
SLIGO COUNTY COUNCIL

PROVISION OF HOUSING DEVELOPMENTS AT GELDOLF DRIVE AND BENSON COURT CRANMORE CO. SLIGO

SCREENING FOR APPROPRIATE ASSESSMENT

SEPTEMBER 2023

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SLIGO COUNTY COUNCIL
HOUSING DEVELOPMENTS
AT CRANMORE
CO. SLIGO
SCREENING FOR APPROPRIATE ASSESSMENT
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APPENDIX A Drawings

RAU-ZZ-ZZ-DR-A-00-0010 : Geldof Drive Site Plan

RAU-ZZ-ZZ-DR-A-00-0011 : Benson Court Site Plan

R119-CSC-01-XX-DR-C-0007: Benson Court Proposed Drainage Layout

R119-CSC-02-XX-DR-C-0007: Geldof Drive Proposed Drainage Layout

APPENDIX B Technical Memo: Drainage Strategy Benson Court and Geldof Drive

APPENDIX C Trial Hole Reports

1 INTRODUCTION

1.1 BACKGROUND

Jennings O'Donovan & Partners Limited have been commissioned by Reddy Architecture + Urbanism to carry out a Stage I Appropriate Assessment Screening under Article 6(3) of Council Directive 92/43/EEC (Habitats Directive) for the Provision of Works for two housing developments located at Geldof Drive and Benson Court, in the Cranmore area of Sligo town. At Geldof Drive, 10 no. existing one-storey units will be demolished, and 14 no. units will be built. At Benson Court, a new access road will be developed adjacent to Carroll Drive and 16 no. units will be built.

The works hereafter in this report will be identified as 'the Project'.

The purpose of this report is to assess the various elements of the Project in terms of potential impacts to European Sites within the Zone of Influence (ZoI) of the Project. Potential cumulative impacts of the overall project, individually and in-combination with other plans and projects within the area of the waterbody catchment were also. Locations where works were carried out were surveyed for the presence of protected habitats and species as set out in the Birds and Habitats Directives.

This proposal is not necessary for the conservation management of a European Site.

1.2 AUTHOR'S QUALIFICATION AND EXPERTISE

This Stage I Appropriate Assessment Screening has been prepared by Dr. Monica Sullivan, Principal Environmental Scientist and Lead Ecologist at Jennings O'Donovan & Partners Limited. She is a full member of the Chartered Institute of Ecology and the Environmental Management and a chartered Environmentalist. Dr. Sullivan has over 36 years' experience in the natural sciences, specialising in fisheries management, aquatic ecology and freshwater invertebrate taxonomy. She has lectured since the mid 1990's – 2017 in invertebrate zoology, ecology and environmental pollution control to both masters and degree students. She was the examiner for the freshwater biology module for the Institute of Fisheries Management, England. Monica's experience includes invasive species surveys, management plans, ecological studies, Environmental Impact Assessment (EIA) screenings, Appropriate Assessment (AA) screenings, Natura Impact Statements (NIS), otter surveys, badger surveys, freshwater macroinvertebrate and instream flora surveys.

Qualified to doctorate level, Monica previously worked as a partner in an environmental consultancy, undertaking fieldwork and specialising in Environmental Assessments of medium to large scale infrastructural projects and the coordination and management of AA and Environmental Impact Assessment processes. She has a clear understanding of the legislative framework governing the extent of environmental investigations, assessments and reports required to secure the necessary approvals on all types of projects. She has extensive experience in management of specialist sub-consultants and working in a team environment and a history of collaborating with participants on research projects. Dr. Sullivan was author and researcher on an Environmental Government Program on invasive species. She is chief author of a chapter in the book Zebra Mussels in Europe and has

published many papers on the topic. She spent several years working as both English and Scientific editor for international scientific journals. In 2017, she was expert advisor for 'horizon scan' invasive species workshop.

1.3 REGULATORY CONTEXT

Under Section 177U (1) of the Planning Acts, a Screening for AA of the Project shall be carried out by the competent authority (in this case, Sligo County Council) to assess in view of best scientific knowledge, if the Project, individually or in combination with other plans or projects, is likely to have a significant effect(s) on any European Sites.

Collectively, Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are referred to as the Natura 2000 Sites. The legal basis on which SACs are selected and designated is the EU Habitats Directive, 92/43/EEC transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended. The designation features of SACs are referred to as Qualifying Interests (QI) and include both species (excluding birds) and habitats. Similarly, Special Protection Areas (SPA's) are legislated in the Birds Directive 2009/147/EC. The designation features of SPAs are referred to as Special Conservation Interests (SCIs) which comprise bird species as well as wetland bird habitats.

In general terms, SACs and SPAs are considered to be of exceptional importance in terms of rare, endangered or vulnerable habitats and species within the European Community.

Article 6, paragraph 3 of 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”.

The statutory agency responsible for the European Sites is the National Parks and Wildlife Service of the Department of Culture, Heritage and the Gaeltacht.

This report has been prepared in accordance with current guideline documents:

- Assessment of plans and projects significantly effecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2001)
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG 2009, Revised February 2010)
- Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government (DoEHLG, 2009, revised 2010)

- OPR Practice Note PN01: Appropriate Assessment Screening for Development Management, March 2021, Office of the Planning Regulator
- Communication from the Commission on the Precautionary Principle. Office for Official Publications of the European Communities, Luxembourg, (EC, 2000a)
- European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No.477 of 2011).
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013).
- EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (EC, 2007)
- Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2018)
- Strict Protection of Animal Species, NPWS, 2021

The following European Court and Irish High Court rulings have been considered:

- C-127/02 Waddenzee v Staatssecretaris
- C-258/11 Sweetman v An Bord Pleanála
- C-512/12 Briels
- C-387/12 & C388/15 Orleans and others v Vlaams Gewest
- C-142/15 Moorbug
- C-323/17 People Over Wind and Peter Sweetman v Coillte
- C-162/17 Grace and Sweetman
- C-883/18 Holohan and others v An Bord Pleanála
- IEHC 84 (2019) - Kelly v An Bord Pleanála

Relevant plans from national to local scales are critical to inform a robust assessment of in-combination impacts; these are listed below:

- National Biodiversity Action Plan, for the period 2017-2021
- River Basin Management Plan for Ireland 2018-2021
- Sligo County Development Plan 2017-2023 (Under Review) (Proposal to extend to July 2024)
- Sligo County Development Plan 2023-2029 (Pre-Draft Public Consultation)

1.4 THE STAGES IN AN APPROPRIATE ASSESSMENT

There are 4 stages in an Appropriate Assessment as outlined in the European Commission Guidance document (2001). The following is a brief summary of these steps:

Stage 1 – Screening: This stage examines the likely effects of a project either alone or in-combination with other projects upon a European Site and considers whether it can be objectively concluded that these effects will not be significant.

Stage 2 – Appropriate Assessment: In this stage, the impact of the project on the integrity of the European Site is considered, with respect to the conservation objectives of the site and to its structure and function.

Stage 3 – Assessment of Alternative Solutions: Should the Appropriate Assessment determine that adverse impacts are likely upon the European Site, this stage examines alternative ways of implementing the project that, where possible, avoid these adverse impacts.

Stage 4 – Assessment where no alternative solutions exist and where adverse impacts remain: Where imperative reasons of overriding public interest (IROPI) exist, an assessment to consider whether compensatory measures will or will not effectively offset the damage to the European Site will be necessary.

As part of this Screening for Appropriate Assessment, a desk-based study of the European Site within the Zol of the Project is required.

1.5 SCREENING METHODOLOGY

The function of the Screening Assessment is to identify whether or not the project will have a likely significant effect on any European Site. In this context “likely” refers to the presence of doubt with regard to the absence of significant effects (ECJ case C-127/02) and “significant” means not trivial or inconsequential but an effect that has the potential to undermine the site’s conservation objectives (ECJ case C-127/02). In other words, any effect that compromises the functioning and viability of a site and interferes with achieving the conservation objectives for the site would constitute a significant effect.

The nature of the likely interactions between the Project and the integrity of a European Site will depend upon the sensitivity of the European Site’s qualifying features to potential impacts arising from the Project; the current conservation status of the European Site and its qualifying features; and any likely changes to key environmental indicators (e.g. water quality) that underpin the conservation status of European Sites and their qualifying features, in-combination with other plans and projects.

The European Commission (2018) Guidelines outline the stages involved in undertaking a Screening Assessment of a project that has the potential to have likely significant effects on European Sites. The methodology adopted for this Screening Assessment is informed by these guidelines and was undertaken in the following steps:

1. Define the project and determine whether it is directly connected with or necessary for the conservation management of European Sites
2. Identify other plans or projects that, in-combination with the project, have the potential to effect European Sites
3. Assess whether or not the project is likely to have significant effects on European Sites in the view of its conservation objectives.

1.6 DESK STUDY

A desk study was carried out to collate the available information on the ecological environment of the Project area. The National Parks and Wildlife Service (NPWS) database was consulted concerning designated conservation areas and records of rare and protected plant and animal species in the

vicinity of the Project. The National Biodiversity Data Centre (NBDC) website was also consulted. A 4.4 ha polygon was drawn around the Project, no protected species have been recorded within this area. The Project is entirely contained in the one-kilometre Grid square 'G6935'. Nine protected species have been recorded in this square (which incorporates the Garavogue River), namely the Common Frog (*Rana temporaria*), (last recording 1965), Great Cormorant (*Phalacrocorax Carbo*) (2017), Sea Lamprey (*Petromyzon marinus*) (N.A.), Common Seal (*Phoca Vitulina*) (2008), European Otter (*Lutra lutra*) (2015), Lesser Noctule (*Nyctalus leisleri*) bat (2013), Pipistrelle bat (*Pipistrellus pipistrellus sensu lato*) (2004), Soprano Pipistrelle bat (*Pipistrellus pygmaeus*) and the West European Hedgehog (*Erinaceus Europaeus*). Many of the former aquatic related species are likely to be associated with the Garavogue River, while the named bats and hedgehog are likely to be using natural corridors within the 1km range.

The Sligo County Development Plan 2017-2023 (proposal to extend to July 2024), the Sligo County Development Plan 2023 – 2029 (Pre-Draft Public Consultation) and the Sligo County Council planning enquiry website were reviewed to identify any proposed plans or projects which may have a direct, indirect or cumulative impact with the Project.

1.7 FLOODING

Office of Public Works (OPW) website and the CFRAM study were accessed (August, 2023) to determine flood areas within and near the Project. **Figure 1.1** shows the probability of flooding at and in the vicinity of the Project, along with records of past flood events.

The Project itself has no surface and groundwater records of flooding events (including winter 2015/2016 Geological Survey Ireland surface water flooding records). The nearest historical previous flood event occurred on O'Connell Street, approximately 800 metres northwest of the Project's boundary. There is no foreseen risk of a flood event extending to the Project. The nearest historical surface water flooding occurred in the Garavogue, which runs north and west of the Project site, and is approximately 550 metres north at its closest point.

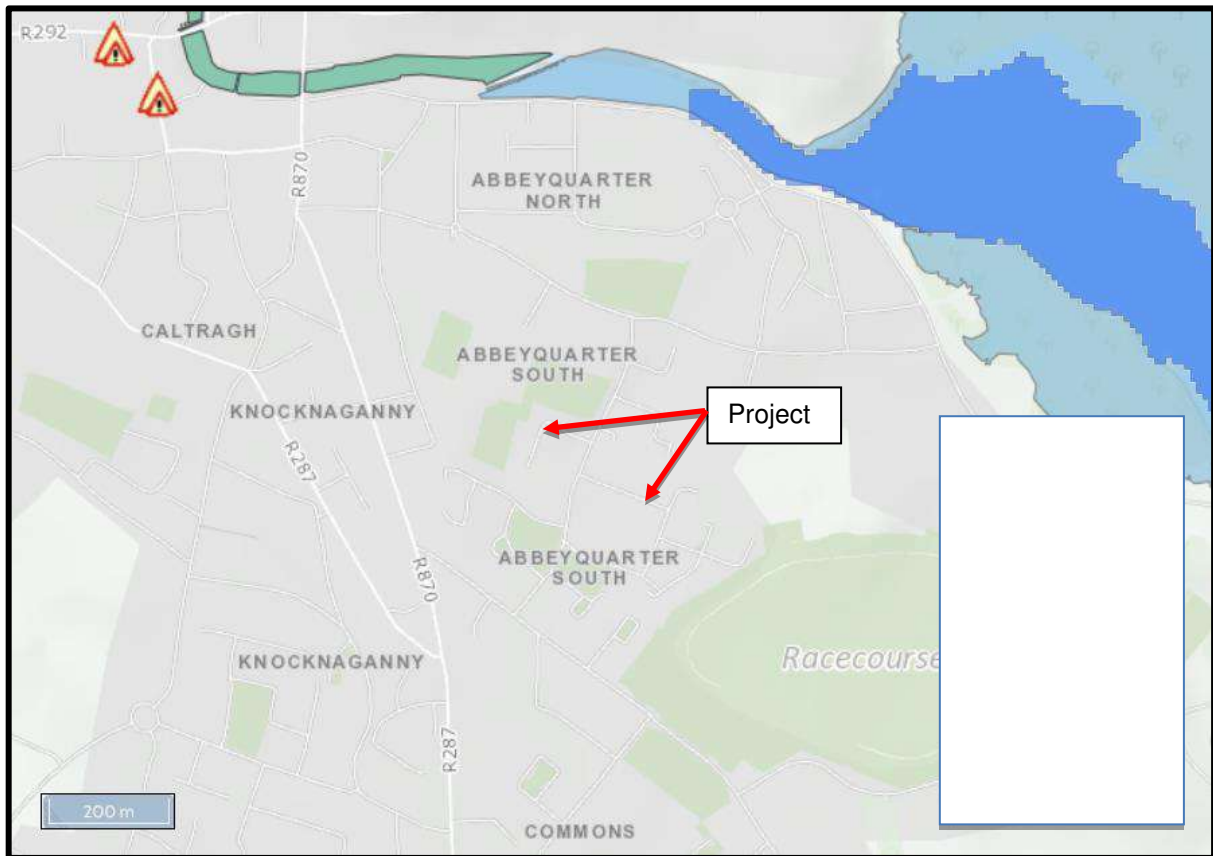


Figure 1.1 Flood map in the vicinity of the proposed Project, Co. Sligo (Source: www.floodinfo.ie, 2023)

The Geological Survey Ireland (GSI) Groundwater Flooding Probability Maps were also examined (August, 2023) to determine if there was an existing risk from groundwater flooding at the site. The groundwater flood mapping confirmed that the site is not at risk from groundwater flooding. Given that the entirety of bedrock at the work area is of 'Dartry Limestone Formation', there is not a high risk of groundwater flooding. In addition, there is no risk of tidal or pluvial flooding at this site.

The associated ground waterbody (GWB) Carrowmore East (EPA Code IE_WE_G_0042) is 'Karstic' and covers an overall area of approximately 73km². The Water Framework Directive (WFD) latest status for this GWB is 'Good'. The 2016-2021 overall groundwater status is 'Good', indicating no change from the previous monitoring periods 2013-2018 and 2010-2015 status. Four percolation test pits were excavated in 2023 for groundwater strike tests. All test pits were 2.2m deep and no groundwater or bedrock was encountered. Based on these onsite tests and other trial pits/works around Sligo town and in proximity to the Project, it is anticipated that the groundwater table will not be encountered at maximum excavation depths required during construction.

2 PROJECT DESCRIPTION

2.1 SITE LOCATION

The Project is located in the Cranmore area of Sligo Town, County Sligo. The Project is located at two separate sites, namely Geldof Drive and Benson Court.

Cranmore is located to the Southwest of the town centre and contains many amenities in the near proximity of the site (within a 10min. walking distance) such as large grocery stores including Dunnes Stores, Aldi and Lidl, a roman catholic church, a mosque, the Mercy Secondary school, Doorly Park Amenity, the Racecourse, the Riverside Promenade and more.

The Project is directly surrounded by residential housing estates. Larger commercial buildings are located north of the Project, as well as town centre, and the Garavogue. To the west of the Project, there is the Sligo racecourse, Cleveragh Retail Park, as well as Doorly Park, along the river. To the south, there are mainly housing estates, and Sligo Cemetery and Markievicz Park GAA Stadium. To the west are the Mercy College school, St John's National school, and Summerhill College; main roads include Pearse Road, Mail Coach Road and the N4 national road.

Currently, there are 10 no. single storey dwellings on the Geldof Drive part of the site. These dwellings are not inhabited and have been derelict for some time. They have temporary security screens installed to prevent entry into the houses.

Benson Court is currently a disused greenfield site, which has perimeter fencing, but open to the public, and maintained by the mowing of the grass. It is part of a larger green area and is located in the southeast corner. McNeill Drive, Langan Drive, Carroll Drive, and Devins Drive are housing complexes located nearby. 60 no. houses were demolished in 2009/2010 as a part of the Cranmore Regeneration Scheme.

This Project in its entirety covers an area of approximately 1.3 hectares.

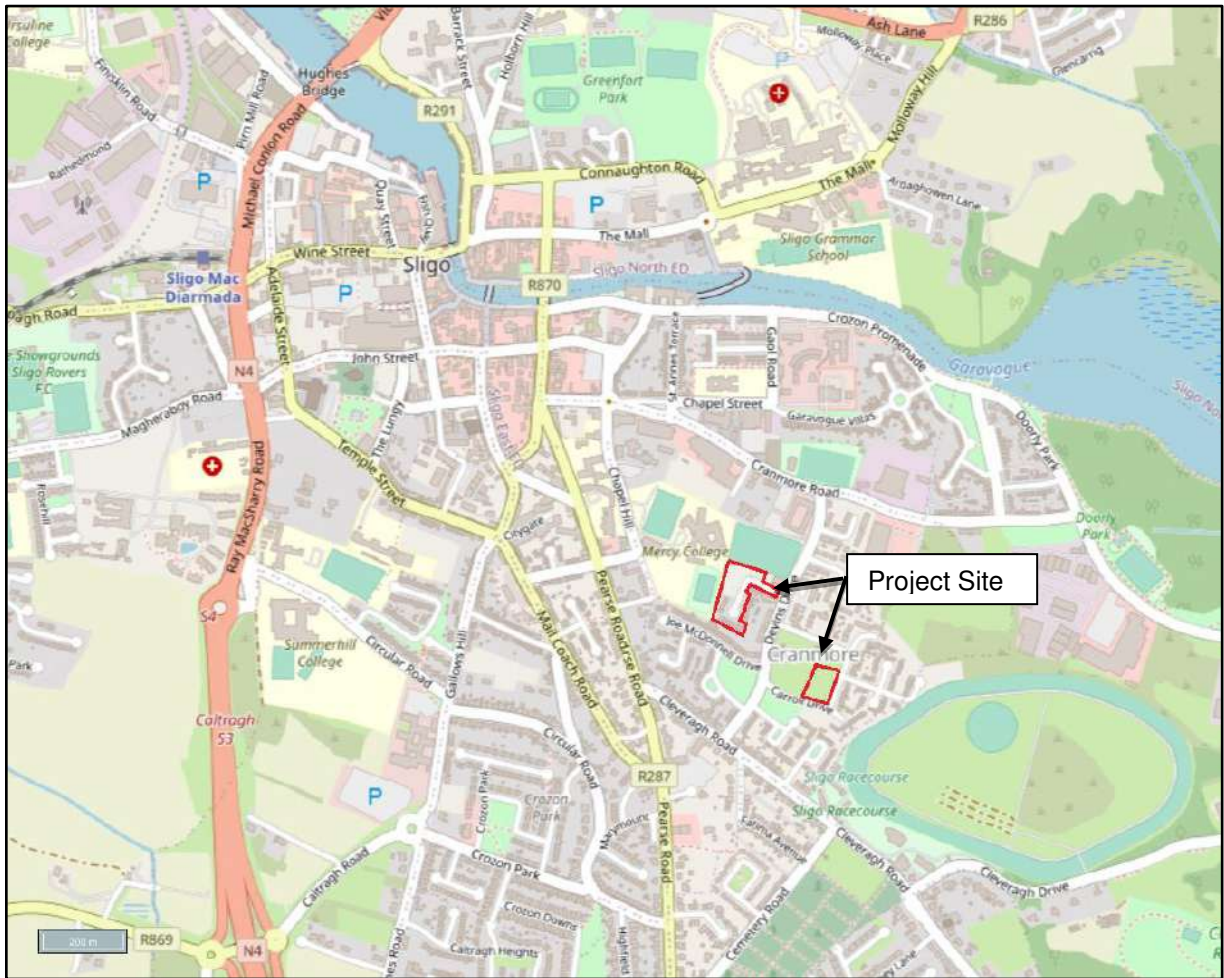


Figure 2.1: General location of the Project

2.2 PROPOSED WORKS

The proposed residential development will consist of four no. apartment blocks spread over two sites, for a total of 30 no. housing units. On Geldof drive, block A will contain 6 no. 2 Bed units, and block B will contain 8 no. 1 Bed units. It will also include a communal open space/community garden, and a new car park. The proposed site area at Geldof Drive is 0.8 ha. At Benson Court, block A will contain 8 No. 2 Bed Units, and block B will contain 8 No. 1 Bed units. An access road for Benson Court road will also be built. The proposed site area at Benson Court is 0.5 ha. Drawings associated with the Project are located in Appendix A. A technical memo relating to both surface and foul water drainage onsite is located in Appendix B.

The proposed Project area, in its entirety covers 1.3 ha.

3 RECEIVING ENVIRONMENT

3.1 GEOLOGY AND SOILS

The quaternary sediments at the site of the Project are classified as 'Urban'.

The Project is located within the Dartry Limestone Formation. This bedrock formation is described by the Geological Survey of Ireland as 'Dark fine-grained cherty limestone'. Corine 2018 denotes this area as *Discontinuous urban fabric*.

Investigative surveys were carried out by IGSL for C. S. Consulting Group on behalf of Sligo County Council. With regard to Benson Court, it was noted that 'MADE GROUND' extends to approximately 0.80 metres BELOW GROUND over most to the site. Below the MADE GROUND, a stratum of firm, becoming stiff, gravelly CLAY was noted. *In some locations more granular soils (typically clay-bound sandy GRAVEL) were noted. This stratum is a Glacial Till and is typical for the region. Ground water was not encountered* (Appendix C; Trial Hole Report). Similarly, Geldof Drive site exhibited MADE GROUND extending deeper to approx. 1.5m over much of the site with glacial till. Both reports noted that *no groundwater was encountered during the investigation and water ingress to excavations is not anticipated* during construction (Appendix C; Trial Hole Report).

3.2 HYDROLOGY AND HYDROGEOLOGY

The site overlies bedrock which is classified as a '*Regionally Important Aquifer – Karstified (conduit)*.' The groundwater vulnerability at the site is classified as 'H - High'. The Project is within a groundwater area denoted as SAC habitat sensitive and SAC species sensitive (EPA Maps website, accessed September 2023). However, as noted above water ingress to excavations is not anticipated for this Project.

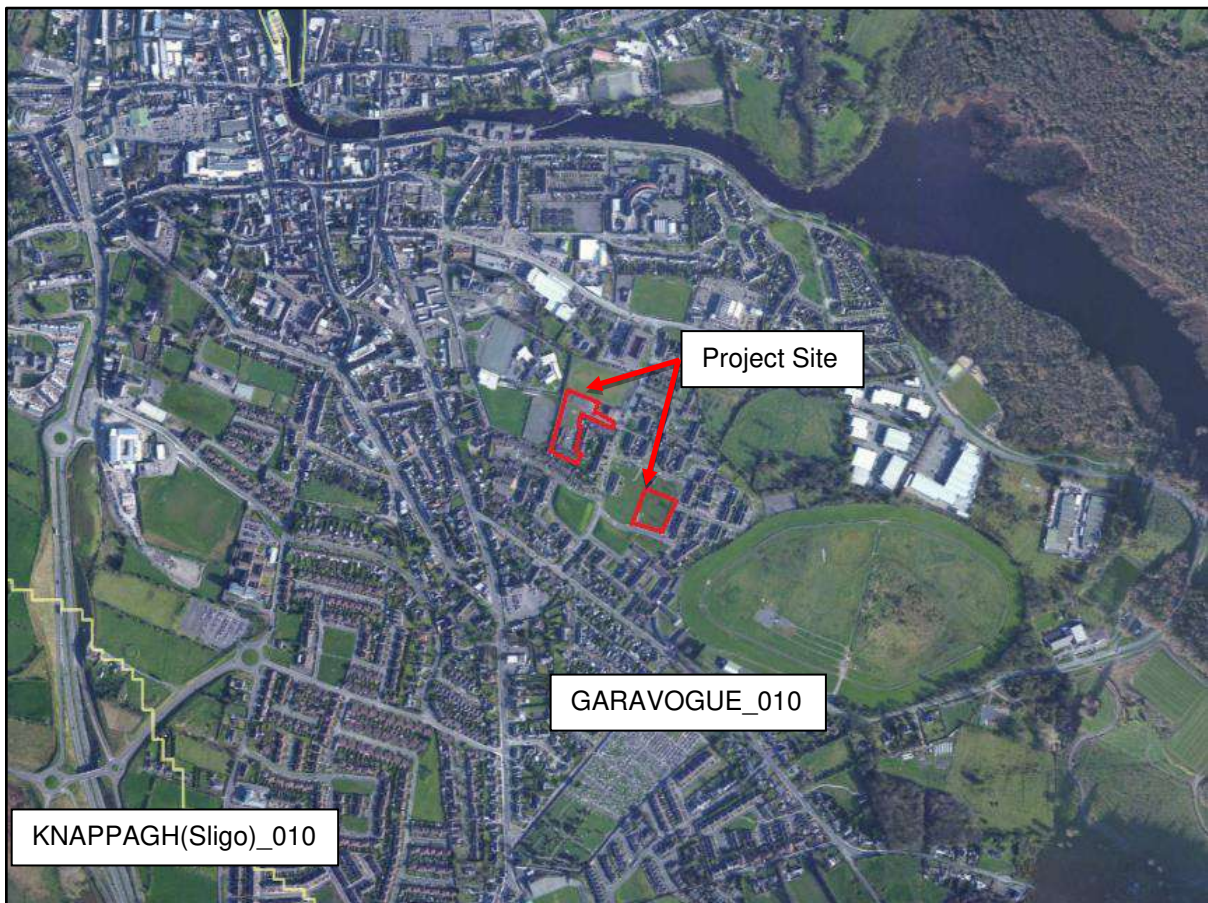


Figure 3.1: River Sub Basins (RSB) in the vicinity of the Project

The Project is wholly located within the GARAVOGUE_010 WFD River Sub Basin (RSB) (IE_WE_35G010200) covering an area of approximately 107km² (Figure 3.1). The RSB had 'Poor' ecological status for the 2016-2021 period and is qualified as 'At Risk' in the WFD.

The Garavogue River (Order 5) lies approximately 580 metres north of the Project (Figure 3.2) and is part of the Lough Gill SAC. This River flows in a north-westerly direction for approximately 1.4km and enters Cummeen Strand which is part of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and Cummeen Strand SPA. The flow of water continues in a westerly direction for approximately 9km before entering Sligo Bay and subsequently discharging into the Atlantic Ocean

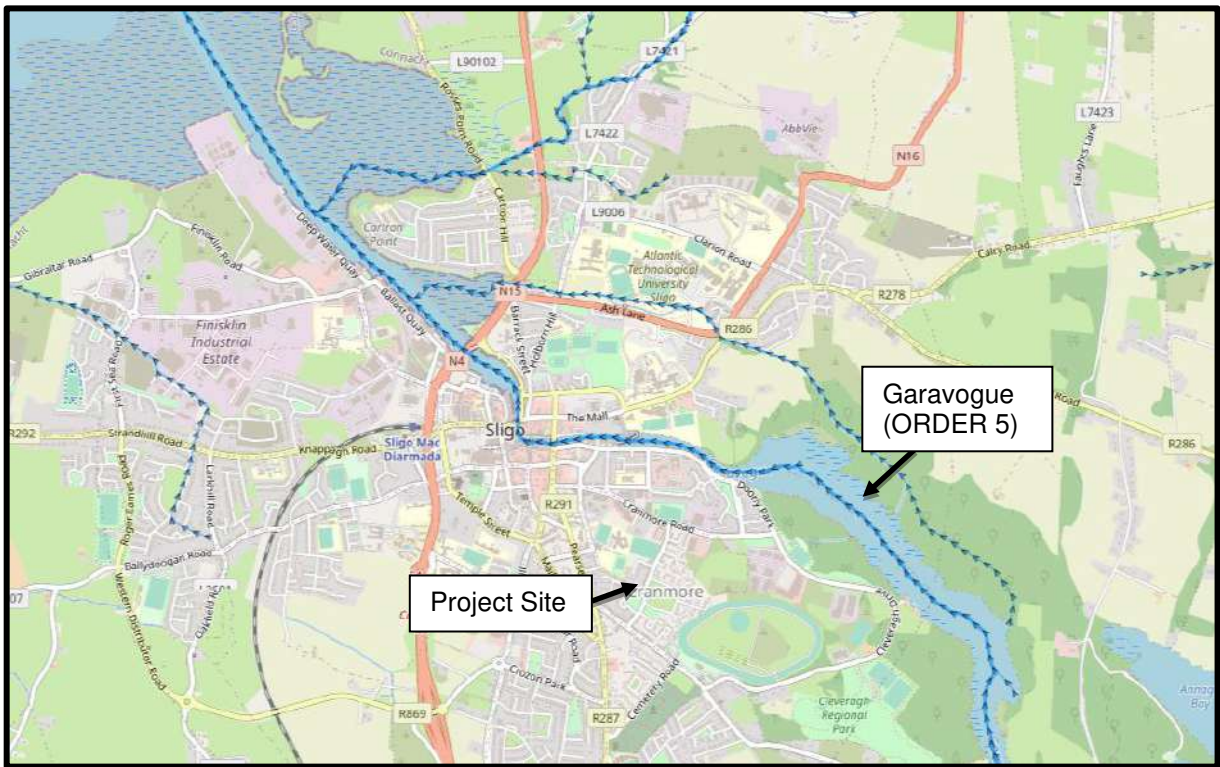


Figure 3.2: Watercourses and waterbodies in the vicinity of the Project

Currently, the groundwater in the area experiences pressure from Forestry. The nearest forests are Carns forest (approx. 1.3km southeast), and Hazelwood Forest (approx. 1.2km northeast), where there is commercial forestry and a Coillte regeneration project.

Other than the forestry pressures, the groundwater in the area has no significant underlying pressures, including waste abstraction, agriculture, anthropogenic, aquaculture, atmospheric, extractive industry, hydro morphology, invasive species, urban runoff or otherwise (EPA Water Maps, accessed August 18th, 2023).

The Project is also within the Carrowmore East groundwater body for the abstraction of drinking water (Article 7- EPA code IEPA1_WE_G_0042).

The EPA Maps (Water) website was also accessed (August 2023) to examine the Project area and its environs for nitrate and phosphorus loading and Pollutant Impact Potential (PIP). PIP maps for Nitrogen (N) and Phosphorus (P) have been generated by the EPA to show the highest risk areas in the landscape for losses of N and P to waters. The PIP model estimates the annual nutrient losses from agricultural land at specific locations, using spatial data from farm management, soils and hydrogeology. This model estimates loads at an annual temporal resolution.

The area immediately surrounding the Project is of residential (due west, south), commercial (due north) and educational (east – the Mercy college) use. The wider surrounding landscape includes Sligo Town centre to the north and northwest, North County Sligo with Rathcormack, Drumcliff and

Benbulbin to the north, Doorly Park, Hazelwood and Lough Gill to the east, Carraroe and the Pearse road and the N4 to the south, with Magheraboy and the Strandhill Road to the west.

The Project and immediate surrounding lands do not have a Phosphorus ranking. The wider area has phosphorus rankings between 3, 4, 5 and 7 (7 is the lowest impact ranking). Pollution Impact Potential Nitrate (PIP N) for the lands within and surrounding the Project also do not have a ranking. The wider area has nitrate rankings between 6 and 7 (7 is the lowest impact ranking). The lack of an overall ranking for these parameters likely reflects little fertiliser use on the Project land in the past, with low-level or no stock. Overall, the Critical Source Areas Maps for the Project and adjacent lands do not indicate a Site where either phosphorus or nitrates are a significant issue.

3.3 HABITATS:

A site visit was carried out in August 2023 on a dry, mild day with air temperature 13°Celsius. Four habitats (according to Fossitt, 2000) were noted in the survey area, namely BL3: Buildings and Artificial Substrates, WS3: Ornamental Scrub and a habitat mixture of GS2/GA2: Dry meadow and grassy verge/ Amenity Grassland.

There is no Annex I habitat occurring within or adjacent to the area of proposed works. No rare, threatened, or protected species of plants as per the Red Data Book (Curtis and McGough, 1988) were found. No species listed in the Flora Protection Order (2015) were found to be growing within the proposed site of works or adjoining lands.

Buildings and Artificial Substrates (BL3)

This is the primary habitat of the Project and incorporates all the artificial man-made surfaces and structures within the Project, including the 10. no derelict buildings and associated cement block wall up to 4 m tall with capping, cement walkway around buildings, an old basketball court, cement and tarmac footpaths, intervening pebble-dashed low front walls, kerbing and roads. The artificial surfaces are almost entirely devoid of vegetative cover; some cultivars overhang residential walls on occasion. Ivy (*Hedera hibernica*) and bindweed (*Convolvulus arvensis*) are common climbers alongside cleavers (*Galium aparine*). *Polypody interjectum* has colonised a section of the roofing at Geldof Drive.

The stone and cement wall by the old basketball court supports toadflax (*Linaria cymbalaria*), wall-rue (*Asplenium ruta-muraria*) and the non-native buddleja (*Buddleja davidii*). This wall also supports overhanging sycamore tree (*Acer pseudoplatanus*) and privet (*Ligustrum vulgare*). Colt's foot (*Tussilago farfara*) is present along the margins of some of the walkways and front gardens.

Ornamental Scrub (WS3)

The backyards of the ten derelict bungalow units at Geldof Drive have not been maintained. Subsequently vegetation has become overgrown and plants are naturally colonising the area.

Main trees include white poplar (*Populus alba*), butterfly-bush (*Buddleja davidii*), fuchsia (*Fuchsia magellanica*), lilac (*Syringa vulgaris*), ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*), and

willow species (*Salix* spp). Gooseberry shrubs are also present in the back yards. Some of the trees have gained good height, e.g. sycamore (*Acer pseudoplatanus*) and hawthorn (*Crataegus monogygna*) 4m tall. Dense clusters of vegetation include rosebay willowherb (*Epilobium angustifolium*), montbretia (*Crocsmia x crocosmiflora*), bramble (*Rubus fruticosus* agg.), nettles (*Urtica dioica*) etc. Sligo County Council recently cutback some of the vegetation to provide access to the rear yards.

There are further areas of ornamental scrub in a green area covering approx. 600m². Ornamental birch (approx.. 6m tall) are clustered over 8m x 4m and bamboo and rowan (*Sorbus aucuparia*) are also clustered and expand over approx. 7m x 4m.

Front gardens also supports small areas of scrub with trees overgrowing and intertwining and include sycamore 6m tall (*Acer pseudoplatanus*), ornamental hawthorn (*Crataegus* sp.), elder (*Sambucus nigra*), and rose bushes.

Dry meadow and grassy verge/ Amenity Grassland (GS2/GA2)

There is an amenity grassy area covering some 600m² (approx.) onsite at Geldof Drive. This habitat has not been maintained or recently mown and has also become overgrown. It supports some of the latter ornamental scrub outlined above. Grasses dominate the general vegetation with oat grasses standing tall above the general composition. Cock's-foot (*Dactylis glomerata*), rye grass (*Lolium perennae*), sweet vernal grass (*Anthoxantum odoratum*) and Yorkshire-fog (*Holcus lanatus*) are common. The broadleaved herbs include daisy (*Bellis perennis*), dandelion (*Taraxacum* spp.), clovers (*Trifolium* spp.), plantains (*Plantago* spp.), nettles (*Urtica dioica*), buttercups (*Ranunculus repens* and *acris*), bush vetch (*Vicia sepium*), ragwort (*Jacobeia vulgaris*), silverweed (*Potentilla anserina*) and some potato shoots. Montbretia (*Crocsmia x crocosmiflora*) is also present in this habitat.

Amenity Grassland (GA2) is the primary habitat (3,500m² approx.) at the Benson Court site. It supports a typical broadleaf / grass composition for this habitat type. The habitat is improved and is species-poor. It is regularly mown and sward height is very short overall.

3.4 INVASIVE SPECIES

No invasive alien species as listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) Part 1 or 2 or of Union Concern were recorded within the Project or its close environs (incorporating 7m in all directions, to allow for any Japanese knotweed root system).

4 SCREENING FOR APPROPRIATE ASSESSMENT

This AA Screening examined the likely significant effects of the Project, either alone or in-combination with other projects or plans on European Sites, that were situated within a ZoI, or a distance that has a potential source-pathway-receptor (SPR), both direct and indirect with the Project.

A total of thirteen European Sites (8 SACs and 5 SPAs) occur within a wider 15km radius of the Project and are listed below in Table 4.1.

Table 4.1: European Sites within a 15km radius

| No. | European Sites within 15km radius | Distance between the Project and European Sites |
|-----|---|---|
| | SAC | |
| 1 | Lough Gill SAC (001976) | 0.6km |
| 2 | Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC (000627) | 0.9km |
| 3 | Ballysadare Bay SAC (000622) | 5.5km |
| 4 | Union Wood SAC (00637) | 6.0km |
| 5 | Unshin River SAC (001898) | 6.5km |
| 6 | Ballysadare Bay SAC (000622) | 9.8km |
| 7 | Ben Bulben, Gleniff and Glenade Complex SAC (000623) | 7.9.8km |
| 8 | Streedagh Point Dunes SAC (001680) | 15.0km |
| | SPA | |
| 1 | Cummeen Strand SPA (004035) | 1.4km |
| 2 | Ballysadare Bay SPA (004129) | 5.5km |
| 3 | Sligo/Leitrim Uplands SPA (004187) | 6.0km |
| 4 | Drumcliff Bay SPA (004013) | 6.2km |
| 5 | Ballintemple and Ballygilgan SPA (004129) | 9.5km |

4.1 EUROPEAN SITES WITHIN THE ZONE OF INFLUENCE (ZOI) OF THE PROJECT

The European Sites identified as being within the Project Zone of Influence (ZoI) using the Source Pathway Receptor (SPR) principle, will be assessed to examine the likelihood of significant effects of the Project either alone or in-combination with other plans or projects, on any European Sites.

The Environmental Protection Agency (EPA) maps were used to identify European Sites that could potentially be located within the ZoI and possibly be connected to the Project site via pathways. In this instance, given the size and scale of the Project, the short-term temporary nature of the works, works will be contained within the Project site, a distance of 1000m from the Project has been identified as the ZoI for any European Site. Other European Sites with a hydrological link either upstream or downstream are considered to have a potential wider ZoI and are assessed separately in Section 4.2.

Two European Sites fall within the 1000m Zol of the Project, namely Lough Gill SAC (001976) (located approximately 600m north) and Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC (000627) (located approximately 970m northwest) (Figures 4.1 and 4.2 respectively). The next nearest European Site to the Project is Cummeen Strand SPA (004035) located over 1.4km northwest of the Project and across an urban sprawl and is not considered to be within the Zol. All other European Sites are greater than 5km distant and considered to occur outside of the terrestrial / airborne Zol of the Project (hydrological link to be assessed in Section 4.2) and have been 'screened out' at this stage. The two named SACs are also noted to be within an area where the groundwater is sensitive to SAC habitat and species. The Project is not within a site where groundwater is recognised as sensitive to a SPA.

Table 4.2: Relevant European Sites, reason for designation and data for Screening

| Designated Site | Reasons for designation (information correct as of 12 th May 2021) (*denotes a priority habitat) | Distance from Proposed Development (km) | Potential adverse effect: Source-Pathway-Receptor Linkage |
|---|---|---|---|
| SPECIAL AREAS OF CONSERVATION (SACs) | | | |
| Lough Gill SAC (001976) | <p>Species</p> <p><i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]</p> <p><i>Petromyzon marinus</i> (Sea Lamprey) [1095]</p> <p><i>Lampetra fluviatilis</i> (River Lamprey) [1099]</p> <p><i>Salmo salar</i> (Salmon) [1106]</p> <p><i>Lutra lutra</i> (Otter) [1355]</p> <p><i>Lampetra planeri</i> (Brook Lamprey) [1096]</p> <p>Habitats</p> <p>Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]</p> <p>Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]</p> <p>Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]</p> | The SAC occurs at a distance of approx. 0.6km northwest of the project site | <p>This SAC is designated for its role in supporting six water dependent species, and two water dependent habitats and two terrestrial based habitats. There is no possibility for significant effects on these ten QIs due to:</p> <ul style="list-style-type: none"> natural eutrophic lakes are located over 2.1km east of the Project (Map 3, NPWS 2021); due to the intervening urban landscape, lack of a hydrological link to this QI, there is no potential SPR from the Project to this QI, therefore direct or indirect effects are not anticipated. semi-natural dry grasslands are located over 5.5km east of the Project and north of Lough Gill (Map 4, NPWS 2021); due to the intervening urban landscape, and Lough Gill waterbody and associated watercourses, there is no potential SPR from the Project to this QI, therefore no direct or indirect effects are anticipated. old sessile oak woodlands [91A0] are located over 6.5km southeast on Killery mountain (Map 5, NPWS 2021); there is no potential SPR from the Project to this terrestrial based QI, therefore no direct or indirect effects are anticipated. alluvial forests [91E0] are located over 1.3km east on the northwestern shores of Lough Gill (Map 5, NPWS 2021); due to the intervening urban landscape, there is no potential SPR from the Project to this QI, therefore no direct or indirect effects are anticipated. works will not occur within the SAC, so direct impacts are not anticipated on any water or terrestrial dependent QIs. no surface hydrological link to this SAC and the respective eight water dependent QI; significant effects (direct or indirect) on any of these water dependent species or water based habitats are not anticipated during either the construction or |

| Designated Site | Reasons for designation (information correct as of 12 th May 2021) (*denotes a priority habitat) | Distance from Proposed Development (km) | Potential adverse effect: Source-Pathway-Receptor Linkage |
|---|--|--|---|
| | <p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)* [91E0]</p> | | <p>operation phase, as a result of the proposed Project</p> <ul style="list-style-type: none"> groundwater investigation trial holes noted no groundwater at a maximum depth of excavation works; significant effects on groundwater as a result of the construction and operation are considered unlikely. no potential SPR to any QI of this SAC all works will be contained within the Project site the size and scale of the Project works within a Project area of 1.3 hectares. works are temporary, short-term and localised; significant effects are not anticipated. |
| <p>Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC (000627)</p> | <p>Species</p> <p><i>Vertigo angustior</i> (Narrow-mouthed Whorl Snail) [1014]</p> <p><i>Petromyzon marinus</i> (Sea Lamprey) [1095]</p> <p><i>Lampetra fluviatilis</i> (River Lamprey) [1099]</p> <p><i>Phoca vitulina</i> (Harbour Seal) [1365]</p> <p>Habitats</p> <p>Estuaries [1130]</p> <p>Mudflats and sandflats not covered by seawater at low tide [1140]</p> <p>Petrifying springs with tufa formation (Cratoneurion) [7220]</p> <p>Embryonic shifting</p> | <p>The SAC occurs at a distance of approx. 0.9km northwest of the project site</p> | <p>This SAC is designated for its role in supporting three water dependent species, three water dependent habitats five terrestrial based habitats and one terrestrial based species. There is no possibility for significant effects on these twelve QIs due to:</p> <ul style="list-style-type: none"> estuaries are located over 1.3km northwest of the Project (Map 3, NPWS 2013); due to the lack of a hydrological link to this QI, intervening urban landscape, there is no potential SPR from the Project to this QI, therefore direct or indirect effects are not anticipated. mudflats and sandflats are also located over 1.7km northwest of the Project (Map 4, NPWS 2013); due to the lack of a hydrological link to this QI, intervening urban landscape, there is no potential SPR from the Project to this QI, therefore direct or indirect effects are not anticipated. petrifying springs are located over 4.8km northwest of the Project (Map 7, NPWS 2013); due to the lack of a hydrological link to this QI, intervening urban landscape, there is no potential SPR from the Project to this QI, therefore direct or indirect effects are not anticipated. dune QI systems [2110], [2120], [2130] and [5130] are all located over |

| Designated Site | Reasons for designation (information correct as of 12 th May 2021) (*denotes a priority habitat) | Distance from Proposed Development (km) | Potential adverse effect: Source-Pathway-Receptor Linkage |
|-----------------|--|---|--|
| | <p>dunes [2110]</p> <p>Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]</p> <p>Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]</p> <p><i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]</p> <p>According to this SAC's site Conservation Objectives document (Version 1. Department of Housing, Local Government and Heritage, 2013), for the listed QI, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and Annex II species for which the SAC has been selected.</p> | | <p>9.3km west of the Project (Map 6, NPWS 2013); due to the intervening urban landscape, there is no potential SPR from the Project to this QI, therefore direct or indirect effects are not anticipated.</p> <ul style="list-style-type: none"> • <i>Vertigo angustior</i> [1017] are located over 9.5km west of the Project (Map 7, NPWS 2013); due to the intervening urban landscape, there is no potential SPR from the Project to this QI, therefore direct and/or indirect effects are not anticipated. • no surface hydrological link to this SAC and the respective water dependent QI; significant effects (direct or indirect) on any of these water dependent species or water based habitats are not anticipated during either the construction or operation phases of the Project • works will not occur within the SAC, so direct impacts are not anticipated on any QI. • no surface hydrological link to this SAC and /or sea and river lamprey and harbour seals; direct or indirect impacts are not considered likely. • mobile nature of harbour seals • groundwater investigation trial holes noted no groundwater at a maximum depth of excavation works; significant effects on groundwater as a result of the construction and operation are considered unlikely. Therefore, despite the Project being located within and area where the groundwater is sensitive for SAC habitat and species, there is unlikely to be any significant impact on these QI species and /or habitats. • no potential SPR to any of the QI of this SAC. • all works will be contained within the Project site. • the size and scale of the Project works within a Project area of 1.3 hectares. • works are temporary, short-term and localised; significant effects are not anticipated. |

European Sites closest to the Project are outlined in Figures 4.1 and 4.2 and include Lough Gill SAC and Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC.

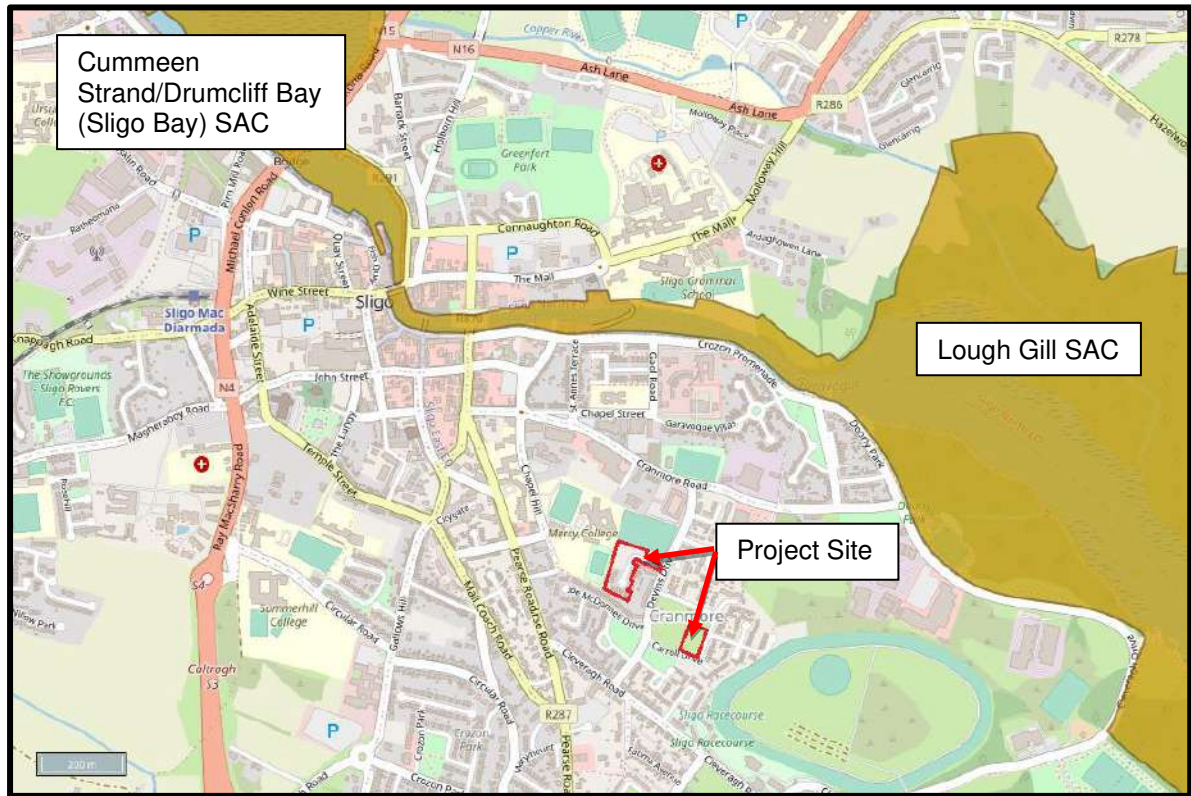


Figure 4.1: Project site showing the closest European SACs Sites

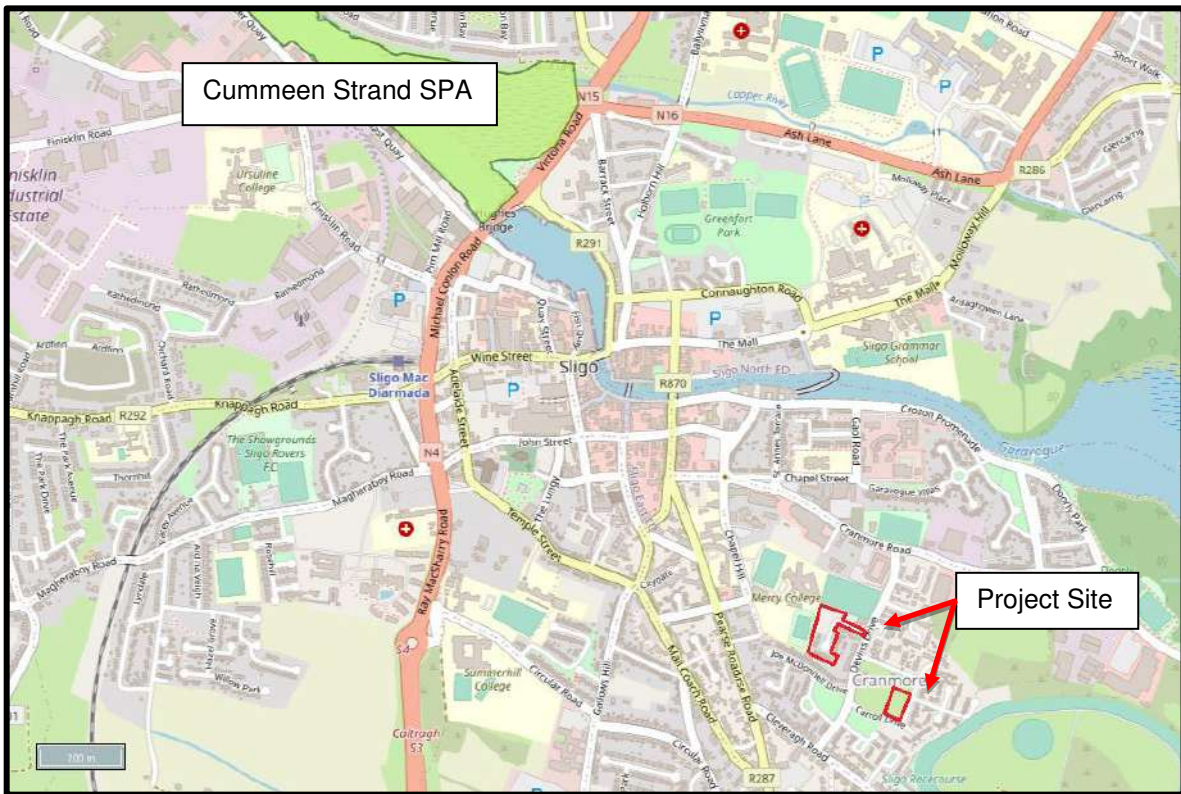


Figure 4.2: Project site showing the closest European SPA Sites

In relation to mobile species listed as qualifying features of European Sites, the following guidance was used to identify whether it recommends the European Site is located within the Zol of the Project:

- SPAs with mobile bird species: “Assessing connectivity with Special Protection Areas (SPAs)” (2016) guidance document was used to identify connectivity between the Project site and SPAs in the wider surrounding area (SNH, now Natural Scotland) as applicable.
- SACs with bats as a qualifying feature were included when the Project occurred within the core sustenance zone of the qualifying bat population. No SACs occurred within a 5km radius designated for this qualifying feature.
- SACs with marsh fritillary as a qualifying feature are included where suitable marsh fritillary habitat occurs within the Project site footprint and where the Project site is located within a 10km radius of a marsh fritillary population. No suitable habitat (Devil’s bit scabious) was detected during the multi-disciplinary site walkover at Benson Court or Geldof Drive. It is also noted that no SACs occurred within a 10km radius designation for this qualifying feature.

Nonetheless, further investigation of a SPR is assessed in Section 4.2 to confidently determine if there will be any potential effect on any European Site hydrologically linked and during the construction or operation this Project.

4.2 IDENTIFICATION OF SOURCE PATHWAY RECEPTOR (SPR) MODEL PATHWAYS

Under the SPR model, the works associated with the construction and operation of the Project represent the source of potential impacts.

Pathways that could arise as a result of Project works and lead to potential impacts are listed below and an appraisal of these pathways potential to connect this Project to European Sites and their qualifying features of interest (which represent the receptors under the SPR model) is also provided:

Emissions to surface water during construction and operation: There is no hydrological connection to the Garavogue River and no potential for a surface water pathway to arise and result in emissions to the Garavogue River. Intervening landscape and land use also support the dissipation of any surface runoff from the site. Works are very localised and will occur within the Project site. There is no surface water pathway from the Project works to any European site via a hydrological pathway. The proposed new surface network from the Project will connect to the Sligo combined network. This strategy formed part of a Pre-Connection Enquiry to Irish Water and received a favourable Confirmation of Feasibility stating no issue with the proposed strategy (Appendix B: Technical Memo).

The storm drainage for the entire development has been designed in accordance with the Greater Dublin Strategic Drainage Study (GSDSDS). Drainage details are outlined in Appendix A in Drawings and in the Technical Memo (Appendix B). The storm water drainage design has been designed to cater for surface water from hard surfaces in the proposed development including roadways, footpaths, and the proposed buildings.

To ensure the water being discharged to the ground is free of any contaminants the following are being provided:

- All surface water from roadways and adjacent footpaths will be collected via road gullies which provide an initial leaf/debris guard and silt trap.
 - All surface water from roofed areas and hardstanding areas will be collected via rainwater gullies which provide an initial leaf/debris guard and silt trap.
 - A Class 1 Petrol/Oil Interceptor, designed and installed in accordance with IS EN 858, will be provided just prior to the last manhole before the attenuation tank. This will ensure that all surface water from the site will be cleansed by the interceptor prior to entering the attenuation tank.
 - The last manhole prior to the infiltration tank will be provided with a 400mm deep silt trap, to further reduce any fine materials reaching the infiltration tank.
- Emissions to groundwater: The groundwater flood mapping confirmed that the site is not at risk from groundwater flooding with no historic record of groundwater flooding at the Project site. Given that the entirety of bedrock at the proposed work area is of Dartry Limestone, there is little risk of groundwater flooding. In addition, there is no risk of tidal or pluvial flooding at this site. Also, given that works will be carried out according to the methodology outlined in Section 2.2 and no groundwater was encountered during trial pit excavations,

pathways carrying nutrients, silt or contaminants to SAC/SPA groundwater are considered unlikely.

- Emissions to air: the Project site will not result in perceptible emissions to air. Significant adverse air emissions to any QI are not anticipated during construction or operation. There is intervening urban sprawl between the Project and the nearest European sites.
- Light emissions: the Project site is located in an urban area. Project works will only be carried out during daylight hours. Bat species are not qualifying features of the surrounding European Sites and therefore have no impact from any lighting issue as a result of this Project during construction or operation. However, NBDC notes several bat species utilising the local area (1 and 2km² radius). Proposed lighting will adhere to the best practice lighting standards provided in the Institute of Lighting Professionals (ILP) guidance document Guidance Note 08/18 – Bats and Artificial Lighting in the UK (2018).
- Visual emissions: The Project works were not predicted to have the potential to result in visual emissions that could generate disturbance to qualifying species of any European Site during construction or operation.
- Human disturbance pathway: Human disturbance to a European Site can occur as an indirect impact arising as a result of land use activities generated by a project. An example of such an indirect impact is an increase in human presence and associated pressures within a European Site. The potential for a human disturbance pathway, through which a proposed development could generate activity within European Sites and result in disturbance to qualifying habitats or species is also identified as a potential pathway requiring examination. Given that the local area is already proximate to residential properties, and urban sprawl, the increase in human activity is unlikely to pose a new or combined significant effect on any qualifying interest of the nearby European Sites or any other European Site.

In light of the above screening assessment, no significant effects have been identified between the Project and any qualifying feature of a designated European Site during either construction or operation.

4.3 IN-COMBINATION EFFECTS

Planning Permission Applications

While effects on European Sites are not expected as a result of the construction and operation of the Project, the potential for cumulative effects on these designated sites due to other plans and projects acting in-combination with the Project are considered. The Sligo County Council on-line planning application portal was used to search planning applications close to the Project (September, 2023). A five-year search timeframe was assessed; Retention, refused and withdrawn planning applications were excluded. **Table 4.3** shows the planning applications in close proximity to the Project (circa 100-0m).

Table 4.3: Planning applications in close proximity to the Project.

| Planning Reference | Description of Development | Site Address | Decision Date | Distance from Site |
|--------------------|--|---|--------------------------------|--------------------------------------|
| 19265 | Development consisting of the provision of a 150m ² single storey prefab building comprising 2 no. ASD classrooms and ancillary accommodation along with all associated site works and site services | Mercy College Sligo, Chapel Street, Sligo, F91 CF80 | 12/08/2019 (works complete) | approx. 10m from the project site. |
| 21338 | Development consisting of amendments to planning application Reference 18/198: the overall layout of the site stays generally the same as before with the foodstore (including ancillary off-licence sales area) with all adjustments to the orientation and movement closer to the western boundary. The gross floor area increases from 2416sqms to 2537sqms. The trolley bay moves from the car park to a location next to the entrance to the store; revised parking layout and pedestrian walkways (parking changes from 140 spaces to 135 spaces); revised mechanical plant area; ESB sub-station building; cycle parking relocated from the front of the store to the same location (under cover) as the trolley bay, next to the access doors; the inclusion of 2 EV parking spaces and the provision of 10 additional "ready to go" EV charging point spaces for future conversion; replace the permitted "Totem" sign at the proposed vehicular entrance with a "Flagpole" sign and other proposed signage with an area of 75sqms; and, the addition of Photovoltaic (PV) panels on the roof of the foodstore. All associated works, drainage landscaping (hard and soft) to facilitate the development. | Lidl Foodstore, Cranmore Road, Sligo, Co. Sligo | 21/12/2021 (works complete) | approx. 200m from the project site. |
| 20445 | Development consisting of the construction of 64 accommodation units in 5 separate blocks with the following typology: 2 no. accommodation blocks with 8 no. Three bed units and 3 no. accommodation blocks with 16 no. Two bed units. Additional works to the site include landscaping, play areas, proposed 204 car parking spaces, boundary treatment, proposed new main entrance and all associated site works and services within the curtilage of a protected structure RPS Ref 12 SE and 13 SE/NIAH 32012037 as identified in the Sligo County Development Plan 2017-2023 | Globe House, Chapel Hill, Abbeyquarter South, Co. Sligo | 10/12/2021 | approx. 210 m from the project site. |
| 18330 | For development consisting of the construction of 2 no. portacabins and internal alterations to the ground, first and second floor of the protected structures to include the dining area, communal kitchen, communal living areas and repairs to be made to the existing flat roofs and all associated site works and services for development at Globe House, which are protected structures RPS 12 and 13 as identified in the Sligo County Development | Globe House, Chapel Hill, Abbeyquarter South, Co. Sligo | 25/09/2018 (works complete) | approx. 230m from the project site. |

| Planning Reference | Description of Development | Site Address | Decision Date | Distance from Site |
|--------------------|--|--|---------------|-------------------------------------|
| | Plan Record of Protected Structures 2017-2023 | | | |
| 2019 | For development consisting of the repositioning of pedestrian and vehicular access onto Pearse Road, along with new driveway, in curtilage parking and associated landscaping | Pearse Road, Abbeyquarter South, Sligo, F91 HDN7 | 13/03/2020 | approx. 180m from the project site. |
| 20293 | PP - development consisting of 1. Demolish existing dwelling house and attached garage. 2. Construct 2 no. 3 storey type detached dwelling houses, a new vehicular entrance onto Pearse Road (existing entrance onto Cleaveragh road to remain), connect to public services and carry out other associated site works at the corner | Cleaveragh Road and Pearse Road, Knocknaganny Td., & Abbeyquarter South Td., , Sligo | 14/10/2020 | approx. 180m from the project site. |
| 20152 | Development consisting of the erection of 1 no. two storey dwelling and 1 no. storey and a half dwelling and all associated siteworks, including garden walls and carparking area on my land | Pearse Road, Knocknaganny, Sligo | 16/07/2020 | approx. 370m from the project site. |
| 21384 | Development consisting of a proposed two-storey dwelling house, to create a new entrance onto the public road and carry out all ancillary site works | Pearse Rd., Knocknaganny Td., Sligo, Co. Sligo | 16/11/2021 | approx. 440m from the project site. |
| 20268 | Development consisting of (1) the subdivision of the existing plot to provide revised site boundaries for the existing dwelling (2) construct a two storey type domestic dwelling (3) construct a new site entrance (4) to connect to the existing public foul sewer mains and all associated ancillary works | Cemetery Road, Sligo, Co. Sligo | 28/09/2020 | approx. 300m from the project site. |
| 22385 | Development consisting of construction of 3 no. new stables building's (providing a total of 17 no. individual stables) and all associated site development works | Sligo Racecourse, Cleveragh Road, Sligo | 06/03/2023 | approx. 170m from the project site. |
| 21190 | Development consisting of the following: (a) a total of 34 no. residential units consisting of 1 no. - Type A - 2 Bed Bungalow House 1 No. - Type A1 - 2 Bed Bungalow House 1 No. - Type A2 - 2 Bed Bungalow House 2 no. - Type A3 - 2 Bed Bungalow Houses 7 no. - Type B - 3 Bed Semi Detached Houses 5 no. - type B1 - 2 Bed Mid Terrace/Semi Detached Houses 1 no. - type B2 - 3 Bed Semi Detached House 5 No. - Type C - 3 Bed Semi Detached / Detached Houses 4 no. - Type C1 - 3 Bed Semi Detached/Mid Terrace Houses 1 no. - Type C2 - 4 Bed Semi Detached House 3 no. - Type D - 4 Bed Semi Detached Houses 3 no. - Type D1 - 4 bed semi detached houses (b) all car parking, landscaping, entrance improvements, pump station and all associated site works | Tonaphubble Road, Sligo, Co. Sligo | 18/11/2021 | approx. 630m from the project site. |

| Planning Reference | Description of Development | Site Address | Decision Date | Distance from Site |
|--------------------|--|--|---------------|---|
| 19414 | For development consisting of a change of use from existing industrial unit to gymnasium and associated signage | Unit B2, Cleveragh Industrial Estate, The Back Avenue, Cleveragh, Sligo | 19/11/2019 | approx. 790m from the project site. |
| 19111 | Development consisting of the construction and installation of 4 floating Angling Stands and associated site works. The proposed Angling stands, varying in lengths are to be located along the existing riverside walk. The Angling Stands comprises of a galvanised access ramp, connected to a 'T' shaped floating platform. each floating stand will be anchored to 2 no. concrete pads which will be placed on the river bed, shore side of the Angling Stand. The documents to be submitted as part of this planning application will include a Natura Impact Statement. | Upper Garavogue River, Doorly Park, Cleveragh Demense Td, Sligo | 09/05/2019 | approx. 760m from the project site. |
| 2343 | Development consisting of construction of a single storey Deposit Return Scheme (DRK) Kiosk (gross floor area: 17 sq. m), including 2 no. signage panel areas for branding on the side elevation of the DRS Kiosk (1.0m x 2.0m), and all associated site development works | Aldi Store, Cranmore Lane, Sligo, Co. Sligo | 08/06/2023 | approx. 270m from the project site. |
| 21290 | Development consisting of construction of a new two-storey pitched roof extension to the side of existing dwelling which will incorporate existing first floor flat roof extension (the proposed extension will comprise of an additional 5.46 sq. m to the first floor and 17.81 sq. m to the ground floor) | 48 Cranmore Drive, Cranmore, Sligo Town, County Sligo F91 WFE4 | 15/09/2021 | approx. 120m from the project site. |
| 2194 | Development consisting of the following 1. Demolish existing single storey rear extension and shed 2. construct single storey extension to the rear of existing dwelling house 3. construct new vehicular entrance to dwelling house with all associated works | 76 Doorly Park, Sligo | 12/05/2021 | approx. 590m from the project site. |
| 20236 | PP - for development consisting of (a) Material change of use of existing domestic garage into a bedroom and en-suite, (b) Alterations to existing garage front facade to include 2 new windows in place of existing garage door and parapet modifications, (c) Construction of a new roof over the existing garage and strengthening of walls, (d) Construction of a new rear extension to connect garage and dwelling, together with all associated site works | Knocknaganny TD, Cleveragh Road, Sligo | 31/08/2020 | approx. 370m from the project site. |
| 21431 | Development consisting of construction of 2 storey extension to the rear of existing dwelling house with alterations to elevations and all associated works | 2 Edenvale, Pearse Road, Sligo | 17/12/2021 | approx. 350m from the project site. |
| 22326 | Development consisting of the construction of the following: to demolish the single storey | Knocknaganny, Pearse Rd., | 23/11/2022 | approx. 500m |

| Planning Reference | Description of Development | Site Address | Decision Date | Distance from Site |
|--------------------|--|---|---------------|-------------------------------------|
| | extension to the rear of the dwelling and attached garage to the side and rear. Demolish covered porch section to the front elevation and alter the eaves height to a portion of the front elevation only. Alter the window and door opes of the existing elevations to facilitate the construction of new windows and doors and to include the omission of the dormer structure on the front elevation. To alter the external render finishes of the existing dwelling. Replace the roof structure of the retained storey and a half dwelling to include for the provision of a solar array system on the southern roof plane. Construct a new dormer structure to the rear of the existing roof. Construct 3nr rooflights on the southern roof plane in -lieu of the existing gable windows. To construct a new single storey extension to the side and rear of dwelling comprising of a pitched and flat roof. Reconnections to existing site services and all associated site development works deemed necessary | Sligo, F91K5FV | | from the project site. |
| 2264 | Development consisting of: (i) construction of a two-storey rear extension, (ii) reduction of existing ground floor window and proposed window to new stairwell on north elevation, (iii) change of windows to the front elevation of the existing house, (iv) proposed new Porch and front door to the existing house and, (v) carrying out of all ancillary site works | No. 25 Marymount, Pearse Road, Knocknaganny Td, Co Sligo F91 NDF8 | 14/04/2022 | approx. 480m from the project site. |
| 2338 | Development consisting of revisions to previously approved planning application ref. no. 22/181. The revisions include the change of house numbers 3 and 14 from 2 bed semi-detached houses to 3 bed semi-detached houses and associated site works | Newtownholmes Road, Caltragh, Sligo, Co. Sligo | 18/05/2023 | approx. 960m from the project site. |
| 21293 | Development consisting of construction of first floor extension to the side of existing dwelling house with alterations to elevations and all associated works | 72 Heatherview, Tonaphubble, Sligo | 15/09/2021 | approx. 900m from the project site. |

There were no other planning applications in the area at the time of writing (September, 2023).

The AA Screening Assessment has shown there will be no likely significant effects to any European Site during the construction or operation of the Project. Works will be contained within the site; it is anticipated that there will be no in-combination impacts from any local planning applications.

5 SCREENING ASSESSMENT – CONCLUSION

It can be objectively concluded that there are not likely to be any significant effects on any European Site as a result of the construction or operation of the Project at Cranmore, Co. Sligo. Therefore, an Appropriate Assessment is not required.

6 RECOMMENDATIONS

A) While no invasive alien species as listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) Part 1 or 2 or of European Union Concern were recorded within the Project or its close environs (incorporating 7m in all directions, to allow for any Japanese knotweed root system), there are non-native plants onsite that are invasive and can cause problems into the future if not handled and managed correctly. These include the following:

- *Buddleja davidii* (butterfly bush) should be treated and controlled onsite. It is a highly invasive plant that produces a lot of light seeds which spread extremely easily. It can grow in many habitats and can develop in the smallest of spaces, e.g. between stones in a wall. It can grow rapidly and form thickets, outcompeting other native plants.
- *Griselinia* (*Greslinia lucida*) and *Montbretia* (*Crocsmia*) should also be treated and controlled onsite.

B) A lighting professional should be appointed to prepare a final lighting scheme design and/or lux calculations or undertake baseline light surveys as necessary. A dimming profile of the lighting system should be discussed and agreed with the local authority to avoid and /or reduce any harmful effects of new artificial lighting on local bats and their habitats. Lighting should avoid key habitats and features onsite. The lighting should demonstrate compliance with lux limits and buffers for all bat species frequenting the area. Bat and lighting monitoring may be required during operation.

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APPENDIX A: DRAWINGS



853400

835300

Cranmore - Geldof Drive Site Plan
Scale 1 : 250

Notes:
 - Do not scale from this drawing. Use figured dimensions in all cases.
 - Verify dimensions on site and report any discrepancies to the Architect immediately.
 - This drawing to be read in conjunction with the Architect's Specification.
 - © This drawing is copyright and may only be reproduced with the Architect's permission.

Drawing Notes:

TOTAL 14 UNITS

6 No. 2 Bed Units - Type A
 8 No. 1 bed Units - Type B

Site Area (Red Line Boundary) 0.80 Hec
 Public Open Space 15% 1200 sqm

Carparking 27 Spaces

Existing Tree Proposed Tree

| Rev. | Date | Drawn | Issued For Information |
|------|----------|-------|-----------------------------|
| P01 | 12/06/23 | PJC | Details of Issue / Revision |

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Client Details:
Sligo County Council

Project Details:
Cranmore - Sligo

Drawing Title:
Geldof Drive Site Plan

| | | |
|---|--|----------------------------|
| Job No. P22-240D | Sheet Size: | Scale @A1: As indicated |
| Issue Date: 12/06/23 | Drawn By: PJC | Reviewed By: KK |
| Status S | Purpose of Issue For Information | |
| Project-Originator-Zone-Level-Type-Role-Classification-Number RAU-ZZ-DR-A-00-0010 | | Revision P1 |



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 - Verify dimensions on site and report any discrepancies to the Architect immediately.
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Drawing Notes:

TOTAL 14 UNITS

8 No. 2 Bed Units - Type A
 8 No. 1 bed Units - Type B

Site Area (Red Line Boundary) 0.5 ha
 Public Open Space 15% 750 sqm

Car parking 24 Spaces

Existing Tree
 Proposed Tree

| Rev. | Date | Drawn | Issued For Information |
|------|----------|-------|-----------------------------|
| P01 | 12/06/23 | PJC | Details of Issue / Revision |

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Client Details:
Sligo County Council

Project Details:
Cranmore - Sligo

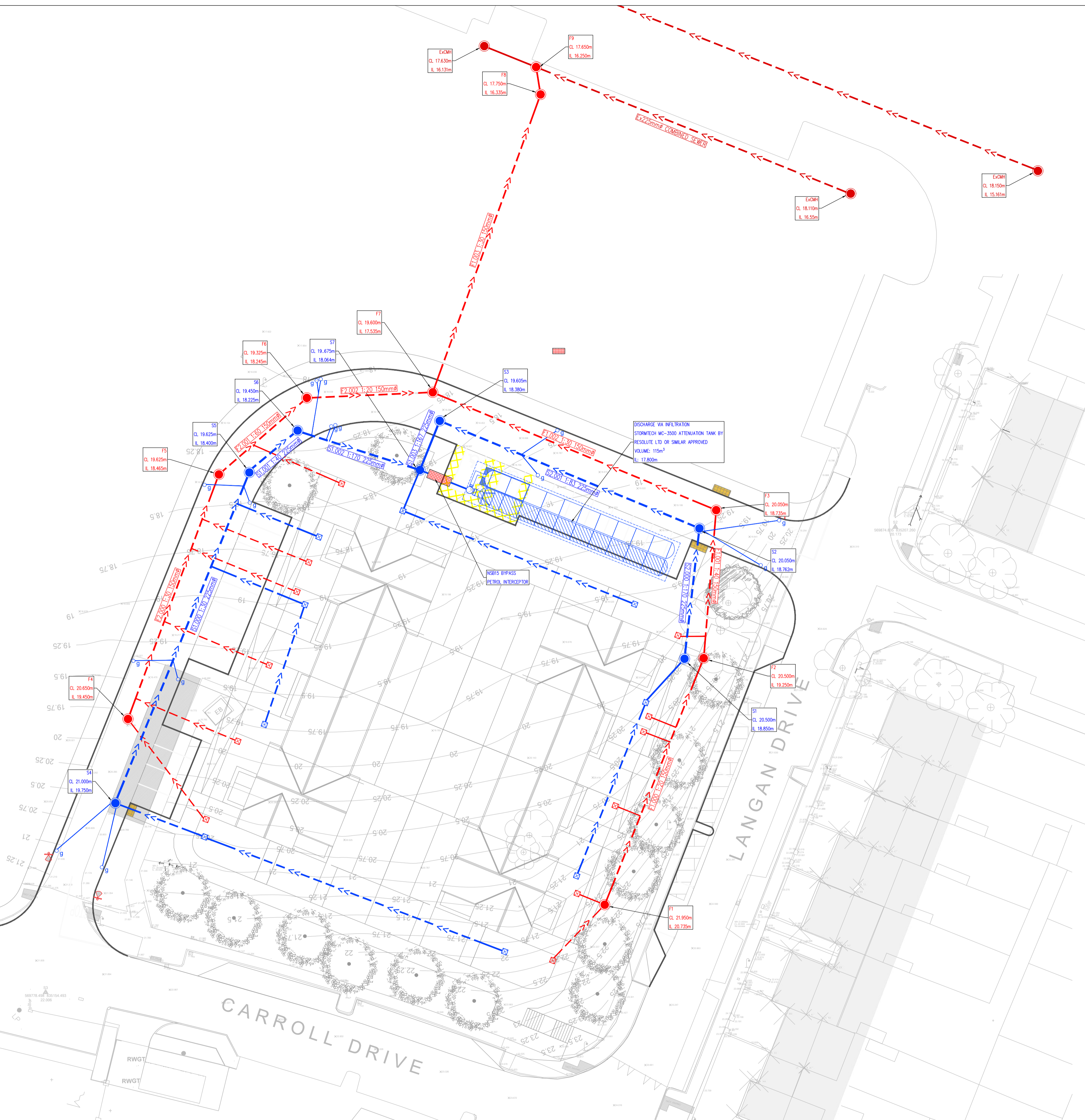
Drawing Title:
Benson Court Site Plan

| | | |
|---|--|----------------------------|
| Job No. P22-240D | Sheet Size: | Scale @A1: As indicated |
| Issue Date: 12/06/23 | Drawn By: PJC | Reviewed By: KK |
| Status S | Purpose of Issue For Information | |
| Project-Originator-Zone-Level-Type-Role-Classification-Number RAU-ZZ-DR-A-00-0011 | | Revision P1 |



LEGEND:

| | |
|--|--|
| SITE BOUNDARY | |
| PROPOSED FOUL SEWER | |
| PROPOSED SURFACE WATER SEWER | |
| EXISTING FOUL SEWER | |
| EXISTING SURFACE WATER SEWER | |
| PROPOSED CULVERT DIVERSION OF EXISTING STREAM | |
| EXISTING FOUL SEWER REMOVED AFTER DIVERSION | |
| EXISTING SURFACE WATER SEWER REMOVED AFTER DIVERSION | |
| 6.0m IRISH WATER WAYLEAVE/EASEMENT | |



R119

INFORMATION ONLY
 THIS DRAWING HAS BEEN ISSUED FOR INFORMATION PURPOSES ONLY AND MUST NOT BE USED FOR CONSTRUCTION UNDER ANY CIRCUMSTANCES

- NOTES**
- For setting out refer to Architect's drawings.
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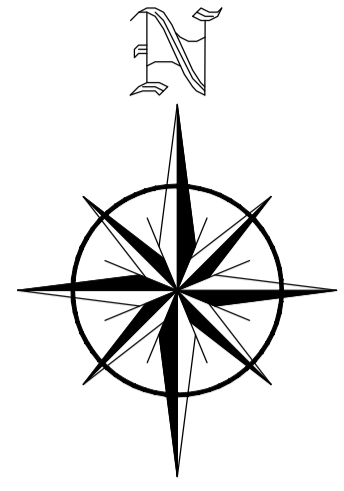
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| P01 | 2023 09 26 | PETROL INTERCEPTOR ADDED | AB | GL |

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|-----------|--|
| Architect | REDDY ARCHITECTURE & URBANISM |
| Project | DEVELOPMENT AT BENSON COURT CRANMORE, SLIGO TOWN |
| Title | Proposed Drainage Layout |
| Dwg. No. | R119-CSC-01-ZZ-DR-C-0009 |
| Date | FEB 2023 |
| Dim by | AB |
| Chkd by | GL |
| Aprvd by | NB |
| Scale | 1:250 @ A1 |
| Revision | P01 |

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 w: www.csconsulting.ie

Quality Environment Health & Safety
 I.S. EN ISO 9001:2008
 I.S. EN ISO 14001:2004
 I.S. EN ISO 50001:2011
 OHSAS 18001:2007



LEGEND:

| | |
|--|--|
| SITE BOUNDARY | |
| PROPOSED FOUL SEWER | |
| PROPOSED SURFACE WATER SEWER | |
| EXISTING FOUL SEWER | |
| EXISTING SURFACE WATER SEWER | |
| PROPOSED CULVERT DIVERSION OF EXISTING STREAM | |
| EXISTING FOUL SEWER REMOVED AFTER DIVERSION | |
| EXISTING SURFACE WATER SEWER REMOVED AFTER DIVERSION | |
| 6.0m IRISH WATER WAYLEAVE/EASEMENT | |

R119

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|---------|------------|--------------------------|---------|----------|
| P01 | 2023.09.26 | PETROL INTERCEPTOR ADDED | AB | GL |

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|-----------|--|
| Architect | REDDY ARCHITECTURE & URBANISM |
| Project | DEVELOPMENT AT BENSON COURT CRANMORE, SLIGO TOWN |
| Title | Proposed Drainage Layout |
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| Date | FEB 2023 |
| Dim by | AB |
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| Aprvd by | NB |
| Scale | 1:250 @ A1 |
| Revision | P01 |

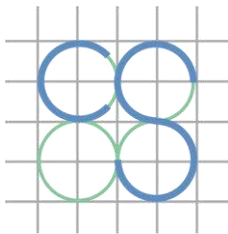
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Quality Environment I.S. EN ISO 9001:2008
 NSAI Certified I.S. EN ISO 14001:2004
 Health & Safety OHSAS 18001:2007

APPENDIX B: Technical Memo: Drainage Strategies

Benson Court and Geldof Drive



CS CONSULTING
GROUP

CS CONSULTING GROUP

HEAD OFFICE: 19-22 Dame Street, Dublin 2, D02 E267, Ireland

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MEMORANDUM

To: Jennings O'Donovan Consulting Engineers Ltd
From: CS Consulting
Date: 20/09/2023
Re: Drainage Strategies at Geldof Drive and Benson Court, Cranmore, Sligo

Below is a brief outline of the Surface Water and Foul Drainage strategies for both development sites in the Cranmore Estate.

Geldof Drive

Surface Water Strategy

Drainage records indicates an existing 225mm diameter combined sewer which runs south to north to east along Geldof Drive. There is no existing dedicated storm line in Geldof Drive. As part of the new development a new dedicated surface drainage system shall be provided as part of the development's construction.

All surface water runoff generated from the new development scheme shall be collected in 100mm and 150mm diameter pipes and flow under gravity to a new 225mm diameter storm main drain that shall traverse Geldof Drive from south to north. This new main drain discharges to a stormtech attenuation system located in the new landscaped area to the north, that shall then restrict flow from the new build element to 2.0 l/s via a hydrobrake prior to discharging to the existing combined network in Geldof Drive. The attenuation tank is sized for 78m³ storage and shall allow for infiltration due to receipt positive soakaway tests carried out on site. Please see Drawing R119-CSC-02-XX-DR-C-0007 for the proposed drainage layouts for Geldof Drive.

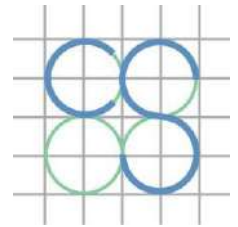
As the new surface network connects to the combined network, the above strategy formed part of a Pre-Connection Enquiry to Irish Water and we recently received a favourable Confirmation of Feasibility stating no issue with the above proposals.

KP & Associates Consulting Engineers Ltd. T/A Cronin & Sutton Consulting
Company No. 505303 | Registered Office: 19-22 Dame Street, Dublin 2, Ireland
Directors: N. Barrett, R. Fitzmaurice, M. McEntee, L. McNamee,
O. Sullivan (Managing), C. Sutton-Smith, E. Sutton, P. Sutton (Chairman)
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The storm water drainage network for the development shall be in accordance with Part H of the Building Regulations and to the requirements and specifications of Sligo Co Co.

Foul Water Strategy

Drainage records indicates an existing 225mm diameter combined sewer which runs south to north to east along Geldof Drive. There is no dedicated foul sewer serving the residential houses of Geldof Drive.

As stated above there shall be a new dedicated surface water network to serve the new build elements of Geldof Drive meaning there shall be excess capacity now available in the existing combined network. Therefore all foul effluent generated from the new units shall be collected in 100mm and 150mm diameter foul pipes and flow under gravity to the existing 225mm diameter combined sewer in Geldof Drive.

Please see Drawing R119-CSC-02-XX-DR-C-0007 for the proposed drainage layouts for the Geldof Drive. A Pre-Connection Enquiry was issued to Irish Water based on the above and we recently received a favourable Confirmation of Feasibility stating no issue with the above proposals.

The new foul drainage network for the development shall be in accordance with Part H of the Building Regulations and to the requirements and specifications of Irish Water.

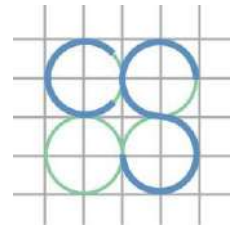
Benson Court

Surface Water Strategy

The existing development site is greenfield and is not served by a dedicated surface water network. There is an existing combined network on Carroll Drive and Langan Drive respectively but due to the existing topography of development site it is not possible to connect under gravity.

All surface water runoff generated from the new development scheme shall be collected in 100mm, 150mm and 225mm diameter pipes and flow under gravity to a stormtech tank system located in the new car parking bays to the north of the development site. Due to receipt positive soakaway tests carried out on site, the stormtech tank shall allow discharge of surface water to ground through infiltration. Please see Drawing R119-CSC-01-XX-DR-C-0007 for the proposed drainage layouts for Benson Court.

The storm water drainage network for the development shall be in accordance with Part H of the Building Regulations and to the requirements and specifications of Sligo Co Co.



Foul Water Strategy

There is an existing combined network on Carroll Drive and Langan Drive respectively but due to the existing topography of development site it is not possible to connect under gravity. The nearest combined sewer, a 225mm diameter sewer, is located to the north along McNeill Drive.

All foul effluent generated from the new units shall be collected in 100mm and 150mm diameter foul pipes and flow under gravity to the existing combined sewer on McNeill Drive to the north. Please see Drawing R119-CSC-01-XX-DR-C-0007 for the proposed drainage layouts for Benson Court.

A Pre-Connection Enquiry was issued to Irish Water based on the above and we recently received a favourable Confirmation of Feasibility stating no issue with the above proposals. The new foul drainage network for the development shall be in accordance with Part H of the Building Regulations and to the requirements and specifications of Irish Water.

Gary Lindsay, BE CEng MIEI

Associate Director

CS Consulting

APPENDIX C: Trial Hole Reports

**NEW HOUSING
DEVELOPMENT
BENSON COURT SLIGO**

C.S. CONSULTING ENGINEERS

SLIGO COUNTY COUNCIL

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| II | FIELDWORK |
| III | TESTING |
| III | DISCUSSION |

APPENDICES

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|-------------|------------------------------------|
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| II | TRIAL PIT RECORDS |
| III | SLIT TRENCHES |
| IV | DYNAMIC PROBES |
| V | BRE DIGEST 365 SOAKAWAY |
| VI | CBR BY PLATE TEST |
| VII | LABORATORY DATA |
| | a. Geotechnical |
| | b. Environmental / Chemical |
| VIII | SITE PLAN |

FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

General.

Recommendations made, and opinions expressed in the report are based on the strata observed in the exploratory holes, together with the results of in-situ and laboratory tests. No responsibility can be held for conditions which have not been revealed by exploratory work, or which occur between exploratory hole locations. Whilst the report may suggest the likely configuration of strata, both between exploratory hole locations, or below the maximum depth of the investigation, this is only indicative, and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

Standards

The ground investigation works for this project have been carried out by IGSL in accordance with Eurocode 7 - Part 2: Ground Investigation & Testing (EN 1997-2:2007). This has been used together with complementary documents such as BS 5930 (1999), BS 1377 (Parts 1 to 9) and Engineers Ireland Specification & Related Documents for Ground Investigation in Ireland (2006). The following Irish (IS) and European Standards or Norms are referenced:

- IS EN 1997-2 Eurocode 7: 2007 – Geotechnical Design – Part 2: Ground Investigation & Testing
- IS EN ISO 22475-1:2006 Geotechnical Investigation and Sampling – Sampling Methods & Groundwater Measurements
- IS EN ISO 14688-1:2002 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 1: Identification and Description
- IS EN ISO 14688-2:2004 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 2: Classification Principles

Routine Sampling.

Undisturbed samples of soils, predominantly cohesive in nature are obtained unless otherwise stated by a 104mm diameter open-drive tube sampler or Piston Sampler. In granular soils, and where undisturbed sampling is inappropriate, disturbed samples are collected. Smaller disturbed samples are also recovered at intervals to allow a visual examination of the full strata section.

In-Situ Testing.

Standard penetration tests were conducted strictly in accordance with Section 4.6 of IS EN 1997-2:2007. The SPT equipment (hammer energy test) has been calibrated in accordance with EN ISO 22476-3:2005 to obtain the Energy Ratio (E_r) of each hammer. A calibration certificate is available upon request. The E_r is defined as the ratio of the actual energy E_{meas} (measured energy during calibration) delivered to the drive weight assembly into the drive rod below the anvil, to the theoretical energy (E_{theor}) as calculated from the drive weight assembly. The recorded number of blows (N) reported on the engineering logs are uncorrected. In sands, the energy losses due to rod length and the effect of the overburden pressure should be taken into account (see IS EN ISO 22476-3:2005).

Groundwater

The depth of entry of any influx of groundwater is recorded during the course of boring operations. However, the normal rate of boring does not usually permit the recording of an equilibrium level for any one water strike. Where possible drilling is suspended for a period of twenty minutes to monitor the subsequent rise in water level. Groundwater conditions observed in the borings or pits are those appertaining to the period of investigation. It should be noted however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions, tidal variations etc.

Engineering Logging

Soil and rock identification has been based on the examination of the samples recovered and conforms with IS EN ISO 14688-1:2002 and IS EN ISO 14689-1:2004.

Where peat has been encountered during site works, samples have been logged in accordance with the Von Post Classification (ref. Von Post, L. 1992. Sveriges Geologiska Undersöknings torvinventering och några av dess hittills vunna resultat (SGU peat inventory and some preliminary results) Svenska Mosskulturforeningens Tidskrift, Jonkoping, Swedden, 36, 1-37 & Hobbs N. B. Mire morphology and the properties of some British and foreign peats. QJEG, Vol. 19, 1986).

Retention of Samples.

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded unless a period of retention of samples is agreed, it is our normal practice to discard all soil samples one month after submission of our final report.

Reporting

Recommendations made and opinions expressed in this report are based on the strata observed in the exploratory holes, together with the results of in-situ and laboratory tests. No responsibility can be held by IGSL Ltd for ground conditions between exploratory hole locations.

The engineering logs provide ground profiles and configuration of strata relevant to the investigation depths achieved and caution should be taken when extrapolating between exploratory points. No liability is accepted for ground conditions extraneous to the investigation points. Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction, mining works or karstification below or close to the site.

This report has been prepared for the project client and the information should not be used without prior written permission. Any recommendations developed in this report specifically relate to the proposed development. IGSL Ltd accepts no responsibility or liability for this document being used other than for the purposes for which it was intended.

**REPORT ON A SITE INVESTIGATION
FOR A HOUSING DEVELOPMENT
AT
BENSON COURT SLIGO
FOR
SLIGO COUNTY COUNCIL

C.S.CONSULTING GROUP**

Report No. 24759 / B

August 2023

I Introduction

New residential developments are proposed for two sites located at Geldof Drive and Benson Court in Sligo. Reports on the individual developments are presented separately.

An investigation of sub soil conditions in the area of the proposed new developments has been carried out by IGSL for C.S. Consulting Group on behalf of Sligo County Council.

The investigation at BENSON COURT included the following elements.

| | |
|---|-------|
| * Cable Percussion Borehole | 1 nr. |
| • Trial Pits | 4 nr. |
| • Slit Trenches | 2 nr. |
| • Dynamic Probes | 4 nr. |
| • BRE DIGEST 365 Soakaway | 1 nr. |
| • CBR by Plate Bearing Test | 2 nr |
| • Geotechnical Laboratory Testing | |
| • Environmental and Chemical Laboratory Testing | |

This report includes all factual data available from field and laboratory operations and discusses these findings relative to foundation and infrastructural design for the proposed new housing development.

II Fieldwork

This new development is to take place on a site located in Sligo Town at the junction of Langton Drive and Carroll Drive. The surface comprised a grassed recreational area.

The site location and the exploratory positions are noted on the site plan and map enclosed in Appendix VIII.

All locations have been referenced to National Grid and OD levels have been established.

The various elements of the investigation are detailed in the following paragraphs. All field works were supervised by an experienced geotechnical engineer who carefully recorded stratification, took photographs as necessary, recovered samples and prepared detailed records.

Close liaison was maintained throughout with C.S. and Sligo County Council. Each location was scanned electronically (CAT) to ensure that existing services were not damaged. A shallow trial pit was also opened by hand at the exploratory borehole locations to confirm this. Statutory HSE safety precautions were observed, with working areas restricted to IGSL personnel only, to ensure safety of the general public.

Boreholes

The borehole was constructed using conventional 200mm diameter cable percussion equipment. The hole was referenced BH01. The initial attempt at boring encountered a concrete obstruction at 0.60 metres. The equipment was moved and a re-bore (BH01A) was carried out.

Detailed geotechnical records are contained in Appendix I to this report - the records give details of stratification, sampling, in-situ testing and groundwater. Note is also taken of any obstructions to normal boring requiring the use of the heavy chisel for advancement. In general it was not possible to recover undisturbed samples because of the granular nature of the strata encountered and the presence of cobbles and boulders.

A variable layer of MADE GROUND was penetrated from GL to 0.80 metres. This overlies a stratum of firm to stiff brown sandy gravelly CLAY. Boring was terminated at 3.20 metres BGL, following a period of abortive chiselling on a presumed BOULDER obstruction.

No ground water was observed during the course of drilling operation.

Trial Pits

Trial Pits were scheduled at four locations and referenced TP01 to TP04.

A tracked excavator was used under engineering supervision. Detailed records for each location are presented in Appendix II with accompanying photographs. These records note the soil stratification and record sampling, stability and ground water details. Each location was CAT scanned to ensure that underground services were not damaged.

The trial pits fairly consistently indicate the presence of approximately 0.80 metres of MADE GROUND below topsoil cover with an underlying stratum of soft to firm grey brown sandy gravelly CLAY

The excavations were dry and generally stable during the investigation period.

TRIAL PIT DETAILS

| No. | MADE GROUND | Brown Gravelly CLAY |
|------|-------------|---------------------|
| TP01 | 0 – 0.80 | 0.80 - 2.20 |
| TP02 | 0 – 0.80 | 0.80 – 2.20 |
| TP03 | 0 – 0.80 | 0.80 – 2.30 |
| TP04 | 0 – 0.80 | 0.80 – 2.20 |

Trial Pits were backfilled with excavated material and each location was levelled and surplus material was removed.

Slit Trenches

Slit trenches were excavated in two specified locations to determine the possible presence of services. A combination of machine and hand excavation was employed.

Slit Trench records (ST01 and ST02) are presented in Appendix III. The trenches were 78.00 and 57.00 metres long and 1.50 metres wide and was excavated through about 0.80 metres of MADE GROUND overlying brown grey gravelly CLAY.

Numerous services were located in each excavation with full details noted on the individual records.

Excavations were carefully backfilled on completion.

Heavy Duty Dynamic Probes

Heavy Duty Dynamic Probes were taken at the four trial pit locations and referenced DP01 to DP04.

Probing was in accordance with the heavy-duty probe specification of BS 1377: Part 9: 1990. In these tests, the soil resistance is measured in terms of the number of drop-hammer blows required to drive the test probe through each 100 mm increment of penetration. Probing is terminated when the blow count exceeds 25/100mm to avoid damage to the apparatus. Where loose material is present a single blow count may drive the apparatus in excess of 100mm. In this instance blow counts of zero may be recorded. Individual probe records are contained in Appendix IV.

Probe findings are summarised in the following table.

High Probe resistance was recorded from GL to about 0.80 metres in some probe locations with REFUSAL, presumably on coarse dense MADE GROUND.

Probes DP01 and DP02 indicate that original gravelly clay soils were encountered at a depth of about 1.00 metre. It should be noted that the probing technique does not identify soils type and that high values can often be obtained in well compacted made ground.

SUMMARY DYNAMIC PROBE DETAILS

| Probe No. | FILL | Soft Clay | Stiff Clay |
|------------------|--------------------|------------------|-------------------|
| DP 01 | 0 – 0.90 | | 0.90 - 1.60 |
| DP 02 | 0 – 0.90 | | 0.90 – 1.70 |
| DP 03 | 0 – 1.20 (Refusal) | | |
| DP 04 | 0 – 1.00 (Refusal) | | |

BRE Digest 365 Soakaway

One soakaway test was scheduled and carried out in a grassed areas as noted on the site plan. Test details including stratification are noted in Appendix V.

To obtain a measure of the infiltration rate of the sub-soils, water was poured into the test pit, and records taken of the fall in water level against time. The tests are usually carried over two cycles following initial soakage. Designs are based on the slowest infiltration rate, which is calculated from the final cycle.

The infiltration rate is the volume of water dispersed per unit exposed area per unit of time, and is generally expressed as metres/minute or metres/second. In these calculations the exposed area is the sum of the base area and the average internal area of the pit sides over the test duration. The results for the final test cycle are as follows

| Location | Infiltration Rate (f) | Stratum |
|----------|-------------------------|----------------|
| SA01 | 0.00358 metres / minute | FILL over CLAY |

CBR by Plate Bearing Test

In situ CBR value and Modulus of Subgrade Reaction were determined at two locations by Plate Bearing Test. Tests are referenced CBR01 and CBR 02.

A steel plate is loaded and off-loaded incrementally over two stages and the deflection under load and recovery under off-load is measured by a system of dial gauges. The data is processed and load settlement graphs are prepared. An equivalent CBR value is calculated in accordance with NRA HD25-26/10.

Results are summarised in the following table and individual test records are found in Appendix VI.

| Test No. | Depth | CBR at Load Cycle (%) | CBR at Reload (%) |
|----------|-----------|-----------------------|-------------------|
| CBR 01 | 0.50 Clay | 15.4 | 17.5 |
| CBR 02 | 0.50 Clay | 20.9 | 28.8 |

III. Testing

In Situ

Standard penetration tests were carried out at approximate 1.00 metre intervals in the geotechnical Borehole to measure relative in-situ soil strength. N values are noted in the right hand column of the boring record, representing the blow count required to drive the standard sampler 300mm into the soil, following initial seating blows. Where full test penetration was not achieved the blow count for a specific penetration is recorded, or refusal is indicated where appropriate. The results of the tests are summarised as follows:

| Stratum Test Depth | N VALUES | COMMENT |
|---------------------------|-----------------|----------------|
| Gravelly Clay | | |
| 1.00 metres BGL | 19 | Stiff |
| 2.00 metres BGL | 32 | Very Stiff |
| 3.00 metres BGL | > 50 | Hard |

Laboratory

A programme of laboratory testing was scheduled following completion of site operations. Geotechnical soil testing was carried out by IGSL in its INAB-Accredited laboratory. Chemical and environmental testing was carried out in the UK by EUROFINS Ltd. The test programme included the following elements:

| | |
|--|----------|
| Liquid and Plastic Limits / Moisture Content | IGSL |
| PSD Grading by Wet Sieve and Hydrometer | IGSL |
| Sulphate / Chloride / pH | EUROFINS |
| RILTA Suite Environmental | EUROFINS |

All laboratory data is presented in Appendices VII a and VII b and individual tests are discussed briefly as follows:

Index Properties / Moisture Content

Samples from the boulder clay stratum had Index Properties and Natural Moisture Contents established. The tests show some variation in composition from gravelly CLAY to clay-bound gravel, this is typical of glacial till or boulder clay deposition. Natural Moisture Contents range from 9.2 % in the brown gravelly CLAY to 5.4% in the coarser clay bound gravel.

Grading

Wet Sieve and hydrometer analysis has been carried out on one sample from 3.00 metres BH01.

The grading curve confirms the composition indicated in the Classification Tests. The material is a clay bound sandy coarse GRAVEL.

Chemical

One sample was sent for analysis to BRE Chemical Suite parameters. A Sulphate concentration (SO₄ 2:1 extract) of < 0.010 g/l was established with a pH value of 8.8. A low Chloride concentration (< 0.010 g/l) was also determined.

RILTA Environmental Suite

One sample of the FILL from the site was sent to EUROFINS environmental laboratory and testing was carried out in accordance with RILTA requirements to establish Landfill Waste Acceptance Criteria (WAC).

The test result confirms an INERT Classification for the sample tested indicating that excavated material will be suitable for disposal to a suitably licensed Landfill facility.

The presence of made ground over much of the site is noted and it is possible that Landfill operators may require additional testing prior to accepting material for disposal.

IV. Discussion:

A residential development is proposed for this small site located at Benson Court in Sligo.

An investigation of ground conditions has been carried out for Sligo County Council to provide data to assist in foundation and infrastructural design.

The investigation consisted of a conventional Borehole with supplementary Trial Pits Dynamic Probes and Plate Tests. Geotechnical and Environmental laboratory testing has also been carried out to confirm soil parameters

STRATIFICATION

The investigation has identified topsoil over MADE GROUND extending to about 0.80 metres BG over most of the site.

Below the MADE GROUND a stratum of firm, becoming stiff, gravelly CLAY has been noted. In some locations more granular soils (typically clay-bound sandy GRAVEL) were noted. This stratum is a GLACIAL TILL (locally referred to as BOULDER CLAY) and is typical of the region.

Ground water was not encountered.

SOIL CHARACTERISTICS

MADE GROUND

Made Ground is generally regarded as unsuitable as a founding medium for structural loading unless selected, placed and compacted under strict engineering control. Visual inspection and in situ tests confirm that the stratum is very variable with construction waste noted throughout. Foundation and floor loads should be transferred to a suitable underlying stratum.

Gravelly CLAY (Boulder Clay)

The strength of the soils below the upper FILL has been assessed by visual inspection of Trial Pit excavations, by Standard Penetration Tests in the boreholes and by Dynamic Probing at six locations. The SPT test in the borehole at 1.00 metres BG is indicative of STIFF consistency, however visual assessment in the trial pits suggests FIRM consistency.

FOUNDATIONS

The data from this investigation suggests that traditional strip or pad foundations will be appropriate for this development using the firm to stiff gravelly clay soil underlying the upper FILL as a founding medium.

An allowable bearing pressure of 100 kN/sq.m. can be adopted at an approximate depth of 1.00 metres (below the MADE GROUND). The allowable bearing would be expected to increase with deeper founding depths.

Given the variations noted both in soil composition and strength visual inspection of excavated formation by experienced personnel is strongly recommended to ensure uniformity and suitability of the founding medium. All suspect material should be removed and replaced with low-grade concrete.

GROUND WATER

No ground water was encountered during the investigation and water ingress to excavations is not anticipated.

PERCOLATION

One test was carried out in accordance with BRE Digest 365 to establish the suitability of the soils for dispersion of surface water. Testing was carried out in soils comprising FILL and gravelly CLAY. An infiltration Rate of "f" = 0.0036 metres/minute was established, indicative of moderate permeability. The use of the local authority drainage system can also be considered for disposal of storm and surface water.

PAVEMENTS

Two Plate Tests were performed in the specified locations and in situ CBR values were established.

CBR values exceeded 15% confirming that the gravelly CLAY soils will be suitable for Road or Car Park construction.

Visual assessment of excavated formation is advised to ensure suitability of the material for purpose. All organic or suspect material should be removed.

Imported granular fill for road construction should fully comply with NRA requirements, particularly relating to Pyrites.

CONCRETE

No special precautions are necessary to protect foundation concrete from sulphate or chloride aggression. A sulphate design class of DS-1 (ACEC Classification for Concrete) is indicated for concentrations less than 0.5 g/l.

ENVIRONMENTAL

While the sample sent for RILTA Suite analysis is classed as INERT, the extensive MADE GROUND deposits should be noted. The appointed Landfill may require additional testing to fulfil their licence requirements.

IGSL/JC
August 2023

Appendix I Boring Records



GEOTECHNICAL BORING RECORD

REPORT NUMBER

24759

| | | | | | |
|--|--|-----------------------------------|--|----------------------------------|--|
| CONTRACT Geldof Drive & Benson Court | | | | BOREHOLE NO. BH01 (BC) | |
| CO-ORDINATES 569,817.38 E 835,181.90 N | | RIG TYPE Dando 2000 | | SHEET Sheet 1 of 1 | |
| GROUND LEVEL (m AOD) 19.88 | | BOREHOLE DIAMETER (mm) 200 | | DATE COMMENCED 16/06/2023 | |
| | | BOREHOLE DEPTH (m) 0.60 | | DATE COMPLETED 16/06/2023 | |
| CLIENT Sligo Co.Co. | | SPT HAMMER REF. NO. | | BORED BY P.Allan | |
| ENGINEER CS Consulting | | ENERGY RATIO (%) | | PROCESSED BY F.C | |

| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | | Field Test Results | Standpipe Details |
|-----------|--|--------|-----------|-----------|-------------|-------------|-----------|----------|--------------------|-------------------|
| | | | | | Ref. Number | Sample Type | Depth (m) | Recovery | | |
| 0 | TOPSOIL | | 19.78 | 0.10 | | | | | | |
| | MADE GROUND comprised of grey sandy Gravel with cobbles and bricks | | | | | | | | | |
| | Obstruction - Possible CONCRETE End of Borehole at 0.60 m | | 19.28 | 0.60 | | | | | | |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |

| HARD STRATA BORING/CHISELLING | | | | WATER STRIKE DETAILS | | | | | |
|-------------------------------|--------|----------|----------|----------------------|--------------|-----------|---------|------------|-----------------|
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments |
| | | | | | | | | | No water strike |

| INSTALLATION DETAILS | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments |
|----------------------|-----------|--------|---------|------|------|------------|--------------|----------------|----------|
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | |
| | | | | | | | | | |

REMARKS CAT scanned location and hand dug inspection pit carried out. Obstruction encountered (concrete). Moved to BH01A (BC) and attempted rebore.

Sample Legend
 D - Small Disturbed (tub)
 B - Bulk Disturbed
 LB - Large Bulk Disturbed
 Env - Environmental Sample (Gas, Vol, Tub)
 UT - Undisturbed 100mm Diameter Sample
 P - Undisturbed Platen Sample
 W - Water Sample

IGSL BH LOG 24759 BELDOF PARK.GPJ IGSL.GDT 8/8/23



GEOTECHNICAL BORING RECORD

REPORT NUMBER

24759

| | | | |
|--|--|----------------------------------|--|
| CONTRACT Geldof Drive & Benson Court | | BOREHOLE NO. BH01A (BC) | |
| CO-ORDINATES 569,817.38 E 835,181.90 N | | SHEET Sheet 1 of 1 | |
| GROUND LEVEL (m AOD) 19.88 | | DATE COMMENCED 16/06/2023 | |
| CLIENT Sligo Co.Co. | | DATE COMPLETED 16/06/2023 | |
| ENGINEER CS Consulting | | BORED BY P.Allan | |
| RIG TYPE Dando 2000 | | PROCESSED BY F.C | |
| BOREHOLE DIAMETER (mm) 200 | | | |
| BOREHOLE DEPTH (m) 3.20 | | | |
| SPT HAMMER REF. NO. | | | |
| ENERGY RATIO (%) | | | |

| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | | Field Test Results | Standpipe Details |
|-----------|--|--------|-----------|-----------|-------------|-------------|-----------|----------|--------------------|------------------------------|
| | | | | | Ref. Number | Sample Type | Depth (m) | Recovery | | |
| 0 | TOPSOIL | | 19.78 | 0.10 | | | | | | |
| | MADE GROUND comprised of grey brown sandy gravelly CLAY | | | | AA196233 | B | 0.50 | | | |
| | Firm brown sandy gravelly CLAY | | 19.08 | 0.80 | AA196234 | B | 1.00 | | | N = 19 (2, 2, 2, 3, 6, 8) |
| | Stiff brown sandy gravelly CLAY with a medium cobble content | | 18.08 | 1.80 | AA196235 | B | 2.00 | | | N = 32 (6, 7, 9, 7, 8, 8) |
| | Obstruction End of Borehole at 3.20 m | | 16.68 | 3.20 | AA196236 | B | 3.00 | | | N = 50/0 mm (25, 50) |

| HARD STRATA BORING/CHISELLING | | | | WATER STRIKE DETAILS | | | | | |
|-------------------------------|--------|----------|----------|----------------------|--------------|-----------|---------|------------|-----------------|
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments |
| 2.1 | 2.3 | 1 | | | | | | | |
| 3 | 3.2 | 1.5 | | | | | | | No water strike |

| INSTALLATION DETAILS | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments |
|----------------------|-----------|--------|---------|------|------|------------|--------------|----------------|----------|
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | |
| | | | | | | | | | |

| | |
|--|---|
| REMARKS CAT scanned location and hand dug inspection pit carried out. | Sample Legend D - Small Disturbed (Sub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vib) + Tub UT - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample W - Water Sample |
|--|---|

IGSL BH LOG 24759 GELDOF PARK.GPJ IGSLGDT 8/8/23

**Appendix II Trial Pit Records
Photographs**



TRIAL PIT RECORD

REPORT NUMBER

24759

| | | |
|--|--|----------------------------------|
| CONTRACT Geldof Drive and Benson Court | | TRIAL PIT NO. TP01 (CP) |
| LOGGED BY BC | | SHEET Sheet 1 of 1 |
| CO-ORDINATES 569,826.52 E 835,196.52 N | | DATE STARTED 27/07/2023 |
| GROUND LEVEL (m) 19.37 | | DATE COMPLETED 27/07/2023 |
| CLIENT Sligo Co.Co. | EXCAVATION METHOD Tracked Excavator | |
| ENGINEER CS Consulting | | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation | Water Strike | Samples | | | Vane Test (KPa) | Hand Penetrometer (KPa) |
|-----------|---|--------|-----------|-----------|--------------|------------|------|-----------|-----------------|-------------------------|
| | | | | | | Sample Ref | Type | Depth | | |
| 0.0 | TOPSOIL | | | | | | | | | |
| 0.30 | MADE GROUND comprising firm dark grey brown slightly sandy gravelly silty CLAY with a medium cobble and boulder content, occasional gravel hardcore, plastic and building rubble. Boulders up to 300mm. Sand is fine. | | 0.30 | 19.07 | | 209125 | B | 0.50-0.70 | | |
| 0.80 | Soft to firm light grey brown slightly sandy gravelly clayey SILT with a medium cobble and high boulder content. Sand is medium. | | 0.80 | 18.57 | | 209126 | B | 0.90-1.10 | | |
| 2.20 | Obstruction - Possible Boulder End of Trial Pit at 2.20m | | 2.20 | 17.17 | | | | | | |

Groundwater Conditions
Dry

Stability
Good

General Remarks

IGSL TP LOG 24759 GELDOF PARK G.P.J. IGSL.GDT. 08/23



TRIAL PIT RECORD

REPORT NUMBER

24759

| | | |
|--|--|----------------------------------|
| CONTRACT Geldof Drive and Benson Court | | TRIAL PIT NO. TP02 (CP) |
| LOGGED BY BC | | SHEET Sheet 1 of 1 |
| CO-ORDINATES 569,837.50 E 835,165.24 N | | DATE STARTED 27/07/2023 |
| GROUND LEVEL (m) 21.24 | | DATE COMPLETED 27/07/2023 |
| CLIENT Sligo Co.Co. | EXCAVATION METHOD Tracked Excavator | |
| ENGINEER CS Consulting | | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation | Water Strike | Samples | | | Vane Test (kPa) | Hand Penetrometer (kPa) |
|-----------|--|--------|-----------|-----------|--------------|------------|------|-----------|-----------------|-------------------------|
| | | | | | | Sample Ref | Type | Depth | | |
| 0.0 | TOPSOIL | | | | | | | | | |
| | MADE GROUND comprising firm dark grey brown slightly sandy gravelly clayey SILT with plastic and builders rubble | | 0.30 | 20.94 | | 209129 | B | 0.50-0.70 | | |
| | Soft light brown grey sandy very gravelly silty CLAY with a high cobble and boulder content. Sand is medium to coarse. | | 0.80 | 20.44 | | 209130 | B | 1.00-1.20 | | |
| 1.0 | | | | | | | | | | |
| 2.0 | | | | | | | | | | |
| | Obstruction - Possible Boulder End of Trial Pit at 2.20m | | 2.20 | 19.04 | | | | | | |

Groundwater Conditions
Dry

Stability
Good

General Remarks

IGSL TP LOG 24759 GELDOF PARK GPJ IGSL GDT BR/23



TRIAL PIT RECORD

REPORT NUMBER

24759

| | | | |
|---|--|--|--|
| CONTRACT Geldof Drive and Benson Court | | TRIAL PIT NO. TP03 (CP) | |
| LOGGED BY BC | | SHEET Sheet 1 of 1 | |
| CO-ORDINATES 569,813.64 E 835,173.13 N | | DATE STARTED 27/07/2023 | |
| GROUND LEVEL (m) 20.40 | | DATE COMPLETED 27/07/2023 | |
| CLIENT Sligo Co.Co. ENGINEER CS Consulting | | EXCAVATION METHOD Tracked Excavator | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation | Water Strike | Samples | | | Vane Test (KPa) | Hand Penetrometer (KPa) |
|-----------|---|--------|-----------|-----------|--------------|------------|------|-----------|-----------------|-------------------------|
| | | | | | | Sample Ref | Type | Depth | | |
| 0.0 | TOPSOIL | | | | | | | | | |
| 0.30 | MADE GROUND comprising firm dark grey brown slightly sandy gravelly silty CLAY with hardcore gravel, plastic and building rubble. | | 0.30 | 20.10 | | 209127 | B | 0.50-0.70 | | |
| 0.80 | Soft light brown grey sandy very gravelly silty CLAY with a high cobble and boulder content. Sand is medium to coarse. | | 0.80 | 19.60 | | 209128 | B | 0.90-1.10 | | |
| 2.30 | Obstruction - Possible Boulder End of Trial Pit at 2.30m | | 2.30 | 18.10 | | | | | | |

Groundwater Conditions
Dry

Stability
Good

General Remarks

IGSL TP LOG 24759 GELDOF PARK CPJ IGSL.GDT 28/23



TRIAL PIT RECORD

REPORT NUMBER

24759

| | | | |
|--|--|--|--|
| CONTRACT Geldof Drive and Benson Court | | TRIAL PIT NO. TP04 (CP) | |
| LOGGED BY BC | | SHEET Sheet 1 of 1 | |
| CLIENT Sligo Co.Co. | | DATE STARTED 27/07/2023 | |
| ENGINEER CS Consulting | | DATE COMPLETED 27/07/2023 | |
| CO-ORDINATES 569,804.35 E 835,208.47 N | | EXCAVATION METHOD Tracked Excavator | |
| GROUND LEVEL (m) 18.51 | | | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation | Water Strike | Samples | | | Vane Test (KPa) | Hand Penetrometer (KPa) |
|-----------|--|--------|-----------|-----------|--------------|------------|------|-----------|-----------------|-------------------------|
| | | | | | | Sample Ref | Type | Depth | | |
| 0.0 | TOPSOIL | | | | | | | | | |
| 0.30 | MADE GROUND comprising firm dark grey brown slightly sandy gravelly silty CLAY with a medium cobble and boulder content, occasional concrete, plastic and metal fragments. | | 0.30 | 18.21 | | | | | | |
| 0.80 | Soft to firm light brown grey slightly sandy gravelly CLAY with a medium cobble and boulder content (up to 250mm). Sand is medium. | | 0.80 | 17.71 | | | | | | |
| 1.0 | | | | | | 209124 | B | 1.00-1.20 | | |
| 2.0 | | | | | | | | | | |
| 2.20 | Obstruction - Possible Boulder End of Trial Pit at 2.20m | | 2.20 | 16.31 | | | | | | |

Groundwater Conditions
Dry

Stability
Good

General Remarks

IGSL TP LOG 24759 GELDOF PARK.GPJ IGSL.GDT 8/8/23

Report No: 24759
Geldof Drive & Benson Court – Trial Pit Photographs

TP01 (CP) – 1 of 2



TP01 (CP) – 2 of 2



TP02 (CP) – 1 of 2



TP02 (CP) – 2 of 2



Report No: 24759
Geldof Drive & Benson Court – Trial Pit Photographs

TP03 (CP) – 1 of 2



TP03 (CP) – 2 of 2



Report No: 24759
Geldof Drive & Benson Court – Trial Pit Photographs

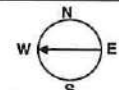


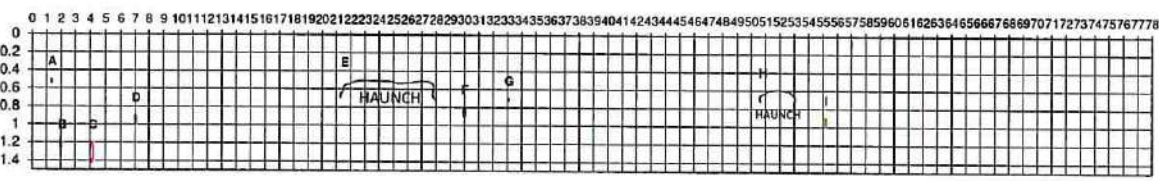
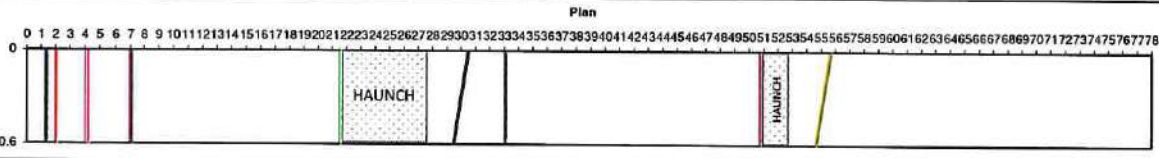
TP04 (CP) – 1 of 2

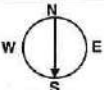



TP04 (CP) – 2 of 2




Appendix III Slit Trenches

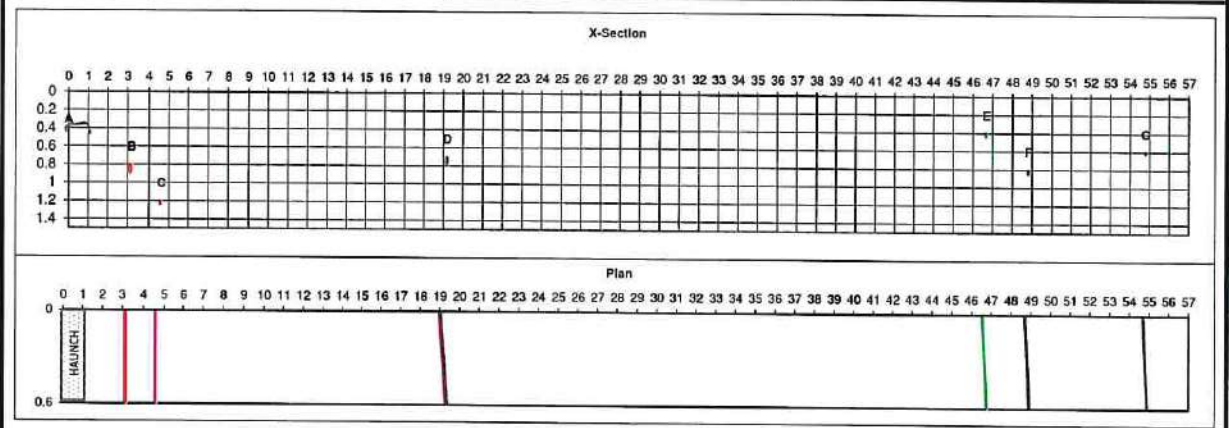
| | | | | | | |
|--|----------------------------------|---|---|---------------------|---------------------------|---------------------|
| Report No. 24759 | SLIT TRENCH RECORD | FACING DIRECTION:  |  | | | |
| Project: Geldof Drive and Benson Court Engineer: CS Consulting Crew: BC / Flanagans Location Cranmore Pitch Section | Start of Trench End of Trench | Survey Easting (m) 569819.922 Northing (m) 835154.813 Elevation (mOD) 22.633 18.5 | Slit Trench No. 1 Sheet 1 of 1 Date Commenced 26/07/2023 Date Completed 26/07/2023 | | | |
| Ground Conditions | | | | | | |
| From (m) | To (m) | Soil Description | Photograph | | | |
| 0 | 0.3 | TOPSOIL |  | | | |
| 0.3 | 0.8 | MADE GROUND comprising firm dark grey brown slightly sandy gravelly clayey SILT with a medium cobble and boulder content, occasional concrete, plastic and metal fragments. | | | | |
| 0.8 | 1.5 | Firm to soft light brown grey slightly sandy gravelly CLAY with a medium cobble content and boulder content (up to 400mm). Sand is medium. | | | | |
| Trench Dimensions | | Location | Excavation Quantities | | | |
| LHS of Trench (m) | 0.0 | | Surface | | | |
| RHS of Trench (m) | 78.0 | | Road | | | |
| Trench Depth (m) | 1.5 | | Path (LHS) | | | |
| Trench Width (m) | 0.6 | | Path (RHS) | | | |
| Facing Direction | | SAMPLES | Grass Verge (LHS) 78.0 | | | |
| Facing Features Cranmore Offices | | | 209131 @ 1.00m | Grass Verge (RHS) | | |
| Groundwater | | | Other | | | |
| | | | Total Length 78.0 | | | |
| | | | Zero Metres Taken As: GRASS AREA (inside fenceline) | | | |
| X-Section | | | | | | |
|  | | | | | | |
| Plan | | | | | | |
|  | | | | | | |
| Service | Diameter (mm) | Material | Description | Distance (m) | Depth to crown (m) | Angle (deg.) |
| Service A | 50 | PVC | Red | 1.4 | 0.5 | 90 |
| Service B | 50 | PVC | Red | 2.1 | 1.2 | 90 |
| Service C | 225 | PVC | Black | 4.2 | 1.2 | 90 |
| Service D | 100 | Plastic | Yellow | 7.1 | 0.9 | 90 |
| Service E | | Concrete | 6m wide haunch (21.6-27.7m) | 21.6 | 0.5 | 90 |
| Service F | 100 | Wavin | Orange | 30 | 0.8 | 30 |
| Service G | 25 | PVC | Black | 33.1 | 0.7 | 90 |
| Service H | | Concrete | 2m wide haunch (50.8-52.8m) | 50.8 | 0.6 | 90 |
| Service I | 100 | Wavin | Orange | 55.2 | 0.9 | 30 |
| Service J | | | | | | |
| Service K | | | | | | |
| Service L | | | | | | |
| Service M | | | | | | |

| | | | |
|-------------------------|---------------------------|---|---|
| Report No. 24759 | SLIT TRENCH RECORD | FACING DIRECTION: W  E |  |
|-------------------------|---------------------------|---|---|

| | | | | | | |
|--|----------------------------------|-------------|--------------|-----------------|-----------------|------------|
| Project: Geldof Drive and Benson Court Engineer: CS Consulting Crew: BC / Flanagan Location: Cranmore Pitch Section | Start of Trench End of Trench | Survey | | | Slit Trench No. | 2 |
| | | Easting (m) | Northing (m) | Elevation (mOD) | Sheet | 1 of 1 |
| | | 569846.894 | 835176.352 | 20.982 | Date Commenced | 26/07/2023 |
| | | 569793.243 | 835195.2 | 19.2 | Date Completed | 27/07/2023 |

| Ground Conditions | | Soil Description | Photograph |
|-------------------|--------|---|---|
| From (m) | To (m) | | |
| 0 | 0.3 | TOPSOIL |  |
| 0.3 | 0.8 | MADE GROUND comprising firm dark grey brown slightly sandy gravelly clayey SILT with a medium cobble and boulder content, occasional concrete, plastic and metal fragments. | |
| 0.8 | 1.5 | Firm to soft light brown grey slightly sandy gravelly CLAY with a medium cobble content and boulder content (up to 400mm). Sand is medium. | |
| | | | |
| | | | |
| | | | |
| | | | |

| Trench Dimensions | | Location | Excavation Quantities | | |
|-------------------|------|----------------|--|------------|----------|
| LHS of Trench (m) | 0.0 | | Surface | Length (m) | Material |
| RHS of Trench (m) | 57.0 | | Road | | |
| Trench Depth (m) | 1.5 | | Path (LHS) | | |
| Trench Width (m) | 0.6 | | Path (RHS) | | |
| Facing Direction | | Hill | Grass Verge (LHS) | 57.0 | |
| Facing Features | | | Grass Verge (RHS) | | |
| Groundwater | | | Other | | |
| | | SAMPLES | Total Length | 57.0 | |
| | | 209133 @ 1.00m | Zero Metres Taken As: LHS (inside lamp post) | | |



| Service | Diameter (mm) | Material | Description | Distance (m) | Depth to crown (m) | Angle (deg.) |
|-----------|---------------|---------------|---------------------|--------------|--------------------|--------------|
| Service A | | Concrete | 1m wide haunch | 0 | 0.5 | 90 |
| Service B | 100 | Drainage Pipe | Yellow - perforated | 3.2 | 0.8 | 90 |
| Service C | 50 | PVC | Black | 4.6 | 1.2 | 90 |
| Service D | 100 | Wavin | Orange | 19.2 | 0.7 | 120 |
| Service E | 50 | PVC | Red | 46.7 | 0.4 | 110 |
| Service F | 50 | PVC | Red | 48.8 | 0.8 | 110 |
| Service G | 25 | Copper | Copper | 54.8 | 0.6 | 110 |
| Service H | | | | | | |
| Service I | | | | | | |
| Service J | | | | | | |
| Service K | | | | | | |
| Service L | | | | | | |
| Service M | | | | | | |

Appendix IV Dynamic Probes



DYNAMIC PROBE RECORD

REPORT NUMBER

24759

| | | | | | |
|--|--|--------------------------------|--|--------------------------------|--|
| CONTRACT Geldof Drive & Benson Court | | | | PROBE NO. DP01 (CP) | |
| CO-ORDINATES 569,828.52 E 835,196.52 N | | | | SHEET Sheet 1 of 1 | |
| GROUND LEVEL (mOD) 19.37 | | HAMMER MASS (kg) 50 | | DATE DRILLED 28/07/2023 | |
| CLIENT Sligo Co.Co. | | INCREMENT SIZE (mm) 100 | | DATE LOGGED 28/07/2023 | |
| ENGINEER CS Consulting | | FALL HEIGHT (mm) 500 | | PROBE TYPE DPH | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation (mOD) | Water | Depth (m) | Probe Readings (Blows/Increment) | Graphic Probe Record |
|-----------|--------------------------|--------|-----------|-----------------|-------|-----------|----------------------------------|----------------------|
| 0.0 | | | | | | 0.00 | 1 | |
| 0.10 | | | | | | 0.10 | 5 | |
| 0.20 | | | | | | 0.20 | 6 | |
| 0.30 | | | | | | 0.30 | 10 | |
| 0.40 | | | | | | 0.40 | 7 | |
| 0.50 | | | | | | 0.50 | 4 | |
| 0.60 | | | | | | 0.60 | 3 | |
| 0.70 | | | | | | 0.70 | 6 | |
| 0.80 | | | | | | 0.80 | 8 | |
| 0.90 | | | | | | 0.90 | 8 | |
| 1.00 | | | | | | 1.00 | 5 | |
| 1.10 | | | | | | 1.10 | 5 | |
| 1.20 | | | | | | 1.20 | 5 | |
| 1.30 | | | | | | 1.30 | 13 | |
| 1.40 | | | | | | 1.40 | 21 | |
| 1.50 | | | | | | 1.50 | 26 | |
| 1.60 | End of Probe at 1.60 m | | | 17.77 | | | | |
| 2.0 | | | | | | | | |
| 3.0 | | | | | | | | |
| 4.0 | | | | | | | | |

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 24759 GELDOF PARK.GPJ IGSL.GDT 08/23



DYNAMIC PROBE RECORD

REPORT NUMBER

24759

| | | | | | |
|--|--|--------------------------------|--|--------------------------------|--|
| CONTRACT Geldof Drive & Benson Court | | | | PROBE NO. DP02 (CP) | |
| CO-ORDINATES 569,837.50 E 835,165.24 N | | | | SHEET Sheet 1 of 1 | |
| GROUND LEVEL (mOD) 21.24 | | HAMMER MASS (kg) 50 | | DATE DRILLED 28/07/2023 | |
| | | INCREMENT SIZE (mm) 100 | | DATE LOGGED 28/07/2023 | |
| CLIENT Sligo Co.Co. | | FALL HEIGHT (mm) 500 | | PROBE TYPE DPH | |
| ENGINEER CS Consulting | | | | | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation (trOD) | Water | Depth (m) | Probe Readings (Blows/increment) | Graphic Probe Record |
|-----------|--------------------------|--------|-----------|------------------|-------|-----------|----------------------------------|----------------------|
| 0.0 | | | | | | 0.00 | 0 | |
| | | | | | | 0.10 | 1 | |
| | | | | | | 0.20 | 9 | |
| | | | | | | 0.30 | 14 | |
| | | | | | | 0.40 | 13 | |
| | | | | | | 0.50 | 9 | |
| | | | | | | 0.60 | 8 | |
| | | | | | | 0.70 | 8 | |
| | | | | | | 0.80 | 4 | |
| | | | | | | 0.90 | 11 | |
| | | | | | | 1.00 | 13 | |
| | | | | | | 1.10 | 14 | |
| | | | | | | 1.20 | 17 | |
| | | | | | | 1.30 | 19 | |
| | | | | | | 1.40 | 13 | |
| | | | | | | 1.50 | 20 | |
| | | | | | | 1.60 | 25 | |
| 2.0 | End of Probe at 1.70 m | | | 19.54 | | | | |
| 3.0 | | | | | | | | |
| 4.0 | | | | | | | | |

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 24759 GELDOF PARK G.F.U. IGSL GDT 28/23



DYNAMIC PROBE RECORD

REPORT NUMBER

24759

| | | | | | |
|--|--|--------------------------------|--|--------------------------------|--|
| CONTRACT Geldof Drive & Benson Court | | | | PROBE NO. DP03 (CP) | |
| CO-ORDINATES 569,813.64 E 835,173.13 N | | | | SHEET Sheet 1 of 1 | |
| GROUND LEVEL (mOD) 20.40 | | HAMMER MASS (kg) 50 | | DATE DRILLED 28/07/2023 | |
| CLIENT Sligo Co.Co. | | INCREMENT SIZE (mm) 100 | | DATE LOGGED 28/07/2023 | |
| ENGINEER CS Consulting | | FALL HEIGHT (mm) 500 | | PROBE TYPE DPH | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation (mOD) | Water | Depth (m) | Probe Readings (Blows/Increment) | Graphic Probe Record | | |
|-----------|--------------------------|--------|-----------|-----------------|-------|-----------|----------------------------------|----------------------|------|----|
| 0.0 | End of Probe at 1.30 m | | | 19.10 | | 0.00 | 0 | | | |
| | | | | | | | | | 0.10 | 5 |
| | | | | | | | | | 0.20 | 12 |
| | | | | | | | | | 0.30 | 16 |
| | | | | | | | | | 0.40 | 15 |
| | | | | | | | | | 0.50 | 9 |
| | | | | | | | | | 0.60 | 7 |
| | | | | | | | | | 0.70 | 23 |
| | | | | | | | | | 0.80 | 20 |
| | | | | | | | | | 0.90 | 16 |
| | | | | | | | | | 1.00 | 21 |
| | | | | | | | | | 1.10 | 22 |
| | | | | | | | | | 1.20 | 25 |

GROUNDWATER OBSERVATIONS

REMARKS

IGSL.DP.LOG.100MM.INCREMENTS.24759.GELDOF.PARK.GPJ.IGSL.GDT.28/07/23



DYNAMIC PROBE RECORD

REPORT NUMBER

24759

| | | | | |
|--|--|--------------------------------|----------------------------|--------------------------------|
| CONTRACT Geldof Drive & Benson Court | | | PROBE NO. DP04 (CP) | |
| CO-ORDINATES 569,804.35 E 835,208.47 N | | | SHEET Sheet 1 of 1 | |
| GROUND LEVEL (mOD) 18.51 | | HAMMER MASS (kg) 50 | | DATE DRILLED 28/07/2023 |
| CLIENT Sligo Co.Co. | | INCREMENT SIZE (mm) 100 | | DATE LOGGED 28/07/2023 |
| ENGINEER CS Consulting | | FALL HEIGHT (mm) 500 | | PROBE TYPE DPH |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation (mOD) | Water | Depth (m) | Probe Readings (Blows/Increment) | Graphic Probe Record |
|-----------|--------------------------|--------|-----------|-----------------|-------|-----------|----------------------------------|----------------------|
| 0.0 | | | | | | 0.00 | 0 | |
| | | | | | | 0.10 | 0 | |
| | | | | | | 0.20 | 7 | |
| | | | | | | 0.30 | 14 | |
| | | | | | | 0.40 | 20 | |
| | | | | | | 0.50 | 23 | |
| | | | | | | 0.60 | 22 | |
| | | | | | | 0.70 | 21 | |
| | | | | | | 0.80 | 23 | |
| | | | | | | 0.90 | 25 | |
| 1.0 | End of Probe at 1.00 m | | | 17.51 | | | | |
| 2.0 | | | | | | | | |
| 3.0 | | | | | | | | |
| 4.0 | | | | | | | | |

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 24759 GELD OF PARK.GPJ IGSL.GDT 8/8/23

Appendix V Percolation Test (BRE Digest 365)

Soakaway Design f -value from field tests (F2C) IGSL

| | | | |
|-----------|--------------|--------------|------------|
| Contract: | Benson Court | Contract No. | 24759 |
| Test No. | CP SA01 | Easting | 569827.978 |
| Client | Sligo Co.Co. | Northing | 835225.778 |
| Date: | 27/07/2023 | Elevation | 18.151 |

| Summary of ground conditions | | | |
|------------------------------|------|--|--------------|
| from | to | Description | Ground water |
| 0.00 | 0.30 | TOPSOIL | Dry |
| 0.30 | 0.80 | MADE GROUND - Firm dark grey brown slightly sandy gravelly CLAY/SILT with hardcore gravel, plastic, building rubble and cobbles and boulders (up to 300mm) | |
| 0.80 | 1.60 | Soft to firm light grey brown slightly sandy gravelly CLAY/SILT with a medium cobble content and high boulder content | |

Notes: _____ Samples: _____

Field Data

| Depth to Water (m) | Elapsed Time (min) |
|--------------------|--------------------|
| 0.90 | 0.00 |
| 0.92 | 1.00 |
| 0.94 | 2.00 |
| 1.00 | 3.00 |
| 1.02 | 4.00 |
| 1.03 | 5.00 |
| 1.09 | 6.00 |
| 1.11 | 7.00 |
| 1.13 | 8.00 |
| 1.15 | 9.00 |
| 1.16 | 10.00 |
| 1.19 | 12.00 |
| 1.22 | 14.00 |
| 1.24 | 16.00 |
| 1.26 | 18.00 |
| 1.29 | 20.00 |
| 1.35 | 25.00 |
| 1.40 | 30.00 |

Field Test

| | | |
|--------------------------|-------|---|
| Depth of Pit (D) | 1.60 | m |
| Width of Pit (B) | 0.30 | m |
| Length of Pit (L) | 1.40 | m |
| | | |
| Initial depth to Water = | 0.90 | m |
| Final depth to water = | 1.40 | m |
| Elapsed time (mins)= | 30.00 | |
| | | |
| Top of permeable soil | | m |
| Base of permeable soil | | m |

*Av. side area of permeable stratum over test period=

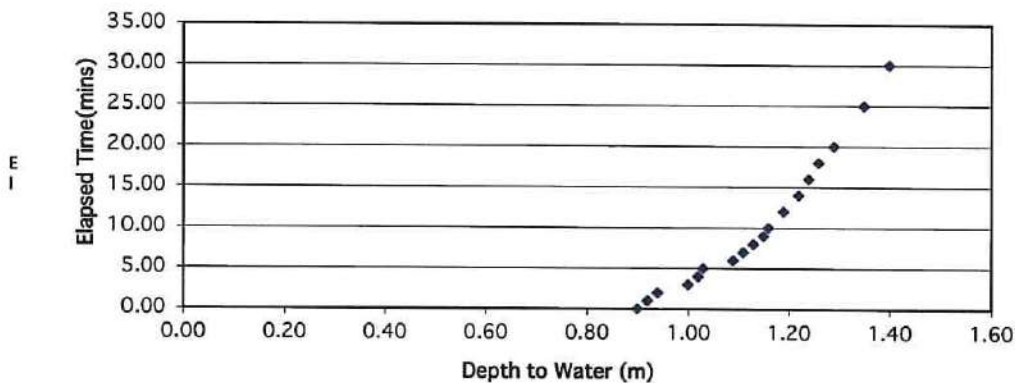
| | | |
|----------------------|------|----------------|
| Base area= | 0.42 | m ² |
| Total Exposed area = | 1.53 | m ² |

Infiltration rate (f) =

Volume of water used/unit exposed area / unit time

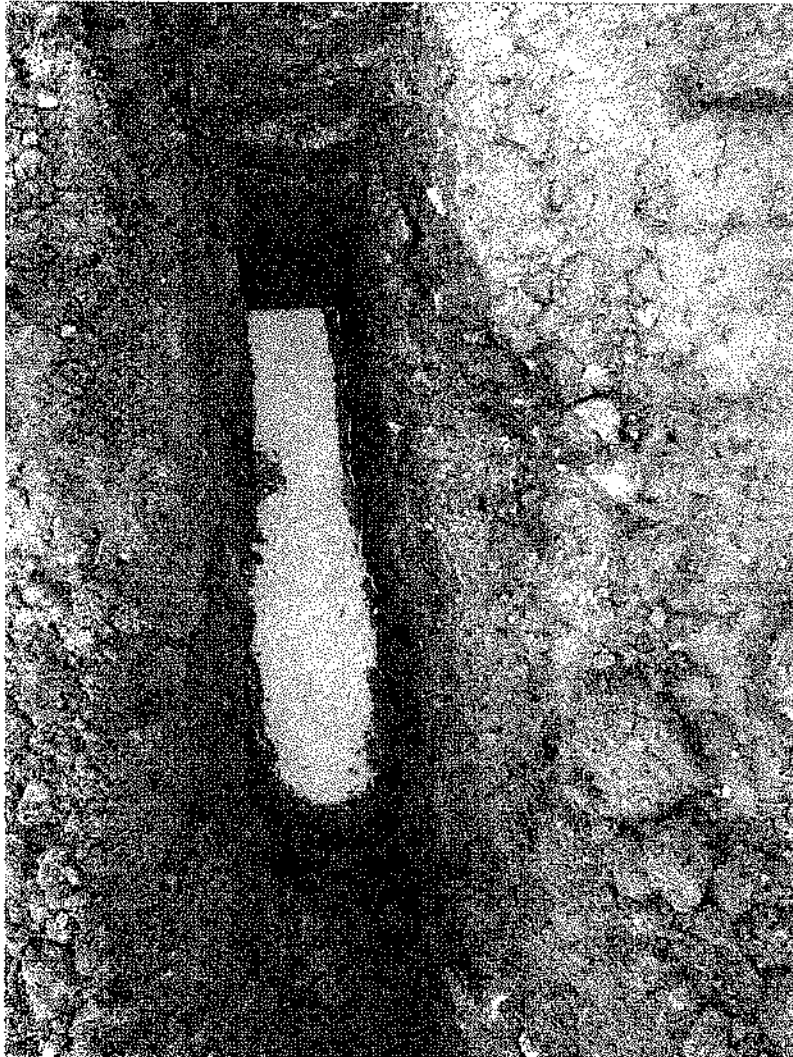
$f = 0.003589744 \text{ m/min}$ or $5.983E-05 \text{ m/sec}$

Depth of water vs Elapsed Time (mins)



Report No: 24759
Geldof Drive & Benson Court – Soak Pit Photograph

SA01 (CP)



Appendix VI CBR by Plate Test

| PLATE TEST REPORT SHEET (F3.1) | | Applied Pressure/Settlement Curve | |
|--------------------------------|--|---|--|
| Reference No. | R148883 | | |
| Contract | 24759 Cranmore Court | Description of soil under test (natural soil, placed fill, sub-base) Brown sandy gravelly SILT/CLAY | |
| Test No. | CBR1 Load | | |
| Location | See site Map | Sample Ref No. _____ m bgl Depth _____ | |
| Depth | 0.5m | | |
| Client | Cronin Sutton | IGSL LTD | |
| Plate Diameter: | 450 mm | | |
| Test Method | BS 1377: Part 9: 1990 Test4 - Incremental Loading Test | INAB INTEGRATED NATURE AND BUILDING | |
| Technician | B Campbell | | |
| Authorised by | <i>[Signature]</i> | | |
| Date | 27/07/2023 | | |



Pressure / Settlement

| Pressure (kN/m ²) | Settlement (mm) |
|-------------------------------|-----------------|
| 0 | 0.00 |
| 15 | -0.15 |
| 30 | -0.35 |
| 45 | -0.55 |
| 60 | -0.75 |
| 80 | -0.95 |
| 100 | -1.15 |
| 120 | -1.35 |
| 140 | -1.55 |

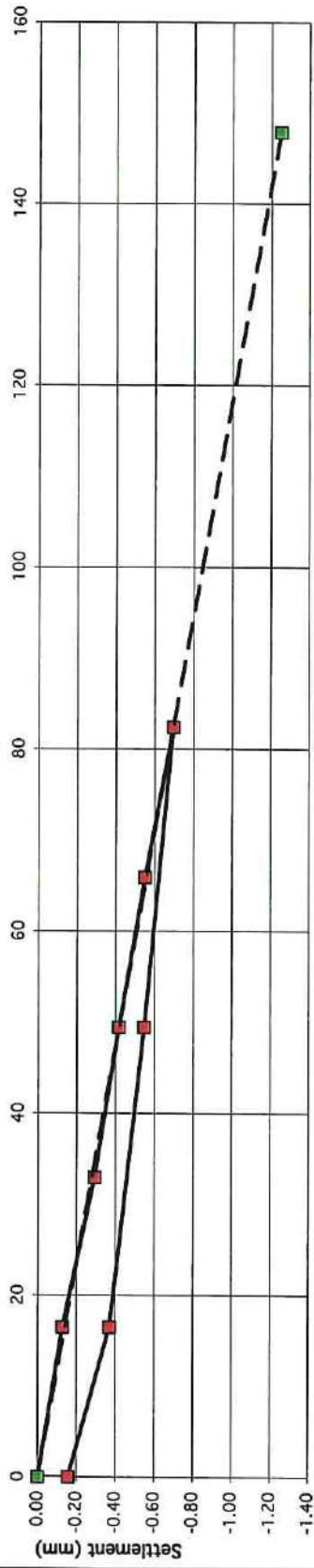
Gradient at 1.25 mm settlement intersection = 110
 Modulus of subgrade reaction = 71 MPa/m
 Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10
 15.4 %

| PLATE TEST REPORT SHEET (F3.1) | | Applied Pressure/Settlement Curve | |
|--------------------------------|--|---|----------------------------|
| Reference No. | R148883 | Description of soil under test (natural soil, placed fill, sub-base) | |
| Contract | 24759 Cranmore Court | Brown sandy gravelly SILT/CLAY | Sample Ref No. _____ m bgl |
| Test No. | CBR1 Reload | | |
| Location | See site Map | | |
| Depth | 0.5m | | |
| Client | Cronin Sutton | | |
| Plate Diameter: | 450 mm | | |
| Test Method | BS 1377: Part 9: 1990 Test4 - Incremental Loading Test | | |
| Technician | B Campbell | | |
| Authorised by | <i>[Signature]</i> | | |
| Date | 27/07/2023 | | |

Pressure / Settlement





| Pressure (kN/m ²) | Settlement (mm) |
|-------------------------------|-----------------|
| 0 | 0.00 |
| 10 | -0.15 |
| 20 | -0.30 |
| 30 | -0.45 |
| 40 | -0.55 |
| 50 | -0.65 |
| 60 | -0.75 |
| 70 | -0.85 |
| 80 | -0.95 |
| 100 | -1.15 |
| 120 | -1.35 |
| 140 | -1.45 |

Pressure (kN/m²)

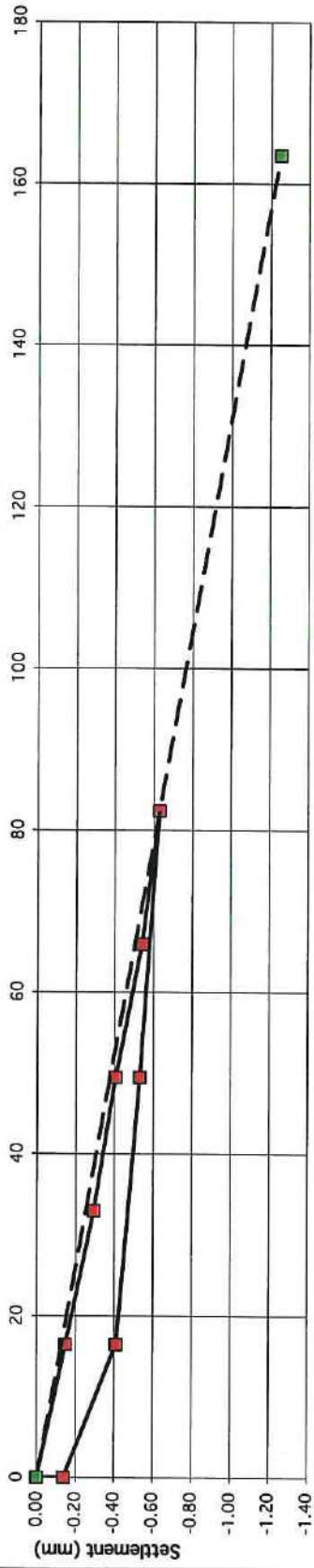
Gradient at 1.25 mm settlement intersection = 118
 Modulus of subgrade reaction = 76 MPa/m
 Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10
 17.5 %

| PLATE TEST REPORT SHEET (F3.1) | | Applied Pressure/Settlement Curve | |
|--------------------------------|--|---|----------------------------|
| Reference No. | R148884 | Description of soil under test (natural soil, placed fill, sub-base) | |
| Contract | 24759 Cranmore Court | Brown sandy gravelly SILT/CLAY | Sample Ref No. _____ m bgl |
| Test No. | CBR2 Load | | |
| Location | See site Map | | |
| Depth | 0.5m | | |
| Client | Cronin Sutton | | |
| Plate Diameter: | 450 mm | | |
| Test Method | BS 1377: Part 9: 1990 Test4 - Incremental Loading Test | | |
| Technician | B Campbell | | |
| Authorised by | <i>[Signature]</i> | | |
| Date | 27/07/2023 | | |

Pressure / Settlement



| Pressure (kN/m ²) | Settlement (mm) |
|-------------------------------|-----------------|
| 0 | 0.00 |
| 10 | -0.15 |
| 20 | -0.30 |
| 30 | -0.40 |
| 40 | -0.45 |
| 50 | -0.50 |
| 60 | -0.55 |
| 70 | -0.60 |
| 80 | -0.65 |
| 90 | -0.70 |
| 100 | -0.75 |
| 110 | -0.80 |
| 120 | -0.85 |
| 130 | -0.90 |
| 140 | -0.95 |
| 150 | -1.00 |
| 160 | -1.05 |
| 165 | -1.10 |
| 170 | -1.15 |
| 175 | -1.20 |
| 180 | -1.25 |



Gradient at 1.25 mm settlement intersection = 131

Modulus of subgrade reaction = 84 MPa/m

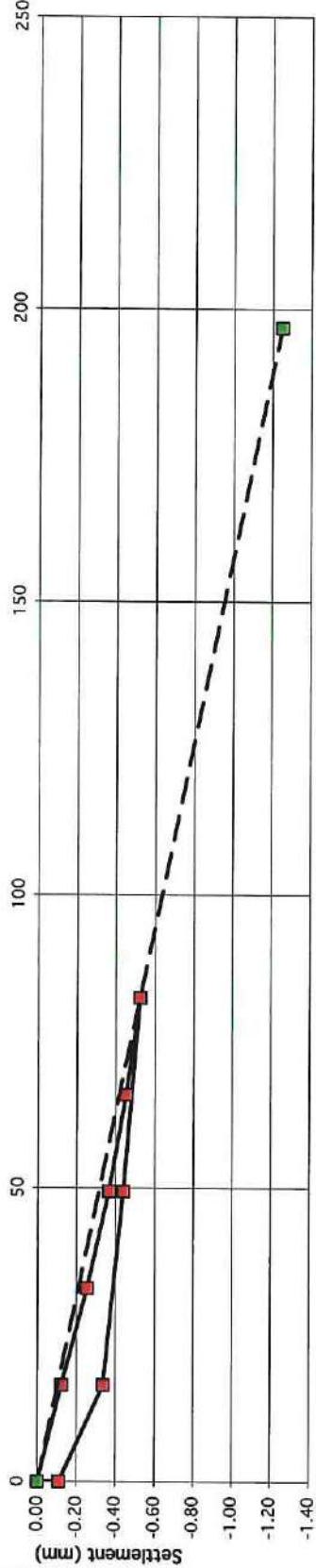
Correction factor applied = 0.64 as per HD 25-26/10

Equivalent CBR value in accordance with NRA HD25-26/10

20.9 %

| PLATE TEST REPORT SHEET (F3.1) | | Applied Pressure/Settlement Curve | |
|--------------------------------|--|---|----------------------------|
| Reference No. | R148884 | Description of soil under test (natural soil, placed fill, sub-base) | |
| Contract | 24759 Cranmore Court | Brown sandy gravelly SILT/CLAY | Sample Ref No. _____ m bgl |
| Test No. | CBR2 Reload | | |
| Location | See site Map | | |
| Depth | 0.5m | | |
| Client | Cromin Sutton | | |
| Plate Diameter: | 450 mm | | |
| Test Method | BS 1377: Part 9: 1990 Test4 - Incremental Loading Test | | |
| Technician | B Campbell | | |
| Authorised by | <i>[Signature]</i> | | |
| Date | 27/07/2023 | | |
| | |   | |

Pressure / Settlement



Pressure (kN/m²)

| | |
|--|--------|
| Gradient at 1.25 mm settlement intersection = 157 | 28.8 % |
| Modulus of subgrade reaction = 101 MPa/m | |
| Correction factor applied = 0.64 as per HD 25-26/10 | |
| Equivalent CBR value in accordance with NRA HD25-26/10 | |

Appendix VII Laboratory Data

a. Geotechnical



Test Report

Determination of Moisture Content, Liquid & Plastic Limits

Tested in accordance with BS1377:Part 2:1990, clauses 3.2, 4.3, 4.4 & 5.3**

IGSL Ltd
 Materials Laboratory
 Unit J5, M7 Business Park
 Newhall, Naas
 Co. Kildare
 045 846176

Report No. **R148875** Contract No. **24759** Contract Name: **Silgo**
 Customer **Cronin Sutton**
 Samples Received: **26/07/23** Date Tested: **26/07/23**

| BH/TP* | Sample No. | Depth* (m) | Lab. Ref | Sample Type* | Moisture Content % | Liquid Limit % | Plastic Limit % | Plasticity Index | % <425µm | Preparation | Liquid Limit Clause | Classification (BS5930) | Description |
|------------|------------|------------|----------|--------------|--------------------|----------------|-----------------|------------------|----------|-------------|---------------------|-------------------------|---|
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| BH01A (BC) | AA196234 | 1.0 | A23/2845 | B | 9.2 | 28 | 14 | 14 | 51 | WS | 4.4 | CL | Brown sandy gravelly CLAY |
| BH01A (BC) | AA196236 | 3.0 | A23/2846 | B | 5.4 | 30 | 15 | 15 | 43 | WS | 4.4 | CL | COBBLES with brown clayey, sandy gravel |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Preparation: WS - Wet sieved
 AR - As received
 NP - Non plastic
 Liquid Limit 4.3 Cone Penetrometer definitive method
 Clause: 4.4 Cone Penetrometer one point method

Sample Type: B - Bulk Disturbed
 U - Undisturbed

Remarks:
 Results relate only to the specimen tested, in as received condition unless otherwise noted.
 NOTE: **These clauses have been superseded by EN 17692-1 and EN17692-12.
 Opinions and interpretations are outside the scope of accreditation. * denotes Customer supplied information.
 This report shall not be reproduced except in full without written approval from the Laboratory.

IGSL Ltd Materials Laboratory

Persons authorized to approve reports
H Byrne (Laboratory Manager)

Approved by: *[Signature]* Date: **16/08/23** Page: **1 of 1**

TEST REPORT

Determination of Particle Size Distribution

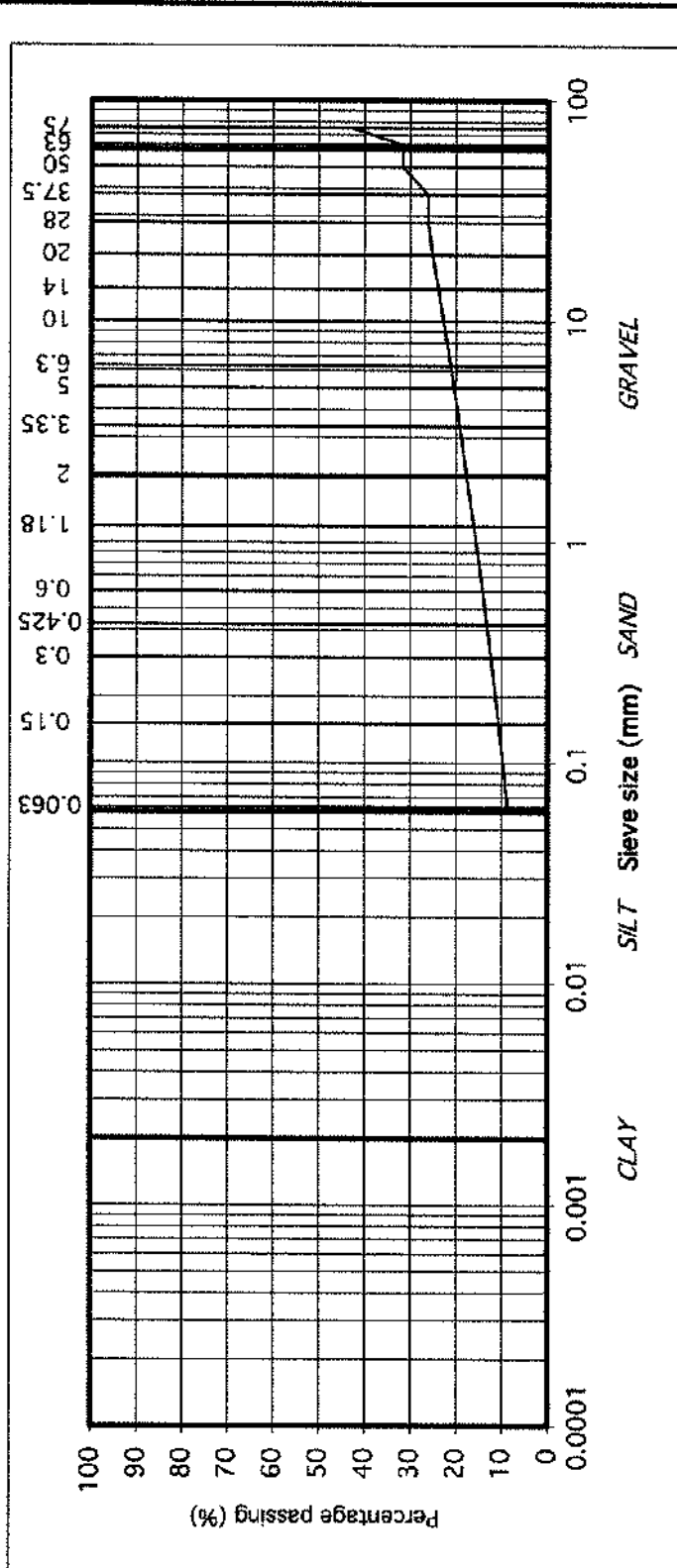
Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5**
(note: Sedimentation stage not accredited)



| | | | |
|-----------------|--|----------------------|---------------|
| Contract No. | 24759 | Report No. | R148876 |
| Contract Name : | Geldof Drive & Benson Court, Cranmore, Sligo | | |
| BH/TP No. | BH01A (BC) | | |
| Sample No.* | AA196236 | Lab. Sample No. | A23/2846 |
| Sample Type: | B | | |
| Depth* (m) | 3.00 | Customer: | Cronin Sutton |
| Date Received | 26/07/2023 | Date Testing started | 26/07/2023 |
| Description: | COBBLES with brown clayey, sandy, gravel | | |

Results relate only to the specimen tested in as received condition unless otherwise noted. * denotes Customer supplied information. Opinions and interpretations are outside the scope of accreditation.
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Remarks Note: **Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2. Sample size did not meet the requirements of BS1377



| | |
|---------------|-----------|
| particle size | % passing |
| 75 | 43 |
| 63 | 32 |
| 50 | 32 |
| 37.5 | 26 |
| 28 | 26 |
| 20 | 25 |
| 14 | 24 |
| 10 | 23 |
| 6.3 | 21 |
| 5 | 20 |
| 3.35 | 19 |
| 2 | 18 |
| 1.18 | 16 |
| 0.6 | 14 |
| 0.425 | 13 |
| 0.3 | 12 |
| 0.15 | 11 |
| 0.063 | 9 |

Appendix VII Laboratory Data

b. Environmental and Chemical



Final Report

Report No.: 23-26185-1

Initial Date of Issue: 14-Aug-2023

Re-Issue Details:

Client IGSL

Client Address: M7 Business Park
Naas
County Kildare
Ireland

Contact(s): Darren Keogh

Project 24759 Geldof Drive & Benson Court

Quotation No.: **Date Received:** 03-Aug-2023

Order No.: **Date Instructed:** 03-Aug-2023

No. of Samples: 4

Turnaround (Wkdays): 7 **Results Due:** 11-Aug-2023

Date Approved: 14-Aug-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Leachate

Project: 24759 Geldof Drive & Benson Court

| Client: IGSL | Chemtest Job No.: | 23-26185 | 23-26185 | | | |
|-------------------|----------------------|-----------|------------|-------|-------|---------|
| Quotation No.: | Chemtest Sample ID.: | 1683341 | 1683343 | | | |
| Order No.: | Client Sample Ref.: | AA196228 | AA196233 | | | |
| | Sample Location: | BH01 (GD) | BH01A (BC) | | | |
| | Sample Type: | SOIL | SOIL | | | |
| | Top Depth (m): | 0.50 | 0.50 | | | |
| Determinand | Accred. | SOP | Type | Units | LOD | |
| pH | U | 1010 | 10:1 | | N/A | 8.2 |
| Ammonium | U | 1220 | 10:1 | mg/l | 0.050 | < 0.050 |
| Ammonium | N | 1220 | 10:1 | mg/kg | 0.10 | 0.46 |
| Boron (Dissolved) | U | 1455 | 10:1 | mg/kg | 0.01 | < 0.01 |
| Benzofluoranthene | N | 1800 | 10:1 | µg/l | 0.010 | < 0.010 |

Results - Soil

Project: 24759 Geldof Drive & Benson Court

| Client: IGSL | Chemtest Job No.: | 23-26185 | 23-26185 | 23-26185 | 23-26185 |
|-------------------------------------|----------------------|-----------|-----------|------------|----------------------|
| Quotation No.: | Chemtest Sample ID.: | 1683341 | 1683342 | 1683343 | 1683344 |
| Order No.: | Client Sample Ref.: | AA196228 | AA196230 | AA196233 | AA196234 |
| | Sample Location: | BH01 (GD) | BH01 (GD) | BH01A (BC) | BH01A (BC) |
| | Sample Type: | SOIL | SOIL | SOIL | SOIL |
| | Top Depth (m): | 0.50 | 2.00 | 0.50 | 1.00 |
| | Asbestos Lab: | NEW-ASB | NEW-ASB | NEW-ASB | NEW-ASB |
| Determinand | Accred. | SOP | Units | LOD | |
| ACM Type | U | 2192 | | N/A | |
| Asbestos Identification | U | 2192 | | N/A | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 16 |
| pH (2.5:1) | N | 2010 | | 4.0 | [A] 8.8 |
| Boron (Hot Water Soluble) | U | 2120 | mg/kg | 0.40 | [A] < 0.40 |
| Magnesium (Water Soluble) | N | 2120 | g/l | 0.010 | [A] 0.010 |
| Sulphate (2:1 Water Soluble) as SO4 | U | 2120 | g/l | 0.010 | [A] < 0.010 |
| Total Sulphur | U | 2175 | % | 0.010 | [A] 0.039 |
| Sulphur (Elemental) | U | 2180 | mg/kg | 1.0 | [A] 1.1 |
| Chloride (Water Soluble) | U | 2220 | g/l | 0.010 | [A] < 0.010 |
| Nitrate (Water Soluble) | N | 2220 | g/l | 0.010 | < 0.010 |
| Cyanide (Total) | U | 2300 | mg/kg | 0.50 | [A] < 0.50 |
| Sulphide (Easily Liberatable) | N | 2325 | mg/kg | 0.50 | [A] 3.4 |
| Ammonium (Water Soluble) | U | 2220 | g/l | 0.01 | < 0.01 |
| Sulphate (Acid Soluble) | U | 2430 | % | 0.010 | [A] 0.028 |
| Arsenic | U | 2455 | mg/kg | 0.5 | 5.5 |
| Barium | U | 2455 | mg/kg | 0 | 16 |
| Cadmium | U | 2455 | mg/kg | 0.10 | 0.26 |
| Chromium | U | 2455 | mg/kg | 0.5 | 9.3 |
| Molybdenum | U | 2455 | mg/kg | 0.5 | < 0.5 |
| Antimony | N | 2455 | mg/kg | 2.0 | < 2.0 |
| Copper | U | 2455 | mg/kg | 0.50 | 11 |
| Mercury | U | 2455 | mg/kg | 0.05 | 0.05 |
| Nickel | U | 2455 | mg/kg | 0.50 | 23 |
| Lead | U | 2455 | mg/kg | 0.50 | 8.3 |
| Selenium | U | 2455 | mg/kg | 0.25 | 0.57 |
| Zinc | U | 2455 | mg/kg | 0.50 | 21 |
| Chromium (Trivalent) | N | 2490 | mg/kg | 1.0 | 9.3 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 |
| Mineral Oil (TPH Calculation) | N | 2670 | mg/kg | 10 | < 10 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C8-C10 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C10-C12 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C12-C16 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C16-C21 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C21-C35 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |

Results - Soil

Project: 24759 Geldof Drive & Benson Court

| Client: IGSL | Chemtest Job No.: | 23-26185 | 23-26185 | 23-26185 | 23-26185 | 23-26185 |
|------------------------------|----------------------|-----------|-----------|------------|--------------|--------------|
| Quotation No.: | Chemtest Sample ID.: | 1683341 | 1683342 | 1683343 | 1683344 | 1683344 |
| Order No.: | Client Sample Ref.: | AA196228 | AA196230 | AA196233 | AA196234 | AA196234 |
| | Sample Location: | BH01 (GD) | BH01 (GD) | BH01A (BC) | BH01A (BC) | BH01A (BC) |
| | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL |
| | Top Depth (m): | 0.50 | 2.00 | 0.50 | 1.00 | 1.00 |
| | Asbestos Lab: | NEW-ASB | | NEW-ASB | | NEW-ASB |
| Determinand | Accred. | SOP | Units | LOD | | |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | [A] < 5.0 | [A] < 5.0 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C8-C10 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C10-C12 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C12-C16 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C16-C21 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C21-C35 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | [A] < 5.0 | [A] < 5.0 |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 10.0 | [A] < 10 | [A] < 10 |
| Benzene | U | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Toluene | U | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Ethylbenzene | U | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| m & p-Xylene | U | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| o-Xylene | U | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Methyl Tert-Butyl Ether | U | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Naphthalene | N | 2800 | mg/kg | 0.010 | [A] 1.3 | [A] 2.6 |
| Acenaphthylene | N | 2800 | mg/kg | 0.010 | [A] < 0.010 | [A] 0.15 |
| Acenaphthene | N | 2800 | mg/kg | 0.010 | [A] < 0.010 | [A] 0.22 |
| Fluorene | N | 2800 | mg/kg | 0.010 | [A] < 0.010 | [A] < 0.010 |
| Phenanthrene | N | 2800 | mg/kg | 0.010 | [A] 0.22 | [A] < 0.010 |
| Anthracene | N | 2800 | mg/kg | 0.010 | [A] 0.14 | [A] < 0.010 |
| Fluoranthene | N | 2800 | mg/kg | 0.010 | [A] 0.49 | [A] < 0.010 |
| Pyrene | N | 2800 | mg/kg | 0.010 | [A] 0.53 | [A] < 0.010 |
| Benzo[a]anthracene | N | 2800 | mg/kg | 0.010 | [A] 0.59 | [A] < 0.010 |
| Chrysene | N | 2800 | mg/kg | 0.010 | [A] 0.53 | [A] < 0.010 |
| Benzo[b]fluoranthene | N | 2800 | mg/kg | 0.010 | [A] 0.75 | [A] < 0.010 |
| Benzo[k]fluoranthene | N | 2800 | mg/kg | 0.010 | [A] 0.63 | [A] < 0.010 |
| Benzo[a]pyrene | N | 2800 | mg/kg | 0.010 | [A] 0.53 | [A] < 0.010 |
| Indeno[1,2,3-c,d]Pyrene | N | 2800 | mg/kg | 0.010 | [A] 0.80 | [A] < 0.010 |
| Dibenz[a,h]Anthracene | N | 2800 | mg/kg | 0.010 | [A] 0.50 | [A] < 0.010 |
| Benzo[g,h,i]perylene | N | 2800 | mg/kg | 0.010 | [A] 0.78 | [A] < 0.010 |
| Coronene | N | 2800 | mg/kg | 0.010 | [A] < 0.010 | [A] < 0.010 |
| Total Of 17 PAH's | N | 2815 | mg/kg | 0.20 | [A] 7.8 | [A] 3.0 |
| PCB 28 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | [A] < 0.0010 |
| PCB 52 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | [A] < 0.0010 |
| PCB 90+101 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | [A] < 0.0010 |
| PCB 118 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | [A] < 0.0010 |

Results - Soil

Project: 24759 Geldof Drive & Benson Court

| Client: IGSL | | Chemtest Job No.: | 23-26185 | 23-26185 | 23-26185 | 23-26185 |
|--------------------------|---------|----------------------|-----------|-----------|--------------|------------|
| Quotation No.: | | Chemtest Sample ID.: | 1683341 | 1683342 | 1683343 | 1683344 |
| Order No.: | | Client Sample Ref.: | AA196228 | AA196230 | AA196233 | AA196234 |
| | | Sample Location: | BH01 (GD) | BH01 (GD) | BH01A (BC) | BH01A (BC) |
| | | Sample Type: | SOIL | SOIL | SOIL | SOIL |
| | | Top Depth (m): | 0.50 | 2.00 | 0.50 | 1.00 |
| | | Asbestos Lab: | NEW-ASB | | NEW-ASB | |
| Determinand | Accred. | SOP | Units | LOD | | |
| PCB 153 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | |
| PCB 138 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | |
| PCB 180 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | |
| Total PCBs (7 congeners) | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | |
| Total Phenols | U | 2920 | mg/kg | 0.10 | < 0.10 | |

Results - Single Stage WAC

Project: 24759 Geldof Drive & Benson Court

Chemtest Job No: 23-26185

Chemtest Sample ID: 1683343

Sample Ref: AA196233

Sample ID: BH01A (BC)

Top Depth(m): 0.50

Bottom Depth(m):

Sampling Date:

| Determinand | SOP | Accred. | Units | Landfill Waste Acceptance Criteria Limits | | |
|------------------------------|------|---------|------------------|---|--|--------------------------|
| | | | | Inert Waste Landfill | Stable, Non-reactive hazardous waste in non-hazardous Landfill | Hazardous Waste Landfill |
| Total Organic Carbon | 2625 | U | % | [A] 2.4 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 6.9 | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] 3.0 | -- | -- |
| pH | 2010 | U | | 8.5 | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.0070 | To evaluate | To evaluate |
| Eluate Analysis | | | 10:1 Eluate mg/l | 10:1 Eluate mg/kg | Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg | |
| Arsenic | 1455 | U | 0.0017 | 0.017 | 0.5 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.050 | 20 | 100 |
| Cadmium | 1455 | U | < 0.00011 | < 0.0011 | 0.04 | 1 |
| Chromium | 1455 | U | < 0.0005 | < 0.0050 | 0.5 | 10 |
| Copper | 1455 | U | 0.0015 | 0.015 | 2 | 50 |
| Mercury | 1455 | U | < 0.00005 | < 0.00050 | 0.01 | 0.2 |
| Molybdenum | 1455 | U | 0.0004 | 0.0043 | 0.5 | 10 |
| Nickel | 1455 | U | < 0.0005 | < 0.0050 | 0.4 | 10 |
| Lead | 1455 | U | < 0.0005 | < 0.0050 | 0.5 | 10 |
| Antimony | 1455 | U | < 0.0005 | < 0.0050 | 0.06 | 0.7 |
| Selenium | 1455 | U | 0.0007 | 0.0069 | 0.1 | 0.5 |
| Zinc | 1455 | U | 0.010 | 0.10 | 4 | 50 |
| Chloride | 1220 | U | < 1.0 | < 10 | 800 | 15000 |
| Fluoride | 1220 | U | 0.14 | 1.4 | 10 | 150 |
| Sulphate | 1220 | U | 1.9 | 19 | 1000 | 20000 |
| Total Dissolved Solids | 1020 | N | 47 | 460 | 4000 | 60000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | -- |
| Dissolved Organic Carbon | 1610 | U | 3.8 | < 50 | 500 | 800 |

| Solid Information | |
|-----------------------------|-------|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 16 |

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63, Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

| Sample: | Sample Ref: | Sample ID: | Sample Location: | Sampled Date: | Deviation Code(s): | Containers Received: |
|---------|-------------|------------|------------------|---------------|--------------------|----------------------|
| 1683341 | AA196228 | | BH01 (GD) | | A | Amber Glass 250ml |
| 1683341 | AA196228 | | BH01 (GD) | | A | Plastic Tub 500g |
| 1683342 | AA196230 | | BH01 (GD) | | A | Plastic Tub 500g |
| 1683343 | AA196233 | | BH01A (BC) | | A | Amber Glass 250ml |
| 1683343 | AA196233 | | BH01A (BC) | | A | Plastic Tub 500g |
| 1683344 | AA196234 | | BH01A (BC) | | A | Plastic Tub 500g |

Test Methods

| SOP | Title | Parameters included | Method summary |
|------|--|--|--|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1020 | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Conductivity Meter |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1455 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1610 | Total/Dissolved Organic Carbon in Waters | Organic Carbon | TOC Analyser using Catalytic Oxidation |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2015 | Acid Neutralisation Capacity | Acid Reserve | Titration |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2175 | Total Sulphur in Soils | Total Sulphur | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2180 | Sulphur (Elemental) in Soils by HPLC | Sulphur | Dichloromethane extraction / HPLC with UV detection |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2220 | Water soluble Chloride in Soils | Chloride | Aqueous extraction and measurement by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate. |
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easily liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2325 | Sulphide in Soils | Sulphide | Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine. |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2455 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |

Test Methods

| SOP | Title | Parameters included | Method summary |
|------|--|---|--|
| 2610 | Loss on ignition | loss on ignition (LOI) | Determination of the proportion by mass that is lost from a soil by ignition at 550°C. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2680 | TPH A/A Split | Aliphatics: >C5–C6, >C6–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44 Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44 | Dichloromethane extraction / GCxGC FID detection |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |
| 2815 | Polychlorinated Biphenyls (PCB) ICES7 Congeners in Soils by GC-MS | ICES7 PCB congeners | Acetone/Hexane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols>Note: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |
| 640 | Characterisation of Waste (Leaching C10) | Waste material including soil, sludges and granular waste | Compliance Test for Leaching of Granular Waste Material and Sludge |

Report Information

Key

| | |
|-----|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |
| SOP | Standard operating procedure |
| LOD | Limit of detection |

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

-
- A - Date of sampling not supplied
 - B - Sample age exceeds stability time (sampling to extraction)
 - C - Sample not received in appropriate containers
 - D - Broken Container
 - E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Appendix VIII Site Plan

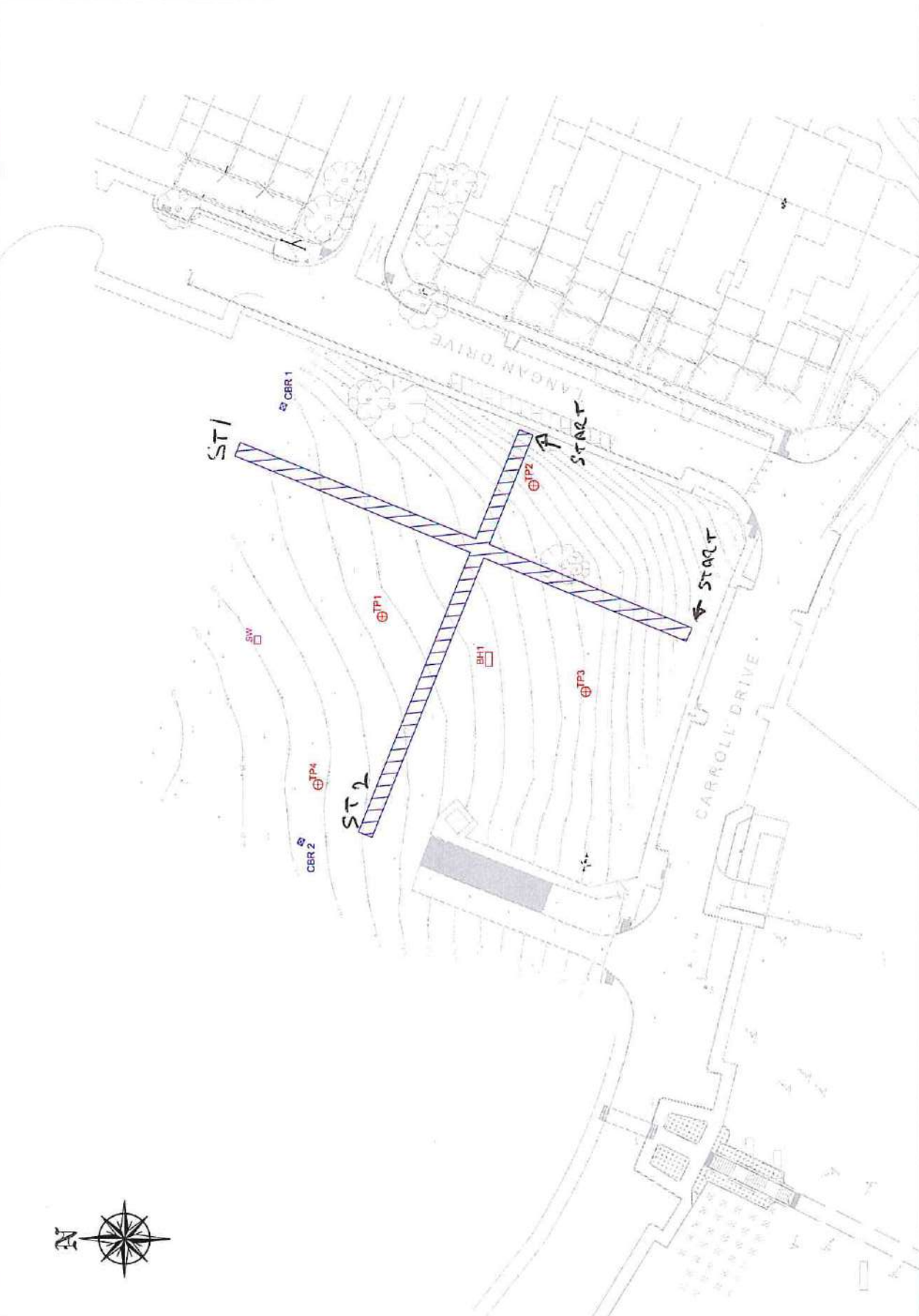


LEGEND

INTERNAL LOCATION
 TRAIL, PIPE AND CHAINING PINNAC
 CBR TEST
 SUMMARY TEST IN ONE CORNER 300
 SET TRACK

1. MARKER AS SHOWN ON PLAN OF PLOTTED AREA AND TO BE USED AS A GUIDE FOR THE POSITION OF THE TEST
 2. TRACKS SHALL ALSO MARK FOR THE SUBSEQUENT LOCATION OF THE TEST AND TO BE USED AS A GUIDE FOR THE POSITION OF THE TRACK
 3. TRACKS SHALL ALSO MARK FOR THE SUBSEQUENT LOCATION OF THE TEST AND TO BE USED AS A GUIDE FOR THE POSITION OF THE TRACK
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 L4Y 1H4
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 WWW: CS-CO.COM

REDDY ARCHITECTURE & URBANISM
 DEVELOPMENT AT BENSON COURT
 CHANNING, SLEICO TOWN
 SITE INVESTIGATION
 SCOPING PLAN

Project No: R119-CSC-01-ZZ-SKC-1000
 Date: FEB 2023
 Scale: 1:500 @ A1, 1:100 @ A1, 1:50 @ A1

| No. | Date | Description | By | Check |
|-----|------|-------------|----|-------|
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- NOTES**
- The field is to be used to identify the location of the test locations and to be used as a guide for the position of the test locations.
 - DO NOT SCALE THIS DRAWING. Use the dimensions only.
 - Before used in any project, the user must check the accuracy of the data and the accuracy of the data.
 - Check the accuracy of the data and the accuracy of the data.

INFORMATION ONLY
 THIS DRAWING HAS BEEN PREPARED FOR INFORMATION ONLY.
 FOR CONSTRUCTION UNDER ANY CONTRACTS.

**NEW HOUSING
DEVELOPMENT
GELDOF DRIVE SLIGO**

C.S. CONSULTING ENGINEERS

SLIGO COUNTY COUNCIL

CONTENTS

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| III | DISCUSSION |

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| | a. Geotechnical |
| | b. Environmental / Chemical |
| VI | SITE PLANS |

FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

General.

Recommendations made, and opinions expressed in the report are based on the strata observed in the exploratory holes, together with the results of in-situ and laboratory tests. No responsibility can be held for conditions which have not been revealed by exploratory work, or which occur between exploratory hole locations. Whilst the report may suggest the likely configuration of strata, both between exploratory hole locations, or below the maximum depth of the investigation, this is only indicative, and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

Standards

The ground investigation works for this project have been carried out by IGSL in accordance with Eurocode 7 - Part 2: Ground Investigation & Testing (EN 1997-2:2007). This has been used together with complementary documents such as BS 5930 (1999), BS 1377 (Parts 1 to 9) and Engineers Ireland Specification & Related Documents for Ground Investigation in Ireland (2006). The following Irish (IS) and European Standards or Norms are referenced:

- IS EN 1997-2 Eurocode 7: 2007 – Geotechnical Design – Part 2: Ground Investigation & Testing
- IS EN ISO 22475-1:2006 Geotechnical Investigation and Sampling – Sampling Methods & Groundwater Measurements
- IS EN ISO 14688-1:2002 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 1: Identification and Description
- IS EN ISO 14688-2:2004 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 2: Classification Principles

Routine Sampling.

Undisturbed samples of soils, predominantly cohesive in nature are obtained unless otherwise stated by a 104mm diameter open-drive tube sampler or Piston Sampler. In granular soils, and where undisturbed sampling is inappropriate, disturbed samples are collected. Smaller disturbed samples are also recovered at intervals to allow a visual examination of the full strata section.

In-Situ Testing.

Standard penetration tests were conducted strictly in accordance with Section 4.6 of IS EN 1997-2:2007. The SPT equipment (hammer energy test) has been calibrated in accordance with EN ISO 22476-3:2005 to obtain the Energy Ratio (E_r) of each hammer. A calibration certificate is available upon request. The E_r is defined as the ratio of the actual energy E_{meas} (measured energy during calibration) delivered to the drive weight assembly into the drive rod below the anvil, to the theoretical energy (E_{theor}) as calculated from the drive weight assembly. The recorded number of blows (N) reported on the engineering logs are uncorrected. In sands, the energy losses due to rod length and the effect of the overburden pressure should be taken into account (see IS EN ISO 22476-3:2005).

Groundwater

The depth of entry of any influx of groundwater is recorded during the course of boring operations. However, the normal rate of boring does not usually permit the recording of an equilibrium level for any one water strike. Where possible drilling is suspended for a period of twenty minutes to monitor the subsequent rise in water level. Groundwater conditions observed in the borings or pits are those appertaining to the period of investigation. It should be noted however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions, tidal variations etc.

Engineering Logging

Soil and rock identification has been based on the examination of the samples recovered and conforms with IS EN ISO 14688-1:2002 and IS EN ISO 14689-1:2004.

Where peat has been encountered during site works, samples have been logged in accordance with the Von Post Classification (ref. Von Post, L. 1992. Sveriges Geologiska Undersöknings torvinventering och några av dess hittills vunna resultat (SGU peat inventory and some preliminary results) Svenska Mosskulturforeningens Tidskrift, Jonköping, Sweden, 36, 1-37 & Hobbs N. B. Mire morphology and the properties of some British and foreign peats. QJEG, Vol. 19, 1986).

Retention of Samples.

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded unless a period of retention of samples is agreed, it is our normal practice to discard all soil samples one month after submission of our final report.

Reporting

Recommendations made and opinions expressed in this report are based on the strata observed in the exploratory holes, together with the results of in-situ and laboratory tests. No responsibility can be held by IGSL Ltd for ground conditions between exploratory hole locations.

The engineering logs provide ground profiles and configuration of strata relevant to the investigation depths achieved and caution should be taken when extrapolating between exploratory points. No liability is accepted for ground conditions extraneous to the investigation points. Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction, mining works or karstification below or close to the site.

This report has been prepared for the project client and the information should not be used without prior written permission. Any recommendations developed in this report specifically relate to the proposed development. IGSL Ltd accepts no responsibility or liability for this document being used other than for the purposes for which it was intended.

**REPORT ON A SITE INVESTIGATION
FOR A HOUSING DEVELOPMENT
AT
GELDOF DRIVE SLIGO
FOR
SLIGO COUNTY COUNCIL

C.S.CONSULTING GROUP**

Report No. 24759 / A

August 2023

I Introduction

New residential developments are proposed for two sites located at Geldof Drive and Benson Court in Sligo. Reports on the individual developments are presented separately.

An investigation of sub soil conditions in the area of the proposed new developments has been carried out by IGSL for C.S. Consulting Group on behalf of Sligo County Council.

The investigation at Geldof Drive included the following elements.

- | | |
|---|-------|
| * Cable Percussion Borehole | 1 nr. |
| • Trial Pits | 6 nr. |
| • Slit Trenches | 2 nr. |
| • Dynamic Probes | 6 nr. |
| • Geotechnical Laboratory Testing | |
| • Environmental and Chemical Laboratory Testing | |

This report includes all factual data available from field and laboratory operations and discusses these findings relative to foundation and infrastructural design for the proposed new housing development.

II Fieldwork

This new development is to take place on a site located in Sligo Town at the end of Geldof Drive.

The site location and the exploratory positions are noted on the site plan and map enclosed in Appendix VI.

All locations have been referenced to National Grid and OD levels have been established.

The various elements of the investigation are detailed in the following paragraphs. All field works were supervised by an experienced geotechnical engineer who carefully recorded stratification, took photographs as necessary, recovered samples and prepared detailed records.

Close liaison was maintained throughout with C.S. and Sligo County Council. Each location was scanned electronically (CAT) to ensure that existing services were not damaged. A shallow trial pit was also opened by hand at the exploratory borehole locations to confirm this. Statutory HSE safety precautions were observed, with working areas restricted to IGSL personnel only, to ensure safety of the general public.

Boreholes

The borehole was constructed using conventional 200mm diameter cable percussion equipment. The hole was referenced BH01.

Detailed geotechnical records are contained in Appendix I to this report - the records give details of stratification, sampling, in-situ testing and groundwater. Note is also taken of any obstructions to normal boring requiring the use of the heavy chisel for advancement. In general it was not possible to recover undisturbed samples because of the granular nature of the strata encountered and the presence of cobbles and boulders.

A variable layer of MADE GROUND was penetrated from GL to 1.20 metres. This overlies a stratum of stiff brown sandy gravelly CLAY. Boring was terminated at 4.30 metres BGL, following a period of abortive chiselling on a presumed BOULDER obstruction.

No ground water was observed during the course of drilling operation.

Trial Pits

Trial Pits were scheduled at six locations and referenced TP01 to TP06.

A tracked excavator was used under engineering supervision. Detailed records for each location are presented in Appendix II. These records note the soil stratification and record sampling, stability and ground water details. Each location was CAT scanned to ensure that underground services were not damaged.

The trial pits fairly consistently indicate the presence of MADE GROUND below a thin topsoil covering with several trial pits recording REFUSAL on obstructions in the fill.

At TP01 however gravelly CLAY was noted below the topsoil, initially soft but becoming firm below 0.70 metres and continuing to completion at 2.00 metres.

At TP05 the MADE GROUND extended to 1.00 metre and overlies firm to stiff brown gravelly CLAY.

TRIAL PIT DETAILS

| No. | MADE GROUND | Brown Gravelly CLAY |
|------|-------------|---------------------|
| TP01 | | 0.30 – 2.00 |
| TP02 | 0 – 1.50 | |
| TP03 | 0 – 1.20 | |
| TP04 | 0 – 1.00 | |
| TP05 | 0 – 1.00 | 1.00 – 2.10 |
| TP06 | 1 – 1.20 | |

No ground water was observed during the trial pitting operation.

Trial Pits were backfilled with excavated material and each location was levelled and surplus material was removed.

Slit Trenches

Slit trenches were excavated in two specified locations to determine the possible presence of services. A combination of machine and hand excavation was employed.

Slit Trench records (ST01 and ST02) are presented in Appendix III. Each trench was 3.80 metres long and 1.50 metres wide and was excavated through variable MADE GROUND material.

Services were located in each excavation with details noted on the individual records. Excavations were carefully backfilled on completion.

Heavy Duty Dynamic Probes

Heavy Duty Dynamic Probes were taken at the six trial pit locations and referenced DP01 to DP06.

Probing was in accordance with the heavy-duty probe specification of BS 1377: Part 9: 1990. In these tests, the soil resistance is measured in terms of the number of drop-hammer blows required to drive the test probe through each 100 mm increment of penetration. Probing is terminated when the blow count exceeds 25/100mm to avoid damage to the apparatus. Where loose material is present a single blow count may drive the apparatus in excess of 100mm. In this instance blow counts of zero may be recorded. Individual probe records are contained in Appendix IV.

Probe findings are summarised in the following table.

High Probe resistance was recorded from GL to about 0.80 metres in several locations with REFUSAL , presumably on coarse dense MADE GROUND.

Probes DP04 and DP05 however penetrated the FILL zone to identify soft material (probably old surface soil) and stiff gravelly CLAY at approximately 1.60 metres BGL.

It should be noted that the probing technique does not identify soils type and that high values can often be obtained in well compacted made ground.

SUMMARY DYNAMIC PROBE DETAILS

| Probe No. | DENSE FILL | Soft Clay | Stiff Clay |
|------------------|---------------------|------------------|-------------------|
| DP 01 | 0 – 0.80 (Refusal) | | |
| DP 02 | 0 – 0.90 (Refusal) | | |
| DP 03 | 0 – 0.70 (Refusal) | | |
| DP 04 | 0 – 1.30 | 1.30 – 1.60 | 1.70 – 2.20 |
| DP 05 | 0 – 1.20 | 1.20 – 1.50 | 1.60 – 2.00 |
| DP 06 | 0 – 0.80 (Refusal) | | |

III. Testing

In Situ

Standard penetration tests were carried out at approximate 1.00 metre intervals in the geotechnical Borehole to measure relative in-situ soil strength. N values are noted in the right hand column of the boring record, representing the blow count required to drive the standard sampler 300mm into the soil, following initial seating blows. Where full test penetration was not achieved the blow count for a specific penetration is recorded, or refusal is indicated where appropriate. The results of the tests are summarised as follows:

| Stratum Test Depth | N VALUES | COMMENT |
|---------------------------|-----------------|----------------|
| FILL (1.00) | Refusal | |
| Gravelly Clay | | |
| 2.00 metres BGL | 29 | Stiff |
| 3.00 metres BGL | 33 | Stiff |
| 4.00 metres BGL | > 50 | Hard |

Laboratory

A programme of laboratory testing was scheduled following completion of site operations. Geotechnical soil testing was carried out by IGSL in its INAB-Accredited laboratory. Chemical and environmental testing was carried out in the UK by EUROFINS Ltd. The test programme included the following elements:

| | |
|--|----------|
| Liquid and Plastic Limits / Moisture Content | IGSL |
| PSD Grading by Wet Sieve and Hydrometer | IGSL |
| Sulphate / Chloride / pH | EUROFINS |
| RILTA Suite Environmental | EUROFINS |

All laboratory data is presented in Appendices V a and V b and individual tests are discussed briefly as follows:

Index Properties / Moisture Content

Samples from the gravelly CLAY stratum had Index Properties and Natural Moisture Contents established. The tests show some variation in composition from gravelly CLAY to clay-bound gravel, this is typical of glacial till or boulder clay deposition. Natural Moisture Contents range from 11 to 13 % in the brown gravelly CLAY

Grading

Wet Sieve and hydrometer analysis has been carried out on one sample from BH01.

The grading curve confirms the composition indicated in the Classification Tests. The CLAY matrix soil has a straight line grading ranging from the fine clay to coarse gravel fraction, again typical of glacial till deposition.

Chemical

One sample was sent for analysis to BRE Chemical Suite parameters. A Sulphate concentration (SO₄ 2:1 extract) of < 0.010 g/l was established with a pH value of 8.8. A low Chloride concentration (< 0.010 g/l) was also determined.

RILTA Environmental Suite

One sample of the FILL from the site was sent to EUROFINS environmental laboratory and testing was carried out in accordance with RILTA requirements to establish Landfill Waste Acceptance Criteria (WAC).

The test result confirms an INERT Classification for the sample tested indicating that excavated material will be suitable for disposal to a suitably licensed Landfill facility.

The presence of made ground over much of the site is noted and it is possible that Landfill operators may require additional testing prior to accepting material for disposal.

IV. Discussion:

A residential development is proposed for this small site located at Geldof Drive in Sligo.

An investigation of ground conditions has been carried out for Sligo County Council to provide data to assist in foundation and infrastructural design.

The investigation consisted of a conventional Borehole with supplementary Trial Pits and Dynamic Probes. Geotechnical and Environmental laboratory testing has also been carried out to confirm soil parameters

STRATIFICATION

The investigation has identified MADE GROUND extending to about 1.50 metres over much of the site.

Below the MADE GROUND a stratum of firm, becoming stiff, gravelly CLAY has been noted. In some locations more granular soils (typically clay-bound sandy GRAVEL) were noted. This stratum is a GLACIAL TILL (locally referred to as BOULDER CLAY) and is typical of the region.

Ground water was not encountered.

SOIL CHARACTERISTICS

MADE GROUND

Made Ground is generally regarded as unsuitable as a founding medium for structural loading unless selected, placed and compacted under strict engineering control. Visual inspection and in situ tests confirm that the stratum is very variable with construction waste noted throughout. Foundation and floor loads should be transferred to a suitable underlying stratum.

Gravelly CLAY (Boulder Clay)

The strength of the soils below the upper FILL has been assessed by visual inspection of Trial Pit excavations, by Standard Penetration Tests in the boreholes and by Dynamic Probing at six locations.

FOUNDATIONS

The data from this investigation confirms that traditional strip or pad foundations will be appropriate for this development using the firm to stiff gravelly clay soil underlying the upper FILL as a founding medium.

An allowable bearing pressure of 150 kN/sq.m. can be adopted at an approximate depth of 1.50 to 2.00 metres (below the MADE GROUND).

Given the variations noted both in soil composition and strength visual inspection of excavated formation by experienced personnel is strongly recommended to ensure uniformity and suitability of the founding medium. All suspect material should be removed and replaced with low-grade concrete.

GROUND WATER

No ground water was encountered during the investigation and water ingress to excavations is not anticipated.

CONCRETE

No special precautions are necessary to protect foundation concrete from sulphate or chloride aggression. A sulphate design class of DS-1 (ACEC Classification for Concrete) is indicated for concentrations less than 0.5 g/l.

ENVIRONMENTAL

While the sample sent for RILTA Suite analysis is classed as INERT, the extensive MADE GROUND deposits should be noted. The appointed Landfill may require additional testing to fulfil their licence requirements.

IGSL/JC
August 2023

Appendix I Boring Record



GEOTECHNICAL BORING RECORD

REPORT NUMBER

24759

| | | | | | |
|--|--|-----------------------------------|--|----------------------------------|--|
| CONTRACT Geldof Drive & Benson Court | | | | BOREHOLE NO. BH01 (GD) | |
| CO-ORDINATES 569,638.01 E 835,331.67 N | | RIG TYPE Dando 2000 | | SHEET Sheet 1 of 1 | |
| GROUND LEVEL (m AOD) 18.55 | | BOREHOLE DIAMETER (mm) 200 | | DATE COMMENCED 15/06/2023 | |
| | | BOREHOLE DEPTH (m) 4.20 | | DATE COMPLETED 15/06/2023 | |
| CLIENT Sligo Co.Co. | | SPT HAMMER REF. NO. | | BORED BY P.Allan | |
| ENGINEER CS Consulting | | ENERGY RATIO (%) | | PROCESSED BY F.C | |

| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | | Field Test Results | Standpipe Details |
|-----------|---|--------|-----------|-----------|-------------|-------------|-----------|----------|--------------------|-------------------------------|
| | | | | | Ref. Number | Sample Type | Depth (m) | Recovery | | |
| 0 | MADE GROUND comprised of grey gravelly CLAY with concrete block fragments | | | | | | | | | |
| 1 | | | 17.35 | 1.20 | AA196228 | B | 0.50 | | | |
| | | | | | AA196229 | B | 1.00 | | | N = 26 (2, 3, 4, 6, 9, 10) |
| 2 | Stiff brown sandy gravelly CLAY with a low to medium cobble content | | | | AA196230 | B | 2.00 | | | N = 33 (5, 5, 7, 9, 9, 8) |
| 3 | | | | | AA196231 | B | 3.00 | | | N = 33 (6, 4, 5, 8, 8, 12) |
| 4 | | | 14.25 | 4.30 | AA196232 | B | 4.00 | | | N = 50/75 mm (25, 50) |
| | Obstruction End of Borehole at 4.20 m | | | | | | | | | |

| HARD STRATA BORING/CHISELLING | | | | WATER STRIKE DETAILS | | | | | |
|-------------------------------|--------|----------|----------|----------------------|--------------|-----------|---------|------------|-----------------|
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments |
| 2 | 2.2 | 1 | | | | | | | |
| 4.1 | 4.3 | 1.5 | | | | | | | No water strike |

| INSTALLATION DETAILS | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments |
|----------------------|-----------|--------|---------|------|------|------------|--------------|----------------|----------|
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | |
| | | | | | | | | | |

REMARKS CAT scanned location and hand dug inspection pit carried out. (Possible demolished wall at 1.0m)

Sample Legend
 D - Small Disturbed (tub)
 B - Bulk Disturbed
 LB - Large Bulk Disturbed
 Env - Environmental Sample (Jar + Vial + Tub)
 UT - Undisturbed 100mm Diameter Sample
 P - Undisturbed Piston Sample
 W - Water Sample

GSI BH LOG 24759 GELDOF PARK GPJ | GSI GDT 8/8/22

**Appendix II Trial Pit Records
Photographs**



TRIAL PIT RECORD

REPORT NUMBER

24759

| | |
|--|--|
| CONTRACT Geldof Drive and Benson Court | TRIAL PIT NO. TP01 (GD) |
| LOGGED BY BC | SHEET Sheet 1 of 1 |
| CLIENT Sligo Co.Co. | DATE STARTED 28/07/2023 |
| ENGINEER CS Consulting | DATE COMPLETED 28/07/2023 |
| CO-ORDINATES 569,670.27 E 835,295.12 N | EXCAVATION METHOD Tracked Excavator |
| GROUND LEVEL (m) 19.27 | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation | Water Strike | Samples | | | Vane Test (KPa) | Hand Penetrometer (kPa) |
|-----------|--|--------|-----------|-----------|--------------|------------|------|-----------|-----------------|-------------------------|
| | | | | | | Sample Ref | Type | Depth | | |
| 0.0 | TOPSOIL | | | | | | | | | |
| | Soft to firm grey brown sandy gravelly silty CLAY with a medium cobble content. Sand is medium to coarse. Gravel is angular to subrounded. | | 0.30 | 18.97 | | 209141 | B | 0.50-0.70 | | |
| | Firm grey sandy gravelly slightly silty CLAY with a medium cobble and boulder content. Sand is medium to coarse. Gravel is subangular to subrounded. Boulders up to 250mm. | | 0.70 | 18.57 | | | | | | |
| 2.0 | Obstruction - Possible Boulder End of Trial Pit at 2.00m | | 2.00 | 17.27 | | | | | | |

Groundwater Conditions
Dry

Stability
Good

General Remarks

IGSL TP LOG 24759 GELDOF PARK GP3 IGSL_GDT_8/8/23



TRIAL PIT RECORD

REPORT NUMBER

24759

| | | |
|--|--|----------------------------------|
| CONTRACT Geldof Drive and Benson Court | | TRIAL PIT NO. TP02 (GD) |
| LOGGED BY BC | | SHEET Sheet 1 of 1 |
| CO-ORDINATES 569,656.22 E 835,295.65 N | | DATE STARTED 28/07/2023 |
| GROUND LEVEL (m) 19.29 | | DATE COMPLETED 28/07/2023 |
| CLIENT Silgo Co.Co. | EXCAVATION METHOD Tracked Excavator | |
| ENGINEER CS Consulting | | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation | Water Strike | Samples | | | Vane Test (KPa) | Hard Penetrometer (KPa) |
|-----------|---|--------|-----------|-----------|--------------|------------|------|-----------|-----------------|-------------------------|
| | | | | | | Sample Ref | Type | Depth | | |
| 0.0 | TOPSOIL | | | | | | | | | |
| | MADE GROUND comprising dark grey brown sandy silty/clayey GRAVEL with a high cobble and boulder content and occasional building rubble and plastic. | | 0.30 | 18.99 | | 209140 | B | 0.50-0.70 | | |
| 1.0 | | | | | | | | | | |
| | End of Trial Pit at 1.50m | | 1.50 | 17.79 | | | | | | |
| 2.0 | | | | | | | | | | |

Groundwater Conditions
Dry

Stability
Good

General Remarks

IGSL TP LOG 24759 GELDOF PARK GPJ IGSL GDT 8/8/23



TRIAL PIT RECORD

REPORT NUMBER

24759

| | | |
|---|--|--|
| CONTRACT Geldof Drive and Benson Court | | TRIAL PIT NO. TP03 (GD) |
| LOGGED BY BC | CO-ORDINATES 569,623.44 E 835,316.80 N | SHEET Sheet 1 of 1 |
| CLIENT Sligo Co.Co. | GROUND LEVEL (m) 19.22 | DATE STARTED 28/07/2023 |
| ENGINEER CS Consulting | | DATE COMPLETED 28/07/2023 |
| | | EXCAVATION METHOD Tracked Excavator |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation | Water Strike | Samples | | | Vane Test (kPa) | Hand Penetrometer (kPa) |
|-----------|---|--------|-----------|-----------|--------------|------------|------|-----------|-----------------|-------------------------|
| | | | | | | Sample Ref | Type | Depth | | |
| 0.0 | TOPSOIL | | | | | | | | | |
| | MADE GROUND comprising dark grey brown sandy silty/clayey GRAVEL with a high cobble and boulder content and occasional plastic and metal fragments. | | 0.30 | 18.92 | | 209139 | B | 0.50-0.70 | | |
| 1.0 | Obstruction - Possible Boulder End of Trial Pit at 1.20m | | 1.20 | 16.02 | | | | | | |
| 2.0 | | | | | | | | | | |

Groundwater Conditions
Dry

Stability
Good

General Remarks

IGSSL TP LOG 24759 GELDOF PARK, SRJ IGSSL.GDT 8/9/23



TRIAL PIT RECORD

REPORT NUMBER

24759

CONTRACT Geldof Drive and Benson Court

TRIAL PIT NO. TP04 (GD)
SHEET Sheet 1 of 1

LOGGED BY BC

CO-ORDINATES 569,621.32 E
835,335.08 N

DATE STARTED 28/07/2023
DATE COMPLETED 28/07/2023

CLIENT ENGINEER Sligo Co.Co.
CS Consulting

GROUND LEVEL (m) 18.51

EXCAVATION METHOD Tracked Excavator

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation | Water Strike | Samples | | | Vane Test (kPa) | Hand Penetrometer (kPa) |
|-----------|--|--------|-----------|-----------|--------------|------------|------|-----------|-----------------|-------------------------|
| | | | | | | Sample Ref | Type | Depth | | |
| 0.0 | TOPSOIL | | | | | | | | | |
| | MADE GROUND comprising dark grey brown sandy silty/clayey GRAVEL with a high cobble and boulder content and occasional plastic and metal wire fragments. Sand is medium to coarse. | | 0.30 | 18.21 | | 209137 | B | 0.50-0.70 | | |
| 1.0 | Obstruction - Possible Boulder End of Trial Pit at 1.00m | | 1.00 | 17.51 | | 209138 | B | 1.00-1.20 | | |
| 2.0 | | | | | | | | | | |

Groundwater Conditions
Dry

Stability
Good

General Remarks

IGSL TP LOG 24759 GELDOF PARK GPJ IGSL GDT 8/8/23



TRIAL PIT RECORD

REPORT NUMBER

24759

| | | |
|--|--|----------------------------------|
| CONTRACT Geldof Drive and Benson Court | | TRIAL PIT NO. TP05 (GD) |
| LOGGED BY BC | | SHEET Sheet 1 of 1 |
| CO-ORDINATES 569,643.62 E 835,343.27 N | | DATE STARTED 28/07/2023 |
| GROUND LEVEL (m) 18.16 | | DATE COMPLETED 28/07/2023 |
| CLIENT Sligo Co.Co. | EXCAVATION METHOD Tracked Excavator | |
| ENGINEER CS Consulting | | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation | Water Strike | Samples | | | Vane Test (KPa) | Hand Penetrometer (KPa) |
|-----------|---|--------|-----------|-----------|--------------|------------|------|-------|-----------------|-------------------------|
| | | | | | | Sample Ref | Type | Depth | | |
| 0.0 | TOPSOIL | | | | | | | | | |
| 0.30 | MADE GROUND comprising soft dark grey brown slightly sandy gravelly silty CLAY with a medium cobble content and occasional plastic. Boulders up to 250mm. | | 0.30 | 17.86 | | | | | | |
| 0.40-0.60 | | | 209135 | B | | | | | | |
| 0.80-1.00 | | | 0.80-1.00 | | | 209136 | B | | | |
| 1.00 | Firm to stiff brown sandy gravelly silty CLAY with a medium cobble content. Sand is medium. | | 1.00 | 17.16 | | | | | | |
| 2.10 | Obstruction - Possible Boulder End of Trial Pit at 2.10m | | 2.10 | 16.06 | | | | | | |

Groundwater Conditions
Dry

Stability
Good

General Remarks

IGSL TP LOG 24759 GELDOF PARK G.P.J IGSL G.D.T. 08/23



TRIAL PIT RECORD

REPORT NUMBER

24759

| | |
|--|--|
| CONTRACT Geldof Drive and Benson Court | TRIAL PIT NO. TP06 (GD) |
| LOGGED BY BC | SHEET Sheet 1 of 1 |
| CLIENT Sligo Co.Co. | DATE STARTED 28/07/2023 |
| ENGINEER CS Consulting | DATE COMPLETED 28/07/2023 |
| CO-ORDINATES 569,633.66 E 835,321.48 N | EXCAVATION METHOD Tracked Excavator |
| GROUND LEVEL (m) 18.96 | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation | Water Strike | Samples | | | Vane Test (KPa) | Hand Penetrometer (KPa) |
|-----------|---|--------|-----------|-----------|--------------|------------|------|-----------|-----------------|-------------------------|
| | | | | | | Sample Ref | Type | Depth | | |
| 0.0 | TOPSOIL | | | | | | | | | |
| 0.30 | MADE GROUND comprising dark brown grey sandy silty/clayey GRAVEL with a high cobble and boulder content and occasional plastic and metal fragments. Sand is medium to coarse. | | 0.30 | 18.66 | | 209134 | B | 0.50-0.70 | | |
| 1.20 | Obstruction - Possible Boulder End of Trial Pit at 1.20m | | 1.20 | 17.76 | | | | | | |

Groundwater Conditions
Dry

Stability
Good

General Remarks

IGSL TP LOG 24759 GELDOF PARK.GPJ IGSL.GDT 8/8/23

TP01 (GD) – 1 of 2



TP01 (GD) – 2 of 2



TP02 (GD) – 1 of 2



TP02 (GD) – 2 of 2



TP03 (GD) – 1 of 2



TP03 (GD) – 2 of 2



TP04 (GD) – 1 of 2



TP04 (GD) – 2 of 2



Report No: 24759
Geldof Drive & Benson Court – Trial Pit Photographs

TP05 (GD) – 1 of 2



TP05 (GD) – 2 of 2



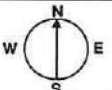


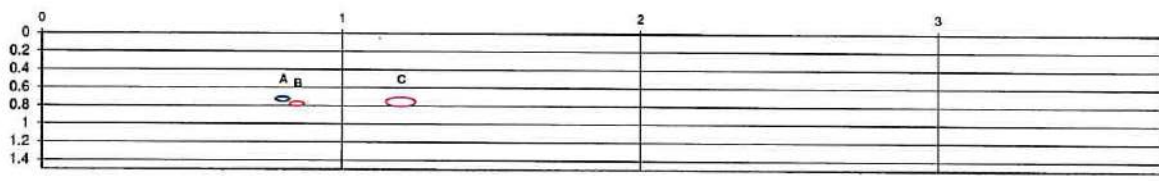
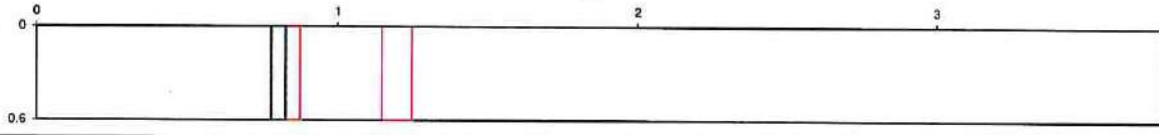
TP06 (GD) – 1 of 2



TP06 (GD) – 2 of 2



Appendix III Slit Trenches

| | | | | | | | | |
|--|----------------------|--------------------|----------------------------|--|---|--------------------------------|---|---------------------------|
| Report No. 24759 | | SLIT TRENCH RECORD | | | FACING DIRECTION:  | |  | |
| Project: Geldof Drive and Benson Court | | | Survey | | | Slit Trench No. 1 | | |
| Engineer: CS Consulting | | | Easting (m) 569643.258 | | | Northing (m) 835339.019 | | Sheet 1 of 1 |
| Crew: BC / Flanagans | | | Start of Trench 569646.698 | | | End of Trench 835337.7 | | Elevation (mOD) 18.311 |
| Location Geldof Drive Section | | | | | | Date Commenced 28/07/2023 | | Date Completed 28/07/2023 |
| Ground Conditions | | | | | | | | |
| From (m) | | To (m) | | Soil Description | | | Photograph | |
| 0 | | 0.5 | | MADE GROUND comprising Hardcore FILL | | |  | |
| 0.5 | | 1.5 | | MADE GROUND comprising of dark grey brown sandy silty/clayey GRAVEL with a high cobble and boulder content and rare fragments of plastic, metal and building rubble. | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Trench Dimensions | | | Location | | | Excavation Quantities | | |
| LHS of Trench (m) | 0.0 | | | | | Surface | | Material |
| RHS of Trench (m) | 3.8 | | | | | Road | 2.0 | |
| Trench Depth (m) | 1.5 | | | | | Path (LHS) | 1.8 | |
| Trench Width (m) | 0.6 | | | | | Path (RHS) | | |
| | | | | | | Grass Verge (LHS) | | |
| Facing Direction | | | SAMPLES | | | Grass Verge (RHS) | | |
| Facing Features Pitch | | | | | | Other | | |
| Groundwater | | | | | | Total Length | | 3.8 |
| | | | | | | Zero Metres Taken As: LHS Wall | | |
| | | | | | | | | |
| X-Section | | | | | | | | |
|  | | | | | | | | |
| Plan | | | | | | | | |
|  | | | | | | | | |
| | Diameter (mm) | Material | Description | Distance (m) | Depth to crown (m) | Angle (deg.) | | |
| Service A | 50 | Black PVC | | 0.8 | 0.7 | 90 | | |
| Service B | 50 | Black PVC | | 0.85 | 0.75 | 90 | | |
| Service C | 100 | Black PVC | | 1.2 | 0.7 | 90 | | |
| Service D | | | | | | | | |
| Service E | | | | | | | | |
| Service F | | | | | | | | |
| Service G | | | | | | | | |
| Service H | | | | | | | | |
| Service I | | | | | | | | |
| Service J | | | | | | | | |
| Service K | | | | | | | | |
| Service L | | | | | | | | |
| Service M | | | | | | | | |

Appendix IV Dynamic Probes



DYNAMIC PROBE RECORD

REPORT NUMBER

24759

| | | | | | |
|--|--|--------------------------------|--|--------------------------------|--|
| CONTRACT Geldof Drive & Benson Court | | | | PROBE NO. DP01 (GD) | |
| CO-ORDINATES 569,870.27 E 835,295.12 N | | | | SHEET Sheet 1 of 1 | |
| GROUND LEVEL (mOD) 19.27 | | HAMMER MASS (kg) 50 | | DATE DRILLED 28/07/2023 | |
| | | INCREMENT SIZE (mm) 100 | | DATE LOGGED 28/07/2023 | |
| CLIENT Sligo Co.Co. | | FALL HEIGHT (mm) 500 | | PROBE TYPE DPH | |
| ENGINEER CS Consulting | | | | | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation (mOD) | Water | Depth (m) | Probe Readings (Blows/Increment) | Graphic Probe Record | | |
|-----------|--------------------------|--------|-----------|-----------------|-------|-----------|----------------------------------|----------------------|----|--|
| 0.0 | End of Probe at 0.80 m | | | 18.47 | | 0.00 | 1 | | | |
| | | | | | | | 0.10 | | 6 | |
| | | | | | | | 0.20 | | 12 | |
| | | | | | | | 0.30 | | 21 | |
| | | | | | | | 0.40 | | 23 | |
| | | | | | | | 0.50 | | 22 | |
| | | | | | | | 0.60 | | 22 | |
| | | | | | | | 0.70 | | 25 | |
| 1.0 | | | | | | | | | | |
| 2.0 | | | | | | | | | | |
| 3.0 | | | | | | | | | | |
| 4.0 | | | | | | | | | | |

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 24759 GELDOF PARK.GPJ IGSL GDT 8/8/23



DYNAMIC PROBE RECORD

REPORT NUMBER

24759

| | | | | | |
|--|--|--------------------------------|--|--------------------------------|--|
| CONTRACT Geldof Drive & Benson Court | | | | PROBE NO. DP02 (GD) | |
| CO-ORDINATES 589,656.22 E 835,295.85 N | | | | SHEET Sheet 1 of 1 | |
| GROUND LEVEL (mOD) 19.29 | | HAMMER MASS (kg) 50 | | DATE DRILLED 28/07/2023 | |
| | | INCREMENT SIZE (mm) 100 | | DATE LOGGED 28/07/2023 | |
| CLIENT Sligo Co.Co. | | FALL HEIGHT (mm) 500 | | PROBE TYPE DPH | |
| ENGINEER CS Consulting | | | | | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation (mOD) | Water | Depth (m) | Probe Readings (Blows/Increment) | Graphic Probe Record |
|-----------|--------------------------|--------|-----------|-----------------|-------|-----------|----------------------------------|----------------------|
| 0.0 | | | | | | 0.00 | 3 | |
| | | | | | | 0.10 | 1 | |
| | | | | | | 0.20 | 12 | |
| | | | | | | 0.30 | 16 | |
| | | | | | | 0.40 | 20 | |
| | | | | | | 0.50 | 24 | |
| | | | | | | 0.60 | 22 | |
| | | | | | | 0.70 | 23 | |
| | | | | | | 0.80 | 25 | |
| 1.0 | End of Probe at 0.90 m | | | 18.39 | | | | |
| 2.0 | | | | | | | | |
| 3.0 | | | | | | | | |
| 4.0 | | | | | | | | |

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 24759 GELDOF PARK GP J IGSL GDT 8/8/23



DYNAMIC PROBE RECORD

REPORT NUMBER

24759

| | | |
|--|--------------------------------|--------------------------------|
| CONTRACT Geldof Drive & Benson Court | | PROBE NO. DP03 (GD) |
| CO-ORDINATES 569,823.44 E 835,316.80 N | | SHEET Sheet 1 of 1 |
| GROUND LEVEL (mOD) 19.22 | HAMMER MASS (kg) 50 | DATE DRILLED 28/07/2023 |
| CLIENT Sligo Co.Co. | INCREMENT SIZE (mm) 100 | DATE LOGGED 28/07/2023 |
| ENGINEER CS Consulting | FALL HEIGHT (mm) 500 | PROBE TYPE DPH |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation (mOD) | Water | Depth (m) | Probe Readings (Blows/Increment) | Graphic Probe Record | |
|-----------|--------------------------|--------|-----------|-----------------|-------|-----------|----------------------------------|----------------------|----|
| 0.0 | End of Probe at 0.70 m | | | 18.52 | | 0.00 | 1 | | |
| | | | | | | | 0.10 | | 2 |
| | | | | | | | 0.20 | | 15 |
| | | | | | | | 0.30 | | 21 |
| | | | | | | | 0.40 | | 21 |
| | | | | | | | 0.50 | | 22 |
| | | | | | | | 0.60 | | 25 |
| 1.0 | | | | | | | | | |
| 2.0 | | | | | | | | | |
| 3.0 | | | | | | | | | |
| 4.0 | | | | | | | | | |

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 24759 GELDOLF PARK GPJ IGSL GDT RIR23



DYNAMIC PROBE RECORD

REPORT NUMBER

24759

CONTRACT Geldof Drive & Benson Court

PROBE NO. **DP04 (GD)**

CO-ORDINATES 569,621.32 E
835,335.06 N

SHEET Sheet 1 of 1

GROUND LEVEL (mOD) 18.51

HAMMER MASS (kg) 50

DATE DRILLED 28/07/2023

DATE LOGGED 28/07/2023

CLIENT Sligo Co.Co.

INCREMENT SIZE (mm) 100

PROBE TYPE DPH

ENGINEER CS Consulting

FALL HEIGHT (mm) 500

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation (mOD) | Water | Depth (m) | Probe Readings (Blows/Increment) | Graphic Probe Record |
|-----------|--------------------------|--------|-----------|-----------------|-------|-----------|----------------------------------|----------------------|
| 0.0 | | | | | | 0.00 | 0 | |
| | | | | | | 0.10 | 2 | |
| | | | | | | 0.20 | 6 | |
| | | | | | | 0.30 | 8 | |
| | | | | | | 0.40 | 12 | |
| | | | | | | 0.50 | 7 | |
| | | | | | | 0.60 | 8 | |
| | | | | | | 0.70 | 6 | |
| | | | | | | 0.80 | 4 | |
| | | | | | | 0.90 | 8 | |
| | | | | | | 1.00 | 10 | |
| | | | | | | 1.10 | 10 | |
| | | | | | | 1.20 | 11 | |
| | | | | | | 1.30 | 11 | |
| | | | | | | 1.40 | 3 | |
| | | | | | | 1.50 | 3 | |
| | | | | | | 1.60 | 4 | |
| | | | | | | 1.70 | 14 | |
| | | | | | | 1.80 | 13 | |
| | | | | | | 1.90 | 12 | |
| | | | | | | 2.00 | 20 | |
| | | | | | | 2.10 | 25 | |
| | End of Probe at 2.20 m | | | 16.31 | | | | |

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 24759 GELDOF PARK GPJ IGSL GDT 8/8/23



DYNAMIC PROBE RECORD

REPORT NUMBER

24759

| | | | |
|--|--|--------------------------------|--|
| CONTRACT Geldof Drive & Benson Court | | PROBE NO. DP05 (GD) | |
| CO-ORDINATES 569,643.62 E 835,343.27 N | | SHEET Sheet 1 of 1 | |
| GROUND LEVEL (mOD) 18.16 | | DATE DRILLED 28/07/2023 | |
| CLIENT Sligo Co.Co. | | DATE LOGGED 28/07/2023 | |
| ENGINEER CS Consulting | | PROBE TYPE DPH | |
| HAMMER MASS (kg) 50 | | INCREMENT SIZE (mm) 100 | |
| FALL HEIGHT (mm) 500 | | | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation (mOD) | Water | Depth (m) | Probe Readings (Blows/Increment) | Graphic Probe Record |
|-----------|--------------------------|--------|-----------|-----------------|-------|-----------|----------------------------------|----------------------|
| 0.0 | | | | | | 0.00 | 1 | |
| 0.10 | | | | | | 0.10 | 1 | |
| 0.20 | | | | | | 0.20 | 2 | |
| 0.30 | | | | | | 0.30 | 3 | |
| 0.40 | | | | | | 0.40 | 7 | |
| 0.50 | | | | | | 0.50 | 5 | |
| 0.60 | | | | | | 0.60 | 4 | |
| 0.70 | | | | | | 0.70 | 9 | |
| 0.80 | | | | | | 0.80 | 6 | |
| 0.90 | | | | | | 0.90 | 6 | |
| 1.00 | | | | | | 1.00 | 5 | |
| 1.10 | | | | | | 1.10 | 4 | |
| 1.20 | | | | | | 1.20 | 2 | |
| 1.30 | | | | | | 1.30 | 2 | |
| 1.40 | | | | | | 1.40 | 1 | |
| 1.50 | | | | | | 1.50 | 5 | |
| 1.60 | | | | | | 1.60 | 8 | |
| 1.70 | | | | | | 1.70 | 19 | |
| 1.80 | | | | | | 1.80 | 20 | |
| 1.90 | | | | | | 1.90 | 25 | |
| 2.0 | End of Probe at 2.00 m | | | 16.16 | | | | |
| 3.0 | | | | | | | | |
| 4.0 | | | | | | | | |

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 24759 GELDOF PARK.GPJ IGSL.GDT 8/8/23



DYNAMIC PROBE RECORD

REPORT NUMBER

24759

| | | | | | |
|--|--|--------------------------------|--|--------------------------------|--|
| CONTRACT Geldof Drive & Benson Court | | | | PROBE NO. DP06 (GD) | |
| CO-ORDINATES 589,633.66 E 835,321.48 N | | | | SHEET Sheet 1 of 1 | |
| GROUND LEVEL (mOD) 18.96 | | HAMMER MASS (kg) 50 | | DATE DRILLED 28/07/2023 | |
| CLIENT Silgo Co.Co. | | INCREMENT SIZE (mm) 100 | | DATE LOGGED 28/07/2023 | |
| ENGINEER CS Consulting | | FALL HEIGHT (mm) 500 | | PROBE TYPE DPH | |

| Depth (m) | Geotechnical Description | Legend | Depth (m) | Elevation (mOD) | Water | Depth (m) | Probe Readings (Blows/increment) | Graphic Probe Record |
|-----------|--------------------------|--------|-----------|-----------------|-------|-----------|----------------------------------|----------------------|
| 0.0 | End of Probe at 0.80 m | | | 18.16 | | 0.00 | 1 | |
| 0.10 | | 2 | | | | | | |
| 0.20 | | 14 | | | | | | |
| 0.30 | | 19 | | | | | | |
| 0.40 | | 21 | | | | | | |
| 0.50 | | 20 | | | | | | |
| 0.60 | | 22 | | | | | | |
| 0.70 | | 25 | | | | | | |
| 1.0 | | | | | | | | |
| 2.0 | | | | | | | | |
| 3.0 | | | | | | | | |
| 4.0 | | | | | | | | |

GROUNDWATER OBSERVATIONS

REMARKS

IGSSL_DP_LOG_100MM_INCREMENT_24759_GELDOF_PARK.GPJ IGSSL.GDT 8/9/23

Appendix V Laboratory Data

a. Geotechnical

TEST REPORT

Determination of Particle Size Distribution

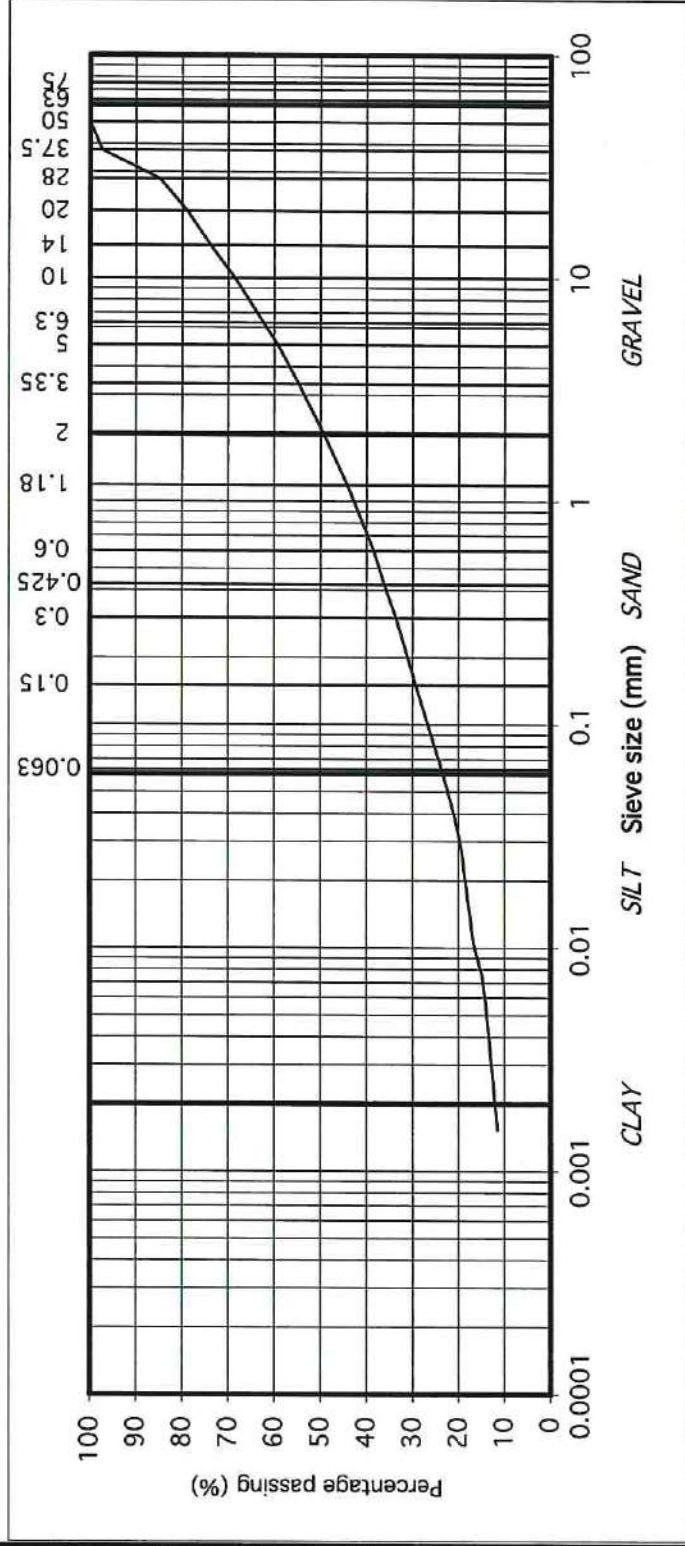
Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5**
(note: Sedimentation stage not accredited)



| | | | |
|-----------------|--|----------------------|---------------|
| Contract No. | 24759 | Report No. | R148877 |
| Contract Name : | Geldof Drive & Benson Court, Cranmore, Sligo | | |
| BH/TP No. | BH01 (GD) | | |
| Sample No.* | AA196232 | Lab. Sample No. | A23/2844 |
| Sample Type: | B | | |
| Depth* (m) | 4.00 | Customer: | Cronin Sutton |
| Date Received | 26/07/2023 | Date Testing started | 26/07/2023 |
| Description: | Brown slightly sandy, gravelly, CLAY | | |

Results relate only to the specimen tested in as received condition unless otherwise noted. * denotes Customer supplied information. Opinions and interpretations are outside the scope of accreditation.
This report shall not be reproduced except in full without the written approval of the Laboratory.

Remarks Note: **Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 .



| particle size | % passing |
|---------------|-----------|
| 75 | 100 |
| 63 | 100 |
| 50 | 100 |
| 37.5 | 97 |
| 28 | 85 |
| 20 | 79 |
| 14 | 74 |
| 10 | 69 |
| 6.3 | 62 |
| 5 | 59 |
| 3.35 | 55 |
| 2 | 49 |
| 1.18 | 44 |
| 0.6 | 38 |
| 0.425 | 36 |
| 0.3 | 34 |
| 0.15 | 29 |
| 0.063 | 24 |
| 0.040 | 21 |
| 0.028 | 19 |
| 0.018 | 18 |
| 0.010 | 17 |
| 0.007 | 15 |
| 0.005 | 14 |
| 0.002 | 12 |

IGSL Ltd Materials Laboratory

Approved by: *J Barrett* Date: 15/08/23 Page no: 1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

Appendix V Laboratory Data

b. Environmental and Chemical



Final Report

Report No.: 23-26185-1

Initial Date of Issue: 14-Aug-2023

Re-Issue Details:

Client IGSL

Client Address: M7 Business Park
Naas
County Kildare
Ireland

Contact(s): Darren Keogh

Project 24759 Geldof Drive & Benson Court

Quotation No.: Date Received: 03-Aug-2023

Order No.: Date Instructed: 03-Aug-2023

No. of Samples: 4

Turnaround (Wkdays): 7 Results Due: 11-Aug-2023

Date Approved: 14-Aug-2023

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Leachate

Project: 24759 Geldof Drive & Benson Court

| Client: IGSL | Chemtest Job No.: | 23-26185 | 23-26185 | | |
|-------------------|----------------------|-----------|------------|-------|---------|
| Quotation No.: | Chemtest Sample ID.: | 1683341 | 1683343 | | |
| Order No.: | Client Sample Ref.: | AA196228 | AA196233 | | |
| | Sample Location: | BH01 (GD) | BH01A (BC) | | |
| | Sample Type: | SOIL | SOIL | | |
| | Top Depth (m): | 0.50 | 0.50 | | |
| Determinand | Accred. | SOP | Type | Units | LOD |
| pH | U | 1010 | 10:1 | | N/A |
| Ammonium | U | 1220 | 10:1 | mg/l | < 0.050 |
| Ammonium | N | 1220 | 10:1 | mg/kg | 0.10 |
| Boron (Dissolved) | U | 1455 | 10:1 | mg/kg | 0.01 |
| Benzofluoranthene | N | 1800 | 10:1 | µg/l | < 0.010 |

Results - Soil

Project: 24759 Geldof Drive & Benson Court

| Client: IGSL | Chemtest Job No.: | 23-26185 | 23-26185 | 23-26185 | 23-26185 |
|-------------------------------------|----------------------|-----------|-----------|------------|----------------------|
| Quotation No.: | Chemtest Sample ID.: | 1683341 | 1683342 | 1683343 | 1683344 |
| Order No.: | Client Sample Ref.: | AA196228 | AA196230 | AA196233 | AA196234 |
| | Sample Location: | BH01 (GD) | BH01 (GD) | BH01A (BC) | BH01A (BC) |
| | Sample Type: | SOIL | SOIL | SOIL | SOIL |
| | Top Depth (m): | 0.50 | 2.00 | 0.50 | 1.00 |
| | Asbestos Lab: | NEW-ASB | NEW-ASB | NEW-ASB | NEW-ASB |
| Determinand | Accred. | SOP | Units | LOD | |
| ACM Type | U | 2192 | | N/A | |
| Asbestos Identification | U | 2192 | | N/A | No Asbestos Detected |
| Moisture | N | 2030 | % | 0.020 | 16 |
| pH (2.5:1) | N | 2010 | | 4.0 | 8.7 [A] 8.8 |
| Boron (Hot Water Soluble) | U | 2120 | mg/kg | 0.40 | [A] < 0.40 |
| Magnesium (Water Soluble) | N | 2120 | g/l | 0.010 | [A] 0.010 |
| Sulphate (2:1 Water Soluble) as SO4 | U | 2120 | g/l | 0.010 | [A] < 0.010 |
| Total Sulphur | U | 2175 | % | 0.010 | [A] 0.039 |
| Sulphur (Elemental) | U | 2180 | mg/kg | 1.0 | [A] 1.1 |
| Chloride (Water Soluble) | U | 2220 | g/l | 0.010 | [A] < 0.010 |
| Nitrate (Water Soluble) | N | 2220 | g/l | 0.010 | < 0.010 |
| Cyanide (Total) | U | 2300 | mg/kg | 0.50 | [A] < 0.50 |
| Sulphide (Easily Liberatable) | N | 2325 | mg/kg | 0.50 | [A] 2.4 |
| Ammonium (Water Soluble) | U | 2220 | g/l | 0.01 | < 0.01 |
| Sulphate (Acid Soluble) | U | 2430 | % | 0.010 | [A] 0.028 |
| Arsenic | U | 2455 | mg/kg | 0.5 | 5.5 |
| Barium | U | 2455 | mg/kg | 0 | 16 |
| Cadmium | U | 2455 | mg/kg | 0.10 | 0.26 |
| Chromium | U | 2455 | mg/kg | 0.5 | 9.3 |
| Molybdenum | U | 2455 | mg/kg | 0.5 | < 0.5 |
| Antimony | N | 2455 | mg/kg | 2.0 | < 2.0 |
| Copper | U | 2455 | mg/kg | 0.50 | 11 |
| Mercury | U | 2455 | mg/kg | 0.05 | 0.05 |
| Nickel | U | 2455 | mg/kg | 0.50 | 23 |
| Lead | U | 2455 | mg/kg | 0.50 | 8.3 |
| Selenium | U | 2455 | mg/kg | 0.25 | 0.57 |
| Zinc | U | 2455 | mg/kg | 0.50 | 21 |
| Chromium (Trivalent) | N | 2490 | mg/kg | 1.0 | 9.3 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 |
| Mineral Oil (TPH Calculation) | N | 2670 | mg/kg | 10 | < 10 |
| Aliphatic TPH >C5-C6 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C6-C8 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C8-C10 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C10-C12 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C12-C16 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C16-C21 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C21-C35 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |
| Aliphatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 |

Results - Soil

Project: 24759 Geldof Drive & Benson Court

| Client: IGSL | Chemtest Job No.: | | 23-26185 | 23-26185 | 23-26185 | 23-26185 |
|----------------------------------|---------------------|-----------|----------|----------|--------------|--------------|
| | Quotation No.: | 1663341 | | | | |
| Order No.: | Client Sample Ref.: | | AA196228 | AA196230 | AA196233 | AA196234 |
| | Sample Location: | BH01 (GD) | | | | |
| Sample Type: | | SOIL | SOIL | SOIL | SOIL | SOIL |
| Top Depth (m): | | 0.50 | 0.50 | 2.00 | 0.50 | 1.00 |
| Asbestos Lab: | | NEW-ASB | NEW-ASB | NEW-ASB | NEW-ASB | NEW-ASB |
| Determinand | Accred. | SOP | Units | LOD | | |
| Total Aliphatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | [A] < 5.0 | [A] < 5.0 |
| Aromatic TPH >C5-C7 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C7-C8 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C8-C10 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C10-C12 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C12-C16 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C16-C21 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C21-C35 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Aromatic TPH >C35-C44 | N | 2680 | mg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Total Aromatic Hydrocarbons | N | 2680 | mg/kg | 5.0 | [A] < 5.0 | [A] < 5.0 |
| Total Petroleum Hydrocarbons | N | 2680 | mg/kg | 10.0 | [A] < 10 | [A] < 10 |
| Benzene | U | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Toluene | U | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Ethylbenzene | U | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| m & p-Xylene | U | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| o-Xylene | U | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Methyl Tert-Butyl Ether | U | 2760 | µg/kg | 1.0 | [A] < 1.0 | [A] < 1.0 |
| Naphthalene | N | 2800 | mg/kg | 0.010 | [A] 1.3 | [A] 2.6 |
| Acenaphthylene | N | 2800 | mg/kg | 0.010 | [A] < 0.010 | [A] 0.15 |
| Acenaphthene | N | 2800 | mg/kg | 0.010 | [A] < 0.010 | [A] 0.22 |
| Fluorene | N | 2800 | mg/kg | 0.010 | [A] < 0.010 | [A] < 0.010 |
| Phenanthrene | N | 2800 | mg/kg | 0.010 | [A] 0.22 | [A] < 0.010 |
| Anthracene | N | 2800 | mg/kg | 0.010 | [A] 0.14 | [A] < 0.010 |
| Fluoranthene | N | 2800 | mg/kg | 0.010 | [A] 0.49 | [A] < 0.010 |
| Pyrene | N | 2800 | mg/kg | 0.010 | [A] 0.53 | [A] < 0.010 |
| Benzo[<i>a</i>]anthracene | N | 2800 | mg/kg | 0.010 | [A] 0.59 | [A] < 0.010 |
| Chrysene | N | 2800 | mg/kg | 0.010 | [A] 0.53 | [A] < 0.010 |
| Benzo[<i>b</i>]fluoranthene | N | 2800 | mg/kg | 0.010 | [A] 0.75 | [A] < 0.010 |
| Benzo[<i>k</i>]fluoranthene | N | 2800 | mg/kg | 0.010 | [A] 0.63 | [A] < 0.010 |
| Benzo[<i>a</i>]pyrene | N | 2800 | mg/kg | 0.010 | [A] 0.53 | [A] < 0.010 |
| Indeno(1,2,3- <i>c,d</i>)Pyrene | N | 2800 | mg/kg | 0.010 | [A] 0.80 | [A] < 0.010 |
| Dibenz[<i>a,h</i>]Anthracene | N | 2800 | mg/kg | 0.010 | [A] 0.50 | [A] < 0.010 |
| Benzo[<i>g,h,i,j</i>]perylene | N | 2800 | mg/kg | 0.010 | [A] 0.78 | [A] < 0.010 |
| Coronene | N | 2800 | mg/kg | 0.010 | [A] < 0.010 | [A] < 0.010 |
| Total Of 17 PAH's | N | 2800 | mg/kg | 0.20 | [A] 7.8 | [A] 3.0 |
| PCB 28 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | [A] < 0.0010 |
| PCB 52 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | [A] < 0.0010 |
| PCB 90+101 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | [A] < 0.0010 |
| PCB 118 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | [A] < 0.0010 |

Results - Soil

Project: 24759 Geldof Drive & Benson Court

| Client: IGSL | | Chemtest Job No.: | | 23-26185 | 23-26185 | 23-26185 | 23-26185 |
|--------------------------|---------|----------------------|-------|-----------|--------------|--------------|------------|
| Quotation No.: | | Chemtest Sample ID.: | | 1683341 | 1683342 | 1683343 | 1683344 |
| Order No.: | | Client Sample Ref.: | | AA196228 | AA196230 | AA196233 | AA196234 |
| | | Sample Location: | | BH01 (GD) | BH01 (GD) | BH01A (BC) | BH01A (BC) |
| | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | Top Depth (m): | | 0.50 | 2.00 | 0.50 | 1.00 |
| | | Asbestos Lab: | | NEW-ASB | | NEW-ASB | |
| Determinand | Accred. | SOP | Units | LOD | | | |
| PCB 153 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | [A] < 0.0010 | |
| PCB 138 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | [A] < 0.0010 | |
| PCB 180 | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | [A] < 0.0010 | |
| Total PCBs (7 congeners) | N | 2815 | mg/kg | 0.0010 | [A] < 0.0010 | [A] < 0.0010 | |
| Total Phenols | U | 2920 | mg/kg | 0.10 | < 0.10 | < 0.10 | |

Results - Single Stage WAC

Project: 24759 Geldof Drive & Benson Court

Chemtest Job No: 23-26185

Chemtest Sample ID: 1883341

Sample Ref: AA196228

Sample ID: BH01 (GD)

Sample Location: 0.50

Top Depth(m):

Bottom Depth(m):

Sampling Date:

| Determinand | SOP | Accred. | Units | Landfill Waste Acceptance Criteria | | |
|------------------------------|------|---------|-------------|------------------------------------|--|--------------------------|
| | | | | Inert Waste Landfill | Stable, Non-reactive hazardous waste in non-hazardous Landfill | Hazardous Waste Landfill |
| Total Organic Carbon | 2625 | U | % | [A] 3.0 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 1.7 | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | -- | -- |
| Total Of 17 PAHs | 2800 | N | mg/kg | [A] 7.8 | -- | -- |
| pH | 2010 | U | | 8.6 | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.0040 | To evaluate | To evaluate |
| Eluate Analysis | | | 10:1 Eluate | mg/kg | Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg | |
| Arsenic | 1455 | U | mg/l | 0.0084 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.050 | 20 | 100 |
| Cadmium | 1455 | U | < 0.0011 | < 0.011 | 0.04 | 1 |
| Chromium | 1455 | U | < 0.005 | < 0.050 | 0.5 | 10 |
| Copper | 1455 | U | 0.008 | 0.063 | 2 | 50 |
| Mercury | 1455 | U | < 0.0005 | < 0.0050 | 0.01 | 0.2 |
| Molybdenum | 1455 | U | 0.014 | 0.14 | 0.5 | 10 |
| Nickel | 1455 | U | < 0.005 | < 0.050 | 0.4 | 10 |
| Lead | 1455 | U | < 0.005 | < 0.050 | 0.5 | 10 |
| Zinc | 1455 | U | < 0.005 | < 0.050 | 0.06 | 0.7 |
| Antimony | 1455 | U | 0.010 | 0.10 | 0.1 | 0.5 |
| Selenium | 1455 | U | 0.007 | 0.073 | 4 | 50 |
| Fluoride | 1220 | U | < 1.0 | < 10 | 800 | 15000 |
| Sulphate | 1220 | U | 0.14 | 1.4 | 10 | 150 |
| Total Dissolved Solids | 1020 | N | 4.3 | 43 | 1000 | 20000 |
| Phenol Index | 1920 | U | 58 | 580 | 4000 | 60000 |
| Dissolved Organic Carbon | 1610 | U | < 0.030 | < 0.30 | 1 | 100000 |
| | | | 3.6 | < 50 | 500 | 800 |

| Solid Information | |
|-----------------------------|-------|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 16 |

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

| Sample: | Sample Ref: | Sample ID: | Sample Location: | Sampled Date: | Deviation Code(s): | Containers Received: |
|---------|-------------|------------|------------------|---------------|--------------------|----------------------|
| 1683341 | AA196228 | | BH01 (GD) | | A | Amber Glass 250ml |
| 1683341 | AA196228 | | BH01 (GD) | | A | Plastic Tub 500g |
| 1683342 | AA196230 | | BH01 (GD) | | A | Plastic Tub 500g |
| 1683343 | AA196233 | | BH01A (BC) | | A | Amber Glass 250ml |
| 1683343 | AA196233 | | BH01A (BC) | | A | Plastic Tub 500g |
| 1683344 | AA196234 | | BH01A (BC) | | A | Plastic Tub 500g |

Test Methods

| SOP | Title | Parameters included | Method summary |
|------|--|--|--|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1020 | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters | Conductivity Meter |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1455 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1610 | Total/Dissolved Organic Carbon in Waters | Organic Carbon | TOC Analyser using Catalytic Oxidation |
| 1800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Pentane extraction / GCMS detection |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2015 | Acid Neutralisation Capacity | Acid Reserve | Titration |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2175 | Total Sulphur in Soils | Total Sulphur | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2180 | Sulphur (Elemental) in Soils by HPLC | Sulphur | Dichloromethane extraction / HPLC with UV detection |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2220 | Water soluble Chloride in Soils | Chloride | Aqueous extraction and measurement by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate. |
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2325 | Sulphide in Soils | Sulphide | Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine. |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2455 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |

Test Methods

| SOP | Title | Parameters included | Method summary |
|------|--|---|--|
| 2610 | Loss on Ignition | loss on Ignition (LOI) | Determination of the proportion by mass that is lost from a soil by ignition at 550°C. |
| 2625 | Total Organic Carbon In Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6-C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8-C40 | Dichloromethane extraction / GC-FID |
| 2680 | TPH A/A Split | Aliphatics: >C5-C6, >C6-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35- C44 Aromatics: >C5-C7, >C7-C8, >C8- C10, >C10-C12, >C12-C16, >C16- C21, >C21- C35, >C35- C44 | Dichloromethane extraction / GCxGC FID detection |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS |
| 2815 | Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS | ICES7 PCB congeners | Acetone/Hexane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols>Note: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |
| 640 | Characterisation of Waste (Leaching C10) | Waste material including soil, sludges and granular waste | Compliance Test for Leaching of Granular Waste Material and Sludge |

Report Information

Key

| | |
|-----|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |
| SOP | Standard operating procedure |
| LOD | Limit of detection |

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

-
- A - Date of sampling not supplied
 - B - Sample age exceeds stability time (sampling to extraction)
 - C - Sample not received in appropriate containers
 - D - Broken Container
 - E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Appendix VI Site Plan / Map



LEGEND

BOROUGH LOCATION 

TRIAL PIT AND DYNAMIC PROBE 

SILT TRENCH 

ALL REMEDIATION WORKS SHALL BE REQUIRED TO OBTAIN PERMITS TO A DEPTH OF 1.0m. THE EXACT LOCATION OF THE SILT TRENCHES SHALL BE NOTED ON SITE BY THE CONTRACTOR AND THE LOCAL AUTHORITY.

ALL REMEDIATION WORKS TO THE CONTAMINATED AND ADJACENT AREAS SHALL BE ACCORDING WITH THE REQUIREMENTS SET OUT IN THE SPECIFICATIONS FOR REMEDIATION WORKS IN THE 'SPECIFICATIONS FOR REMEDIATION WORKS' DOCUMENT. THE CONTRACTOR SHALL ALLOW FOR THE REQUIREMENTS FOR TRAFFIC MANAGEMENT ON SITE DURING THE REMEDIATION WORKS AND SHALL BE AWARE THAT THEIR PRICE IS TO INCLUDE THE PROVISION OF SAME.

NOTES

DESIGN INVESTIGATION CONTRACTOR TO ALLOW FOR THE ANALYSIS AND PRE-DRILL TESTING OF MATERIALS TO ALLOW ESTABLISHMENT OF BENTONITE/SANDWICH AND HAZARDOUS WASTEWORK (CLASSIC A, B, C, D, E, F)

CONTRACTOR TO ALLOW FOR LIFTING AND SORTING THE THE COORDINATES OF ALL INVESTIGATION WORKS INCLUDING DYNAMIC SITE LEVELS.



INFORMATION ONLY
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NOTES

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6. Ordnance Survey National Grid Reference: E040074423

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REDDY ARCHITECTURE & URBANISM
 DEVELOPMENT AT GELDOLF DRIVE
 CRANMORE, SLIGO TOWN
SITE INVESTIGATION SCOPING PLAN
 Proj No: R119-CSC-02-ZZ-SK-C-1000
 Date: May 2023
 Rev: AD, CE, HB, 1:20 @ A1

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