

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN FOR A PROPOSED RESIDENTIAL DEVELOPMENT

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Cork Office


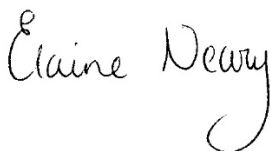
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1.0 INTRODUCTION

This Construction Environmental Management Plan (CEMP) has been prepared by AWN Consulting (AWN) on behalf of Ironborn Real Estate Limited. The proposed development relates to a residential development and creche facility at a site located at 'Sector 3' Aikens Village, Stepside, Co. Dublin. The proposal consists of the construction 438 no. residential apartments including a creche facility and all associated site works.

This CEMP explains the construction techniques and methodologies which will be implemented during construction of the proposed development.

The CEMP mitigation measures will be implemented to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection.

The CEMP will be implemented and adhered to by the construction contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the site will be trained in the implementation of the procedures.

The construction contractor will provide a further detailed CEMP to include any subsequent planning conditions relevant to the proposed development and set out further detail of the overarching vision of how the construction contractor of the proposed development manage the site in a safe and organised manner.

This CEMP has been prepared to account for activities at the site during the excavation and construction phase of the project.

The main issues that have been considered within this document are as follows;

- Description of works;
- Construction programme and phasing;
- Site logistics;
- Workforce;
- Public relations and community liaison;
- Construction traffic and access; and
- Safety, health and environmental management.

2.0 DESCRIPTION OF THE PROJECT

Figure 2.1 presents a site location plan showing the location of the site at Aikens Village, Stepside, Co. Dublin. The site is a large brownfield site located within the existing Aikens Village development. The site is accessed via an existing entrance located on Village Road and proposed new entrance from Atkinson Drive.

The surrounding land use is almost entirely residential. The site is bounded to the west by Atkinson Drive, a residential access roadway and a greenfield area further west. Located to the north is Thornberry Road and an existing live residential development. To the south is the main site access roadway Village Road and an existing live residential development the opposite side of Village Road. An existing public pathway is also located to the south boundary that will be maintained for project duration. To the east is another existing live residential estate.



Figure 2.1 Proposed location of site ((illustrated by red line boundary)

The site for proposed residential development is generally bounded by Thornberry Road to the north, by Atkinson Drive and the adjoining open space lands to the west, Sandyford Hall residential development adjacent Ferncarraig Avenue to the east and by Village Road and Griannan Fidh residential development to the south (Townland of Woodside). The site for proposed below ground wastewater storage tank is on open space lands generally bounded Griannan Fidh residential development to the north, Sandyford Hall residential development to the east and open space lands (including detention basin) to the south and west (Townland of Kilgobbin).

The development will consist of: -

- 438no. 'Build-to-Rent' apartment units (154no. 1 bedroom units and 284no. 2 bedroom units) arranged in 9no. blocks ranging in height from 2 – 8 storeys over 2no. independent single level basements. Private patios / terraces and balconies are provided for some apartment units (not all units have a patio, terrace or balcony). Upper level balconies are proposed on elevations of all multi-aspect apartment buildings.
- Blocks A – D are located above Basement 1 (c. 6,002 sq. m gross floor area) and Blocks F – J are above Basement 2 (c. 5,058 sq. m gross floor area).
- Provision 1no. childcare facility (c. 514.9 sq. m gross floor area) in Block D.
- Provision of resident amenity space / communal areas (c. 1,455.7 sq. m gross floor area) in Block C and Block G.

And all associated and ancillary site development, infrastructural, landscaping and boundary treatment works including: -

- New vehicular access to / from Basement 1 from Atkinson Drive and new vehicular access to / from Basement 2 from Thornberry Road.
- Provision of c. 9,799 sq. m public open space, including a public plaza onto Village Road and improvement works to existing open space area to the north of existing Griannan Fidh residential development.
- Provision of 350no. car parking spaces including basement parking, set down spaces for proposed childcare facility and repositioning of set down area on Atkinson Drive.
- Provision of 669no. bicycle parking spaces.
- Provision of 14no. motorcycle parking spaces.
- Communal bin storage and plant provided at basement level and additional plant provided at roof level.
- Provision of below ground wastewater storage tank (c. 500m³) and associated connection to the wastewater networks including ancillary above ground kiosk and appropriate landscaping on open space lands to the south of Griannan Fidh residential development.

3.0 CONSTRUCTION PROGRAMME AND PHASING

The construction works associated with the development will be undertaken in two phases as indicated in Figure 3.1. There will also be an excavation phase associated with removing and reprofiling spoil onsite.

The construction programme is intended to commence in May 2023 with a 27.5-month programme.

Subject to detailed planning at the construction stage, it is currently envisaged that the construction compound, offices, staff parking and storage areas will be located at the locations in Figure 5.1.

3.1 Excavation & Construction Phase

The project excavations will involve excavations for new foundations, site levelling and excavations for roads and services. The Construction and Demolition Waste Plan / Resource & Waste Management Plan prepared by AWN Consulting (ref CB_20_11775WMR01a), for the development will be updated by the main contractor and will be in compliance with the requirements of the Environmental Protection Agency (EPA) of Ireland issued '*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects*' 2021 ¹ and the Dun Laoghaire Rathdown County Council (DLRCC) *Guidance Notes for Environmental Design and Management of Construction Projects* (July 2022) ² which will identify and categorise resource consumed and waste arising from the development.

The plan will also contain the proposals for the minimisation, re-use and re-cycling of site generated waste. As part of this plan separate storage areas will be designated on the site for various types of material in order to maximise the re-use and re-cycling potential. Procedure will also be put in place to ensure that all sub-contractors fulfil the requirements of the Waste Management Plan.

The project involves the construction 438 no. residential apartments including a creche / nursery and all associated site works.

The scheme is split into 2 phases covering 9 blocks in total:

Phase 1

- Block F
- Block G
- Block J
- Block H

Phase 2

- Block A
- Block B
- Block C
- Block D
- Block E

The works will include:

- Site set up, welfare facilities and compound establishment, decommissioning and movement of site compound and facilities as needed.
- Set up of hoarding around compound and the site boundary.
- Erection of safety signage to all areas and implementation of traffic/pedestrian management plan.

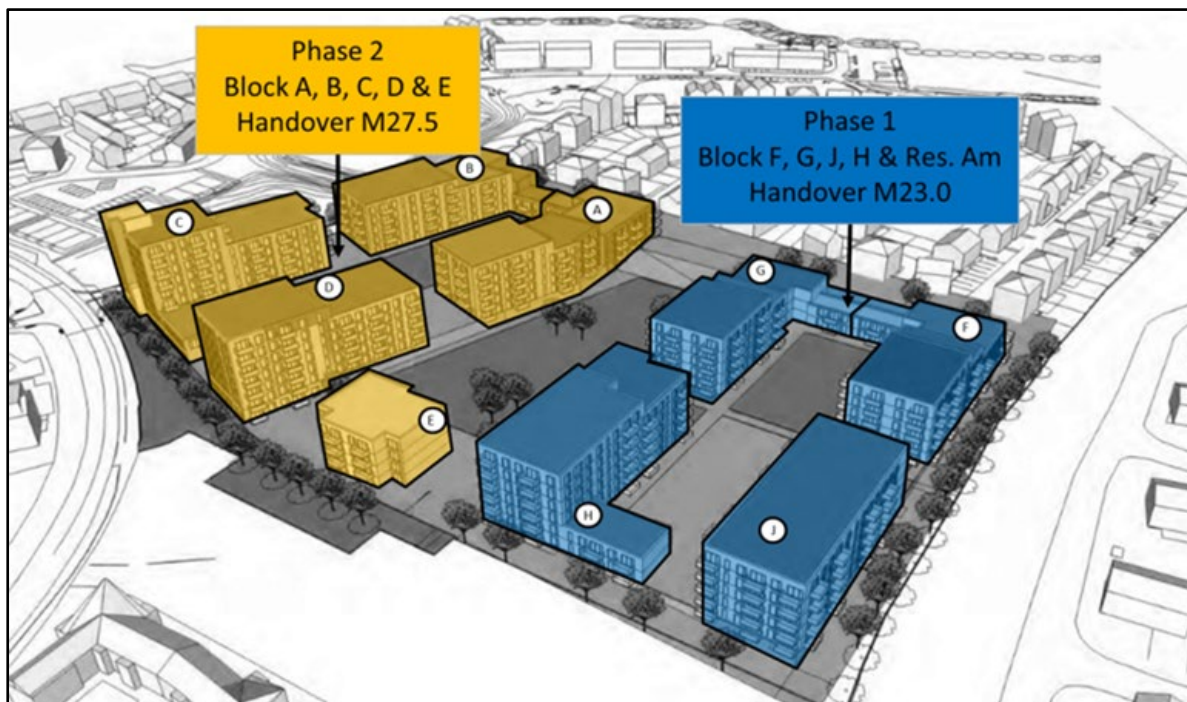


Figure 3.1 Site construction phasing strategy

4.0 EXCAVATIONS

4.1 Archaeological and Architectural Heritage

The proposed development site has also been previously disturbed by construction practices.

Should archaeological features or material be uncovered during archaeological testing or any phase of construction, ground works will cease immediately and the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht will be informed. Time must be allowed for a suitably qualified archaeologist to inspect and assess any material. If it is established that archaeologically significant material is present, the National Monuments Service may require that further archaeological mitigation be undertaken.

4.2 Ground Conditions

Soil investigations were undertaken by IGSL. Between May and July 2019, window samples and existing stockpiles were sent for testing (RILTA suit) in order to assess their suitability for disposal to landfill. All samples tested returned inert readings. All excavations will be carefully monitored by a suitably qualified person to ensure that potentially contaminated soil is identified and segregated, if encountered.

It is not anticipated that the development site works, or excavation works will be deep enough to impact the underlying bedrock geology.

It has been calculated by the project engineers that c.75,000m³ of topsoil, made ground, gravel & clay will be excavated to facilitate the construction of the proposed ground level other ancillary works. It is envisioned that all excavated material arising on the site will be removed from the site.

A Waste Characterisation Assessment has been carried out by O'Callaghan Moran (OCM). This assessment characterised all samples as "non-hazardous" and suitable for retention on site, or recovery at permitted waste recovery facility subject to the approval of the facility operator. It is noted that, depending on the overall volume of the bulk excavation the landfill may require additional samples to be taken in order to achieve, the frequency of analysis (i.e. number of samples per unit volume of excavation) that meets their license requirements.

If any contaminated material is found on site, this material 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*'⁴ 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*⁵, which establishes the criteria for the acceptance of waste at landfills.

In the event that Asbestos containing materials (ACMs) are found, 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 DLRCC 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).

4.3 Foundations / Temporary Works

The construction methodology and programme of these activities will be dictated by the Contractor. The construction of the various structures will involve complex sequencing of activities and various construction methodologies could be adopted to deliver the Contract. Drawings relating to proposed foundations and temporary works can found in appendix A of this CEMP.

Standard Pad & Strip Footings

The selection of the current foundation proposal of standard strip and pad footings is based on results of the site investigations, structural considerations and site constraints. If during excavation of the foundations and basement unexpected ground

conditions arise that vary from the site investigations results, it may be necessary to amend the indicative foundation solutions proposed at this juncture.

Temporary Works

The temporary works are proposed along Thornberry Road are to consist of precast concrete panels spanning between steel columns designed by a specialist supplier with a mass concrete base and associated propping. If during excavation of the foundations and basement unexpected ground conditions arise that vary from the site investigations results, it may be necessary to amend the indicative temporary works solutions proposed at this juncture.

5.0 SITE LOGISTICS

5.1 Site Safety Compliance

The contractor shall be responsible for overall management of the site for the duration of the proposed works and will progress their works with reasonable skill, care, diligence and to proactively manage the works in a manner most likely to ensure the safety and welfare of those carrying out construction works.

The contractor shall comply with all relevant Statutory requirements such as the 2005 Safety Health and Welfare at Work Act, The Construction Regulations (SI 291 of 2013), the General Application Regulations (SI 299 of 2007), etc. (and any amendments thereof).

5.2 Site Establishment and Security

The first activity to be carried out at the site will be the establishment of site facilities and security. It is anticipated that site establishment works will take approximately four weeks. The site office and welfare facilities will be confirmed in advance of the commencement of site works and agreed with Dun Laoghaire Rathdown County Council. Figure 5.1 point shows the proposed locations of the site compound and staff parking.

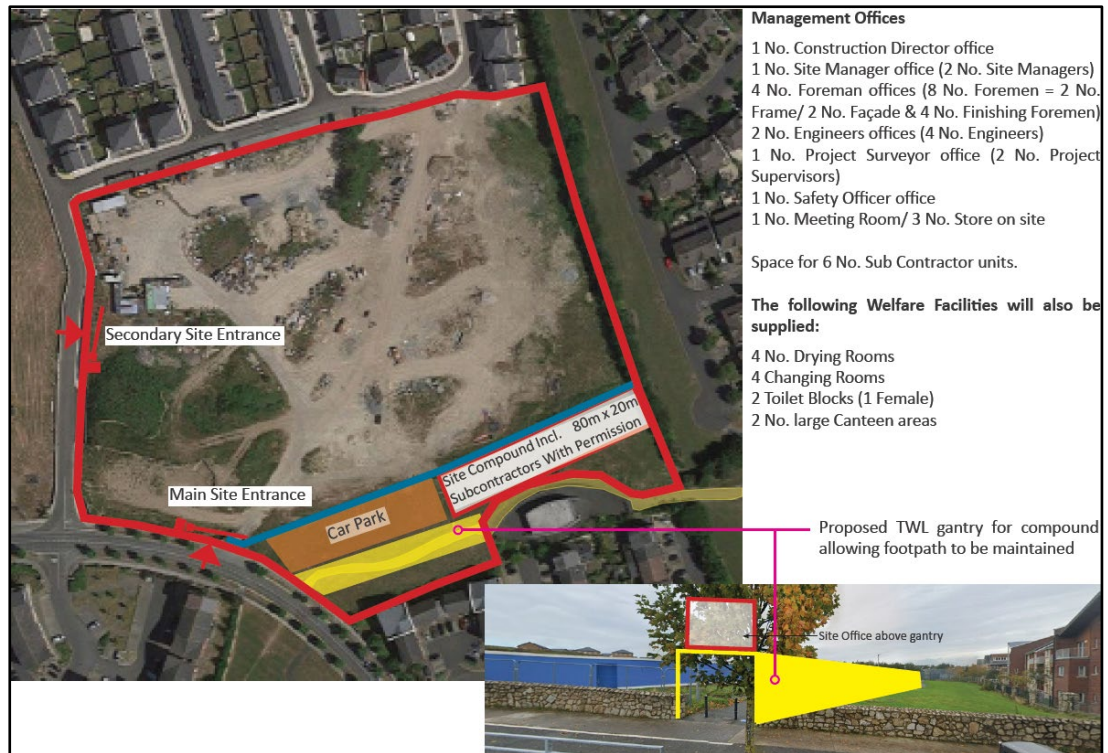


Figure 5.1 Proposed Site Compounds & Staff parking Locations.

The installation of the wastewater storage tank on the additional site to the southeast of the main site will have temporary fencing erected immediately prior to works beginning on site. All staff will use the facilities allocated at the main site, while all waste will be generated from excavation and installation will be removed directly from the smaller site.

All of the sub-contractors as well as the main contractor and project managers will occupy offices within the construction compounds. The site parking for all staff, contractors and visitors will also be in this area.

5.3 Proposed Tower Crane Locations

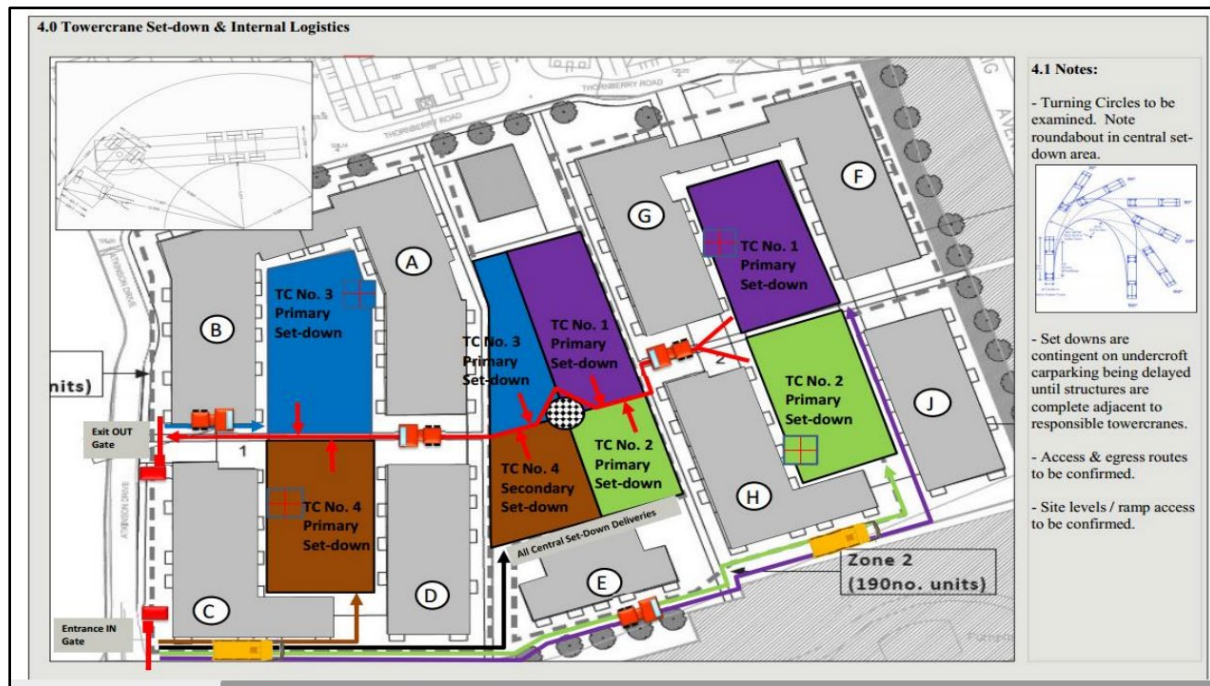


Figure 5.2 Proposed Site Tower Crane Locations

5.4 Consents and Licenses

All statutory consents and licences required to commence on-site construction activities will be obtained ahead of works commencing, allowing for the appropriate notice period. These will include, but are not limited to:

- Site notices;
- Construction commencement notices; and
- Licence to connect to existing utilities and mains sewers, where required;

5.5 Services and Utilities

Welfare facilities (canteens, toilets etc.) will be available within the construction compound and this will remain in place for the construction of the proposed development. The offices and site amenities will initially need to have their own power supply (generator), water deliveries and foul water collection until connections are made to the mains networks.

Electrical connections will be made by suitably qualified personnel following consultation with the relevant authorities and will be cognisant of subsequent construction works. High voltage connections will be established for heavy duty equipment and site facilities, as required.

The current electricity facilities on the site of the proposed development are supplied by the ESB through a ring network. All electrical works, including connection to the ESB network will be carried out by a suitably qualified contractor.

Water supply required for welfare facilities, dust suppression and general construction activities will be sourced from the existing public piped supplies running into the site.

Although before connections are established to the water supply it may need to be trucked onto site. As with electrical works, this will be carried out by a suitably qualified contractor. It will be necessary to service the site with a reliable and safe water supply.

Site welfare facilities will be established to provide sanitary facilities for construction workers on site. The main contractor will ensure that sufficient facilities are available at all times to accommodate the number of employees on site. Foul water from the offices and welfare facilities on the site will discharge into the existing sewer on site (the cabins may initially need to have the foul water collected by a licensed waste sewerage contractor before connection to the sewer line can be made).

5.6 Material Handling and Storage

Key materials which will be ordered by specific order for the project, a 'Just in Time' delivery system will operate to minimise storage of materials, the quantities of which are unknown at this stage, where possible. However due to ongoing supply chain issues this may not always be practical.

Where possible it is proposed to source general construction materials from the Dublin area to minimise transportation distances.

Aggregate materials such as sands and gravels will be stored in clearly marked receptacles in the compound area within the site. Liquid materials will be stored within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications – BS EN 1992-3:2006) to prevent spillage.

Construction materials will be brought to site by road. Construction materials will be transported in clean vehicles. Lorries/trucks will be properly enclosed or covered during transportation of friable construction materials and spoil to prevent the escape material along the public roadway.

The majority of construction waste materials generated will be soil from excavation works. Material will be removed from site regularly to ensure there is minimal need for stockpiling.

5.7 Visitor Management

Visitors will only be allowed to enter the main site compound via the designated pedestrian access gate. A dedicated, secured footpath to the site office is established at the gate for registration and obtaining PPE prior to entering the site. A log will be maintained by security to control access to the site. Visitors will be required to attend a site-specific induction to allow access to the compound and/or construction site unless being accompanied by an inducted member of the site team.

Visitors will then be taken by an inducted member of the construction team to the required area of the site.

5.8 Site Working Hours

Site development and building works will only be carried out between the hours of 0700 to 1900 Mondays to Fridays inclusive and between 0800 and 1600 hours on Saturdays. There will be no construction works carried out on Sundays or public holidays. Deviation from these times will only take place when written approval is granted by DLRCC in exceptional circumstances.

5.9 Employment and Management Workforce

It is estimated that there will initially be 40-60 staff on site on a typical day, however during peak construction periods this is expected to fluctuate up to 150-250 staff and contractors on site per day.

It is anticipated that the key project managers and main contractor representatives will maintain a presence on site for the whole duration of the project and the labour workforce will be determined by the specialist contractors required on site.

All employees working on the site will be required to have a SafePass Card (or similar approved Construction Health & Safety card), manual handling training, CIF COVID 19 training and the necessary certificates to operate machinery as required. The details of training required, records maintained, and induction procedures will be outlined in the Main Contractor's Health and Safety Plan(s).

6.0 CONSTRUCTION TRAFFIC AND SITE ACCESS

The proposed construction vehicle routes for the site will require a traffic management plan to be agreed upon with DLRCC and TII prior to site workings beginning.

Two-way traffic will be maintained throughout the project. Advanced warning signs will be placed at sufficient distances to taper off the entry and exit points. Pedestrian marshals will be used as and when required.

Traffic Management Plan (TMP) will be prepared for the site works in accordance with the principles outlined below and shall comply at all times with the requirements of:

- Department of Transport Traffic Signs Manual 2010 – Chapter 8 Temporary Traffic Measures and Signs for Roadworks ⁷
- Department of Transport Guidance for the Control and Management of Traffic at Road Works (2010) ⁸
- Any additional requirements detailed in Design Manual for Urban Roads & Streets (DMURS) ⁹

The contractor shall prepare a detailed traffic management plan for works at that interface with the existing road network and obtain all required road opening licenses from Dun Laoghaire Rathdown County Council.

Construction traffic operation would only be limited 0700 to 1900 from Monday to Friday and 0800 to 1600 on Saturday for the off-road construction. These times may vary to facilitate specific site requirements and/or construction activities associated with the site. Any variation will be discussed and agreed in advance with DLRCC.

All construction vehicles / delivery vehicles shall access & egress the site via designated entrance points on both Village Road & Atkinson Drive. Access & egress for deliveries and removal of materials will be planned, scheduled and co-ordinated by site management. All vehicle movements both on and around the site will be controlled by a competent and certified banksman. Site entrances can be viewed in Figure 5.1.

In general, the impact of the construction period will be temporary in nature. HGV vehicle movements are not expected to exceed 10 vehicles per hour during the busiest period of construction works.

Excavated material will be reused as part of the site development works where possible to minimise truck movements to and from the site (e.g. use as non-structural fill under green areas).

Approved traffic management plans will be submitted with the updated CEMP, prior to the commencement of works.

6.1 Traffic Queueing

Material deliveries and collections from site will be planned, scheduled and staggered to avoid any unnecessary build-up of construction works related traffic.

Deliveries to site shall be booked in advance using a delivery schedule, so as to prevent lorry congestion on the road networks surrounding the site. Alternative safe routeways shall be established for traffic and pedestrians where existing routeways have to be altered, removed or worked on during the project.

6.2 Site Hoarding and Security Fencing

All areas of construction will be fenced / hoarded off to prevent unauthorized access. This fencing shall remain closed at all times during construction works and closed and locked after construction work hours / break times.

This fencing shall be erected in accordance with good practice and the Construction Regulations 2013. Fencing arrangements shall be reviewed as the life of the project progresses.

Access/Egress to site for site operatives and visitors shall be via gates. Site security fencing/ Hoarding up to a height of 2.4 M will be erected in line with the Construction Regulations 2013 that will clearly separate the work site from the surrounding public. It is not envisaged that the fencing will impinge upon the safe passage of pedestrians during the construction phase

7.0 SAFETY, HEALTH AND ENVIRONMENTAL CONSIDERATIONS DURING CONSTRUCTION WORKS

The appointed main contractor will be required to prepare a Construction Health & Safety Plan which will be put in place prior to commencement of the works. At a minimum, this plan will include:

- Construction Health & Safety training requirements;
- Covid 19 guidelines;
- Induction procedures;
- Emergency protocols; and
- Details of welfare facilities.

7.1 Construction Lighting

Construction work will generally be confined to daylight hours and lightning will generally not be required for the construction phase. There will however be occasions where the provision of portable lighting will be required (works on roadways and power floating floors as examples). Where possible and without jeopardising site safety lights will be pointed down at a 45-degree angle and away from sensitive receptors. The site compound will have external lights for safety and security. These lights will be pointed down at a 45-degree angle and away from sensitive receptors where possible.

7.2 Air Quality

This section describes the site policy with regard to dust management and the specific mitigation measures which will be put in place during construction works. The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby

sensitive receptors. In order to develop a workable and transparent dust control strategy, the measures set out below have been formulated by drawing on best practice guidance from Ireland, the UK and the US, such as:

- Department of Environment, Heritage and Local Government (DOEHLG), *Quarries and Ancillary Activities, Guidelines for Planning Authorities* (2004) ¹⁰;
- US Environment Protection Agency (USEPA), *Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition* (periodically updated) (1986) ¹¹;
- The Scottish Office – Development Department, *Planning Advice Note PAN50 Controlling the Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings* (1996) ¹²; and
- Institute of Air Quality Management (IAQM), *Guidance on the Assessment of Dust from Demolition and Construction* (2014) ¹³.

7.2.1 DLRCC Requirements

Air Monitoring will be undertaken in line with DLRCC requirements as outlined in the DLRCC Guidance Notes for Environmental Design Management of Construction Projects, which are as follows.

- I. A programme of air quality monitoring shall be put in place at the site boundaries for the duration of excavation and construction activities to ensure that the air quality standards as set out in The Air Quality Standards Regulations 2011 relating to dust deposition and specifically PM10 levels are not exceeded
- II. Measures to ensure that where levels exceed specified air quality limit values, dust generating activities cease and alternative working methods are identified and implemented.
- III. The selection of sampling point locations will be completed after consideration of the requirements of Standard Method VDI 2119 (Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Institute) with to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures. The optimum locations will be determined by a suitably qualified air quality expert 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.
- IV. Technical monitoring reports detailing all measurement results shall be subsequently prepared and maintained on site.

7.2.2 Site Management

The site activities will be undertaken with due consideration of the surrounding environment and the close proximity of sensitive receptors such as residents and pedestrians. Dust management during the construction phase will be the most important aspect in terms of minimising the impacts of the project on the surrounding air quality. The following measures will also be implemented to ensure impacts are minimised:

- Complaint registers will be kept detailing all telephone calls and letters of complaint received in connection with construction activities, together with details of any remedial actions carried out;
- Equipment and vehicles used on site will be in good condition such that emissions from diesel engines etc. are not excessive; and

- Pre-start checks will be carried out on equipment to ensure they are operating efficiently and that emission controls installed as part of the equipment are functional.

Dust deposition levels will be monitored on a regular basis in order to assess the impact that site activities may have on the local ambient air quality. The following procedure will be implemented:

- The dust deposition rate will be measured by positioning Bergerhoff Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 30 (+/- 2) days if required. Monitoring should be conducted as required during periods when the highest levels of dust are expected to be generated i.e., during site preparation works and soil stripping activities.
- The exact locations will be determined after consideration of the requirements of Method VDI 2119 with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures.
- After each 30 (+/- 2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m²/day in accordance with the relevant standards.
- Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the Site Manager.

A limit value of 350 mg/m²/day will be used in comparison with recorded values.

7.2.3 Dust Control Measures

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design, planning and effective control strategies. The siting of construction activities and the limiting of stockpiling will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance. In addition, good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or using effective control measures quickly before the potential for nuisance occurs.

- During working hours, technical staff will be available to monitor dust levels as appropriate; and
- At all times, the dust management procedures put in place will be strictly monitored and assessed.

The dust minimisation measures should be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust generation. In the event of dust nuisance occurring outside the site boundary, site activities should be reviewed, and procedures implemented to rectify the problem. Specific dust control measures to be employed are presented below.

Site Routes

Site access routes (particularly unpaved areas) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25% to 80% ⁵.

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles or delivery vehicles within the vicinity of the site;
- Bowsers will be available during periods of dry weather throughout the construction period. Research shown found that the effect of surface watering is to reduce dust emissions by 50% ⁶. The bowser will operate during dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use; and
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced areas shall be restricted to essential site traffic only.

Stockpiling

The location and moisture content of stockpiles are important factors which determine their potential for dust emissions. The following measures will be put in place:

- Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible;
- Regular watering will take place during dry/windy periods to ensure the moisture content is high enough to increase the stability of the soil and suppress dust;

Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:

- Vehicles delivering material with potential for dust emissions to an off-site location shall be enclosed or covered at all times to restrict the escape of dust;
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only and
- Road sweepers will be employed to clean the site access route as full time.

General

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory management of dust by the construction contractor.

7.3 Ecology

The key strategies to be undertaken to minimise impact on the local flora and fauna during site clearing and construction are as follows.

- All site clearance works will comply with current legislative requirements and best practice;
- Taking measures to limit the working area during the construction phase will reduce the impacts of the development on adjacent areas. The construction area will be clearly delimited by the site boundary and machinery should operate only within this allocated site area;
- All re-fuelling of plant, equipment and vehicles will be carried out at the construction site boundary. All fuels, chemicals, liquid and solid waste will be stored in areas bunded in accordance with established best practice guidelines at the construction compound also; and Provision of spill kits;

- Provision of a water and sediment management plan, providing for means to ensure that surface water run-off is controlled such that no silt or other pollutants enter local water courses or drains; and
- The measures outlined in Section 7.5 will ensure that silt run-off and potential flooding risks are minimised which will protect any ecological receptors associated with the site.

7.4 Noise and Vibration

Noise impacts arising from earthworks and construction activities have the potential to cause annoyance or nuisance to local residents and businesses in the area.

The earthworks will generate typical construction activity related noise and vibration sources from use of a variety of plant and machinery such as rock breakers (unlikely to be required based on underlying boulder clay), excavators, lifting equipment, dumper trucks, compressors and generators.

The noise limits to be applied for the duration of the infrastructure works are those specified in the B Category of BS 5228. These limits are summarised below and will be applied at the nearest sensitive receptors to the works.

- Night (23:00-07:00) = 55dB $L_{Aeq,1hr}$
- Evening (19:00-23:00) = 65dB $L_{Aeq,1hr}$
- Day (07:00-19:00) = 70dB $L_{Aeq,1hr}$

The total construction noise ($L_{Aeq,1hr}$) which should not be exceeded during daytime is therefore 70dB.

7.4.1 DLRCC Requirements Noise

- I. Prior to the commencement of the proposed site works noise monitors stations shall be installed and maintained by a suitable qualified specialist firm to provide continuous noise monitoring to measure and record the impact of site activities on local receptors.
- II. All noise monitoring data shall be compiled into a weekly technical report which will include a full assessment of the noise impacts arising from site construction activities.
- III. Trigger limits at which remedial action will be taken and maximum limits at which work will be suspended should be clearly set out.
- IV. Should construction noise trigger limits be approached or exceeded appropriate measures shall be implemented to address the issues raised.

DLRCC Requirements Vibration

- I. Specialist advice be sought in relation to vibration monitoring that and that prior to the commencement of the proposed site works vibration monitors stations be installed and maintained by a suitable qualified specialist firm to provide vibration monitoring to measure and record the impact of site activities on local receptors, as required.
- II. Appropriate specialist advice will be sought in relation to any measures that may be required to monitor and protect the structural integrity of any nearby structures, as required.

General Noise Mitigation

The earthworks will generate typical construction activity related noise and vibration sources from use of a variety of plant and machinery such as rock breakers (if required), excavators, lifting equipment, dumper trucks, compressors and generators.

Following the same approach, BS 5228-2:2009+A1:2014¹⁹ Code of practice for noise and vibration control on construction and open sites. Vibration recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15mm/s at 4Hz increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above.

The standard also notes that below 12.5 mm/s PPV the risk of damage tends to zero. The recommended construction vibration criteria;

- Less than 15Hz - 15mm/s
- 15 to 40 Hz - 20mm/s
- 40 Hz and above - 50mm/s

Any noise complaints related to activities at the site will be logged and investigated and, where required, measures taken to ameliorate the source of the noise complaint.

A designated noise liaison should be appointed to site during construction works. Any complaints should be logged and followed up in a prompt fashion. In addition, prior to particularly noisy construction activity, e.g. excavation close to a property, etc., the site contact should inform the nearest noise sensitive locations of the time and expected duration of the works.

All works on site shall comply with BS 5228 2009+ A1 2014 (Parts 1 & 2) which gives detailed guidance on the control of noise and vibration from construction activities. In general, the contractor shall implement the following mitigation measures during the proposed infrastructure works:

- Avoid unnecessary revving of engines and switch off equipment when not required.
- Keep internal haul roads well maintained and avoid steep gradients.
- Minimise drop height of materials.
- Start-up plant sequentially rather than all together

More specifically the contractor shall ensure that:

- In accordance with "Best Practicable Means", plant and activities to be employed on site are reviewed to ensure that they are the quietest available for the required purpose.
- Where required, improved sound reduction methods are used e.g. enclosures.
- Site equipment is located away from noise sensitive areas, as much as physically possible.
- Regular and effective maintenance by trained personnel is carried out to reduce noise and / or vibration from plant and machinery.
- Hours are limited during which site activities likely to create high levels of noise and vibration are carried out.
- A site representative responsible for matters relating to noise and vibration will be appointed prior to construction on site.

External noise and vibration monitoring will be undertaken at locations on the site boundary closest to sensitive locations. It is considered that it will be appropriate to

amend the monitoring program as the works progress. Accordingly, monitors may be added, removed or relocated as necessary.

The noise monitoring terminals should provide the following at minimum:

- Logging at hourly intervals; and
- Daily CIC automated calibrations.

Vibration monitoring terminals should 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 ²⁰: *Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures*.

The mounting of the transducer to the vibrating structure, by way of resin fixings only, will need to comply with BS EN ISO 5348: 1998 ²¹: *Mechanical vibration and shock – Mechanical mounting of accelerometers*. In summary, the following ideal mounting conditions apply:

- The transducer and its mountings should be as rigid as possible;
- The mounting surfaces should be as clean and flat as possible;
- Simple symmetric mountings are best, and;
- The mass of the mounting should be small in comparison to that of the structure under test.

7.5 Waste Management

This section outlines the measures that will be undertaken to minimise the quantity of waste produced at the site and the measures to handle the waste in such a manner as to minimise the effects on the environment. A site-specific C&D WMP/ RWMP has been prepared by AWN and will be employed to ensure sustainable and effective waste management throughout the demolition, excavation and construction phases of the project.

Adherence to the RWMP prepared for the construction works will ensure that the management of waste arising is dealt with in compliance with the provisions of the *Waste Management Act 1996* as amended ²², associated Regulations, the *Litter Pollution Act of 1997* as amended ²³ and the *Eastern-Midlands Region Waste Management Plan 2015 – 2021* ²⁴, and that it will achieve optimum levels of waste reduction, re-use and recycling.

Typical waste materials that will be generated from the construction works will include:

- Soil and stones;
- Concrete, bricks, tiles and ceramics;
- Wood, glass and plastics;
- Metals;
- Gypsum-based construction material;
- Paper and cardboard;
- Mixed C&D waste;
- Chemicals (solvents, paints, adhesives, detergents etc.); and

The management of all hazardous waste arisings, if they occur, shall be coordinated in liaison with Health and Safety Management.

7.5.1 Waste Minimisation

Waste minimisation measures proposed are summarised as follows (and are described in more detail in the RWMP):

- Materials will be ordered on an 'as needed' basis to prevent over supply;
- Materials will be correctly stored and handled to minimise the generation of damaged materials;
- Materials will be ordered in appropriate sequence to minimise materials stored on site;
- A waste tracking log will be established;
- Sub-contractors will be responsible for similarly managing their wastes; and
- All wood waste generated by site works will be inspected and examined and will be segregated as re-useable wood and scrap wood waste.

7.5.2 Waste Storage

The main waste storage area will be located in the main compound. A dedicated and secure area containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the development see Figure 3.1.

Waste materials generated will be segregated on-site at waste collection and storage area 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. All waste receptacles leaving the 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 Dún Laoghaire Rathdown Region that provide this service.

The site construction manager will ensure that all staff are informed of the requirements for segregation of waste materials by means of clear signage and verbal instruction. Appointed employees will be made responsible for ensuring good site housekeeping.

7.5.3 Pest Management

A pest control operator will be appointed as required to manage pest onsite during the construction phase of the project. Organic and food wastes generated by staff will not be stored in open skips, but in closed waste receptacles. Any waste receptacles will be carefully managed to prevent leaks, odours and pest problems.

7.5.4 Responsibility

It will be the responsibility of the construction manager to ensure that a written record of all quantities and natures of wastes removed from the site are maintained on-site in a waste file (in hardcopy or electronically).

It is the responsibility of the project manager or his/her delegate that all contracted waste haulage drivers hold an appropriate waste collection permit for the transport of waste loads and that all waste materials are delivered to an appropriately licensed or permitted waste facility in compliance with the relevant Regulations as outlined in the RWMP.

The contractor, as part of regular site inspection audits, will determine the effectiveness of the waste management strategy and will assist the project manager in implementing the measures under the RWMP and in determining the best methods for waste

minimisation, reduction, re-use, recycling and disposal as the construction phase progresses and waste materials are generated.

Prior to commencement of the demolition, excavation and construction activity and removal of any waste off-site, details of the proposed destination of each waste stream will be provided to DLRCC, along with waste collection permit numbers.

7.6 Surface Water Management

Run-off into excavations/earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions.

Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. All run-off will be prevented from directly entering into any water courses as no construction will be undertaken directly adjacent to open water.

No significant dewatering will be required during the construction phase which would result in the localised lowering of the water table. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry.

The following measures will be put in place during the construction phase to ensure protection of surface waterbodies. Construction works are informed by best practice guidance from Inland Fisheries Ireland on the prevention of pollution during development projects:

- Control of Water Pollution from construction Sites, Guidance for consultants and contractors (C532); and
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016).
- Environmental Good Practice on Site (3rd edition) (C692).

Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction.

It is envisaged that a number of geotextile lined settling basins and temporary mounding's and/or silt fences will be installed to ensure silts do not flow off site during the construction stage. This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed. All inlets to the settling basins will be 'riprapped' to prevent scour and erosion in the vicinity of the inlet.

7.6.1 Pollution Control

Management of Suspended solids in run-off

Any temporary storage of spoil, hardcore, crushed concrete or similar material will be stored as far as possible from any surface water drains and also stored in receptacles where possible. In order to minimise the risk of contamination, the stockpiled material will be removed off-site as soon as possible. Surface water drain gratings in areas near or close to where stockpiles are located will be covered by appropriate durable polyurethane covers or similar.

There will be no direct pumping of silty water from the works to any watercourse. Sediment entrapment facilities will be installed 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 such as straw bales, silt fencing, silt barriers and diversion dams.

Concrete Run-off

No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within 10 meters of an existing surface water drainage point. Wash-outs will only be allowed to take place in designated areas with an impervious surface.

Accidental Spills and Leaks

No bulk chemicals will be stored within the active construction areas. Temporary oil and fuel storage tanks will be kept in the material storage area in suitable containers and will be appropriately bunded as required. Refuelling of vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in designated areas of the site, where possible, which will be kept away from surface water drains.

Spill protection equipment such as absorbent mats, socks and sand will be available to be used in the event of an accidental release during refuelling. Training will be given to appropriate site workers in how to manage a spill event.

The following mitigation measures will be taken at the construction site in order to prevent any spillages to ground of fuels during machinery activities and prevent any resulting soil and/or groundwater quality impacts:

- Refuelling will be undertaken off site where possible;
- Where mobile fuel bowzers are used the following measures will be taken:
 - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
 - The pump or valve will be fitted with a lock and will be secured when not in use;
 - All bowzers must carry a spill kit;
 - Operatives must have spill response training; and
 - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

Monitoring

Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 10m from surface water receptors. A regular log of inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not reoccur.

8.0 SUMMARY

This CEMP sets out the overall management strategy for excavation and construction works for the proposed development. The CEMP aims to ensure the management of construction activity is carried out in a planned, structured and considerate manner which minimises the impacts of the works on the local environment, residents and commercial activities in the vicinity of the site. Due to the nature of construction works, there may be unforeseen events which occur at the site and the project team will actively manage any changes and discuss with the relevant authorities, where

required. The CEMP should be viewed as a live document that will be updated as the development progress and circumstances change.

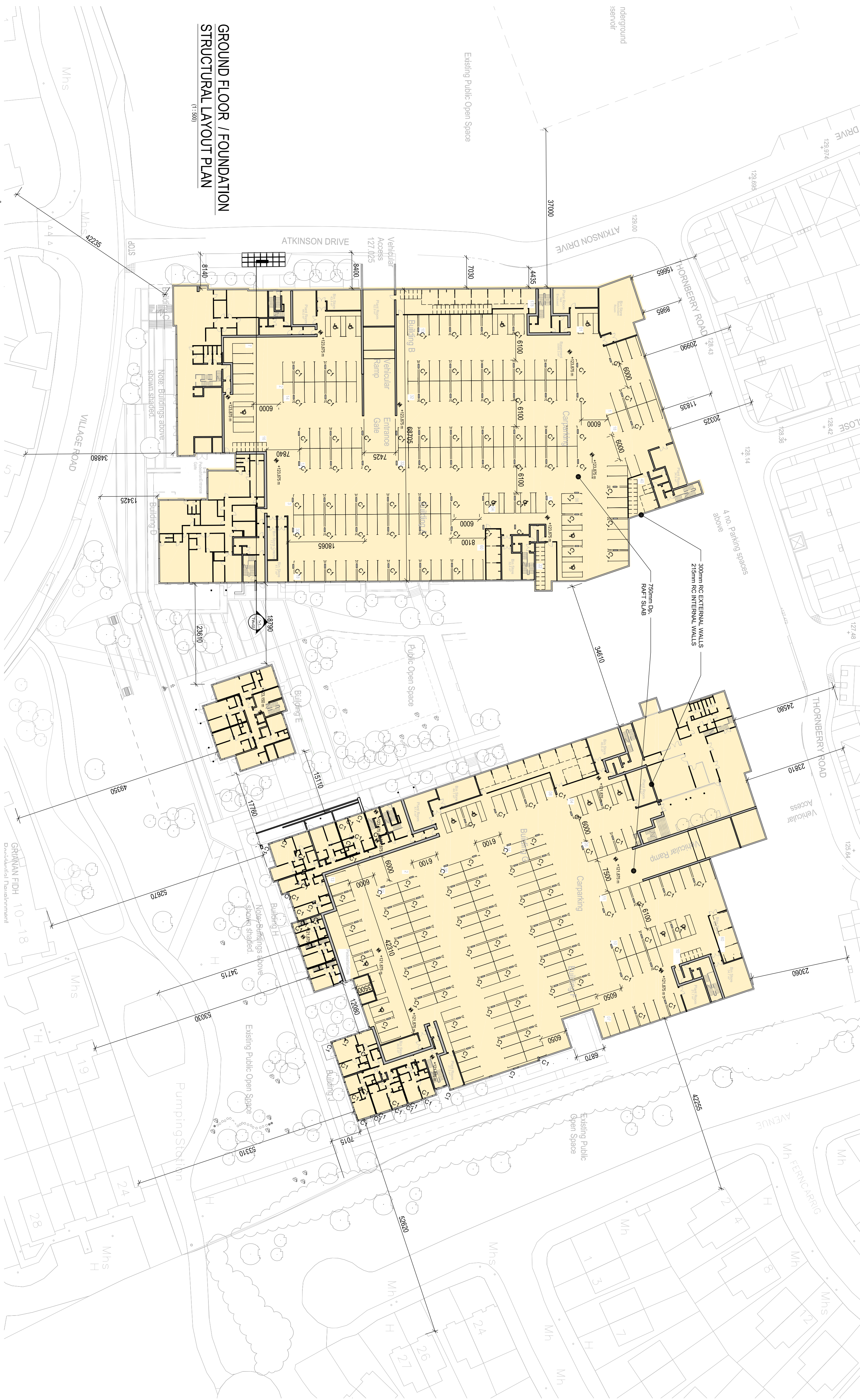
The project team are committed to ensuring that the construction activities to be carried out are pro-actively managed so as to minimise potential impacts.

9.0 REFERENCES

1. British Standards Institution (BSI), *BS 6187: 2011 Code of Practice for full and partial demolition* (2011).
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20. British Standards Institution (BSI), *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* (2010).
21. British Standards Institution (BSI), *BS EN ISO 5348: 1998: Mechanical vibration and shock – Mechanical mounting of accelerometers* (1998).
22. *Waste Management Act 1996* (No. 10 of 1996) as amended, including sub-ordinate and associated legislation.
23. *Litter Pollution Act 1997* (No. 12 of 1997) as amended

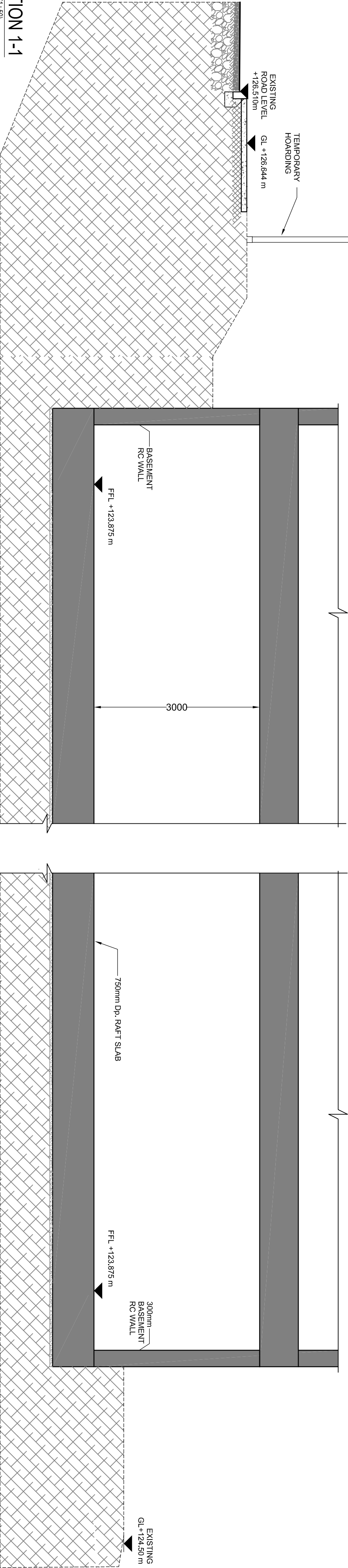
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Appendix A
Foundation Drawings and Temporary Works Drawings



GROUND FLOOR / FOUNDATION
STRUCTURAL LAYOUT PLAN
(1:500)

SECTION 1-1
(1:50)



NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS & SPECIFICATIONS.
- DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.
- ALL CONCRETE IN CONTACT WITH THE GROUND TO BE MIN. STRENGTH CLASS C30/37, EXPOSURE CLASS XC3.
- ALL OTHER CONCRETE TO BE MIN. STRENGTH CLASS C30/37, EXPOSURE CLASS XC3.
- ALL FOUNDATIONS TO BE PLACED ON GRADE C20/25 CONCRETE BLINDING TO GOOD GROUND.
- ALL STRIPS TO BE CENTRED ON 215 WALLS.
- ALL LEVELS ARE STRUCTURAL.
- ALL COLUMNS CENTRED ON 215 WALLS (U.N.O.)
- ALL LOAD BEARING BLOCKWORK TO BE SOLID
- ALL STEEL TO BE GRADE S275 STEEL (U.N.O.)
- ALL BOLTS TO BE GRADE 8.8 BOLTS (U.N.O.)
- ALL WELDS TO BE 6mm FILLET WELDS (U.N.O.)
- ALL BLOCKWORK TO BE SN (U.N.O.)

RC COLUMN SCHEDULE

REF.	SIZE	REF.	SIZE
C1	1000 x 300 RC COLUMN		

RAFT FOUNDATION

THE SELECTION OF THE CURRENT FOUNDATION PROPOSAL OF RAFT FOUNDATION IS BASED ON RESULTS OF THE SITE INVESTIGATIONS, STRUCTURAL CONSIDERATIONS AND SITE CONSTRAINTS. IF DURING EXCAVATION OF THE FOUNDATIONS AND BASEMENTS UNEXPECTED GROUND CONDITIONS WERE THE MAIN REASON FOR THE SITE INVESTIGATIONS RESULTS, THE DESIGNER WILL BE RESPONSIBLE FOR PROVIDING THE NECESSARY FOUNDATION SOLUTIONS PROPOSED AT THIS JUNCTURE.

Project No.	1000000001	AT (S) DOS	SHD PLANNING ISSUE	Revision
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10/1/20

SECTOR 3
AIKEN'S VILLAGE
STEPASIDE
DUBLIN 18

Drawing Title
GROUND FLOOR / FOUNDATION
STRUCTURAL LAYOUT PLAN

Architect
FERREIRA ARCHITECTS

KAVANAGH BURKE
CONSULTING ENGINEERS

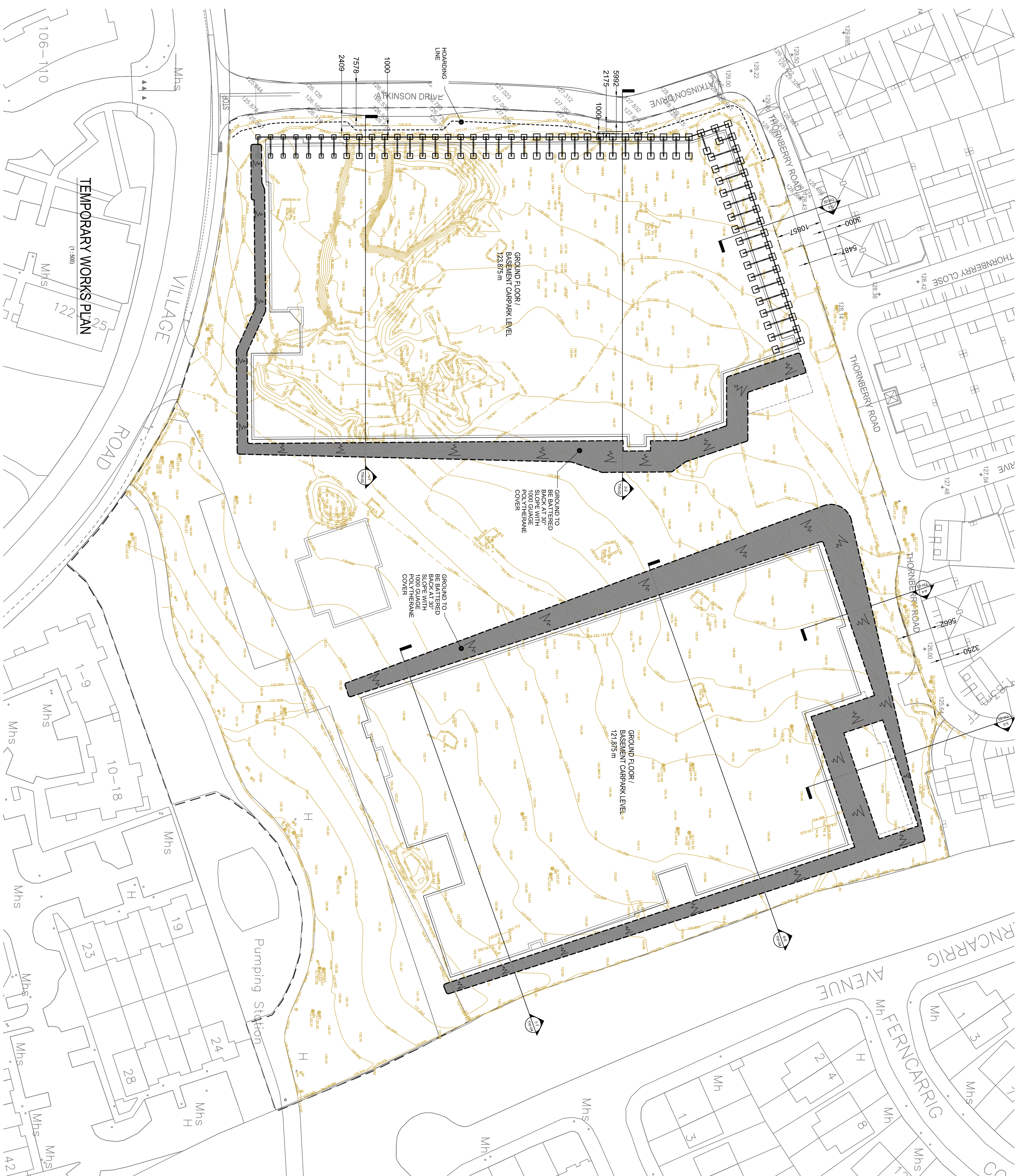
Tel. 01 - 450 0094 Unit G3, Calmount Pk.
Fax. 01 - 450 4540 Bellinamont,
Ballypharragh, Kavanagh Road, Dublin 12.

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NOTE:

1. All temporary works the responsibility of the contractor. Temporary works design to be submitted to the engineer for approval prior to commencement. Drawing to be read in conjunction with survey drawing to confirm exact existing ground levels
- 2.

TEMPORARY WORKS

THE TEMPORARY WORKS ARE PROPOSED ALONG THORNBERRY ROAD AND ATKINSON DRIVE ARE TO CONSTRUCT OF PRECAST CONCRETE PANELS SPANNING BETWEEN STEEL COLUMNS DESIGNED BY A SPECIALIST SUPPLIER WITH A MASS CONCRETE BASE AND ASSOCIATED PROPING. IF DURING EXCAVATION OF THE FOUNDATIONS, AND BASEMENT UNEXPECTED GROUND CONDITIONS ARE FOUND THAT VARY FROM THE SITE INVESTIGATIONS RESULTS, IT MAY BE NECESSARY TO AMEND THE INDICATIVE TEMPORARY WORKS SOLUTIONS PROPOSED AT THIS JUNCTURE.

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SHD PLANNING ISSUE

Job Title

SECTOR 3
AIKEN'S VILLAGE
STEPASIDE
DUBLIN 18

Drawing Title

TEMPORARY WORKS PLAN & SECTIONS SHEET 1

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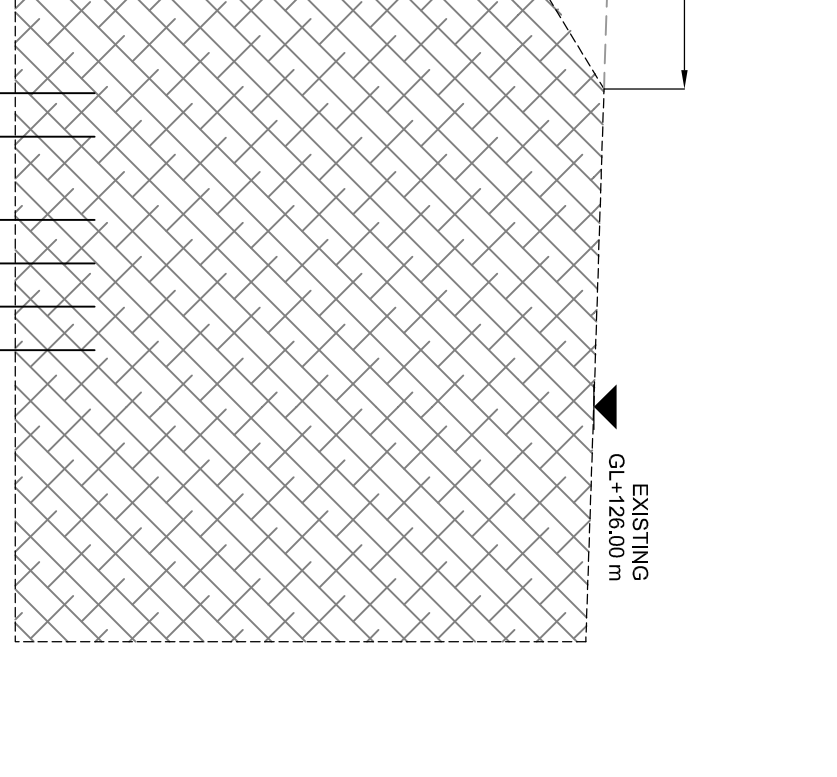
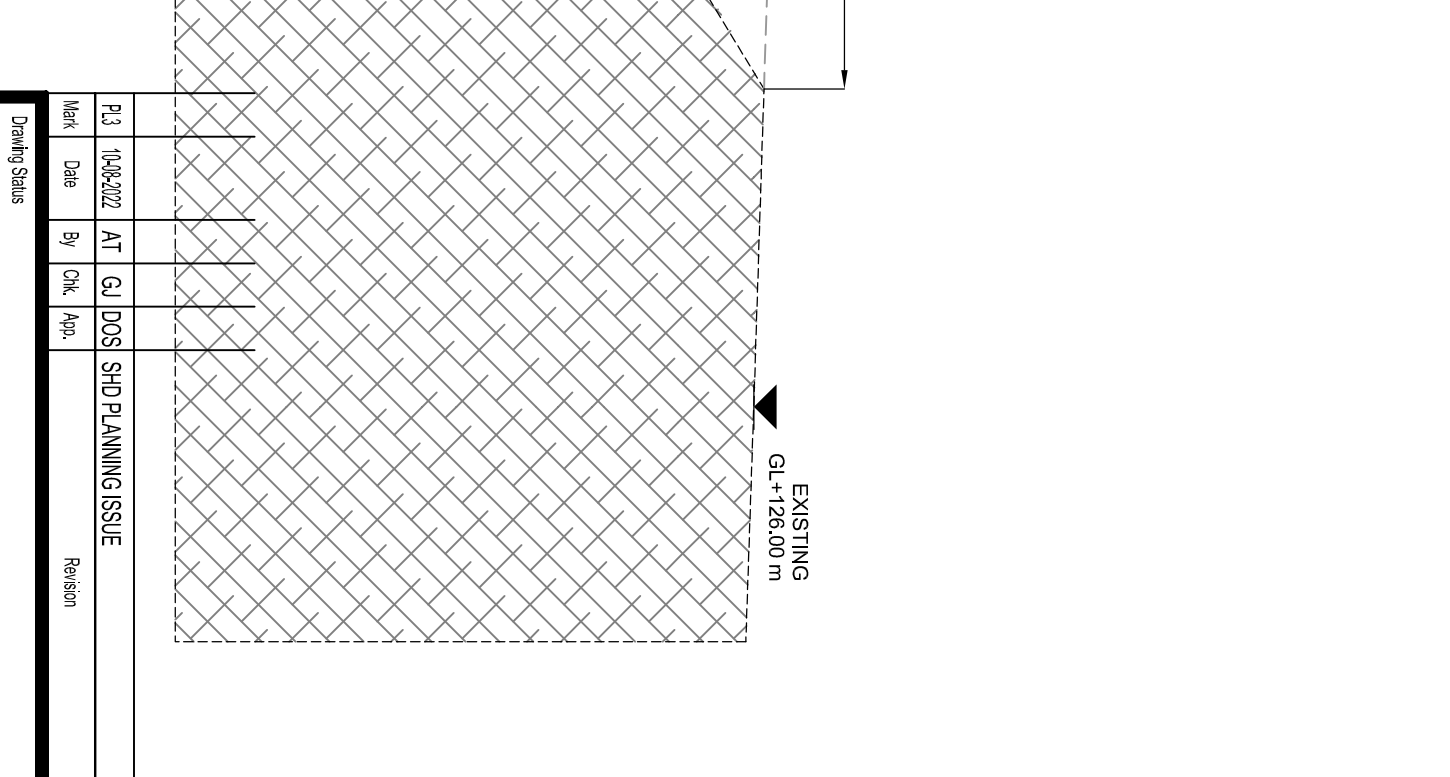
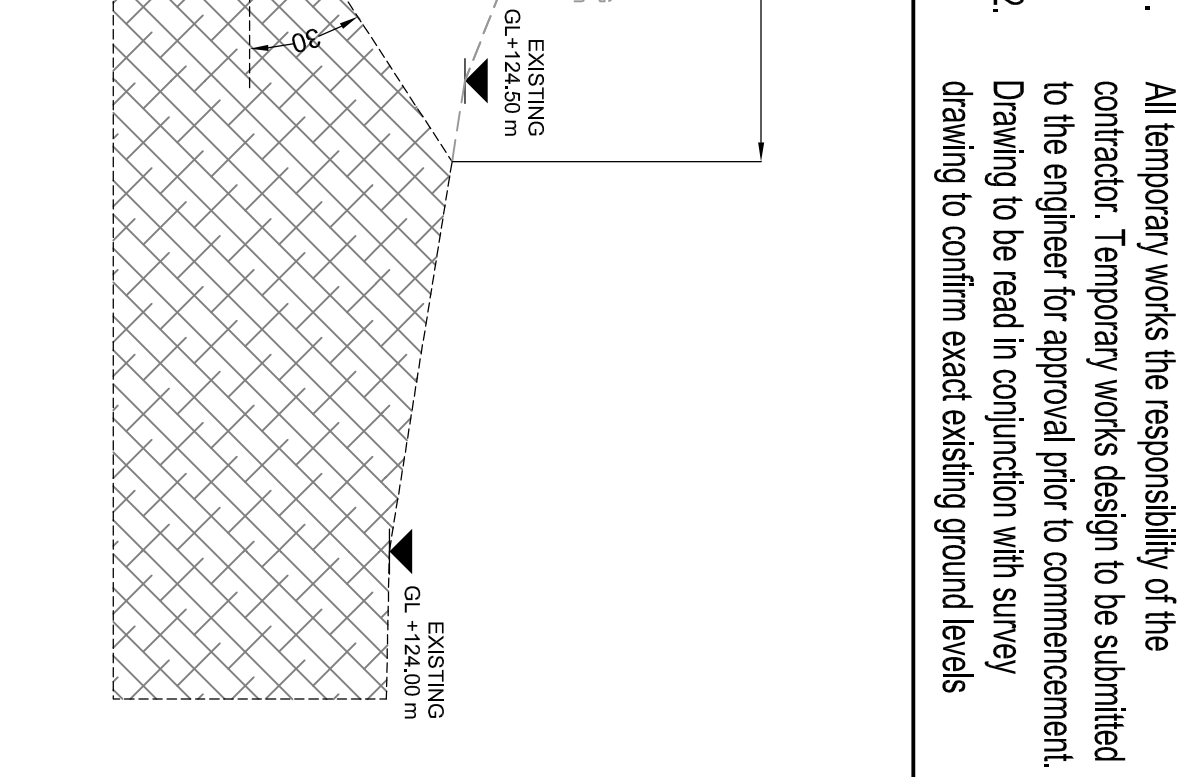
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SECTION 3
AIKEN'S VILLAGE
STEPASIDE
DUBLIN 18

CLAYTON INC.
**TEMPORARY WORKS PLAN
 & SECTIONS SEET 2**

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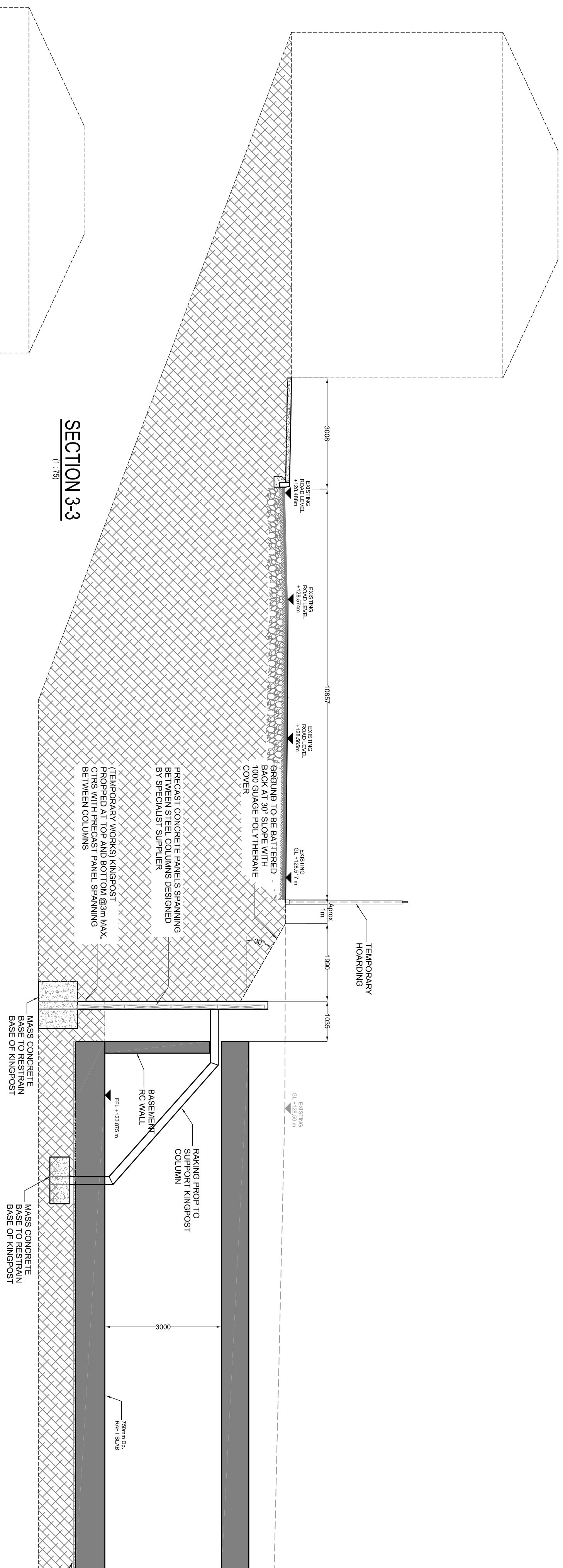
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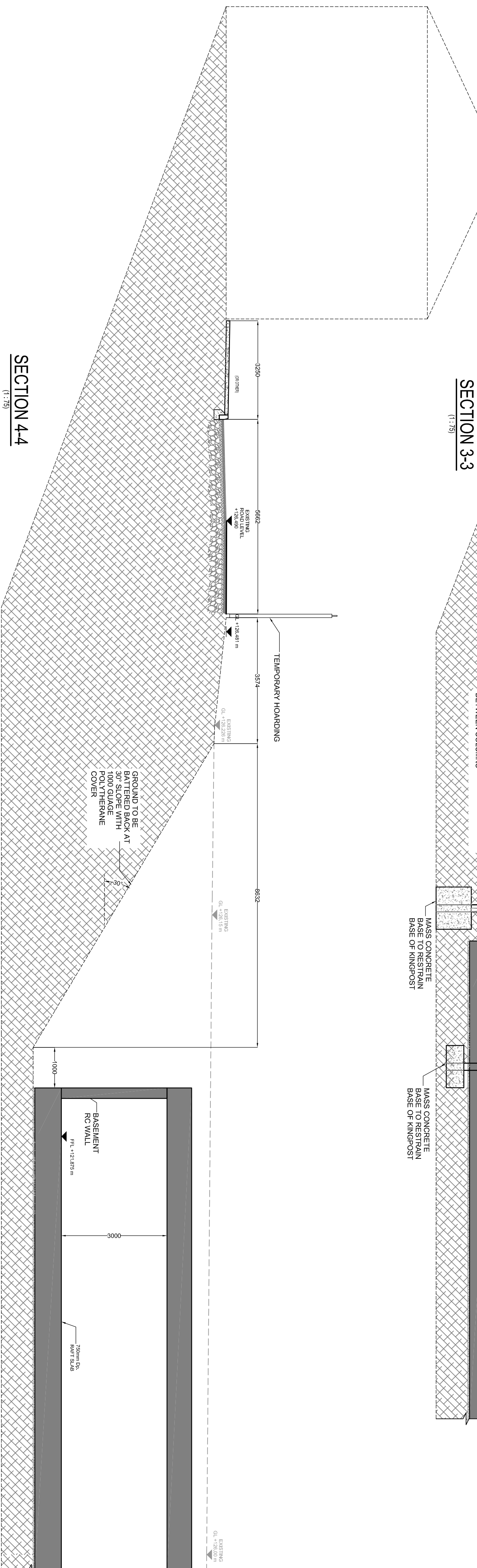
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2. Drawing to be read in conjunction with survey drawing to confirm exact existing ground levels

TEMPORARY WORKS

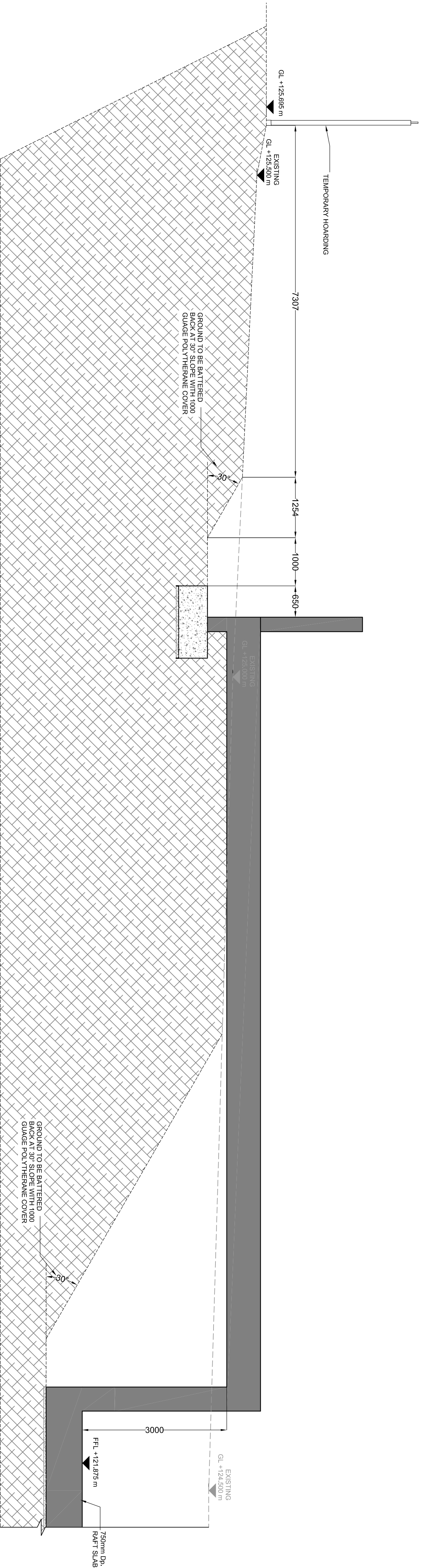
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SECTION 3-3



SECTION 4-4



SECTION 5-5

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Drawing Title

TEMPORARY WORKS PLAN & SECTIONS SHEET 3

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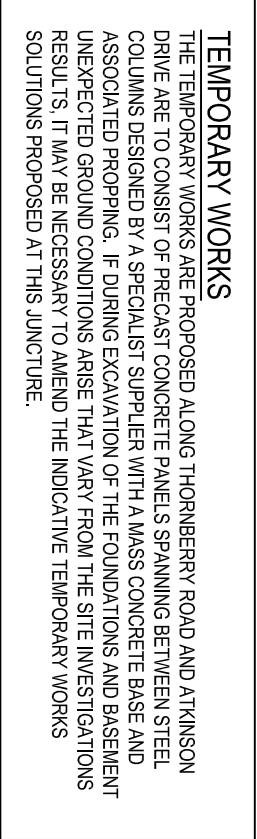
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TEMPORARY WORKS PLAN
& SECTIONS SHEET 4

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