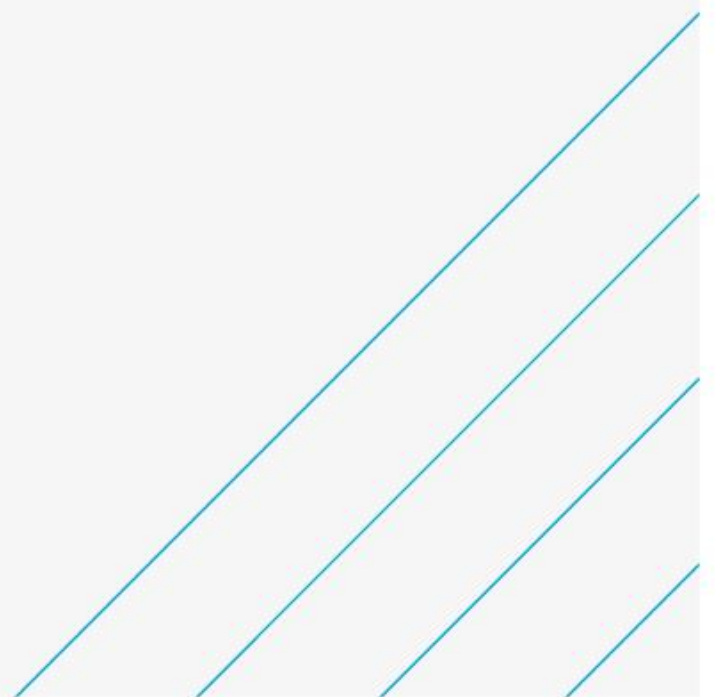


Coastal Quarter SHD 2

Construction Management Plan

Shankill Property Investments Limited

Sept. 2022



Notice

This document and its contents have been prepared and are intended solely as information for Shankill Property Investments Limited and use in relation to Construction Management Plan for the Coastal Quarter SHD 2

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1. Introduction

This document outlines a Construction Management Plan for the proposed development referred to as the Coastal Quarter SHD 2 located on the former Bray Golf Club Lands in the administrative areas of Dun Laoghaire Rathdown and Wicklow County Councils. Items discussed in this document include a brief description of the project, planned project sequencing and an overview of the Health & Safety Plan for the project, along with environmental management and monitoring requirements. The purpose of this report is to identify and summarise the measures to be implemented at this preliminary juncture and to guide the Main Contractor who will be required to develop and implement a Detailed Construction Management Plan on site during the course of the construction period, all of which will be agreed prior to commencement of development with both Local Authorities.

2. Site Location

The Site is located at the former Bray Golf Club Lands in the administrative areas of Dun Laoghaire Rathdown and Wicklow County Councils at approximate grid reference 53°12'38.9"N 6°06'19.7"W. The site is generally bounded to the north by existing public open space at Corke Abbey Valley Park, to the east by the Irish Rail Dublin-Rosslare main rail line, to the south by the River Dargle and to the west by the remains of the former golf course lands and the existing Ravenswell school's campus. The site location is shown below in Figure 2.1 and in Appendix A included in this document.

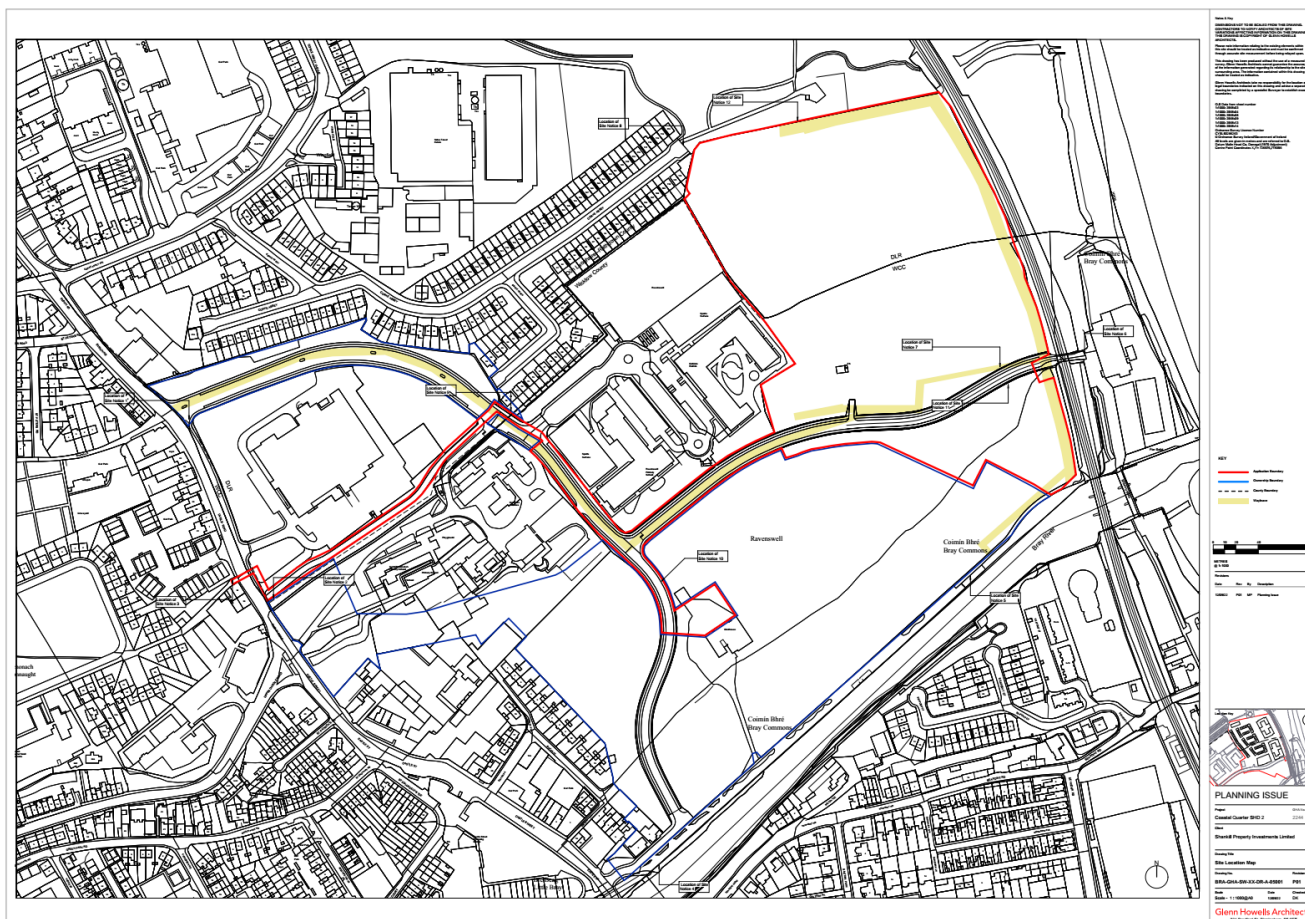


Figure 2-1 - Site location (showing red-line application / site boundary for the Coastal Quarter) (blue-line denotes overall ownership boundary).

3. Scheme Description

The proposed Coastal Quarter development comprises 586no. residential units in a mix of apartments, duplexes and houses with a combined gross floor area of 67,814m² on an 8.812ha parcel of land within the former Golf Course lands to the north of Bray Town Centre. In addition, a childcare facility (gross floor area of 627m²), café (gross floor area of 195m²), retail unit (gross floor area of 249m²), and 1no. mixed use commercial unit (gross floor area of 512m²) are proposed along with all associated and ancillary development and infrastructural works, boundary treatment works, ancillary car and bicycle parking spaces at surface and undercroft levels and all associated ancillary works.

The proposed development will also include all associated plant, refuse storage areas, communal open space, public open space, playgrounds, multi-use games area, associated internal roads and drainage arrangements, facilitating utility connections, facilitating linkages with adjoining sites; landscaping, public lighting, construction compounds; and all site development works.

The proposed maximum height of the apartment blocks will be ca. 12no. storeys. The proposed houses and duplexes range in height from 2 to 3 storeys with the proposed apartment blocks ranging in height from 3 to 12 storeys.

4. Project Health & Safety Plan

A Health & Safety Management System (HSMS) will be utilised to ensure that the health, safety and welfare of all personnel involved in or in the proximity of the proposed scheme will be not be negatively impacted in any way during the various stages of the Works. The HSMS translates Health and Safety Policy into processes so that the overall responsibilities and performance can be monitored, reported, and improved upon throughout the Works.

All principal matters will be detailed in the Project Construction Health and Safety Plan (CHSP) to be compiled as part of pre commencement works and will highlight all areas required to be managed during the construction phase.

4.1. Applicable Legislation

- Safety, Health & Welfare at Work Act 2005
- Safety, Health & Welfare at Work (Construction) Regulations 2013
- General Application Regulations 2007
- Fire Services Act 1981

4.2. Applicable codes of practice available from the Health and Safety Authority

- Construction Codes of Practice - HSA website

4.3. Construction Specific Health & Safety Risks & Mitigation Measures

- Construction specific H&S risks & mitigation measures associated with the proposed development are outlined in Table 1 below:

Table 4-1 - H&S risks & mitigation measures

Table 1	
Risks	Mitigation Measures
1. Protection of public & adjoining buildings	<ul style="list-style-type: none"> • The installation of site enclosures / boundary fencing. • Ensure appropriate traffic control measures are employed to ensure separation of construction activities from the public. • Implement construction traffic management plan. • Ensure appropriate directional signage is in place for access pathways and trafficable areas. • Ensure site enclosures / boundaries are adequate to eliminate the risk of unauthorised access to construction zones.
2. Noise & Vibration from construction activities	<ul style="list-style-type: none"> • Excavation methodologies will be developed to minimise the impacts on adjoining properties. • To minimise the noise and vibration impacts during excavation the following will be considered: <ul style="list-style-type: none"> ○ Noise mitigation equipment to be fitted to construction equipment. ○ Progressive breakage from open excavated face. ○ Minimise use of heavy rock breaking equipment closer than 10m to property boundaries to adjoining properties. ○ Commencement of excavation as far from structures as possible and monitoring of vibration whilst working towards these buildings. • Position concrete pumping operations in locations to cause minimum effect to neighbours. • Position rubbish removal operations in locations to cause minimum effect to neighbours. • Site enclosures / boundaries and appropriate sound screening to be employed to ensure separation of construction activities from adjoining neighbours. • No work is to occur outside approved working hours.
3. Dust from construction works	<ul style="list-style-type: none"> • Use of site enclosures / boundaries • Regular cleaning of site. • Hosing down of access road during dry weather. • Regular cleaning of approach roadways. • Wheel washing of construction vehicles leaving site.
4. Removal of hazardous materials	<ul style="list-style-type: none"> • A hazardous material & dangerous goods assessment will be completed and an approved removal and disposal work method plan will be put in place, if required.
5. Construction Traffic	<ul style="list-style-type: none"> • Ensure appropriate traffic control measures are employed to ensure separation of construction activities from the public. • Ensure appropriate directional signage is in place for access pathways and trafficable areas. • Barriers and the site enclosures / boundaries in place to ensure no unauthorised access to construction zones. • Ensure site personnel use identified traffic routes to site as shown in the construction traffic management plan.

5. General Site Set-Up and Pre-Commencement Measures

In advance of any works commencing onsite, a Detailed Construction Management Plan will be submitted to the Local Authority as part of obtaining a validated Commencement Notice and will elaborate on the principles set out below:

In general, the following measures will be carried out by the Main Contractor in advance of commencing any Works and will be included in the pre commencement Construction Management Plan:

- A full condition survey of the public infrastructure that will be utilised or affected by construction traffic, prior to the commencement of any work on the site, will be carried out. This condition survey will include an inventory of the road network intended to be used by vehicles, weight restrictions to be imposed on vehicles, a full colour photographic record of the road network intended to be used, a full written account of the existing condition and structural integrity of the infrastructure detailing all existing defects and features.
- Prior to any site works commencing, the Main Contractor will investigate / identify the exact location of and tag all existing services and utilities around and through the site with the assistance of the relevant Local Authority Technical Divisions and Utility Providers

- A site compound including offices and welfare facilities to accommodate all operatives will be set up by the Main Contractor including sufficient hardstanding to ensure that no parking of construction related vehicles will be permitted on the adjoining road network and if required to hold on site for a period of time, they can be accommodated within the Phase boundary
- Measures will be put in place to ensure no waste, dirt, debris, or other material shall be deposited on the public road or verge by machinery or vehicles travelling to or from the site during the construction phase. Excavated material will generally be stored on site for removal near to the completion of the project or at a stage where the removal can be aligned with favourable weather conditions, timing relative to local traffic, etc.
- Site access will be controlled, and the surrounding road network monitored to ensure that the roads and footpaths affected by the construction works are maintained in a safe and tidy condition. Road sweepers will be utilised as required.
- Site security lighting will be located and designed so as not to result in glare on the public road or to impact negatively on any nearby dwellings
- Typical working hours for the site will be 08:00 to 18:00 Monday to Friday and 08:00 to 14:00 Saturday. Special construction operations may need to be carried out outside these hours to minimise disruption to the surrounding area, which will be subject to agreement with the Local Authority. No activities will be permitted onsite on Sundays or Public Holidays unless by prior agreement with the Local Authority.
- All comments and any specific considerations/requirements as noted in the final planning permission grant will be addressed in the detailed Construction Management Plan for approval by the Local Authority ahead of implementation onsite.

6. Project Programme, Sequencing & Methodology

6.1. Phasing

The construction of this development is intended to take place in three phases (Phase 1, 2 and 3) starting from the south west corner of the site moving in an anti-clockwise direction through Phase 2 to the North and Phase 3 to the East. The proposed sequence of construction outlined below is subject to confirmation once the building contract has been awarded and on completion of the Detailed Construction Management Plan for agreement with the relevant Local Authority. The overall duration of the project is estimated to be 48 months.

Each Phase can be summarised as follows:

- The first development phase, which is expected to be constructed between Q4 '22 and Q3 '24, will be developed in the south western corner of the Site and will be accessed through the existing access road to the school development.
- Following the construction of Phase 1, this access route will become operational for the residents of the units developed during this phase and will also be used by construction traffic for the construction of Phase 2 which is located in the north western corner of the Site and is expected to be constructed between Q4 '23 and Q1 '26.
- Phase 3 will be developed in the eastern portion of the Site and will be accessed from the existing access route. It is anticipated that this phase will be constructed between Q3 '23 and Q4 '26.
- 3no. pedestrian / cyclist access points are proposed during the construction phase, as presented in Figure 2-5 below; 2no. points in the south (1no. in south west and 1no. in south east) and 1no. in the north. The proposed construction period will last 48 months.

Access from the north (Corke Abbey Valley Park) to the underpass and Ravenswell Schools complex, and from the underpass to the Ravenswell schools complex will be maintained at all times throughout the construction process. Details are set out in the Construction Management Plan.

6.2. Sequencing

Stage 1

This stage of the Works will include the erection of a site compound area which will accommodate the site welfare facilities, temporary office units and material storage areas as identified in Appendix B below. Utilities to serve the compound including power, wastewater and stormwater are existing in the proposed compound location and will all be surveyed in advance of connection along with obtaining the relevant discharge licence from the Local Authority. The Phase boundary will be demarcated and prior to commencing, all construction activities will be segregated from the surrounding area using a suitable fence or hoarding line.

Stage 2

This stage of the Works will involve the construction of each Phase including the installation of foundations, ground floor slabs, suspended concrete slabs, RC rising elements, façade erection, roofing, and internal fit out. Waste generated as part of the Construction phase of the project will be managed in line with the recommendations set out in the Outline C&DWMP report referenced above. All relevant environmental mitigation measures / monitoring requirements (for the construction phase) as set out within the Outline CEMP (and schedule of commitments within the final EIAR document) will be adhered to by the Main Contractor.

Stage 3

This stage will involve the Phased occupation of the proposed scheme in line with Appendix C below. Consideration will be given to ensure safe and suitable access is provided to both members of the public around the site perimeter and residents entering the proposed scheme by using clearly defined interfaces created with suitable and secure hoarding lines. A pre commencement version of this document will include specifics in relation to signage locations, traffic management plans, etc

6.3. Construction Methodology

There are several construction activities involved in a large-scale residential development such as the proposed site, independent of phasing, which can be generally divided into five categories:

Excavation – this includes site clearing and earthworks required to prepare the site for building foundations and installing utility services. All generated material will be stock piled in designated areas and removed from site in line with the methodology set out in the C&DWMP.

Structure – the structure includes the foundations and the physical frame of the apartment buildings and housing elements. Generally, the frame will be constructed using a combination of insitu reinforced concrete frame and precast concrete elements with the more low-rise housing units constructed in a combination of block work, timber frame and precast concrete all subject to detailed design.

Envelope/façade – the building enclosures will be formed using a combination of block work, render, timber frame, glazing and relevant roofing systems all with the required levels of insulation, ventilation, and weathering in accordance with the relevant building regulations.

Services – the requisite services will be provided such as drainage, water supply, telecoms, electricity, and lighting which will all be coordinated with the relevant utility providers including obtaining permits and connection agreements where relevant.

Landscaping – The landscaping works include some hard landscaping, roads, footpaths cycle-paths, bed and tree planting, and the relevant areas of open space associated with each Phase.

7. Waste Management Plan

A Construction Resource and Waste Management Plan has been prepared by Atkins (2022) and accompanies the planning application as referenced above. All recommendations identified in the report will be implemented during the Construction stage of the proposed scheme including the appointment of a C&D Waste Manager. A Community Liaison Officer will also be appointed to provide a point of contact between the Local Community & Residents and the Site Manager.

It should be noted that any surplus material arising from the development will be disposed of off-site by a licensed contractor to an appropriate disposal point.

8. Environmental Management Plan

A Construction Environmental Management Plan (CEMP) has been prepared in order to support the Coastal Quarter SHD 2 Planning Application. The purpose of the CEMP is to provide recommended measures to avoid, minimise and control adverse environmental impacts associated with the construction of the proposed residential development. The Designer should be aware of all key environmental risks and associated measures set out within the CEMP and the final detailed design should take due cognisance of these. The Contractor should add to and further develop the CEMP into the Detailed CEMP which should address all key environmental risks and associated measures. A number of the mitigation measures are summarised below. Refer to the CEMP for further information.

8.1. Ground Water Management Plan

8.1.1. Overview / Objectives

All surface water from the proposed scheme will be drained in accordance with the principles of Sustainable Urban Drainage Systems (SUDS) and as detailed by the Project Engineer, Atkins Consulting Engineers. The Main Contractor will ensure that measures for the attenuation, de-silting, and hydrocarbon interception, where necessary, will be installed for all surface water discharges during both Construction and Operational phases preventing any environmental impact to the surrounding watercourses.

8.1.2. Ground Water

The excavations for the drainage pipes, water supply, utilities and foundations have been designed to be as shallow as possible to reduce excavation depths. Careful attention will be required to maintain the excavations clear of ground water. A discharge Licence will be required for any ground water pumped from the excavations to any public water course or sewer. All water pumped from the excavations will require to be treated for silt and deleterious matter. During any discharge of water from the excavations, the quality of the water will be regularly monitored visually for hydrocarbon sheen and suspended solids. Periodic laboratory testing of discharge water samples will be carried out in accordance with the requirements of the discharge licence obtained from the Local Authority.

With regard to groundwater and surface water quality impacts the following mitigation measures are proposed. The Contractor will be responsible for ensuring these measures are fully implemented:

- In advance of commencement of the Construction Stage, all onsite monitoring wells (as identified in the Ground Investigation Report (IGSL, 2021) presented as part of Volume 3 of the EIAR, and the historic well located in the north eastern portion of the Site, will be fully decommissioned by an experienced borehole specialist in accordance with relevant guidelines, 'Good practice for decommissioning redundant boreholes and wells' (UK Environment Agency, 2012);
- The construction management of the Site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guidelines 'Control of Water Pollution from Construction Sites' and 'Groundwater control - design and practice' and CIRIA 2010 'Environmental Good Practice on Site' to minimise as far as possible the risk of pollution.
- All of the mitigation measures (for the protection of soils and geology) listed in Chapter 7 of Volume 2 of the EIAR will be implemented onsite during the construction phase.

- Any groundwater temporarily dewatered during the excavation works for the proposed attenuation tanks and for building foundations in the central and southern portions of the Site, and during piling (as required), will be treated via. the installation of a temporary in-situ water treatment system;
 - This system should be designed and sized to ensure that all pumped groundwater water is treated via. a temporary attenuation pond, prior to discharge to a selected onsite location (via. a temporary soakaway).
 - The Contractor will be required to provide a Site-specific dewatering plan, clearly setting out proposed excavation methodology, estimated dewatering rates, details of proposed treatment system, and discharge location.
- The Contractor will be responsible for ensuring that the existing drainage network, specifically along the existing road, and as required elsewhere across the site, will be suitably protected (via. the use of physical barriers and / or the implementation a Site-specific water run-off management plan as required).
- In order to prevent any potential surface water / groundwater impacts via. release of hydrocarbon / chemical contaminants the following standard measures will be implemented:
 - Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;
 - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling;
- A response procedure will be put in place to deal with any accidental pollution events. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of in accordance with all relevant waste management legislation;
 - All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area.
 - Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of groundwater becoming contaminated through Site activity.
 - All oil stored on Site for construction vehicles will be kept in a locked and bunded area;
 - Generators, pumps and similar plant will be placed on drip-trays to prevent contamination;
 - All Site vehicles used will be refuelled in bunded areas;
 - All temporary construction fuel tanks will also be located in a suitably bunded area and all tanks will be double skinned. Relevant Material Safety Data Sheets along with oil absorbent materials will be kept on Site in close proximity to any fuel storage tanks or bowsers during proposed Site development works; and,
 - All fuel / oil deliveries to on-Site oil storage tanks will be supervised, and records will be kept of delivery dates and volumes.
- In order to prevent any potential surface water / groundwater impacts via. release of cementitious materials the following measures will be implemented where poured concrete is being used on Site;
 - The production, transport and placement of all cementitious materials will be strictly planned and supervised. Site batching/production of concrete will not be carried out on Site and therefore these aspects will not pose a risk to the waterbodies present, namely any temporarily exposed groundwater, the River Dargle or the Irish Sea;
 - Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed;
 - Any spillages will be cleaned up and disposed of correctly;
 - Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening;
 - Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete;
 - Mixer washings and excess concrete will not be discharged directly into the drainage network, or any drainage ditches, surface water bodies or exposed groundwater; and,

- Surplus concrete will be returned to batch plant after completion of a pour.
- Foul drainage from Site offices and Site compounds will be directed to the existing wastewater network or will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations.
- No fuels, chemicals, oils or hazardous materials shall be stored within the proposed Phase 3 site compound area due to the potential flood risk identified in the southern portion of the proposed development (presented within the Flood Risk Assessment (Atkins, 2022)). Any such hazardous materials must be stored in other identified compound areas located outside of the lower lying southern portion of the site, but within the site boundary.

8.1.3. Erosion and Sediment Control

Waste and potential pollutants can be generated during construction. Controls must be put in place to prevent these pollutants from washing into surrounding watercourses.

The recommendations as outlined in the Eastern Regional Fisheries Board document outline the following seven items to be considered for the protection of adjacent water courses during the construction stage:

- Fuels, oils, greases, and hydraulic fluids must be stored in bunded compounds well away from the watercourse. Refuelling of machinery, etc., should be carried out in bunded areas.
- Runoff from machine service and concrete mixing areas must not enter the watercourse.
- Stockpile areas for sands and gravel should be kept to minimum size, well away from the watercourse.
- Runoff from the above should only be routed to the watercourse via suitably designed and sited settlement ponds/filter channels.
- Settlement ponds should be inspected daily and maintained regularly.
- Temporary crossings should be designed to the criteria laid down for permanent works.
- Watercourse banks should be left intact if possible. If they must be disturbed, all practicable measures should be taken to prevent soils from entering the watercourses.
- The main pollutants of site water are silt, fuel/oil, concrete, and chemicals. See Table 8-1 below for a list and brief description of pollution prevention measures.

The following additional measures have been incorporated from the CEMP

- Temporary stockpiling of native soils and imported materials onsite will require careful management in order to prevent the release of sediment into drainage ditches (and receiving streams), and any temporarily exposed groundwater (in the unlikely event that groundwater is encountered). The following mitigation measures should be implemented by the Contractor:
 - Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Topsoil stockpiles will be protected for the duration of the works and will be located so as not to necessitate double handling.
 - Stockpiled materials should not be located immediately adjacent to any onsite drainage ditches, or any temporarily exposed groundwater (in the unlikely event that groundwater is encountered);
 - Stockpiled materials should be covered as required to prevent it spilling over/blowing onto areas of environmental interest or semi-natural vegetation outside the agreed lands;
 - Stockpile of materials to be kept to an absolute minimum, and where possible, stockpiled for as short a time as possible prior to use;
 - Any stockpiled materials will be stored in low mounds where possible;
 - Slopes of material should be stable, and the side slopes compacted down and stabilised, with regular checks by the Contractor;
 - The Contractor is to examine the risk arising from storage areas and identify as appropriate the need for mitigation measures at the toe of slopes to reduce silt transport from areas of stockpiled material (in line with IFI best practice guidance);
 - Stockpiles of materials not suitable for onsite re-use should be removed as soon as is practicable in accordance with applicable waste management legislation, and under no circumstances to be stockpiled in sensitive ecological areas;

- The Contractor should develop a contingency plan for temporary covering of stockpiles during adverse weather conditions, or other measures as deemed necessary in order to minimise risk of sediment release to watercourses;
- The Contractor should comply with best practice when sourcing imported materials for site works, including NRA (2006) A Guide to Landscape Treatments; and,
- If imported material is required, it must be from a reputable source who can confirm that it has been screened for potential presence of invasive species.

Table 8-1 - Pollution Prevention Measures

Source	Action
Detergents	Use of detergents should be carried out in designated areas draining to the foul sewer.
Fuel/Oil	Fuel/oil stores must be located away from the site drainage system and the edge of watercourses.
Fuel/Oil	Ensure adequate measures are identified to prevent or contain any spillage such as creating a fall away from any drainage grid or blocking drainage points.
	Prevent oil pollution by: <ul style="list-style-type: none"> • Suitable bunded storage of fuel/oil, and use of drip trays under plant, and • An oil separator, and/or • On-site spill-kit • Commercially available absorbent granules, pads or booms.
Material Storage	Store drums, oil and chemicals on an impervious base and within a secured bund.
	Ensure topsoil and/or spoil heaps are located at least 10m away from water courses. Consider seeding them or covering with a tarpaulin to prevent silty runoff and losses due to wind.
Leaks and Spills	Storage facilities are to be checked on a regular basis to ensure any leaks or drips are fixed to prevent loss and pollution.
	Ensure appropriate spill response equipment is located near to the material in case of containment failure or material spills, and ensure site staff know how to use it.
	Adequate stocks of absorbent materials, such as sand or commercially available spill kits and booms should be available at all times.
Litter	Provide waste bins on-site as appropriate.
Construction Vehicles	Provide vehicle wheel washing.
Concrete, Cement and Bentonite	Washout of these materials should be carried out in a designated, impermeable contained area. The washout water itself should be disposed of off-site, or discharged to the foul sewer if authorised.

8.1.4. Sediment Control

Construction runoff is heavily laden with silt which can block road gullies and reduce the hydraulic capacity in pipes and rivers, contributing to ponding and flooding. Continued development without appropriate controls will ultimately keep maintenance costs elevated, whether that be in cleaning gullies, jetting pipes or dredging. Sediment control plans can be implanted on site to mitigate these issues.

Sediment basins and traps should be installed before any major site grading takes place. Additional sediment traps and silt fences should be installed as grading takes place to keep sediment contained on site at appropriate locations.

Key runoff-control measures should be in conjunction with sediment traps to divert water from planned undisturbed areas away from the traps and sediment-laden water into the traps. Diversions should be installed above the areas to be disturbed before any grading operations. Any perimeter drains should be installed with stable outlets before opening major areas for development. Any additional facilities needed for runoff control should be installed as grading takes place.

During grading operations, temporary diversions, slope drains, and inlet and outlet protection installed in a timely manner can be very effective in controlling erosion and sediment build up.

The main run-off conveyance system with inlet and outlet protection measures should be installed early and used to convey stormwater run-off through the development site without creating gullies or channels. Install inlet protection for storm drains as soon as the drain is functional to trap sediment on site in willow pools and to allow the flood flows to enter the storm drainage system safely. Install outlet protection at the same time as the conveyance system to prevent damage to the receiving waters.

8.1.5. Sediment Control Measures

Sediment entrapment facilities are necessary to reduce sediment discharges to downstream properties and receiving waters. All run-off leaving a disturbed area should pass through a sediment entrapment facility before it exits the site and flows downstream.

8.2. Ground Contamination

As a precautionary measure, the potential risk of encountering ground contamination should be addressed by the Contractor in the Detailed CEMP.

- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Topsoil stockpiles will be protected for the duration of the works and will be located so as not to necessitate double handling.
- Soil beneath the proposed footprint of all housing and duplex units is suitable (from a human health and environmental perspective) for reuse within the proposed residential gardens, with the exception of two localised hotspots (TP205 and TP208). The extent of these hotspot areas (from ground level to 1mbgl) is estimated to be 10m x 10m, centred around each of the following locations:
 - TP205 Hotspot - Grid Reference: 726,442.09 E, 719,477.12 N; and,
 - TP208 Hotspot - Grid Reference: 726,491.25 E, 719,426.98 N.
- This material (ca. 200m³) should be removed for reuse elsewhere onsite, or for offsite disposal to a suitably licenced / permitted waste facility. These soils can be replaced if needed by soils from elsewhere beneath the proposed footprint of all housing and duplex units, or from the north western portion of the Site (e.g. excavated material from Block D), or via. suitable imported uncontaminated soil / topsoil. The Contractor, in consultation with the Client and the Engineer, will be responsible for ensuring that these two localised soil hotspots (TP205 and TP208) are removed and replaced with suitable material as required.
- The design of road levels and finished floor levels has been carried out in such a way as to minimise cut/fill type earthworks operations. The duration that subsoil layers are exposed to the effects of weather will be minimised. Disturbed subsoil layers will be stabilised as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles. The Contractor will be responsible for ensuring these measures are fully implemented.
- The excavation of material will be minimised as much as possible to reduce the impact on soils and geology. Any surplus material, or materials which are deemed not suitable for onsite reuse will be classified in

accordance with the EPA Guidance Document 'Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous' (2015). It will be the Contractors responsibility to ensure that all waste soils are classified correctly and managed, transported and disposed of offsite in accordance with the requirements of the Waste Management Act 1996, as amended, the Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste and any relevant subsequent waste management legislation.

- The minor amount of waste C&D material observed in a localised area within the southern portion of the Site will also be removed from site and disposed of in accordance with all relevant waste management legislation. A Resource and Waste Management Plan has been generated for the Site (Document Ref: 5214419DG0011(Atkins, 2022)). It will be the Contractors responsibility to ensure that a project specific Detailed Waste Management Plan is fully implemented onsite for the duration of the project.
- Based on CIRIA 665 guidance, gas protection measures would be required in the vicinity of proposed apartment blocks B and C, based on this part of the Site being CS2. The typical scope of protective measures for residential buildings (not low rise traditional housing), such as apartment blocks B and C (for CS2) is as follows (CIRIA 665, 2007):
 - Option a) - Reinforced concrete cast in situ floor slab (suspended, non-suspended or raft) with at least 1200g damp proof membrane (DPM) and underfloor venting; or;
 - Option b) - Beam and block or pre-cast concrete and 2000g DPM / reinforced gas membrane and underfloor venting; and,
- All joints and penetrations sealed.

Gas protection measures (based on the above scope) for apartment blocks B and C will be incorporated into the Detailed Design Stage of the proposed development; and will be installed by experienced and trained specialists and will be subject to inspection and certification, during the Construction Stage. The Contractor, in consultation with the Client and the design team, will be responsible for ensuring that these measures are fully implemented and verified.

Further mitigation measures for the prevention of soil / bedrock contamination during construction are proposed below. The Contractor will be responsible for ensuring these measures are fully implemented. Mitigation measures outlined in Section 6.16, Water Management are also applicable to the protection of soils and geology during the construction phase:

- In advance of commencement of the Construction Stage, all onsite monitoring wells (as identified in the Ground Investigation Report (IGSL, 2021) presented in Appendix B.5, and the historic well located in the north eastern portion of the Site, will be fully decommissioned by an experienced borehole specialist in accordance with relevant guidelines, 'Good practice for decommissioning redundant boreholes and wells' (UK Environment Agency, 2012);
- Earthworks / piling plant and vehicles delivering construction materials to Site will be confined to predetermined haul routes around the Site for each phase of the proposed development;
- The need for vehicle wheel wash facilities will be assessed by the Contractor depending on the phasing of works and onsite activity and will be installed as needed, near any Site entrances and road sweeping implemented as necessary to maintain the road network in the immediate vicinity of the Site;
- Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods;
- All excavated materials / piling arisings will be stored away from the excavations / immediate works area, in an appropriate manner at a safe and stable location. The maximum height of temporary stockpiles will be 3m;
- A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the Site;
- The employment of good construction management practices will serve to minimise the risk of pollution from construction activities at the proposed development in line with the Construction Industry Research and Information Association (CIRIA) publication entitled, Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, CIRIA - C532 (2001); and,
- Specifically, regarding pollution control measures, the following will be adhered to;

- Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or re-cycling;
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of;
- All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area;
- All plant and machinery will be serviced before being mobilised to Site;
- No plant maintenance will be completed on Site, any broken-down plant will be removed from Site to be fixed;
- Refuelling will be completed in a controlled manner using drip trays at all times;
- Mobile bowzers, tanks and drums will be stored in secure, impermeable storage areas away from open water;
- Fuel containers will be stored within a secondary containment system, e.g. bunds for static tanks or a drip tray for mobile stores;
- Containers and bunding for storage of hydrocarbons and other chemicals will have a holding capacity of 110% of the volume to be stored;
- Ancillary equipment such as hoses and pipes will be contained within the bund;
- Taps, nozzles or valves will be fitted with a lock system;
- Fuel and chemical stores including tanks and drums will be regularly inspected for leaks and signs of damage;
- Drip-trays will be used for fixed or mobile plant such as pumps and generators to retain oil leaks and spills;
- Only designated trained operators will be authorised to refuel plant on Site;
- Procedures and contingency plans will be set up to deal with emergency accidents or spills;
- An emergency spill kit with oil boom, absorbers etc. will be kept on-site for use in the event of an accidental spill. A specific team of staff will be trained in the use of spill containment;
- Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of soils and bedrock becoming contaminated through Site activity; and,
- The highest standards of Site management will be maintained and utmost care and vigilance followed to prevent accidental contamination or unnecessary disturbance to the Site and surrounding environment during construction. A named person will be given the task of overseeing the pollution prevention measures agreed for the Site to ensure that they are operating safely and effectively.

The above mitigation measures will be incorporated (as required) during Detailed Design Stage, and will form part of a site-specific Construction Environmental Management Plan (CEMP) which will be implemented during the Construction Stage (including initial Site preparatory / enabling works).

9. Dust and Dirt Control

Nuisance dust emissions from construction activities are a common and well recognised problem. Fine particles from these sources are recognised as a potential significant cause of pollution. The Main Contractor will monitor the air quality for the purposes of demonstrating that both nuisance dust and fine particle emissions from the site is adequately controlled and are within acceptable limits. The total dust emission arising from on-site operations

associated with the proposed development shall, when measured at the site boundaries, not exceed 350 milligrams per square metre per day, averaged over 30 days. The necessary number and locations of the monitoring and recording stations for dust deposition shall be in accordance with the requirements of the Local Authority and the Local Authority shall be afforded access at all reasonable times in order to inspect, examine and check apparatus and equipment used or required to carry out monitoring of dust. Dust and fine particle generation from construction and demolition activities on the site can be substantially reduced through carefully selected mitigation techniques and effective management. Once particles are airborne it is very difficult to prevent them from dispersing into the surrounding area. The most effective technique is to control dust at source and prevent it from becoming air borne, since suppression is virtually impossible once it has become air borne.

9.1. Mitigation Measures

The following are techniques and methods which are widely used currently throughout the construction industry to control dust and dirt emitting from the site, and which may be used in the development and will be detailed as part of the pre commencement Construction Management Plan:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic. The roads around the site are all surfaced, and no dust is anticipated arising from unsealed surfaces.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary;
- A regime of 'wet' road sweeping can be set up to ensure the roads around the immediate site are as clean and free from dirt / dust arising from the site, as is reasonably practicable. This cleaning will be carried out by approved mechanical sweepers.
- Footpaths immediately around the site can be cleaned by hand regularly, with damping as necessary.
- High level walkways and surfaces such as scaffolding can be cleaned regularly using safe 'wet' methods, as opposed to dry methods.
- Vehicle waiting areas or hard standings can be regularly inspected and kept clean by brushing or vacuum sweeping and will be regularly sprayed to keep moist, if necessary.
- Vehicle and wheel washing facilities can be provided at site exit(s) where practicable. If necessary, vehicles can be washed down before exiting the site.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates;
- Netting can be provided to enclose scaffolding to mitigate escape of air borne dust from the existing and new buildings.
- Vehicles and equipment will not emit black smoke from exhaust system, except during ignition at start up
- Engines and exhaust systems should be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation
- Servicing of vehicles and plant should be carried out regularly, rather than just following breakdowns.
- Internal combustion plant should not be left running unnecessarily.
- Where possible fixed plant such as generators should be located away from residential areas.
- The number of handling operations for materials will be kept to a minimum to ensure that dusty material is not moved or handled unnecessarily.
- The transport of dusty materials and aggregates should be carried out using covered / sheeted lorries.
- Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.
- Material handling areas should be clean, tidy, and free from dust.
- Vehicle loading should be dampened down and drop heights for material to be kept to a minimum.
- Drop heights for chutes / skips should be kept to a minimum.
- Dust dispersal over the site boundary should be minimised using static sprinklers or other watering methods as necessary.
- Stockpiles of materials should be kept to a minimum and if necessary, they should be kept away from sensitive receptors such as residential areas etc.
- Stockpiles were necessary, should be sheeted or watered down.

- Methods and equipment should be in place for immediate clean-up of spillages of dusty material.
- No burning of materials, including green waste will be permitted on site.
- Earthworks excavations should be kept damp where necessary and where reasonably practicable.
- Cutting on site should be avoided where possible by using pre-fabrication methods.
- Equipment and techniques for cutting / grinding / drilling / sawing / sanding etc., which minimise dust emissions and which have the best available dust suppression measures, should be employed.
- Where scabbling is to be employed, tools should be fitted with dust bags, residual dust should be vacuumed up rather than swept away, and areas to be scabbled should be screened off.
- Wet processes should be used to clean building facades if possible. If dry grit blasting is unavoidable then ensure areas of work are sealed off and dust extraction systems used.
- Where possible pre-mixed plasters and masonry compounds should be used to minimise dust arising from on-site mixing
- Prior to commencement, the Main Contractor should identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions. Furthermore, the Main Contractor should prepare environmental risk assessments for all dust generating processes, which are envisaged.
- The Main Contractor should allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.
- All hydrocarbons, chemicals, oils, etc. shall be stored in a dedicated bounded area at least 30m from watercourses and capable of storing 110% of the container/tank capacity.
- All refuelling shall take place in a designated refuelling area at least 30m from watercourses
- The contractor shall ensure adequate supply of spill kits and hydrocarbon absorbent pads are stocked on site
- The contractor shall provide to the Local Authority, on completion of works, a comprehensive report detailing the management of all waste streams generated during the construction and commissioning stages of the project. This shall include but not be limited to type of waste streams, amount of each waste stream generated, destination of waste stream (including final destination if applicable), percentage of waste re-used, recycled, recovered and disposed, and prevention and minimisation initiatives undertaken.
- At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

10. Noise Assessment and Control Measures

10.1. Introduction

During the construction phase, best available technology will be employed by the Main Contractor to minimise noise from the construction operations and shall comply with the BS5228:2009 “Noise and Vibration Control on Construction and Open Sites”.

The main contractor will deal with the immediate dangers to hearing etc. associated with high noise levels and the impact of same on construction operatives, by means of risk assessment and mitigation/precautionary measures and equipment, all pursuant to the current health and safety legislation. Current legislation limits, assessment period of 8 hours of one week. (noisiest 8 hours likely to experience)

- Lower Action Value (LAV) – 80 dBA LEX,8, 135 dB Peak – Hearing Protection shall be made available and information shall be provided.
- Upper Action Value (UAV) – 85 dBA LEX,8, 137 dB Peak – Use of Hearing Protection is mandatory, measures to eliminate the noise as much as possible shall be applied.
- Exposure Limit Value (ELV) – 87 dBA LEX,8, 140 dB Peak – Not to be exceeded

Protection by ear plugs/muffs given by their Signal-to-Noise Ratio (SRN) or Noise Reduction Rating (NRR) is typically 20 – 30 dB

Exposure = LEX,8 – (SNR - 10)

As a guide, if it is difficult to hear a normal conversation at 2m or a workplace is consistently noisier than a busy street, it is likely that the noise levels in the area are above 80 dBA.

10.2. Noise Assessment

It is not envisaged that any excessively noisy activities will be carried out over extended periods of time during the construction stage. However, due to the nature of the construction works, exposure to noise levels in excess of 80 dBA (Safe Working Limit) may occur occasionally. The Main Contractor will carry out a noise assessment in relation to the proposed works at construction stage. The noise assessment identified the following steps in its analysis:

- Potentially Hazardous Activities: Use of site machinery and power tools. For example, concrete saws, angle grinders, vibratory plate compactors etc.
- Potential Hazards: Excessive noise
- Persons at Risk: People in the vicinity of the work generating an excessive noise. These people include employees, contractors, and members of the public
- Risk of Exposure to the Potential Hazard: Temporary or permanent hearing loss.
- Risk Assessment before the Implementation of Control Measures: Medium
- Risk Assessment after the Implementation of Control Measures: Low
- Control Measures Implemented by: Site Manager / Works Supervisor

10.3. Control Measures

The following control measures are to be implemented and the Main Contractor shall monitor a likelihood of prolonged exposure to excessive noise and commission noise surveying/monitoring programme where necessary:

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise;
- The Main Contractor shall assess risk arising from noise prior to each activity taking place and determine appropriate action. The aim shall be to minimise the exposure to excessive noise levels.
- If it is likely that the noise exposure exceeds Lower Action Value, then hearing protection must be made available.
- If it is likely that the noise exposure exceeds Upper Action Value, then hearing protection is mandatory to be used. Work Supervisor shall decide on the most suitable hearing protection to be used based on Exposure (see formula above) and worker's personal preference (earmuffs or earplugs).
- The Main Contractor shall ensure proposed measures are put in place and that their effectiveness and suitability is evaluated on regular bases.
- The Main Contractor shall minimise noise at work by looking for alternative processes and/or working methods, which would make the work quieter and/or exposure times shorter.
- The Main Contractor shall liaise with all sub-contractors to effectively control noise exposure.
- Number of people working near source of the noise shall be minimised.
- Plant and machinery shall be compliant with current legislation and fitted with silencers where possible.
- Employees must use hearing protection where its use is made compulsory.
- Hearing protection zones shall be identified where necessary.
- Spot checks on appropriate use of hearing protection shall be carried out.
- Operators of rock breaking machines and workers nearby must wear adequate ear protection.
- The Main Contractor will adhere to the working hours as set out in clause 3.5
- Limiting the hours during which site activities which are likely to create high levels of noise or vibration are permitted; and,
- During construction, the contractor will manage the works to comply with noise limits outlined in BS 5228-1:2009+A1 2014. Part 1 – Noise;
- All plant to be serviced and maintained in good working order to ensure noise production is kept to a minimum
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;

- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- Selection of plant with low inherent potential for generation of noise and/ or vibration;
- The Contractor will endeavour to position noise plant where possible away from sensitive receptor and will be mindful of sensitive receptors in arrangement of site set up.
- Erection of good quality site hoarding to the site perimeters adjacent to sensitive receptors which will act as a noise barrier to general construction activity at ground level;
- Idle plant to be switched off or throttled down to both save energy and reduce noise emissions.
- All plant operators to be qualified in their specific piece of plant.
- Compressors and generators will be sited in areas least likely to give rise to nuisance where practicable
- Erection of barriers as necessary around items such as generators or high duty compressors,
- If the Contractor gets a complaint about noise from a neighbour, he will act immediately to remedy the situation

10.4. Correct Use of Hearing Protection

- Earmuffs: Workers must make sure that they totally cover their ears, fit tightly and that there are no gaps around the seals. Hair, glasses, jewellery, hats etc. shall not interfere with the seal. Seals and insides of earmuffs shall be kept clean. Workers shall make sure that any headband keeps its tension.
- Earplugs: Workers shall make sure that they are wearing them properly. They shall practice fitting them and get help if they are having trouble. Hands shall be clean before fitting earplugs. Earplugs must not be shared with other workers.
- Semi-inserts/caps: Same applies as for earplugs. Worker shall make sure that any headband keeps its tension.

All workers are expected to:

- Co-operate: Help the Main Contractor to do what is needed to protect their hearing. Make sure that they use properly any noise control device and follow any working methods that are put in place.
- Wear any hearing protection they are given: Make sure that they are wearing it properly. They shall wear it all the time when they are exposed noisy environment (over UAV). Taking it off even for a short while means that the hearing could still be damaged.
- Maintain their hearing protection to preserve it's working condition
- Report any problems: Report any problems with the hearing protection or effectiveness of the measures to the work supervisor.

11. Working at Height

11.1. Cranes

It is likely that each of the 4 Apartment Blocks on the proposed scheme will be provided with a tower crane to serve the shell and core element of the Works. Prior to the erection of any cranes, all relevant statutory bodies likely to be impacted including the Irish Aviation Authority and Irish Rail will be contacted for the purposes of obtaining any necessary licences, agreements and permits. A detailed lifting plan including crane positions where relevant will be included in the pre commencement Construction Management Plan for discussion and approval by the Local Authority.

11.2. Hoists

Passenger and Goods hoists will likely be utilised for each Apartment Block as required to facilitate loading out of materials during the construction stage of the Works.

Hoist locations and durations TBC as part of the pre commencement Construction Management Plan.

12. Construction Traffic Management

12.1. Overview

All construction activities will be managed and directed by a Construction Traffic Management Plan (CTMP). The details of the CTMP will be agreed with the roads department of the Local Authority in advance of construction activities commencing on-site. The objective of the CTMP is to ensure that the impacts of all related construction activities generated during the construction phase of the proposed development upon both the public (off-site) and internal (on-site) construction workers environments are fully considered and proactively managed and scheduled with full consideration of the requirements of key stakeholders. This will ensure that the safety, health and well-being of both the public's and construction workers is maintained at all times.

The likely traffic impact of the construction works will be short-term in nature. The number of staffs on site will fluctuate over the construction phases of the subject development and is estimated to peak at 300 workers onsite. From similar developments completed by the Applicant, workers will typically make use of shared transport thereby reducing traffic generation and will also utilise public transport facilities, especially given the proximity to the Dart Station – it is predicted that site operative vehicles will have an average occupancy of 3 people per vehicle and 20% will travel on public transport. This considered, it is estimated that the peak level of site personnel activity will equate to approximately 80 arrival trips during the AM and the same during the PM periods. In terms of arrivals and departure times, on-site personnel will typically arrive between 07:00 and 08:00 and will generally depart at 16:00. These arrival and departure times are offset and outside of the commuter AM and PM peak hours, therefore further reducing the impact of the construction phase. Given the shared use of transport and the offset arrival and departure times inherent with the construction worker travel characteristics, the level of AM and PM peak hour traffic impact (i.e. 08:00-09:00 and 17:00-18:00) on the adjacent local road network during the construction stage, even at peak construction phase, will be less than during the operational stage. HGV movements are estimated to be in the Order of 40 two ways trips per day and will generally have a steady profile throughout the day, through measures will be in place to ensure these movements do not occur during school drop off and pick up times of the adjacent schools. Further detail on the traffic generation estimates and impact and assumptions are provided in the Section 12.2 Traffic Analysis.

In this context the existing junctions and the proposed development junctions will have adequate capacity to accommodate the relatively modest traffic volumes anticipated during the construction stage. Therefore, the potential impact during the construction phase is considered to have a short-term slight impact on the surrounding network. The implementation of the CTMP and active management of traffic generated by construction worker and deliveries will reduce these potential impacts to have imperceptible impact on the adjacent local and strategic road network.

12.2. Traffic Analysis

The overall traffic generation for the construction phase of the proposed development has been devised with the anticipated volumes of excavation of the site from the Contractor. For the purpose of this assessment, the following assumptions have been applied:

Traffic Generation Heavy Goods Vehicles

- The primary construction activities (i.e. excavation and construction) will take place over ca. 48 months during which the majority of HGV movements will occur;
- The greatest number of HGV movements will occur during the enabling and excavation works stage;
- The enabling and excavation works stage is assumed to take place over a period of time in the range of 10 – 12 months. A period of 10 months has been utilised to represent a worst case scenario from a traffic perspective;
- The anticipated volume of material to be moved (imported and exported) during the enabling and excavation works is ca. 79,511 m³ which is made up of the following
 - Topsoil to be Exported: ca. 3569 m³
 - Topsoil to be reused on site: ca. 10685 m³ (400mm deep topsoil)
 - Subsoil Exported: ca. 37630 m³
 - Imported Material: ca. 27,627 m³

- A bulking factor of 10% has been applied to the above excavation volume;
- It is envisaged that the works required to implement the development shall only be carried out between the hours of;
 - Monday to Friday: 08h00 to 18h00;
 - Saturday: 08h00 to 14h00;
 - Sunday and Public Holidays: No activity on site;
- It is assumed that there will be 20 working days in each month. As such, the total material required to be moved each day over a period of 10 months will be ca. 340m³;
- It is assumed that a Rigid HGV carries up to 20 tonnes in terms of payload and an articulated vehicle can carry up to 30 tonnes payload. However, for the purpose of a robust assessment the lower 20 tonne payload has been used in this assessment. A combination of both is envisaged to be utilised by the contractor. Taking into account a typical soil bulk density of 1.3 this would equate to ca. 15m³ per load,

Site Operatives

- An average peak level of site operatives has been assumed to be in the order of 300;
- An average occupancy level of 3 operatives per vehicle is assumed;
- It is assumed that 20% of site operatives will utilise public transport;
- It is assumed that the average peak level of site operatives will coincide with the peak level of HGV movements during the enabling and excavation works. In reality this will not occur as the enabling / excavation works will occur during the first year of the 3 year construction period, whilst the peak level of site operatives will occur during the third year. However, for the purpose of assessment, this scenario has been considered to represent a robust assessment of the potential construction impacts;
- As such, the average number of two-way LGV vehicle movements per day will be 80; and,
- It is assumed that in the order of 80% of these trips will arrive to the site between the hours of 07h00 and 08h00, with the remaining 20% arriving during the period 08h00 to 09h00. In terms of departures it is assumed that 30% will depart during 16h00 and 17h00, 20% between 17h00 – 18h00hrs and 50% between 18h00 – 19h00hrs.

The profiles have been quantified against the peak daily number of site operative and HGV traffic and are presented in Table 12-1 below.

Table 12-1 - Anticipated Hourly Profile of Movements during the Day

Peak Hour	HGV Movements (two way)	Site Operative Movements	Total Movements
07h00 - 08h00	-	64	64
08h00 - 09h00	4	16	20
09h00 - 10h00	4	-	4
10h00 - 11h00	4	-	4
11h00 - 12h00	4	-	4
12h00 - 13h00	4	-	4
13h00 - 14h00	4	-	4
14h00 - 15h00	4	-	4
15h00 - 16h00	4	-	4
16h00 - 17h00	4	24	28
17h00 - 18h00	4	16	20
18h00 - 19h00	-	40	40
Total	40	160	260

The above construction traffic volumes have been reviewed with the baseline flows on the adjacent road network and the resulting percentage impact is shown in Table 12-2 below.

Table 12-2 - Percentage Impact during the Construction Phase of the proposed development

Junction	Peak Period	Opening Year	Site Operative Traffic During Peak Hour	HGV Traffic During Peak Hour	Total Two Way Flow	% Impact
R761 Dublin Road	AM (08h00 – 09h00)	1396	16	4	20	1.4%
	PM (17h00 – 18h00)	1348	16	4	20	1.5%

The above table demonstrates that the increase in construction traffic volumes associated with the site is below 5% during the AM peak hour and PM peak hours of the adjacent road network. 5% is the threshold level noted within TII’s Traffic and Transport Assessment Guidance (2014) as being the point where a sensitive road network should be subject to detailed assessment.

It is therefore considered that the level of traffic impact during the construction stage is of an acceptable level in the short term. It should be noted that HGV movements can be managed so as not to occur during the background traffic peak period, particularly the AM school drop off period. This will be further addressed in the Construction Stage Traffic Management Plan and associated liaison with the Planning Authority. In terms of assessment, assuming that the school drop off period for the adjacent primary schools is between 08:00-09:00 hours this would result in no HGV movements during the AM peak hour and thus the percentage traffic impact would be lower. Assuming that the school pick up times of the adjacent primary schools occur between 13:00-14:00 it is not considered that this would impact of the HGV movements during the PM peak period.

The above reported impacts represent a short term slight negative impact due to construction traffic. The inclusion of HGV traffic in the assessment provides a more robust analysis, further reinforcing the slight impact of the construction traffic on the surrounding road network.

12.3. Construction Haul Routes

To access the proposed development, HGV’s travelling from the north will utilise Junction 5 of the M11 (the Wilford Interchange) via the Wilford Roundabout and travel south along the R761 before accessing Northern Access route to the proposed development and onto the Eastern Access Route and entering the proposed development. HGV’s leaving the site to travel to the north will utilise the same route. HGV’s attending the site from the south will also utilise Junction 5 of the M11 (the Wilford Interchange) but this time via Old Connaught Avenue and then travel south along the R761 before accessing Northern Access route to the proposed development and onto the Eastern Access Route and entering the proposed development. HGV’s leaving the site to travel to the south will utilise the same route as those vehicles travelling to the north but will take the correct southbound lane of the Wilford Interchange. These routes are illustrated in Figure 12-1 below.

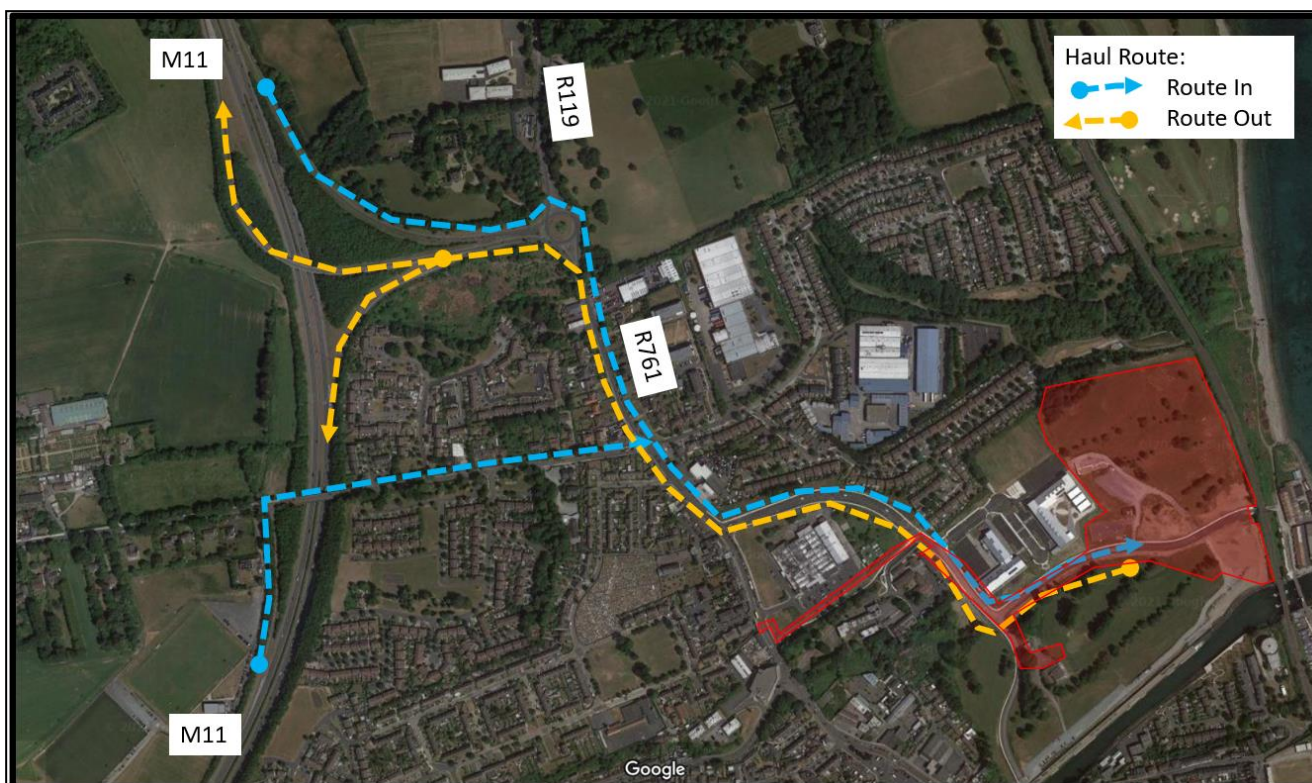


Figure 12-1 - Construction Haul Routes

12.4. Access to Existing underground Irish Water foul storage tank

Access to the existing underground Irish Water foul storage tank and all infrastructure will be maintained throughout the construction stage for Irish Water maintenance vehicles and tankers. Appropriate construction traffic management will be implemented, and this will be the responsibility of the contractor to maintain this access at all times.

12.5. Relevant Management Issues

The primary issues that affect construction projects include:

- General site access and egress
- Interaction with existing facilities and operations
- The location and amount of parking
- The timing and extent of material deliveries
- Traffic conflicts with both existing vehicles and other construction traffic
- Traffic congestion and conflicts on external roads
- Signage and directions

12.6. Site Actions

It is proposed to manage the impact of construction traffic through the provision of controlled access points to the site. These will be carefully coordinated to minimise conflicts with other activities.

The following action will be implemented to manage construction traffic:

- All construction activities will be managed and directed by a Construction Traffic Management Plan (CTMP). The details of the CTMP will be agreed with the roads department of the Local Authority in advance of construction activities commencing on-site.

Below is a list of proposed traffic management measures to be adopted during the construction works by the Contractor. Note that this is not an exhaustive list, and it will be the appointed contractor's responsibility to prepare

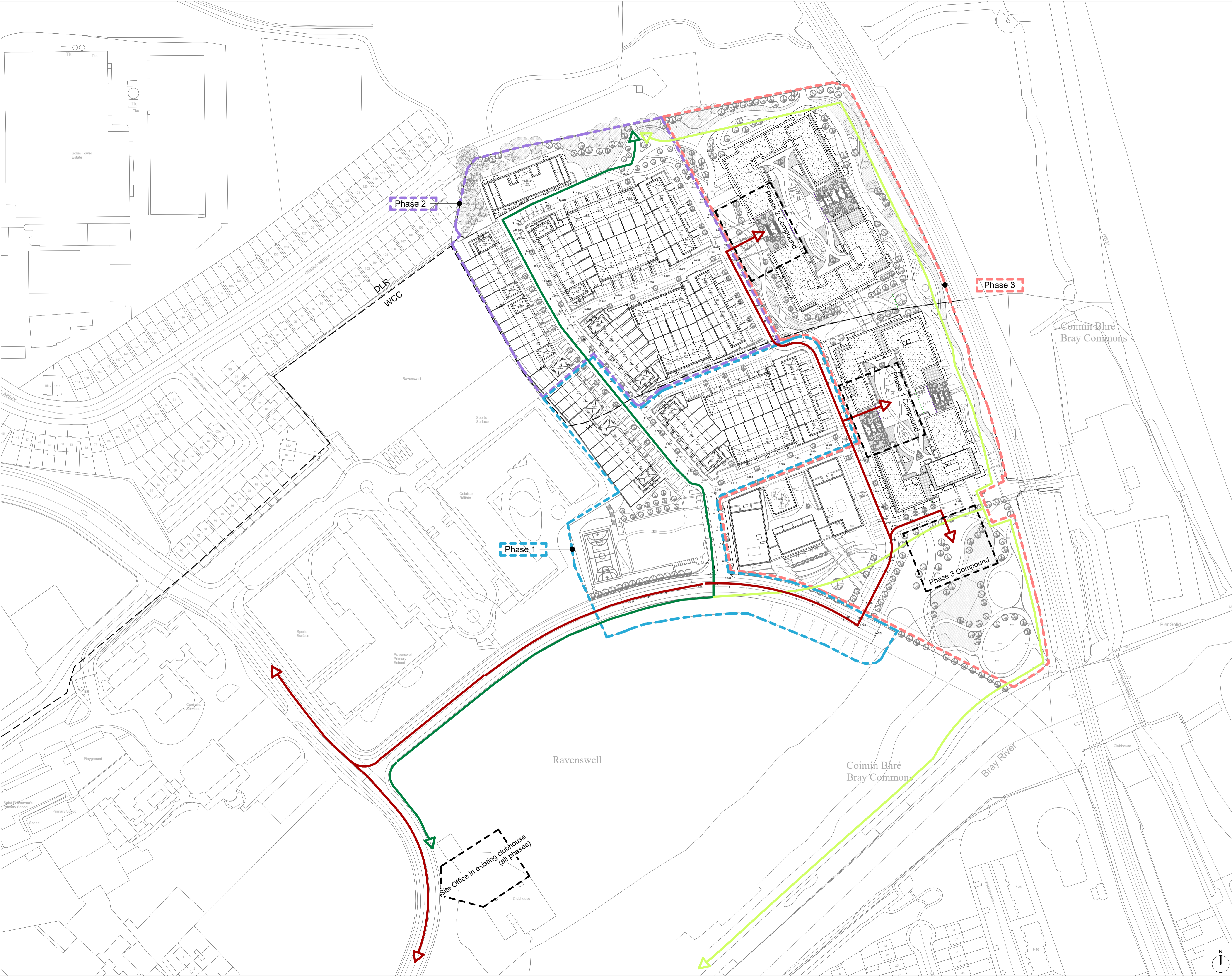
a detailed Construction Traffic Management Plan to be approved with the Planning Authority prior to commencement of construction.

- Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access;
- Construction and delivery vehicles will be instructed to use only the approved and agreed means of access and movement of construction vehicles will be restricted to these designated routes;
- Restriction of HGV movements during drop off and pick up times associated with the adjacent schools;
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material;
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the Site;
- Parking of Site vehicles will be managed, and will not be permitted on public roads, unless proposed within that designated area that is subject to traffic management measures;
- A road sweeper will be employed to clean the public roads adjacent to the Site of any residual debris that may be deposited on the public road leading away from the construction Site;
- On Site wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the Site, to avoid any potential for debris on the local roads;
- All vehicles will be suitably serviced and maintained to avoid leaks or spillage of oil, petrol or diesel. Spill kits will be available on Site. All scheduled maintenance carried out off Site will not be carried out on the public highway; and,
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footway. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users and mobility impaired persons.
- HGV movements will be managed so as not to occur during the background traffic peak period, particularly the AM school drop off period.

The above mitigation measures will minimise any significant environmental degradation or safety concerns in the vicinity of the proposed works, due to the presence of construction traffic. Furthermore, it is in the interest of the construction programme that deliveries, particularly concrete deliveries are not unduly hampered by traffic congestion, and as a result continuous review of haulage routes, delivery timings and access arrangements will be undertaken as construction progresses to ensure smooth operation.

Appendix A. Site Location Plan

Appendix B. Site Phasing Plan



Notes & Key

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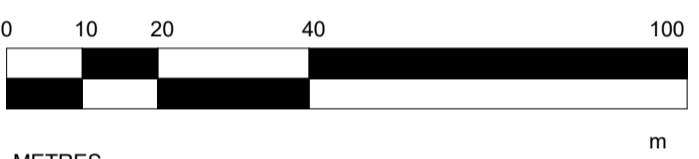
Please note information relating to the existing elements within this site should be treated as indicative and must be confirmed through accurate site measurement before being relayed upon.

This drawing has been produced without the use of a measured survey. Glenn Howells Architects cannot guarantee the accuracy of the information generated regarding its relationship to the site or surrounding area. The information contained within this drawing should be treated as indicative.

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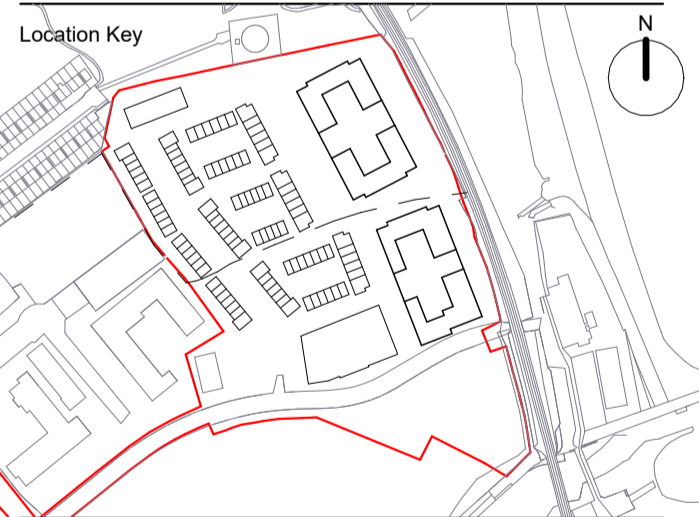
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 Datum Malin Head Co. Donegal (1970 Adjustment)
 Centre Point Coordinates X,Y= 726576,719356

- KEY**
- - - County Boundary
 - - - Phase 1
 - - - Phase 2
 - - - Phase 3
 - Construction Traffic Route
 - Segregated Pedestrian Route during Phase 3
 - Segregated Pedestrian Route during Phases 1&2
 - - - Phasing works compound / site office



Revisions

Date	Rev	By	Description
12/09/22	P01	MP	Planning Issue



PLANNING ISSUE

Project	GHA No.
Coastal Quarter SHD 2	2244
Client	
Shankill Property Investments Limited	

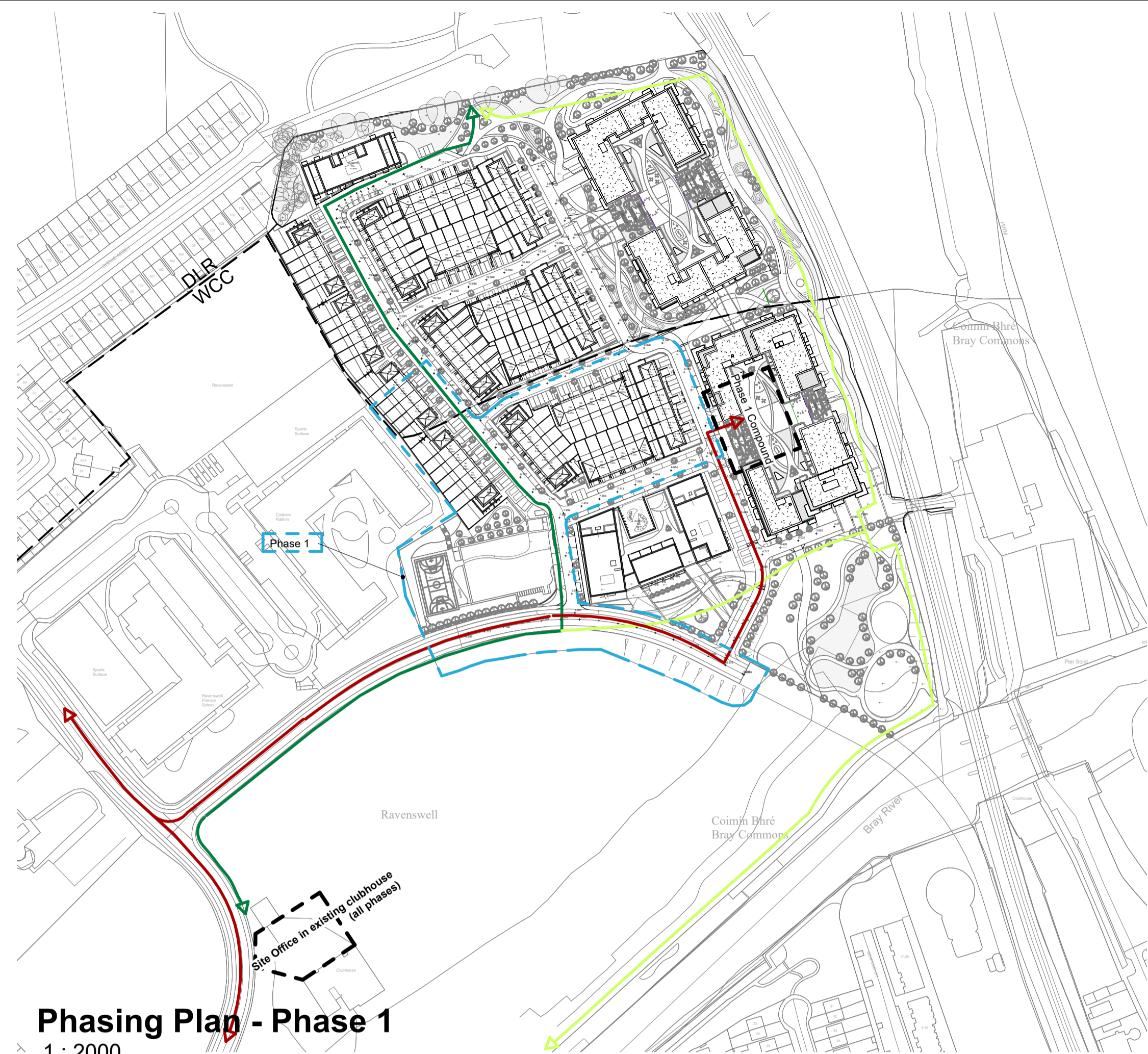
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Phasing Plan

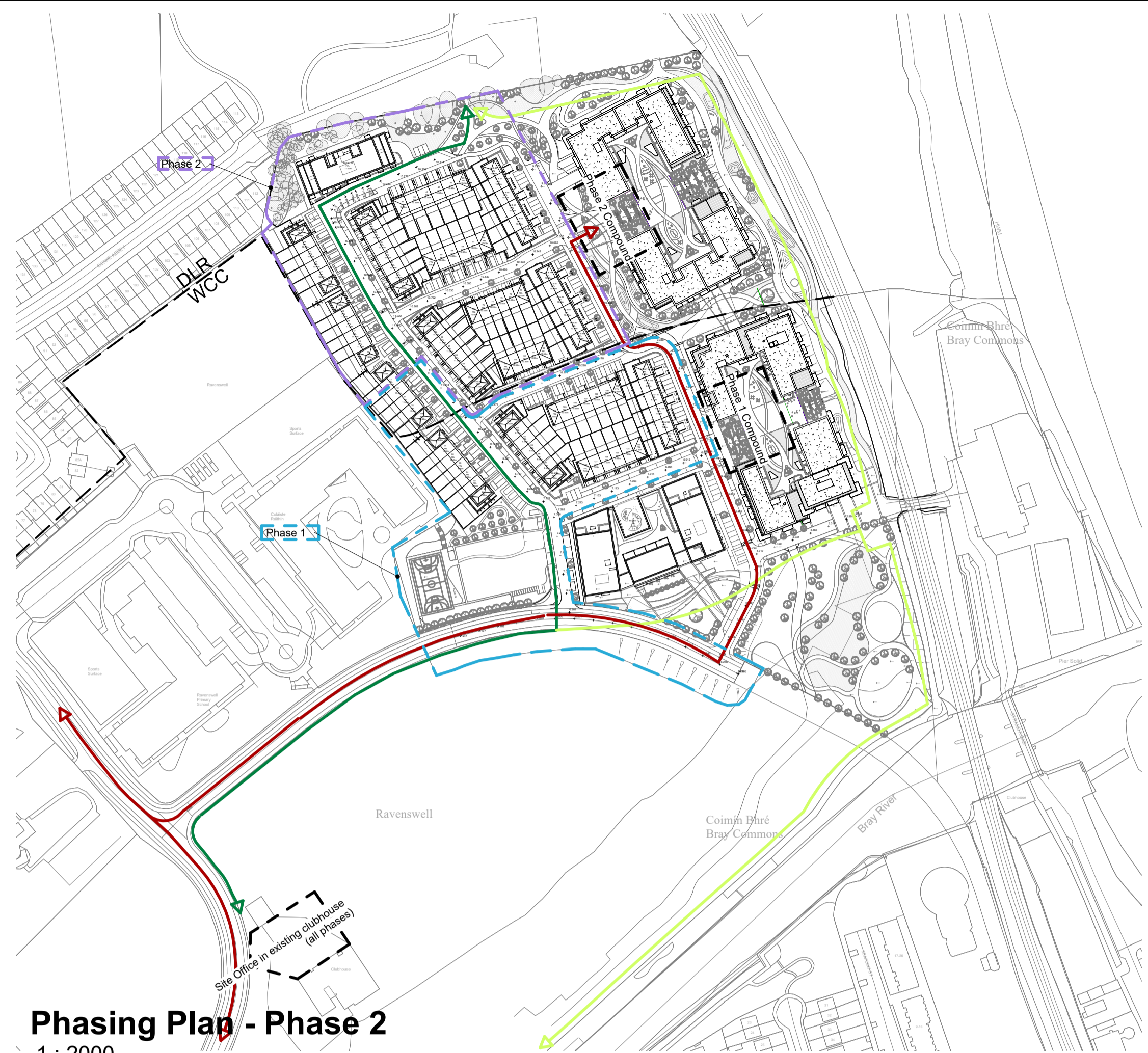
Drawing No.	Revision	
BRA-GHA-SW-ZZ-DR-A-05005	P01	
Scale	Date	Checked
Scale - 1 : 1000@A1	12/09/22	DK

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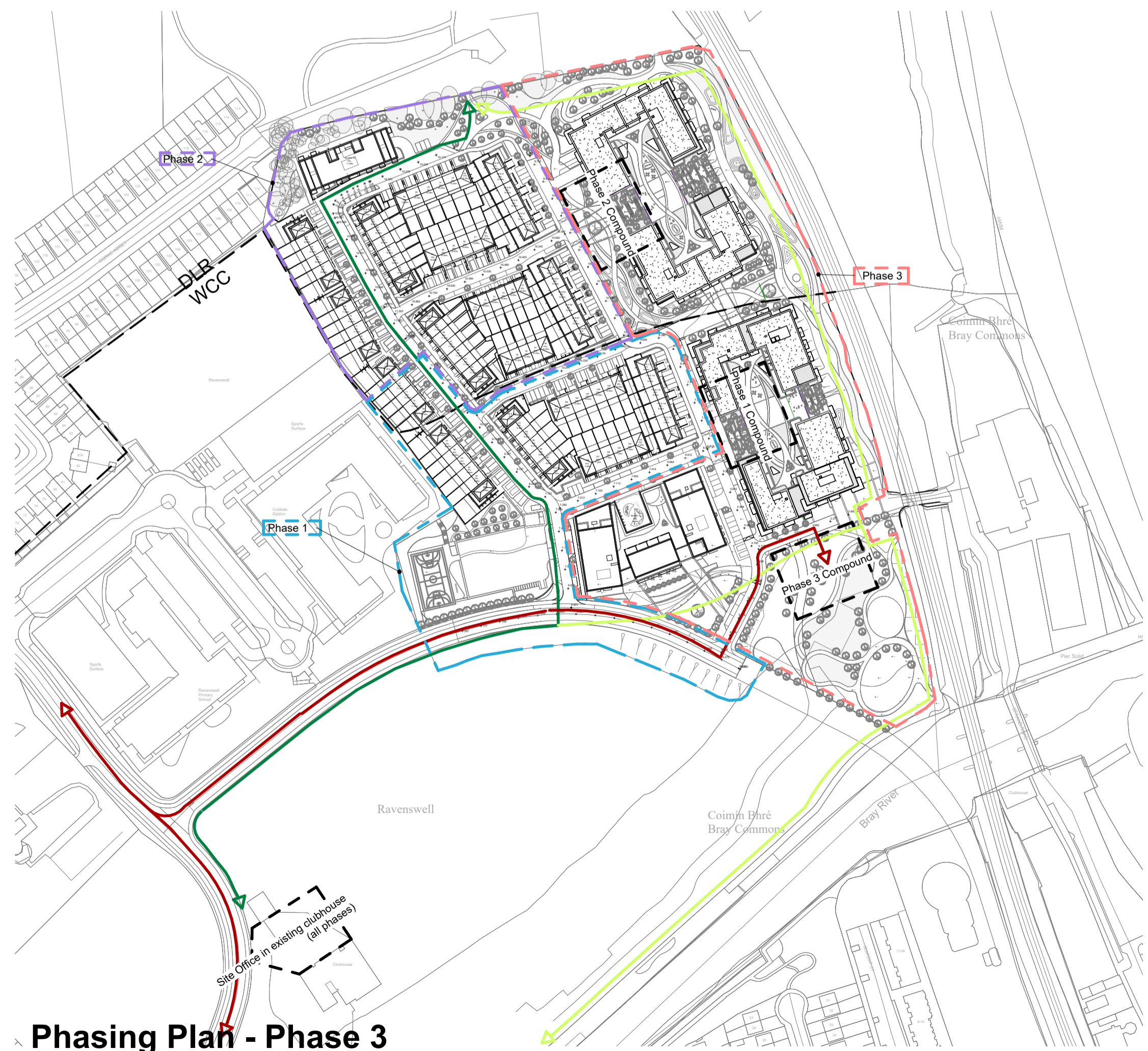
Appendix C. Phasing Works Plans



Phasing Plan - Phase 1
1 : 2000



Phasing Plan - Phase 2
1 : 2000



Phasing Plan - Phase 3
1 : 2000

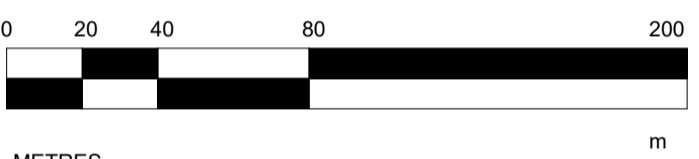
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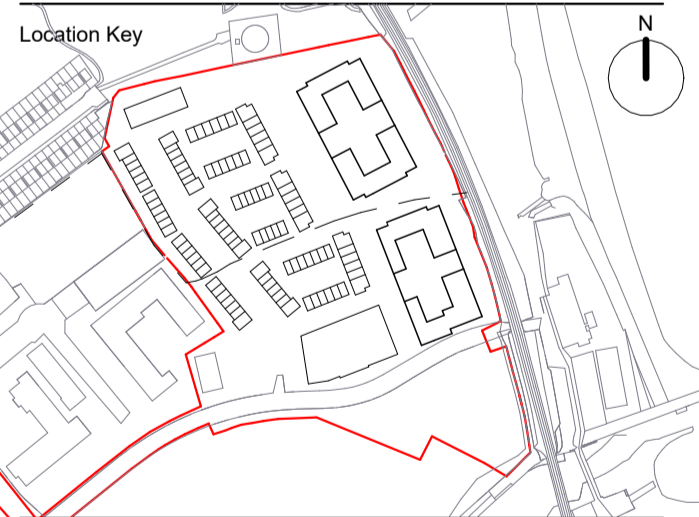
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METRES
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Revisions

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12/09/22	P01	MP	Planning Issue

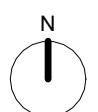


PLANNING ISSUE

Project	GHA No.
Coastal Quarter SHD 2	2244
Client	
Shankill Property Investments Limited	

Drawing Title	
Phasing Works Plan	
Drawing No.	Revision
BRA-GHA-SW-ZZ-DR-A-05009	P01
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