31 May 2021

Report

Construction Environmental Management Plan (rev 4)

Holy Cross SHD

CWTC Multi Family ICAV acting on behalf of its SUB Fund
DBTR DR1 Fund

securing right **outcomes**

LOCATION	BLOCKS	LEVELS	DISP.	REPORT NO. | REV
HOLY CROSS LANDS, DRUMCONDRA, D3	A1-A4 B1-B3 C1-C2 D1-D4 E1-E4	ALL (ABOVE AND BELOW GROUND)	PSDP	DCEMP-DCON-RPT-001-04

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DCEMP-DCON-RPT-001-04

1 Executive summary

DCON Safety Consultants has prepared this Construction Environmental Management Plan (CEMP) based on the overall Development Construction Management Plan (DCMP) and Environmental Impact Assessment Report (EIAR). This document includes a description of the proposed works, identifies the control measures to alleviate impacts and specifies an environmental monitoring programme. It seeks to address the following:

- Direct impacts – those impacts associated directly with the environmental aspect, such as increased dust, noise or vibration levels;
- Indirect impacts – those impacts associated indirectly with the environmental aspect, such as transport and disposal of waste;
- Normal situations – progress according to plan;
- Abnormal situations – the project programme not progressing as planned because of unforeseen or unpredictable circumstances; and
- Emergency situations – an unplanned or unwanted situation has occurred, such as fire, explosion or malicious damage.

The CEMP will be reviewed prior to commencement of each construction phase. As the ultimate controlling mind for the works, CWTC Multi Family ICAV acting on behalf of its SUB Fund DBTR DR1 Fund ('CWTC') through their project managers will take the lead in ensuring that there are suitable and sufficient systems and personnel in place that promote environmental control compliance.

1.1 Limitations

The DCEMP has incorporated the alleviation measures and environmental monitoring measures specified in the EIAR. These alleviation and monitoring measures are based on the application of best practice guidance and where relevant regulatory compliance limits. Plans created by contractors will be required to be in compliance with this CEMP. Contractors will prepare detailed Environmental Management Plans specifying the precise location of various elements of their construction programme e.g. the location of stockpile areas, the location and precise method of surface water control measures on each construction area and the location of monitoring points for noise monitoring which may need to be amended as the various phases of construction progress.

2 Project description

2.1 Development introduction (refer also to Appendix A for site redline drawing)

The development will consist of the construction of a Build To Rent residential development set out in 12 no. blocks, ranging in height from 2 to 18 storeys, to accommodate 1614 no. apartments including a retail unit, a café unit, a crèche, and residential tenant amenity spaces. The development will include a single level basement under Blocks B2, B3 & C1, a single level basement under Block D2 and a podium level and single level basement under Block A1 to accommodate car parking spaces, bicycle parking, storage, services and plant areas. To facilitate the proposed development the scheme will involve the demolition of a number of existing structures on the site.

The proposed development sits as part of a wider Site Masterplan for the entire Holy Cross College lands which includes a permitted hotel development and future proposed GAA pitches and clubhouse.

The site contains a number of Protected Structures including The Seminary Building, Holy Cross Chapel, South Link Building, The Assembly Hall and The Ambulatory. The application proposes the renovation and extension of the Seminary Building to accommodate residential units and the renovation of the existing Holy Cross Chapel and Assembly Hall buildings for use as residential tenant amenity. The wider Holy Cross College lands also includes Protected Structures including The Red House and the Archbishop's House (no works are proposed to these Structures).

The residential buildings are arranged around a number of proposed public open spaces and routes throughout the site with extensive landscaping and tree planting proposed. Communal amenity spaces will be located adjacent to residential buildings and at roof level throughout the scheme. To facilitate the proposed development the scheme will involve the removal of some existing trees on the site.

The site is proposed to be accessed by vehicles, cyclists and pedestrians from a widened entrance on Clonliffe Road, at the junction with Jones's Road and through the opening up of an unused access point on Drumcondra Road Lower at the junction with Hollybank Rd. An additional cyclist and pedestrian access is proposed through an existing access point on Holy Cross Avenue. Access from the Clonliffe Road entrance will also facilitate vehicular access to future proposed GAA pitches and clubhouse to the north of the site and to a permitted hotel on Clonliffe Road.

The proposed application includes all site landscaping works, green roofs, boundary treatments, PV panels at roof level, ESB Substations, lighting, servicing and utilities, signage, and associated and ancillary works, including site development works above and below ground.

2.2 Site setting

The Clonliffe College lands are located in Drumcondra which forms part of the 19th century built up area of Dublin city, immediately located outside the Canal Ring. It is a vibrant urban village with a strong mix of retail, services, cafe-restaurants, employment, and education, with excellent transport links to the city centre and beyond. The Clonliffe College lands, subject to the accompanying masterplan, are approximately 12.86 ha in size and are located 1.7 km north of Dublin City Centre.

The lands comprise the Clonliffe College seminary, Holy Cross lands and are bound by Clonliffe Road, Drumcondra Road, the River Tolka, and Belvedere sports pitches and residential development to the east. These lands are a combination of Z12 and Z9 zoned lands. The Z9 lands stretch along the banks of the River Tolka. The lands also include a number of sports pitches, existing large institutional buildings (some of which are protected structures), and a large number of mature trees. The surrounding area is predominately residential in nature, with other land uses such as light industry, and commercial enterprise adjacent, with Tolka Park Stadium to the north of the river, and the sports pitches for Belvedere College to the east. Drumcondra Railway Station is also nearby the site.

3 Construction activities

3.1 Construction schedule (refer also to Appendix B for proposed works programme timelines)

3.1.1 Sequence of proposed works

- Phase 0 - Enabling Works (fencing, hoarding, tree protection, construction of temporary access roads from Clonliffe and Drumcondra Roads and Block A1 basement creation);

- Phase 1 - Blocks D1 and D2 construction with construction vehicular access of Clonliffe Road;
- Phase 2a - Blocks A1 – A4 construction with construction vehicular access off Drumcondra Road;
- Phase 2b – Demolition of selected Block E areas;
- Phase 2c - East West Road construction;
- Phase 3a - Blocks E1 (Seminary, Library and Church) refurbishment works and Blocks E2 & Block B1 construction with construction vehicular access off Clonliffe Road; and
- Phase 3b – Blocks B2 – B3, Blocks C1 – C2 construction with construction vehicular access off Clonliffe Road.

The first construction activity on the development will be a series of enabling works. Enabling works accounts for the provision of site, tree and invasive species protective means, construction of a temporary segregated onsite vehicular roadway and Block A1 basement excavation and piling. Block D2 will commence simultaneously with Block A1 basement excavation and piling works. A more detailed construction programme will be prepared by each contractor in advance of the commencement of any construction works. Each site CEMP will be prepared to reflect the specific details of relevant phase of works scheduled for completion and will be submitted to Dublin City Council (DCC).

4 Method statement for construction

The DCMP provides a detailed description of the construction programme within Appendix B. A detailed Environmental Management Plan and Construction Health and Safety Plan will be developed by each contractor. The implementation of and compliance with this DCEMP will be monitored by an Environmental Officer appointed by CWTC.

4.1 Site preparation works

Site preparation works will include the '*site establishment'* set up by each contractor which will include the following:

- Setting up of access control to the various Block site areas;
- Secure compounds for the storage of all on-site machinery and materials;
- Tree protection means;
- Permanent and temporary hoarding | fencing; and
- Erection of signage.

Prior to commencement of construction, each contractor will consult records and drawings to establish the location of existing buried services | utilities i.e. electricity, gas, water, foul, drainage etc. Where it is necessary to disconnect services | utilities during the construction works for a notable period, appropriate temporary alternative provisions will be provided.

4.2 Construction compounds (refer also to Appendix C for indicative compound locations and servicing connection drawings)

The indicative locations of the construction compound for the development are depicted in Appendix C. Block site compounds will include as a minimum offices, accommodation and welfare facilities. Compounds will be serviced with electrical power, water supply and toilet facilities. Haul routes and storage | staging areas will be established within each Block site area. Storage | staging areas will vary, depending on Block spatial allocation and their exact

locations will be decided taking ecology, proximity to The Tolka River and archaeology into consideration. **Fuel storage areas will not be located within 50.00m of any watercourse**. Suitably robust hoarding will be erected around the perimeter of each storage| staging area; hoarding will typically be standard plywood to a height of 2.40m.

4.3 Excavation works

Excavation works will take place on each Block site to achieve formation levels for e.g., basement, car park ramp access, modification of existing services and the construction of new foundations and services. It is estimated that approximately 100,000 m^3 will be excavated. There will stockpiling of excavated soils for reuse. In the event that short term c24-48-hour storage is required the material will be retained in a designated stockpile storage area identified on the relevant site layout drawings. All excavated soils leaving the site will be recorded using a materials dispatch log detailing the date of transport, vehicle registration, quantity and type of material and destination.

4.4 Potential for historic contamination on the site

A comprehensive soil testing programme is being completed on all of the Block site areas. The chemical quality of the soil is being established by testing an appropriate number of representative samples collected from a range of depths and spread across the proposed excavation footprint of the soils for a range of parameters typically used to establish if a soil is contaminated. Samples are being collected from a range of depths from window sample boreholes, cable tool percussion boreholes and from trial pit excavations. The testing results will be included in a report prepared to establish the suitability of the soils for re-use off-site and form part of the electronic database of accessible environmental information being provided to DCC.

Sample results confirmed that all Block sites are not contaminated. However, in the event of any evidence of soil contamination being found during either the excavation or the construction works, appropriate remediation measures will be employed. Any contaminated soil will be delineated, removed and stored on impervious quarantine areas pending testing to confirm appropriate removal and disposal to permitted | licensed waste facilities. Records of disposal will be retained on site for inspection by DCC.

4.5 Construction of services

4.5.1 Electrical connections

It is anticipated that power will also be required for temporary lighting and temporary signals during the works. If a connection to the existing network is not available a generator will be used on a Block site.

4.5.2 Surface water | drainage system

Temporary construction surface drainage and sediment control measures, including the use of SUDS, will be provided before earthworks commence. The drainage design follows the natural topography of the site and utilises the existing storm water infrastructure within the surrounding infrastructure where possible including The Tolka River.

4.6 Phasing (refer also to Appendix D for phasing plan)

4.6.1 Enabling works

4.6.1.1 Preparatory and site set up works (all Blocks)

- Site cabin delivery and placement;

- Completion of all outstanding required surveys;
- Contractor temporary service installations etc.;
- Construction of appropriate hoarding to neighbouring properties;
- Installation of CCTV coverage or other agreed security means;
- Set up of required noise | dust | vibration monitoring stations | receptors in predetermined areas closest to sensitive locations as defined by the grant of planning;
- Review environmental controls defined within the EIAR;
- Review of pest control needs i.e., pigeons | rats (specialist contractor);
- New builder's supply main board to be installed in an appropriate determined location agreed between the M&E designer, contractor and temporary works electrician;
- New main board will also feed the following:
  - site security load | requirements; and
  - all storage area requirements.
- Site-wide contractor supply and distribution will be agreed with the ESB.

4.6.1.2 Knotweed management | removal

The Management of Japanese knotweed on site shall be overseen by a competent specialist A specific management plan will be prepared and kept for site owners. This Management Plan will be required to be read in conjunction with the Environment Agency Knotweed Code of Practice, Managing Knotweed on Developing Site's, 2013, and Managing Knotweed, Property Care Association, 2014.

- All Knotweed on site will be treated following Best Practice Guidelines while also following guidance on the Herbicides label;
- All Knotweed infested soil to be stockpiled on a ground membrane and stored on site to await haulage to the e.g., IMS landfill facility in Naul, County Dublin. Loading machine will not be allowed track/wheel over infested soils;
- All Knotweed areas on site had temporary barrier fencing and signage;
- Excavation pits when backfilling will be backfilled in layers of 20cm. Each layer will be compacted sufficiently with plant machine;
- Following Best Practice when building near to or over Knotweed it is envisaged that to cover the hardstanding with a Knotweed Root Barrier; and
- Prevention of further spread - All Japanese knotweed areas to be isolated prior to any work being carried out on site. This should include an area of ~ 7.00m laterally from above ground stems to ensure that any underground parts are also isolated.

4.6.1.3 Substructure construction (Blocks A1, B2 & B3, C1 and D2)

The development will include a single level basement under Blocks B2, B3 & C1, a single level basement under Block D2 and a podium level basement and single level basement under Block A1 to accommodate car parking spaces, bicycle parking, storage, services and plant areas. To facilitate the proposed development the scheme will involve the demolition of a number of existing structures on the site. Substructure works will commence at Block A1 and then followed by Blocks D2, B2 & B3 and C1. Substructure works i.e., groundworks | formwork | basement creation (up to ground floor podium) | rising concrete elements | attenuation and drainage etc. will be completed in a sequential series allowing the Block A podium slab for both

sites to be constructed | poured consecutively. As Block A1 podium continue, Blocks A2 and A3 substructure works is intended to commence. Where possible, an overlap of substructure works between Blocks B2 & B3 and C1 will be sought to achieve and maximise supply chain efficiencies for each contractor.

4.6.1.4 Residential block construction (Blocks A, B, C, D and E2)

- Cores are central to each block footprint. For the upper-level slabs to be completed, the core must be cast to that level. To minimise program impact, zones will be created to each basement or podium slab level to allow it to be cast without the core being complete to that level. For example, the use of a propriety vertical wall formwork system that is self-climbing to cast the core may be used;
- The core system will be supported by a tower crane for lifting of materials, an Alimak or alternative means to get workers and tools to the system, and its own satellite concrete placing boom to place concrete;
- Lobby slabs, header beams and stairs will follow the core walls and will be cast as soon as practical to maintain structural stability of the core walls and provide access to cast the core slabs. When the last vertical wall elements are cast, the jump form will be removed in a strategic sequence and manner for safety reasons and to allow the lift motor rooms to be cast as early as possible to get builders lifts operating.
- Structure trades and works will be supported by tower cranes for lifting of materials, formwork hoists to lift recycled formwork, Alimaks or alterative means to transport operatives and materials to the decks, satellite placing booms to place concrete, propriety perimeter edge screens to provide fall protection to operatives;
- The façade will be erected as soon as practical to commence waterproofing floors so that finishes and fit out can commence. The roof embellishments will commence when the structure is complete. These works will not be able to be completed until all plant has been lifted into the plant rooms and the façade has been installed to this level to complete the water tightness of the fabric;
- When slabs are cast and the formwork is stripped, the services will commence to be installed. These works will commence within the building but will not be completed till the façade to that level is complete. The façade provides edge protection for the men working near the edge and provides weatherproofing for equipment that is water sensitive. The works will be organised in several passes, with what we term “rough in of services” being the first pass which is all services that can be installed before the façade is installed to that level;
- Finishes are normally commenced in earnest when the façade is installed to that floor. The services will be scheduled to be completed enough to allow finishes to commence in our programming. Plant, equipment and materials will be lifted to the floors via several means depending on what stage the building is at. The means will be tower cranes, Alimaks or builders lift. The builders lifts will be used for “clean trades” such as services fit off, carpets, ceiling tiles and fit out, to minimise damage to the lifts. Materials that will be hoisted via the Alimaks or Builders lifts will be unloaded in the loading dock to save congestion to the material handling areas; and
- When the fabric of the tower is complete, and the tower cranes have been removed, the gantries will also be removed. This will allow the external works to be commenced and completed in a timely manner. The works will also include restoring any areas that have been affected by the construction of the project. As some of the external works will be to footpaths and roads to mesh them in with the new building, some footpath and lane closures will be required. These will be coordinated with DCC.

4.6.1.5 Hard demolition (non protected areas)

Hard demolition of all non-protected structures. Works include the safe removal of all building structural members, external façades and roof finishes. Each contractor shall:

- Remove all debris and rubbish from the site area to licensed tips;
- Disposal or re-use of demolition materials will be carried out in accordance with the Development Construction and Demolition Waste Management Plan as prepared by AWN Consulting (refer to Appendix F). Records shall be forwarded to the client project manager for information on the quantities disposed;
- Ensure, following the demolition of the buildings (or part thereof), the site shall be left in a tidy and safe condition in agreement with the client project manager;
- Ensure measures shall be taken to ensure that the existing services in the vicinity of each structure are not affected by the demolition works; and
- Seal by means of grouting all drainage within the curtilage of the site not to be removed during demolition of the buildings. Sealing shall only be up to the last manhole within the site.

4.6.1.6 Refurbishment works (Blocks E1 – Seminary, Library and Church)

Isolation of power | energy supplies

Confirmation of isolation by a competent person of all onsite services – services include but not limited to:

- heating pipework;
- sprinklers;
- local electrical distribution boards;
- substation(s);
- water;
- drainage;
- soil pipes;
- general arrangement electrical services i.e., lighting, control panels and fire alarm circuits and systems;
- fire boards; and
- gas mains | skids.

Asbestos removal

- Licenced asbestos containing material removal in adherence with agreed works phasing plan;
- Non-licenced asbestos containing material removal in adherence with agreed works phasing plan; and
- Reoccupation certification will be provided for all areas prior to soft strip works being undertaken.

Soft strip works (subject to safe isolation of electrical, gas and water services within each building | structure)

- Soft strip areas deemed to be safe and not contaminated within each structure – works included removal of all non-load bearing internal structures, finished and FF&E; and
- Soft strip of contaminated areas posts Lead | ACM deep clean and clearance certification receipt of all non-load bearing internal structures, finishes and FF&E:
- carefully cut interface of demolition works and existing retained structure; and
- primary elements of building structures not to be disturbed during soft strip works.

Refurbishment works

- An external independent scaffold will be erected;
- Appropriate temporary works as required will be installed to stabilise external walls prior to any internal remodelling taking place;
- Construction materials will be loaded out by crane and will follow in accordance with the construction programme;
- Scaffolding will be designed to allow for all alterations to facilitate other trades cleaning or repointing the external façade;
- Replacement windows (as required) will be fixed as the frame progresses to maintain water tightness;
- Internal works will commence behind the frame erection on a rolling programme consisting of:
  - services 1st fix;
  - carpentry 1st fix;
  - services 2nd fix;
  - carpentry 2nd fix;
  - decoration;
  - floor finishes; and
  - install fitted furniture.

4.7 Materials – source and transportation

The selection and specification of construction materials will be informed by the local availability of these materials. Within the necessary constraints of performance, durability and cost, construction materials will be sourced from local suppliers and manufacturers, where possible.

4.8 Health and safety

The DCMP is the overall development governance and control document that will act as the boilerplate template for all site-specific health & safety documentation complying with the relevant planning condition and other documentation required under the Safety, Health and Welfare at Work (Construction) Regulations, 2013 – 2020. Each site-specific Preliminary Safety & Health and Construction Stage Health & Safety Plan will be reviewed as the development progresses. The contents of the Health and Safety Plan will comply with the requirements of the Regulations. Safety on site will be of paramount importance. During the selection of the relevant contractor and the respective subcontractors their safety records will be investigated. Only contractors with the highest safety standards will be selected.

Prior to working on site, each individual will receive a full safety briefing and will be provided with all of the safety equipment relevant to the tasks the individual will be required to perform during employment on site. Safety briefings will be held regularly and prior to any onerous or special task. 'Toolbox talks' will be held to ensure all workers are fully aware of the tasks to be undertaken and the parameters required to ensure that the task will be successfully and safely completed.

All visitors will be required to wear appropriate 6-point personal protective equipment prior to going on to the site and will undergo a safety briefing by a member of the site safety team. Regular site safety audits will be carried out throughout the construction programme to ensure that the rules and regulations established for the site are complied with at all times. At any time that a potentially unsafe practice is observed, the site safety manager will have the right as well as the responsibility to halt the work in question, until a safe system of working is again put in place.

4.9 Employment and accommodation

Office accommodation and other construction facilities will be located on each site for the construction phase. All units will be of a high standard in accordance with statutory regulations as a minimum and the current CIF C-19 Safe Operating Procedures. The co-ordination of people and materials on site will be one of the key activities throughout the construction phase of each Block. The DCMP seeks to designate traffic routes, timings and parking arrangements. It is envisaged that typical working hours during the construction phase will be as follows:

4.9.1.1 Working Hours

- CWTC will establish a Client Liaison Officer (CLO) so that particular issues | complaints may be quickly identified and responded to. CLO details will be shared with residents;
- Working hours are determined and conditioned by the Grant of Permission - envisaged working hours for all Blocks is 07:00 – 18:00 Monday to Friday and 08:00 – 14:00 on Saturday.
- It is recognised that there may be circumstances where the restriction on hours of work cannot be adhered to e.g., concrete pours, power floating works, works on or adjoining the Luas line outside Luas operating hours etc. In these circumstances each contractor will be required to provide written agreement with DCC before any works start outside normal hours;
- Where out of hours works are noise sensitive, such exceptional events will only be permitted to be undertaken when all other alternatives have been considered and exhausted. Any night time operations in particular will comply with good alleviation practices as specified by British Standards or similar;
- All such works above will be preceded by written approval from the Planning Authority, showing evidence of consultative communications with local residents and businesses. Each contractor in these circumstances must ensure that appropriate notice (10 working days) is given to the CLO to update DCC and local residents;
- Deliveries will be sequenced 'just in time' to ensure that their arrival and departures time are outside high traffic interface periods. Delivery vehicles are to enter and exit the site through an agreed travel plan detailed within the CMP. Each contractor is responsible to ensure compliance with this;
- Deliveries are not permitted to hold | temporary wait on any approach public roadway unless previously agreed with DCC Roads and Traffic Department;

- Operatives may access their site prior to 7:00 but are not permitted to operate construction machinery before 07:00; and
- No significant work will commence before 07:00 with no vehicles queuing on public roadways unless otherwise agreed with DCC Roads. Vehicle engines will be required to be turned off while onsite before 07:00.

5 Construction phase environmental impacts and alleviation measures

5.1 Introduction

The development will generate emissions during the construction phase these include emissions to air (dust, noise and vibration), construction traffic, surface water run-off or infiltration to groundwater. In addition, leaks or spills from fuel storage areas and construction plant and equipment will have the potential to impact on soil, surface water and groundwater quality. The DCEMP includes emission limits for the various environmental media that require monitoring. The emission limits presented below have been established having regard for the limits outlined in the EIAR and best practice guidance for the respective media. They include for Trigger and Action Limits the details of which are discussed further in the relevant subsections below. CWTC will establish a Community Liaison Officer (CLO) so that particular issues or complaints in relation to construction related impacts including environmental issues may be quickly identified and addressed. Issues in relation to environmental nuisance will be addressed by an Environmental Monitoring Officer who will brief the CLO who will then update the key stakeholders on the actions being taken to alleviate environmental complaints and or breeches of environmental monitoring limits.

5.2 Environmental Monitoring Officer

As will be expected to be required, An Environmental Monitoring Officer (EMO) will be appointed by the Development Team. The EMO will review each contractor's CEMP to ensure that it meets the requirements of this DCEMP. The EMO will also review monitoring reports to be prepared by each contractor based on the requirements specified in DCEMP to ensure that the construction does not impact on the environment and surrounding residential occupants and the general public.

The role of the EMO will be discussed with the Environment Section of DCC. The EMO will act as liaison between each contractor, DCC and the Community Liaison Office and will be the single point of contact to ensure compliance with the implementation of the contractor's CEMP and compliance with emission limits for environmental media where these are specified. The EMO will review monitoring reports prepared by each contractor and provide summary of reports assessing compliance with the limits for surface water quality, noise, vibration and dust specified in the CEMP. The EMO will also report on any incidents such as spills or leaks and how such incidents were dealt with to alleviate environmental impacts. These summary reports will be made available for review by DCC and interested parties.

In the event of an exceedance of Trigger Limit each contractor will be obligated to implement the following measures

- Repeat measurement to confirm findings;
- Identify source(s) of impact;
- Inform EMO;
- Check monitoring data, all plant, equipment and relevant Contractor's working methods; and

- Discuss alleviation measures with EMO;

Each contractor will be required to prepare an Environmental Management Plan (EMP) having regard for this DCEMP. Following a review and approval of each contractors EMP the CEMP will be updated accordingly to reflect the precise details of the various measures to alleviate environmental risk as outlined in the EIAR.

5.3 Noise

The construction phase will involve site clearance, excavation and the construction of buildings and structures associated with the proposed development. No significant demolition will take place on the development until the Seminary is vacated in Q4 2022. At this stage, all non protected structures will be demolished within Block E. A variety of items of mobile plant will be in use, such as excavators, lifting equipment, dumper trucks, compressors, generators and pile drivers. It had initially been proposed to use a rock crusher on site to process rock excavated to achieve formation level beneath the development footprints. There will be vehicular movements to and from the sites that will make use of the existing roads and site access points. These are outlined in detail in the DCMP.

A number of measures will be employed by each contractor 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. 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:

- 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. Plant will not be left idling. No maintenance or repair to plant or machinery will be permitted outside of the permitted construction works hours;
- Hours of work - all construction related works, other than emergency works and security will be carried out during normal construction working hours;

The following alleviation measures are specific to the operation of the onsite mobile crusher, in accordance with measures outlined in BS5228:

- Locating any crushing plant as far from sensitive receptors as possible (minimum of 200.00m).
- The crushing plant will be fully enclosed;
- Materials should be lowered into the crusher and not dropped; and
- Plant will be maintained to minimise noise generation.

Each contractor shall develop a noise and vibration monitoring regime for the duration of the construction works. At a minimum, the regime will include the following:

- Prior to the commencement of the site construction activities noise and vibration monitoring is to be undertaken by each contractor at the proposed baseline monitoring stations to monitor the impact of site activities on local receptors;

- Monitoring data shall be summarised and updated weekly and will be shared with relevant parties. Should construction noise limit criteria exceed the trigger limits appropriate measures shall be implemented;
- In the event that action limits are exceeded works will be suspended in the relevant area(s) until the issues causing the exceedances are identified and alleviated.
- During the construction phase monitoring will routinely be undertaken weekly but the frequency will be amended where complaints are received or where trigger limits are being exceeded.
- To assess construction noise levels measurements will be undertaken inside the hoardings. Measurements will be undertaken separately outside the hoarding to establish background noise emission levels beyond the site boundary i.e., those likely to be associated with traffic or other activities not related to the construction programme.
- Section 5.3.1. details the noise limits proposed for pre-construction and during routine construction noise monitoring. They are based on having regard for NRA Guidelines 2014. They include for Trigger and Action Limits. The trigger limits are 87.5% of the maximum permissible limits specified in the EIAR.

5.3.1 Trigger and action noise monitoring limits

Days & times	$L_{Aeq\ (1hr)}$ dB	$L_{pAmax,\ slow}$ dB
Monday to Friday 07:00 to 18:00hrs Trigger	63	72
Monday to Friday 07:00 to 18:00hrs Action	70	80
Saturday 08:00 to 14:00hrs Trigger	58.5	67.5
Saturday 08:00 to 14:00hrs Action	65	75

The noise monitoring programme will include the following:

- Noise monitoring to include Tonal analysis; and
- All noise and vibration monitoring data shall be compiled into a weekly technical monitoring report by each contractor's Site Manager for review and approval by the Environmental Monitoring Officer. The report shall be based on BS5228 "*Noise Control on Construction and Open Sites*" shall be submitted.

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

- Name and address of complainant;
- Time and date complaint were 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; and
- Investigative and follow - up actions.

5.4 Vibration

Vibration monitoring will include the following:

Vibration monitoring stations must continually log vibration levels using the Peak Particle Velocity parameter (PPV, mm/s) in the X, Y and Z directions in accordance with BS ISO 4866:2010: Mechanical vibration and shock - Vibration of fixed structures - Guidelines for the measurement of vibrations and evaluation of their effects on structures. Vibration monitors, of both aural and visual type, with real time outputs are to be located at agreed points. Traffic light system to be in place consisting of:

- Green-vibrations below all threshold limits - OK TO PROCEED;
- Amber-vibrations exceed first threshold limit - STOP AND CHECK; and
- Red-vibrations exceed second threshold - STOP AND ACTION.

Dilapidation surveys of all properties adjoining works shall be undertaken prior to any works commencing on site. The results of these results will inform any specific requirements in terms of potential locations for vibration monitors. Allowable vibration velocity (Peak Particle Velocity) at the closest part of any sensitive property to the source of vibration at the frequencies specified in Section 5.4.1 below.

5.4.1 Vibration monitoring limits

Frequency	<10Hertz -	10-50 Hertz	50-100Hz and above
Limits Red	8mm/s;	12.5mm/s	20mm/s
Limits Amber	7mm/s	11.0mm/s	15mm/s
Limits Green	<7mm/s	<11.0mm/s	<15mm/s

5.5 Dust

Dust emissions are likely to arise from the following activities during the construction works:

- Site 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 construction site is considered to be at a 'major' scale. This category has the potential for significant soiling impacts within 100.00m; PM_{10} impacts within 25.00m; and vegetation

impacts within 10.00m 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 activities and site haul roads during dry weather using mobile bowser units;
- Provision of wheel wash for all other construction site activities;
- Control of vehicle speeds and speed restrictions; and
- 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.

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. This will help 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 each contractor through regular servicing of machinery;
- Surrounding public 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;
- 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 for all other construction activities for use by all vehicles exiting the site prior to them entering onto the surrounding public roads. These facilities will contain rumble grids to remove excess mud and other waste from wheels, ensuring that these potential dust producing materials are not released onto surrounding public roads. The wheel wash facilities will be self-contained, ensuring that wastewater discharges to nearby water bodies are not necessary. The facilities will be located away from sensitive receptors, where possible;
- 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. Each 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; and
- 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 alleviation 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 when not required. This will help limit potential drainage related impacts on site.

5.5.1 Dust monitoring

Dust deposition monitoring will be carried out at the nearest sensitive receptors to the proposed development 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. Results will be compared with TA Luft guidelines. The guideline dust deposition limit is **350 mg/m2/day (averaged over a 30-day period)**. This limit will be applied on site. This guideline limit is widely applied in Ireland to identify periods of dust nuisance.

The precise location of the dust gauges will be determined by a qualified air quality expert appointed by each contractor to ensure that dust gauge locations are positioned in order to best determine potential dust deposition in the vicinity of site boundaries and existing buildings. Dust monitoring will be completed monthly with the results reported to the EMO. Quarterly Monitoring reports detailing all measurement results shall be prepared and submitted to the EMO for review. Reports will be maintained on site for inspection if/when required by DCC.

Where exceedance of dust emission limits occurs on a monthly basis or where complaints are received an assessment will be undertaken to identify the source(s). This will include an assessment of the construction works taking place, potential off-site sources and meteorological conditions. Should the construction works taking place be identified as the primary cause of the exceedance, each contractor will ensure that the alleviation measures listed above are improved upon. Should exceedances of the guideline limit value continue to occur following these improvements, each contractor will provide alternative alleviation measures and/or will modify the construction works taking place.

5.6 Carbon emissions

The following alleviation measures will be implemented to minimise CO_2 emissions:

- Materials required for the construction works will be sourced locally where possible. Rock crushing will be undertaken on site where possible, to reduce the requirement to import crushed stone to site;
- A detailed Construction Traffic Management Plan will be implemented in full. This plan will seek to minimise congestion and encourage car sharing and the use of public transport by site personnel (refer also to Appendix E);
- 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;
- The regular maintenance of plant and equipment will be carried out;
- Each 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 taps fittings and showers; and
  - The use of solar/thermal power to heat water for the on-site welfare facilities including sinks and showers.

5.7 Land, soils and groundwater (refer also to Section 5.8)

The employment of the following good construction management practices will minimise the risk of pollution of soil and groundwater:

- Each 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 each 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;
- No stockpiling of soils will be undertaken within 50.00m of The Tolka River. It is proposed to excavate and load soil and subsoil directly to haulage vehicles for removal off the site. However, in the event that excavated soil 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 each contractors EMP, the location of stockpiled materials will be

agreed with the EMO and the Project Ecologist in advance of placement to ensure they do not impact on surface waters 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 by each contractor. Such practices will include adequate bunding for all potentially contaminating liquids including fuel and lubricating oils and chemicals, wheel wash and dust suppression on site roads, and regular plant maintenance to ensure ecologically protected sites and sensitive receptors (e.g., The Tolka River);
- Materials such as, fuels, chemicals, lubricants and hydraulic fluids will be carefully handled to avoid spillages. These materials will be stored within double sealed tanks with bunds to prevent any seepage of same into the groundwater. A fuel filling point will be set-up on site with all plant to be brought to this point for filling. Potential pollutants will also be adequately secured against vandalism and will be clearly marked. Any spillages will be immediately contained, and contaminated soil removed from the site and disposed of in a licensed waste facility; and
- Local dewatering and collection of groundwater during construction may require disposal. Disposal of groundwater during construction will be to the surface water sewer system following suitable pollution control and attenuation measures protecting The Tolka River. The precise measures to be used will be agreed in advance with the EMO and Project Ecologist.

5.7.1 Groundwater monitoring

The geotechnical site investigations findings indicate that bedrock excavation will not be required during the excavation works to achieve formation level. For this reason, dewatering is likely to be very limited. 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 basement 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.

5.8 Surface water

Surface water run-off from surface 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;
- 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 poses a threat to aquatic species living in the Tolka River**.

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.

5.8.1 Surface water alleviation measures

Prior to construction each contractor will prepare a detailed Environmental Management Plan for each Block site | phase which will incorporate as necessary the following alleviation measures which will apply for the prevention of pollution to all waters during construction:

- 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:
  - DCC, the EPA and the ERFB;
  - Audit and review schedule;
  - Telephone numbers of DCC 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; and
  - Ensure that all appropriate licences required for construction are obtained from the relevant authorities.

Each contractor is expected to comply with the following guidance documents:

- CIRIA – Guideline Document C532 Control of Water Pollution from Construction Sites (CIRIA, 2001) and
- CIRIA – Guideline Document C624 Development and Flood Risk -guidance for the construction industry (CIRIA, 2004).

The following alleviation measures will be used to control the interaction of wash down water from concrete and cementitious material with surface water:

- Any mixing activities will be located in areas 50.00m 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;
- 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.

As per the above listed guidelines, protection measures will be put in place to ensure that all materials used during the construction phase are appropriately handled, stored and disposed of in accordance with recognised standards and manufacturer's guidance.

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 portions of the DCC sewer network.

Where available proposed permanent connections to the public sewer systems required for the operational phase will be used temporarily for the construction phase, to optimise efficiencies and avoid the creation of new outfalls for temporary construction only.

De-watering operations and surface water run-off discharge on the site, during construction and prior to completion will be controlled and discharged only to the existing sewerage system at an agreed rate of flow in consultation with Irish Water, DCC 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 will be achieved by the construction of filter strips incorporating Straw Bales to reduce sediment loading, settlement tanks, the installation of proprietary surface water treatment systems including Class 1 full retention petrol interceptors and spill protection control measures. Settlement tanks 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 DCC.

Carbon dioxide is accepted "best practice" within the Construction Industry as a neutralising agent due to its environmental and health and safety benefits. It is self-buffering and is virtually impossible to acidify the water through overdosing. The by-products of neutralising the water with CO2 are non-hazardous thereby reducing the impact on the receiving system.

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

5.9 Surface water monitoring parameters

As well as daily visual checks on quality the parameters outlined in Section 5.9.1 will be monitored and analysed during construction, in order to ensure maintenance of water quality protection. Monitoring frequencies are also outlined below. This is in accordance with Transport Infrastructure Ireland (TII)'s 'Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan.' It is considered that the parameter limit values (Guide/Mandatory) defined in the Freshwater Quality Regulations (EU Directive 2006/44/EEC) should act as a trigger value for the monitoring of surface water i.e., the monitoring programme should be able to demonstrate compliance with the limit values for all surface water targeted sampling. The TII Guidelines further specify a recommended frequency and manner of sampling which should be employed during construction monitoring of surface water in order to demonstrate compliance with EU limit values.

5.9.1 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.
Dissolved oxygen	50% of samples ≥ 9 (mg/l O2) 100% of samples ≥ 7(mg/l O2)		Weekly, minimum one sample representative of low oxygen conditions of the day of sampling.
pH		6-9	Weekly
Nitrites	≤ 0.01(mg/l NO2)		Monthly
Suspended Solids	≤ 25(mg/l)		Monthly
BOD5	≤ 3(mg/l)		Monthly
Phenolic Compounds			Monthly where the presence of phenolic compounds is presumed (An examination by taste)
Petroleum Hydrocarbons	5(mg/l)		Monthly (visual)
Non-Ionized Ammonia	≤ 0.005 (mg/l NH_3)		Monthly

Total Ammonium	≤ 0.004 (mg/l NH_4)		Monthly
Total Residual Chlorine		≤ 0.005 (mg/l HOCl)	At appropriate intervals where works activities associated with the scheme have the potential to alter the Total Residual Chlorine of the waters
Electrical Conductivity			Weekly

The monitoring parameters are as presented in the EIAR will be discussed and agreed with DCC.

5.10 Biodiversity

A Habitat Management Plan (HMP) will be prepared for the development by each contractor. The HMP will seek to detail how habitats will be retained, protected and managed during the construction phase of the development. In order to ensure that alleviation measures proposed in the HMP are complied with and to monitor the construction phase, Ecologist Consultants will be appointed for the duration of the project and for an appropriate period of time following completion.

5.10.1 Implementation of a HMP

Each contractor shall be responsible for ensuring a HMP is implemented. The contractor's Site Manager shall:

- Liaise with the Project Ecologist in terms of implementation of the plan.
- The contractor shall schedule meetings with the Project Ecologist to discuss progress towards completing the Fisheries Protection Measures and involve the Project Ecologist as necessary;
- Report and record any incidents resulting in damage to or destruction of habitats, and injury or death to fauna.

The primary responsibilities of the PE will be to:

- Act as the primary on-site ecological contact for the implementation of the HMP;
- Ensure compliance with all recommendations of the HMP during regular site inspections;
- Request relevant records and documentation from the contractor where necessary;
- Attend routine meetings with the contractor;
- Keep detailed records of any ecological incidents and report these;
- Keep records of any variations to construction methods or design brief and modify HMP recommendations; and
- Produce the staged monitoring reports on flora and fauna as detailed in the Schedule of Reporting Requirements. The Project Ecologist will submit these to the EMO. The Project Ecologist will also act as overall technical advisor to the project regarding implementation of the HMP actions.

Typical habitats and species directly or indirectly affected by the development include:

- Recolonising bare ground;
- Tall herb swamp | reed and large sedge swamps;
- Faunal species;
- Breeding birds; and
- Bats.

Objectives and actions for habitats and species are outlined below:

5.10.1.1 Objectives and actions for habitats relevant to a HMP

Action	Habitat	Objective	Target	Responsible Personnel	Action
H1	Recolonising bare ground	Offset habitat loss	Provision of replacement planting and new tree planting to offset habitat loss.	Site Manager and Project Ecologist (SM and PE)	1) Species and structure of the new streetscape tree and grassland planting to be planted are determined by the details included in the EIA report submitted alongside the application for Planning permission; 2) Planting should be as soon as possible to allow for growth but should not be put at risk of accidental damage due to machinery movement etc.;
H2	The Tolka River	Minimise risk of contamination of water body	Turbidity to be limited to area behind silt fences only.	SM and PE	3) Works to adhere to the Fisheries Protection Method Statement 4) Project Ecologist to monitor works to the bankside.
H3	Tall herb swamp/reed and large sedge swamp	Ensure no net loss of habitat	Ensure no net loss of habitat	SM and PE	5) Project Ecologist to translocate plugs of vegetation removed during bankside works into permeable plastic crates; 6) Crates to be anchored to the bed of the river away from the works area during the works; 7) On completion of the works, plugs to be replanted in areas to be agreed with the PE and monitored for re-growth. New plugs will be taken from other areas if unsuccessful growth; and 8) Areas of exposed sediment that may be uncovered due to lower water levels to be

					monitored for recolonisation. If no regrowth after two growing seasons, then plugs of vegetation to be planted.

5.10.1.2 Objectives and actions for faunal species relevant to a HMP

Action Ref	Species	Objective	Target	Responsible Personnel	Action
S1	Breeding birds	Avoid mortalities of breeding bird populations	No reports of infringements by SM/PE	SM and PE	1) Set up clearly fenced exclusion zones around dripline of hedges and treelines from 1st March - 31st August 2) Avoid groundworks & removal/trimming of any scrub, hedges and treelines from 1st March-31st August
S2	Bats	Avoid light-induced disturbance	Maintain bat activity around site perimeter	SM and PE	3) Lighting controls during construction and operation in accordance with best practice

5.10.2 Monitoring requirements

To ensure that HMP actions are achieving the required objectives for each habitat and species, supervision and monitoring is required. Section 5.10.2.1 lists the schedule of monitoring required for each habitat/species, the personnel responsible, the methodologies employed, and the reporting outputs produced. It should be noted that these commitments are being made by the applicant in the context of several planning permissions but that measures listed below apply specifically to the application lands.

If vegetation restoration fails to meet targets, then management action should be undertaken. Further ecological advice and consultation will be required to determine the correct course of management action. Meetings will be scheduled between the DCC, the Project Manager, and the Project Ecologist as required.

Monitoring requirements may apply to the lands described in the planning application and this responsibility may be transferred to new operators or owners in the future as deemed appropriate. Other landowners in the area will be responsible for meeting the monitoring requirements for their own lands and it is expected that the client will coordinate the overall survey and reporting aspects of these requirements.

5.10.2.1 Schedule of monitoring reports undertaken by Project Ecologist

Ref	Monitoring Item	Personnel	Schedule	Methods	Outputs	Target
M1	Vegetation health and recolonisation	Project Ecologist	No pre-construction baseline required.	[1]NVC Phase 21 of 10 x 2m Quadrats: 5 no. quadrats along grass verges in areas	Report and Habitat Map of status of 1. Quadrat GPS locations	Maintain baseline species richness and diversity

			Post-Construction: - 1, 3, 5 years after completion.	of wildflower recolonisation;	2. NVC Attributes2 3. Species Diversity Indices` 4. pH	established in ECIA surveys
M2	1. Bat activity	Project Ecologist	Pre-Construction baseline required in summer 2021 Post-Construction: - 1, 3, 5 years after completion	Indicator parameters will include bat activity index (bat recordings per hour), species distribution density and species diversity	2. Report and Map of bat activity	Maintain bat diversity, activity and flight paths

5.11 Fisheries protection measures

The aim of the Fisheries Protection Measures (FPMs) is to ensure the protection of the existing attenuation pond which drains into the Tolka River and associated tributaries. These measures were prepared following consultation with Inland Fisheries Ireland (IFI). The Project Ecologist will act as the primary on-site ecological contact for the implementation of the FPMs including;

- Ensure compliance with all recommendations of the FPMS during regular site inspections;
- Request relevant records and documentation from the contractor's Site Manager (SM) where necessary;
- Attend routine meetings on FPMs;
- Keep detailed records of any ecological incidents and report these to the Project Manager;
- Keep records of any variations to construction methods or design brief and modify FPMS recommendations in consultation with the Project Manager; and
- Produce the staged monitoring reports on flora and fauna as detailed previously in this report.

Development works have the potential to affect the Tolka River into which it will drain. The Tolka River supports migratory sea trout in addition to resident brown trout populations. The presence of these fish populations highlights the sensitivity of local watercourses and the Clonliffe | Drumcondra catchment in general. Development works will require excavation near to the edge of the river bank, removal of emergent reedbed vegetation and the potential for sediment release to the Tolka River. There are no significant works occurring to the river itself. There will also be localised earthmoving works associated with construction of the path and block wall.

5.11.1.1 Alleviation measures

- Works that may require "instream" work will take place May-September only;
- Passage for fish upstream and downstream will not be impeded;
- Prior to any machinery working on site for any purpose, the working area will be marked out with wooden stakes and where necessary, hazard tape deemed will be erected to identify the working limits;

- Working limits to be checked at the end of every day by the contractor;
- Provision of measures to prevent the release of sediment during the construction work will be installed prior to any site clearance. In respect to works in the river these measures may include but not be limited to the use of silt fences, sedimentation mats etc.;
- Provision of exclusion zones and barriers (sediment fences) between earthworks, stockpiles and temporary surfaces to prevent sediment washing into the receiving water environment;
- Temporary construction surface drainage and sediment control measures will be in place before earthworks commence;
- If pouring of cementitious materials is required for the works adjacent to the river, surface water drainage features, or drainage features connected to same, this will be carried out in the dry;
- Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to surface water. Concrete washout areas will be located remote from any surface water drainage features to avoid accidental discharge to The Tolka River;
- No storage of hydrocarbons or any polluting chemicals will occur within 50.00m of the surface water network. Fuel storage tanks will be bunded to a capacity at least 110% of the volume of the storage tank (plus an allowance of 30mm for rainwater ingress). Refuelling of plant will not occur within 50.00m of the surface water network and only in bunded refuelling areas;
- Emergency procedures and spillage kits will be available and construction staff will be familiar with emergency procedures;
- Implementation of measures to minimise waste and ensure correct handling, storage and disposal of waste;
- If any heavily contaminated land is encountered during construction, it will be removed off-site and be disposed of at a licenced waste facility;
- Contaminated groundwater, if encountered on site, could result in contaminated waters being discharged from the construction site. Any such contaminated waters will be treated via the appropriate measures dependent on the nature of the contamination prior to discharge to the surface water network;
- If dewatering is required, water must be treated prior to discharge to the existing sewer or watercourse. This will include treatment via petrol interceptor and treatment for silt removal either via silt trap, settlement tanks or ponds;
- There will be no direct pumping of contaminated water from the works at any time;
- Foul drainage from site offices and compounds, where not directed to the existing wastewater network, will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations, to prevent the pollution of watercourses;
- 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 non-compliance incident is summarised below; and
- Ensure site staff are trained in the implementation of the Emergency Response Plan and the use of any spill control equipment as necessary;

To ensure that FPMs actions are achieving the required objective, supervision and monitoring is required. Visual checks of the river and outflow will take place on a daily basis and twice per

day during the installation of the outfall and the earthworks stage for the attenuation pond. A log of observations will be maintained on site and available for inspection at any time.

5.12 Landscape and visual

During the construction phase, all site areas within view of any local dwelling will be enclosed with robust and visually impermeable hoarding or boundary wall to a minimum height of 2.40m.

5.13 Waste management

Waste will be produced from surplus materials such as broken concrete blocks or off-cuts of timber, plasterboard, tiles, bricks, etc. during the construction phase. Waste from the oversupply of materials, packaging (cardboard, plastic, timber) and typical municipal wastes from construction employees including food waste will also be generated. The recommended waste management alleviation for the construction phase of the proposed development is included in the Construction and Demolition Waste Management Plan (C&DWMP) which meets the requirements of the '*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects* (DoEHLG, 2006)' (refer to Appendix F). 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 contractor's 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 specifically address the following points:

5.13.1 Overall waste management

- Analysis of waste arising | material surpluses';
- Specific Waste Management objectives of the Project including waste minimisation and the potential to reuse, and process materials generated on site in the construction phase;
- Methods proposed for Prevention, Reuse and Recycling;
- Waste Handling Procedures;
- Waste Disposal Procedures, including tracking of waste to final destination;
- Waste auditing; and
- Record keeping, including gate receipts for waste brought to authorised Waste Handling Facilities.

5.13.2 Waste compound

- Details of the 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 Permitted Waste Contractors who shall be employed to collect and dispose of waste arising from the construction works.

5.13.3 Waste reuse and recycling management

- Identification of potential for Reuse of Inert Wastes; and Proposed management measures.

5.13.4 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, each contractor must notify DCC 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).

5.13.5 Construction waste

5.13.5.1 Waste management (collection Permit) Regulations, 2007 as amended

- Waste from the proposed development may only be collected by the holder of a waste collection permit or a local authority. Waste collection permits are granted in accordance with the Waste Management (Collection Permit) Regulations, 2007 as amended. Waste storage and collection areas on site should be designed to prevent environmental pollution.

5.13.5.2 Waste management (shipments of Waste) Regulations 2007 S.I. No. 419

- Where waste from the proposed development is exported outside of Ireland for recovery or disposal the national TFS office within Dublin City Council must be notified. Certain financial guarantees must be in place and certified issued by the national TFS officer prior to the waste movement taking place.

5.13.5.3 Construction stage waste

- During actual construction activities, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete tiles, glass etc. some packing waste is also expected to be produced. Surplus soil / gravel is expected to be produced due to cut / fill activities;
- This is anticipated to consist of surplus of materials arising from cut-offs of concrete blocks, bricks, tiles, timber joists, steel reinforcement etc.; and
- Waste from packaging and oversupply of materials is also expected.

5.13.6 Roles & training for waste management and site crew Waste Manager

- A dedicated Waste Manager will be appointed by each contractor to ensure commitment, efficiency and site protocols upheld during construction stage;
- The role of the Waste Manager will be to record, oversee and manage everyday handling of waste on the site;
- Their training will be in setup and maintaining record keeping systems and how to produce an audit to ensure waste management targets are being met; and
- They shall also be trained in the best methods for segregation and storage of recyclables. They will also be familiar with the suitability of material reuse and know how to implement the C&D.

5.13.7 Tracking and documentation procedures for off-site waste

The Waste Manager will maintain a copy of all waste collection permits. If waste (soil & stone) is being accepted on-site, a waste docket must be issued to the collector. If the waste is being transported to another site, a copy of the waste permit or EPA Waste Licence for that site must be provided to the waste manager. If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) document must be obtained from Dublin City Council (as this is the relevant authority on behalf of all authorities in Ireland) and kept on-site along with details of the final destination (permits, licences etc). 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. All information will be entered in a waste management system to be maintained on-site.

5.13.7.1 Record keeping

Records shall be kept for each material leaving the site for all types of use or disposal. This shall take the following basic outline form:

- Waste taken for reuse off site;
- Waste taken for recycling;
- Waste taken for disposal; and
- Reclaimed waste materials brought to site for reuse.

For any movement of waste, a docket shall be signed and recorded by Waste Manager, detailing type and weight of material and source or destination. This will be readily comparable with all delivery records to site, so a waste generation percentage for each material can be determined. This will allow ease of comparison of figures with targets established for the recovery, reuse and recycling of Construction waste. It will also highlight the source of failure in meeting these targets.

5.13.7.2 Waste audit procedure

The Waste Manager shall perform audits at the site during the complete construction phase of the works. This shall ensure that all records are being maintained for all movements of all materials. Records shall also be readily available for comparison with the sites targets. At completion of the Construction phase a final report will be prepared outlining the results of the Waste Management process and the total reuse, recycling and recovery figures for the site.

5.13.8 Consultation with relevant bodies

DCC will be consulted throughout the construction phase to ensure that all available waste reduction, reuse and recycling options are being explored and utilised and that compliant Waste Management is being carried out at the site. Specialist companies, wherever required, will be contacted to determine their suitability and each company's record reviewed to ensure relevant current collection permits / licenses are held. Companies will also be contacted to gather information regarding treatment of hazardous materials, if required (although not anticipated for this site), costs of handling and the best methods of transportation for recycling or reuse when hauling off site.

5.13.9 Pest control

Each contractor will be required to adopt an Integrated Pest Management Plan as part of the works. This plan will establish a sustainable approach to managing pests in order to minimise health and environmental risks throughout the construction works and is to be prepared in accordance with the guidelines set out in the '*Rodent Control for Construction Industry' information* leaflet as issued by the Health Service Executive, Environmental Health Service, 2009. Each contractor will be responsible for ascertaining if the proposed lands are currently infested rodents and other pests. If so, any lands will be required to be disinfested by a pest control specialist, as is reasonably possible given the nature of the site. Throughout the works, each contractor will be responsible for ensuring that a good standard of hygiene is maintained to limit the attraction of rodents and other pests to the site. Measures are to include, but are not limited to the following:

- Waste food, empty food tins, and other waste to be stored in bins with sealed lids;
- Accumulations of construction debris which may provide harbourage for rodents are to be cleared away regularly and in a timely manner; and
- Stocks of building material are to be neatly stored.

Each contractor shall implement measures to prevent infestations during the proposed works. This will include infestation of existing and proposed drains, sewers, ducts and nearby properties. Measures are to include, but are not limited to the following:

- Removal of all existing refuse from site;
- During the laying of new drains, the sewers, open pipe ends, and manholes are to be protected against entry by rodents when work is not in progress – particularly at night time; and
- Surface water pipes discharging into watercourses to be fitted with an antiflood flap valves at outlet points.

A finalised Pest Control Management Plan is required to be submitted by each contractor to CWTC Multi Family ICAV acting on behalf of its SUB Fund DBTR DR1 Fund prior to commencement of works.

6 Environmental emergency response plan

Emergency response preparedness will be addressed in detail by the selected contractor. Environmental emergencies at the site requiring intervention will 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 each 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 each 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; and
- An incident investigation will be performed in accordance with procedures and the report sent to the Development team Project Manager.

Each contractor 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 contractor's Contracts Manger in liaison with the Project Manager and contractors 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 Safety Data Sheets (SDS) pertaining to their works is kept on file and up to date in their site offices. Each contractor will also retain a duplicate copy of all SDSs held.

Appendix A – Development site redline boundary drawing

ALL DIMENSIONS TO BE CHECKED ON SITE
NO DIMENSIONS TO BE SCALED FROM THIS DRAWING
DRAWING IS TO BE READ IN CONJUNCTION WITH RELEVANT CONSULTANTS DRAWINGS

A1

N

Room Number Legend

- 1 Bed
- 2 Bed
- 3 Bed
- Studio
- Lobby
- Residents Lounge
- Cafe /Retail

Site Boundary
- Site boundary subject of application

Access Points
- Proposed car park entrance
- Proposed bicycle parking entrance
- Proposed building entrance
- Proposed unit entrance

Basement outline

LANDSCAPE KEY:

- MOBILITY IMPAIRED PARKING
- BIN/WASTE COLLECTION
- ESB STATION
- ESB/CIE STATION
- PL PLATFORM LIFT
- CAR CLUB
- SIGNAGE
- BIKE PARKING
- COLLAPSABLE BOLLARD
- LIGHTING

REV	DATE	DESCRIPTION	CHK	DRN
P2	May 2021	Issued for Planning	BG	BF
P1	Nov 2020	Issued for Pre Application consultation	BG	BF

STATUS CODE DESCRIPTION
ISSUED FOR PLANNING APPROVAL

APPLICANT NAME
CIRTC Multi Family ICAV acting on behalf of its sub-fund DDTR CR1 Fund

PROJECT NAME
Holy Cross College SHD

LOCATION
Holy Cross College, Clonliffe Road, Dublin 3 and Drumcondra Road Lower, Drumcondra, Dublin 9

DRAWING
Proposed Site Plan - Typical Level 02

PROJECT NUMBER	DATE
20054	May'21
SCALE@ A1	DRAWN/CHECKED
1 : 1000	BG/ BF

STATUS CODE	DRAWING NUMBER	REVISION
A1	CLN-HJL-SW-02-DR-A-0011	P2

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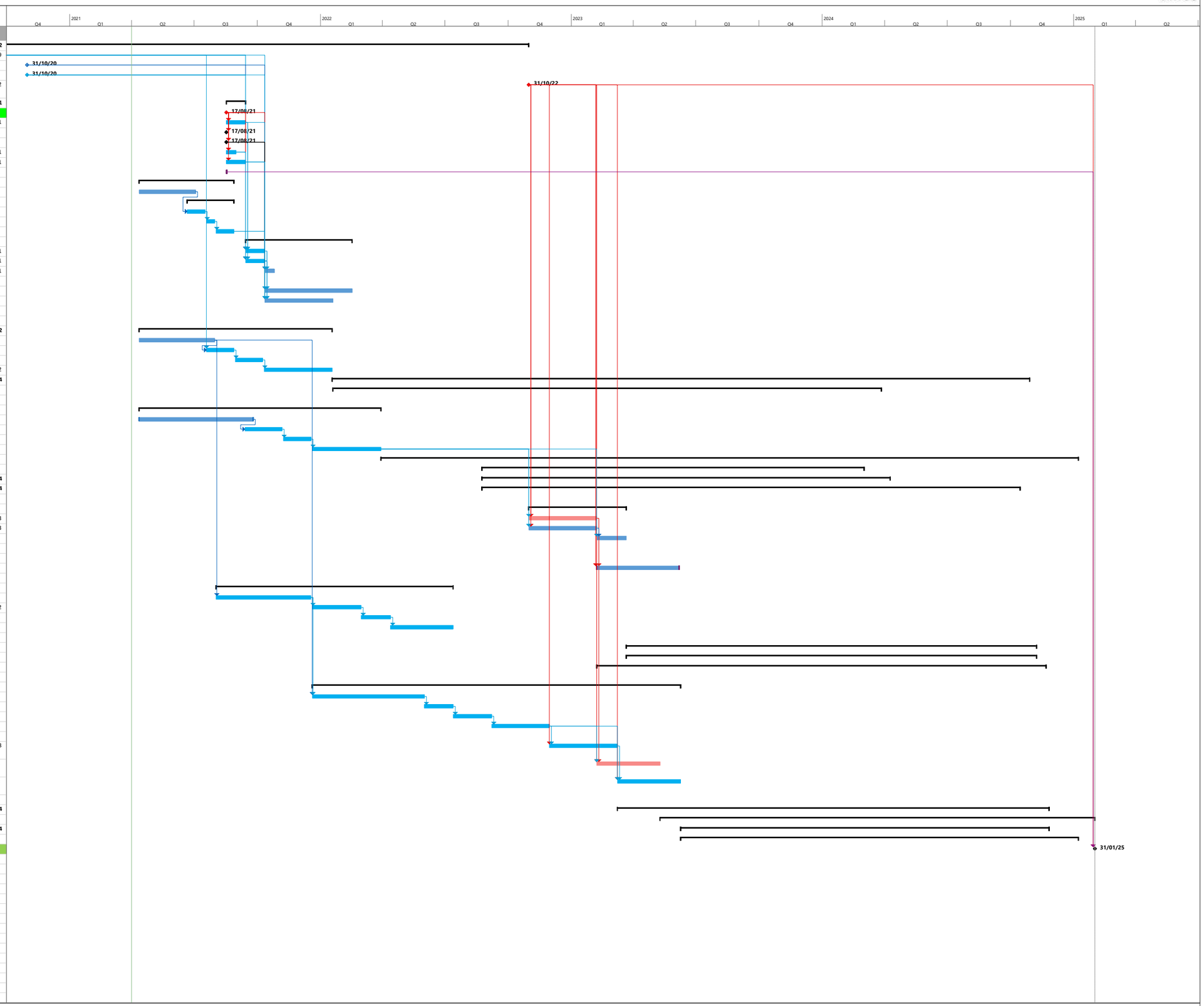
NMP
o'mahony pike
BM
OCSC

Appendix B – Proposed works programme

VIRTUS

ID	Task Name	No of Floors incl GF	No of Units per Core	Duration	Start	Finish
1	CLONLIFFE - PHASING & PROGRAMME					
2	**Land Tranches**			**154.4 wks**	**Mon 23/09/19**	**Mon 31/10/22**
3	Aquire Tranche 1c land - Phase 1b D1, D2			0 days	Mon 23/09/19	Mon 23/09/19
4	Aquire Tranche 2a land - Phase 1a C2			0 days	Sat 31/10/20	Sat 31/10/20
5	Aquire Tranche 2b land - Phase 2, A1, A2, A3 & A4			0 days	Sat 31/10/20	Sat 31/10/20
6	Aquire Tranche 4 land - Phase 3, B1,B2,B3, C1, E1 & E2 & Church			0 days	Mon 31/10/22	Mon 31/10/22
7	**Planning**			**4 wks?**	**Tue 17/08/21**	**Mon 13/09/21**
8	ABP Grant Permission			0 wks	Tue 17/08/21	Tue 17/08/21
9	Pre-Commencement Planning Conditions Compliance			4 wks	Tue 17/08/21	Mon 13/09/21
10	Finance Approval / Cashflow t.b.c			0 wks	Tue 17/08/21	Tue 17/08/21
11	Judicial Review - Standstill Period			0 wks	Tue 17/08/21	Tue 17/08/21
12	Commencement Notice - Enabling Works-14 calendar			10 days	Tue 17/08/21	Mon 30/08/21
13	Commencement Notice - D1 & D2 - 28 calendar days			20 days	Tue 17/08/21	Mon 13/09/21
14				0.2 wks?	Tue 17/08/21	Tue 17/08/21
15	**Enabling Works - c. €5m**			**20 wks**	**Mon 12/04/21**	**Fri 27/08/21**
16	Design & Scope of Works			12 wks	Mon 12/04/21	Fri 02/07/21
17	**Tender Docs, Award and Mobilisation ***			**10 wks**	**Mon 21/06/21**	**Fri 27/08/21**
18	BoQ & Tender Pack			4 wks	Mon 21/06/21	Fri 16/07/21
19	Tender Negotiations			2 wks	Mon 19/07/21	Fri 30/07/21
20	Award and Mobilsation			4 wks	Mon 02/08/21	Fri 27/08/21
21	**Construction Enabling Works**			**20 wks**	**Tue 14/09/21**	**Tue 15/02/22**
22	Fencing / Hoarding / Tree Protection - Phase 1 & 2			4 wks	Tue 14/09/21	Mon 11/10/21
23	Access Roads - Drumcondra & Clonliffe via C2			4 wks	Tue 14/09/21	Mon 11/10/21
24	JKW - A Blocks - Fencing to contaminated area			2 wks	Tue 12/10/21	Mon 25/10/21
25						
26	A1 Basement - Temp Piling, Bulk Excavation, Infrastruc			16 wks	Tue 12/10/21	Tue 15/02/22
27	D2 Basement - Temp Piling, Bulk Excavation, Infrastruc			12 wks	Tue 12/10/21	Tue 18/01/22
28						
29						
30	**Phase 1 - D1 & D2**			**38 wks**	**Mon 12/04/21**	**Mon 17/01/22**
31	Detailed Design			16 wks	Mon 12/04/21	Fri 30/07/21
32	BoQ & Tender Pack			6 wks	Mon 19/07/21	Fri 27/08/21
33	Tender Period			6 wks	Mon 30/08/21	Fri 08/10/21
34	Tender Negotiation, Award and Mobilsation			12 wks	Mon 11/10/21	Mon 17/01/22
35	**Construction D1 - c. 151 Units (€28m)**	**18**		**130 wks**	**Tue 18/01/22**	**Mon 28/10/24**
43	**Construction D2 - incl basement c. 245 Units (€45m)**	**'4 - 8**		**103 wks**	**Wed 19/01/22**	**Tue 26/03/24**
55						
56	**Phase 2a - A1, A2, A3 & A4**			**48 wks**	**Mon 12/04/21**	**Tue 29/03/22**
57	Detailed Design			24 wks	Mon 12/04/21	Fri 24/09/21
58	BoQ & Tender Pack			8 wks	Mon 13/09/21	Fri 05/11/21
59	Tender Period			6 wks	Mon 08/11/21	Fri 17/12/21
60	Tender Negotiation, Award and Mobilsation			12 wks	Mon 20/12/21	Tue 29/03/22
61	**Construction A1 - incl basement c. 305 Units (€56m)**	**'4 - 8**		**128 wks**	**Wed 30/03/22**	**Tue 07/01/25**
74	**Construction A2 - c. 73 Units (€13m)**	**7**		**72 wks**	**Wed 24/08/22**	**Fri 01/03/24**
83	**Construction A3 - c. 87 Units (€16m)**	**8**		**76 wks**	**Wed 24/08/22**	**Mon 08/04/24**
92	**Construction A4 - c. 104 Units (€19m)**	**13**		**100 wks**	**Wed 24/08/22**	**Mon 14/10/24**
102						
103	**Phase 2b - Demolition**			**18 wks**	**Mon 31/10/22**	**Tue 21/03/23**
104	Demolition of East Wing for new B2 block			12 wks	Mon 31/10/22	Mon 06/02/23
105	Demolition of West Wing for new B1 block			12 wks	Mon 31/10/22	Mon 06/02/23
106	Demolition of Rear of E1 block			6 wks	Tue 07/02/23	Tue 21/03/23
107						
108						
109	**Phase 2c - East West Road**			**16 wks**	**Mon 06/02/23**	**Tue 06/06/23**
110						
111	**Phase 3a - B1, E1, E2, E3, E4 Church & Library**			**46 wks**	**Mon 02/08/21**	**Tue 12/07/22**
112	Detailed Design			20 wks	Mon 02/08/21	Fri 17/12/21
113	BoQ & Tender Pack			8 wks	Mon 20/12/21	Mon 28/02/22
114	Tender Period			6 wks	Tue 01/03/22	Tue 12/04/22
115	Tender Negotiation, Award and Mobilsation			12 wks	Wed 13/04/22	Tue 12/07/22
116						
117	**Construction E1 - c. 56 Units, E3 & E4 (€10m)**	**4**		**76 wks**	**Wed 22/03/23**	**Thu 07/11/24**
124	**Construction E2 - c. 48 Units (€9m)**	**4**		**76 wks**	**Wed 22/03/23**	**Thu 07/11/24**
133	**Construction B1 - c. 92 Units (€17m)**	**'6-8**		**84 wks**	**Tue 07/02/23**	**Thu 21/11/24**
143						
144	**Phase 3b - B2, B3, C1 & C2 ****|			**68 wks**	**Mon 20/12/21**	**Thu 08/06/23**
145	Detailed Design			20 wks	Mon 20/12/21	Tue 31/05/22
146	BoQ & Tender Pack			6 wks	Wed 01/06/22	Tue 12/07/22
147	Tender Period			6 wks	Wed 13/07/22	Tue 06/09/22
148	Tender Negotiation, Award and Mobilsation			12 wks	Wed 07/09/22	Tue 29/11/22
149						
150	Central Basement Pile, Excavate, Fdns, Floor, Walls & Core to GF @ C1			12 wks	Wed 30/11/22	Wed 08/03/23
151	Central Basement Pile, Excavate, Fdns, Floor, Walls & Core to GF @ B2			12 wks	Tue 07/02/23	Tue 09/05/23
152	Central Basement Pile, Excavate, Fdns, Floor, Walls & Core to GF @ B3			12 wks	Thu 09/03/23	Thu 08/06/23
153						
154	**Construction C1 - c. 146 Units (€26m)**	**6**		**80 wks**	**Thu 09/03/23**	**Mon 25/11/24**
163	**Construction B2 - c. 137 Units (€24m)**	**6**		**80 wks**	**Wed 10/05/23**	**Fri 31/01/25**
172	**Construction B3 - c. 80 Units (€15m)**	**6**		**68 wks**	**Fri 09/06/23**	**Mon 25/11/24**
181	**Construction C2 - c. 96 Units (€17m) Subject to Access ?**			**72 wks**	**Fri 09/06/23**	**Tue 07/01/25**
190	**CONSTRUCTION COMPLETION**			**0 wks?**	**Fri 31/01/25**	**Fri 31/01/25**
191						
192	** incorporates Central Basement Works					
193						
194	**ISSUES TO BE RESOLVED / CONSIDERED**					
195	Multiple tenders and construtrion running concurrenth					
196	Irish Water Works ?					
197	ESB Incoming Power Supply ?					
198	GAA - Works / Services to Hotel ?					
199	GAA - Works / Services to Red House - Keep Live ?					
200	GAA - Works / Services to Clubrooms & Pitches ?					
201	GAA - JKW to be treated insitu					
202	Archbishops - JKW to be part removed/part treated ir					
203	Access to C1 site when C2 begins ?					
204	Out to tender before Grant of Permission					
205	Bricklayer resources / Precast with Brick Slips ?					



Appendix C – Site compound and service connection locations

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT - ASK.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

PHASE 2A
SITE COMPOUND

PHASE 2B
SITE COMPOUND

PHASE 3A
SITE COMPOUND

PHASE 2C
SITE COMPOUND

PHASE 3B
SITE COMPOUND

PHASE 1
SITE COMPOUND

RED HOUSE *

PHASE 1
SITE COMPOUND

SITE COMPOUNDS FOR PHASE 1, 2A, 2B, 2C, 3A & 3B

SCALE @ A0: 1:500
SCALE @ A2: 1:1000

* - SUBJECT TO GAA AGREEMENT

ISSUE	DATE	DESCRIPTION	DRN / ORIG	P.E / P.D.
INF3	07.04.21	ISSUED FOR INFORMATION	SM / SM	MH / OK
PL1	20.11.20	ISSUED FOR PRE-PLANNING APP.	SM / SM	MH / OK
INF2	28.10.20	REVISED AS REQUIRED	SM / SM	MH / OK
INF1	21.10.20	ISSUED FOR PRESENTATION	SM / SM	MH / OK

DRAWING STAGE: **PLANNING**

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ISO 9001:2008 · The Institution of Structural Engineers · ACEI · FIDIC International Federation of Consulting Engineers

CLIENT: **CWTC Multi Family ICAV**

PROJECT TITLE	BM PROJECT No.
CLONLIFFE ROAD, DRUMCONDRA	19.253

MODEL REFERENCE	MODEL REV.	SUITABILITY
-	-	-

DRAWING TITLE: **SITE COMPOUNDS FOR PHASE 1, 2A, 2B, 2C, 3A & 3B**

DRAWING No.	ISSUE
CLA-BMD-00-ZZ-DR-C-3004	INF3

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT - ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

CONNECTION TO EXISTING 675Ø IW SEWER

Ex.C

PHASE 2A
SITE COMPOUNDS WELFARE CONNECTION

PHASE 2B
SITE COMPOUNDS WELFARE CONNECTION

PHASE 3A
SITE COMPOUNDS WELFARE CONNECTION

PHASE 2C
SITE COMPOUNDS WELFARE CONNECTION

PHASE 3B
SITE COMPOUND WELFARE CONNECTION

PHASE 1
SITE COMPOUND WELFARE CONNECTION

Ex.C

CONNECTION TO EXISTING FOUL MANHOLE INSIDE SITE BOUNDARY

SITE COMPOUNDS CONNECTION TO EXISTING FOUL DRAINAGE - PHASE 1, 2A, 2B, 2C, 3A & 3B

SCALE @ A0: 1:500
SCALE @ A2: 1:1000

* - CONNECTIONS TO EX. FOUL DRAINAGE

ISSUE	DATE	DESCRIPTION	DRN / ORIG	P.E / P.D.
INF3	07.04.21	ISSUED FOR INFORMATION	SM / SM	MH / OK
PL1	20.11.20	ISSUED FOR PRE-PLANNING APP.	SM / SM	MH / OK
INF2	28.10.20	REVISED AS REQUIRED	SM / SM	MH / OK
INF1	21.10.20	ISSUED FOR PRESENTATION	SM / SM	MH / OK

DRAWING STAGE: **PLANNING**

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ISO 9001:2008
The Institution of Structural Engineers
ACEI
International Federation of Consulting Engineers

CLIENT: **CWTC Multi Family ICAV**

PROJECT TITLE: **CLONLIFFE ROAD, DRUMCONDRA**
BM PROJECT No.: **19.253**
MODEL REFERENCE: -
MODEL REV.: -
SUITABILITY: -

DRAWING TITLE: **SITE COMPOUNDS CONNECTION TO EXISTING FOUL DRAINAGE - PHASE 1, 2A, 2B, 2C, 3A & 3B**

DRAWING No.: **CLA-BMD-00-ZZ-DR-C-3006**
ISSUE: **INF3**

Appendix D – Proposed phasing plan

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT - ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

PHASE 2A

PHASE 2B

PHASE 2C

PHASE 3A

PHASE 3B

PHASE 1

PHASE	DESCRIPTION
1	BLOCKS D1 & D2
2A	BLOCKS A1, A2, A3 & A4
2B	DEMOLITION OF EXISTING SEMINARY (NORTH AND EAST WINGS)
2C	NEW EAST WEST ROAD & ASSOCIATED UNDERGROUND SERVICES
3A	BLOCKS B1, E1, E2, CHURCH & LIBRARY
3B	BLOCKS B2, B3, C1 & C2

PHASING PLAN

SCALE @ A0: 1:500
SCALE @ A2: 1:1000

NOTE:
PHASING BOUNDARY LINES ARE APPROXIMATE

ISSUE	DATE	DESCRIPTION	DRN. / ORIG.	P.E. / P.D.
INF4	07.04.21	ISSUED FOR INFORMATION	SM / SM	MH / OK
PL2	31.03.21	ISSUED FOR DCC APPROVAL	SM / SM	MH / OK
INF3	22.03.21	ISSUED FOR INFORMATION	SM / SM	MH / OK
INF2	18.03.21	ISSUED FOR INFORMATION	SM / SM	MH / OK
PL1	20.11.20	ISSUED FOR PRE-PLANNING APP.	SM / SM	MH / OK
INF1	21.10.20	ISSUED FOR PRESENTATION	SM / SM	MH / OK

DRAWING STAGE: **PLANNING**

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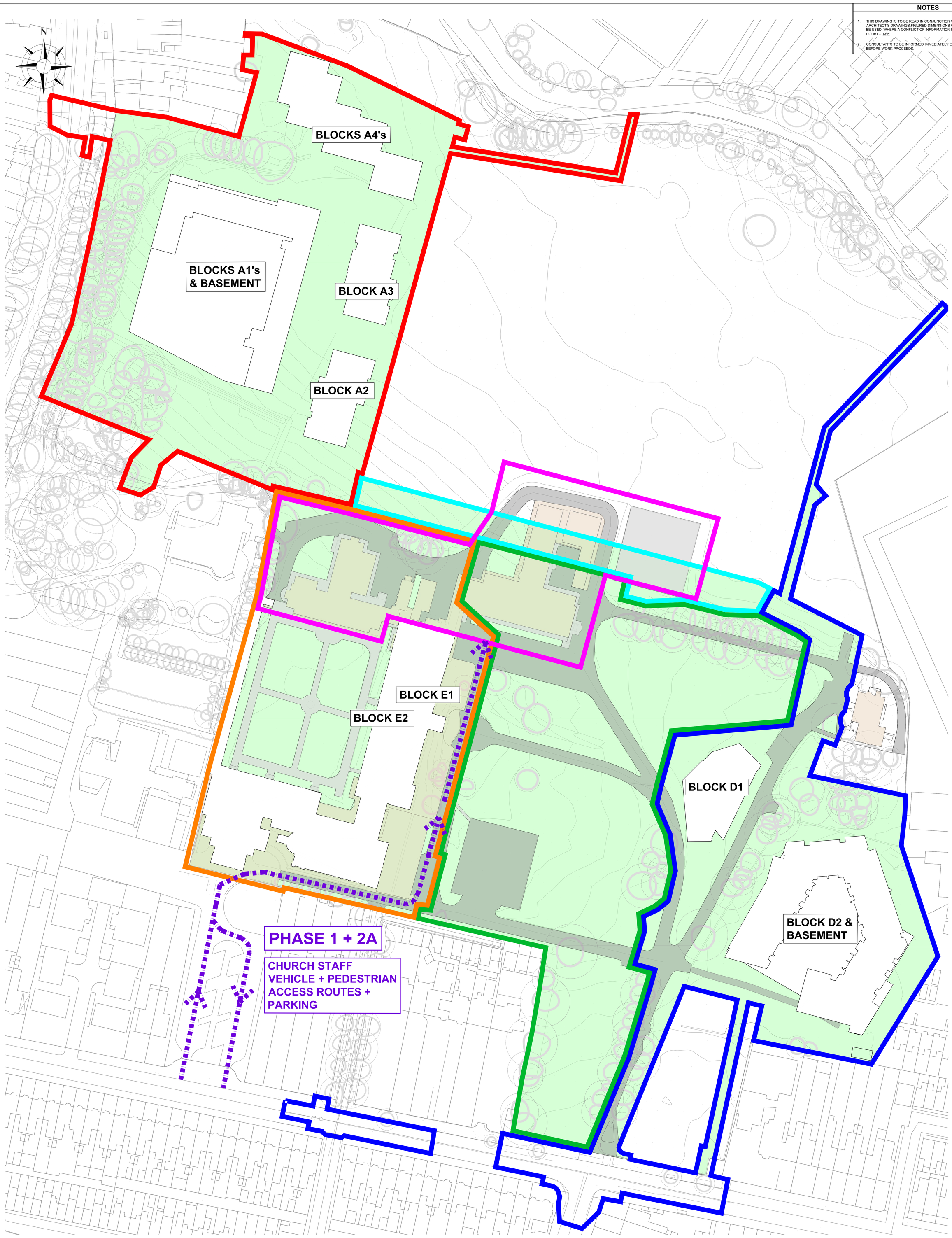
CLIENT: **CWTC Multi Family ICAV**

PROJECT TITLE: **CLONLIFFE ROAD, DRUMCONDRA**
BM PROJECT No.: **19.253**
MODEL REFERENCE: -
MODEL REV.: -
SUITABILITY: -
DRAWING TITLE: **PHASING PLAN**
DRAWING No.: **CLA-BMD-00-ZZ-DR-C-3007**
ISSUE: **INF4**

Appendix E – Proposed traffic management plans

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT - 'ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.



CHURCH STAFF VEHICLE, PEDESTRIAN ACCESS ROUTES & PARKING - PHASE 1 + 2A

SCALE @ A0: 1:500
SCALE @ A2: 1:1000

ISSUE	DATE	DESCRIPTION	DRN / ORIG	P.E / P.D.
INF2	07.04.21	ISSUED FOR INFORMATION	SM / SM	MH / OK
PL1	20.11.20	ISSUED FOR PRE-PLANNING APP.	SM / SM	MH / OK
INF1	21.10.20	ISSUED FOR PRESENTATION	SM / SM	MH / OK

DRAWING STAGE: **PLANNING**

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CLIENT: **CWTC Multi Family ICAV**

PROJECT TITLE: **CLONLIFFE ROAD, DRUMCONDRA**

BM PROJECT No.: **19.253**

MODEL REFERENCE: -

MODEL REV.: -

SUITABILITY: -

DRAWING TITLE: **CHURCH STAFF VEHICLE, PEDESTRIAN ACCESS ROUTES & PARKING - PHASE 1 + 2A**

DRAWING No.: **CLA-BMD-00-ZZ-DR-C-3002**

ISSUE: **INF2**

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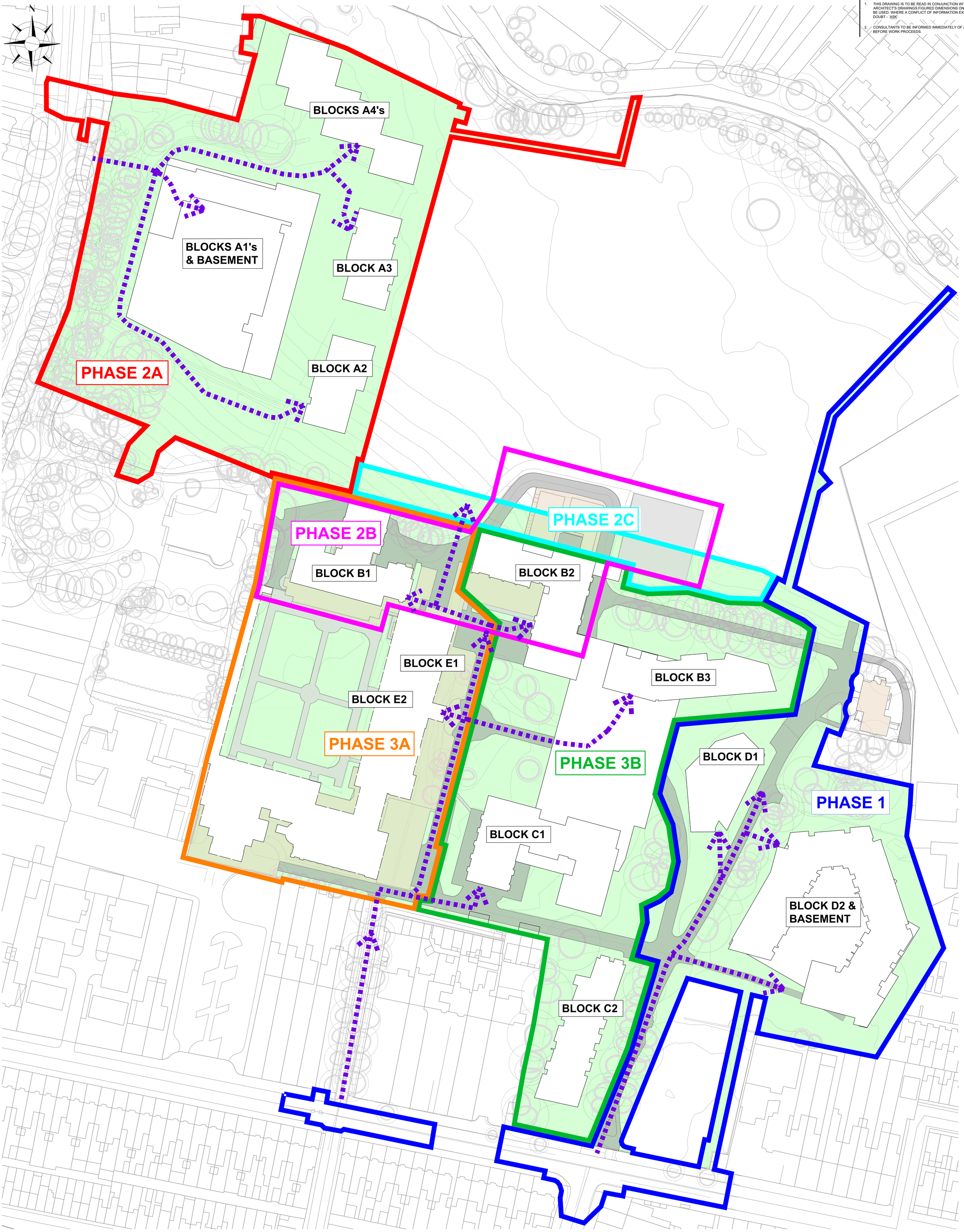

CONSTRUCTION STAFF ACCESS PEDESTRIAN ROUTES FOR PHASE 1, 2A, 2B, 2C, 3A & 3B

SCALE @ A0: 1:500
SCALE @ A2: 1:1000

ISSUE	DATE	DESCRIPTION	DRN. / ORIG.	P.E. / P.D.
INF2	07.04.21	ISSUED FOR INFORMATION	SM / SM	MH / CK
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DRAWING STAGE: **PLANNING**

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CLIENT: **CWTC Multi Family ICAV**

PROJECT TITLE: **CLONLIFFE ROAD, DRUMCONDRA**

BM PROJECT No.: **19.253**

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SUITABILITY: -

DRAWING TITLE: **CONSTRUCTION STAFF ACCESS PEDESTRIAN ROUTES FOR PHASE 1, 2A, 2B, 2C, 3A & 3B**

DRAWING No.: **CLA-BMD-00-ZZ-DR-C-3003**

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TEMPORARY CONSTRUCTION ACCESS ROAD - FORMED DURING ENABLING WORKS

PHASE 1

CONSTRUCTION VEHICLE ACCESS TEMPORARY ROAD - PHASE 1

SCALE @ A0: 1:500
SCALE @ A2: 1:1000

ISSUE	DATE	DESCRIPTION	DRN. / CHKD.
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CLIENT: **CWTC Multi Family ICAV**

PROJECT TITLE: **CLONLIFFE ROAD, DRUMCONDRA**

BM PROJECT No.: **19.253**

MODEL REFERENCE: -

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DRAWING TITLE: **CONSTRUCTION VEHICLE ACCESS TEMPORARY ROAD PHASE 1**

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N

BLOCKS A4's

BLOCKS A1's & BASEMENT

BLOCK A3

PHASE 2A

BLOCK A2

PHASE 2B

PHASE 2C

BLOCK B1

BLOCK B2

BLOCK E1

BLOCK B3

BLOCK E2

PHASE 3A

BLOCK D1

BLOCK C1

PHASE 3B

PHASE 1

BLOCK D2 & BASEMENT

CONSTRUCTION VEHICLE ACCESS TEMPORARY ROAD & INTERNAL ROUTES FOR PHASE 1, 2A, 2B, 2C, 3A & 3B

SCALE @ A0: 1:500
SCALE @ A2: 1:1000

ISSUE	DATE	DESCRIPTION	DRN. / ORIG.	P.E. / P.D.
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DRAWING STAGE
PLANNING

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CWTC Multi Family ICAV

PROJECT TITLE	BM PROJECT No.
CLONLIFFE ROAD, DRUMCONDRA	19.253

MODEL REFERENCE	MODEL REV.	SUITABILITY
-	-	-

DRAWING TITLE
CONSTRUCTION VEHICLE ACCESS TEMPORARY ROAD & INTERNAL ROUTES FOR PHASE 1, 2A, 2B, 2C, 3A & 3B

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Appendix F – Construction & demolition waste management plan

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CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN FOR A PROPOSED RESIDENTIAL DEVELOPMENT

HOLY CROSS COLLEGE SHD

Report Prepared For

CWTC Multi Family ICAV acting on behalf of its sub-fund DBTR DR DR1 Fund

Report Prepared By

Chonaill Bradley, Senior Environmental Consultant

Our Reference

CB/20/11566WMR02

Date of Issue

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Signature		
Name	Chonaill Bradley	Fergal Callaghan
Title	Senior Environmental Consultant	Director
Date	04 May 2021	04 May 2021

Contents Page

1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Construction & Demolition Waste Management Plan (C&D WMP) on behalf of CWTC Multi Family ICAV acting on behalf of its sub-fund DBTR DR DR1 Fund. The development will principally consist of the construction of a Build To Rent residential development set out in 12 no. blocks, ranging in height from 3 to 18 storeys, to accommodate residential apartments and including a retail unit, a café unit, a crèche, and residential tenant amenity spaces.

This plan will provide information necessary to ensure that the management of C&D waste at the site is undertaken in accordance with the current legal and industry standards including the *Waste Management Acts 1996 - 2011* and associated Regulations [1], *Protection of the Environment Act 2003* as amended [2], *Litter Pollution Act 1997* as amended [3] and the *Eastern-Midlands Region Waste Management Plan 2015 – 2021* [4]. In particular, this Plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also seeks to provide guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

This C&D WMP includes information on the legal and policy framework for C&D waste management in Ireland, estimates of the type and quantity of waste to be generated by the proposed development and makes recommendations for management of different waste streams.

2.0 CONSTRUCTION & DEMOLITION WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Irish Government issued a policy statement in September 1998*, Changing Our Ways*[5], which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five year period (by 2003), with a progressive increase to at least 85% over fifteen years (i.e. 2013).

In response to the *Changing Our Ways* report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report entitled '*Recycling of Construction and Demolition Waste'* [6] concerning the development and implementation of a voluntary construction industry programme to meet the Government's objectives for the recovery of C&D waste.

In September 2020 the government released a new national policy document outlining a new action plan for Ireland and its waste to cover the period of 2020-2025. This plan, 'A Waste Action Plan for a Circular Economy' [7], was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to a new economy, where climate and environmental challenges are turned into opportunities, replacing the previous national waste management plan 'A Resource Opportunity (2012)'It aims to fulfil the commitment in the Programme for Government to publish and start implementing a new National Waste Action Plan. It is intended that this new national waste policy will inform and give direction to waste planning and management in Ireland over the coming years. It will be followed later this year by an All of Government Circular Economy Strategy. The policy document

shifts focus away from waste disposal and moves it back up the production chain. To support the policy, regulation is already in place (Circular Economy Legislative Package) or in the pipeline (Single Use Plastics Directive). The policy document contains over 200 measures across various waste areas including circular economy, municipal waste, consumer protection and citizen engagement, plastics and packaging, construction and demolition, textiles, green public procurement and waste enforcement.

The National Construction and Demolition Waste Council (NCDWC) was launched in June 2002, as one of the recommendations of the Forum for the Construction Industry, in the Task Force B4 final report. The NCDWC subsequently produced '*Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects'* [8] in July 2006 in conjunction with the then Department of the Environment, Heritage and Local Government (DoEHLG). The guidelines outline the issues that need to be addressed at the pre-planning stage of a development all the way through to its completion. These guidelines have been followed in the preparation of this document and include the following elements:

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for waste manager and site crew;
- Details of proposed record keeping system;
- Details of waste audit procedures and plan; and
- Details of consultation with relevant bodies i.e. waste recycling companies, Dublin City Council, etc.

Section 3 of the Guidelines identifies thresholds above which there is a requirement for the preparation of a C&D Waste Management Plan for developments. This development requires a C&D WMP under the following criterion:

- New residential development of 10 houses or more; and
- Demolition/renovation/refurbishment projects generating in excess of 100 m³ in volume, of C&D waste.

Other guidelines followed in the preparation of this report include *'Construction and Demolition Waste Management – a handbook for Contractors and Site Managers'* [9] , published by FÁS and the Construction Industry Federation in 2002.

These guidance documents are considered to define best practice for C&D projects in Ireland and describe how C&D projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

2.2 Regional Level

The proposed development is located in the Local Authority area of Dublin City Council (DCC). The *Eastern-Midlands Region Waste Management Plan 2015 – 2021* is the regional waste management plan for the DCC area published in May 2015.

The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of *"70% preparing for reuse, recycling and other*

recovery of construction and demolition waste" (excluding natural soils and stones and hazardous wastes) to be achieved by 2020.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €130 - €150 per tonne of waste, which includes a €75 per tonne landfill levy introduced under the *Waste Management (Landfill Levy) (Amendment) Regulations 2012.*

The *Dublin City Development Plan 2016 – 2022* [10] sets out a number of policies and objectives for Dublin City in line with the objectives of the regional waste management plan. The plan identifies the development of recycling in order to minimise the use of landfill as the main objective of the City Council. Waste policies and objectives with a particular relevance to the proposed development are:

Policies:

- *SI19: To support the principles of good waste management and the implementation of best international practice in relation to waste management in order for Dublin City and the region to become self-reliant in terms of waste management.*
- *SI20: To prevent and minimise waste and to encourage and support material sorting and recycling.*
- *SI21: To minimise the amount of waste which cannot be prevented and ensure it is managed and treated without causing environmental pollution.*

Objectives:

- *SIO17: To promote the re-use of building materials, recycling of demolition material and the use of materials from renewable sources. In all developments in excess of 10 housing units and commercial developments in excess of 1000 sqm, a materials source and management plan showing type of materials/proportion of re-use/recycled materials to be used shall be implemented by the developer.*
- *SIO18: To implement the current Litter Management Plan through enforcement of the litter laws, street cleaning and education and awareness campaigns.*
- *SIO19: To implement the Eastern-Midlands Waste Management Plan 2015-2021 and achieve the plan targets and objectives.*

2.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the project are:

- Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate legislation includes:
  - European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended
  - Waste Management (Collection Permit) Regulations (S.I No. 820 of 2007) as amended
  - Waste Management (Facility Permit and Registration) Regulations 2007, (S.I No. 821 of 2007) as amended
  - Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended

- Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended
- Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)
- Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
- European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended
- Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009), as amended
- European Union (Household Food Waste and Bio-waste) Regulation 2015 (S.I. No. 191 of 2015)
- Waste Management (Hazardous Waste) Regulations, 1998 (S.I. No. 163 of 1998) as amended
- Waste Management (Shipments of Waste) Regulations, 2007 (S.I. No. 419 of 2007) as amended
- Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended;
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)
- European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended

- Environmental Protection Act 1992 (No. 7 of 1992) as amended.
- Litter Pollution Act 1997 (No. 12 of 1997) as amended.
- Planning and Development Act 2000 (No. 30 of 2000) as amended [11].

European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 2.1).

Figure 2.1 *Waste Hierarchy (Source: European Commission)*

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996 - 2001* and subsequent Irish legislation, is the principle of *"Duty of Care"*. This implies that the waste producer is responsible for waste from the time it is generated through until its legal recycling, recovery or disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final destination, waste contractors will be employed to physically transport waste to the final destination. Following on from this is the concept of *"Polluter Pays"* whereby the waste producer is liable to be prosecuted for pollution incidents, which may arise from the incorrect management of waste produced, including the actions of any contractors engaged (e.g. for transportation and disposal/recovery/recycling of waste).

It is therefore imperative that the Developer ensures that the waste contractors engaged by demolition and construction contractors are legally compliant with respect to waste transportation, recycling, recovery and disposal. This includes the requirement that a contractor handle, transport and recycle/recover/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments* or a Waste or Industrial Emissions Licence granted by the EPA. The COR / permit / licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

3.0 DESCRIPTION OF THE PROJECT

3.1 Location, Size and Scale of the Development

The development will consist of the construction of a Build To Rent residential development set out in 12 no. blocks, ranging in height from 3 to 18 storeys, to accommodate 1614 no. apartments (comprising 540 studios, 602 no. 1 bed units, 419 no. 2 bed units and 53 no. 3 bed units) including a retail unit, a café unit, a crèche, and residential tenant amenity spaces. The development will include a single level basement under Blocks B2, B3 & C1, a single level basement under Block D2 and a podium level and single level basement under Block A1 to accommodate car parking spaces, bicycle parking, storage, services and plant areas. To facilitate the proposed development the scheme will involve the demolition of a number of existing structures on the site.

The proposed development sits as part of a wider Site Masterplan for the entire Holy Cross College lands which includes a permitted hotel development and future proposed GAA pitches and clubhouse.

The site contains a number of Protected Structures including The Seminary Building, Holy Cross Chapel, South Link Building, The Assembly Hall and The Ambulatory. The application proposes the renovation and extension of the Seminary Building to accommodate residential units and the renovation of the existing Holy Cross Chapel and

Assembly Hall buildings for use as residential tenant amenity. The wider Holy Cross College lands also includes Protected Structures including The Red House and the Archbishop's House (no works are proposed to these Structures).

The residential buildings are arranged around a number of proposed public open spaces and routes throughout the site with extensive landscaping and tree planting proposed. Communal amenity spaces will be located adjacent to residential buildings and at roof level throughout the scheme. To facilitate the proposed development the scheme will involve the removal of some existing trees on the site.

The site is proposed to be accessed by vehicles, cyclists and pedestrians from a widened entrance on Clonliffe Road, at the junction with Jones's Road and through the opening up of an unused access point on Drumcondra Road Lower at the junction with Hollybank Rd. An additional cyclist and pedestrian access is proposed through an existing access point on Holy Cross Avenue. Access from the Clonliffe Road entrance will also facilitate vehicular access to future proposed GAA pitches and clubhouse to the north of the site and to a permitted hotel on Clonliffe Road.

The proposed application includes all site landscaping works, green roofs, boundary treatments, PV panels at roof level, ESB Substations, lighting, servicing and utilities, signage, and associated and ancillary works, including site development works above and below ground.

3.2 Details of the Non-Hazardous Wastes to be Produced

There will be waste materials generated from the demolition of some of the existing buildings, renovations and updating to other existing structures and removal of some hardstanding areas on site, as well as from the excavation of the building foundations. The volume of waste generated from demolition will be more difficult to segregate than waste generated from the construction phase, as many of the building materials will be bonded together or integrated i.e. plasterboard on timber ceiling joists, steel embedded in concrete, etc.

There will be soil, stones, clay and made ground excavated to facilitate construction of new foundations, underground services, and the installation of the proposed basements. The project quantity surveyors have estimated that 100,000m^3 of material will need to be excavated to do so. It is currently envisaged that 30,000m^3 will be able to be retained and reused onsite for landscaping and fill, the remaining material, will need to be removed offsite due to the limited opportunities for reuse on site. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

During the construction phase there may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and supply of materials will also be generated. The contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided on site during the construction phase. Waste printer

/ toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

3.3 Potential Hazardous Wastes Arising

3.3.1 Contaminated Soil

Site investigations and environmental soil testing were undertaken between February and March 2020, along with a further survey in June 2020 by Ground Investigations Ireland (GII).

Samples were selected from the exploratory holes for a range of geotechnical and environmental testing to assist in the classification of soils and to provide information for the proposed design. Environmental and Chemical testing as required by the specification, including the Rilta Suite, pH and sulphate testing was carried out by Element Materials Technology Laboratory in the UK. The Rilta suite testing includes both Solid Waste and Leachate Waste Acceptance Criteria.

The suite also includes those parameters specified in the EU Council Decision establishing criteria for the acceptance of waste at Landfills (Council Decision 2003/33/EC), which for the solid samples are total organic carbon (TOC), speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, phenol, polychlorinated biphenyls (PCB) and PAH). Results can be found in the Site Investigation report submitted with this application.

If any potentially contaminated material is encountered, it will need to be segregated from clean / inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled *'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* [12] using the *HazWasteOnline* application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the *EC Council Decision 2003/33/EC* [13], which establishes the criteria for the acceptance of waste at landfills.

In the event that Asbestos Containing Materials (ACMs) are found within the excavated material, the removal will only be carried out by a suitably permitted waste contractor, in accordance with *S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.* All asbestos will be taken to a suitably licensed or permitted facility.

In the event that hazardous soil, or historically deposited waste is encountered during the construction phase, the contractor will notify DCC and provide a Hazardous / Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal / treatment, in addition to information on the authorised waste collector(s).

For further information in relation to contaminated land, please refer to Chapter 9 of the EIAR for the proposed Project (Land, Soils, Geology & Hydrogeology).

3.3.2 Fuel/Oils

Fuels and oils are classed as hazardous materials; any on-site storage of fuel / oil, and all storage tanks and all draw-off points will be bunded and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and the site crew are

trained in the appropriate refuelling techniques, it is not expected that there will be any fuel / oil waste generated at the site.

3.3.3 Invasive Plant Species

A site invasive species surveys were undertaken by Invas Biosecurity in December 2020. This included a site walkover survey of the entire site, and around part of the outside perimeter to search for any invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011.

Evidence of an extensive Japanese Knotweed (*Fallopia japonica*) stand was recorded at the north-west perimeter of the Site, adjacent to Cian Park Industrial Units; and a second stand was located to the perimeter bordering the Archbishop's Palace grounds. There was evidence that these have previously been treated by the Church's grounds maintenance contractor over the past number of years.

The Contractor will be required to adhere to any mitigation measures / conditions prescribed in relation to invasive plant species. For further information on this topic, please refer to Chapter 8 of the EIAR for the proposed Project (Biodiversity).

3.3.4 Asbestos

Multiple asbestos refurbishment / demolition surveys were undertaken by Phoenix Environmental Safety Ltd in May 2020. As is normal at this stage of the project the scope of the surveys was confined to all accessible areas of the existing buildings which are due for demolition and / or refurbishment in the future.

Asbestos Containing Materials (ACM) were detected in several locations within some of the buildings, including in floor tiling, insulating boards, downpipes, bitumen and stair nosings.

Removal of asbestos or ACMs will be carried out by a suitably qualified contractor and ACMs will only be removed from Site by a suitably permitted / licenced waste contractor, in accordance with *S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.* All material will be taken to a suitably licensed or permitted facility.

3.3.5 Other Known Hazardous Substances

Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.

In addition, WEEE (containing hazardous components), printer toner / cartridges, batteries (Lead, Ni-Cd or Mercury) and / or fluorescent tubes and other mercury containing waste may be generated from during C&D activities or temporary site offices. These wastes, if generated, will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

3.4 Main Construction and Demolition Waste Categories

The main non-hazardous and hazardous waste streams that could be generated by the construction activities at a typical site are shown in Table 3.1. The List of Waste (LoW) code (applicable as of 1 June 2015) (also referred to as the European Waste Code (EWC)) for each waste stream is also shown.

Table 3.1 *Typical waste types generated and LoW codes (individual waste types may contain hazardous substances)*

Waste Material	LoW/EWC Code
Concrete, bricks, tiles, ceramics	17 01 01-03 & 07
Wood, glass and plastic	17 02 01-03
Treated wood, glass, plastic, containing hazardous substances	17-02-04*
Bituminous mixtures, coal tar and tarred products	17 03 01*, 02 & 03*
Metals (including their alloys) and cable	17 04 01-11
Soil and stones	17 05 03* & 04
Gypsum-based construction material	17 08 01* & 02
Paper and cardboard	20 01 01
Mixed C&D waste	17 09 04
Green waste	20 02 01
Electrical and electronic components	20 01 35 & 36
Batteries and accumulators	20 01 33 & 34
Liquid fuels	13 07 01-10
Chemicals (solvents, pesticides, paints, adhesives, detergents etc.)	20 01 13, 19, 27-30
Insulation materials	17 06 04
Organic (food) waste	20 01 08
Mixed Municipal Waste	20 03 01

** Individual waste type may contain hazardous substances*

4.0 WASTE MANAGEMENT

4.1 Demolition Waste Generation

The demolition stage will involve the demolition and renovation of multiple brick buildings on-Site. The demolition areas are identified in the planning drawings provided with this application under separate cover. The anticipated demolition waste and rates of reuse, recycling / recovery and disposal are shown in

Table 4.1, below.

Table 4.1 Estimated off-site reuse, recycle and disposal rates for demolition waste

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Glass	324.0	0	0.0	85	275.4	15	48.6
Concrete, Bricks, Tiles, Ceramics	1836.0	30	550.8	65	1193.4	5	91.8
Plasterboard	144.0	30	43.2	60	86.4	10	14.4
Asphalts	36.0	0	0.0	25	9.0	75	27.0
Metals	540.0	5	27.0	80	432.0	15	81.0
Slate	288.0	0	0.0	85	244.8	15	43.2
Timber	432.0	10	43.2	60	259.2	30	129.6
Asbestos	5.0	0	0.0	0	0.0	100	5.0
Total	**3605.0**		**664.2**		**2500.2**		**440.6**

4.2 Construction Waste Generation

Table 4.2 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA *National Waste Reports* [14] *and the joint EPA & GMIT study* [15]

Table 4.2: *Waste materials generated on a typical Irish construction site*

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

Table 4.3, below, shows the estimated construction waste generation for the proposed Project based on the gross floor area of construction and other information available to date, along with indicative targets for management of the waste streams. The estimated amounts for the main waste types (with the exception of soils and stones) are based on an average large-scale development waste generation rate per m^2, using the waste breakdown rates shown in Table 4.2. These have been calculated from the schedule of development areas provided by the architect.

***Table 4.3**: Predicted on and off-site reuse, recycle and disposal rates for construction waste*

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	2261.8	10	226.2	80	1809.4	10	226.2
Timber	1919.1	40	767.6	55	1055.5	5	96.0
Plasterboard	685.4	30	205.6	60	411.2	10	68.5
Metals	548.3	5	27.4	90	493.5	5	27.4
Concrete	411.2	30	123.4	65	267.3	5	20.6
Other	1028.1	20	205.6	60	616.8	20	205.6
Total	**6853.8**		**1555.8**		**4653.8**		**644.3**

In addition to the waste streams in Table 4.3, there will be c. 100,000 m^3 of soil, stones, clay and made ground excavated to facilitate construction of new foundations, underground services, and the installation of the proposed basements. Any suitable excavated material will be temporarily stockpiled for reuse as fill, where possible, but reuse on Site is expected to be limited and all of the excavated material except for 30,000 m^3 is expected to be removed off-Site for appropriate reuse, recovery and / or disposal.

It should be noted that until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

4.3 Proposed Waste Management Options

Waste materials generated will be segregated on-Site, where it is practical. Where the on-Site segregation of certain wastes types is not practical, off-Site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source, where feasible. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled. There are numerous waste contractors in the Dublin region that provide this service.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arisings requiring disposal off-Site will be reused, recycled, recovered or disposed of at a facility holding the appropriate registration, permit or licence, as required.

During construction, some of the sub-contractors on Site will generate waste in relatively low quantities. The transportation of non-hazardous waste by persons who are not directly involved with the waste business, at weights less than or equal to 2 tonnes, and in vehicles not designed for the carriage of waste, are exempt from the requirement to have a waste collection permit (per Article 30 (1) (b) of the Waste Collection Permit Regulations 2007, as amended). Any sub-contractors engaged that do not generate more than 2 tonnes of waste at any one time can transport this waste off-Site in their work vehicles (which are

not designed for the carriage of waste). However, they are required to ensure that the receiving facility has the appropriate COR / permit / licence.

Written records will be maintained by the contractor(s), detailing the waste arising throughout the C&D phases, the classification of each waste type, waste collection permits for all waste contactors who collect waste from the site and COR / permit / licence for the receiving waste facility for all waste removed off-Site for appropriate reuse, recycling, recovery and / or disposal

Dedicated bunded storage containers will be provided for hazardous wastes which may arise, such as batteries, paints, oils, chemicals, if required.

The anticipated management of the main waste streams is outlined as follows:

Soil, Stone, Gravel & Clay

The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The excavations are required to facilitate construction works so the preferred option (prevention and minimisation) cannot be accommodated for the excavation phase.

When material is removed off-Site it could be reused as a by-product (and not as a waste). If this is done, it will be done in accordance with Article 27 of the *European Communities (Waste Directive) Regulations 2011*, which requires that certain conditions are met and that by-product notifications are made to the EPA via their online notification form. Excavated material should not be removed from site until approval from the EPA has been received.

The next option (beneficial reuse) may be appropriate for the excavated material, pending environmental testing to classify the material as hazardous or non-hazardous in accordance with the EPA *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* publication. Clean inert material may be used as fill material in other construction projects or engineering fill for waste licensed sites. Beneficial reuse of surplus excavation material as engineering fill may be subject to further testing to determine if materials meet the specific engineering standards for their proposed end use.

If the material is deemed to be a waste, then removal and reuse / recovery / disposal of the material will be carried out in accordance with the *Waste Management Acts 1996 – 2011* as amended, the *Waste Management (Collection Permit) Regulations 2007* as amended and the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

In the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any non-hazardous material. It will require off-site treatment at a suitable facility or disposal abroad via Transfrontier Shipment of Wastes (TFS).

Bedrock

While it is not envisaged that bedrock will be encountered, if bedrock is encountered, it is anticipated that it will not be crushed on Site. Any excavated rock is expected to be removed off-Site for appropriate reuse, recovery and / or disposal. If bedrock is to be crushed on-Site, the appropriate mobile waste facility permit will be obtained from DCC.

Silt & Sludge

During the construction phase, silt and petrochemical interception will be carried out on run-off and pumped water from Site works, where required. Sludge and silt will then be collected by a suitably licensed contractor and removed off-Site.

Concrete Blocks, Bricks, Tiles & Ceramics

The majority of concrete blocks, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and should be recycled, where possible. If concrete is to be crushed on-Site, the appropriate mobile waste facility permit will be obtained from DCC.

Hard Plastic

As hard plastic is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. All recyclable plastic will be segregated and recycled, where possible.

Timber

Timber that is uncontaminated, i.e. free from paints, preservatives, glues, etc., will be disposed of in a separate skip and recycled off-Site.

Metal

Metals will be segregated, where practical, and stored in skips. Metal is highly recyclable and there are numerous companies that will accept these materials.

Plasterboard

There are currently a number of recycling services for plasterboard in Ireland. Plasterboard from the construction phases will be stored in a separate skip, pending collection for recycling. The Site Manager will ensure that oversupply of new plasterboard is carefully monitored to minimise waste.

Glass

Glass materials will be segregated for recycling, where possible.

Waste Electrical & Electronic Equipment (WEEE)

Any WEEE will be stored in dedicated covered cages / receptacles / pallets pending collection for recycling.

Other Recyclables

Where any other recyclable wastes, such as cardboard and soft plastic, are generated, these will be segregated at source into dedicated skips and removed off-Site.

Non-Recyclable Waste

C&D waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip / receptacle will be examined by a member of the waste team (see Section 7.0) to determine if recyclable materials have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

Asbestos Containing Materials

Any asbestos or ACM found on-Site should be removed by a suitably competent contractor and disposed of as asbestos waste before the demolition works begin. All asbestos removal work or encapsulation work must be carried out in accordance with *S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.*

Other Hazardous Wastes

On-site storage of any hazardous wastes produced (i.e. contaminated soil if encountered and / or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately.

On-Site Crushing

It is currently not envisaged that the crushing of waste materials will occur on-Site. However, if the crushing of material is to be undertaken, a mobile waste facility permit will first be obtained from DCC and the destination of the accepting waste facility will be supplied to the DCC waste unit.

4.4 Tracking and Documentation Procedures for Off-Site Waste

All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by a weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the nominated project Waste Manager (see Section 7.0).

All movement of waste and the use of waste contractors will be undertaken in accordance with the *Waste Management Acts 1996 - 2011*, *Waste Management (Collection Permit) Regulations 2007* as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* and amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project Waste Manager (see Section 7.0) will maintain a copy of all waste collection permits on-Site.

If the waste is being transported to another site, a copy of the Local Authority waste COR / permit or EPA Waste / Industrial Emissions Licence for that site will be provided to the nominated project Waste Manager (see Section 7.0). If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) notification document will be obtained from DCC (as the relevant authority on behalf of all Local Authorities in Ireland) and kept on-Site along with details of the final destination (COR, permits, licences, etc.). A receipt from

the final destination of the material will be kept as part of the on-Site waste management records.

All information will be entered in a waste management recording system to be maintained on-Site.

5.0 ESTIMATED COST OF WASTE MANAGEMENT

An outline of the costs associated with different aspects of waste management is outlined below. The total cost of C&D waste management will be measured and will take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

5.1 Reuse

By reusing materials on site, there will be a reduction in the transport and recycle / recovery / disposal costs associated with the requirement for a waste contractor to take the material off-Site. Clean and inert soils, gravel, stones, etc., which cannot be reused on-Site may be used as access roads or capping material for landfill sites, etc. This material is often taken free of charge or at a reduced fee for such purposes, reducing final waste disposal costs.

5.2 Recycling

Salvageable metals will earn a rebate, which can be offset against the costs of collection and transportation of the skips. Clean, uncontaminated cardboard and certain hard plastics can also be recycled. Waste contractors will charge considerably less to take segregated wastes, such as recyclable waste, from a site than mixed waste. Timber can be recycled as chipboard. Again, waste contractors will charge considerably less to take segregated wastes, such as timber, from a site than mixed waste.

5.3 Disposal

Landfill charges are currently at around €130 - €150 per tonne which includes a €75 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015*. In addition to disposal costs, waste contractors will also charge a collection fee for skips.

Collection of segregated C&D waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a licensed or permitted facility and, where possible, remove salvageable items from the waste stream before disposing of the remainder to landfill. Clean soil, rubble, etc., is also used as fill / capping material, wherever possible.

6.0 DEMOLITION PROCEDURES

The demolition stage will involve the demolition of multiple brick style buildings on-Site. The demolition areas are identified in the planning drawings submitted as part of this application, under separate cover. A formal demolition plan including safety procedures will be prepared by the demolition contractor. However, in general, the following sequence of works should be followed during the demolition stage:

Check for Hazards

Prior to commencing works, buildings and structures to be demolished will be checked for any likely hazards including asbestos, ACMs, electrical power lines or cables, gas reticulation systems, telecommunications, unsafe structures and fire / explosion hazards, e.g. combustible dust, chemical hazards, oil, fuels and contamination.

Removal of Components

All hazardous materials will be removed first. All components from within the buildings that can be salvaged will be removed next. This will primarily be comprised of metal; however, may also include timbers, doors, windows, wiring and metal ducting, etc.

Removal of Roofing

Steel roof supports, beams, etc., will be dismantled and taken away for recycling / salvage.

Excavation of Services, Demolition of Walls and Concrete

Services will be removed from the ground and the breakdown of walls will be carried out once all salvageable or reusable materials have been taken from the buildings. Finally, any existing foundations and hard standing areas will be excavated.

7.0 TRAINING PROVISIONS

A member of the construction team will be appointed as the project Waste Manager to ensure commitment, operational efficiency and accountability in relation to waste management during the C&D phases of the project.

7.1 Waste Manager Training and Responsibilities

The nominated Waste Manager will be given responsibility and authority to select a waste team if required, i.e. members of the Site crew that will aid them in the organisation, operation and recording of the waste management system implemented on site.

The Waste Manager will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the Waste Manager to delegate responsibility to sub-contractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

The Waste Manager will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on site. The Waste Manager will also be trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and be knowledgeable in how to implement this C&D WMP.

7.2 Site Crew Training

Training of Site crew in relation to waste is the responsibility of the Waste Manager and, as such, a waste training program should be organised. A basic awareness course will be

held for all Site crew to outline the C&D WMP and to detail the segregation of waste materials at source. This may be incorporated with other Site training needs such as general site induction, health and safety awareness and manual handling.

This basic course will describe the materials to be segregated, the storage methods and the location of the Waste Storage Areas (WSAs). A sub-section on hazardous wastes will be incorporated into the training program and the particular dangers of each hazardous waste will be explained.

8.0 RECORD KEEPING

Records should be kept for all waste material which leaves the site, either for reuse on another site, recycling or disposal. A recording system will be put in place to record the waste arisings on Site.

A waste tracking log should be used to track each waste movement from the Site. On exit from the Site, the waste collection vehicle driver should stop at the Site office and sign out as a visitor and provide the security personnel or Waste Manager with a waste docket (or Waste Transfer Form (WTF) for hazardous waste) for the waste load collected. At this time, the security personnel should complete and sign the Waste Tracking Register with the following information:

- Date
- Time
- Waste Contractor
- Company waste contractor appointed by, e.g. Contractor or subcontractor name
- Collection Permit No.
- Vehicle Reg.
- Driver Name
- Docket No.
- Waste Type
- EWC / LoW

The waste vehicle will be checked by security personal or the Waste Manager to ensure it has the waste collection permit no. displayed and a copy of the waste collection permit in the vehicle before they are allowed to remove the waste from the Site.

The waste transfer dockets will be transferred to the Waste Manager on a weekly basis and can be placed in the Waste Tracking Log file. This information will be forwarded onto the DCC Waste Regulation Unit when requested.

Alternatively, each subcontractor that has engaged their own waste contractor will be required to maintain a similar waste tracking log with the waste dockets / WTF maintained on file and available for inspection on Site by the main contractor as required.

Waste receipts from the receiving waste facility will also be obtained by the Site contractor(s) and retained. A copy of the Waste Collection Permits, CORs, Waste Facility Permits and Waste Licences will be maintained on site at all times. Subcontractors who have engaged their own waste contractors, should provide the main contractor with a copy of the waste collection permits and COR / permit / licence for the receiving waste facilities and maintain a copy on file, available for inspection on Site as required.

9.0 OUTLINE WASTE AUDIT PROCEDURE

9.1 Responsibility for Waste Audit

The appointed Waste Manager will be responsible for conducting a waste audit at the Site during the C&D phase of the proposed Project. Contact details for the nominated Waste Manager will be provided to the DCC Waste Regulation Unit after the main contractor is appointed and prior to any material being removed from Site.

9.2 Review of Records and Identification of Corrective Actions

A review of all waste management costs and the records for the waste generated and transported off-site should be undertaken mid-way through the demolition and construction phase of the proposed Project.

If waste movements are not accounted for, the reasons for this should be established in order to see if and why the record keeping system has not been maintained. The waste records will be compared with the established recovery / reuse / recycling targets for the site. Each material type will be examined, in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved.

Upon completion of the C&D phase, a final report will be prepared, summarising the outcomes of waste management processes adopted and the total recycling / reuse / recovery figures for the development.

10.0 CONSULTATION WITH RELEVANT BODIES

10.1 Local Authority

Once construction contractors have been appointed and have appointed waste contractors, and prior to removal of any C&D waste materials off-Site, details of the proposed destination of each waste stream will be provided to the DCC Waste Regulation Unit.

DCC will also be consulted, as required, throughout the demolition, excavation and construction phases in order to ensure that all available waste reduction, reuse and recycling opportunities are identified and utilised and that compliant waste management practices are carried out.

10.2 Recycling / Salvage Companies

The appointed waste contractor for the main waste streams managed by the demolition and construction contractors will be audited in order to ensure that relevant and up-to-date waste collection permits and facility registrations / permits / licences are held. In addition, information will be obtained regarding the feasibility of recycling each material, the costs of recycling / reclamation, the means by which the wastes will be collected and transported off-Site, and the recycling / reclamation process each material will undergo off-Site.

11.0 REFERENCES

1. Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate and associated legislation includes:
   - European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended.
   - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended.
   - Waste Management (Facility Permit and Registration) Regulations 2007 (S.I No. 821 of 2007) as amended.
   - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended.
   - European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014) as amended.
   - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended.
   - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
   - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
   - European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended.
   - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended.
   - European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 430 of 2015)
   - Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended.
   - Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended.
   - The European Communities (Transfrontier Shipment of Hazardous Waste) Regulations 1988 (S.I. No. 248 of 1988)
   - European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324 of 2011)
   - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended
2. Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
4. Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015).
5. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998).
6. Forum for the Construction Industry – *Recycling of Construction and Demolition Waste.*
7. Department of Communications, Climate Action and Environment (DCCAE), *Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025* (Sept 2020).
8. Department of Environment, Heritage and Local Government, *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (2006).
9. FÁS and the Construction Industry Federation (CIF), *Construction and Demolition Waste Management – a handbook for Contractors and Site Managers* (2002).
10. Dublin City Council (DCC), Dublin City Council Development Plan 2016-2022 (2016)

11. Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended

12. EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2015)

13. Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.

14. Environmental Protection Agency (EPA), *National Waste Database Reports 1998 – 2012*.

15. EPA and Galway-Mayo Institute of Technology (GMIT), *EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned* (2015).