# Appropriate Assessment Screening and Natura Impact Statement

## Killough Bio-Renewables Anaerobic Digestion (AD) Plant

### Roadstone Ltd.

Killough Hill, Gaile, Holycross, Co. Tipperary

Prepared by:

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## Revision Record



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# Basis of Report

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# 1.0 Introduction

SLR Consulting Ireland (SLR) was commissioned by Roadstone Ltd., to prepare an Appropriate Assessment (AA) report and Natura Impact Statement (NIS) in support of a planning application to be submitted to Tipperary County Council (the Competent Authority) for a bio-renewables anaerobic digestion (AD) plant (the Project) at Killough Quarry, Killough Hill, Gaile. Holycross. Co. Tipperary.

## 1.1 Background

The existing quarry, which has been in operation since the 1950's, is used for the extraction and processing of material using mobile processing plant. The materials are then stockpiled, pending further use in the value added activities on site (concrete manufacturing, asphalt production, limestone production, agricultural lime production) or transported off-site to market.

The anaerobic digestion plant will be used to breakdown organic volatiles using the anaerobic digestion process with offtake of biogas and digestate for further processing. CO2 will be captured and converted to methane for reuse. Digestate will be processed to produce solid fertilisers. All works will be designed, constructed and operated with Best Available Techniques (BAT) and products will be certified before storage for removal from the facility.

The development is expected to yield approximately 2,400 tonnes per year of renewable fuels, some of which will be used by the Client to power machinery at Killough and other centres and the balance will be sold/ traded to third parties.

## 1.2 General Description of the Site

The proposed Project will cover ca. 6.3 ha of land located within the southwest corner of the existing Killough hard rock quarry at approximate Irish Transverse Mercator (ITM) coordinates 610684, 650457. Killough quarry itself is located in Killough Hill, a limestone escarpment which is elevated above the surround plain. The development area consists of processed aggregate stockpiles, a storage building. The surrounding area within the landholding consists primarily of active quarry, asphalt plant, concrete plant, limestone plant, agricultural lime facility, mixed woodland, and improved agricultural lands.

Property in the surrounding area principally comprises isolated, one-off residential houses and/or farmsteads, which largely takes the form of ribbon development along the local road network.

## 1.3 Purpose of the Report

The purpose of this report is to provide supporting information to assist the Competent Authority to carry out an Appropriate Assessment screening and, if deemed necessary, an appropriate assessment for adverse effects on the integrity of European (Natura 2000) sites resulting from the Project at Killough Quarry, Killough Hill, Gaile. Holycross. Co. Tipperary.

## 1.4 Statement of Authority

SLR Graduate Ecologist Lorcan Kelly wrote this report and SLR Associate Ecologist Michael Bailey MCIEEM carried out the technical review.

Lorcan Kelly holds a BSc. in Science (Zoology) from University College Dublin and an MSc. in Applied Ecology and Conservation from the University of East Anglia. He joined SLR in

September 2023 having previously worked for The Ecology Consultancy, Norwich. He is a qualifying member of CIEEM. He has prepared multiple bird reports and reports to inform Appropriate Assessment (AA) screenings.

Michael Bailey holds a BSc. in Biology and Ecology from the University of Ulster and an MSc. in Quantitative Conservation Biology from the University of the Witwatersrand in Johannesburg. He has extensive experience in ecological studies and assessments across a range of sectors in Ireland and of agricultural, mining and renewable energy projects across Africa. He is a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM).



## 1.5 Relevant Legislation

Relevant legislation and policy can be found in **0**.

# 2.0 Methodology

## 2.1 General Approach

The methodology used in this report is based on guidance provided by the National Parks and Wildlife Service (NPWS [DoEHLG], 2010), the Office of the Planning Regulator (OPR, 2021) and EC Guidance (EC, 2018) (EC, 2020) (EC, 2021) on the application of Article 6 of the Habitats Directive.

The 2021 EC guidance describes a series of stages and steps which should be completed when carrying out the assessment and these are followed here with minor modifications. The assessment applies only to European sites (SPAs and SACs). More specifically, it only applies to the qualifying interest features of such sites i.e. the features which are the reason that the site was designated.

## 2.2 Overall Assessment Method

This report assesses potential effects on European sites following a standard source-pathway-receptor model, where, for an effect to be established, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism is sufficient to conclude that a potential effect is not of any relevance or significance.

- Source(s) – e.g. pollutant run-off from proposed project.
- Pathway(s) – e.g. groundwater connecting to nearby qualifying wetland habitats; and,
- Receptor(s) – qualifying aquatic habitats and species of European sites.

In the context of this report, a receptor is an ecological feature that is known to be utilised by the qualifying interests or special conservation interests of a European site. A source is any identifiable element of the proposed project (as outlined in Section 3.3) that is known to interact with ecological processes. A pathway is any connection or link between the source and the receptor.

This report provides information on whether direct, indirect and cumulative adverse effects could arise from the proposed project.

## 2.3 Pathways - Ecological Connections

#### 2.3.1.1 General overview of connection rationale

A population of a mobile species that is a qualifying interest of a European site could also use habitat within or in the vicinity of a project site. If such a population is sometimes present within a project site, it is ecologically connected to the relevant European site. For example, ecological connections may include populations of birds, mammals, migratory fish and other species form the QIs of a European site.

Other examples of potential ecological connections include habitat connections either directly or as ‘stepping stones’. Also, a project site may support a population of the same species as within a connected European site which occasionally exchange individuals. Furthermore, a project site may support populations of species which are prey/ food or hosts to the QIs of a European site.

#### 2.3.1.2 Ecological Connections – Zone of Influence

NPWS guidelines (NPWS, 2010) and the Office of the Planning Regulator's Practice Note PN01 (OPR, 2021) suggest that a 15 km study area is adopted, but a case-by-case basis is undertaken when assessing the potential for source-receptor connectivity between a project and European sites.

While an initial 15 km study area was adopted for SACs, a different approach was undertaken for SPAs.

In the absence of any specific European or Irish guidance in relation to establishing ecological connectivity to SPAs, NatureScot guidance (formerly Scottish Natural Heritage or 'SNH') (SNH, 2016) was consulted. This document provides guidance in relation to the identification of ecological connectivity between development sites and SPAs. The guidance takes into consideration the distances species may travel beyond the boundary of relevant SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects. It goes on to state that *"in most cases the core range should be used when determining whether there is connectivity between the proposal and the QIs"*. Where SPAs and developments are separated by a greater distance than the core foraging ranges for the SPAs listed QI species, there is no likely ecological connectivity to the development.

For example, according to NatureScot guidance (SNH, 2016), the core foraging distances of wintering grey geese (greylag goose *Anser anser* and pink-footed goose *Anser brachyrhunchus*) from SPAs is 15-20 km. This represents the largest foraging range of all the species listed in this guidance document recorded in Ireland. It is acknowledged that information on core foraging ranges is not available for all Irish SCI species. In such cases, the 15-20 km core foraging range for SCI bird species has been adopted as a precautionary approach. Thus, all SPAs within 20 km from the Project were considered for ecological source-receptor connectivity.

Airborne emissions were considered using the approaches outlined in IAQM guidance (IAQM, 2019) (IAQM, 2014), which suggests that air pollution and dust from road schemes are only likely to be important for sensitive European sites within 200 m and 500 m, respectively.

## 2.4 Stage One: AA Screening

The methodology for the appropriate assessment follows that set out in EC (and other) guidelines and is based on the data, surveys and assessments. In summary this will comprise:

**Step 1**: ascertaining whether the Project is directly connected with or necessary to the management of a European site. Typically, this applies only to a management plan, or parts thereof, which has the purpose of maintaining or restoring the conservation interest of a European site, and which would not have a negative effect on any other European site.

**Step 2**: identifying the relevant elements of the Project and their likely impacts, which is subdivided into:

**Step 2**, **Part 1**: an outline description of the Project, including construction, operation and decommissioning, containing enough information for potential impact pathways to be understood, and the Project site and its surroundings, focussing on the habitats and species that may form part of the qualifying interest of a European site.

**Step 2**, **Part 2**: an identification of the aspects of the project which have the potential to affect European sites, either alone or in combination with other Projects and Plans. This may include for example emissions to air and water, noise and increases in recreational activity (Sources).

**Step 3**: identifying which (if any) European sites may be affected, considering the potential effects of the Project alone or in combination with other plans or projects, which is subdivided into:

**Step 3**, **Part 1**: generating an initial list of European sites to be considered in the screening process, which are those which are potentially connected (via a Pathway) to the Project site including (i) any which overlap with the Project site or are close enough to experience increased noise, vibration, light, visible human activity or invasive species; (ii) those that may have downstream connectivity via watercourses or groundwater to the Project site or transport routes; (iii) those that may receive deposition of pollutants as a result of emissions to air from the Project or transport routes; (iv) those which may support migratory or mobile species populations which may also use the Project site or its environs; and (v) those which may receive additional recreational activity once the Project site is inhabited.

**Step 3**, **Part 2**: compiling basic information on the European sites identified in Part 1, including a list of qualifying interest features/special conservation interest (the Receptors), their conservation objective if known (maintain or restore), the distance and direction from the Project site (including transport routes) and how it is or is not connected, using the Source-Pathway-Receptor model, to the Project site (including transport routes). Likely significant effects can be immediately excluded for any European sites and any qualifying /special conservation interest features which clearly lack a pathway or were it can be demonstrated there is a very weak pathway, such that any effects would not be appreciable.

**Step 4**: assessing whether likely significant effects (LSE) on all European sites can be ruled out, in view of their conservation objectives.

**Step 4**, **Part 1**: assessing LSE for the project alone, determining whether there is a risk that the project could undermine the conservation objectives for the qualifying interest features/special conservation interest for those European sites for which a pathway has been identified. This is a scientific determination which considers whether the maintain or restore objective applies and both direct and indirect effects. If there is any uncertainty or detailed investigation or mitigation are required, LSE are assumed.

**Step 4**, **Part 2**: assessing LSE for the project in combination with other Projects and Plans. Along the same lines as Part 1, this considers whether the effects of the Project, if not capable of undermining the conservation objectives on their own, could do so cumulatively with other projects and plans. It also considers whether the risk of undermining conservation objective is elevated when cumulative effects are considered.

**Conclusion**: stating whether likely significant effects arising from the Project, alone and in-combination with projects and plans, on European sites can excluded, and if they cannot, which European sites and which qualifying interest features/special conservation interest are at risk from significant effects, and the relevant impact sources and pathways. If the latter, an AA will be required. The conclusion will not consider any mitigation measures designed to avoid likely significant effects on a European site.

## 2.5 Stage Two: Appropriate Assessment

**Step 1**, **Part 1**: Information on the Project and the Project Site. Whilst the Project has been described in outline at Stage 1, a more detailed description is provided here at Stage 2 including construction/ decommissioning methods, relevant details of the design and timescales, providing all the details needed by the competent authority to complete its AA. The description of the Project Site here provides further details of the habitats and species that may form part of the qualifying interest of a European site which is at risk of significant

effects and its potential effects on the qualifying /special conservation interest features, considering any scoping opinion provided by the competent authority and prescribed bodies.

**Step 1**, **Part 2**: Information on the European sites, provides further information on the European sites identified at Stage 1, including a complete list of the qualifying interest features (if not already provided), investigation into the conservation condition and distribution of qualifying habitats and populations, a description of the site and further information on the conservation objectives, including the attributes and targets that define the conservation objectives, and the main threats and pressures.

**Step 2**: Assessing the implications of the Project in view the site's conservation objectives, individually or in combination with other plans or projects.

**Step 2**, **Part 1**: Assessment of the Project alone. For each of the impact pathways, separately and cumulatively, that were identified at Stage 1 and any others that have been identified subsequently, identifying which conservation objective(s) they could undermine and how and to what degree these objectives could be undermined by the Project. If site-specific conservation objectives have not been published it is assumed that the objective is to maintain the area of the qualifying habitat or the population of a qualifying species (or the extent of habitat for that species) at the level it was when the site was designated, or restore it to that level, and that the species are not significantly disturbed. The assessment also considers supporting populations of the same and other species and connected habitats. Low level effects of short duration and from which habitats and species populations would quickly recover may be regarded as not undermining the conservation objectives.

**Step 2**, **Part 2**: Assessment of Project 'in combination', including the confirmation of the projects and plans (from Stage 1) which could act in combination with the Project to undermine the conservation objectives of a European site, and an examination as to whether these cumulatively with the project could undermine the conservation objectives, even if the Project does not on its own. Those included are other plans or projects that have been already completed, approved but not yet completed, or submitted for consent, and have likely significant effects on the same European sites as the Project. All projects and plans are considered together rather than pairwise with the Project, and assessments already made at the Plan level (especially the relevant County Council development plans) are used to inform the assessment.

**Step 3**: Ascertain the effects of the plan or Project on the integrity of European sites. Following on from Step 2, and a detailed scientific investigation of the implications of the Project on the conservation objectives, it is determined that where a conservation objective could be undermined, there would be an effect on site integrity and vice versa, which is based on the published conservation objectives where these exist, or an assumed objective as set above.

**Step 4** Identify mitigation measures. For any effect that could have an adverse effect on the integrity of a European site, avoidance and mitigation measures are identified with the aim of removing the risk to the integrity of the identified European sites, including in combination effects with other projects and plans. Measures to compensate for adverse effects must not be considered at this Stage, and neither are actions designed to enhance biodiversity.

**Conclusion**. Taking into account the mitigation identified at Step 4, determining whether the risk to the conservation objectives have been reduced or removed such that they will not be undermined, and adverse effects on the integrity of all European sites can be excluded.

## 2.6 Baseline Information

### 2.6.1 Ecological Desk Study

A desk study was carried out to collate information available on (i) all European sites located within 15 km of the Site; (ii) SPA's designated for Barnacle Goose (*Branta leucopsis*) and Greylag Goose (*Anser anser*) within 25 km of the Site; and (iii) all European sites with hydrological connections to the Site

The Site and the surrounding area were viewed using satellite imagery[1] and Environmental Protection Agency (EPA) Maps[2]. The principal source of information on European sites and key qualifying features has been data collected through information publicly available through the National Parks and Wildlife Service (NPWS)[3] and with other relevant sources such as data from the National Biodiversity Data Centre[4], the Ireland Wetland Bird Survey (IWeBS)[5] and Ordnance Survey Ireland (Geohive)[6] being used to provide data on current baseline conditions at the site of the proposed development and within its potential zone of influence.

### 2.6.2 Field Survey

A field survey was carried out by SLR Graduate Ecologist Lorcan Kelly on 07 August 2024 to identify and map any habitats listed as Qualifying Interests (QIs) for relevant SACs, Annex I of the Habitats Directive, or habitats which have a supporting function for such habitats, habitats which may support Annex II species of the Habitats Directive, and habitats which may support Species of Conservation Interest (SCIs) for relevant SPAs or Annex I species of the Birds Directive.

## 2.7 Sources of Information

Sources of information for the assessment of the Project '*alone*' include:

- Article 17 and Article 12 reports completed by the National Parks and Wildlife Service[7];
- Site Synopses, Conservation Objectives and Standard Data Forms for the European Sites[8];
- Environmental Protection Agency (EPA) Maps[9];
- Environmental Impact Assessment Report – Chapter 7 Water and Chapter 8 – Air.

Sources of information for the plans and projects for the '*in-combination'* assessment were as above and also include:

- Tipperary County Development Plan 2022 - 2028[10]

[1] https://www.google.com/maps (last accessed 10 January 2025)
[2] https://gis.epa.ie/EPAMaps/ (last accessed 10 January 2025)
[3] https://www.npws.ie/protected-sites (last accessed 10 January 2025)
[4] https://maps.biodiversityireland.ie/ (last accessed 10 January 2025)
[5] https://irishwetlandbirdsurvey.ie/ (last accessed 10 January 2025)
[6] https://enviromap.ie/ (last accessed 10 January 2025)
7 Article 17 Reports | National Parks & Wildlife Service (npws.ie) (last accessed 10 January 2025)
8 Protected Sites in Ireland | National Parks & Wildlife Service (npws.ie) (last accessed 10 January 2025)
9 Environmental Protection Agency, Ireland (EPA) Geoportal (last accessed 10 January 2025)
[10] https://www.tipperarycoco.ie/planning-and-building/development-plan-consultation/tipperary-county-development-plan-2022-2028

- Tipperary County Council planning portal[11] and myplan.ie[12] were accessed for information on other projects and plans.



11 https://www.tipperarycoco.ie/planning-and-building/planning-information-and-advice/planning-enquiry-system-eplan (last accessed 10 January 2025)
12 Home - My Plan (last accessed 10 January 2025)

# 3.0 Stage One: Screening

## 3.1 Step One: Management of European (Natura 2000) Sites

The Project involves the construction of an anaerobic digestion plant. Therefore, it is not connected to, or necessary for, the management of a European (Natura 2000) site.

## 3.2 Step Two: Part One – Project Description

### 3.2.1 Existing Site

The existing quarry operations comprise extraction of limestone using blasting techniques; processing (crushing and screening) of the fragmented rock to produce lime and aggregates for concrete production (readymix and blocks), asphalt production, road construction and site development works generally. Existing manufacturing facilities at the quarry comprise a concrete manufacturing facility, an asphalt plant, a limestone production facility and an agricultural lime facility.

Ancillary facilities at the existing quarry include site offices, weighbridge and weighbridge office, canteen, toilets, wheelwash with overhead spray bar, bunded fuel storage areas and a garage / workshop.

### 3.2.2 Proposed Development

The proposed development will have an overall planning application area of c. 6.3 ha. (c. 15.6 acres) comprises the proposed bio-renewables production facility, buffer screening, ancillary facilities, all located within the southwest corner of the existing permitted Killough hard rock quarry.

A detailed project description is provided in **Appendix C** and a summary outlined below. The design engineering planning drawings are provided in **Appendix D**.

The proposed bio-renewables production facility (incorporating anaerobic digestion) compound will cover an area of c. 4 hectares with c. 16,821.5m² of new buildings consisting of an administration building; a dry matter reception building; a workshop; a bio-conversion building; a pre-treatment, equalisation and gas upgrading building; a digestate handling building; a warehouse storage building; a bio-filling station building; an odour abatement and pumping station building; a linear generator building; and an ESB sub-station building.

Ancillary facilities to be provided will include, a wheelwash; a weighbridge; surface water and fire water storage ponds; storage tanks for water, silage feed, cattle manure, pot ale and spent grain, maize, chicken litter and gas; effluent collection and storage tanks; staff and visitor car parking and bicycle storage; HGV parking; roof mounted solar panels; hydrocarbon interceptors; wastewater treatment equipment; bunding and surface treatments; boundary treatments and fencing; lighting; services; drainage; landscaping; and all associated ancillary works.

Key aspects include:

- Proposed development situated within the footprint of the existing permitted rock quarry at Killough which is owned and operated by Roadstone (i.e. not a greenfield site);
- A maximum tank height of c. 16 metres (gas storage balloon structure) and a maximum stack height of c. 17.5m (associated with the linear generator building);

- Facility will operate 24 hours a day / 7 days a week;
- Delivery of feedstock will be between the hours of 8am to 6pm Monday – Saturday / no deliveries Sundays or bank holidays;
- Feedstock importation will be c. 105,000 tonnes per annum consisting of:
  - Chicken Waste c. 15,000 tpa
  - Cattle Slurry c. 20,000 tpa
  - Grass Silage c. 60,000 tpa
  - Maize Silage c. 5,000 tpa
  - Pot ale and Spent Grain c. 5,000 tpa
- Outputs will consist of:
  - bio-methane (gas);
  - compressed bio-methane (bio-CNG);
  - carbon dioxide ($CO_2$);
  - electricity (green);
  - organic fertilisers (pelleted); and
  - water.

The adjacent Roadstone Killough Quarry plant will utilise the electricity, bio-methane and water generated by the proposed development.

It is anticipated that pelletised digestate will, on the whole, be returned to lands associated with feedstock supplies of crop and/or slurry, thereby promoting a local circular bioeconomy.

### 3.2.3 Process Design

The following points are highlighted with respect to the design:

- As mentioned, feedstock capacity will be c. 105,000 tonnes per annum including grass, maize, silage, pot ale, spent grain, cattle slurry and chicken waste;
- Pretreatment will include special conditioning to maximise nutrient separation and conversion of volatiles, thereby maximising process performance;
- The digestion process put forward comprises of plug flow reactors running in series with biogas production significantly exceeding that of conventional digesters;
- Biogas will be separated into biomethane and $CO_2$ with further processing of both products to produce finished fuel, for internal use by Roadstone;
- Digestate will be separated and further processed to provide solid organic fertilisers. All products will be certified;
- The thermal energy resulting from the various in-house unit operations will be captured for reuse at the fertiliser drying stage. It is anticipated that all energy that is produced will be used in-house. The conversion of excess energy to electricity maybe executed using state of the art fuel cell (CHP);
- The short-term storage of feedstock, gases, solids and liquids produced on site will be accommodated within the design with BAT environmental management measures;

- There will be no fugitive emissions, so that air quality standards can be maximised ensuring 100% methane and CO2 capture across the mass balance of the process.

### 3.2.4 Water Management

Process water and precipitation will be typically reused and not discharged offsite. On site water will be captured, pumped to storage with in-line quality monitoring, for use on the application site and for use in the adjacent quarry site.

When the site is operational, process water will be recovered from the digestate and recirculated through the process to dilute incoming feedstock. The feedstock will be on average 70% water (30% DM) and requires dilution to 94% water (6% DM) for processing so process water will be added.

Excess water will be treated and stored for use in the concrete plant on the adjacent quarry site.

There is no requirement for a groundwater supply to the plant. There is no requirement for a connection to any Irish Water infrastructure.

Surface water runoff and roof water will gravitate to the surface water pond for use as dust suppression water by the adjacent quarry site.

### 3.2.5 Landscaping

The overall development plan is entirely within the existing operational quarry site. There is no requirement to remove topsoil or overburden off site. While the site is within the aggregate stockpile storage area, 6 semi-mature trees (beech and pine), as well as 5 young pine and ca. 50 young willow, which have self-seeded throughout the site, will have to be removed to facilitate the development.

Existing screening berms (c. 4-6m in height) and hedge/tree vegetation bound the southern and western boundaries of the application site, and these features will be retained.

## 3.3 Step Two: Part Two – Potential Impact Factors

The proposed development has the potential to result in the following impacts during the construction phase:

- Disturbance from machinery and personnel;
- Dust emissions;
- Noise and vibration; and,
- Increased vehicle emissions

The proposed development has the potential to result in the following impacts during the operation phase:

- Disturbance from site operations;
- Air emissions associated with site operations; and
- Increased vehicle emissions.

The habitats and species listed as features of interest of any European sites in proximity to the project must therefore be assessed for effects from the above potential impacts from the proposed development project. These effects are considered further below.

## 3.4 Step Three: Identification of Relevant European (Natura 2000) Sites



The first step in identification of relevant European (Natura 2000) sites for further assessment is to identify those that will be at risk from likely significant effects where a Source-Pathway-Receptor link exists between the project site and the Natura 2000 site.

The relevant European (Natura 2000) sites are identified through a review of the nature and scale of the Project, the Project location relative to European (Natura 2000) sites, presence of ecological (including mobile and migratory species) and landscape connectivity, such as along waterways, hedgerows and treelines between the Site and the European (Natura 2000) sites, known impacts and effects likely to arise as a result of this type of project, distance from European (Natura 2000) sites and the qualifying interests of the European (Natura 2000) sites.

**Table 3-1** provides a list of European sites which were selected for initial consideration of Source-Pathway-Receptor links (See **Figure 1**); a description of each site, their qualifying interests, and any Source-Pathway-Receptor links and the potential for likely significant effects (LSEs).

**Table 3-1: Description of European sites with Potential Source-Pathway-Receptor Links**

| European (Natura 2000) Site | Distance[13] | Qualifying Interests[14] and Conservation Objectives | Connections (Source-Pathway-Receptor) | Considered Further in Screening (Y/N) |
|---|---|---|---|---|
| Lower River Suir SAC (002137) | 3.3 km northwest | **Habitats**<br>Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]<br>Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]<br>Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]<br>Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]<br>Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae*) [91E0]<br>*Taxus baccata* woods of the British Isles [91J0]<br><br>**Species**<br>*Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]<br>*Austropotamobius pallipes* (White-clawed Crayfish) [1092]<br>*Petromyzon marinus* (Sea Lamprey) [1095]<br>*Lampetra planeri* (Brook Lamprey) [1096] | **Disturbance –** The Project Site is not located adjacent to or within 200 m of any watercourse associated with this European Site[15]. There are no habitats on Site which would be utilised by otter and therefore, no pathway exists for potential LSE from disturbance to any of its Qualifying Interests.<br>***Screened out***.<br><br>**Dust –** The Project Site is located over 500m from this European Site and sufficiently distant to be affected by dust. Therefore, no pathway exists for potential LSE from dust emissions[16]<br>***Screened out***. | **Y** |

[13] When measured in a straight line over the shortest distance between the Site and European (Natura 2000) site.
[14] For SPAs, the bird species that are the reason for designation are Species of Conservation Interest (SCIs) and for SACs the habitats and species that are the reason for designation are its Qualifying Interests (QIs). For convenience, the term qualifying interest or QI is used here for both SPAs and SACs.
[15] NatureScot (2024) Standing advice for planning consultations - Otters
[16] Institute of Air Quality Management – IAQM (2014) Guidance on the assessment of dust from demolition and construction. https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf

| European (Natura 2000) Site | Distance[13] | Qualifying Interests[14] and Conservation Objectives | Connections (Source-Pathway-Receptor) | Considered Further in Screening (Y/N) |
|---|---|---|---|---|
| | | *Lampetra fluviatilis* (River Lamprey) [1099]<br>*Alosa fallax fallax* (Twaite Shad) [1103]<br>*Salmo salar* (Salmon) [1106]<br>*Lutra lutra* (Otter) [1355]<br><br>https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002137.pdf | **Noise and vibration –** The Site is sufficiently distant from this European Site to exclude potential LSE from noise and vibration.<br>***Screened out.***<br><br>**Vehicle emissions/ Traffic –** Forecast development traffic associated with the Project will be contained to the adjacent road network and the M8 motorway. These roads are considered sufficiently distant from this European Site to exclude any LSE from the Project.<br>***Screened out.***<br>**Operation Emissions –** The Project Site is located within 15 km of this European Site; therefore a pathway exists for potential LSE arising from operational emissions.<br>***Screened in.*** | |
| River Barrow and River Nore SAC (002162) | 19.5 km east | **Habitats**<br>Estuaries [1130]<br>Mudflats and sandflats not covered by seawater at low tide [1140]<br>Reefs [1170] | **Disturbance –** The Project Site is not located adjacent to or within 200 m of any watercourse associated with | **N** |

| European (Natura 2000) Site | Distance[13] | Qualifying Interests[14] and Conservation Objectives | Connections (Source-Pathway-Receptor) | Considered Further in Screening (Y/N) |
|---|---|---|---|---|
| | | *Salicornia* and other annuals colonising mud and sand [1310]<br>Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]<br>Mediterranean salt meadows (*Juncetalia maritimi*) [1410]<br>Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]<br>European dry heaths [4030]<br>Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]<br>Petrifying springs with tufa formation (*Cratoneurion*) [7220]<br>Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]<br>Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]<br><br>**Species**<br>*Vertigo moulinsiana* (Desmoulin's Whorl Snail) [1016]<br>*Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]<br>*Austropotamobius pallipes* (White-clawed Crayfish) [1092] | this European Site[17]. There are no habitats on Site which would be utilised by otter and therefore, no pathway exists for potential LSE from disturbance to any of its Qualifying Interests.<br>***Screened out***.<br><br>**Dust –** The Project Site is located over 500m from this European Site and sufficiently distant to be affected by dust. Therefore, no pathway exists for potential LSE from dust emissions[18]<br>***Screened out***.<br><br>**Noise and vibration –** The Site is sufficiently distant from this European Site to exclude potential LSE from noise and vibration.<br>***Screened out.***<br><br>**Vehicle emissions/ Traffic –** Forecast development traffic | |

[17] NatureScot (2024) Standing advice for planning consultations - Otters
[18] Institute of Air Quality Management – IAQM (2014) Guidance on the assessment of dust from demolition and construction. https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf

| European (Natura 2000) Site | Distance[13] | Qualifying Interests[14] and Conservation Objectives | Connections (Source-Pathway-Receptor) | Considered Further in Screening (Y/N) |
|---|---|---|---|---|
| | | *Petromyzon marinus* (Sea Lamprey) [1095]<br>*Lampetra planeri* (Brook Lamprey) [1096]<br>*Lampetra fluviatilis* (River Lamprey) [1099]<br>*Alosa fallax fallax* (Twaite Shad) [1103]<br>*Salmo salar* (Salmon) [1106]<br>*Lutra lutra* (Otter) [1355]<br>*Trichomanes speciosum* (Killarney Fern) [1421]<br>https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002162.pdf | associated with the Project will be contained to the adjacent road network and the M8 motorway. These roads are considered sufficiently distant from this European Site to exclude any LSE from the Project.<br>***Screened out.***<br><br>**Operation Emissions –** The Project Site is located in excess of 15 km of this European Site, and no pathway exists for potential LSE arising from operational emissions.<br>***Screened out***. | |

## 3.5 Step Four: Part One – Likely Significant Effects for the Project '*Alone*'

### 3.5.1 Lower River Suir SAC (002137)

The Site is sufficiently distant from the Lower River Suir SAC that there are no pathways for potential LSE from disturbance, dust, noise and vibration, and traffic movements. As such, they can be excluded from further assessment.

The operation of the AD plant will result in the production of emissions to air associated with the on-site combustion of bio-methane, and odour and ammonia emissions associated with other site operations. The Site is located within 3.3 km of the Lower River Suir SAC and therefore a pathway exists for potential LSE from changes in air quality resulting from operational emissions.

As the QI habitats and species designated for the Lower River Suir SAC may be affected by increased levels of air and depositing nitrogen levels falling on vegetation or into the surface water bodies, and taking the precautionary principle, without appropriate mitigation potential LSE on this European site as a result of emissions during the operation phase cannot be excluded at this stage and must be considered for further assessment.

## 3.6 Step Four: Part Two – Assessment of Likely Significant 'In Combination' Effects

In combination, or cumulative, effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a proposed development results in individually insignificant impacts that, when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

Other plans and projects that should be considered when establishing cumulative effects are:

- proposals for which consent has been applied but which are awaiting determination;
- projects which have been granted consent, but which have not yet been started or which have been started but are not yet completed (i.e., under construction);
- proposals which have been refused permission, but which are subject to appeal, and the appeal is undetermined;
- constructed developments whose full environmental effects are not yet felt and therefore cannot be accounted for in the baseline; or
- developments specifically referenced in a National Policy Statement, a National Plan or a Local Plan.

There were three planning applications within 500 m of the Site within the last 5 years (see **0 Table B-1**). One of these applications was incomplete, while the remaining applications involved the construction of single-storey buildings that were considered unlikely to contribute to any 'in combination' effects with the Project.

Planning applications with hydrological connections to the Site were also considered. Those applications which were of significantly large scale or had the potential for similar LSE as the Project were considered for potential cumulative impacts. The Natura Impact Statements associated with these developments concluded that, following appropriate mitigation

measures, there were no likely significant effects anticipated. As such, it is considered that there are no likely significant 'in combination' effects anticipated from this Project.



## 3.7 Conclusions

It is considered that there is one European site, Lower River Suir SAC (002137) where a Source-Pathway-Receptor link exists for operational emissions associated with the proposed anaerobic digestion plant at Killough Quarry, Gaile, Holycross, Co. Tipperary.

Therefore, it is our view that, in the absence of a more detailed assessment or consideration of suitable mitigation, likely significant effects on these European sites cannot be excluded and the assessment must proceed to Stage 2: Appropriate Assessment and a Natura Impact Statement (NIS) must be prepared.

# 4.0 Stage Two: Appropriate Assessment (Natura Impact Statement)

This Natura Impact Statement (NIS) was prepared as part of a planning application by Roadstone Ltd. to Tipperary County Council in respect of a new bio-renewables anaerobic digestion (AD) plant at Killough Quarry, Killough Hill, Gaile. Holycross. Co. Tipperary.

This NIS presents data and information on the proposed bio-renewables anaerobic digestion plant and on the European sites which may be affected by the project, and an analysis of potential effects on the sites in order for the competent authority, in this case Tipperary County Council, to carry out a Stage 2 Appropriate Assessment to determine whether the project would adversely affect the integrity of Lower River Suir SAC. The '*integrity of the site'* can be defined as '*the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and / or populations of species for which the site is or will be classified'*[19].

The headings within the appropriate assessment report template provided in the European Commission guidance document on the assessment of plans and projects significantly affecting European sites have been used to provide a framework to examine the potential impacts of the proposed bio-renewables anaerobic digestion (AD) plant on Lower River Suir SAC. This section of the report sets out the potential implications of the plan or project (both alone or in combination with other projects or plans) on the integrity of the European site with respect to the conservation objectives of the site and to its structure and function. The precautionary principle should be applied when considering the potential implications and the focus should be on demonstrating, with supporting evidence, that there will be no adverse effects on the integrity of Lower River Suir SAC. Where this is not the case, adverse effects must be assumed.

## 4.1 Step One: Collect Information on the Project and on the European Sites Concerned

A full and detailed project description is provided in **Appendix C** which provides details on the construction and operational phases of the project.

The detailed description of the project is provided in Chapter 2 of the EIAR which was also prepared for the planning application for the proposed development. Sections covering water and air quality are also covered in the EIAR Chapter 7- Water and Chapter 8 – Air, and these are discussed further in this NIS.

A description of the Lower River Suir SAC is provided in **Table 3-1** above and detail on the conservation objectives for the site are discussed further below.

### 4.1.1 Lower River Suir SAC (002137)

The conservation objectives for Lower River Suir SAC include objectives to *restore* the favourable conditions of the following Qualifying Interests within the European Site:

- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]

[19] http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision_of_art6_en.pdf

- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]
- *Taxus baccata* woods of the British Isles [91J0]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Austropotamobius pallipes* (White-clawed Crayfish) [1092]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Alosa fallax fallax* (Twaite Shad) [1103]
- *Salmo salar* (Salmon) [1106]

The conservation objectives for Lower River Suir SAC also include objectives to *maintain* the favourable conservation conditions of the following Qualifying Interests within the European Site:

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]
- *Lutra lutra* (Otter) [1355]

Specific attributes and targets can be found within the associated conservation objectives document (see **Table 3-1**).

## 4.2 Step Two: Assessing the Implications of the Plan or Project in View of the Sites Conservation Objectives, Individually or in Combination with Other Plans or Projects

The Appropriate Assessment Screening process showed that the elements of the project alone identified as having potential to affect Lower River Suir SAC are as follows:

- Adverse effects on habitats and species from emission deposition arising from the operational phase of the project.

Likely significant effects from other plans and projects were screened out during the Appropriate Assessment Screening (see **Section 3.6**)

### 4.2.1 Lower River Suir SAC

The most important impacts and activities with high effects on the site include discharges, dykes and flooding defence, fertilisation, pollution to surface waters, and urbanised areas/ human habitation. Of these threats and pressures, fertilisation and pollution to surface waters are considered most relevant to the Project.

The Qualifying Interests designated within the SAC and potential impacts and effects on each of the QIs are discussed in **Table 4-1** below in relation to the Project. Information regarding

known threats and pressures for habitats[20] and species[21] was taken from NPWS Article 17 reports.



[20] https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol2_Habitats_Article17.pdf (Last accessed 10/01/2025)
[21] https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol3_Species_Article17.pdf (Last accessed 10/01/2025)

**Table 4-1: Conservation Objectives, Threats and Pressures for QI's of the Lower River Suir SAC**

| Qualifying Interest | Conservation Objectives | Pressures and Threats (Including Relevant Codes) | Potential Likely Significant Effects resulting from Project (Y/N) |
|---|---|---|---|
| Atlantic Salt Meadows (Glauco-Puccinellietelia maritimae) [1330] | • Habitat Area<br>• Habitat Distribution<br>• Physical Structure: Sediment Supply<br>• Physical Structure: Creeks and Pans<br>• Physical Structure: Flooding Regime<br>• Vegetation Structure: Zonation<br>• Vegetation Structure: Sward Height<br>• Vegetation Structure: Vegetation Cover<br>• Vegetation Composition: Typical Species and Sub-Communities<br>• Vegetation Composition: Negative Indicator Species - *Spartina anglica* | • A09 Intensive grazing or overgrazing by livestock (H)<br>• F07 Sports, tourism and leisure activities (H)<br>• A33 Modification of hydrological flow or physical alternation of water bodies for agriculture (excluding development and operation of dams) (M)<br>• A36 Agriculture activities not referred to above (M)<br>• F08 Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas including sea defence or coast protection works and infrastructure (M)<br>• I02 Other invasive alien species (other than species of Union concern) (M) | **N –** There has only been one subsite containing this habitat identified within the Lower River Suir SAC during the most recent survey conducted by the Saltmarsh Monitoring Project (SMP)[22] – Lower Suir Estuary (Little Island – Cheekpoint). This subsite is located near the River Suir's confluence with the River Barrow and River Nore SAC and can be considered sufficiently distant from the Site to avoid potential LSE resulting from the Project. |
| Mediterranean Salt Meadows (Juncetalia maritime) [1410] | • Habitat Area<br>• Habitat Distribution<br>• Physical Structure: Sediment Supply<br>• Physical Structure: Creeks and Pans<br>• Physical Structure: Flooding Regime<br>• Vegetation Structure: Zonation<br>• Vegetation Structure: Sward Height<br>• Vegetation Structure: Vegetation Cover<br>• Vegetation Composition: Typical Species and Sub-Communities<br>• Vegetation Composition: Negative Indicator Species - *Spartina anglica* | • A09 Intensive grazing or overgrazing by livestock (H)<br>• A33 Modification of hydrological flow or physical alternation of water bodies for agriculture (excluding development and operation of dams) (M)<br>• A36 Agriculture activities not referred to above (M)<br>• A10 Extensive grazing or undergrazing by livestock (M) | **N –** This habitat was not recorded within the SAC during the most recent survey conducted by the SMP and the total area of the QI within the SAC is unknown. As a coastal habitat, this QI is limited to the tidal reaches of the SAC and therefore any possible impact can be considered sufficiently distant from the Site to avoid potential LSE resulting from the Project. |
| Water Courses of Plain to Montane Levels with the Ranunculion fluitantis and Callitricho-Batrachion Vegetation [3260] | • Habitat Area<br>• Habitat Distribution<br>• Hydrological Regime: River Flow<br>• Hydrological Regime: Groundwater Discharge<br>• Hydrological Regime: Tidal Influence<br>• Substratum Composition: Particle Size Range<br>• Water Quality<br>• Typical Species<br>• Floodplain Connectivity<br>• Fringing Habitats | • A26 Agricultural activities generating diffuse pollution to surface or ground waters (H)<br>• A25 Agricultural activities generating point source pollution to surface or ground waters (H)<br>• K04 Modification of hydrological flow (H)<br>• K05 Physical alteration of water bodies (H)<br>• F12 Discharge of urban wastewater (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water (H)<br>• B23 Forestry activities generating pollution to surface or ground waters (M)<br>• F11 Pollution to surface or ground water due to urban runoffs (M)<br>• C05 Peat extraction (M)<br>• F13 Plants, contaminated or abandoned industrial sites generating pollution to surface or ground water (M)<br>• K01 Abstraction from groundwater, surface water or mixed water (M) | **N** – This habitat is dependent of surface water quality. As there will be no discharge from the project Site there will be no potential for LSE on this QI from any reduction in water quality. |

[22] Brophy, J.T., Perrin, P.M., Penk, M.R., Devaney, F.M. & Leyden, K.J. (2019) Saltmarsh Monitoring Project 2017-2018. Irish Wildlife Manuals, No. 108. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

| Qualifying Interest | Conservation Objectives | Pressures and Threats (Including Relevant Codes) | Potential Likely Significant Effects resulting from Project (Y/N) |
|---|---|---|---|
| Hydrophilous Tall Herb Fringe Communities of Plains and of the Montane to Alpine Levels [6430] | • Habitat Area<br>• Habitat Distribution<br>• Hydrological Regime: Flooding Depth/ Height of Water Table<br>• Vegetation Composition: Positive Indicator Species<br>• Vegetation Composition: Non-Native Species<br>• Vegetation Composition: Negative Indicator Species<br>• Vegetation Composition: Scrub, Bracken and Heath<br>• Vegetation Structure: Height<br>• Physical Structure: Bare Soil<br>• Physical Structure: Grazing and Disturbance | • A09 Intensive grazing or overgrazing by livestock (M)<br>• A31 Drainage for use as agricultural land (M)<br>• I01 Invasive alien species of Union concern (M)<br>• I02 Other invasive alien species (other than species of Union concern) (M) | **Y –** Nitrogen deposition can lead to changes in vegetation composition through changing the nutrient base in a manner that may favour certain plant species. As such, there is potential to undermine the conservation objective for this QI. |
| Old Sessile Oak Woods with *Ilex* and *Blechnum* in the British Isles [91A0] | • Habitat Area<br>• Habitat Distribution<br>• Woodland Size<br>• Woodland Structure: Cover and Height<br>• Woodland Structure: Community Diversity and Extent<br>• Woodland Structure: Natural Regeneration<br>• Woodland Structure: Dead Wood<br>• Woodland Structure: Veteran Trees<br>• Woodland Structure: Indicators of Local Distinctiveness<br>• Vegetation Composition: Native Tree Cover<br>• Vegetation Composition: Typical Species<br>• Vegetation Composition: Negative Indicator Species | • I02 Other invasive alien species (other than species of Union concern) (H)<br>• A09 Intensive grazing or overgrazing by livestock (H)<br>• I04 Problematic native species (M)<br>• B09 Clear-cutting, removal of all trees (M)<br>• M07 Storm, cyclone (M) | **Y –** Nitrogen deposition can lead to changes in vegetation composition through changing the nutrient base in a manner that may favour certain plant species. As such, there is potential to undermine the conservation objective for this QI. |
| Alluvial Forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] | • Habitat Area<br>• Habitat Distribution<br>• Woodland Size<br>• Woodland Structure: Cover and Height<br>• Woodland Structure: Community Diversity and Extent<br>• Woodland Structure: Natural Regeneration | • I02 Other invasive alien species (other than species of Union concern) (H)<br>• I04 Problematic native species (M)<br>• B09 Clear-cutting, removal of all trees (M)<br>• I05 Plant and animal diseases, pathogens and pests (M) | **Y –** Nitrogen deposition can lead to changes in vegetation composition through changing the nutrient base in a manner that may favour certain plant species. As such, there is potential to undermine the conservation objective for this QI. |

| Qualifying Interest | Conservation Objectives | Pressures and Threats (Including Relevant Codes) | Potential Likely Significant Effects resulting from Project (Y/N) |
|---|---|---|---|
| | • Hydrological Regime: Flooding Depth/ Height of Water Table<br>• Woodland Structure: Dead Wood<br>• Woodland Structure: Veteran Trees<br>• Woodland Structure: Indicators of Local Distinctiveness<br>• Vegetation Composition: Native Tree Cover<br>• Vegetation Composition: Typical Species<br>• Vegetation Composition: Negative Indicator Species | | |
| *Taxus baccata* Woods of the British Isles [91J0] | • Habitat Area<br>• Habitat Distribution<br>• Woodland Size<br>• Woodland Structure: Cover and Height<br>• Woodland Structure: Community Diversity and Extent<br>• Woodland Structure: Natural Regeneration<br>• Woodland Structure: Dead Wood<br>• Woodland Structure: Veteran Trees<br>• Woodland Structure: Indicators of Local Distinctiveness<br>• Vegetation Composition: Native Tree Cover<br>• Vegetation Composition: Typical Species<br>• Vegetation Composition: Negative Indicator Species | • I02 Other invasive alien species (other than species of Union concern) (H)<br>• A09 Intensive grazing or overgrazing by livestock (H)<br>• I05 Plant and animal diseases, pathogens and pests (M) | **Y –** Nitrogen deposition can lead to changes in vegetation composition through changing the nutrient base in a manner that may favour certain plant species. As such, there is potential to undermine the conservation objective for this QI. |
| Freshwater Pearl Mussel (Margaritifera margaritifera) [1029] | • Distribution<br>• Population Size<br>• Population Structure: Recruitment<br>• Population Structure: Adult Mortality<br>• Suitable Habitat: Extent<br>• Suitable Habitat: Condition<br>• Water Quality: Macorinvertebrate and Phytobenthos (Diatoms)<br>• Substratum Quality: Filamentous Algae (Macroalgae); Macrophytes (Rooted Higher Plants) | • A31 Drainage for use as agricultural land (H)<br>• B27 Modification of hydrological conditions, or physical alteration of water bodies and drainage for forestry (including dams) (H)<br>• F31 Other modification of hydrological conditions for residential or recreational development (H)<br>• A26 Agricultural activities generating diffuse pollution to surface or ground waters (H)<br>• B23 Forestry activities generating pollution to surface or ground waters (H)<br>• F12 Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water (M)<br>• C05 Peat extraction (M)<br>• F28 Modification of flooding regimes, flood protection for residential or recreational development<br>• D02 Hydropower (dams, weirs, run-off-the-river), including infrastructure (M)<br>• F33 Abstraction of ground and surface waters (including marine) for public water supply and recreational use (M) | **Y –** This species is dependent on surface water quality and is highly sensitive to pollution. Pollution of surface water through excessive nitrogen deposition has the potential to undermine the conservation objective for this QI. |

| Qualifying Interest | Conservation Objectives | Pressures and Threats (Including Relevant Codes) | Potential Likely Significant Effects resulting from Project (Y/N) |
|---|---|---|---|
| | • Substratum Quality: Filamentous Algae (Macroalgae); Macrophytes (Rooted Higher Plants)<br>• Substratum Quality: Sediment<br>• Substratum Quality: Oxygen Availability<br>• Hydrological Regime: Flow Variability<br>• Host Fish<br>• Fringing Habitat: Area and Condition | | |
| White-Clawed Crayfish (*Austropotamobius pallipes*) [1092] | • Distribution<br>• Population Structure: Recruitment<br>• Negative Indicator Species<br>• Disease<br>• Water Quality<br>• Habitat Quality: Heterogeneity | • I01 Invasive alien species of Union concern (H)<br>• I05 Plant and animal diseases, pathogens and pests (H/M) | **Y –** This species is dependent on surface water quality and is highly sensitive to pollution. Pollution of surface water through excessive nitrogen deposition has the potential to undermine the conservation objective for this QI.. |
| Sea Lamprey (*Petromyzon marinus*) [1095] | • Distribution: Extent of Anadromy<br>• Population Structure of Juveniles<br>• Juvenile Density in Fine Sediment<br>• Extent and Distribution of Spawning Habitat<br>• Availability of Juvenile Habitat | • D02 Hydropower (dams, weirs, run-off-the-river), including infrastructure (H)<br>• N03 Increases or changes in precipitation due to climate change (H)<br>• A19 Application of natural fertilisers on agricultural land (M)<br>• A20 Application of synthetic (mineral) fertilisers on agricultural land (M)<br>• A31 Drainage for use as agricultural land (M)<br>• G01 Marine fishing and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (M)<br>• Xo Threats and pressures from outside the Member State (M)<br>• N01 Temperature changes (e.g. rise of temperature & extremes) due to climate change (M)<br>• N02 Droughts and decreases in precipitation due to climate change (M) | **Y –** This species is dependent on surface water quality and is highly sensitive to pollution. Pollution of surface water through excessive nitrogen deposition has the potential to undermine the conservation objective for this QI... |
| Brook Lamprey (*Lampetra planeri*) [1096] | • Distribution<br>• Population Structure of Juveniles<br>• Juvenile Density in Fine Sediment<br>• Extent and Distribution of Spawning Habitat<br>• Availability of Juvenile Habitat | • A19 Application of natural fertilisers on agricultural land (M)<br>• A20 Application of synthetic (mineral) fertilisers on agricultural land (M)<br>• A31 Drainage for use as agricultural land (M)<br>• B09 Clear-cutting, removal of all trees (M)<br>• D02 Hydropower (dams, weirs, run-off-the-river), including infrastructure (M)<br>• F11 Pollution to surface or ground water due to urban run-offs (M)<br>• F12 Discharge of urban waste water (excluding storm overflows and/ or urban run-offs) generating pollution to surface or ground water (M)<br>• N01 Temperature changes (e.g. rise of temperature & extremes) due to climate change (M)<br>• N02 Droughts and decreases in precipitation due to climate change (M) | **Y –** This species is dependent on surface water quality and is highly sensitive to pollution. Pollution of surface water through excessive nitrogen deposition has the potential to undermine the conservation objective for this QI. |
| River Lamprey (*Lampetra fluviatilis*) [1099] | • Distribution<br>• Population Structure of Juveniles<br>• Juvenile Density in Fine Sediment<br>• Extent and Distribution of Spawning Habitat | • D02 Hydropower (dams, weirs, run-off-the-river), including infrastructure (H)<br>• N03 Increases or changes in precipitation due to climate change (H)<br>• A19 Application of natural fertilisers on agricultural land (M)<br>• A20 Application of synthetic (mineral) fertilisers on agricultural land (M)<br>• A31 Drainage for use as agricultural land (M) | **Y –** This species is dependent on surface water quality and is highly sensitive to pollution. Pollution of surface water through excessive nitrogen deposition has the potential to |

| Qualifying Interest | Conservation Objectives | Pressures and Threats (Including Relevant Codes) | Potential Likely Significant Effects resulting from Project (Y/N) |
|---|---|---|---|
| | • Availability of Juvenile Habitat | • E03 Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (M)<br>• N01 Temperature changes (e.g. rise of temperature & extremes) due to climate change (M)<br>• N02 Droughts and decreases in precipitation due to climate change (M) | undermine the conservation objective for this QI. |
| Twaite Shad (*Alosa fallax fallax*) | • Distribution: Extent of Anadromy<br>• Population Structure: Age Classes<br>• Extent and Distribution of Spawning Habitat<br>• Water Quality: Oxygen Levels<br>• Spawning Habitat Quality: Filamentous Algae; Macrophytes; Sediment | • A19 Application of natural fertilisers on agricultural land (M/H)<br>• A20 Application of synthetic (mineral) fertilisers on agricultural land (M/H)<br>• D02 Hydropower (dams, weirs, run-off-the-river), including infrastructure (M)<br>• E03 Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (M)<br>• G01 Marine fishing and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (M)<br>• G06 Freshwater fish and shellfish harvesting (recreational) (M)<br>• G12 Bycatch and incidental killing (due to fishing and hunting activities) (M/H)<br>• I02 Other invasive alien species (other than species of Union concern) (M)<br>• N01 Temperature changes (e.g. rise of temperature & extremes) due to climate change (M)<br>• N03 Increases or changes in precipitation due to climate change (M) | **N –** The upstream extent of favourable range for this species is represented by the first impassable barrier for movement along the river, which in this case, is a weir located in Clonmel. This is considered sufficiently distant from the Site to avoid potential LSE resulting from the Project. |
| Salmon (*Salmo salar*) | • Distribution: Extent of Anadromy<br>• Adult Spawning Fish<br>• Salmon Fry Abundance<br>• Out-Migrating Smolt Abundance<br>• Number and Distribution of Redds<br>• Water Quality | • A25 Agricultural activities generating diffuse pollution to surface or ground waters (H)<br>• G19 Other impacts from marine aquaculture, including infrastructure (H)<br>• K05 Physical alteration of water bodies (H)<br>• J01 Mixed source pollution to surface and ground waters (limnic and terrestrial) (H)<br>• A25 Agricultural activities generating point source pollution to surface or ground waters (M)<br>• B23 Forestry activities generating pollution to surface or ground waters (M)<br>• D02 Hydropower (dams, weirs, run-off-the-river), including infrastructure (M)<br>• G11 Illegal harvesting, collecting and taking (M)<br>• G20 Abstraction of water, flow diversion, dams and other modifications of hydrological conditions for freshwater aquaculture (M)<br>• L06 Interspecific relations (competition, predation, parasitism, pathogens) (M)<br>• F12 Discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water (M)<br>• F28 Modification of flooding regimes, flood protection for residential or recreational development (M)<br>• N01 Temperature changes (e.g. rise of temperature & extremes) due to climate change (H)<br>• I02 Other invasive alien species (other than species of Union concern) (M) | **Y –** This species is dependent on surface water quality and is highly sensitive to pollution. Pollution of surface water through excessive nitrogen deposition has the potential to undermine the conservation objective for this QI. |
| Otter (*Lutra lutra*) | • Distribution<br>• Extent of Terrestrial Habitat<br>• Extent of Marine Habitat<br>• Extent of Freshwater (River) Habitat<br>• Couching Sites and Holts<br>• Fish Biomass Available<br>• Barriers to Connectivity | • Xxp No pressures or threats | **Y** – The availability of fish is an attribute of the conservation objective for this species. Therefore, pollution of surface water bodies through or nitrogen deposition has the potential to undermine the conservation objective for this QI. |

## 4.3 Step Three: Ascertain the Effects of the Plan or Project on the Integrity of the European Site

As shown in **Table 4-1** above, the Project has the potential to undermine conservation objectives of the Lower River Suir SAC through impacts from excessive deposition of nitrogen arising from the emissions from the proposed bio-renewables anaerobic digestion (AD) plant.

Specific Qualifying Impacts that could potentially be impacted include:

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Austropotamobius pallipes* (White-clawed Crayfish) [1092]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

As such, there is potential to undermine the integrity of the Lower River Suir SAC without appropriate mitigation.

## 4.4 Step Four: Mitigation Measures

To mitigate against emissions during the operational phase of the Project which has the potential to undermine the conservation objectives of the Lower River Suir SAC, the following mitigation measures will be implemented.

### 4.4.1 Air Quality Management

The operational measures proposed for the control of emissions arising from the Project are as follows:

- the chicken litter and brewery residue siloes, cattle slurry tanks, pretreatment and equalization building, bio rest tanks and digestate handling building would be enclosed structures, with air extracted to the odour abatement system;
- the odour abatement system would treat the air extracted from these areas prior to discharge to atmosphere via a dispersion stack at a height of 17.5m;
- the anaerobic digestion process would be undertaken within sealed reactors located within the bioconversion building. These sealed reactors would be connected to the gas capture system, ensuring complete containment; and
- a site management system would be in place to ensure routine cleaning measures are undertaken (i.e. spillages cleared and not left in situ).

### 4.4.2 Environmental Management System (EMS)

In addition, an Environmental Management System (EMS) will be put in place for the facility which will include, but not be limited to the following:

- Measures to comply with the Industrial Emissions licence and other relevant environmental legislation;
- Waste Acceptance Procedures;
- Standard Operating Procedures;
- Measures to comply with the corporate sustainability goals (e.g., reducing water and energy consumption); and
- Accident prevention and emergency response procedures.

## 4.5 Assessment of Critical Levels and Loads with Mitigation

As part of the Air Quality Assessment for the preparation of an EIAR for the Project, and in accordance with the EPA's EIAR guidance and EPA guidance AG4 (therein deferring to AQTAG06), a detailed dispersion modelling assessment has been undertaken to assess the impact of combustion emissions from the Proposed Development.

In addition to EPA guidance AG4, and EA AERA guidance, the EA's Operational Instruction 66_12[23] details how air quality impacts on ecological sites should be assessed. This guidance is considered suitable for this assessment providing a risk-based screening criteria to determine whether impacts will have '*no likely significant effects'* for European sites as follows:

- PC does not exceed 1% of the long-term $C_{Le}$ and/or $C_{Lo}$ or that the PEC does not exceed 70% long-term $C_{Le}$ and/or $C_{Lo}$ for European sites;
- PC does not exceed 10% of the short-term $C_{Le}$ for $NO_x$ for European sites; and
- PC does not exceed 100% of the short or long-term $C_{Le}$ and/or $C_{Lo}$ for other conservation sites.

### 4.5.1 Impacts on Critical Levels

The results of the assessment of impacts at ecological receptors on $C_{Le}$ (as a result of $NO_X$, $SO_2$ and $NH_3$ emissions) are presented in Error! Reference source not found.**4-2** below.

The findings were as follows:

- the PC is below 1% of the long-term $C_{Le}$ at the SAC;
- the PC is below 10% of the short-term $C_{Le}$ at the SAC; and
- the PC is below 100% of the short- and long-term $C_{Le}$ at the pNHA.

In consideration of impacts on the $C_{Le}$, it is determined that the Proposed Development will cause '*no likely significant effects'* at the Lower River Suir SAC.

[23] EA Operational Instruction 66_12 - Simple assessment of the impact of aerial emissions from new or expanding IPPC regulated industry for impacts on nature conservation. Issued 08/05/2012.

**Table 4-2: Impact on Critical Levels**

| Receptor | Averaging Period | Applied $C_{Le}$ (µg/m³) | PC (µg/m³) | PC as % of $C_{Le}$ | PEC (µg/m³) | PEC as % of $C_{Le}$ |
|---|---|---|---|---|---|---|
| Lower River Suir SAC | $NO_X$ Annual | 30 | <0.1 | 0.1% | 3.4 | 11.4% |
| | $NO_X$ 24-hour | 200 | 0.8 | 1.0% | 7.6 | 10.1% |
| | $SO_2$ Annual | 10 (A) | <0.01 | <0.1% | 0.2 | 2.0% |
| | $NH_3$ Annual | 1.0 (A) | 0.008 | 0.8% | 3.408 | 340.8% |

Table note:
(A) The lower $SO_2$ and $NH_3$ $C_{Le}$ has been applied, reflecting a conservative approach (assuming the presence of lichens and/or bryophytes at all areas across both designations).

### 4.5.2 Impacts on Critical Loads

The results of the assessment of impacts on $C_{Lo}$ (as a result of $NO_X$ and $NH_3$ emissions) are presented in **Table4-3** below.

The findings are as follows:

- the nitrogen deposition PC exceeds 1% of the $C_{Lo}$ at the SAC, however the PEC is less than 70% of the $C_{Lo}$;
- the acid deposition PC does not exceed 1% of the $C_{Lo}$ at the SAC; and

In consideration of impacts on the $C_{Lo}$, it is determined that the Proposed Development will cause '*no likely significant effects'* at the Lower River Suir SAC.

**Table 4-3: Impact on Nitrogen Critical Load**

| Site | Applied $C_{Lo}$ (kg N/ha/yr) | PC (A) (kg N/ha/yr) | PC as % of $C_{Lo}$ | PEC (kg N/ha/yr) | PEC as % of $C_{Lo}$ |
|---|---|---|---|---|---|
| Lower River Suir SAC | 5 | 0.07 | 1.4% | 2.3 | 46.1% |

Table note:
(A) Process Contribution inclusive of contributions from $NO_X$ and $NH_3$ from both combustion emissions and ammonia contribution.

## 4.6 Conclusion

This Natura Impact Statement, based on the best available scientific information, shows that, considering the proposed mitigation measures which are designed to prevent likely significant effects as a result of the release of $NO_X$ and $NH_3$ emissions from the operation of the proposed bio-renewables anaerobic digestion (AD) plant at Killough Quarry will not undermine the conservation objectives of the Lower River Suir SAC, either alone or in-combination with other projects or plans.

Based on the information set out in this report we submit that the competent authority has sufficient information to allow it to determine that the application for the proposed development will not have an adverse effect on the integrity or pose a risk of likely significant effects on the Lower River Suir SAC, or any other European site.

# 5.0 References



**CIEEM (2018)** Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

**DoEHLG (2010)** Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government. Dublin.

**European Commission (2018)** Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats Directive' 92/43/EEC.

**European Commission (2021)** Assessment of Plans and Projects in relation to Natura 2000 sites – Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC.

**European Union Habitats Directive, (1992)** Council Directives 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

**NPWS (2019).** The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report.

**Office of the Planning Regulator – OPR (2021)** Appropriate Assessment Screening for Development Management.

# Drawings

**Figure 1: Location of the Site Relative to European (Natura 2000) Sites**

# Appendix A Relevant Legislation

## Appropriate Assessment Screening and Natura Impact Statement

**Killough Bio-Renewables Anaerobic Digestion (AD) Plant**

**Roadstone Ltd.**

SLR Project No.: 501.065577.00001

6 January 2025

SLR

## European Nature Directives (Habitats and Birds)

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) forms the basis for the designation of Special Areas of Conservation (SAC). Similarly, Special Protection Areas (SPA) are classified under the Birds Directive (Council Directive 2009/147/EEC on the Conservation of Wild Birds). Collectively, SACs and SPAs are referred to as the European network. The European Network is the minimum required to conserve certain habitats and species which are listed in the Directives.

Under Article 6(3) of the Habitats Directive, an Appropriate Assessment (AA) must be undertaken for any plan or project that is not directly connected with or necessary to the management of a European site but is likely to have a significant effect thereon, either individually or in combination with other plans or projects. An AA is an evaluation of the potential impacts of a plan or project on the conservation objectives of a European site, and the identification, where necessary, of mitigation or avoidance measures to preclude adverse effects on the integrity of the site.

Article 6, paragraph 3 of the European Commission Habitats Directive 92/43/EEC ("the Habitats Directive") states that:

"*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public*".

## European Communities (Birds and Natural Habitats) Regulations 2011

Pursuant to the Habitats Directive, Part 5 of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended, similarly sets out the requirements for screening assessments and the circumstances under which an AA is required.

Regulation 42(1) requires that '*a screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site*.' Regulation 42(2) expands on this, stipulating that a public authority must carry out a screening for AA before consent for a plan or project is given, or a decision to undertake or adopt a plan or project is taken.

Regulation 42(6) requires that '*the public authority shall determine that an Appropriate Assessment of a plan or project is required where the plan or project is not directly connected with or necessary to the management of the site as a European Site and if it cannot be excluded, on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site'*.

Regulation 42(3)(a) gives the public authority the power to direct a third party to provide a Natura Impact Statement (NIS) and Regulation 42(3)(b) allows it to request any additional information that it needs to complete the screening assessment or AA. Regulation 42(5) goes

on to make clear that the NIS should include such information as the public authority considers necessary to enable it to undertake the AA and to ascertain if a project or plan will affect the integrity of a European site. In addition to the information, Regulation 2(1) provides a definition of a Natura Impact Statement as '*a report comprising the scientific examination of a plan or project and the relevant European Site or European Sites, to identify and characterise any possible implications of the plan or project individually or in combination with other plans or projects in view of the conservation objectives of the site or sites, and any further information including, but not limited to, any plans, maps or drawings, scientific information or data required to enable the carrying out of an Appropriate Assessment*'.

Regulation 42(11) makes clear that the AA must be carried out by the public authority and that it must include its conclusion as to whether the project or plan would adversely affect the integrity of a European site, and that this must be done prior to consenting the project.

## Planning and Development Act 2000 (as amended)

These processes have been further enshrined in the Planning and Development Act 2000 (as amended), in sections 177T, 177U and 177V, which are as follows:

*s177T(1)(b) A Natura impact statement means a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites.*

*(2) Without prejudice to the generality of subsection (1), a Natura impact report or a Natura impact statement, as the case may be, shall include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one European site in view of the conservation objectives of the site or sites.*

*177U. — (1) A screening for appropriate assessment of a draft Land use plan or application for consent for proposed development shall be carried out by the competent authority to assess, in view of best scientific knowledge, if that Land use plan or proposed development, individually or in combination with another plan or project is likely to have a significant effect on the European site.*

*(4) The competent authority shall determine that an appropriate assessment of a draft Land use plan or a proposed development, as the case may be, is required if it cannot be excluded, on the basis of objective information, that the draft Land use plan or proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.*

*177V. — (1) An appropriate assessment carried out under this Part shall include a determination by the competent authority under Article 6.3 of the Habitats Directive as to whether or not a draft Land use plan or proposed development would adversely affect the integrity of a European site and an appropriate assessment shall be carried out by the competent authority, in each case where it has made a determination under section 177U(4) that an appropriate assessment is required, before — ... ( b ) consent is given for the proposed development.*

# Appendix B Planning Application Search

## Appropriate Assessment Screening and Natura Impact Statement

**Killough Bio-Renewables Anaerobic Digestion (AD) Plant**

**Roadstone Ltd.**

SLR Project No.: 501.065577.00001

6 January 2025

**Table B-1: Relevant Local Planning Applications within 500 m of the Site within the Last 5 Years**

| Planning Ref | Brief Description | Planning Status |
|---|---|---|
| 19600799 | to construct a single-storey ancillary family accommodation and all associated works | Conditional |
| 22206 | The development will consist of an aggregate storage shed (area 980 m2) within the existing quarry landholding | Conditional |
| 18600270 | development comprising the establishment and operation of an enclosed limestone processing facility (area 600 sq. metres and max. height 30 metres) and associated ancillary infrastructure on a O.S. hectare site within the existing quarry landholding. The development will include the lowering of existing ground levels by c.7 meters | Incomplete |

**Table B-2: Relevant Planning Applications with Hydrological Connections to the Site within the Last 5 Years**

| ` | Brief Description | Planning Status |
|---|---|---|
| 21532 | (a) construct an extension to the dwelling (b) construct a new site entrance and (c) to construct a septic tank and percolation area and including all associated site works | Conditional |
| 2316 | slatted cubicle house and associated site works for dairy cows | Conditional |
| 2360806 | 1) an extension to existing warehouse consisting of warehouse storage use with open canopy to the North facing elevation with internal roadway around the new extension and carparking area and boundary fencing, 2) a machine store/lift store with electrical charging points and 3) RETENTION PERMISSION for an open canopy constructed to the rear of the premises (West facing) with all associated siteworks | Conditional |
| 2260538 | a mixed-use development that will provide 93 no. residential dwellings 2 no. local retail units, a cafe and a riverside walk. The 93 no. residential dwellings are in the form of 30 no. two storey houses, 21 no. three storey duplex apartments and a four and five storey apartment building containing 42 no. apartments (three of which are duplex). All duplex and apartments have balconies or ground floor terraces. The 2 no. retail units and the café are located on the ground floor of the apartment building. Open space provided on site consists of a central public open space (1,610sq.m), public plaza (c.200sq.m) as well as a riverside walk (3,000sq.m) along the south of the site bound by the River Suir. Residents of the apartment building will also have access to a communal roof garden at fourth floor level. The proposed development will include the reduction in height and alterations to the existing stone boundary wall on Abbey Road and removal of the remaining boundary walls onto Abbey Road and Convent Road and increase permeability through the site. A single vehicular access is proposed off Abbey Road and there will be dedicated pedestrian/cycle access points to both Abbey Road and Convent Road, all associated car parking including car parking on Abbey Road and Convent Road, footpaths and alterations to road markings on Abbey Road and Convent Road, landscaping and boundary treatments, bin storage and bicycle storage structures, public lighting, ESB sub- | Conditional |

| ` | Brief Description | Planning Status |
|---|---|---|
| | station and all associated site development works, including alterations to existing site levels and retaining walls/structures and the removal/decommissioning of existing utility structures and services on site. The planning application will be accompanied by a Natura Impact Statement (NIS) | |
| 21125 | (a) construction of an agricultural building to include milking parlour, dairy, ancillary rooms, underground slatted storage tank, waiting yard and livestock handling facilities (b) erection of external milk storage tank, meal bins and water storage tanks and all associated siteworks | Conditional |
| 2460316 | amendments to the Strategic Housing Development (SHD) permitted on site under Ref. ABP-311290-21 for 115 no. residential units(47 no. apartments/duplexes within 5 no. 3 storey blocks and 68 no. 2-4 bed houses), creche and associated works. This amendment application seeks to omit all permitted duplex units (24 no.) and replace with a mix of additional houses (8 no.) and apartments (23 no.) along with a revised mix of units, resulting in a revised residential development of 122 no. units (7 no. additional units) and comprising: - 46 no. apartments (8 no. 1-bed & 38 no. 2-bed) within 3 no. 3 storey blocks - 76 no. two-three storey houses (9 no. 2-bed terraced houses, 37 no. 3-bed terraced houses, 10 no. 3-bed semi-detached houses & 20 no. 4-bed semi-detached houses). This amendment also includes a revised childcare facility of c.160 sq.m, and revised car and cycle parking provision (resulting in a revised overall total of 205 no. car parking spaces and 389 no. cycle parking spaces to serve the entire development). Vehicular and pedestrian access to be provided from Coleville Road (R680) as per the parent permission. All other site works including boundary treatments, landscaping and site services to facilitate development. The remainder of the development to be carried out in accordance with the parent permission Ref. ABP-311290-21. An updated Natura Impact Statement has been prepared in respect of the proposed development. | Conditional |
| 2460096 | development of an Integrated Constructed Wetland (ICW) for the treatment and management of wash waters arising from the Mart's facility. The existing Balancing tank will be retained. Flows from the existing tank will be routed via new pipework to the ICW for treatment. The proposed ICW will consist of a screen, settlement tank, 3 ICW treatment cells, discharge tank, pipework and associated works. Discharge flows, following treatment will be to the River Suir within the ownership boundary of the site | Permission |
| 21696 | construction of slatted shed with underground effluent tank and put roof over existing underground effluent tank feeding area and all associated site works (within the curtilage of a Protected Structure S50) and all associated site works | Conditional |
| 2360958 | The development will consist of works to protect and stabilise the banks of the existing by-pass channel of the River Suir, and will comprise: (1) construction of rock armour along a linear stretch of 2.5m on both the eastern and western banks of the channel, adjacent to the abutments of the existing footbridge; (2) construction of rock armour along a linear stretch of 30m on | Conditional |

| ` | Brief Description | Planning Status |
|---|---|---|
| | the eastern bank of the channel (to the rear of the existing tennis courts); (3) construction of rock armour along a linear stretch of 30m on the western bank of the channel (immediately before the channel meets the River Suir); and, (4) all ancillary and temporary works including the provision of temporary accessways. A Natura Impact Statement (NIS) will be submitted with this Planning Application. | |
| 2474 | the existing building as constructed. PLANNING PERMISSION for the construction of a manure pit, soiled water tank and a new splayed entrance from the public road and all ancillary site works | Conditional |
| 22401 | (1) alterations to the dwelling including demolition of existing single storey extension, and elevational changes including rendering, replacement roof, installation of windows, and alteration to chimney and flue, erection of sky and broadband dishes, and installations of rainwater goods. (2) alterations to the existing boundary walls enclosing the curtilage of the dwelling including the alteration of the site entrances serving the property from the public road L2506, and removal of rear boundary wall and replacement with low wall. (3) development of a deck and slipway with metal framing adjoining the Anner river. (4) the alterations of ground levels and construction of steps within the curtilage. (5) the clearing of a yard area and laying of hardcore. (6) the erection of a CCTV pole and associated service manholes (6) the erection of a soil berm to enclose the yard area. (7) the laying of concrete kerbs and flexible bollards along the L2506 roadside adjacent to the dwelling. | Conditional |
| 2360390 | the construction of a vehicular entrance, dwelling house, domestic garage, septic tank & Percolation area together with all associated site works | Conditional |
| 2360112 | slatted shed with underground effluent tank & lie back area, Permission for demolition of open tank and Permission to construct (i) cubicles shed extension with underground effluent tanks (ii) Dung stead (iii) Walled silage slab and all associated site works | Conditional |
| 2360579 | the construction of a 4.00m wide access track, including crossing of the Rackethall Stream and other stream (unnamed), measuring approximately c.750m in overall length to facilitate access between two consented solar farms, those being Monaincha Solar Farm (Ref. 21261) and The Sheehy's Solar Farm (Ref. 16/600917). The access track would be located (Grid Easting: 618575; Northing 686630 centre of application site. A Natura Impact Statement is submitted as part of the planning application | Conditional |
| 20731 | construction of an extension to existing abattoir building for (i) new Hide store (ii) New refrigeration store (iii) hide/offal yard (iv) walled concrete yard (v) underground effluent tank (vi) cover crush and holding yard (vii) Entrance hall with Hygiene lobby and all associated site works | Conditional |
| 23196 | the existing temporary carpark (contractor carpark facility) and associated existing service roadway and existing compound area, comprising a mix of existing stone base and also tarmac | Conditional |

| ` | Brief Description | Planning Status |
|---|---|---|
| | surface treatment, and including existing site lighting installations, existing fencing, existing smoking shelter and existing bicycle rack. We also wish to apply for permission to extend the existing carpark by circa 2m to the east to accommodate the construction of 178 no permanent carparking spaces (which includes for the designation of 17 no. new e-car charging carparking spaces and 1 no. new combined disabled/e-car charging carparking space), upgrade of the existing surface finish to a tarmac finish as applicable throughout, installation of line markings and kerbing, drainage works including the installation of a petrol/oil interceptor and attenuation system, adaption of existing site lighting as required ( including the replacement of all existing site lighting fixtures), the alterations of existing tree line, adaptation of existing compound area to form a secure delivery drop-off/short-term storage area, and all necessary alterations to accommodate the above works, complete with all associated site works and ancillary accommodation. The planning application is accompanied by a Natura Impact Statement (NIS). This application refers to a development on a site that carries out activity for which an industrial Emissions Licence under Part IV of the Environmental Protection Agency Act 1992 (as amended) is required and where the major accident directive applies | |
| 211819 | alterations to the previously granted solar farm (Tipperary County Council Reg Ref 17600928) Permission was originally granted for a solar photovoltaic installation comprising arrays of approximately 13,770 solar PV panels on ground mounted frames no taller than 2.8m; 2 no. inverter/transformer container units; a battery storage container unit; a 20kV on-site substation; landscaping, fencing and CCTV cameras around the solar PV arrays and connecting to the off-site Deerpark ESB substation; provision of a temporary construction compound; widening of the existing farm entrance and internal tracks; and all ancillary works on a site of 9.12 ha. Permission is now sought for the following: optimised solar pv panel configuration to comprise up to 23,581 m" of solar panels on ground mounted frames; increase in height to the permitted solar panels from 2.72m to 2.82m and; Permission for an operational period of the solar farm from 35 years. Planning Permission is sought for a period of 10 years | Conditional |
| 21110 | the demolition of the former St. Joseph's College and associated outbuildings and the construction of a new 2-storey 8-classroom school building with a total floor area of 1,627 sqm and incorporating a general purpose hall, a library resource area, staff rooms, support teaching spaces and all ancillary accommodation. The building will also include 34 no. photovoltaic panels and rainwater harvesting tanks at roof level. Works to the new school grounds will consist of the provision of a ball court, senior and junior play areas, kick about and orchard and nature areas and associated hard and soft landscaping throughout. The development will also include the widening of the road along the North Quay, drop-off and pick-up areas for both cars and buses, the provision of 16 no. car parking spaces (including 1 no. disabled parking space), sheltered bicycle stands, public realm works to include new paving on Clonmel/Well Road and North Quay, with new entrances, gates | Conditional |

| ` | Brief Description | Planning Status |
|---|---|---|
| | and boundary treatments, flood storage compensation area, and all other associated site and development works. A Natura Impact Statement (NIS) has been prepared and will be submitted to the planning authority with the application | |
| 21407 | construction of a proposed three-storey pilot plant manufacturing facility sized approximately 3,266 square metres and approximately 20.75 metres high and located and linked to the existing factory 03 manufacturing building and located south of the O.S.D. manufacturing facility, currently under construction (ref. 20/693). The project development also includes the following: a) An equipment yard housing plant, equipment and abatement system, vents and equipment housings including a covered waste tank, b) Roof mounted equipment and vents, c) Modifications to existing underground utilities including a surface water attenuation tank, underground storage tanks and miscellaneous works, d) The extension of the temporary contractors' compound, currently under construction and additional local temporary contractor parking together with a second compound directly adjacent to the proposed facility, e) Revised landscaping and site-works, f) Modifications to the existing internal roads layouts, site lighting, pipe bridges, links, bunded tanks and supporting structures, and a truck staging area, g) Modifications to the existing car park layout to allow for the inclusion of additional accessible car parking spaces and electrical charge points, h) Alterations to the elevations of Factory 03 to accommodate the proposed development. This application consists of a development for an activity for which a licence under Part IV of the Environmental Protection Agency Act 1992 (as amended by the Protection of the Environment Act 2003) is required. An Environmental Impact Assessment Report (EIAR) and a Natura Impact Statement (NIS) accompany this planning application. This is a site to which the Chemicals Act (Control of Major Accident Hazards involving dangerous Substances) Regulations 2015 (S.I. 209 of 2015) applies | Conditional |
| 21194 | an Indoor Astroturf Sports Hall, Decommission the existing Septic Tank and Install a Packaged Wastewater Treatment System and Polishing Filter and all associated site works | Conditional |
| 20339 | construction of a single storey conservatory roof to existing courtyard and alterations to existing Raheen House, which is a protected structure (RPS No. 274), for the construction of a new two storey hotel building comprising 30 beds and an additional 19 no. car parking spaces, and for the construction of a new single storey leisure & spa building, with all associated site works and landscaping | Conditional |
| 20693 | an extension to the existing Research and Development and Formulation Building. The proposed development will comprise a total gross floor area of c.6400 sqm including (i) a new three-storey extension to the northern elevation of the existing Research & Development and Formulation Building, to be developed in two blocks, and to a maximum height of 19.94m (ii) 30 no. new permanent car parking spaces; (iii) a temporary construction compound and contractors parking area to support the development; (iv) all associated site development and ancillary works, including local modifications to internal site roads, footpaths, underground drainage and utility services, | Conditional |

| ` | Brief Description | Planning Status |
|---|---|---|
| | realignment of internal fencing, and provision of a new storm water attenuation tank. This application refers to a development on a site that carries out an activity for which an Industrial Emissions licence under Part IV of the Environmental Protection Agency Act 1992 (as amended) is required and where the Major Accident Directive applies | |
| 19600729 | (1) Redevelopment of their existing lands to provide: (a) new crossover arrangement at eastern end of site to provide access for service station and access/egress for oil depot; (b) dedicated HGV parking, fuelling and marshalling area including relocation of oil tanker offloading point and HGV hi-speed fuel pump; (c) car/LCV parking areas for service station; (d) relocation of drive-thru automatic brush wash with associated screens; (e) demolition of existing canopy, pump islands and underground tanks; (f) provision of 4 no. fuel pump islands with canopy over and link-back to forecourt building and new underground fuel storage tanks; (g) construction of extension to existing forecourt building to provide a store (54.48 sq.m) and deli/cafe prep area (17.76 sq.m); (h) revised internal layout including change of use from office, stores and welfare facilities to provide new deli/cafe seating area, office, stores and welfare facilities; (i) sale of specially prepared hot and cold food for consumption both on and off the premises from the deli-cafe area of forecourt building; (j) provision of revised fenestration and elevational changes to existing forecourt building; (k) ancillary signage for development, both illuminated and non-illuminated; (l) all associated site works including bin compound; (m) revised road markings at east & west crossovers on Waterford Road and (2) Permission for Retention of extensions and alterations (area 31.31 sq.m) to forecourt building previously approved under Plan File No. 02/759 | Conditional |
| 18600038 | a) Provision of 17 no. residential apartment units in existing three storey building, and refurbishment of protected structure (ref no. 1.24) - St Joseph's Convent Buildings - to provide 4 no. apartments. b) Change of use at ground floor level to Main street from retail units to reception, day room and 1 no. caretaker's apartment. c) Demolition of external escape stairs and single storey building to east elevation. d) External alterations at Main Street to include new pedestrian gate and relocation of existing vehicular gate; and at North Quay to include reopening of existing pedestrian door to North Quay and change from emergency vehicular access to permanent vehicular access. e) External alterations to existing elevations and shop fronts at Main Street, including removal of panel and double doors and insertion of new window and double doors. f) Internal alterations to include demolition of existing internal stairs, construction of new stair and lift core and construction of new partitions. g) Car parking, refuse storage area and associated site boundary and site development works including works to "Saint Joseph's Convent of Mercy" a Protected Structure - ref. no. 1.24 - in the Carrick-on-Suir Town Development Plan 2013 | Conditional |

| ` | Brief Description | Planning Status |
|---|---|---|
| 20283 | demolition of existing buildings and construction of 60 dwellings comprising of 20 apartments in 2 no. 3 storey blocks and 40 houses in 10 no. 2 storey blocks using existing entrance from public road, connection to public services, carparking, roads, footpaths, open space areas and ancillary site development works | Conditional |
| 20160 | for the construction of riverbank protection works over a length of 200m adjacent to the River Suir | Unconditional |
| 211621 | 1. demolition of existing single storey dwelling, 2. construction of 7 two-storey dwellings including 3 terraced, two-bedroom dwellings, and 4 terraced dwellings consisting of 3 two bedroom dwellings and 1 three bedroom dwelling, 3. new site entrance, including boundary walls and gate, 4. the development will include all associated site development works and services | Conditional |
| 22174 | the proposed development will consist of the construction of 3 no. warehousing/light industrial units (with a floor area of 1029sqm for building 1, a floor area of 1430 sqm for building 2 and a floor area of 1430 sqm for building 3, parking spaces and all associated services. In addition, Flamewell Limited is to apply for a change of use for the existing 100 square metre cottage, which is a protected structure on the development from domestic to office use. Existing outbuildings and sheds are proposed to be demolished. | Conditional |
| 21182 | construction of a milking parlour, dairy, plant room, slatted cubicle shed and underground slurry storage tank along with all associated site works | Conditional |
| 21402 | the proposed development will consist of the upgrade of the existing wastewater treatment plant to increase the treatment capacity, comprising of: the construction of 1 no. partially below ground screened storm overflow chamber; the decommissioning of the existing inlet works and the construction of a new above ground inlet screening works area; the construction of 1 no. partially below ground storm overflow weir chamber and 1 no. partially below ground stormwater overflow flume; 1 no. partially below ground splitter chamber and 1 no partially below ground clarifier tank; and ancillary development including associated underground chambers, cabling and piping and all associated site development works. A Natura Impact Statement has been prepared in respect of this planning application | Conditional |
| 20897 | construction of a cubicle house with slatted tanks, milking parlour with drafting area and effluent tank, roofed holding yard, feed bin, calf house and ancillary works | Conditional |
| 2124 | extension of sand and gravel quarry - the development will consist of extension of the existing sand and gravel quarry and for continued use of the site entrance, access laneway, weighbridge, maintenance shed, settlement lagoons, site office, toilet, plant and machinery and ancillary works. The extension area will be 13.818ha in lands to the north-west of the existing quarry. An Environmental Impact Assessment Report has been prepared and is submitted with the application | Conditional |
| 2011 | the demolition of a silage pit and the construction of a cubicle house, a straw-bedded calving house, a roofed easi-feed area, | Conditional |

| ` | Brief Description | Planning Status |
|---|---|---|
| | a slatted tank and all associated site works. In addition the construction of a walled silage pit, silage aprons and associated site works | |
| 211011 | the demolition of a silage pit and the construction of a cubicle house, a straw-bedded calving house, a roofed easi-feed area, a slatted tank and all associated site works. In addition the construction of a walled silage pit, silage aprons and associated site works | Conditional |
| 22146 | a healthcare and medical related development across 3 no. blocks, comprising the following: a) a 3 storey HSE Primary Care Building consisting of treatment rooms, offices, meeting rooms, staff and ancillary rooms, GP doctor surgeries, dental surgery, plant and refuse stores with a plant area also at roof level, b) a single storey ancillary medical/medicine dispensary unit attached to the Primary Care Building, c) a 1-2 storey Tusla and HSE outpatient department building consisting of treatment rooms, offices, meeting rooms, staff and ancillary rooms, ancillary outdoor children's play area to the Tusla building, GP surgery, plant, refuse stores with a plant room at roof level, d) the proposed development will also comprise of 250 no. surface level car parking spaces, 76 no. surface level bicycle parking spaces, 26 no. surface level motorcycle parking spaces with access control barriers to parking areas, 1 no. ESB substation, street lighting, landscaping, boundary treatment provision of footpath and cycle paths, signage and all associated site development, drainage and engineering works necessary to facilitate the development, the provision of new vehicular, pedestrian and cycle access from the R498 Tyone road and the demolition of the existing detached ESB building and rugby club changing rooms along with all associated structures that are located on the site | Conditional |
| 18601311 | demolition of existing buildings, construction of 35 no. dwelling houses, re-located entrance from public road, connection to public services, car parking, roads, footpaths, open space areas and ancillary and site development works | Conditional |
| 21902 | construction of (i) overground slurry tower (ii) dungstead and all associated site works. Retention Permission for loose shed | Conditional |
| 2128 | to build a sports centre to the rear of the existing Carrick Davins Club premises and all associated site works and to alter the existing south-west vehicular entrance and to develop on site car-parking to the south-west area of the Davin Park to service the proposed development and Davin Park activities | Unconditional |
| 20697 | demolition of a disused cubicle house and storage sheds and to construct a slatted cattle shed, with associated concrete yards and site works | Conditional |

**Table B-3: Relevant Planning Polices within Tipperary County Development Plan 2022 - 2028**

| Policy No. | Policy Description |
|---|---|
| 11 - 1 | In assessing proposals for new development to balance the need for new development with the protection and enhancement of the natural environment and human health. In line with the provisions of Article 6(3) and Article 6 (4) of the Habitats Directive, no plans, programmes, etc. or projects giving rise to significant cumulative, direct, indirect or secondary impacts on European sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects) |
| 11 - 2 | Ensure the protection, integrity and conservation of European Sites and Annex I and II species listed in EU Directives. Where it is determined that a development may individually, or cumulatively, impact on the integrity of European sites, the Council will require planning applications to be accompanied by a NIS in accordance with the Habitats Directive and transposing Regulations, 'Appropriate Assessment of Plans and Projects, Guidelines for Planning Authorities', (DEHLG 2009) or any amendment thereof and relevant Environmental Protection Agency (EPA) and European Commission guidance documents. |
| 11 - 3 | Ensure the conservation and protection of existing, and proposed NHAs, and to ensure that proposed developments within or in close proximity to an existing or proposed NHA would not have a significant adverse impact on the status of the site as described. |
| 11 - 4 | (a) Conserve, protect and enhance areas of local biodiversity value, habitats, ecosystems and ecological corridors, in both urban and rural areas, including rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands in accordance with the objectives of the National Biodiversity Plan (DCHG 2017) and any review thereof. (b) Safeguard, enhance and protect water bodies (rivers/canals/lakes) and river walks and to provide links, where possible, to wider green infrastructure networks as an essential part of the design process. (c) Require an 'Ecosystems Services' approach for new development to incorporate nature-based solutions to SUDS, in so far as practical, as part of water management systems, public realm design and landscaping, in line with best practice. (d) Where trees or hedgerows are of particular local value, the Council may seek their retention, or where retention is not feasible, their replacement and will seek a proactive focus on new tree-planting as part of new development. |
| 11 – 13 | Seek to control the spread of invasive plant and animal species, including consideration of potential pathways for invasive species spread, i.e. watercourses. |
| 11 - 14 | Ensure that proposals for agricultural developments, as appropriate, comply with the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2010 or any amendment thereof. |

# Appendix C Detailed Project Description

## Appropriate Assessment Screening and Natura Impact Statement

**Killough Bio-Renewables Anaerobic Digestion (AD) Plant**

**Roadstone Ltd.**

SLR Project No.: 501.065577.00001

6 January 2025

# Proposed Development

WEW Engineering Limited are the design engineers for the project. The detailed project design, procurement of equipment, control of sub-contract placements and project management will be provided by the Fingleton White Group of which WEW is a member company. Design will accord with Best Available Technology (BAT) regulations and will apply the Circular Economy Action Programme (CEAP) recommendations.

The proposed development being applied for under this planning application will consist of:

1. An overall planning application site area of **c. 6.3 hectares** consisting of a proposed bio-renewables production facility, buffer screening, ancillary facilities and site access via the existing permitted quarry entrance.
2. The proposed bio-renewables production facility (incorporating anaerobic digestion) compound will cover an area of **c. 4 hectares**. The production facility will convert feedstocks to end of line co-products, namely bio-methane (gas), compressed bio-methane (bio-CNG), carbon dioxide (CO2), electricity (green), organic fertilisers (pelleted) and water, with integrated solar energy generation. The adjacent Roadstone Killough Quarry plant will utilise the electricity, bio-methane and water. Pelletised fertiliser will be available for supply to local agriculture and traders off-site. CNG and CO2 will be pressurised and stored for ongoing draw-off by tankers to points of re-use off-site. Demolition of existing quarry store building (c. **158m²**) to facilitate the proposed development.
3. The facility will consist of the following elements to be constructed:

a. Two-storey **administration building with** (gross floor area **664m²** and **8.15m** in height) to accommodate reception and storage areas, canteen, laboratory, first aid room, control room/electrical switch room, storage room, toilets, offices, conference room, training room and kitchenette, and roof solar panels **315m²**;

b. **Dry matter reception building** (gross floor area **5,215m²** and **12.7m** in height) with roof solar panels **4,000m²**;

c. **Workshop building** (gross floor area **122.1m²** and **8.9m** in height) to accommodate workshop and internal gantry crane, store and office at ground level and office at mezzanine level;

d. **Bio-conversion building** (gross floor area **3,257m²** and **12.5m** in height) with roof solar panels **2,400m²**;

e. **Pre-treatment, equalisation and gas upgrading building** (gross floor area **5,685m²** and **12m** in height) to accommodate pre-treatment & equalisation area (3,527m²), utilities area (376m²), heat recovery plant area (361m²), water treatment recovery area (316m²), and gas upgrading facility (1,105m²) with roof solar panels **3,850m²**;

f. **Digestate handling building** (gross floor area **692m²** and **8.6m** in height) to accommodate palletiser station/packing station area (150m²), solid dryer/vacuum evaporator area (392m²) and nutrient adjustment facility (150m²);

g. **Warehouse storage building** (gross floor area **158m²** and **11.2m** in height);

h. **Bio-filling station building** (gross floor area **300m²** and **9.75m** in height) with canopy overhang area of 134m², and externally located bio-methane (CH4) storage tank (**Ø 3m** x **11.5m** height) and bio-carbon dioxide (CO2) storage tank (**Ø 2.4m** x **9.75m** height) to southern elevation;

i. **Odour abatement and pumping station building** (gross floor area **448m²** and **11.25m** in height) to accommodate odour abatement system area (412m²) and pumping station (36m²) with emissions stack (**Ø 2.5m** x **17.5m** height);

j. **Linear generator building** (gross floor area **233m²** and **5.82m** in height) with emissions stack (**Ø 1m** x **17.5m** height);

k. **ESB sub-station building** (gross floor area **47.4m²** and **3.2m** in height);

l. **Wheelwash** (**18m** x **4.5m**) with associated water top-up sump (**6m** x **1.25m**);

m. **Weighbridge** (**16.4m** x **4.6m**);

n. **Surface water storage pond** (**1,900m²** x **6m** depth) and **fire water storage pond** (**2,800m²** x **6m** depth)

o. **External boundary paladin fencing** (**2.28m** in height);

p. 1 no. **water storage tank** (internal size **Ø 9.4m** x **11.23m** height and volume **800m³**);

q. 3 no. **silage feed soil/mixing tanks** (internal size **Ø 8.54m** x **12.63m** height and volume **770m³**);

r. 2 no. **fire water supply tanks** (internal size **Ø 21.35m** x **14m** height and volume **5,020m³**);

s. 2 no. **treated water storage tanks** (internal size **Ø 27.32m** x **14m** height and volume **8,230m³**);

t. 3 no. **bio-rest tanks** (internal size **Ø 17.1m** x **14m** height and volume **3,220m³**);

u. 1 no. **cattle manure/slurry silo** (internal size **Ø 7.5m** x **10m** height);

v. 1 no. **pot ale and spent grain material tank/silo** (internal size **Ø 5.5m** x **3m** height);

w. 1 no. **maize silo** (internal size **Ø 5.5m** x **7m** height);

x. 1 no. **chicken litter silo** (internal size **Ø 5.5m** x **10m** height);

y. 2 no. **precast concrete units (below ground) for surface water and effluent tanks** (internal size **Ø 5.5m** x **7m** height);

z. 1 no. **below ground precast elliptical concrete sewage collection tank** (**3.2m** x 6**m** height and **8,000 gallon** capacity);

aa. 1 no. **gas storage balloon facility** (**Ø 30.6m** x **16m** height);

bb. 1 no. flare (**10m** height);

cc. Associated and ancillary works including **22 no. staff and visitor parking spaces** (16 no. standard, 4 no. EV charging and 2 no. disabled parking spaces with EV charging points); bike storage for 10 no. bikes); HGV parking area adjacent to workshop; 2 no. hydrocarbon interceptors; wastewater treatment equipment; bunding and surface treatments; boundary treatments; lighting; services; drainage; landscaping; and all associated ancillary works.

## Development Overview

The overall planning application site area of c. 6.3 hectares comprises the proposed bio-renewables production facility, buffer screening, ancillary facilities and site access via the existing permitted quarry entrance.

The proposed bio-renewables production facility (incorporating anaerobic digestion) compound will cover an area of c. 4 hectares with c. 16,821.5m² of new buildings consisting

of an administration building; a dry matter reception building; a workshop; a bio-conversion building; a pre-treatment, equalisation and gas upgrading building; a digestate handling building; a warehouse storage building; a bio-filling station building; an odour abatement and pumping station building; a linear generator building; and an ESB sub-station building.

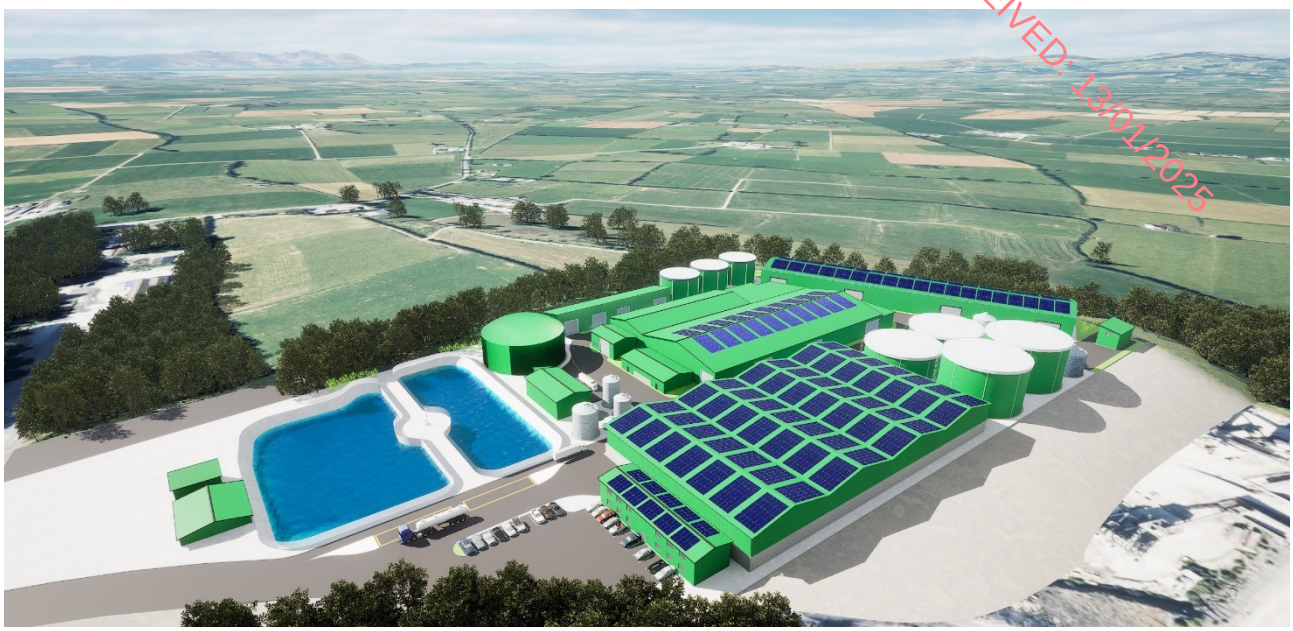
Ancillary facilities to be provided will include, a wheelwash; a weighbridge; surface water and fire water storage ponds; storage tanks for water, silage feed, cattle manure, pot ale and spent grain, maize, chicken litter and gas; effluent collection and storage tanks; staff and visitor car parking and bicycle storage; HGV parking; roof mounted solar panels; hydrocarbon interceptors; wastewater treatment equipment; bunding and surface treatments; boundary treatments and fencing; lighting; services; drainage; landscaping; and all associated ancillary works.

Details of the proposed site layout are shown in **Appendix D**. Key aspects include:

- Proposed development situated within the footprint of the existing permitted rock quarry at Killough which is owned and operated by Roadstone (i.e. not a greenfield site);
- A maximum tank height of c. 16 metres (gas storage balloon structure) and a maximum stack height of c. 17.5m (associated with the linear generator building);
- Facility will operate 24 hours a day / 7 days a week;
- Delivery of feedstock will be between the hours of 8am to 6pm Monday – Saturday / no deliveries Sundays or bank holidays;
- Feedstock importation will be c. 105,000 tonnes per annum consisting of:
  - Chicken Waste c. 15,000 tpa
  - Cattle Slurry c. 20,000 tpa
  - Grass Silage c. 60,000 tpa
  - Maize Silage c. 5,000 tpa
  - Pot ale and Spent Grain c. 5,000 tpa
- Outputs will consist of:
  - bio-methane (gas);
  - compressed bio-methane (bio-CNG);
  - carbon dioxide ($CO_2$);
  - electricity (green);
  - organic fertilisers (pelleted); and
  - water.

The adjacent Roadstone Killough Quarry plant will utilise the electricity, bio-methane and water generated by the proposed development. Pelletised fertiliser will be available for supply to local agriculture and traders off-site. CNG and $CO_2$ will be pressurised and stored for ongoing draw-off by tankers to points of re-use off-site.

**Plate 1: 3D Indicative Image of Proposed Development**



## Bio-Renewables Concept

The bio-renewables concept will include conversion of feedstock carbon to biofuels, CO2 to methane, digestate for further processing on site to capture nutrients for conversion to solid organic fertiliser (N,P,K). All products resulting will be co-products for reuse. There will be no by-products requiring disposal.

The silage, maize and slurry feedstocks required for the manufacturing programme will be supplied from local farms in the region. The total feedstock capacity anticipated from the works will be c.105,000 tonnes per annum.

The concept is based on the breakdown of organic volatiles using the anaerobic digestion process with offtake of biogas and digestate for further processing. CO2 will be captured and converted to methane for reuse. Digestate will be processed to produce solid fertilisers.

## Best Available Technology (BAT) & Process Design

The works will be designed constructed and operated with BAT (Best Available Techniques) and products will be certified before storage for removal from the facility.

The following points are highlighted with respect to the design:

- Feedstock capacity will be contained at c. 105,000 tonnes per annum including grass, maize, silage, pot ale, spent grain, cattle slurry and chicken waste;
- Pretreatment will include special conditioning to maximise nutrient separation and conversion of volatiles, thereby maximising process performance;
- The digestion process put forward comprises of plug flow reactors running in series with biogas production significantly exceeding that of conventional digesters;
- Biogas will be separated into biomethane and $CO_2$ with further processing of both products to produce finished fuel, for internal use by Roadstone;

- Digestate will be separated and further processed to provide solid organic fertilisers. All products will be certified;
- The thermal energy resulting from the various in-house unit operations will be captured for reuse at the fertiliser drying stage. It is anticipated that all energy that is produced will be used in-house. The conversion of excess energy to electricity will be executed using state of the art CHP;
- The short term storage of feedstock, gases, solids and liquids produced on site will be accommodated within the design with BAT environmental management measures;
- There will be no fugitive emissions, so that air quality standards can be maximised ensuring 100% methane and $CO_2$ capture across the mass balance of the process.

## Contribution to Local & Regional Sustainability

The proposed development will provide a significant contribution to local and regional sustainability. This will include the following:

- The silage, maize and slurry feedstocks will be supplied locally, and consideration will be given to supply within a radius of less than 20 kms approximately.
- This feedstock approach increases the potential output of farming in the region and individual contracts will be concluded on the basis of unit feedstock values.
- The fertiliser produced will further increase the potential of agriculture with introduction of regenerative farming and carbon sequestration.
- The energy related products will provide major reduction in carbon footprint (CF) and GHG, specifically:
  - Total methane gas production is estimated to be c. 12,170,000 m³
  - Roadstone will utilise some of the finished fuel to power their machinery at Killough and other centres.
  - The balance of the finished fuel will be sold / traded to third parties.

## Plant / Facility Overview

The facility will consist of the following elements to be constructed as detailed in **Table-1** below. Detailed drawings showing the design, layout, finish and dimensions of each plant component are provided in the accompanying planning drawings prepared by WEW Engineering Limited.

**Table 1: Key Plant / Facility Components and Process**

| Drawing No. | Plant / Facility |
|---|---|
| WEW 1905-DG-**0001** | Two-storey **administration building with** (gross floor area **664m²** and **8.15m** in height) to accommodate reception and storage areas, canteen, laboratory, first aid room, control room/electrical switch room, storage room, toilets, offices, conference room, training room and kitchenette, and roof solar panels **315m²** |
| WEW 1905-DG-**0002** | **Dry matter reception building** (gross floor area **5,215m²** and **12.7m** in height) with roof solar panels **4,000m²** |

| | |
|---|---|
| WEW 1905-DG-**0003** | **Workshop building** (gross floor area **122.1m²** and **8.9m** in height) to accommodate workshop and internal gantry crane, store and office at ground level and office at mezzanine level |
| WEW 1905-DG-**0004** | **Bio-conversion building** (gross floor area **3,257m²** and **12.5m** in height) with roof solar panels **2,400m²** |
| WEW 1905-DG-**0005** | **Pre-treatment, equalisation and gas upgrading building** (gross floor area **5,685m²** and **12m** in height) to accommodate pre-treatment & equalisation area (3,527m²), utilities area (376m²), heat recovery plant area (361m²), water treatment recovery area (316m²), and gas upgrading facility (1,105m²) with roof solar panels 3,850m² |
| WEW 1905-DG-**0006** | **Digestate handling building** (gross floor area **692m²** and **8.6m** in height) |
| WEW 1905-DG-**0007** | **Warehouse storage building** (gross floor area **158m²** and **11.2m** in height) |
| WEW 1905-DG-**0008** | **Bio-filling station building** (gross floor area **300m²** and **9.75m** in height) with canopy overhang area of 134m², and externally located bio-methane (CH4) storage tank (**Ø 3m** x **11.5m** height) and bio-carbon dioxide (CO2) storage tank (**Ø 2.4m** x **9.75m** height) to southern elevation |
| WEW 1905-DG-**0009** | **Odour abatement and pumping station building** (gross floor area **448m²** and **11.25m** in height) to accommodate odour abatement system area (412m²) and pumping station (36m²) with emissions stack (**Ø 2.5m** x **17.5m** height) |
| WEW 1905-DG-**0010** | **Linear generator building** (gross floor area **233m²** and **5.82m** in height) with emissions stack (**Ø 1m** x **17.5m** height) |
| WEW 1905-DG-**0011** | **ESB sub-station building** (gross floor area **47.4m²** and **3.2m** in height) |
| WEW 1905-DG-**0012** | **Wheelwash** (**18m** x **4.5m**) with associated water top-up sump (**6m** x **1.25m**) |
| WEW 1905-DG-**0013** | **Weighbridge** (**16.4m** x **4.6m**) |
| WEW 1905-DG-**0014** | **Surface water storage pond** (**1,900m²** x **6m** depth) and **fire water storage pond** (**2,800m²** x **6m** depth) |
| WEW 1905-DG-**0015** | **External boundary paladin fencing** (**2.28m** in height) |
| WEW 1905-DG-**0016** | 1 no. **water storage tank** (internal size **Ø 9.4m** x **11.23m** height and volume **800m³**)<br>3 no. **silage feed soil/mixing tanks** (internal size **Ø 8.54m** x **12.63m** height and volume **770m³**)<br>2 no. **fire water supply tanks** (internal size **Ø 21.35m** x **14m** height and volume **5,020m³**)<br>2 no. **treated water storage tanks** (internal size **Ø 27.32m** x **14m** height and volume **8,230m³**) |
| WEW 1905-DG-**0017** | 3 no. **bio-rest tanks** (internal size **Ø 17.1m** x **14m** height and volume **3,220m³**) |

| | |
|---|---|
| WEW 1905-DG-**0018** | 1 no. **cattle manure/slurry silo** (internal size **Ø 7.5m** x **10m** height)<br>1 no. **pot ale / spent grain material tank/silo** (internal size **Ø 5.5m** x **3m** height)<br>1 no. **maize silo** (internal size **Ø 5.5m** x **7m** height)<br>1 no. **chicken litter silo** (internal size **Ø 5.5m** x **10m** height)<br>2 no. **precast concrete units (below ground) for surface water and effluent tanks** (internal size **Ø 5.5m** x **7m** height)<br>1 no. **below ground precast elliptical concrete sewage collection tank** (**3.2m** x 6**m** height and **8,000 gallon** capacity);<br>1 no. **gas storage balloon facility** (**Ø 30.6m** x **16m** height)<br>1 no. flare (**10m** height) |
| WEW 1905-DG-**0014**<br>WEW 1905-DG-**0019** | Associated and ancillary works including **22 no. staff and visitor parking spaces** (16 no. standard, 4 no. EV charging and 2 no. disabled parking spaces with EV charging points); bike storage for 10 no. bikes); HGV parking area adjacent to workshop; 2 no. hydrocarbon interceptors; wastewater treatment equipment; bunding and surface treatments; boundary treatments; lighting; services; drainage; landscaping; and all associated ancillary works |

## Administration Building

A two-storey administration building with (gross floor area 664m² and 8.15m in height) as shown on planning drawing WEW 1905-DG-**0001** to accommodate reception and storage areas, canteen, laboratory, first aid room, control room/electrical switch room, storage room, toilets, offices, conference room, training room and kitchenette. The building will be a steel portal frame with blockwork and externally finished with Kingspan architectural wall panels (goosewing grey colour). There will be c. 315m² of solar panels attached to the roof.

The Administration Block will include facilities for ongoing laboratory assessment of feedstocks, gas and fertilisers and water. Wastewaters from the laboratories will be drained to a separate chamber for collection and off-site removal by a licensed contractor.

Certification of bio-methane and organic fertilizer will be carried out with necessary on-site attendances in compliance with the associated regulations, namely:

- Regulation (EU) 2023 / 1640 of 5 June 2023.
- S.I. No. 693/2023

The certificates of origin for the biomethane will be obtained via GNI and will confirm the product as green gas for use across European markets as anticipated on the Ergar market concept.

## Dry Matter Reception Building

The dry matter reception building will be a fully enclosed building (gross floor area 5,215m² and 12.7m in height) with roof solar panels covering c. 4,000m² as shown on planning drawing WEW 1905-DG-**0002**. The building will be a steel portal frame with concrete precast walls to the lower 4m section with the upper section and roof consisting of Kingspan twin skinned insulated sheeting (goosewing grey colour). There will be c. 315m² of solar panels attached to the roof. All dry feedstock arriving on site will be delivered by either truck or tractor & trailer into the reception building where the material will be offloaded into divided storage areas.

## Workshop

The workshop building will be a fully enclosed building (gross floor area 122.1m² and 8.9m in height) as shown on planning drawing WEW 1905-DG-**0003**. The building will be a steel portal frame with the walls and roof consisting of Kingspan twin skinned insulated sheeting (goosewing grey colour). It will accommodate the workshop area with an internal gantry crane, a store and 2 no. offices, one at ground level and one at mezzanine level.

## Bio-Conversion Building

The bio-conversion building will be a fully enclosed building (gross floor area 3,257m² and 12.5m in height) and will contain roof solar panels covering c. 2,400m² as shown on planning drawing WEW 1905-DG-**0004**. The building will be a steel portal frame with the walls and roof consisting of Kingspan twin skinned insulated sheeting (goosewing grey colour).

## Pre-Treatment, Equalisation & Gas Upgrading Building

The pre-treatment, equalisation and gas upgrading building will be a fully enclosed building (gross floor area 5,685m² and 12m in height) to accommodate pre-treatment & equalisation area (3,527m²), utilities area (376m²), heat recovery plant area (361m²), water treatment recovery area (316m²), and gas upgrading facility (1,105m²) with roof solar panels 3,850m² as shown on planning drawing WEW 1905-DG-**0005**. The building will be a steel portal frame with the walls and roof consisting of Kingspan twin skinned insulated sheeting (goosewing grey colour).

## Digestate Handling Building

The digestate handling building will be fully enclosed (gross floor area 692m² and 8.6m in height) as shown on planning drawing WEW 1905-DG-**0006** to accommodate palletiser station/packing station area (150m²), solid dryer/vacuum evaporator area (392m²) and nutrient adjustment facility (150m²). The building will be a steel portal frame with the walls and roof consisting of Kingspan twin skinned insulated sheeting (goosewing grey colour).

## Warehouse Storage Building

The warehouse storage building will be fully enclosed (gross floor area 158m² and 11.2m in height) as shown on planning drawing WEW 1905-DG-**0007**. The building will be a steel portal frame with the walls and roof consisting of Kingspan twin skinned insulated sheeting (goosewing grey colour).

## Bio-Filling Station Building

The bio-filling station building will be fully enclosed (gross floor area 300m² and 9.75m in height) with a canopy overhang area of 134m², and externally located bio-methane (CH4) storage tank (Ø 3m x 11.5m height) and bio-carbon dioxide (CO2) storage tank (Ø 2.4m x 9.75m height) to southern elevation as shown on planning drawing WEW 1905-DG-**0008**. The building will be a steel portal frame with the walls and roof consisting of Kingspan twin skinned insulated sheeting (goosewing grey colour).

## Odour Abatement & Pumping Station Building

The odour abatement and pumping station building will be fully enclosed (gross floor area 448m² and 11.25m in height) as shown on planning drawing WEW 1905-DG-**0009** to accommodate an odour abatement system area (412m²) and pumping station (36m²) with an

emissions stack (Ø 2.5m x 17.5m height). The building will be a steel portal frame with the walls and roof consisting of Kingspan twin skinned insulated sheeting (goosewing grey colour).

The eradication of odorous emissions is necessary to achieve BAT design. During preliminary design stage works the sources of odorous emissions were identified and the constituents requiring specific removal from the diluted gaseous emissions comprise sulphides, ammonia, methane and related volatiles and micro solids. These will be removed and the gaseous emissions will comply with EU EN13725.2022.

Gaseous emissions from buildings will be evacuated and ducted via a ducting network to a modular air purification system using biofiltration and/or adsorption in the odour removal building. Air quality will comply with the guidance recommendations of the EPA Air Guidance Note AG 9, 2019.

## Linear Generator Building

The linear generator building will be fully enclosed (gross floor area 233m² and 5.82m in height) as shown on planning drawing WEW 1905-DG-**0010** with emissions stack (Ø 1m x 17.5m height). The building will be a steel portal frame with the walls and roof consisting of Kingspan twin skinned insulated sheeting (goosewing grey colour).

The biomethane diverted to provide an electrical supply to Killough Quarry will be split to a series of linear electricity generators which can provide electrical supply without waste gas emission. The units come as integrated assemblies and may be installed on a modular basis in the Linear Generator Building shown.

## ESB Sub-Station Building

The ESB sub-station building will be fully enclosed (gross floor area 47.4m² and 3.2m in height) with a render finish as shown on planning drawing WEW 1905-DG-**0011**. The substation will be constructed in accordance with ESB specifications.

Green electricity will be produced by on-site solar power generation, utilizing the building complex with battery storage and supply forward via the new sub-station.

## Wheelwash / Weighbridge

The wheelwash (18m x 4.5m) with associated water top-up sump (6m x 1.25m) as shown on planning drawing WEW 1905-DG-**0012** and the weighbridge (16.4m x 4.6m) ) as shown on planning drawing WEW 1905-DG-**0013** will be located in line along the entry/exit route and located to the south of the administrative building and carpark area.

All vehicles entering the facility to deliver feedstock or export digestate will enter and depart via the weighbridge. Weighbridge information will be recorded automatically by a weighbridge data management system. The weighbridge will be of steel construction, mounted on load cells within a reinforced concrete pit chamber while the wheelwash will be a concrete 'bath type' wheelwash through which the trucks drive through.

## Storage Tanks & Silos

There are several storage tanks and silos located throughout the site as shown on planning drawing WEW 1905-DG-**0016**, **0017** and **0018**, consisting of:

- 1 no. **water storage tank** (internal size **Ø 9.4m** x **11.23m** height and volume **800m³**);

- 3 no. silage feed soil/mixing tanks (internal size Ø 8.54m x 12.63m height and volume 770m³);
- 2 no. **fire water supply tanks** (internal size **Ø 21.35m** x **14m** height and volume **5,020m³**);
- 2 no. treated water storage tanks (internal size Ø 27.32m x 14m height and volume 8,230m³);
- 3 no. **bio-rest tanks** (internal size **Ø 17.1m** x **14m** height and volume **3,220m³**);
- 1 no. cattle manure/slurry silo (internal size Ø 7.5m x 10m height);
- 1 no. pot ale / spent grain material tank/silo (internal size Ø 5.5m x 3m height);
- 1 no. **maize silo** (internal size **Ø 5.5m** x **7m** height);
- 1 no. **chicken litter silo** (internal size **Ø 5.5m** x **10m** height);

## Flare

An enclosed biogas flare is proposed for installation on the site, serving as an additional safety measure. The flare will be located within the water storage ponds area as shown on planning drawing WEW 1905-DG-**0018** and will only operate under distinct scenarios to ensure safety and compliance. The flare is incorporated for emergency use only and is not anticipated to function during normal operating procedures.

## Piping System

All feedstock / digestate pipes will be located above ground so that any leakages in the piping system cannot lead to pollution of the receiving environment. The pipework for the transmission of biogas will be fabricated mostly in stainless steel above the ground. For any biogas pipework located underground, polyethylene will be used. After pipework construction is completed, a tightness test will be carried out with all pipes being pressure tested.

## Compound Security

The perimeter of the site will be secured by a **paladin fencing** and security gates (**2.28m** in height) as shown on planning drawing WEW 1905-DG-**0015**.

## Lighting

Down lighting will be provided at approximately 20m spacing and mounted on buildings, tanks and other suitable structures as shown on planning drawing WEW 1905-DG-**0020**. The lighting will be directed downwards and all lights will be located internally within the site and directed inwards with the buildings and tanks themselves blocking light from being directed externally. Such lighting will be sufficient to permit safe operation of plant and machinery during early morning and late evening periods over winter months.

## Operational Hours and Employment

The facility will operate 24 hours per day, 7 days a week, as anaerobic digestion is a continuous biological process. However, transport of feedstock to the site and any products exported from the site will only be carried out between the hours of 0800 and 1800 Monday to Saturday. There will be no feedstock or product transport on Sundays or Bank Holidays.

The proposed development will provide direct employment for 15 to 20 people.

## Water Management

Process water and precipitation will be typically reused and not discharged to outfall. On site water will be captured, pumped to storage with in-line quality monitoring, for use on the application site and for use in the adjacent quarry site. Drainage networks are shown on planning drawing WEW 1905-DG**-0014.**

The application site drainage will comprise of:

- run-off from the building roofs in the facility will be collected in a sealed pipe network for onsite storage in the surface water pond and reused in the adjacent quarry site as required;
- drainage of hard standing / trafficked areas will be collected in a separate sealed pipe network for onsite storage in the surface water pond and reused in the adjacent quarry site as required.

### Water Supply

When the site is operational, process water will be recovered from the digestate and recirculated through the process to dilute incoming feedstock. The feedstock will be on average 70% water (30% DM) and requires dilution to 94% water (6% DM) for processing so process water will be added.

Excess water will be treated and stored for use in the concrete plant on the adjacent quarry site.

There is no requirement for a groundwater supply to the plant. There is no requirement for a connection to any Irish Water infrastructure.

Potable water supply to the offices will be bottled water brought to site.

#### 5.1.1.1 Water Storage

There are surface water ponds and tanks as noted in the project description above for the use of storing fire water, water for reuse in the anaerobic digestion process and water for use in the adjacent concrete batching plant.

#### 5.1.1.2 Foul Wastewater Management

It is estimated that sewage generated by staff, visitors and canteen will vary between 2m$^3$/d and 4m$^3$/d. This will gravitate to a collection tank, roofed and with an adsorption roof filter, submersible mixer and sealed tanker connection to prevent any odour emission. It will be drawn off site once every two weeks for treatment at an existing sewage works by agreement with the STW operator.

Similarly, the laboratory facility will be plumbed separately to a holding tank for collection and removal off site by a licensed contractor. Storage tanks on site will consist of:

- 2 no. precast concrete units (below ground) for surface water and effluent tanks (internal size Ø 5.5m x 7m height); and
- 1 no. below ground precast elliptical concrete sewage collection tank (3.2m x 6m height and 8,000 gallon capacity).

### Surface Water Management

Surface water runoff and roof water will gravitate to the surface water pond for use as dust suppression water by the adjacent quarry site.

# Construction Phase

## Construction & Commissioning Programme

It is envisaged that construction and commissioning of the proposed development will be undertaken over c. 18 months with works expected to commence in 2025.

## Construction Environmental Management Plan

During the construction phase, the methods of working will comply with all relevant legislation and best practice in reducing the environmental impacts of the project. Construction stage impacts are a short-term localised impact. However, the impacts will be reduced as far as practicable through compliance with the mitigation measures as stated in the following EIAR chapters and current construction industry guidelines.

As part of the preconstruction preparation a comprehensive Construction Environmental Management Plan (CEMP) and a Construction Traffic Plan (CTP) will be implemented.

To ensure the CEMP is tailored to the project and the current environment at the time of construction, it will be prepared by the appointed contractor in advance of any construction works commencing and in accordance with any conditions imposed by the Planning Authority.

The CEMP, in a single document, will outline the procedures and practices for monitoring the effectiveness of the proposed environmental protection measures, and will include at the very least:

- List of all relevant environmental legislation requirements;
- State methods by which the construction works will be managed to avoid, reduce or remedy potential adverse environmental impacts;
- Incorporate environmental mitigation measures and controls in the construction contract documents which will incorporate the mitigation measures as outline in the following chapters of this EIAR; in any conditions attached to a grant of planning permission or any further requirements of statutory bodies;
- Provide a method statement outlining how compliance with the environmental commitments / mitigation measures will be carried out.
- Take account of best practice guidance such as CIRIA C741 Environmental Good Practice on Site (4$^{th}$ edition) and CIRIA C532 Control of Water Pollution for Construction Sites.

In general, disturbance arising from construction works may result from various activities including preparatory works, diversion of services, noise and vibration, excavation operations, earthworks, construction traffic and delivery of materials. Details of the predicted impacts and mitigation measures associated with the construction of the proposed development are included in the relevant chapters (e.g. Air Quality in Chapter 8, and Noise & Vibration in Chapter 10) with a summary of all mitigation and monitoring proposals provided in Chapter 17.

## Construction Employment

It is expected that c. 20 direct jobs will be created during the construction phase. In addition, many more indirect jobs will be generated.

Construction works will be restricted to normal working hours of between 0800 and 1800 Monday to Saturday with no construction works carried out on Sundays or Bank Holidays. Works outside these hours will only take place by exception.

## Temporary Facilities

A temporary contractors compound will be required for the duration of the construction phase works. This will include temporary staff welfare facilities, temporary car parking and will be located within the red line boundary application area.

# Operational Phase (AD Life-Cycle Processes)

## Feedstock

The proposed development has been designed to accept and treat up to 105,000 tonnes per annum of predominantly locally sourced cattle manures, slurries, and crop-based feedstocks along with a small quantity of brewery residues (pot ale and spent grain). The estimated feedstock composition and annual tonnages accepted are outlined in **Table 2** below. These tonnages are indicative and subject to change based on market and season conditions and availability and quality of feedstocks. Overall tonnages will not exceed 105,000 tonnes.

AD can process a broad spectrum of feedstock from various sources. In principle, any biodegradable organic matter can be anaerobically digested to produce biogas.

Cattle manure is one of the most common feedstocks employed in AD because it is readily available in agricultural farms. Despite containing many characteristics favourable for AD (neutral pH, different microbes, a wide variety of nutrients, etc.), they produce a lower amount of biogas than other feedstocks because they are already predigested by the animal intestine.

However, manure is often added as a base substrate and co-digested with other feedstock because of its desirable characteristics. Combination of feedstocks, commonly known as co-digestion process, offers the opportunity to add energy-rich organic waste materials, for example, sustainable co-products from brewing /distilling etc. Typically, these high-energy materials can produce significantly higher levels of biogas than conventional agricultural feedstocks.

**Table 2: Estimated Feedstock Composition and Intake**

| Feedstock | Estimated Quantity (tonnes / annum) |
|---|---|
| Chicken Waste | 15,000 tpa |
| Cattle Slurry | 20,000 tpa |
| Grass Silage | 60,000 tpa |
| Maize Silage | 5,000 tpa |
| Pot ale and Spent Grain | 5,000 tpa |

The silage, maize and slurry feedstocks which make up approximate 80% of the feedstock will be supplied locally, and consideration will be given to supply within a radius of less than 20 kms.

## Feedstock Acceptance and Storage Procedures

Feedstocks will be transported to the proposed development using heavy goods vehicles (HGV's / HDV's) and tractor/trailer, and sealed vacuum tankers. Only feedstocks meeting strict feedstock acceptance procedures and complying with Environmental Protection Agency (EPA) and Department of Agriculture, Food & Marine (DAFM) license conditions will be accepted.

All vehicles entering the facility to deliver feedstock or export compressed bio-methane (bio-CNG), carbon dioxide ($CO_2$) or organic fertilisers (pelleted) will enter and depart via a weighbridge located along the site access road. Weighbridge information will be recorded automatically by a weighbridge data management system.

All suppliers must complete a Feedstock Acceptance Agreement (FAA). Upon arrival at the site, incoming feedstock deliveries will be weighed and logged at the dedicate weighbridge in accordance with regulatory requirements set by the EPA and DAFM. Visual inspection of feedstocks will ensure conformity with the FAA. Once delivery and documentation are confirmed, delivery vehicles will be directed to the Reception Hall for further processing.

Solid materials will be unloaded into designated feedstock bays within the reception hall which has a storage capacity of c. 10,000 tonnes, to allow for continuous operation of the plant on days where no feedstock deliveries are made. Liquid manure will arrive onsite in sealed tankers and be pumped directly into the sealed storage tanks.

## Odour Abatement System

An odour abatement system will recover and treat all odours arising from the processes and activities occurring on site. All major odour sources, inclusive of the reception hall, digestate storage tanks, liquid feed tanks and pasteurisation tanks are all connected to the odour abatement system. The odour treatment will be a proprietary system designed and supplied by a specialist contractor with experience of treating odour from biogas and other organic waste facilities.

## Feedstock Conditioning

This is carried out in the pretreatment and equalization building which is connected to the odour abatement system via ducting to remove odours.

The respective feedstocks will be conditioned to maximise the efficiency of the biochemical methane potential (BMP).

Incoming feedstocks from grasses, maize and manure origins need to undergo size reduction. Breaking down cell walls directly through physical force using mechanical methods are less likely to contaminate the final product than other methods. The Killough project will utilise proven technology to ensure particle size of <5mm through high-pressure grinding, maceration, pulping and on-line transfer to the mixing plant. The Killough plant will include leading feedstock maceration technology.

The feedstocks from other sources will be added in parallel to the premix chamber to create a standardised feedstock that is easily pumped and mixed into the reactor to ensure close culture contact will result as required for efficient AD reactions.

## Anaerobic Digestion Process

Anaerobic digestion (AD) is a natural biochemical process that converts organic materials into combustible biogas. AD has been long practiced for agricultural and urban waste management. The process consists of a series of biochemical reactions where bacteria break down the organic matters of any substrate into a gaseous mixture (CH4, CO2, H2, H2S, etc.) in the absence of free oxygen. Some groups of bacteria involved in the digestion process cannot survive in the presence of oxygen. Therefore, an anaerobic (oxygen-free) environment is necessary for the process.

The AD process typically occurs in a closed vessel such as that shown in **Plate 2**. Produced biogas flows out to temporary storage and later on to the end-use applications. The main commercial applications of biogas are typically fuel, heat and electricity generation. After AD, the vessel will contain residual solids and organic matter known as digestate. Digestate can be separated into liquid and solid streams. Both streams contain valuable plant nutrients and can substitute as fertilizer in agricultural applications.

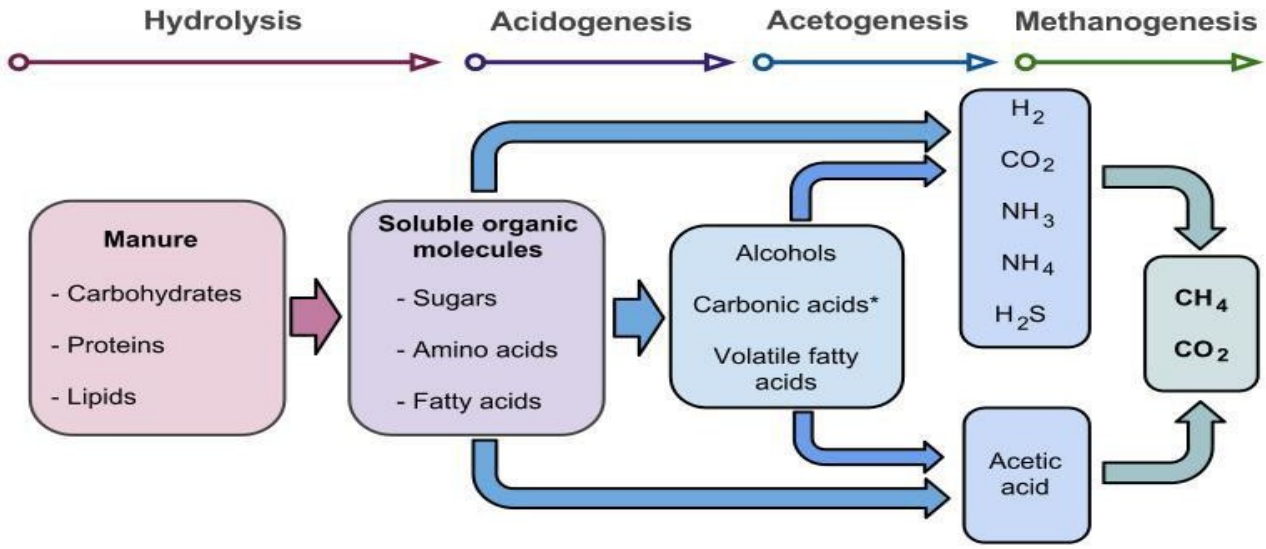

**Plate 2: Typical Reactor Bank**

The AD process occurs through multiple steps with complex interactions between different types of microorganisms. Diverse microbial communities collaborate to break down the complex biomass polymers at different stages and turn them into a gaseous mixture. The biochemical AD reactions can be divided into four distinct stages as outlined below and shown in **Plate 3**:

- **Hydrolysis:** this is essentially the first stage of the digestion process. Water and extracellular enzymes break down the complex polymeric structure of cellulose, starch, proteins and convert them into their respective simple units (monomers or oligomers) such as glucose, fatty acids, and amino acids. Some compounds in this stage are ready to be converted into biogas, but most compounds need further breakdown through other stages.

- **Acidogenesis:** the products of hydrolysis are further broken down in the acidogenesis stage by acidogenic (acid-forming) bacteria.
- **Acetogenesis:** is the third step of anaerobic digestion. Products from fermentation (organic acids, alcohols) are converted into hydrogen (H2), carbon dioxide (CO2) and acetic acid (CH3COOH). To produce acetic acid, acetogenic bacteria need oxygen and carbon. For this, they use the oxygen solved in the solution or bound-oxygen. Hereby, the acid-producing bacteria create an anaerobic condition, which is essential for the methane-producing microorganisms responsible for the final step of anaerobic digestion which is methanogenesis.
- **Methanogenesis:** This is the final stage where methane is produced from all intermediate products of the previous stages. This stage is strictly anaerobic as the methanogenic bacteria cannot survive in the presence of oxygen. $CH_3COOH$ (acetate) and $H_2$ are converted into $CO_2$ and $CH_4$ by two different groups of bacteria, such as acetophilic and hydrogenophilic. Acetophilic bacteria convert acetate into $CH_4$ and $CO_2$, while hydrogenophilic bacteria convert $H_2$ and $CO_2$ into $CH_4$.

**Plate 3**: Stages of the Anaerobic Digestion Process




The AD technology chosen for the site utilises plug flow AD technology and also incorporates internal high rates of reaction due to high intimate contact area. This maximises series performance of the hydrolytic, acidification and methanogenic bacterial groupings.

The plug flow reactor type technology has been researched, patented and proven over years by Antec Biogas. It allows the development of an AD plant that offers a small footprint versus biogas yield with a tight control of the hydrolysed feedstock to the anaerobic bioreactors. The system will also include ammonia stripping to allow for increased processing of high-energy by-products. Please refer to the accompanying technical report prepared by the design engineers WEW Engineering Ltd.

## Bio-Renewables & Anaerobic Digestion Outputs

The anaerobic digestion process at the site will generate a number of end-products also referenced as co-products as outlined below.

## Bio-methane (gas) / Compressed bio-methane (bio-CNG)

Biogas is the product of the complex biological decomposition (anaerobic digestion) of organic materials, mainly consisting of 55-70% by volume methane ($CH_4$), 30-45% carbon dioxide ($CO_2$), together with traces of other gases, i.e., nitrogen, hydrogen, hydrogen sulphide and ammonia, as well as water vapour. The exact composition of biogas is dependent on the type of feedstock being digested.

Biogas can be 'upgraded' to pure methane, often called bio-methane, by removing $CO_2$, $H_2S$, moisture and other trace gases. The biogas upgrading process produces a purified stream of biomethane. The upgrading process also produces a $CO_2$ rich gas stream which can be recovered for treatment within a $CO_2$ recovery system for use off site.

The gas will also be processed further to generate compressed natural gas (CNG) / compressed bio-methane (bio-CNG) which is commonly used by passenger cars, vans, buses, and trucks. The compressed gas will be used as a fuel source for the Killough Quarry operations and any surplus will be tankered off-site for use at other Roadstone facilities or sold on the open market.

## Carbon Dioxide ($CO_2$)

As noted above, upgrade of the biogas requires the removing of the $CO_2$ which would contribute to GHG concentration in the atmosphere if not captured.

The proposed development will provide a biogas upgrading facility which will allow the de-sulphurised biogas to be separated into biomethane and $CO_2$ while using membrane technology. The separated $CO_2$ will be compressed and stored on the site for removal on an ongoing basis. By utilising this process, the biogenic CO2 from biomethane production which would have been emitted to the atmosphere is now captured, purified, and reused, thereby creating a circular economy.

In the EU, the specification for $CO_2$ for use as a food or beverage additive is defined in Commission Regulation No 231/2012. The regulation gives recommendations on establishing levels of such impurities, taking account of variability in naturally sourced $CO_2$ or in source processes using natural feedstocks, and on the quality assurance procedures that should be applied to compressed-$CO_2$ storage and supply operations. The $CO_2$ may then be upgraded to a standard where it can used in various industries, for example food, pharmaceutical, chemical etc.

## Electricity from bio-methane

As noted above, upgrade of the biogas requires the removing of the $CO_2$ which would contribute to GHG concentration in the atmosphere if not captured.

The proposed development will convert a proportion of the biomethane produced directly to electricity for use by the adjacent Roadstone quarry operations without passage through the mains grid.

In addition to the above electricity generation, solar photovoltaic (PV) modules are included upon the roof structures of the administration, dry reception, bio-conversion and pre-treatment buildings, covering a total surface area of c. 10,565$m^2$ with anticipated electricity generation of between 1.5 to 1.8 GWh per annum.

## Organic Fertilisers

The other by-product of the anaerobic digestion is digestate, which consists of undigested inert material and water. The digestate is composed of liquid and solid components and the system carries the nutrients carried into the system via the feedstock to the end co-product as organic fertiliser. Unit operations will be installed which will convert the digestate produced to a certified pelleted fertiliser for use by farmers in place of synthetic fertilisers.

It is anticipated that pelletised digestate and fibre will, on the whole, be returned to lands associated with feedstock supplies of crop and/or slurry, thereby promoting a local circular bioeconomy. Digestate receivers will manage the storage and application of bio-based fertiliser on their lands and will be subject to controls set out in S.I. No. 113 of 2022 European Union (Good Agricultural Practice for Protection of Waters) Regulations 2022.

## Water

When the site is operational, process water will be recovered from the digestate and recirculated through the process to dilute incoming feedstock. The feedstock will be on average 70% water (30% DM) and requires dilution to 94% water (6% DM) for processing so process water will be added.

The system design is based on reuse of excess waters locally by Roadstone at the Quarry and concrete plant. Water from processing will be treated to potable standards, S.I. No. 99/2023 and will be stored on site for export to the quarry site after servicing firewater storage requirements.

Roof waters and clean rainwater will pass via a drainage network to the collection and storage tanks and will be pumped in a programmed manner to the Roadstone Quarry site for re-use.

No excess waters will overflow from the site to a third-party outfall as the total water volume will be passed for use at the quarry site by agreement.

# Appendix D WEW Design Engineer Planning Drawings

## Appropriate Assessment Screening and Natura Impact Statement

**Killough Bio-Renewables Anaerobic Digestion (AD) Plant**

**Roadstone Ltd.**

SLR Project No.: 501.065577.00001

6 January 2025

| KILLOUGH BIO – LEAD SHEET | | Revision Issued | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Drawing No. | Title | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 1905–DG–0000 | LEAD SHEET | 19/07/24 | 24/07/24 | 30/08/24 | | | | |
| 1905–DG–0001 | ADMINISTRATION BUILDING | 19/07/24 | 30/08/24 | | | | | |
| 1905–DG–0002 | DRY MATTER RECEPTION | 19/07/24 | 24/07/24 | 30/08/24 | | | | |
| 1905–DG–0003 | WORKSHOP | 19/07/24 | 30/08/24 | | | | | |
| 1905–DG–0004 | BIO CONVERSION BUILDING | 19/07/24 | 24/07/24 | 30/08/24 | | | | |
| 1905–DG–0005 | PRETREATMENT, EQUALISATION AND GAS UPGRADING | 19/07/24 | 30/08/24 | | | | | |
| 1905–DG–0006 | DIGESTATE HANDLING | 19/07/24 | 30/08/24 | | | | | |
| 1905–DG–0007 | WAREHOUSE | 19/07/24 | 30/08/24 | | | | | |
| 1905–DG–0008 | BIO FILLING STATION | 19/07/24 | 30/08/24 | 16/12/24 | | | | |
| 1905–DG–0009 | ODOUR ABATMENT AND PUMPING STATION | 19/07/24 | 30/08/24 | | | | | |
| 1905–DG–0010 | LINEAR GENERATOR | 19/07/24 | 30/08/24 | | | | | |
| 1905–DG–0011 | SUBSTATION | 19/07/24 | 30/08/24 | | | | | |
| 1905–DG–0012 | WHEEL WASH DETAILS | 19/07/24 | 24/07/24 | 30/08/24 | | | | |
| 1905–DG–0013 | WEIGHBRIDGE DETAILS | 24/07/24 | 30/08/24 | | | | | |
| 1905–DG–0014 | DRAINAGE SITE LAYOUT PLAN | 26/07/24 | 30/08/24 | 13/09/24 | 25/09/24 | 16/12/24 | | |
| 1905–DG–0015 | PALLADIN FENCE & GATE DETAILS | 25/09/24 | | | | | | |
| 1905–DG–0016 | WATER TANKS & SILAGE FEED SILOS/TANKS | 25/09/24 | 16/12/24 | | | | | |
| 1905–DG–0017 | BIOREST TANKS | 12/09/24 | 16/12/24 | | | | | |
| 1905–DG–0018 | WATER PONDS & SILAGE FEED SILOS/TANKS | 12/09/24 | 16/12/24 | | | | | |
| 1905–DG–0019 | SITE CONTEXTUAL SECTIONS | 12/09/24 | 16/12/24 | | | | | |
| 1905–DG–0020 | SITE LAYOUT (1:500) | 18/11/24 | 16/12/24 | | | | | |
| 1905–DG–0021 | SITE LOCATION PLAN (1:10,000) | 18/11/24 | 16/12/24 | | | | | |
| 1905–DG–0022 | SITE LOCATION MAP (1:50,000) | 18/11/24 | 16/12/24 | | | | | |
| 1905–DG–0023 | PROCESS FLOW DIAGRAM | 12/09/24 | 16/12/24 | | | | | |



NOTES

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| 2 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 1 | 24/07/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 19/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

Client

roadstone A CRH COMPANY

WEW water | energy | wastewater CONSULTING ENGINEERS Fingleton White Group

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Project

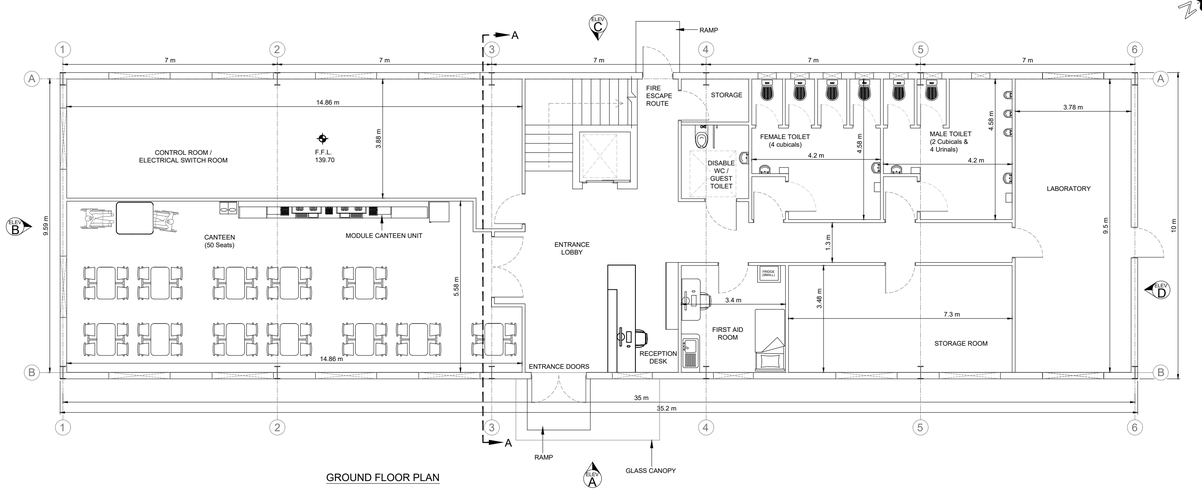
KILLOUGH BIO

LEAD SHEET

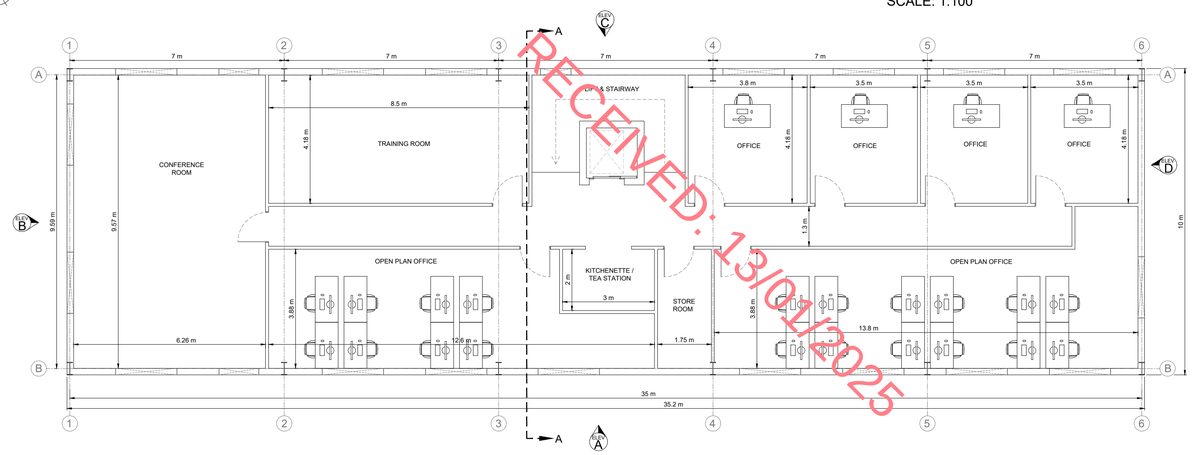
| Drawn | Scale | Drawing Number | Rev. |
|---|---|---|---|
| O.CONROY | NTS/A3 | 1905-DG-0000 | 2 |
| Chkd. F.OYETAYO | Date 30/08/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |

0 2.5 m 5 m 10 m

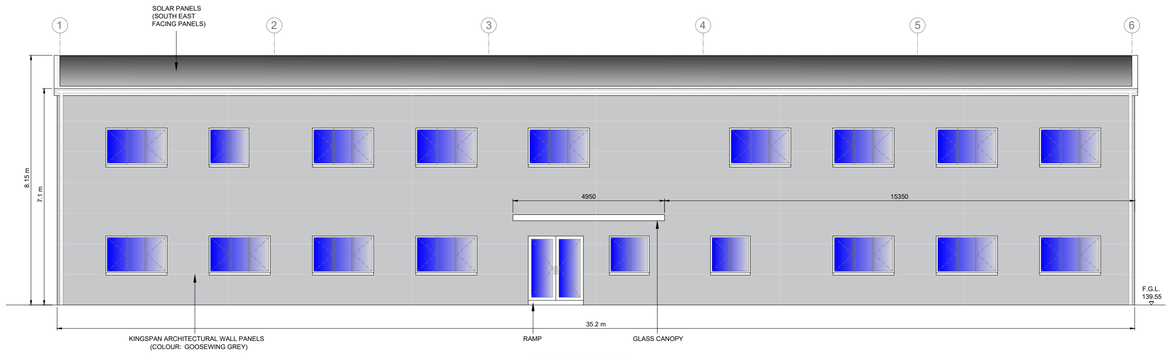
SCALE: 1:100



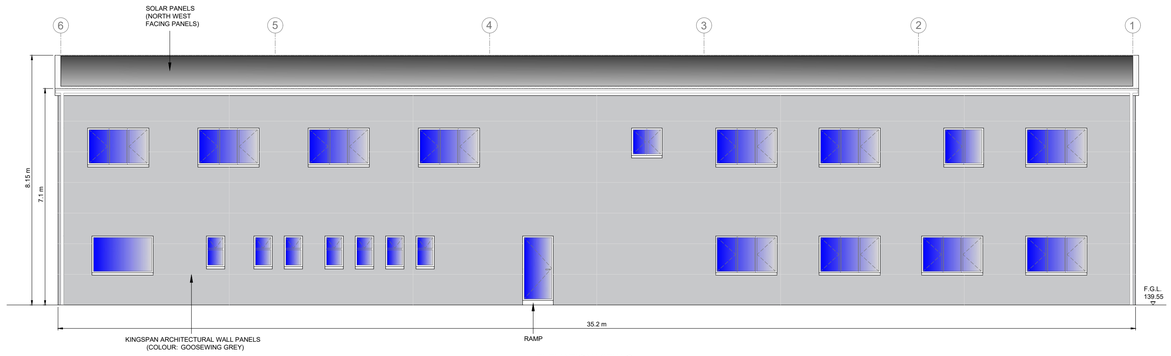

GROUND FLOOR PLAN



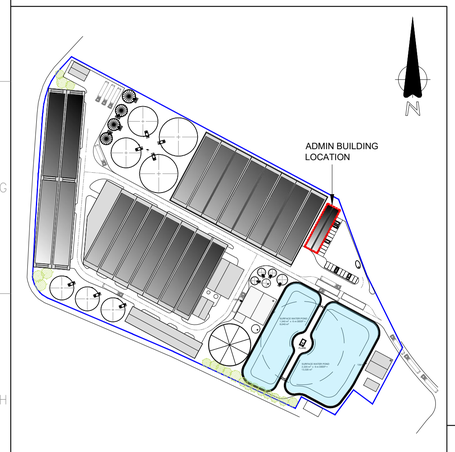

FIRST FLOOR PLAN



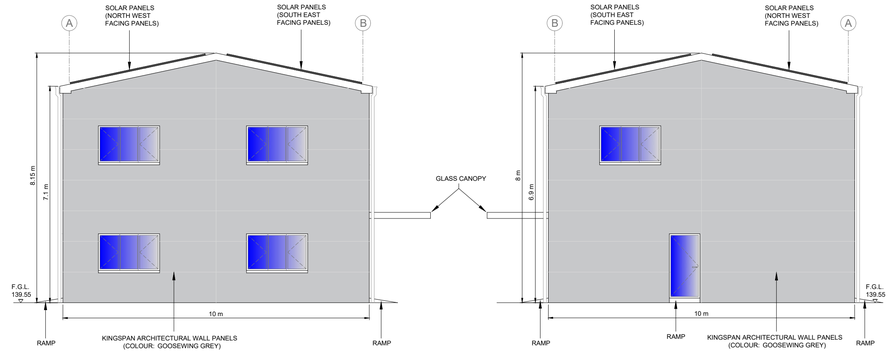

ELEVATION VIEW A




ELEVATION VIEW C

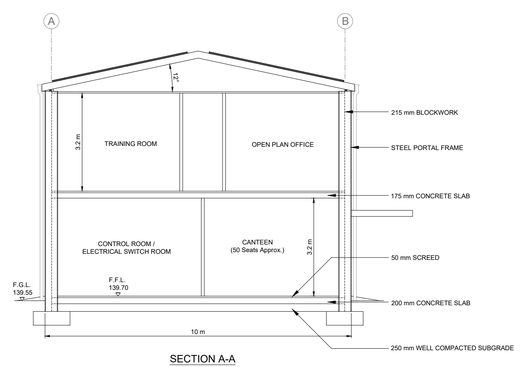



KEY PLAN
(NTS)




ELEVATION VIEW B

ELEVATION VIEW D




SECTION A-A

FLOOR AREA :

| | |
|---|---|
| GROUND FLOOR AREA : | 332 m² |
| FIRST FLOOR AREA : | 332 m² |
| TOTAL FLOOR AREA : | 664 m² |

SOLAR PANELS :

| | |
|---|---|
| SOUTH EAST FACING PANELS (4.5 m x 35 m ) = | 157.5 m² |
| NORTH WEST FACING PANELS (4.5 m x 35 m ) = | 157.5 m² |
| TOTAL SOLAR PANEL SURFACE AREA = | 315 m² |

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| 1 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 19/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

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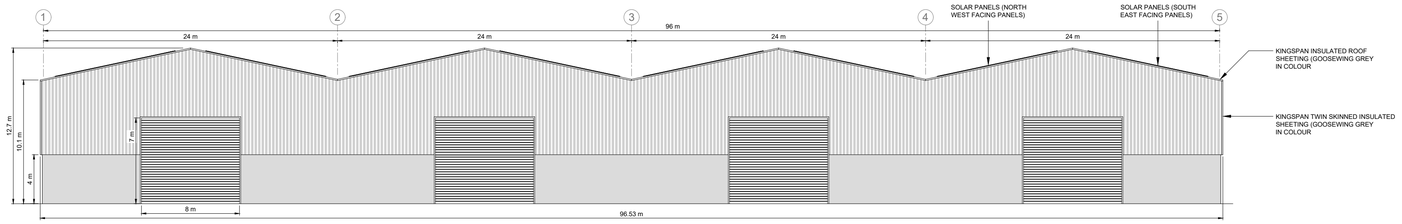
Project

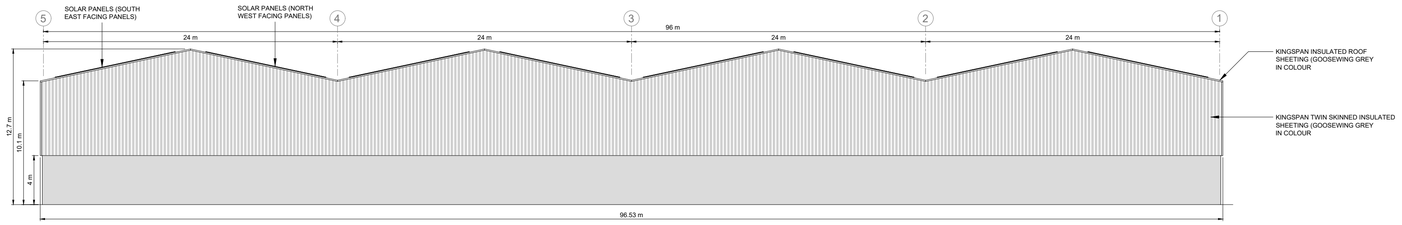
KILLOUGH BIO

ADMINISTRATION BUILDING
PLANS, ELEVATIONS & SECTION

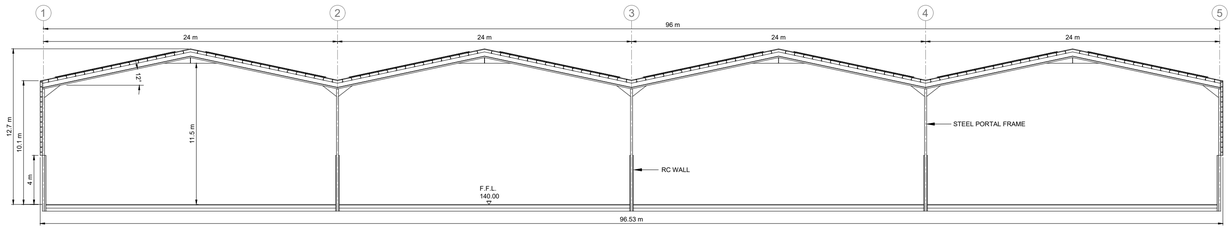
| | | | |
|---|---|---|---|
| Drawn. O.CONROY | Scale 1:100 @ A1 | Drawing Number 1905-DG-0001 | Rev. 1 |
| Chkd. F.OYETAYO | Date 30/08/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |



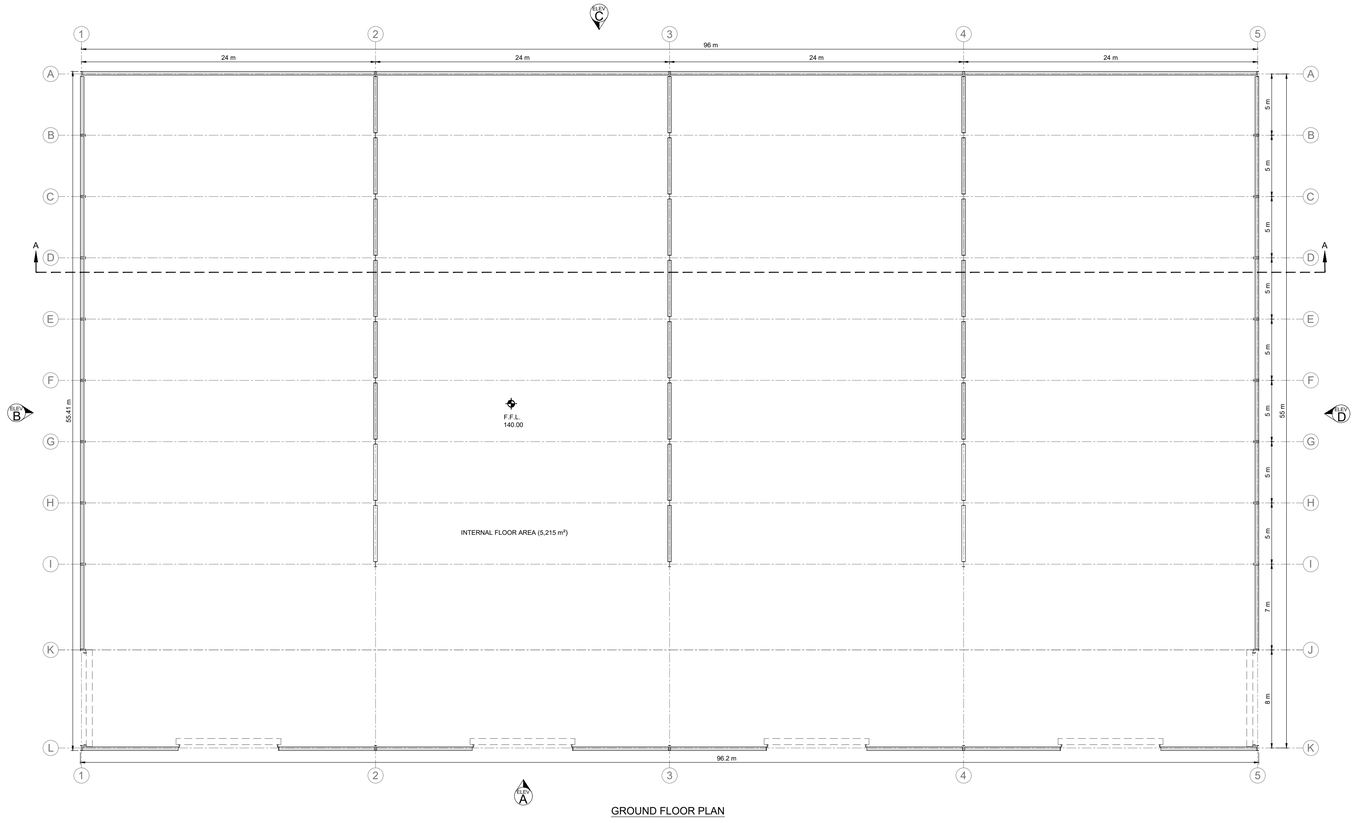

ELEVATION VIEW A



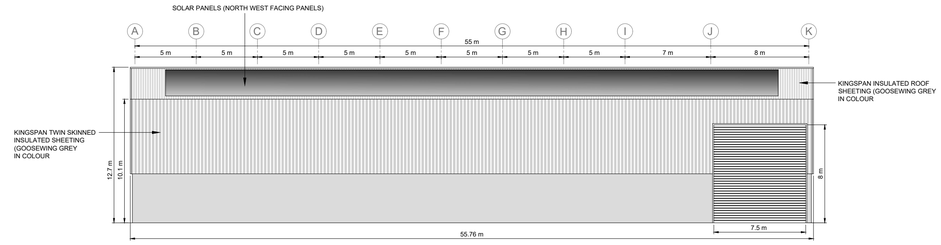

ELEVATION VIEW C



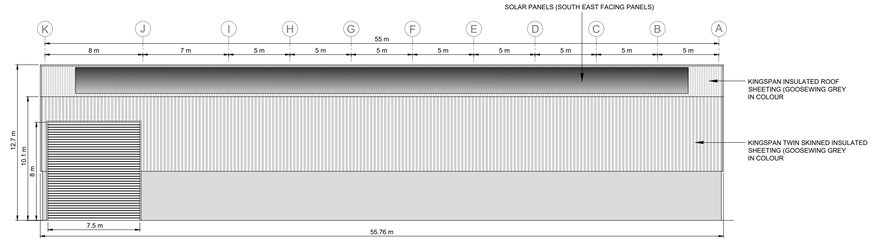

SECTION A-A



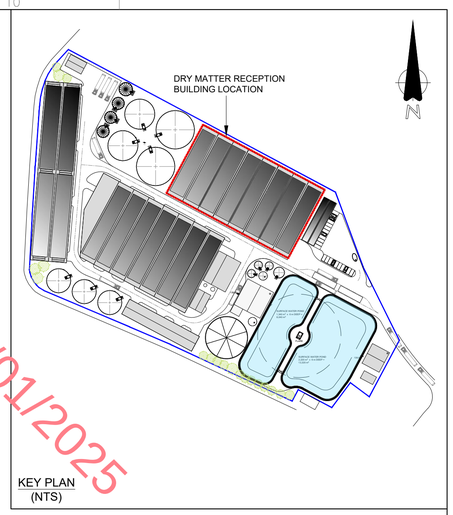

GROUND FLOOR PLAN




ELEVATION VIEW B




ELEVATION VIEW D




KEY PLAN
(NTS)



SOLAR PANELS :

| | |
|---|---|
| SOUTH EAST FACING PANELS (10 m x 50 m x 4 ) = | 2,000 m² |
| NORTH WEST FACING PANELS (10 m x 50 m x 4 ) = | 2,000 m² |
| TOTAL SOLAR PANEL SURFACE AREA = | 4,000 m² |

0 5 m 10 m 20 m

SCALE: 1:250

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| 2 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 1 | 24/07/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 19/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

Client

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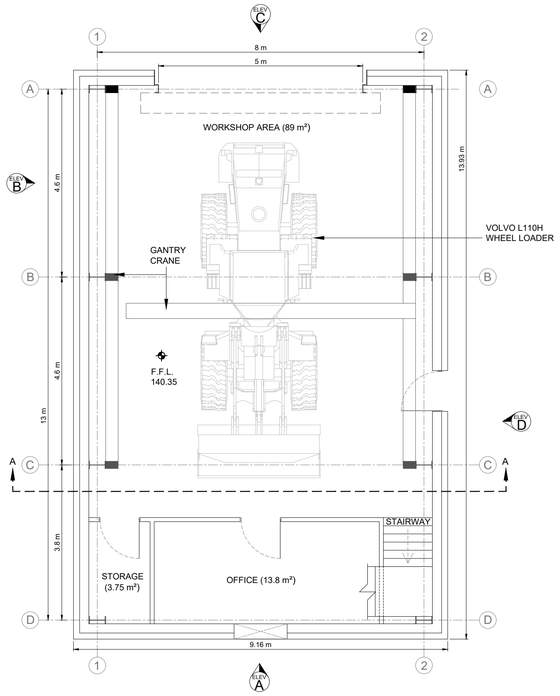
Project

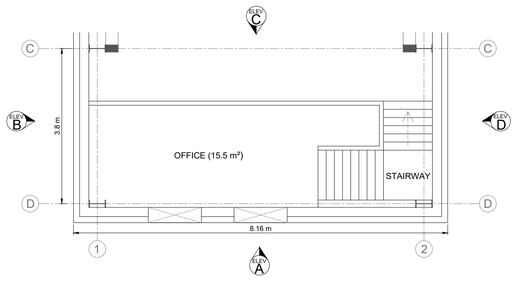
KILLOUGH BIO

DRY MATTER RECEPTION
PLAN, ELEVATIONS & SECTION

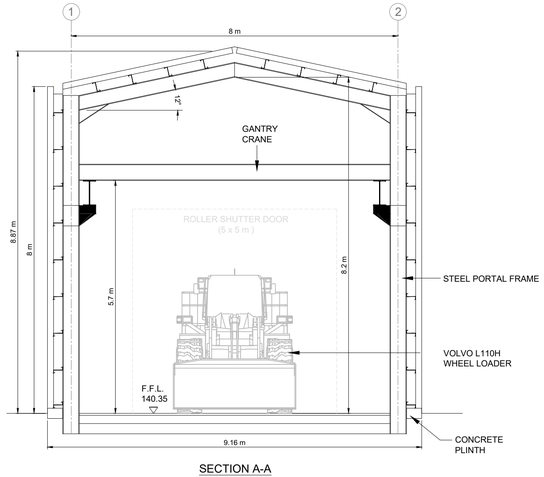
| Drawn | Scale | Drawing Number | Rev. |
|---|---|---|---|
| O.CONROY | 1:250 @ A1 | 1905-DG-0002 | 2 |
| Chkd. F.OYETAYO | Date 30/08/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |



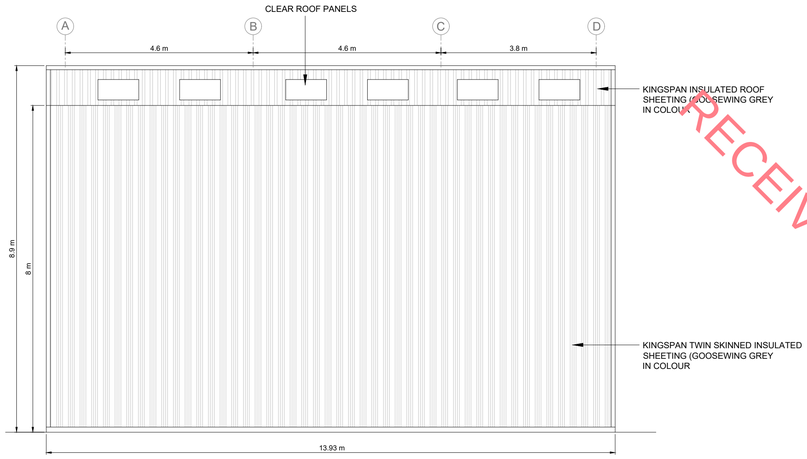

GROUND FLOOR PLAN



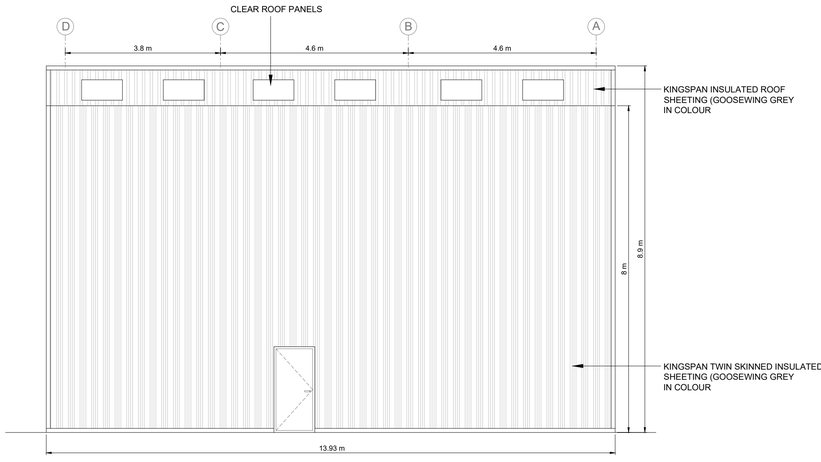

FIRST FLOOR PLAN



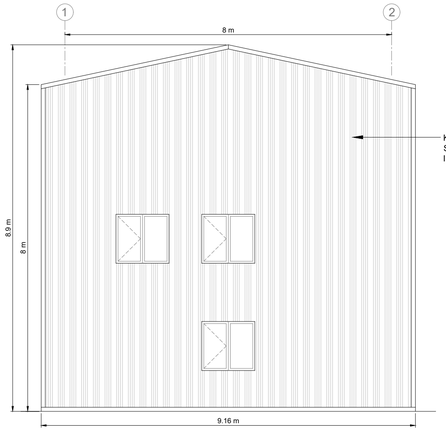

SECTION A-A



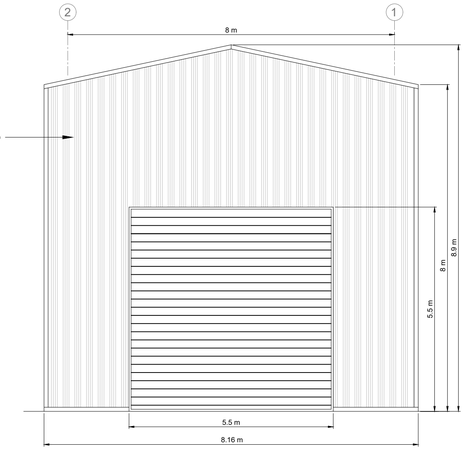

ELEVATION VIEW B



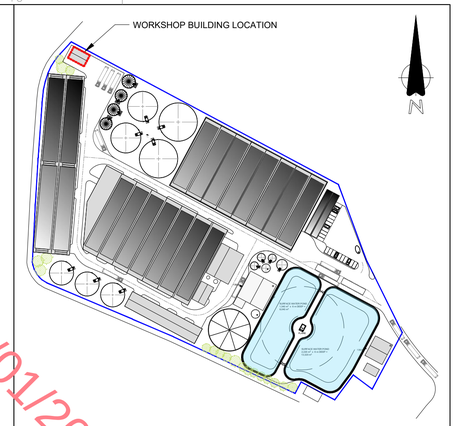

ELEVATION VIEW D




ELEVATION VIEW A




ELEVATION VIEW C




KEY PLAN
(NTS)



0 1.5 m 3 m 6 m

SCALE: 1:75

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| 1 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 19/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

Client

roadstone
A CRH COMPANY

WEW
water | energy | wastewater
CONSULTING ENGINEERS
Fingleton White Group

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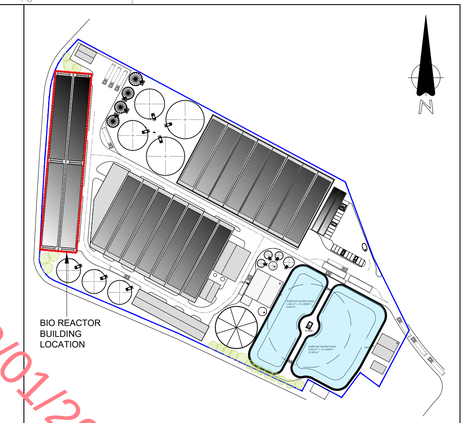
Project

KILLOUGH BIO

WORKSHOP
PLAN, ELEVATIONS & SECTION

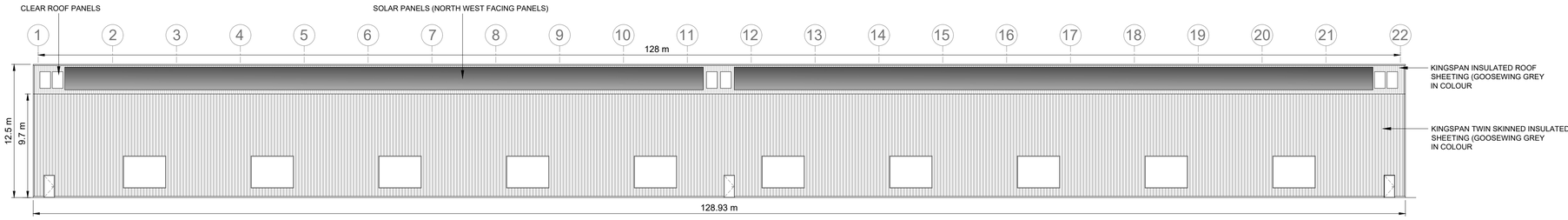
| Drawn | Scale | Drawing Number | Rev. |
|---|---|---|---|
| O.CONROY | 1:75 @ A1 | 1905-DG-0003 | 0 |
| Chkd. F.OYETAYO | Date 30/08/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |


GROUND FLOOR PLAN

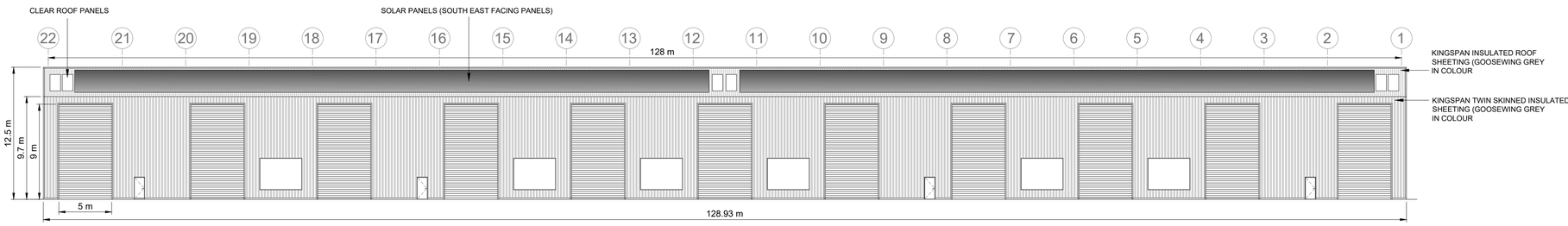



KEY PLAN
(NTS)

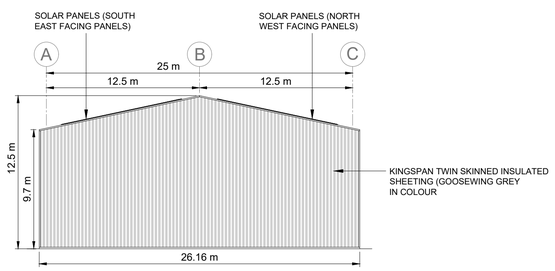




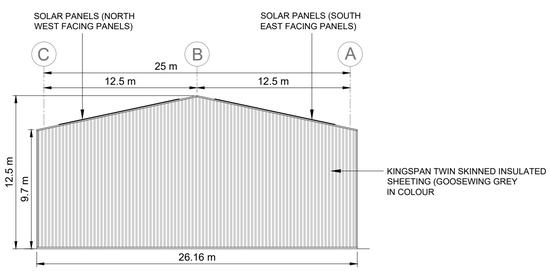

ELEVATION VIEW A



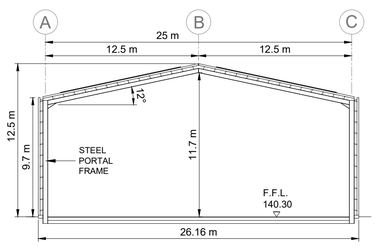

ELEVATION VIEW C




ELEVATION VIEW B




ELEVATION VIEW D




SECTION A-A

FLOOR AREA :
TOTAL GROUND FLOOR AREA : 3,257 m²

SOLAR PANELS :

| | |
|---|---|
| SOUTH EAST FACING PANELS (10 m x 120 m ) = | 1,200 m² |
| NORTH WEST FACING PANELS (10 m x 120 m ) = | 1,200 m² |
| TOTAL SOLAR PANEL SURFACE AREA = | 2,400 m² |

0 6.25 m 12.5 m 25 m

SCALE: 1:250

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| 2 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 1 | 24/07/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 19/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

Client
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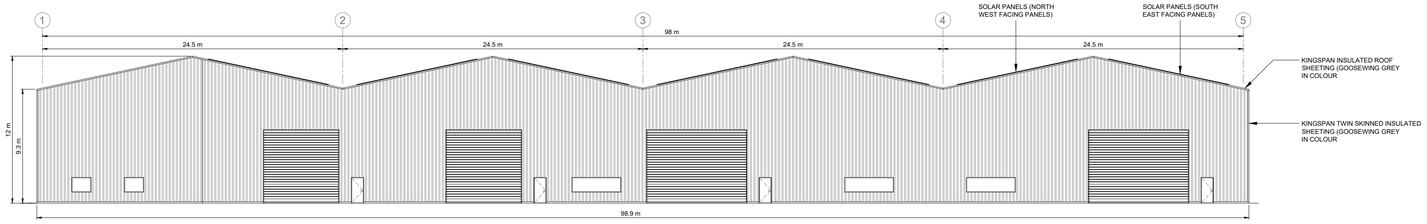
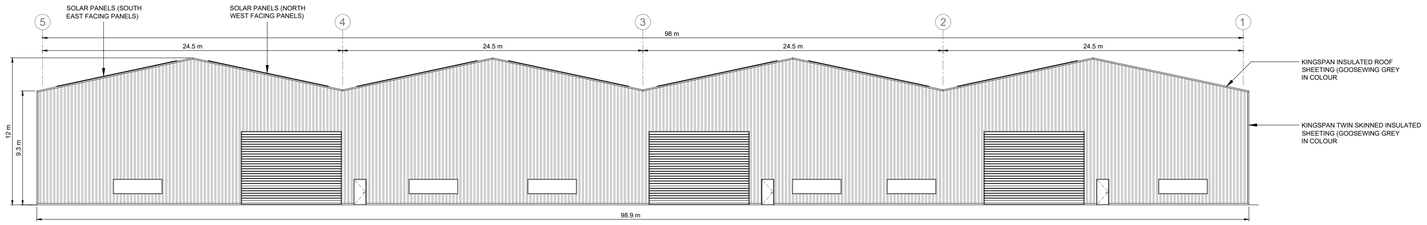
Project
KILLOUGH BIO

BIO CONVERSION BUILDING
PLAN, ELEVATIONS & SECTION

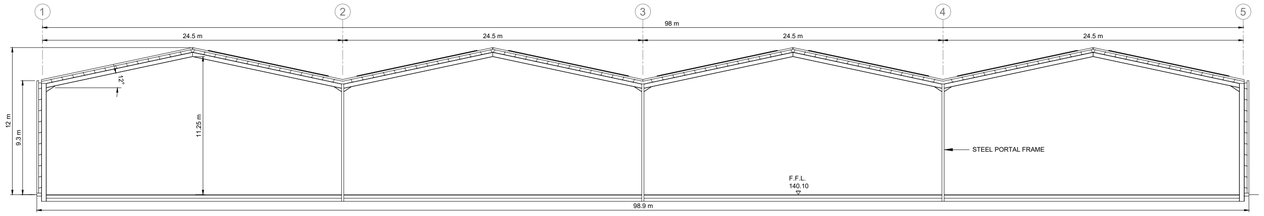
| | | | |
|---|---|---|---|
| Drawn. O.CONROY | Scale 1:250 @ A1 | Drawing Number | Rev. |
| Chkd. F.OYETAYO | Date 30/08/24 | 1905-DG-0004 | 2 |
| Apprd. N.MAHER | Status ISSUED | | |



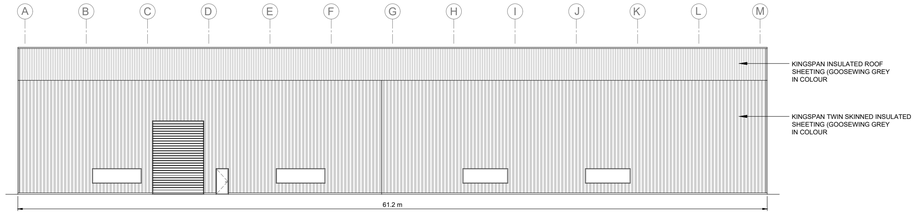

ELEVATION VIEW A



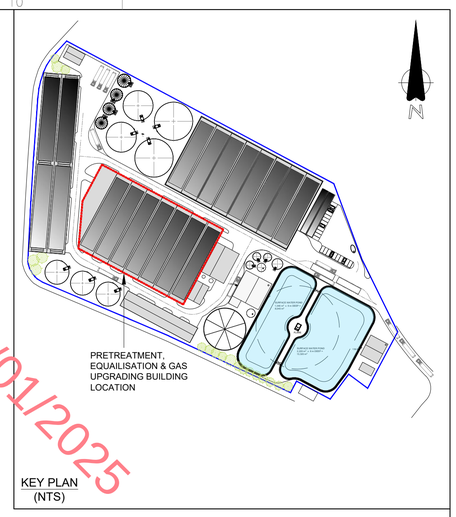

ELEVATION VIEW C




SECTION A-A




ELEVATION VIEW B

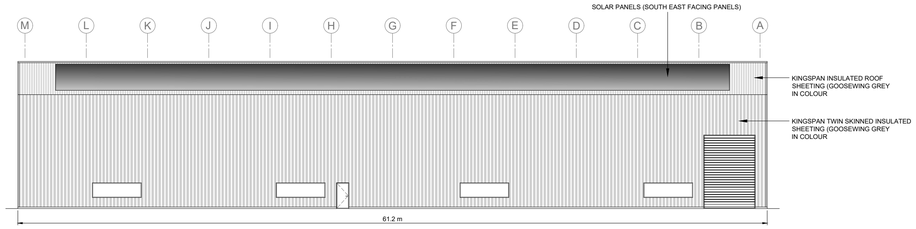



KEY PLAN (NTS)

RECEIVED: 13/01/2025




GROUND FLOOR PLAN




ELEVATION VIEW D

FLOOR AREA :
TOTAL GROUND FLOOR AREA : 5,685 m²

SOLAR PANELS :

| | |
|---|---|
| SOUTH EAST FACING PANELS (10 m x 55 m x 4 ) = | 2,200 m² |
| NORTH WEST FACING PANELS (10 m x 55 m x 3 ) = | 1,650 m² |
| TOTAL SOLAR PANEL SURFACE AREA = | 3,850 m² |

0 6.25 m 12.5 m 25 m

SCALE: 1:250

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| 1 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 19/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

Client: roadstone A CRH COMPANY

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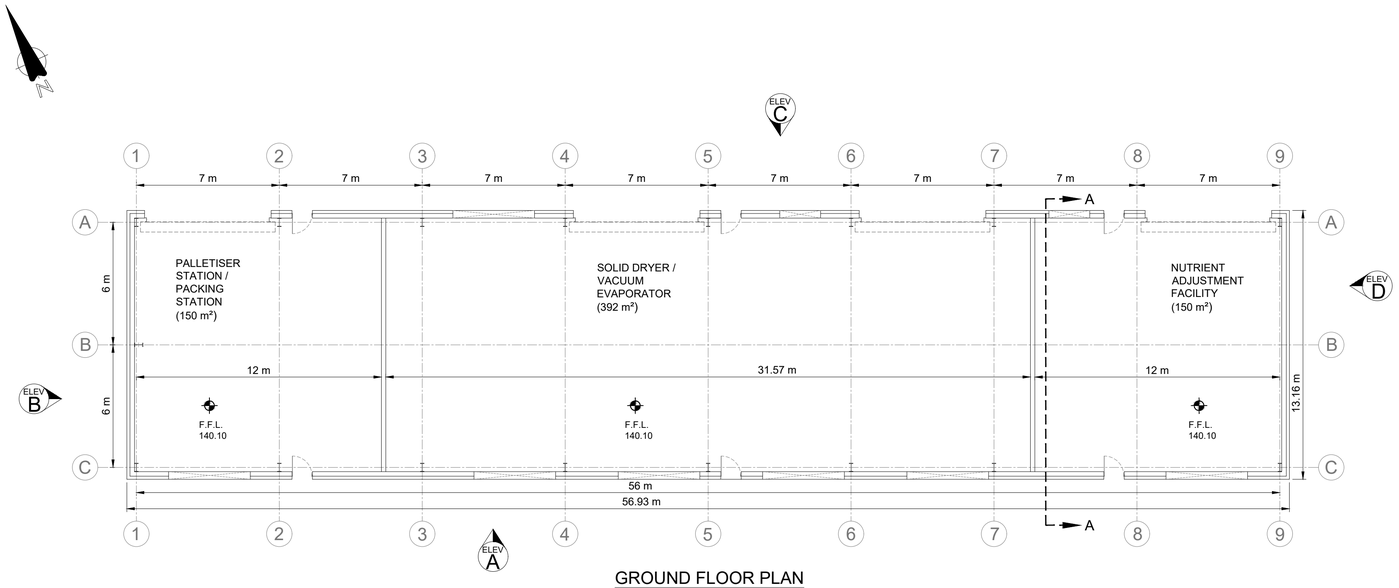
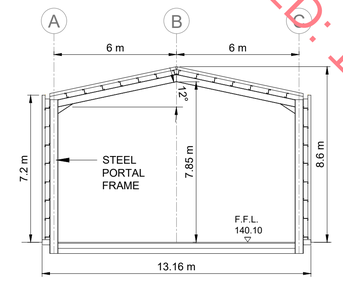
Project: KILLOUGH BIO

PRETREATMENT, EQUALISATION & GAS UPGRADING - PLAN, ELEVATIONS & SECTION

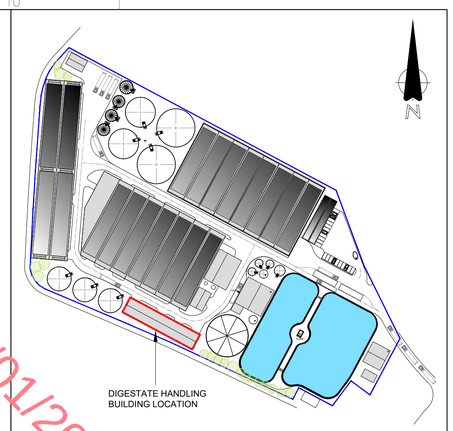
| | | | |
|---|---|---|---|
| Drawn. O.CONROY | Scale 1:250 @ A1 | Drawing Number 1905-DG-0005 | Rev. 1 |
| Chkd. F.OYETAYO | Date 30/08/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |




GROUND FLOOR PLAN

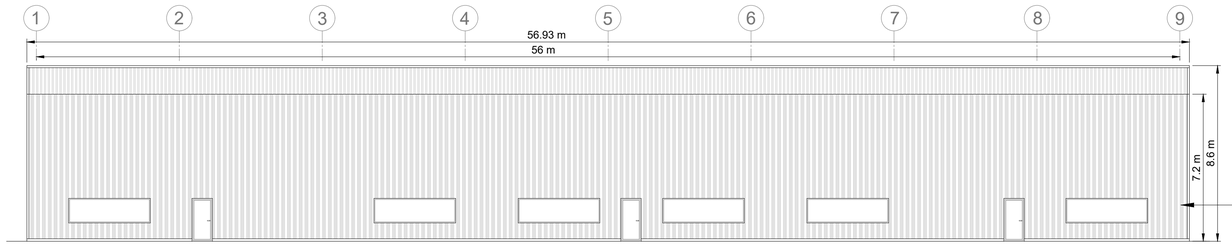



SECTION A-A

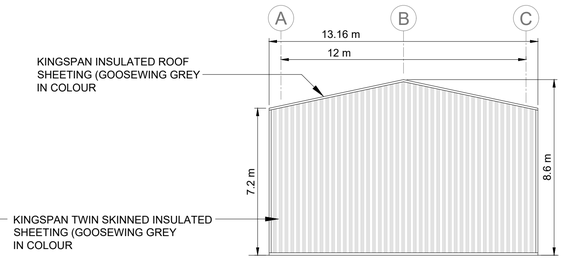



KEY PLAN (NTS)

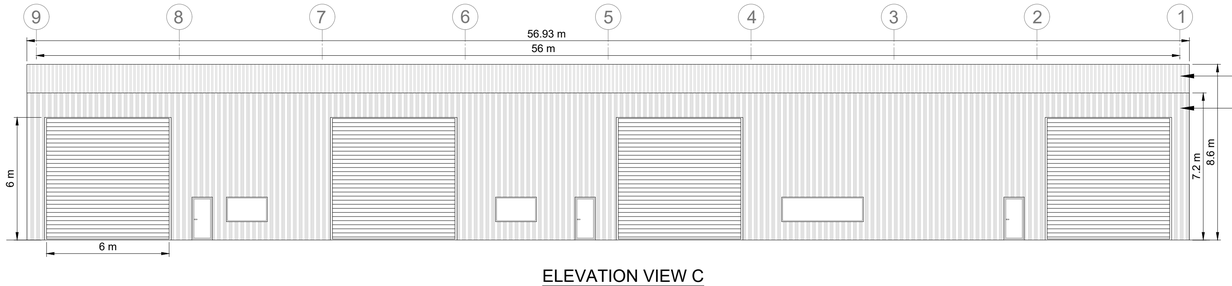
RECEIVED: 13/01/2025



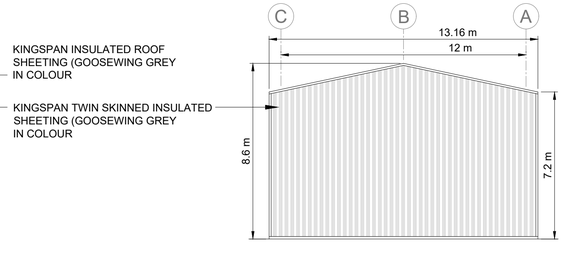

ELEVATION VIEW A




ELEVATION VIEW B




ELEVATION VIEW C




ELEVATION VIEW D

0 3 m 6 m 12 m

SCALE: 1:150

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| 1 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | OF | NM |
| 0 | 19/07/24 | PRELIMINARY DESIGN | OC | OF | NM |

Client

roadstone A CRH COMPANY

WEW water | energy | wastewater CONSULTING ENGINEERS Fingleton White Group

Fingleton White
Bridge Street Centre
Portlaoise
Co. Laois
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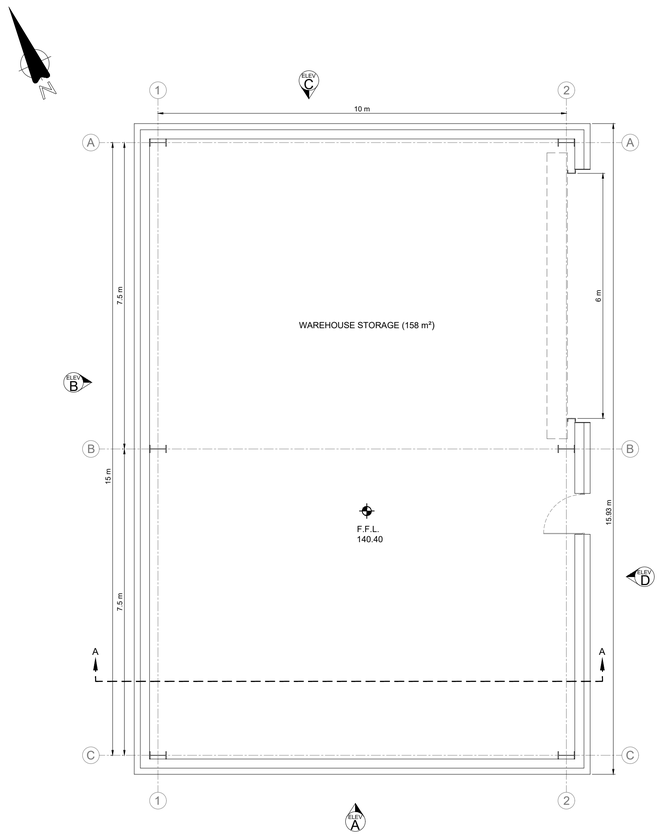
www.fingleton.ie

Project

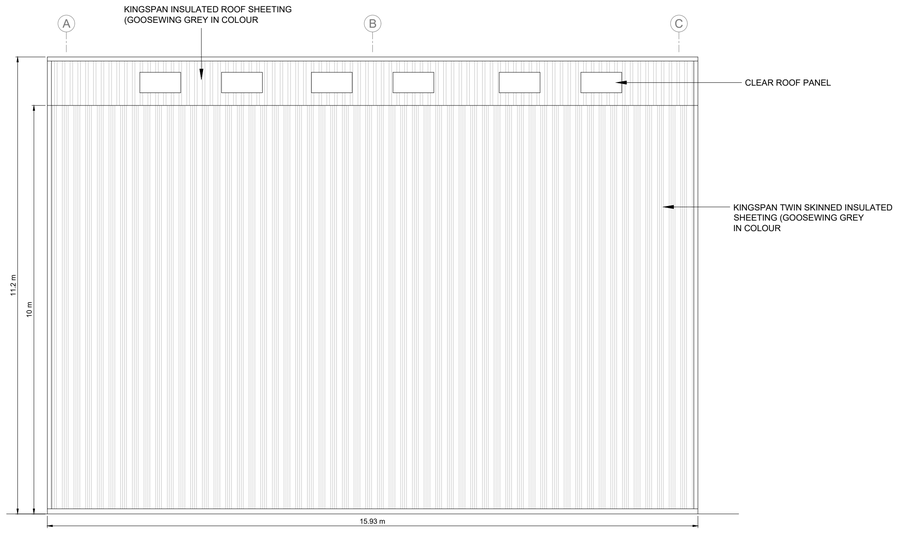
KILLOUGH BIO

DIGESTATE HANDLING BUILDING
PLAN, ELEVATIONS & SECTION

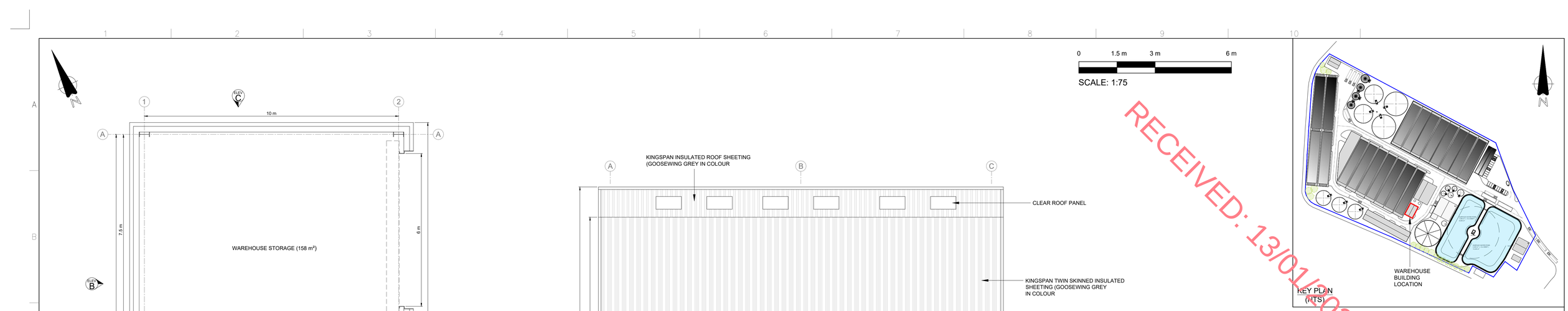
| Drawn | Scale | Drawing Number | Rev. |
|---|---|---|---|
| O.CONROY | 1:150 @ A1 | 1905-DG-0006 | 1 |
| Chkd. F.OYETAYO | Date 30/08/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |



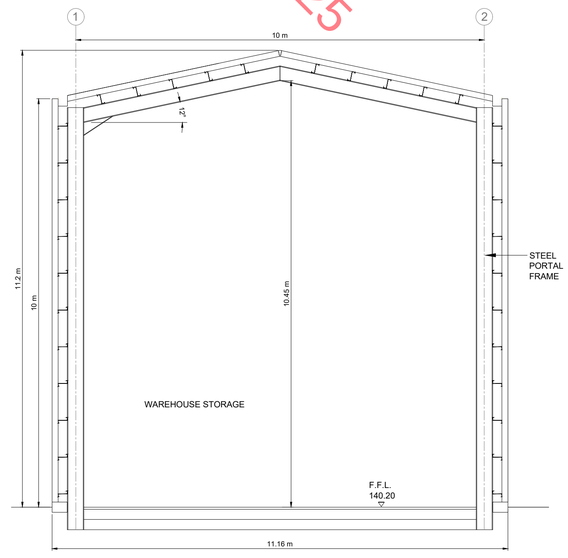

GROUND FLOOR PLAN



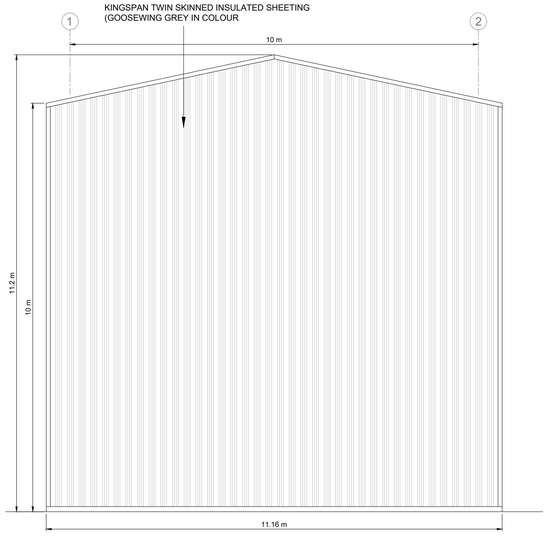

ELEVATION VIEW B



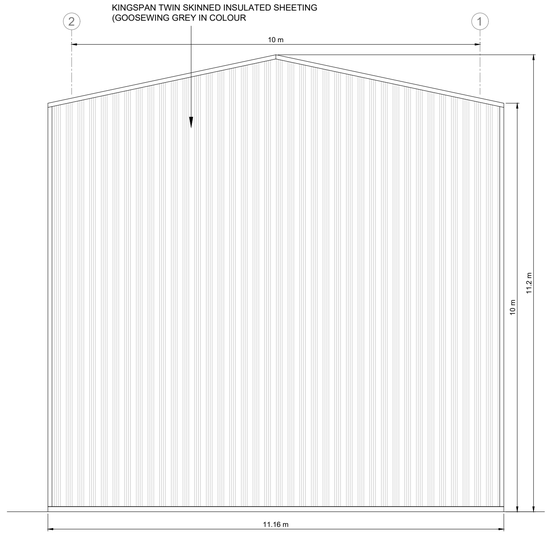

RECEIVED: 13/01/2025



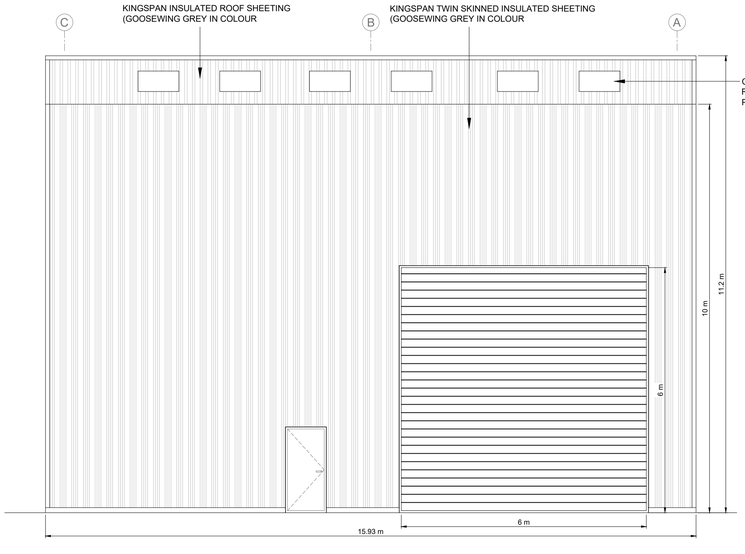

SECTION A-A




ELEVATION VIEW A




ELEVATION VIEW C




ELEVATION VIEW D

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| 1 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 19/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

Client

roadstone
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WEW
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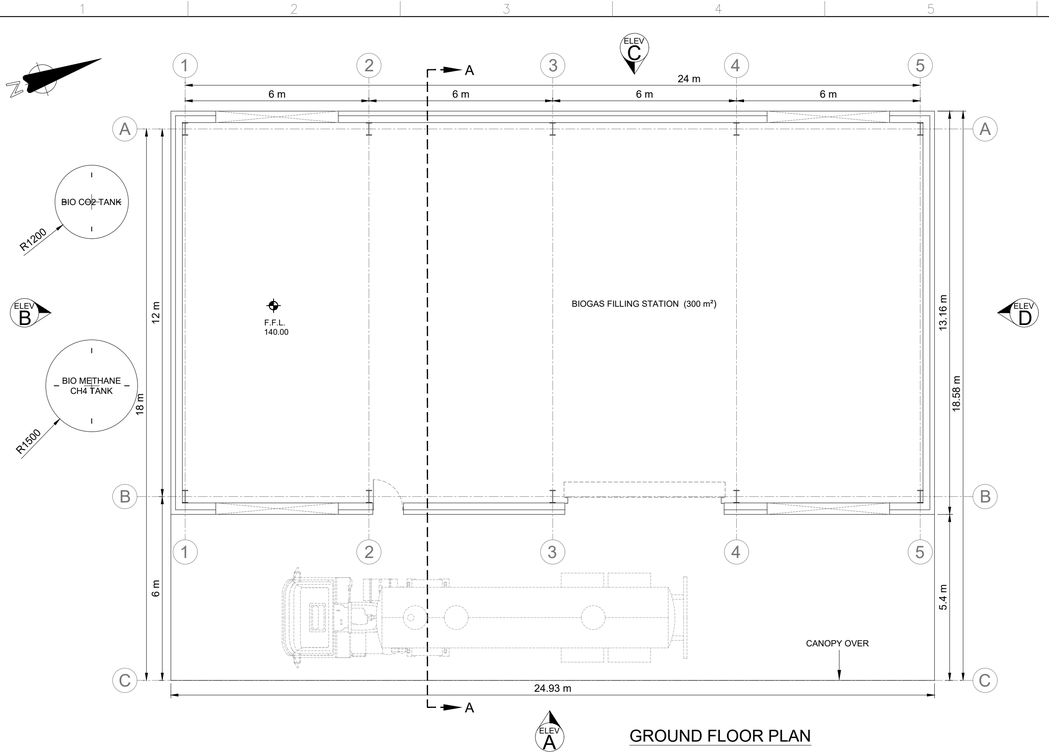
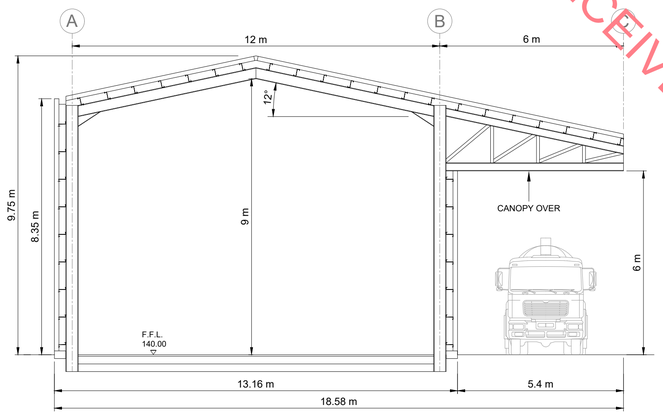
KILLOUGH BIO

WAREHOUSE
PLAN, ELEVATIONS & SECTION

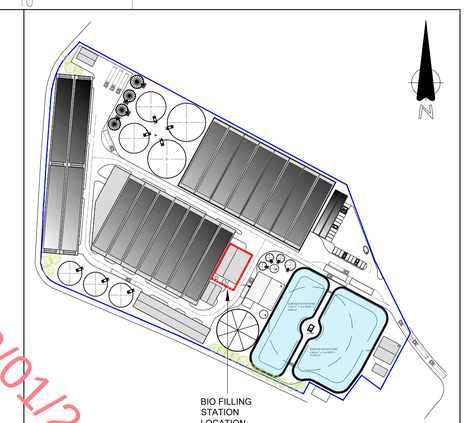
| Drawn: | Scale: | Drawing Number | Rev. |
|---|---|---|---|
| O.CONROY | 1:75 @ A1 | 1905-DG-0007 | 1 |
| Chkd: F.OYETAYO | Date: 30/08/24 | | |
| Apprd: N.MAHER | Status: ISSUED | | |




GROUND FLOOR PLAN

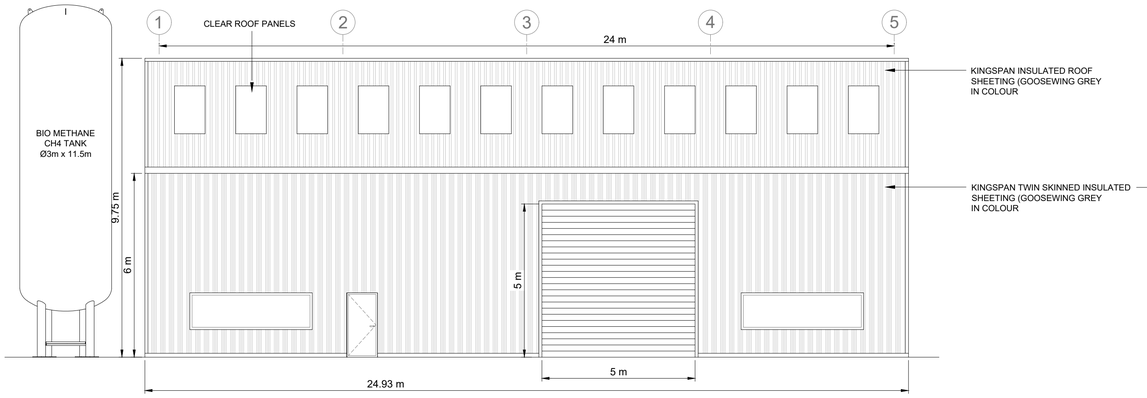



SECTION A-A

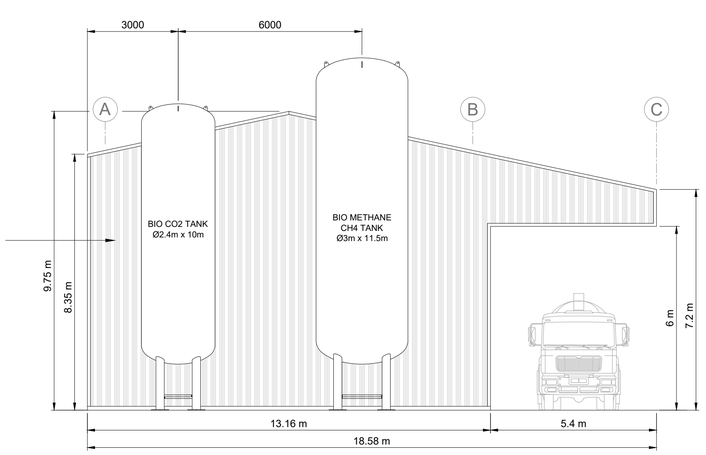



KEY PLAN
(NTS)

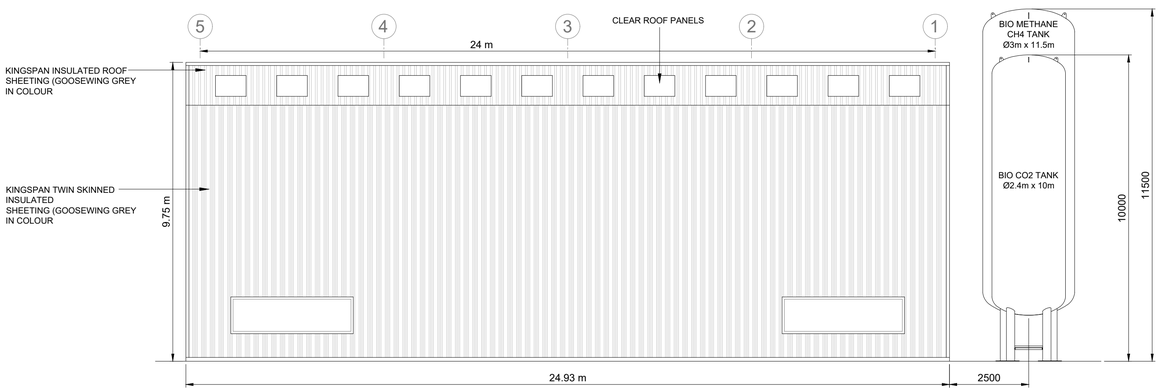




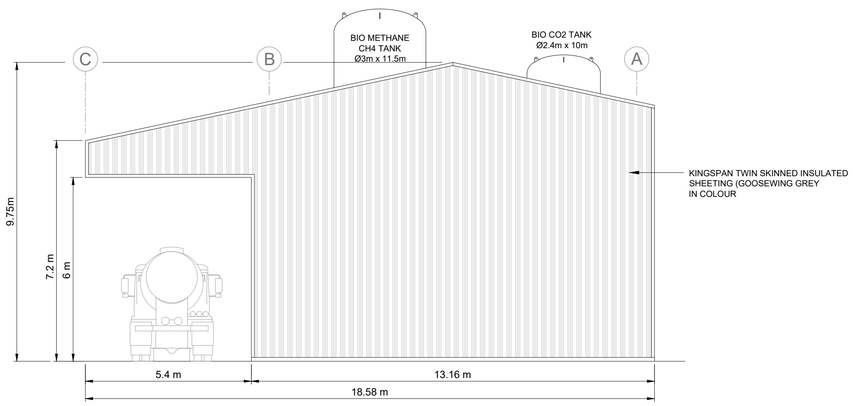

ELEVATION VIEW A




ELEVATION VIEW B




ELEVATION VIEW C




ELEVATION VIEW D

0 2.5 m 5 m 10 m

SCALE: 1:100

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| 3 | 16/12/24 | REVISED PRELIMINARY DESIGN | PD | JB | NM |
| 2 | 25/09/24 | REVISED PRELIMINARY DESIGN | PD | JB | NM |
| 1 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 19/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

Client

roadstone
A CRH COMPANY

WEW
water | energy | wastewater
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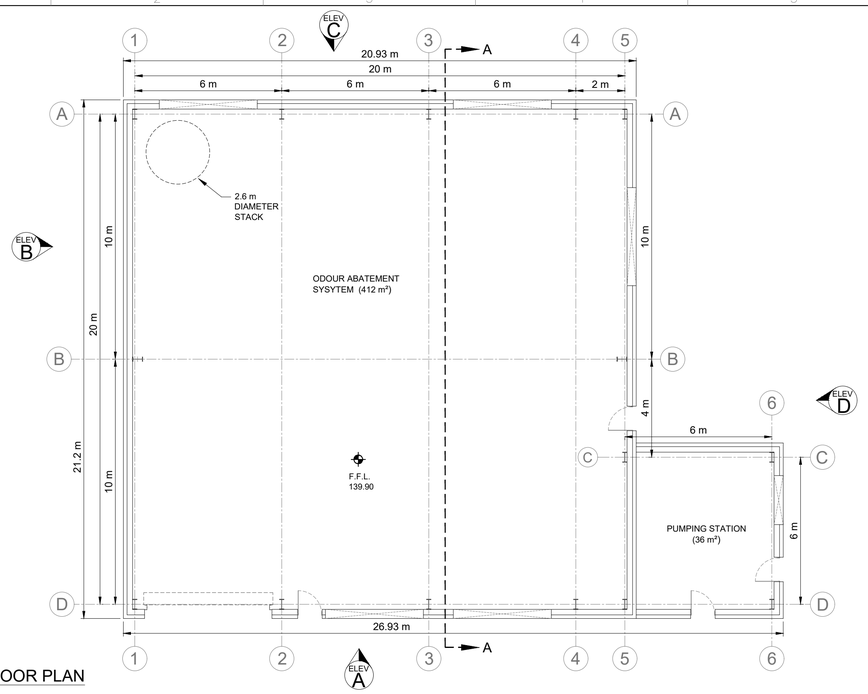
Project

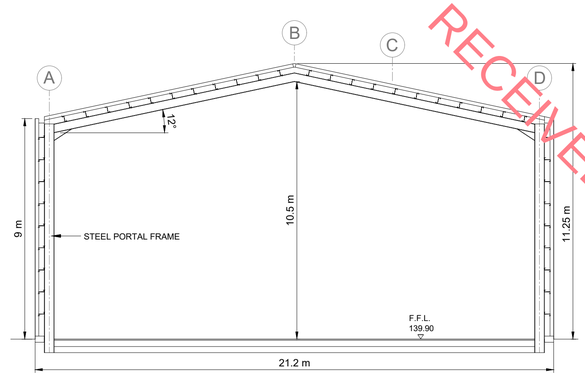
KILLOUGH BIO

BIO FILLING STATION
PLAN, ELEVATIONS & SECTION

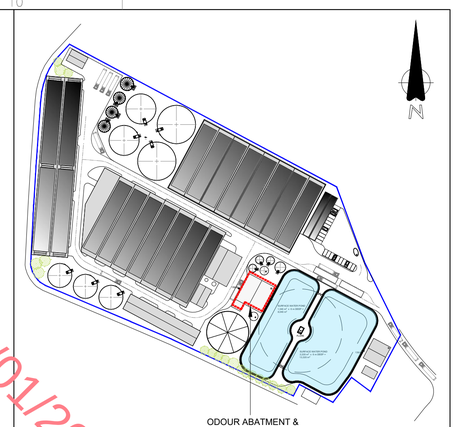
| Drawn | Scale | Drawing Number | Rev. |
|---|---|---|---|
| O.CONROY | 1:100 @ A1 | 1905-DG-0008 | 3 |
| Chkd. F.OYETAYO | Date 30/08/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |




GROUND FLOOR PLAN

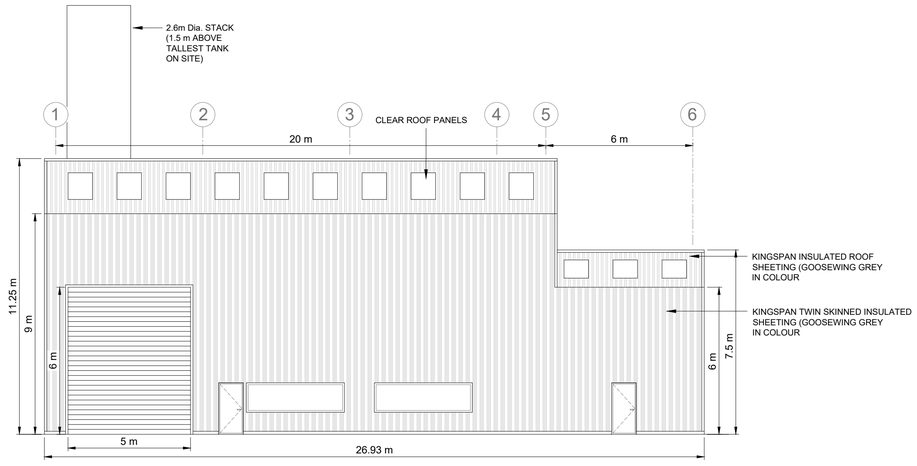



SECTION A-A

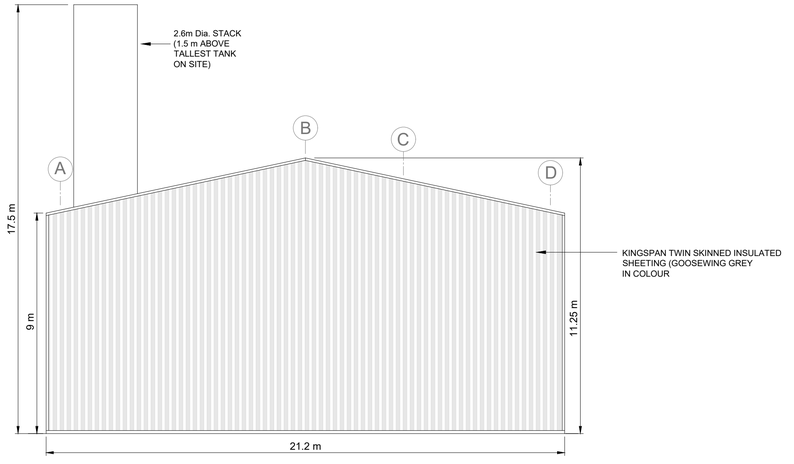



KEY PLAN
(NTS)

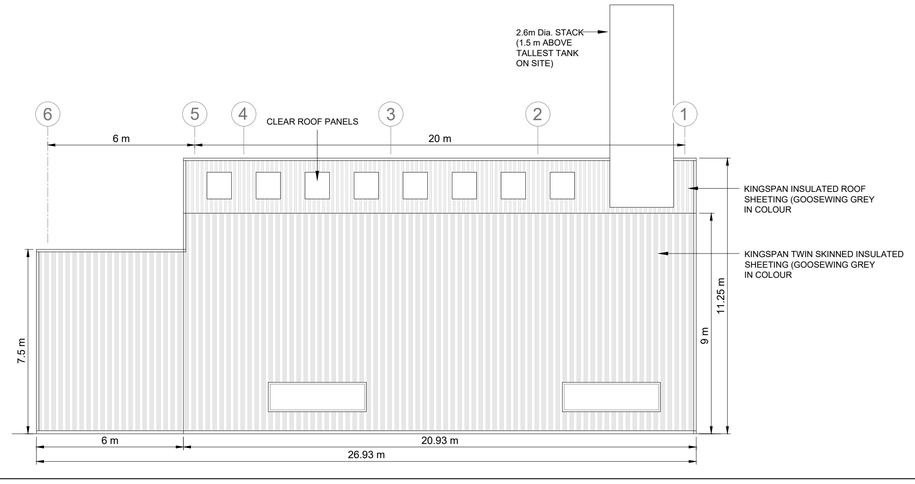
RECEIVED: 13/01/2025



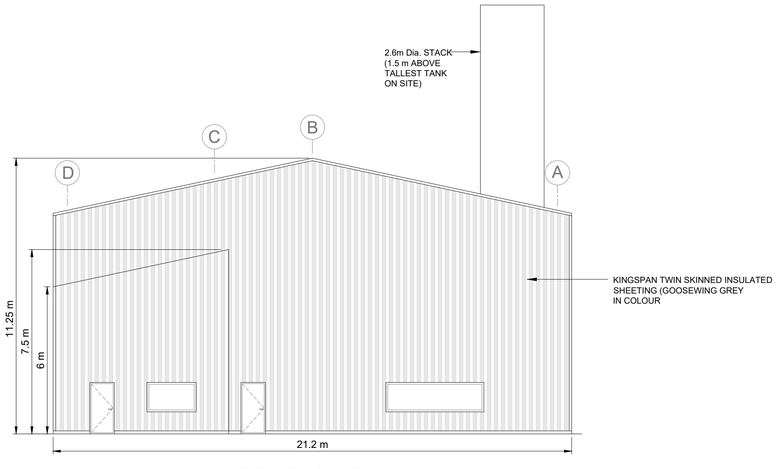

ELEVATION VIEW A




ELEVATION VIEW B




ELEVATION VIEW C




ELEVATION VIEW D

0 2.5 m 5 m 10 m

SCALE: 1:125

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| 1 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 19/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

Client

roadstone A CRH COMPANY

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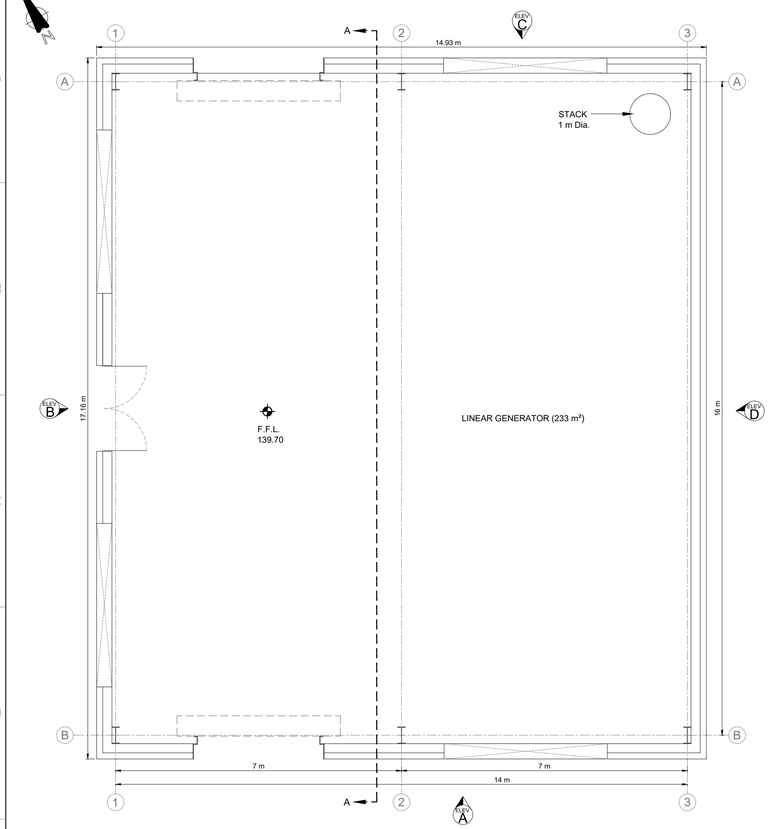
Project

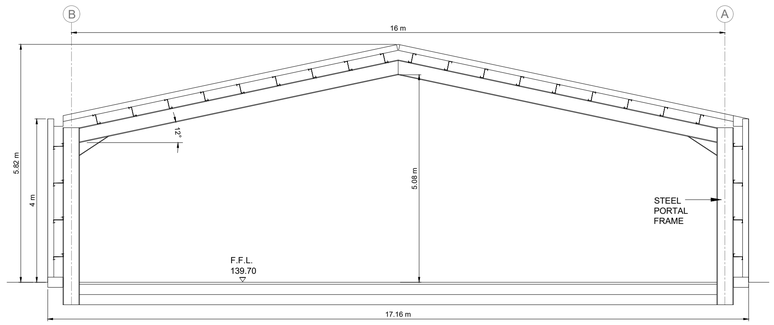
KILLOUGH BIO

ODOUR ABATMENT & PUMPING STATION
PLAN, ELEVATIONS & SECTION

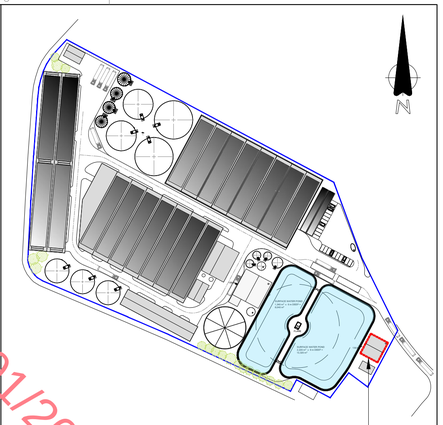
| Drawn | Scale | Drawing Number | Rev. |
|---|---|---|---|
| O.CONROY | 1:125 @ A1 | 1905-DG-0009 | 1 |
| Chkd. F.OYETAYO | Date 30/08/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |




GROUND FLOOR PLAN

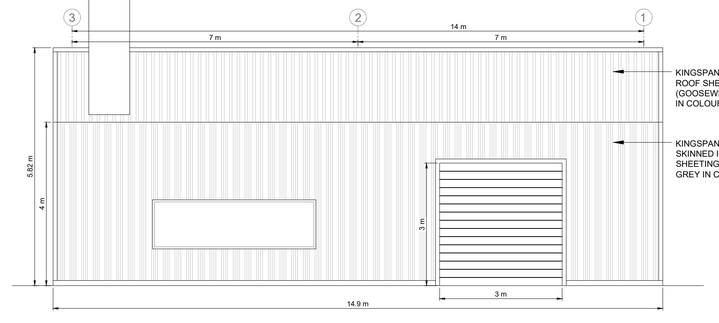



SECTION A-A

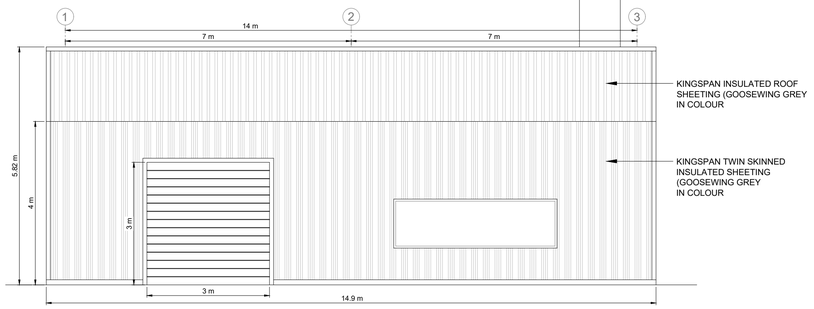



KEY PLAN
(NTS)

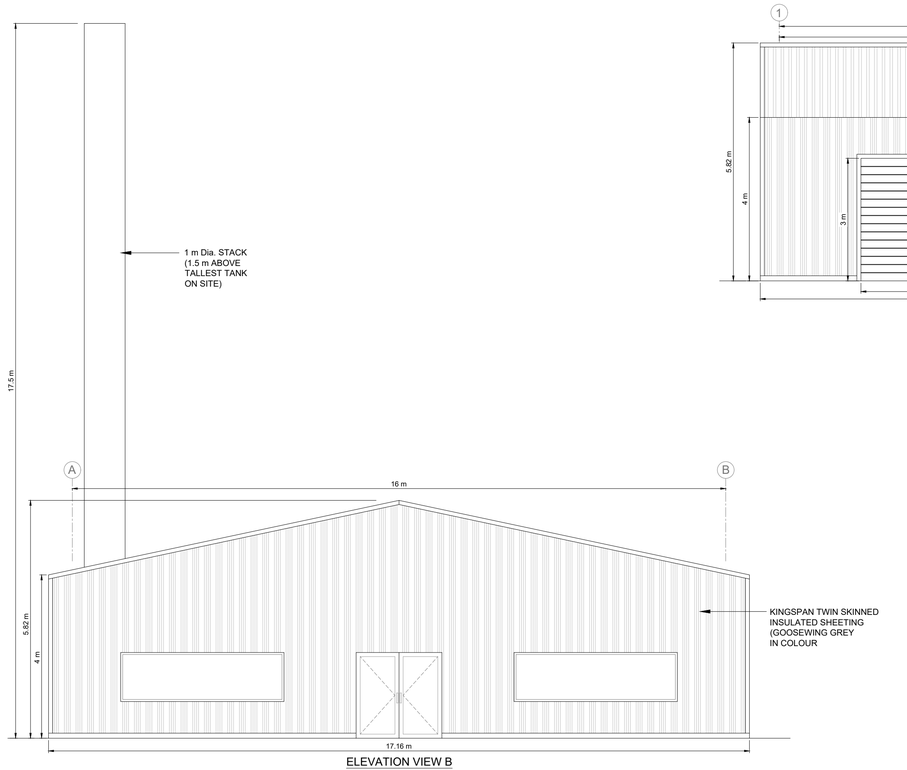
RECEIVED: 13/01/2025



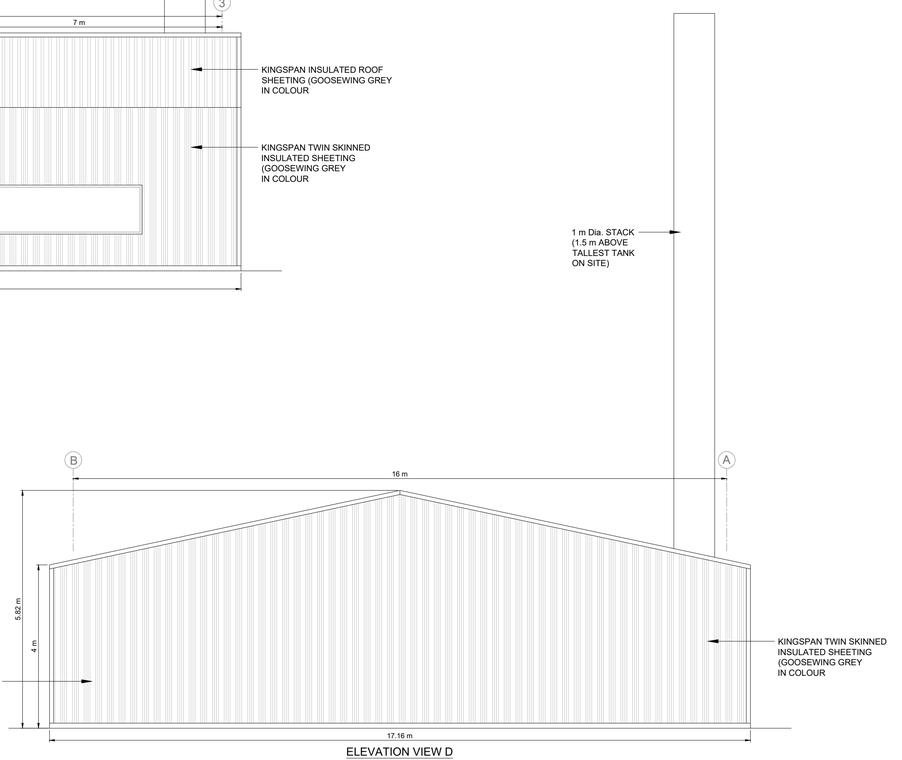

ELEVATION VIEW C




ELEVATION VIEW A




ELEVATION VIEW B




ELEVATION VIEW D

0 1.5 m 3 m 6 m

SCALE: 1:75

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| 1 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 19/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

Client

roadstone
A CRH COMPANY

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CONSULTING ENGINEERS
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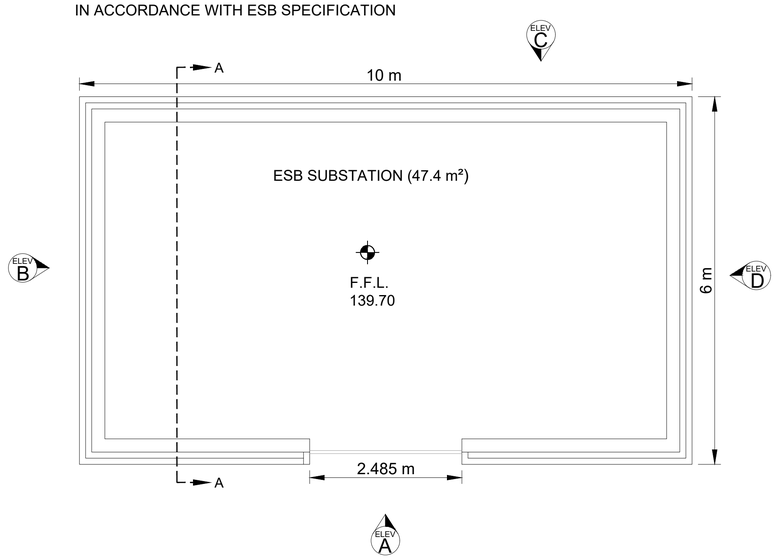
Project

KILLOUGH BIO

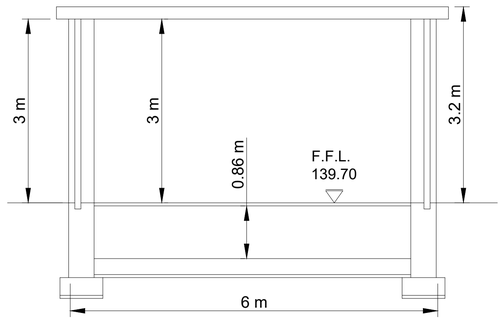
LINEAR GENERATOR
PLAN, ELEVATIONS & SECTION

| Drawn | Scale | Drawing Number | Rev. |
|---|---|---|---|
| O.CONROY | 1:75 @ A1 | 1905-DG-0010 | 1 |
| Chkd. F.OYETAYO | Date 30/08/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |

PROPOSED SUBSTATION TO BE CONSTRUCTED
IN ACCORDANCE WITH ESB SPECIFICATION

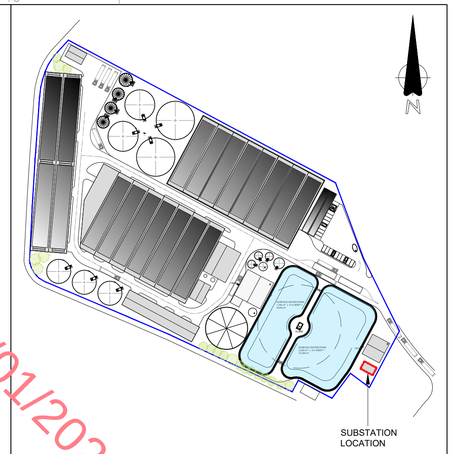



GROUND FLOOR PLAN

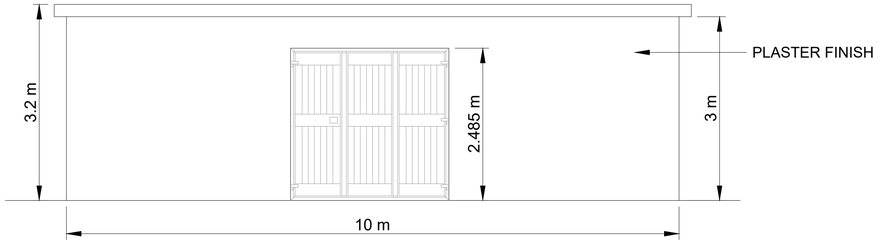



SECTION A-A

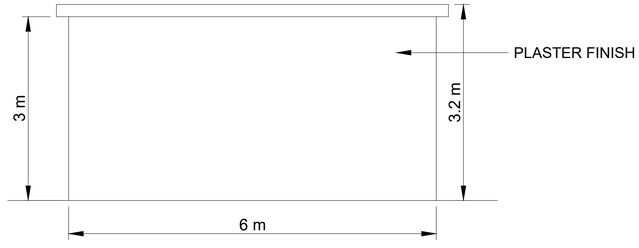
RECEIVED: 13/01/2025



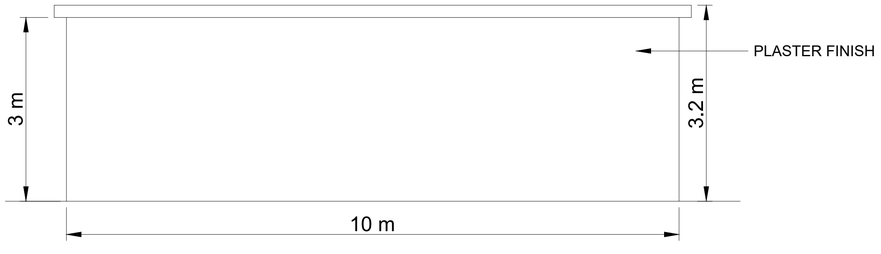

KEY PLAN
(NTS)



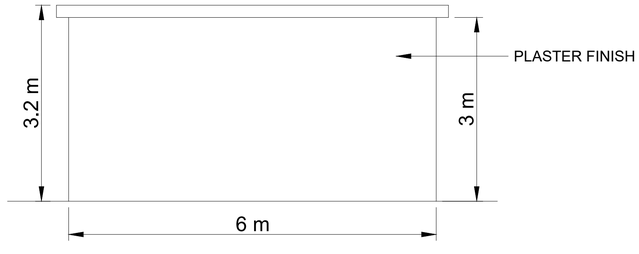

ELEVATION VIEW A




ELEVATION VIEW B




ELEVATION VIEW C




ELEVATION VIEW D

SPECIFICATION

NOTE :

THESE DRAWINGS MUST BE READ IN CONJUCTION WITH THE ESB SPECIFICATIONS CURRENT AT THE TIME OF CONSTRUCTION. (GENERAL SPECIFICATION FOR MV SUBSTATION AND METERING SWITCHROOM BUILDINGS)

WALLS :

THE SUBSTATION WALLS MUST BE A MINIMUM 4 HOUR FIRE RATING.
INTERNAL LEAF SHOULD BE CONSTRUCTED USING 215 mm CONCRETE BLOCKS AND OUTER LEAF WITH 100 mm CONCRETE BLOCKS WITH A 100 mm CAVITY.

ROOF SLAB :

ROOF SLAB TO BE CONSTRUCTED 175 mm R.C. (TBC) TO MEET FIRE SAFETY REQUIRMENTS AND ESB SPECIFIATIONS CURRENT AT THE TIME OF CONSTRUCTION.

FIRE SAFETY REGULATIONS :

THE SUBSTATION BUILDING MUST COMPLY WITH THE FIRE SERVICES ACT 1980, AND ALL REGULATIONS MADE UNDER THIS ACT. THE LOCATION AND CONSTRUCTION OF THE SUBSTATION BUILDING MUST ALSO COMPLY WITH THE FIRE SAFETY REQUIREMENTS OF ESB SPECIFICATIONS.

SUBSTATION DOORS & LOUVRES :

GALVANISED STEEL SUBSTATION DOORS AND WALL LOUVRES FABRICATED TO ESB SPECIFICATION CURRENT AT THE TIME OF CONSTRUCTION MUST BE INSTALLED. DOORS AND LOUVRES SHOULD BE SOURCED FROM AN ESB APPROVED SUPPLIER. THE MASONRY OPENING REQUIRED FOR THE SUBSTATION TO BE AS DETAILED ON ESB DRAWINGS AND SPECIFICATIONS CURRENT AT THE TIME OF CONSTRUCTION.

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| 1 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 19/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

Client

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www.fingleton.ie


Project

KILLOUGH BIO

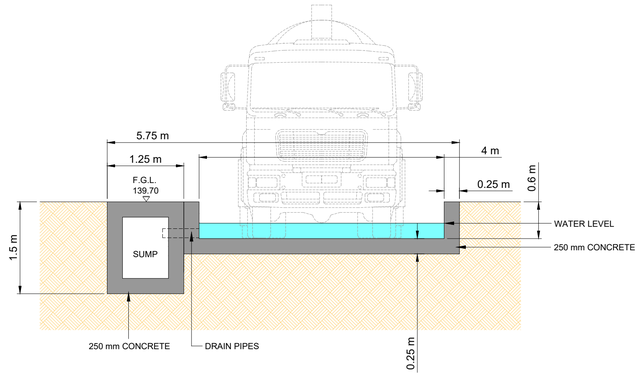
SUBSTATION
PLAN, ELEVATIONS & SECTION

0 1.25 m 2.5 m 5 m

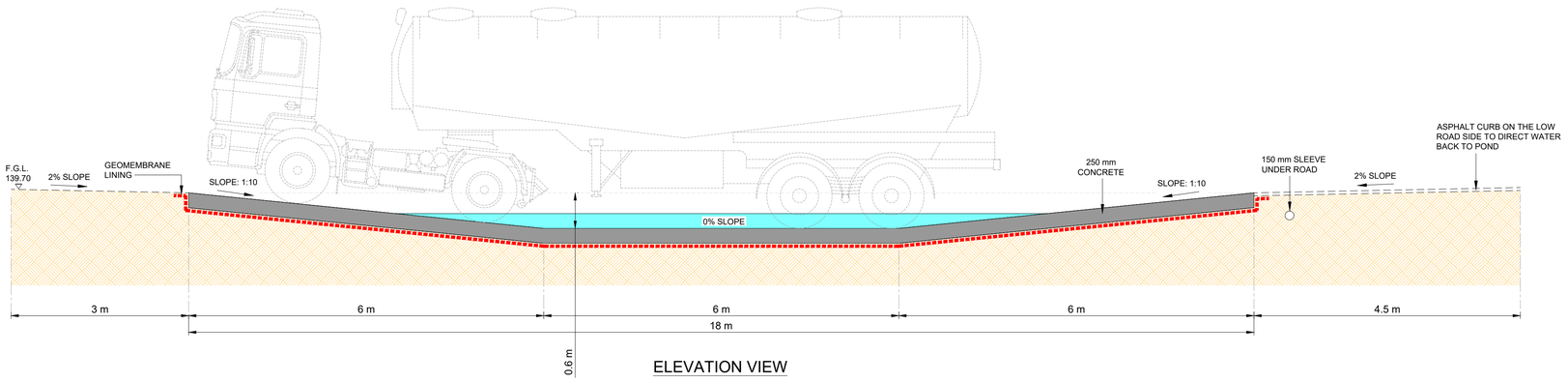
SCALE: 1:50

ISSUED

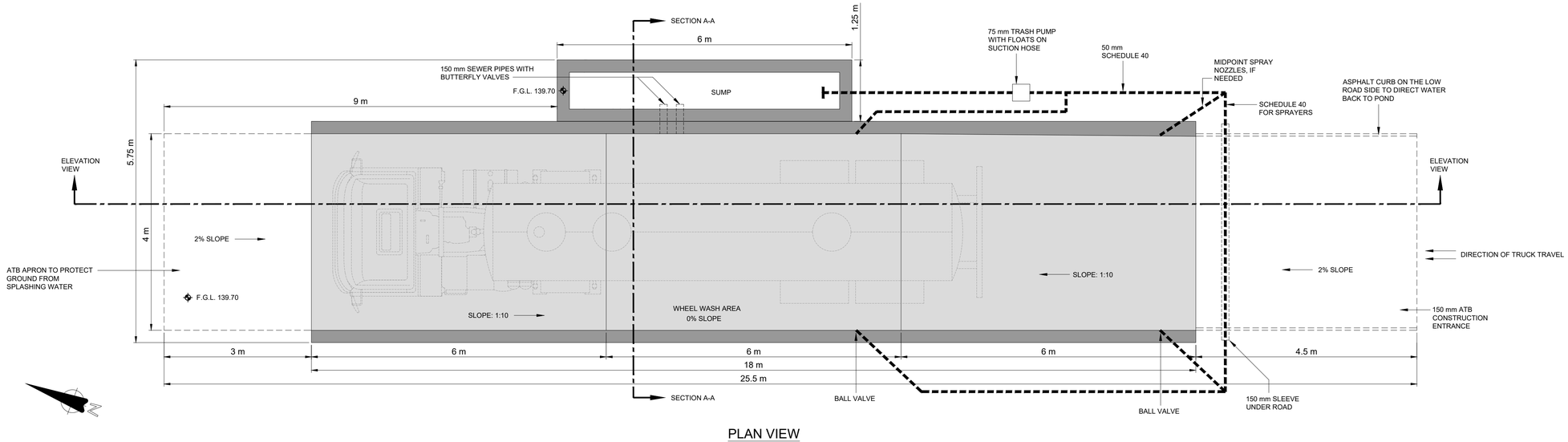
| Drawn | Scale | Drawing Number | Rev. |
|---|---|---|---|
| O.CONROY | 1:50 @ A1 | 1905-DG-0011 | 1 |
| Chkd. F.OYETAYO | Date 30/08/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |



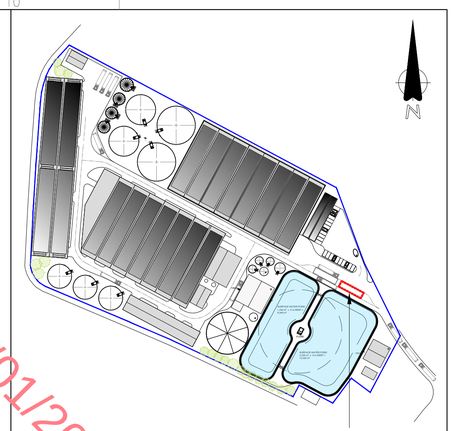

SECTION A-A




ELEVATION VIEW




PLAN VIEW




KEY PLAN
(NTS)

RECEIVED: 13/01/2025

0 1.25 m 2.5 m 5 m

SCALE: 1:50

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| 3 | 12/09/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 2 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 1 | 24/07/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 19/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

Client

roadstone
A CRH COMPANY

WEW
water | energy | wastewater
CONSULTING ENGINEERS
Fingleton White Group

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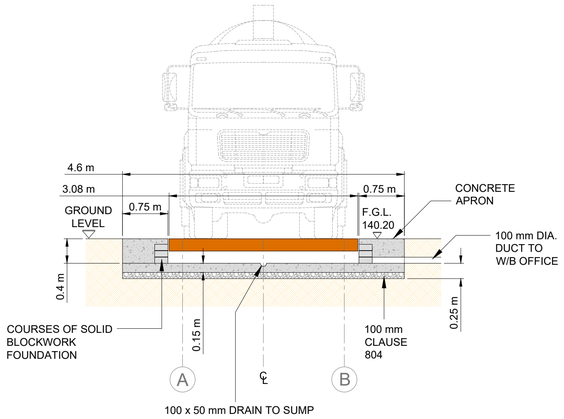
www.fingleton.ie

Project

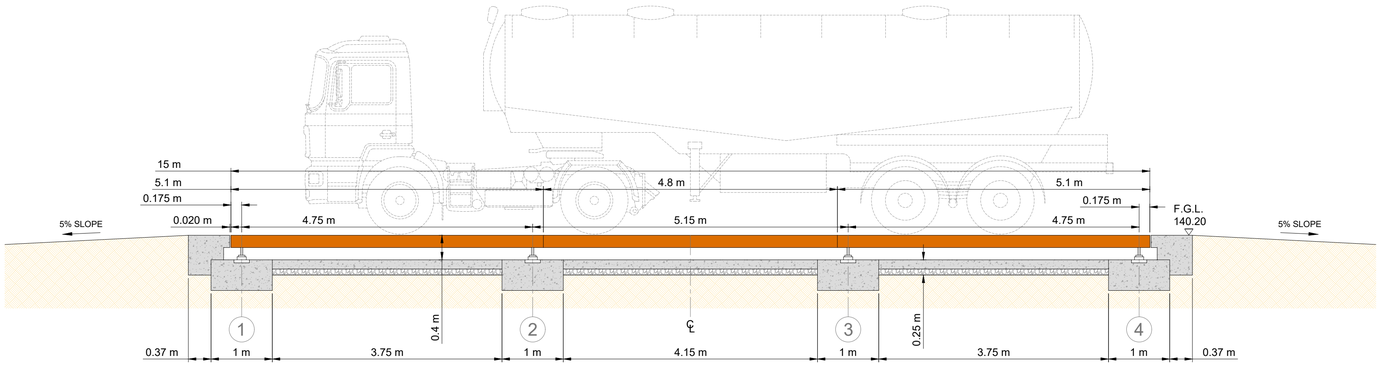
KILLOUGH BIO

WHEEL WASH DETAILS
PLAN, ELEVATION & SECTION

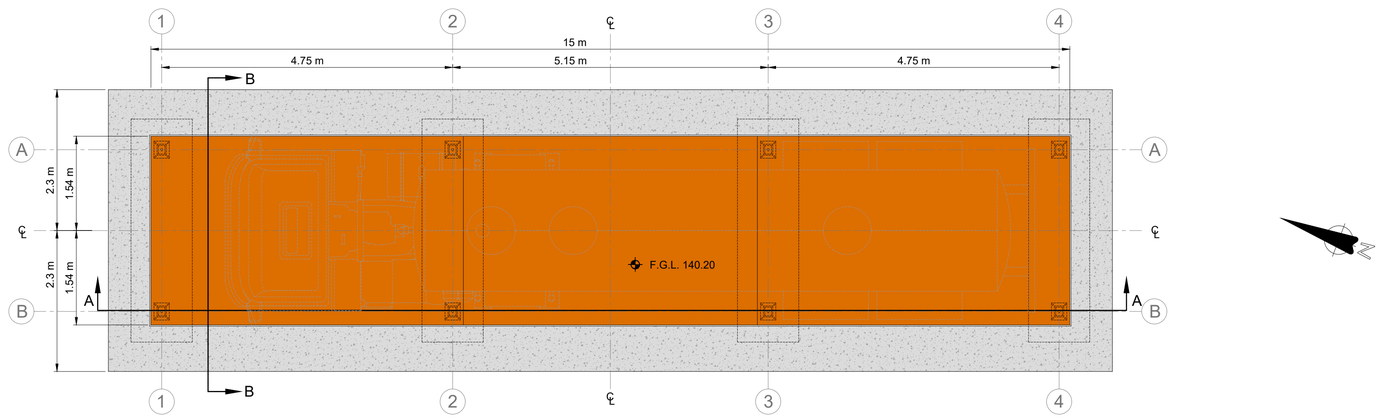
| Drawn | Scale | Drawing Number | Rev. |
|---|---|---|---|
| O.CONROY | 1:50 @ A1 | 1905-DG-0012 | 3 |
| Chkd. F.OYETAYO | Date 12/09/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |



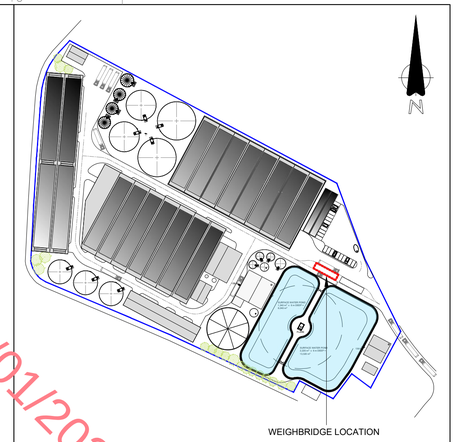

SECTION B-B




SECTION A-A




WEIGHBRIDGE - PLAN VIEW




KEY PLAN
(NTS)

0 1.25 m 2.5 m 5 m

SCALE: 1:50

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR |
|---|---|---|---|---|---|
| 1 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 24/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

Client: roadstone, A CRH COMPANY

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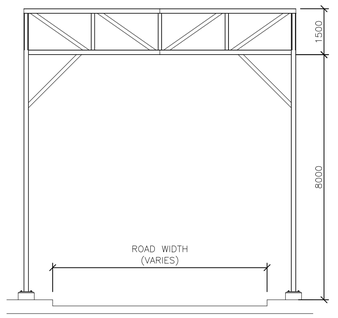
Project
KILLOUGH BIO

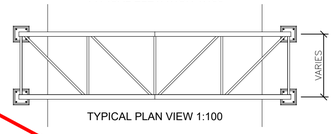
WEIGHBRIDGE DETAILS
PLAN & SECTIONS

| Drawn | Scale | Drawing Number | Rev. |
|---|---|---|---|
| O.CONROY | 1:50 @ A1 | 1905-DG-0013 | 1 |
| Chkd. F.OYETAYO | Date 30/08/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |

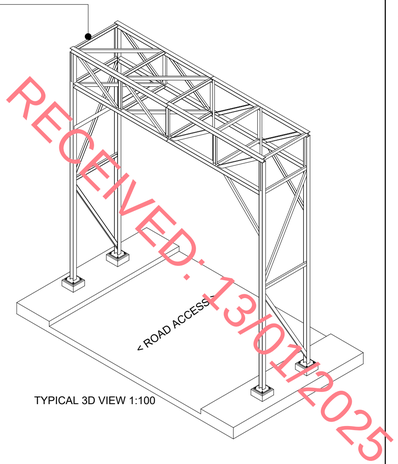
STEEL FRAME PIPE RACK/BRIDGE TO ENGINEERS DETAILS & SPECIFICATION.
BRIDGING SPANS MAY VARY TO SUIT ROAD WIDTHS.
RACK/BRIDGE DEPTH MAY VARY TO ACCOMMODATE NUMBER & SIZE OF REQUIRED PIPE CROSSINGS




TYPICAL ELEVATION 1:100




TYPICAL PLAN VIEW 1:100




TYPICAL 3D VIEW 1:100

RECEIVED: 13/01/2025

N

WORKSHOP
140.25
< PIPEBRIDGE >
140.20
< PIPEBRIDGE
< PIPEBRIDGE >
BIO CONVERSION BUILDING
140.00
DRY MATTER RECEPTION
139.90
PRETREATMENT, EQUALISATION AND GAS UPGRADING
ADMINISTRATION BUILDING
139.60
COVERED BICYCLE RACK
(10 No. BICYCLES)
IN A FIRE EVENT THIS IS TO BE CLOSED
PIPEBRIDGE
PIPEBRIDGE
UNDERGROUND HOLDING TANK
(8,000 Gallon)
BIO FILLING STATION
139.90
PIPEBRIDGE >
140.00
PUMPED TO TREATMENT PLANT
139.80
2 No. INTERCEPTORS
WAREHOUSE
140.00
ODOUR ABATMENT AND PUMPING STATION
140.00
DIGESTATE HANDLING
PUMPED TO QUARRY
SURFACE WATER POND
1,900m² x 6m DEEP
(8,040 m³)
FIRE WATER POND
2,800m² x 6m DEEP
(13,320 m³)
SUMP & PUMP TO SURFACE WATER POND
139.60
LINEAR GENERATOR
139.60
SUBSTATION

0 12.5 m 25 m 50 m

SCALE: 1:500

## LEGEND

- PROPOSED ROAD SURFACE WATER PIPE
- PROPOSED ROOF SURFACE WATER PIPE
- PROPOSED FOUL WATER PIPE
- PROPOSED ROAD GULLY
- PROPOSED ROOF GUTTER / WATER COLLECTION POINT
- PROPOSED MANHOLES
- 140.00 PROPOSED SPOT LEVELS

**ISSUED**

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| 4 | 16/12/24 | REVISED PRELIMINARY DESIGN | PD | JB | NM |
| 3 | 25/09/24 | REVISED PRELIMINARY DESIGN | PD | JB | NM |
| 2 | 13/09/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 1 | 30/08/24 | REVISED PRELIMINARY DESIGN | OC | FO | NM |
| 0 | 26/07/24 | PRELIMINARY DESIGN | OC | FO | NM |

Client: roadstone, A CRH COMPANY

WEW water | energy | wastewater CONSULTING ENGINEERS Fingleton White Group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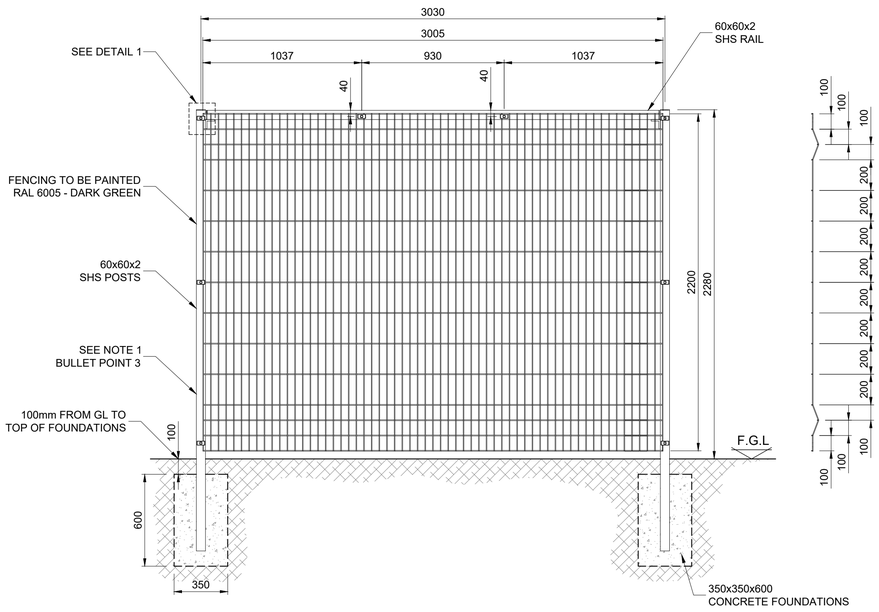
www.fingleton.ie

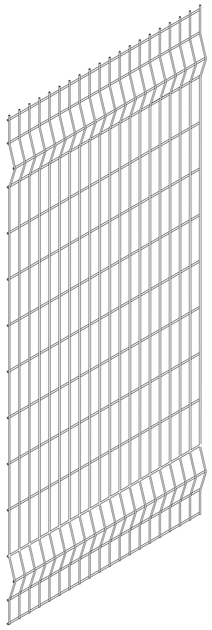

Project
KILLOUGH BIO

DRAINAGE SITE LAYOUT PLAN

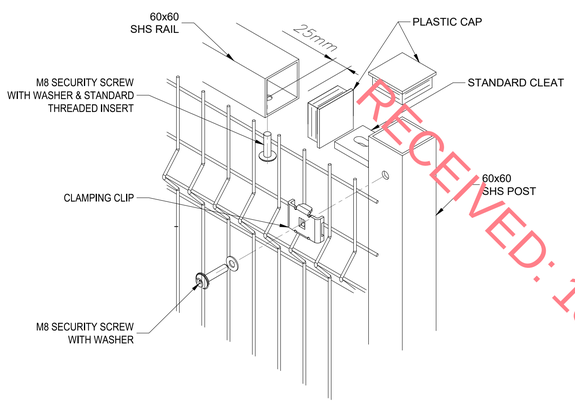
| Drawn | Scale | Drawing Number | Rev. |
|---|---|---|---|
| D.CONROY | 1:500 @ A1 | 1905-DG-0014 | 4 |
| Chkd. F.OYETAYO | Date 13/09/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |



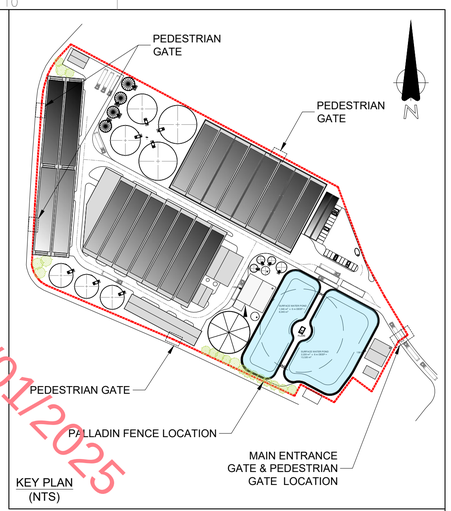

SECTIONAL ELEVATION
(SCALE 1:20)



ISOMETRIC VIEW OF FENCE MESH
(SCALE N.T.S.)




DETAIL 1
FENCE CONNECTION DETAILS
(SCALE N.T.S.)

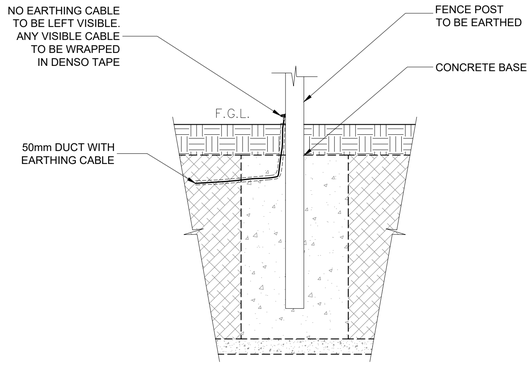



KEY PLAN
(NTS)

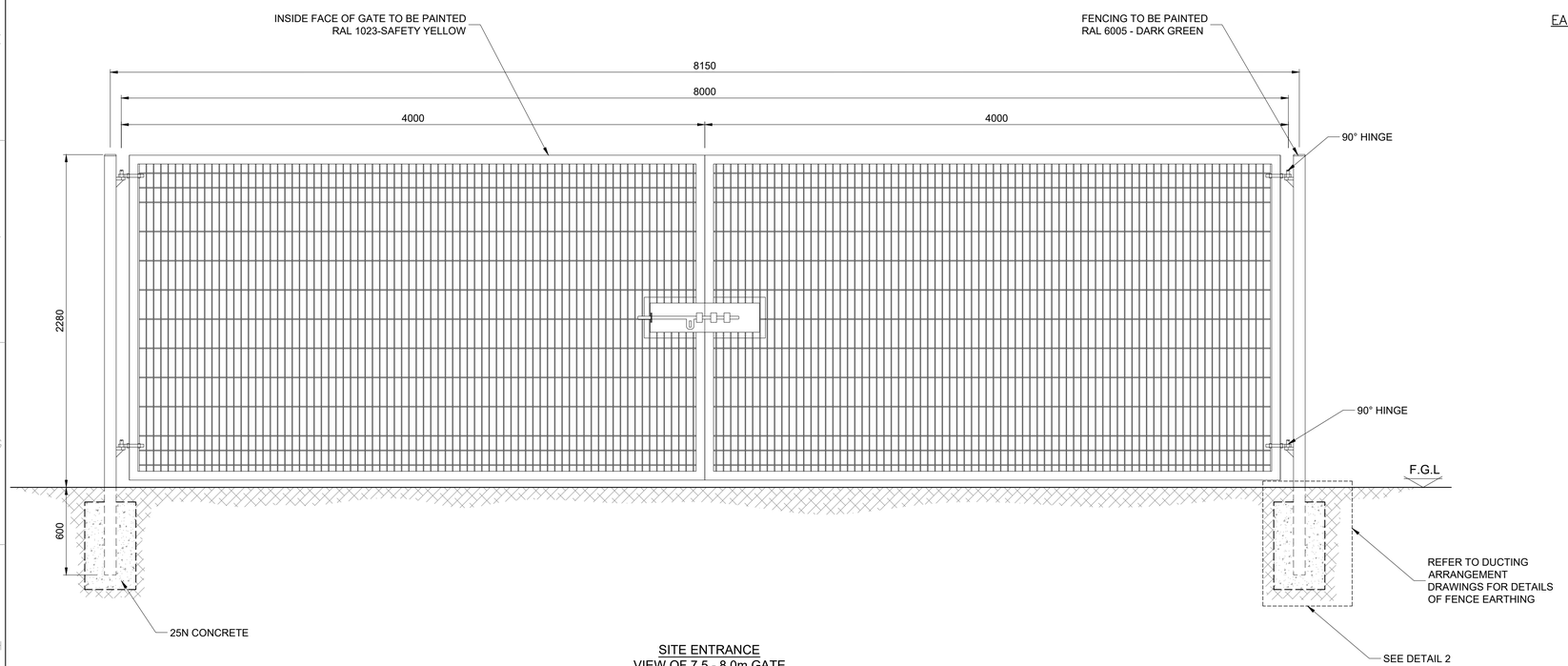


NOTES:

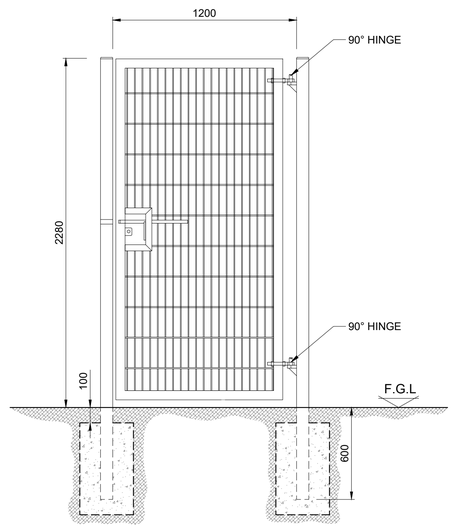
1. PALADIN WELDMESH FENCING. 2200mm HIGH. POWDER COATED FINISH, COLOUR TBC
2. WELDMESH FENCE POST AT 3000mm CENTRES. POWDER COATED FINISH, COLOUR TBC
3. CONCRETE FOUNDATIONS, TO ENGINEER'S SPECIFICATION.




DETAIL 2
EARTHING DETAIL
(SCALE 1:10)




SITE ENTRANCE
VIEW OF 7.5 - 8.0m GATE
(SCALE 1:20)




PEDESTRIAN
VIEW OF 1.2m GATE
(SCALE 1:20)

ISSUED

| REV. | DATE | REVISION | BY | CHKD. | APPR. |
|---|---|---|---|---|---|
| 0 | 25/09/24 | PRELIMINARY DESIGN | AT | FO | NM |

Client

roadstone
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water | energy | wastewater
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Project

KILLOUGH BIO

PALLADIN FENCE & GATE DETAILS

| Drawn | Scale | Drawing Number | Rev. |
|---|---|---|---|
| A.THOMAS | AS SHOWN @ A1 | 1905-DG-0015 | 0 |
| Chkd. F.OYETAYO | Date 25/09/24 | | |
| Apprd. N.MAHER | Status ISSUED | | |