
SLIGO COUNTY COUNCIL

PROVISION OF A 25 UNIT HOUSING DEVELOPMENT AT CARNEY, CO. SLIGO

SCREENING FOR APPROPRIATE ASSESSMENT

JANUARY 2024

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23S03-ST2-106: Landscaping Layout

273S03-ST2-100: Site Plan

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1 INTRODUCTION

1.1 BACKGROUND

Jennings O'Donovan & Partners Limited have been commissioned by Sligo County Council 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 of a 25 Unit Housing Development at Carney, Co. Sligo. 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 (Zol) 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
- Methodological Guidance on Articles 6(3) and 6(4) of the Habitats Directive (Commission, 2021)
- Communication from the Commission on the Precautionary Principle. Office for Official Publications of the European Communities, Luxembourg, (EC, 2000a)

- Methodological Guidance on Articles 6(3) and 6(4) of the Habitats Directive (Commission, 2021)
- Guidance on strict protection of animal species of Community interest under the Habitats Directive (Commission, 2021)
- 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 1.9 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 'G6543'. Two protected species has been recorded in this square namely, the common frog (*Rana temporaria*), with the last recording in 1962 and also and the West European Hedgehog (*Erinaceus Europaeus*) recorded more recently in 2020. Frogs could be associated with the watercourses along the site boundary, whilst the hedgehog may be associated with the Project marginal hedgerows/ treelines.

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.

A planning application was granted 'with conditions' in 2008 for a larger development that included the current project site in 2008. The planning application number is 07827, and the conditions set by Sligo County Council are available on the County Council's website. These conditions were reviewed to identify any conditions which may have an impact on the Project.

1.7 FIELD STUDY

A site visit was carried out on July 24th, 2023 on a cloudy, damp day with an ambient temperature of 13 degrees Celsius. The survey consisted of traversing the entire Project, being conscious of adjacent lots and any invasive species either overhanging the Project or rooted near/within the site. Habitat classification followed Fossitt (2000) and the floral nomenclature used followed Parnell and Curtis (2012) and Scannell and Synnott (1987). The locations where works will be carried out were also surveyed for the presence of invasive species (as listed in the Third Schedule of S.I. No. 477 of 2011, EC (Birds and Natural Habitats) Regulations 2011).

An otter survey was also carried out along all watercourse features within 120m both upstream and downstream of the site. No holt, or other evidence (spraints, chutes, slides couches etc.) of otter were noted.

1.8 FLOODING

Office of Public Works (OPW) website and the CFRAM study were accessed (July, 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 the N15 near Milltown (Recurring), approximately 1,500 metres east of the Project. There is no foreseen risk of a flood event extending to the Project. The nearest historical surface water flooding occurred at Ballygilgan nature preserve, approximately 1,400 metres west of the Project.

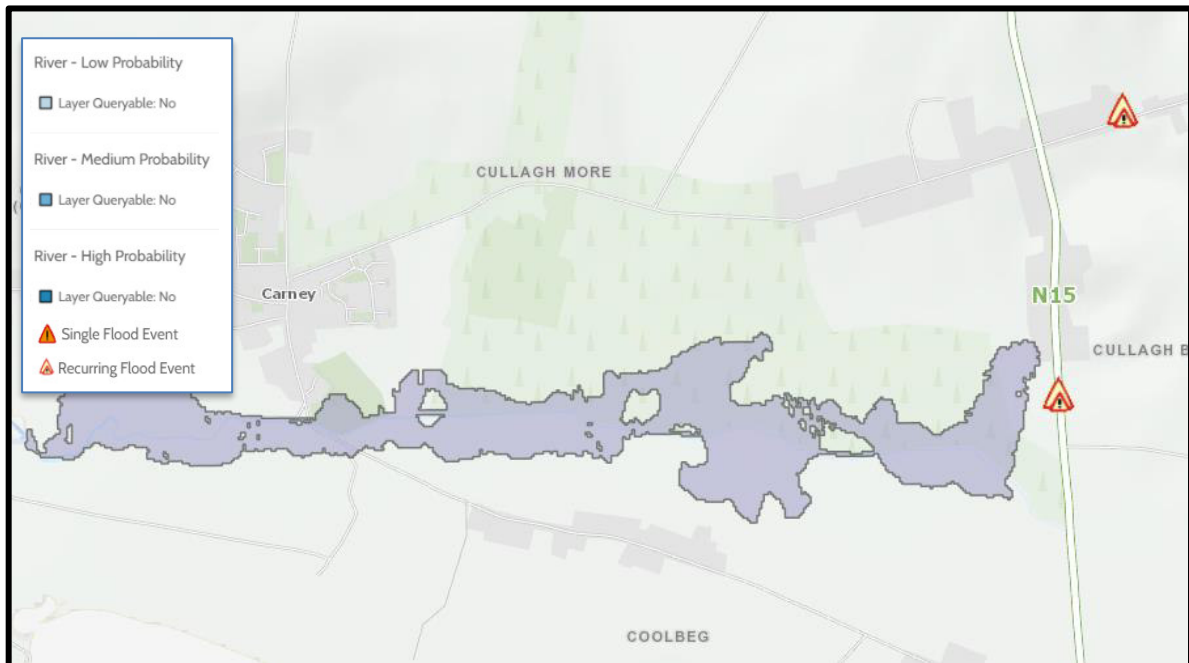


Figure 1.1 Flood map in the vicinity of the proposed Project, Co. Sligo (Source: www.floodinfo.ie, 2023)

The Geological Survey Ireland (GSI) Groundwater Flooding Probability Maps were also examined (January, 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 'Ballyshannon 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) Grange East (EPA Code IE_WE_G_0062) is 'Karstic' and covers an overall area of approximately 40km². 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.

Groundwater will be pumped out of excavations (as necessary) to permit the construction of foundations and rising walls. The quantity of water which will be pumped out will be limited and is not expected to noticeably lower the groundwater table. Standard procedure includes keeping the pumps active until the concrete has cured. Site control measures will be in place to ensure hydrocarbons and chemicals are kept away from groundwater. Spill kits are onsite at all times, alongside personnel trained in their use.

2 PROJECT DESCRIPTION

2.1 SITE LOCATION

The Project is located in the village of Carney on the Maugherow peninsula in County Sligo. The housing development is located at the intersection of the L3405 Carney – Cashelgarran Road with the L3402 Oxfield Road. The Project is approximately a ten-minute drive from Sligo town. Carney village is comprised of housing estates, a football club, a GAA club, a pub/restaurant and a local shop. There is a village walk of 1.8km located east, north and south of the Project, with much of the terrain featured through Floods broad-leaved wood. Surrounding lands are mainly given to agriculture.

The site is located relatively near the coast (approximately 650m southwest), as well as the Ballygilgan Nature Reserve (30 hectares) located 1.3km west of the Project; this reserve was created for the protection of Barnacle geese which have wintered here for centuries. The reserve is known locally as 'the Goosefield' or 'Seafield'; it is an area of improved pasture beside Lissadell, approximately 10 kilometres northwest of Sligo town. The Reserve is west of the village of Carney on the shore of Drumcliff Bay Special Area of Conservation, between local Road L3303 and Lissadell Strand.

The Project covers an area of around 1.084 hectares.

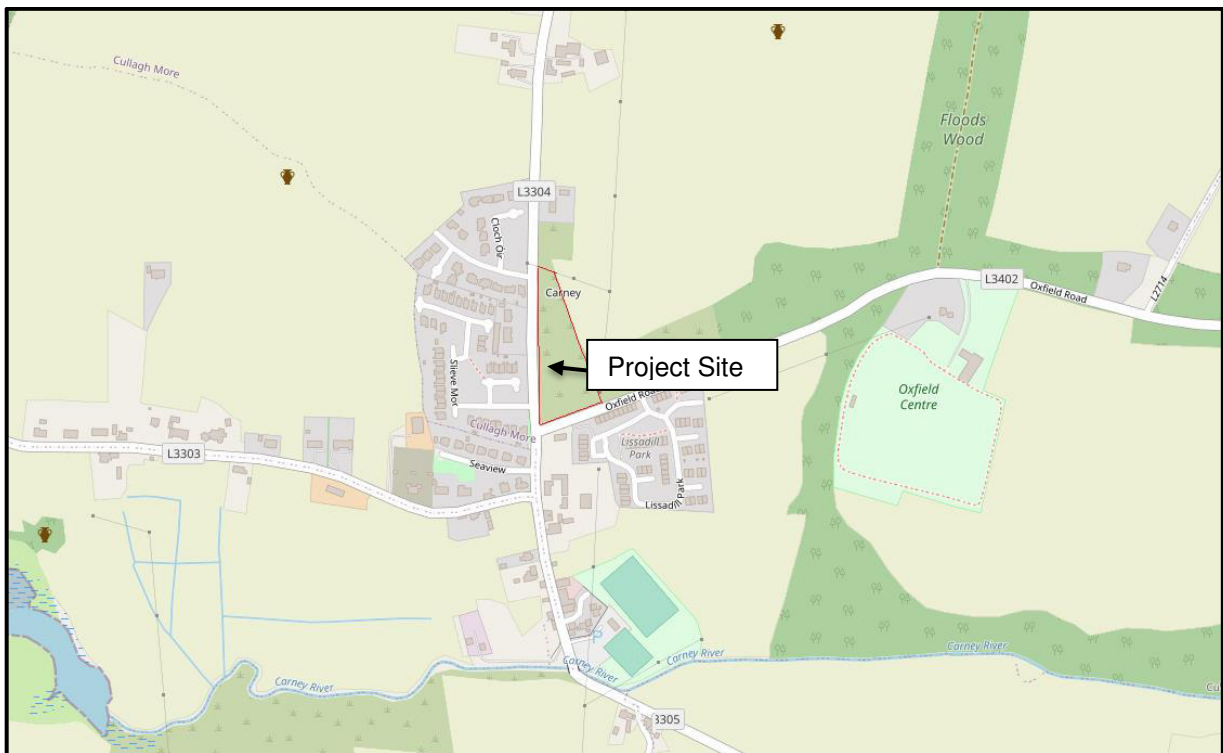


Figure 2.1: General location of the Project

2.2 PROPOSED WORKS

All drawings for the proposed works are outlined in Appendix I with an associated Method Statement outlined in Appendix III. The proposed residential development will consist of eight building types. Three are single storey type; two will have one bedroom, and one will have two bedrooms. The other five building types are two storey buildings with up to five bedrooms. The proposed road layout is outlined

in Drawing 6972-JOD-XX-ZZ-DR-C-200-008 with road construction Details and Sections outlined in Drawing 6972-JOD-XX-ZZ-DR-C-200-009. Excavation details are outlined in Drawing 6972-JOD-XX-ZZ-DR-C-200-012.

A public open space is proposed in the form of a village green area (Drawing No 273SO3-ST2-100 : Site Plan) at the southwest of the site. The proposed site area for Phase 1 is 1.084 ha.

It is proposed to direct the foul water to the public network using gravity systems (Foul Water Sewer Drawing 6972-JOD-XX-ZZ-DR-C-200-003). The connection is made on the south side, on Oxfield Road.

Groundwater will be pumped out of excavations (as required) to permit the construction of foundations and rising walls. The quantity of water which will be pumped out will be limited and is not expected to noticeably lower the groundwater table. Standard procedure includes keeping the pumps active until the concrete has cured. Site control measures will be in place to ensure hydrocarbons and chemicals are kept away from groundwater. Spill kits will be onsite at all times, alongside personnel trained in their use.

The storm drainage for the entire development has been designed in accordance with the Greater Dublin Strategic Drainage Study (GSDSDS) and incorporates normal sustainable drainage systems (SuDS) measures before outfalling to the existing Uisce Éireann storm water network (Drawing:6972-JOD-XX-ZZ-DR-C-200-001). The storm drainage network will be watertight to prevent leaks which could contaminate the groundwater in the area and is designed to cater for surface water from hard surfaces in the proposed development including roadways, footpaths and the proposed buildings (Storm Sewer Drawing 6972-JOD-XX-ZZ-DR-C-200-002). The proposed underground attenuation tank will be lined to prevent groundwater contamination occurring. The existing small watercourse on the site will be culverted over its' entire length to facilitate the construction of the proposed footpath and active travel works. An attenuation tank is proposed under the village green, which would store runoff and release it slowly into the public network. There is an existing step-down well (Drawing no. 6972-JOD-XX-ZZ-DR-C-200-012) on the site (north side of Oxfield Road) which will be upgraded and incorporated into the development as a feature. The proposed watermain layout is outlined in Drawing 6972-JOD-XX-ZZ-DR-C-200-007).

Boundary enhancement shall occur along the eastern treeline/hedgerow habitat where gaps exist (Landscape layout, Appendix I). These gaps shall be supplemented with species that include alder (*Alnus glutinosa*), aspen (*Populus tremula*) and black poplar (*Populus nigra*). Where choosing the latter species, more than one shall be planted for cross pollination. Thickening of the eastern boundary hedgerow/ treeline and the planting of the other areas will contribute to the green infrastructure on site and promote foraging corridors for bats and other mammals, to potentially link the urban and rural habitats and possibly also mitigate future events.

All new trees shall be strictly sourced from native Irish stock nurseries only (not imported from abroad). Tree species will include a mixture of whitebeam (*Sorbus hibernica*), rowan (*Sorbus aucuparia*), hawthorn (*Crataegus monogyna*), silver birch (*Populus pubescens*) and Scots pine (*Pinus sylvestris*).

3 RECEIVING ENVIRONMENT

3.1 GEOLOGY AND SOILS

The quaternary sediments at the site of the Project are classified as 'Till derived from Namurian sandstones and shales'.

The Project is located within the Ballyshannon Limestone Formation. This bedrock formation is described by the Geological Survey of Ireland as 'Pale grey calcarenite limestone'. Corine 2018 denotes this area as *pastures and* denotes the Project as *Mixed forests*. The woodland on the site has been totally removed, leaving an expanse of bare soil, with only marginal treeline/hedgerow remaining.

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 'Extreme', and the ground water approximately 100m to the left, in the housing estate of Cloch Oir is classified as 'X – Rock at or Near Surface'.



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

The Project is wholly located within the DOONOWNEY_010 WFD River Sub Basin (RSB) covering an area of approximately 43km² (Figure 3.1). The RSB had 'Good' ecological status for the 2016-2021 period and has remained the same since 2013/2018 ('Good'). Macroinvertebrate rating was Q4-5 2018 sampling. The overlap of the project area is small in size (1.084 hectares) and given the environmental

conditions, engineering proposed and works being carried out according to Section 2.2 above and the Method Statement provided in Appendix III, the impact of the proposed operations on this waterbody is considered to be negligible.

The order 1 Maugherow stream (Segment Code: 35_193) lies approximately 400 metres west of the Project (**Figure 3.2**). This stream flows south for approximately 480 metres and merges with the order 4 Cullagh Beg River (Segment Code 35_1143) which flows in a westerly direction for approximately 150m before entering the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and the Drumcliff Bay SPA. The River subsequently discharges into the Atlantic Ocean.

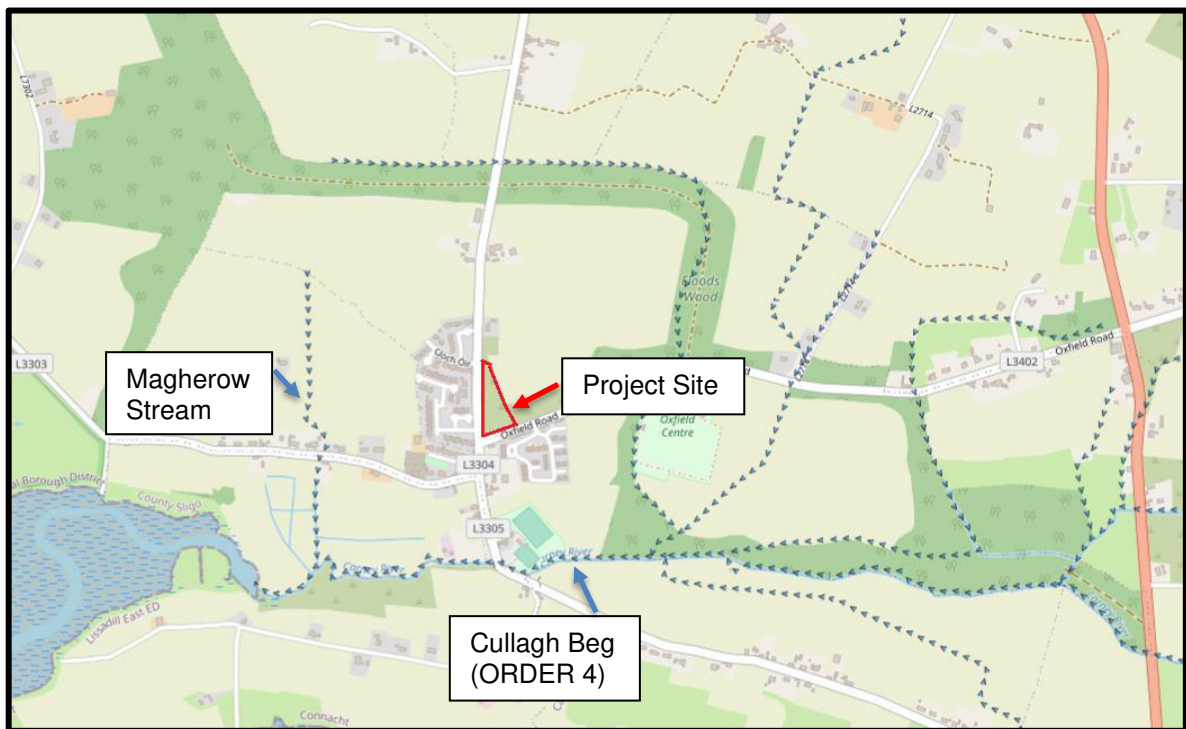


Figure 3.2: EPA watercourses and waterbodies in the vicinity of the Project

Currently, 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 July 18th, 2023).

The Project is however within a groundwater area denoted as SAC habitat sensitive and SAC species sensitive, as well as SPA habitat sensitive. (EPA Maps website, accessed August 2023). The Project is also within the Grange East groundwater body for the abstraction of drinking water (Article 7- EPA code IEPA1_WE_G_0062).

The EPA Maps (Water) website was also accessed (July 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 supports both residential (due west) and agricultural (east) landuse. The wider surrounding landscape includes Drumcliff Bay to the south and west, Benbulbin range to the east, the town of Grange further north and Lisadell/Ballymulderry headland to the west.

The Project and immediate surrounding lands have a Phosphorus ranking of 4 and 6 (7 is the lowest impact ranking). Pollution Impact Potential Nitrate (PIP N) for the lands of the site have a ranking of 5. The overall ranking range likely reflects fertiliser use on the land in the past, with low-level 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.

As noted earlier in Section 3.2, the Project is within the WFD River Sub Basin Doonowey_010. Currently, there are no significant nitrogen or phosphorus pressures from the Project site on this RSB.

3.3 HABITATS:

A site visit was carried out on July 24th, 2023 on a cloudy, damp day with an ambient temperature of 13 degrees Celsius. The survey consisted of traversing the entire Project, being conscious of adjacent lots and any invasive species either overhanging the Project or rooted near/within the site.

Irish Drilling Limited carried out site investigations in April 2023 and noted that the ground conditions were as expected for the area (underlain by carboniferous limestone formation) with soft organic peaty silt/ clay overlying glacial till. The soils onsite predominant consist of glacial tills with slightly gravelly sandy silt/clay with cobbles and boulders and/or silty sands and/or gravels with cobbles and boulders.

Five general habitat types (according to Fossitt, 2000) were noted within the survey area, namely WL1: Hedgerow WL2: Treeline, BL1: Stone walls, ED2: Spoil and bare ground and FW4: Drainage ditch. No Annex I habitat occurs within or adjacent to the Project.

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 (2022) were found to be growing within or adjacent to the Project works.

Hedgerow (WL1)

Linear hedgerows exist along the southern (approx. 70m) and western (approx. 200m) margins of the Project; these hedgerows also border the eastern side of the L3304 road and the northern side of the

L3402 (Oakfield Road) and delineate the Project land boundary. Two short (approx.. 25m long) hedgerows exist along the access entrance at the northern end of the site.

The base of the hedgerows are on occasion, developed on a raised bank/mound with a rocky /stone support in places (northern hedgerows are supported by drystone walls). The roadside hedgerows were surveyed from both the roadside boundary and also internally, from the field. The hedgerows are in general, unfragmented and dense, extending to approx. 2m wide (or more in places) and approximately 1-2m tall. They are unmanaged.

The northern hedgerows taller trees and shrubs have been removed. Native trees such as willow (*Salix* spp.), hawthorn (*Crataegus monogyna*) and young elder (*Sambucus nigra*) remain. Non-native snowberry (*Symphoricarpos albus*) is dense in places with native honeysuckle (*Lonicera periclymenum*) creeping over it. Other climbers include bramble (*Rubus fruticosus* agg.) and bindweed (*Calystegia sepium*), ivy (*Hedera hibernica*) and cleaver (*Galium aparine*). Nettles (*Urtica dioica*) are common. Grass clippings from the neighbouring housing estate are being dumped in this hedgerow.

The roadside hedgerows are dominated by tall grasses with only a few young trees such as elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*) and sycamore (*Acer pseudoplatanus*) gaining some height. The taller vegetation is also supporting climbers as noted above and bush vetch (*Vicia sepium*). There are some dense patches of creeping thistle (*Cirsium arvense*).

Tall grasses, including false oat grass (*Arrhenatherum elatius*), cock's foot (*Dactylis glomerata*) and Yorkshire fog (*Holcus lanatus*), common hogweed (*Heracleum siphondyllum*), cow parsley (*Anthriscus sylvestris*), rosebay willowherb (*Epilobium angustifolium*), wild angelica (*Angelica sylvestris*), nettles (*Urtica dioica*), meadowsweet (*Filipendula ulmaria*) and ferns dominate the tall herbaceous layer, with Herb-Robert (*Geranium robertianum*) and both thyme-leaved speedwell (*Veronica serpyllifolia*) and wood speedwell (*V. montana*) and mosses characteristic of the lower-growing flora. Red bartsia (*Odontites vernus*) and lords and ladies (*Arum maculatum*) are present, but not abundant. Silverweed (*Potentilla anserina*), dandelion (*Taraxacum* sp.), broad-leaved plantain (*Plantago major*) and short meadow grass (*Poa annua*) were noted close to the roadside. Garden shavings are being dumped along these hedgerows; subsequently Montbretia (*Crocasmia* sp.) and rhubarb (*Rheum*) have gained a foothold. Snowberry (*Symphoricarpos albus*) is also a feature of the southern hedgerow.

Treeline (WL2)

A tall treeline (approx. 100m in length) exists along the eastern Project boundary. There is an intimately associated man-made drain adjacent externally to the eastern side of this treeline, which is built on a raised soil embankment. The treeline is continuous for the most part and comprised of native hawthorn (*Crataegus monogyna*), willow (*Salix* spp.), elder (*Sambucus nigra*) and ash (*Fraxinus alnus*). Non-native mature sycamore (*Acer pseudoplatanus*) are also present. The ash specimens have contracted

the die-back fungal disease (*Hymenoscyphus fraxineus*) and are in a declining state of health. Branches of these trees are overhanging the Project.

The trees for the most part are mature and reach some 12-15 metres tall. Fence and post (with wire) close treeline gaps in places. Ivy (*Hedera hibernica*) and honeysuckle (*Lonicera periclymenum*) are common climbers on the trees.

Stone walls (BL1)

A drystone wall exists along the northern aspect of the Project. This wall, for the most part, is difficult to see; is are heavily encroached by both overhanging vegetation and also grassland marginal vegetation (which is creeping upward). The wall is approximately 1.25m tall and comprised of local stone.

Some plants have succeeded in utilising niche opportunities to gain a foothold and include the more primitive ferns, such as the intermediate polypody (*Polypodium interjectum*), Hart's-tongue (*Asplenium scolopendrium*), rustyback fern (*Asplenium ceterach*), and also maidenhair spleenwort (*Asplenium trichomanes*). Ivy-leaved toadflax (*Cymbalaria muralis*) is also present. In the damper and shaded areas, mosses and other plants cover the stones creating tilth and compost for other plants to gain a substantial foothold and develop. Clusters of the native wall-rue (*Asplenium ruta-muraria*), a short-stemmed fern known from old stone walls are utilising niches to become established. Tutson (*Hypericum androsaemum*) is also growing in places along the wall. Exposed areas of the wall also support a variety of lichens. Much of the wall is densely overgrown with both ivy (*Hedera hibernica*) and also bramble (*Rubus fruticosus* agg.).

ED2: Spoil and Bare Ground

The majority of the Project site has recently been cleared (with the exception of the Project perimeter treeline/hedgerows and riparian vegetation) for future construction, leaving an internal expanse of exposed soil that is largely uncolonized. Some vegetation has begun to regain a foothold, but cover is generally not over 30%. There are some areas where the disturbed soils has been dumped and heaped; these areas have a higher rate of colonisation. Other areas are waterlogged especially in the more southerly section of the Project proximate to the marginal watercourses of the Site.

Typical flora beginning to recolonise the disturbed bare ground includes a substantial broadleaved component such as horsetail (*Equisetum* spp.), meadowsweet (*Filipendula ulmaria*), buttercups (*Ranunculus repens* and *R. acris*), marsh thistle (*Cirsium palustre*), meadow thistle (*Cirsium dissectum*), spear thistle (*Cirsium vulgare*), silverweed (*Potentilla anserina*), lesser ribwort plantain (*Plantago lanceolata*), willowherbs (*Epilobium* spp.), ragwort (*Jacobea vulgaris*), groundsel (*Senecio vulgaris*). Proximate to the water features along the Project boundaries are water mint (*Mentha aquatica*), wild turnip (*Brassica rapa*), common marsh-bedstraw (*Galium palustre*), cuckooflower (*Cardamine pratensis*), amphibious bistort (*Persicaria amphibia*), yellow iris (*Iris pseudacorus*), purple

loosestrife (*Lythrum salicaria*), toad rush (*Juncus bufonius*), soft rush (*Juncus effusus*) and also hard rush (*J. inflexus*).

Ground creepers stretching across the expanse of soil include hedge bindweed (*Calystegia sepium*), ivy (*Hedera hibernica*), cleaver (*Galium aparine*) and bramble (*Rubus fruticosus* agg.). A few young saplings occur closer to the hedgerows and include mostly willow (*Salix* spp.) and sycamore (*Acer pseudoplatanus*).

The areas where soil has been deposited in mounds (15m x 30m and up to 2.5 m high) are supporting clusters of the non-native, montbretia (*Crocsmia X crocosmiflora*). Nettles (*Urtica dioica*) and broad-leaved dock (*Rumex obtusifolius*) are also common in this habitat. Young elder (*Sambucus nigra*) saplings also occur here.

No suitable habitat (devil's bit scabious – *Succisa pratensis*) was detected for the marsh fritillary (*Euphydryas aurinia*) butterfly during the site walkover.

FW4: Drainage Ditch

This habitat includes the linear drains / relevant minor watercourses that occur onsite (Drawing 6972-JOD-XX-ZZ-DR-C-200-007). The watercourses are located proximate to the western and southern Project site boundaries and also external to the eastern Project boundary. There was a strong inflow of storm water (more than one point of entry) into the south western drain on the day of the site visit in July.

The watercourses vary in width from 0.5m to 1.25m. The substrate is predominantly comprised of sand, gravel silt with scattered stones /rocks in places. Water depth is approx. 10cm. Fool's watercress (*Apium nodosum*) was noted along the marginal edges and instream. The associated banks reach some 3m along the southern watercourse and roadside. Vegetation cover on the banks is high and often encroaches the watercourses.

The water levels in these water features are likely to undergo seasonal fluctuations.

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 sixteen European Sites (9 SACs and 7 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	Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC (000627)	0.7km
2	Benbulbin, Gleniff and Glenade Complex SAC (000623)	3.1km
3	Streedagh Point Dunes SAC (001680)	6.0km
4	Lough Gill SAC (001976)	8.2km
5	Bunduff Lough and Machair/Trawalua/Mullaghmore SAC (00625)	8.5km
6	Ballysadare Bay SAC (000622)	9.8km
7	Lough Gill SAC (001976)	13.8km
8	Unshin River SAC (001898)	14.0km
9	Union Wood SAC (000638)	14.4km
	SPA	
1	Drumcliff Bay SPA (004013)	0.7km
2	Ballintemple and Ballygilgan SPA (004129)	0.9km
3	Sligo/Leitrim Uplands SPA (004187)	3.1km
4	Cummeen Strand SPA (004035)	4.0km
5	Ardboline Island and Horse Island SPA (004135)	9.3km
6	Ballysadare Bay SPA (004129)	9.7km
7	Inishmurray SPA (004068)	12.7km

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

terrestrial Zol for any European Site. Other European Sites with a hydrological link either upstream or downstream are considered to have a potential wider Zol and are assessed separately in Section 4.2.

Three European Sites fall within the 1000m Zol of the Project, namely Cummeen Strand/Drumcliff Bay SAC (000627) (located approximately 680m west-southwest), Drumcliff Bay SPA (004013) (located approximately 700m west-southwest) and Ballintemple and Ballygilgan SPA (004129) (located approximately 910m west) (Figures 4.1 and 4.2 respectively). The three named European sites are also noted to be within an area where the groundwater is sensitive to SAC habitat and species. The Project is also within a site where groundwater is recognised as sensitive to a SPA. Cummeen Strand/Drumcliff Bay (Sligo Bay) proposed NHA 000627 overlaps Cummeen Strand/Drumcliff Bay SAC (000627) and also approx 0.3km of the Ballintemple and Ballygilgan SPA (004129) – the area on the southern side of the L3303 also identified as the Ballygilgan Nature Reserve.

The next nearest European Site to the Project is over 3.1km east, namely the Benbulbin, Gleniff and Glenade Complex SAC (000623). The Qualifying Interests (QI) of this large SAC are located in the uplands around Ben Bulben, King's Mountain, Benwiskin, Truskmore and Tievebaun (or Eagle's Rock), straddling the Sligo/Leitrim county boundary. This site is important botanically mainly because of the profusion of alpine plants which occur on the cliffs throughout the area, and particularly the cliffs of the Gleniff valley. It also supports a diverse range of good quality upland habitats. The project is located at lower elevations to this SAC and separated from the QI by over 3km; significant effects on the terrestrial based QI of this SAC are not anticipated as a result of the Project construction or operation. Floating River Vegetation [code 3260] habitat (a QI of this SAC) will also not be impacted as the associated watercourses are upstream of the Project. Similarly, transition mire [7140] and alkaline fen [7230] habitats of the SAC will not be impacted. Otter however, are a mobile QI of this SAC and since the headwaters are hydrologically linked to the downstream waters near the Project, this QI will be considered in Section 4.2 below.

All other European Sites were therefore considered to occur outside of the terrestrial-based Zol of the Project and have been 'screened out' at this stage (hydrological link to be assessed in Section 4.2).

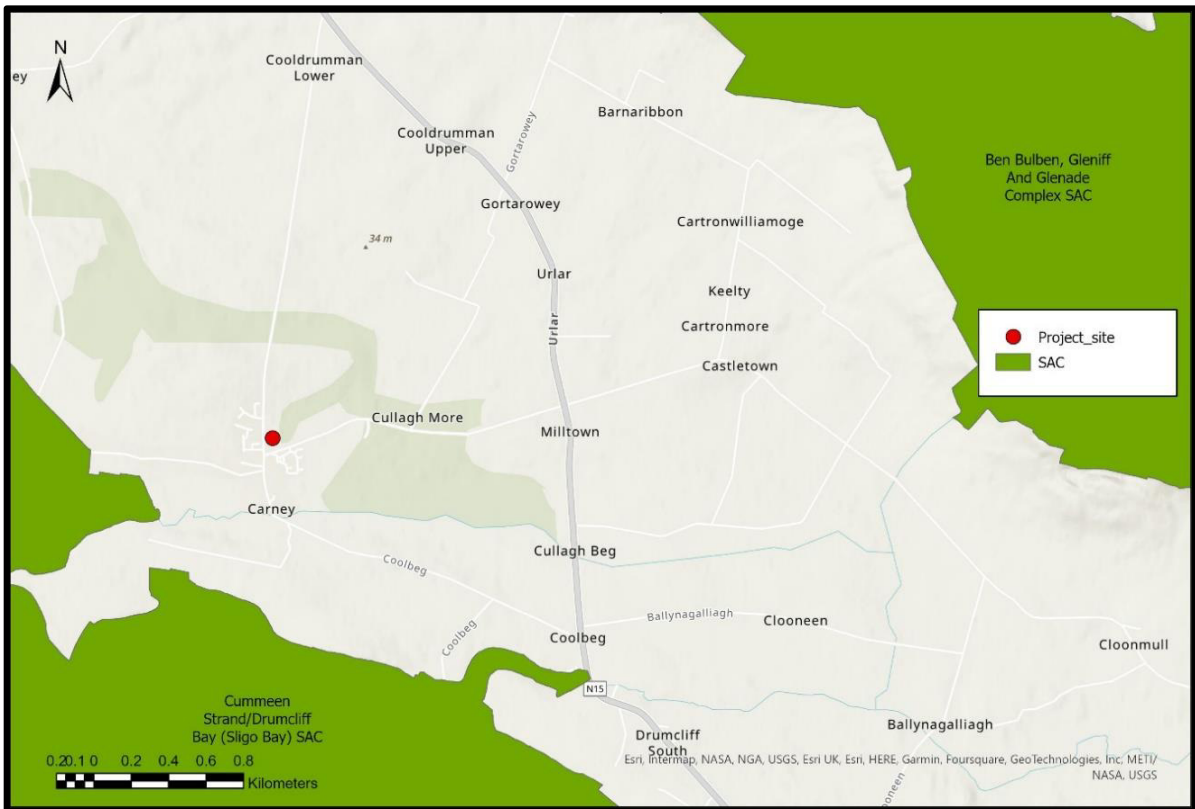


Figure 4.1: Project site showing the closest European SAC Sites



Figure 4.2: Project site showing the closest European SPA Sites

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)			
<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 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</p>	<p>The SAC occurs at a distance of approx. 0.7km west of the Project</p>	<p>This SAC is designated for its role in supporting a variety of habitats and species. There is no possibility for significant effects on these twelve QIs due to:</p> <ul style="list-style-type: none"> • all works will be carried out according to Section 2.2 above and the Method Statement provided in Appendix III • all chemicals and hydrocarbons will be located in the designated bunded area • storm drainage will be designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) and incorporates normal sustainable drainage systems (SuDS) measures before discharging to the existing Uisce Éireann storm water network. • the proposed attenuation tank will be lined to prevent groundwater contamination occurring. • standard working procedures includes spill kits will be onsite at all times with suitably qualified trained personnel • dune QI systems [2110], [2120], [5130] and [6210] are all located over 2.3km southwest of the Project (Map 6, NPWS 2013); due to the intervening urban landscape, there is no potential SPR from the Project to these QI, therefore direct and/or indirect effects are not anticipated. • <i>Vertigo angustior</i> [1017] is located over 8km southwest 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. • works will not occur within the SAC, so direct impacts are not anticipated on any QI. • all works will be contained within the Project site. • the size and scale of the Project works within a Project area of 1.084 hectares.

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>or calcareous grasslands [5130]</p> <p>Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]</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>		<ul style="list-style-type: none"> works are temporary, short-term and localised; significant effects are not anticipated. works will be undertaken under the guidance of an Ecological Clerk of Works.
<p>Benbulbin, Gleniff and Glenade Complex SAC (000623)</p>	<p>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and Callitricho-Batrachion vegetation [3260]</p> <p>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</p> <p>European dry heaths [4030]</p> <p>Alpine and Boreal heaths [4060]</p>	<p>The SAC occurs at a distance of approx. 3km east of the Project</p>	<p>This SAC is designated for its role in supporting a variety of habitats and species. There is no possibility for significant effects on these seventeen QIs due to:</p> <ul style="list-style-type: none"> all works will be carried out according to Section 2.2 above and the Method Statement provided in Appendix III all chemicals and hydrocarbons will be located in the designated bunded area storm drainage will be designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) and incorporates normal sustainable drainage systems (SuDS) measures before discharging to the existing Uisce Éireann storm water network. the proposed attenuation tank will be lined to prevent groundwater contamination occurring

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><i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]</p> <p>Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]</p> <p>Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230]</p> <p>Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]</p> <p>Blanket bogs (* if active bog) [7130]</p> <p>Transition mires and quaking bogs [7140]</p> <p>Petrifying springs with tufa formation (Cratoneurion) [7220]</p> <p>Alkaline fens [7230]</p> <p>Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladan</i>) [8110]</p>		<ul style="list-style-type: none"> • standard working procedures includes spill kits will be onsite at all times with suitably qualified trained personnel • an upstream hydrological connection exists between the project site and otter, a mobile QI of this SAC. There will be no impact on upstream/downstream holts for this QI as a result of this Project, as there was no sign or evidence of otter within 150 m upstream /downstream of the site. • all works will be contained within the Project site • the size and scale of the Project works within a Project area of 1.084 hectares. • works are temporary, short-term and localised; significant effects are not anticipated • works will be undertaken under the guidance of an Ecological Clerk of Works.

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>Calcareous and calcshist screes of the montane to alpine levels (<i>Thlaspietea rotundifolii</i>) [8120]</p> <p>Calcareous rocky slopes with chasmophytic vegetation [8210]</p> <p><i>Vertigo geyeri</i> (Geyer's Whorl Snail) [1013]</p> <p><i>Lutra lutra</i> (Otter) [1355]</p>		
SPECIAL PROTECTION AREAS (SPAs)			
<p>Drumcliff Bay SPA (004013)</p>	<p>Species</p> <p>Sanderling (<i>Calidris alba</i>) [A144]</p> <p>Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]</p> <p>Wetland and Waterbirds [A999]</p> <p>According to this SPA'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</p>	<p>This SPA site occurs at a distance of approx. 0.7km west and 0.9km south of the Project.</p>	<p>This SPA is designated for its role in supporting two specific water dependent birds and one water dependent habitat and its related waterbirds. There is no possibility for significant effects on these QIs due to:</p> <ul style="list-style-type: none"> • no works will occur within the SPA, so direct impacts are not anticipated on any wetland associated with the foraging or roosting sites of the birds associated with this SPA • the SPA is approx. 0.7km west of the Project (Map 1, NPWS 2013); due to the intervening urban landscape, there is no potential visual or noise disturbance on the birds associated with this SPA • sanderling and bar-tailed Godwits feed predominantly on small invertebrates typically along the tidal edge; Drumcliff Bay extends 9 km east to west from Drumcliff village to Raghly Point; foraging opportunities are widespread within this SPA for wintering sanderling. • <i>sanderling are mostly found along sandy coastlines, especially non-estuarine</i> (Birdwatch Ireland ,

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
	for which the SPA has been selected.		<p>accessed August 2023); significant effects on the foraging behaviour of bar-tailed Godwits are not anticipated as a result of the construction or operation of this Project</p> <ul style="list-style-type: none"> • <i>bar-tailed Godwits feed along the tidal edge, or in shallow water (up to 15 cm depth). They usually commence feeding on an ebbing tide, and feed continuously for up to 6 hours. Polychaete worms, particularly lugworms, form a large proportion of their diet</i> (Birdwatch Ireland , accessed August 2023); significant effects on the foraging behaviour of bar-tailed Godwits are not anticipated as a result of the construction or operation of this Project • all works will be carried out according to Section 2.2 above and the Method Statement provided in Appendix III • all chemicals and hydrocarbons will be located in the designated bunded area • storm drainage will be designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) and incorporates normal sustainable drainage systems (SuDS) measures before discharging to the existing Uisce Éireann storm water network. • the proposed attenuation tank will be lined to prevent groundwater contamination occurring. • standard working procedures will include spill kits onsite at all times with suitably trained personnel in their use • all works will be contained within the Project site • the size and scale of the Project works within a Project area of 1.084 hectares. • works are temporary, short-term and localised; significant effects are not anticipated • works will be undertaken under the guidance of an Ecological Clerk of Works
Ballintemple and	Species	This SPA site occurs at approx. 0.9km	This SPA is designated for its role in supporting Barnacle Geese. There is no possibility for significant effects on these QIs due to:

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
Ballygilgan SPA (004234)	Barnacle Goose (Branta leucopsis) [A045]	west of the Project.	<ul style="list-style-type: none"> • no works will occur within the SPA, so direct impacts are not anticipated on barnacle geese • the SPA is approx. 0.9km west of the Project (EPA Maps, 2023); due to intervening residential areas, farmland, delineating mature treelines and hedgerows, a small broadleaved woodland (0.5hectares), established local road networks, etc, there is no potential for significant visual or noise disturbance on the geese associated with this SPA during either construction or operation of this Project • wintering barnacle geese of the Ballintemple and Ballygilgan SPA comprises two separate areas of fields supporting agriculturally improved grassland, situated on the north side of Drumcliff Bay, Co. Sligo; these areas are visually separated from the Project; there is no hydrological link to these fields • the geese feed for much of the winter on fields at Ballintemple and Ballygilgan, which are their core feeding sites, and roost on the nearby island of Inishmurray (Site Synopsis, Ballintemple and Ballygilgan SPA, NPWS 2014); Inishmurray is located approx 6km offshore and over 12km northwest of the Project. • significant effects on the foraging behaviour of barnacle geese of this SPA are not anticipated as a result of the construction or operation of this Project • all works will be carried out according to Section 2.2 above and the Method Statement provided in Appendix III • all chemicals and hydrocarbons will be located in the designated bunded area • storm drainage will be designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) and incorporates normal sustainable drainage systems (SuDS) measures before discharging to the existing Uisce Éireann storm water network.

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
			<ul style="list-style-type: none"> • the proposed attenuation tank will be lined to prevent groundwater contamination occurring. • standard working procedures will include spill kits onsite at all times with suitably trained personnel in their use • all works will be contained within the Project site • the size and scale of the Project works within a Project area of 1.084 hectares. • works are temporary, short-term and localised; significant effects are not anticipated • works will be undertaken under the guidance of an Ecological Clerk of Works

European Sites closest to the Project are outlined in Figures 4.1 and 4.2 and include Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC, Benbulbin, Gleniff and Glenade Complex SAC, Drumcliff Bay SPA, and Ballintemple and Ballygilgan SPA.

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.

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 a minor watercourse that will be culverted onsite, therefore a hydrological connection to the Cullagh Beg River exists. However there is intervening landscape and land use also supporting the dissipation of any surface runoff from the site. Works are very localised and will occur within the Project site.

The storm drainage for the entire development has been designed in accordance with the Greater Dublin Strategic Drainage Study (GSDSDS). The details of the pipe designs and are outlined at Appendix B of Civils Design Report. 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, including high oil level alarm, 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 Ballyshannon Limestone, there is little risk of groundwater flooding. In addition, there is no risk of tidal or pluvial flooding at this site. Six trial pits were dug in 2023 as part of the ground investigation. Trial pits 1 and 2 were dry, trial pits 4, 5 and 6 reported moderate ingress of water from 2.60m to 3.10m below ground level, and trial pit three reported moderate ingress of water at 0.60m below ground level. Given that works will be carried out according to the methodology outlined in Section 2.2 and the Method Statement provided in Appendix III, 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.
- Light emissions: the Project site is located in a rural area. Project works will only be carried out during daylight hours for the most part (this may progress slightly, i.e. 17:30 to 18:00hrs into dusk hours in the autumn /winter/early spring). 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 noted several bat species utilising the local area. Proposed lighting will adhere to EN13201-2015-Part 2 for public lighting standards and will also duly consider 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 Sites 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 proximate to residential properties, 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 (July, 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 1000m).

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

Planning Reference	Description of Development	Site Address	Decision Date	Distance from Site
22159	Development consisting of the conversion of an existing 2-storey agricultural outbuilding (188.4m ²) located to the rear of Carney House; and the construction of a ground floor extension (30.6m ²) to the east of the existing outbuilding to provide 2 no. 3-bedroom semi-detached dwellings; along with associated amendments to existing elevations; associated siteworks and connections to existing services.	Carney House, Carney, Co. Sligo, F91 TP02	04/07/2022	approx. 90m from the project site
22380	development consisting of the construction of a storey and half dwelling house which will be connected to the public sewer and services and all associated site works	Seaview, Carney, Co. Sligo	19/01/2023	approx. 160m from the project site
19249	development consisting of construction of a dwelling house, proprietary effluent treatment unit and soil polishing filter on site together with all ancillary site works and services.	Cullaghmore, Carney, Co. Sligo	31/10/2019	approx. 250m from the project site
1972	development consisting of construction of a new forestry road entrance including all associated site works.	Cullagh More, Carney, Co. Sligo	29/04/2019	approx. 805m from the project site
22316	development consisting of the following: (1) creation of new vehicular site entrance; (2) blocking up of existing entrance; (3) construction of single storey extensions to side and front of existing dwelling and (4) fenestration changes to front and side of dwelling and all other associated site works	Strand View, Carney (O'Beirne), Co Sligo, F91 T3H0	15/11/2022	approx. 670m from the project site

There were no other planning applications in the area at the time of writing (August, 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 Carney, Co. Sligo. Therefore, an Appropriate Assessment is not required.

6 RECOMMENDATIONS

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, e.g. mature and developing trees along the eastern boundary. 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. Due diligence is required to carry out both a frog survey and mammal survey before construction commences.

7 REFERENCES

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European Commission (2001) Assessment of Plans and Projects significantly affecting European Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.

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SNH, Marine Scotland Information, NatureScot <https://marine.gov.scot/data-owners/naturescot-previously-snh>

APPENDIX I

DRAWINGS



SCHEDULE OF UNITS:

TYPE A	1 BED / 2 PERSON	9 No.
TYPE B	1 BED / 2 PERSON (OT)	1 No.
TYPE C	2 BED / 4 PERSON	4 No.
TYPE D	2 BED / 4 PERSON (UD)	1 No.
TYPE E	3 BED / 5 PERSON	7 No.
TYPE F	3 BED / 5 PERSON (OT)	1 No.
TYPE G	4 BED / 7 PERSON	1 No.
TYPE H	5 BED / 8 PERSON	1 No.
TOTAL NUMBER OF UNITS		25 No.

LEGEND OF UNIT TYPES:

HOUSE TYPE A 1 BED/2P SINGLE STOREY	HOUSE TYPE B 1 BED/2P (OT) SINGLE STOREY	HOUSE TYPE C 2 BED/4P TWO STOREY	HOUSE TYPE D 2 BED/4P (UD) SINGLE STOREY
HOUSE TYPE E 3 BED/5P TWO STOREY	HOUSE TYPE F 3 BED/5P (OT) TWO STOREY	HOUSE TYPE G 4 BED/7P TWO STOREY	HOUSE TYPE H 5 BED TWO STOREY

Application Site Area = 1.084ha
 Public Open Space (including Village Green) = 0.20ha
 (18.45% of Site Area - 15% minimum required)

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- Where this drawing is marked FOR TENDER or CONTRACT it is to be read in conjunction with the other drawings and documents which constitute the complete set of tender or contract documents.
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- Where this drawing is marked FOR TENDER or FOR CONSTRUCTION below, the Contractor is required to provide a CE Marked Declaration of Performance for all proposed materials in compliance with Building Regulations TGD Part D prior to placing an order.

- LEGEND OF PAVING & ROAD FINISHES**
- NEW ROADWAYS AND DRIVEWAYS FINISHED WITH BITUMEN MACADAM TO CIVIL ENGINEER'S SPECIFICATION
 - SHARED SURFACE AREAS IN COLOURED ASPHALT TO CIVIL ENGINEER'S SPECIFICATION
 - CAST IN-SITU CONCRETE FOOTPATHS WITH BRUSHED FINISH TO CIVIL ENGINEER'S SPECIFICATION
 - SELECTED PAVER FINISH ON hardcore BASE TO CIVIL ENGINEER'S SPECIFICATION

- LEGEND OF SOFT LANDSCAPING FINISHES**
- NEW PUBLIC GRASSED AREAS TO ARCHITECT'S SPECIFICATION
 - NEW PRIVATE GRASSED AREAS TO ARCHITECT'S SPECIFICATION
 - NEW GROUND COVER AND SHRUB PLANTING TO ARCHITECT'S SPECIFICATION
 - NEW TREES TO ARCHITECT'S SPECIFICATION
 - EXISTING TREES RETAINED

- GENERAL**
- APPLICATION SITE BOUNDARY
 - DROPPED KERB FOR PEDESTRIAN CROSSING

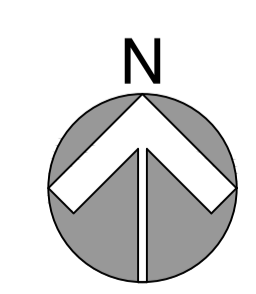
03900 Sligo Co. Co., 25 Houses of Carney, Co. Sligo@Sligo County Council.org

P6			
P5			
P4			
P3	UNIT 23 LAYOUT REVISED	FD	08.08.23
P2	EXTERNAL BIN STORES REVISED	FD	31.07.23
P1	REAR GARDEN LEVELS ADDED	FD	28.07.23
Rev.	Description	By	Date


HAMILTON YOUNG ARCHITECTS

12 Beulah Buildings - Finisklin Road
 Sligo, F91-NXT5
 T: 071 916 1457 W: www.hya.ie

Drawing Status STAGE 2 - PLANNING PERMISSION		Drawn By MGW	
Client SLIGO COUNTY COUNCIL		Checked By TMcD	
Project 25 No. SOCIAL HOUSING UNITS AT CURRAGHMORE, CARNEY, CO. SLIGO		Scale 1:500	
Title PROPOSED SITE PLAN		Date JULY 2023	
Job No. 23S03	Stage ST2	Drawing No. 102	Rev P3



LEGEND OF SOFT LANDSCAPING FINISHES
(Refer to Notes also)

-  NEW PUBLIC GRASSED AREAS
-  NEW NATIVE WILDFLOWER MEADOW AREA
-  NEW NATIVE SPECIES GROUND COVER AND SHRUB PLANTING
-  NEW NATIVE SPECIES TREES

NOTES




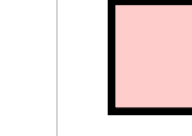
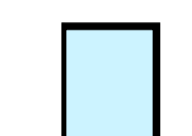

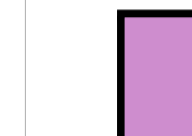
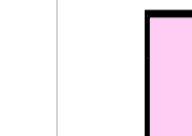
1. All new trees shall be strictly sourced from native Irish stock nurseries only (not imported from abroad). Trees species will include a mixture of Whitebeam (*Sorbus hibernica*), Rowan (*Sorbus aucuparia*), Hawthorn (*Crataegus monogyna*), Silver Birch (*Populus pubescens*) and Scots Pine (*Pinus sylvestris*).
2. Boundary enhancement shall occur along the eastern tree line / hedgerow habitat where gaps exist. These gaps shall be supplemented with species that include Alder (*Alnus glutinosa*), Aspen (*Populus tremula*) and Black Poplar (*Populus nigra*). Where choosing the latter species, more than one shall be planted for cross pollination. Thickening of the eastern boundary hedgerow/tree line and planting of the other areas will contribute to the green infrastructure on site and promote foraging corridors for bats and other mammals, to potentially link the urban and rural habitats and possibly also mitigate future flood events.

Existing hedgerow/tree line retained and enhanced as per Note 2 above

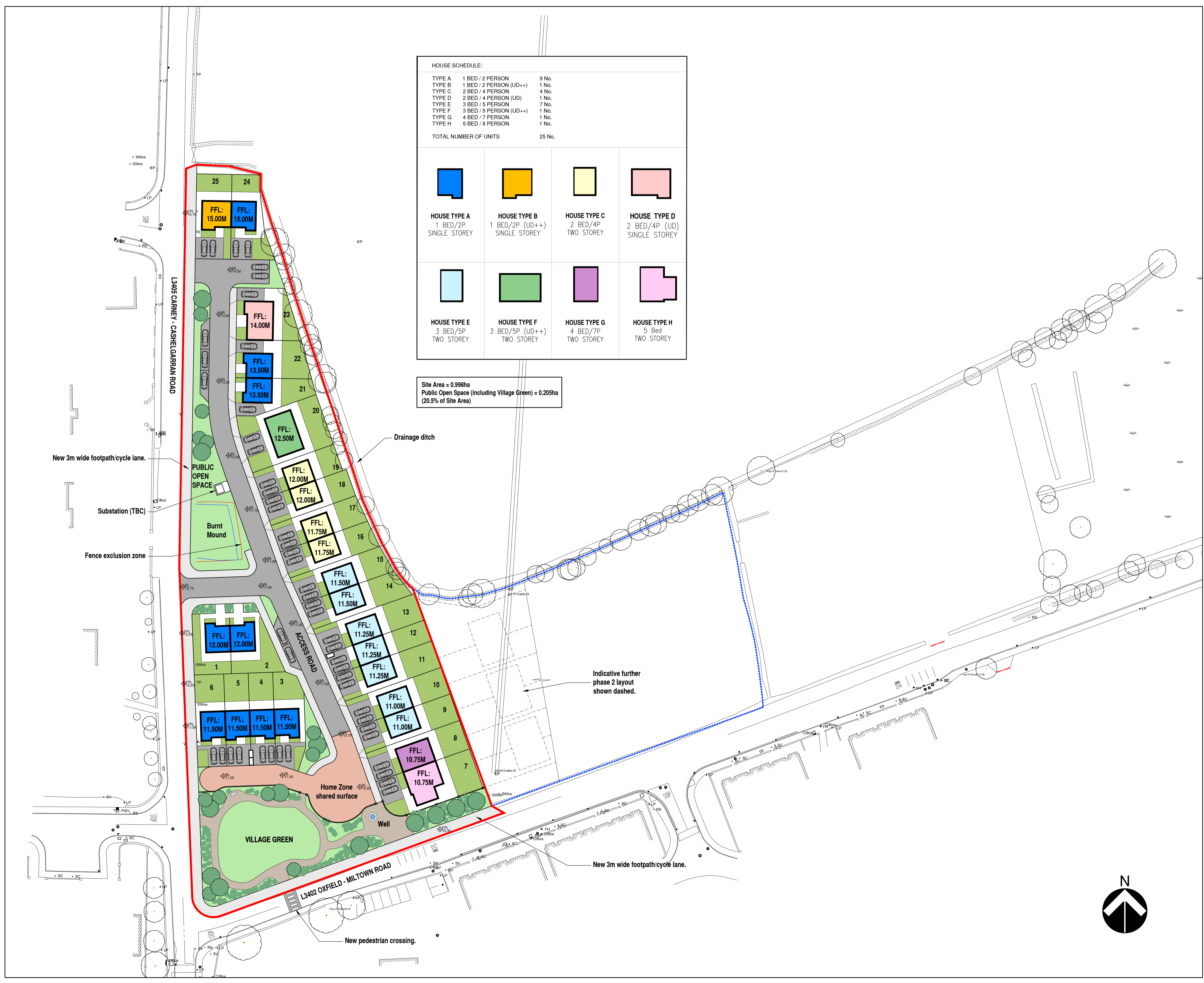


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- Where this drawing is marked FOR TENDER or FOR CONSTRUCTION below, the Contractor is required to provide a CE Marked Declaration of Performance for all proposed materials in compliance with Building Regulations TGD Part D prior to placing an order.

HOUSE SCHEDULE:		
TYPE A	1 BED / 2 PERSON (UD++)	9 No.
TYPE B	1 BED / 2 PERSON (UD++)	1 No.
TYPE C	2 BED / 4 PERSON	4 No.
TYPE D	2 BED / 4 PERSON (UD)	1 No.
TYPE E	3 BED / 5 PERSON	7 No.
TYPE F	3 BED / 5 PERSON (UD++)	1 No.
TYPE G	4 BED / 7 PERSON	1 No.
TYPE H	5 BED / 8 PERSON	1 No.
TOTAL NUMBER OF UNITS		25 No.

			
HOUSE TYPE A 1 BED/2P SINGLE STOREY	HOUSE TYPE B 1 BED/2P (UD++) SINGLE STOREY	HOUSE TYPE C 2 BED/4P TWO STOREY	HOUSE TYPE D 2 BED/4P (UD) SINGLE STOREY
			
HOUSE TYPE E 3 BED/5P TWO STOREY	HOUSE TYPE F 3 BED/5P (UD++) TWO STOREY	HOUSE TYPE G 4 BED/7P TWO STOREY	HOUSE TYPE H 5 Bed TWO STOREY

Site Area = 0.998ha
Public Open Space (including Village Green) = 0.205ha
(20.5% of Site Area)



G			
F			
E			
D	LAYOUT UPDATED FOLLOWING MEETING WITH SLIGO CoCo ON THE 24/05/23	MW	24/05/23
C	LAYOUT UPDATED	MW	24/05/23
B	AMENDMENTS AS PER MEETING 10/05/2023	MW	10/05/23
Rev.	Description	By	Date

HAMILTON YOUNG ARCHITECTS
12 Beulah Buildings - Finisklin Road
Sligo, F91-NXT5
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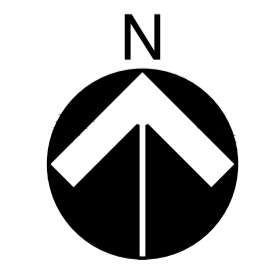
Drawing Status	STAGE 2	Drawn By	MGW
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Client	SLIGO COUNTY COUNCIL	Checked By	TMcD
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Project	CARNEY HOUSING DEVELOPMENT	Scale	1:500
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Title	PROPOSED SITE PLAN	Date	05/05/2023
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Job No.	23S03	Stage	ST2	Drawing No.	100	Rev	D
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Wastewater Infrastructure Standard Details

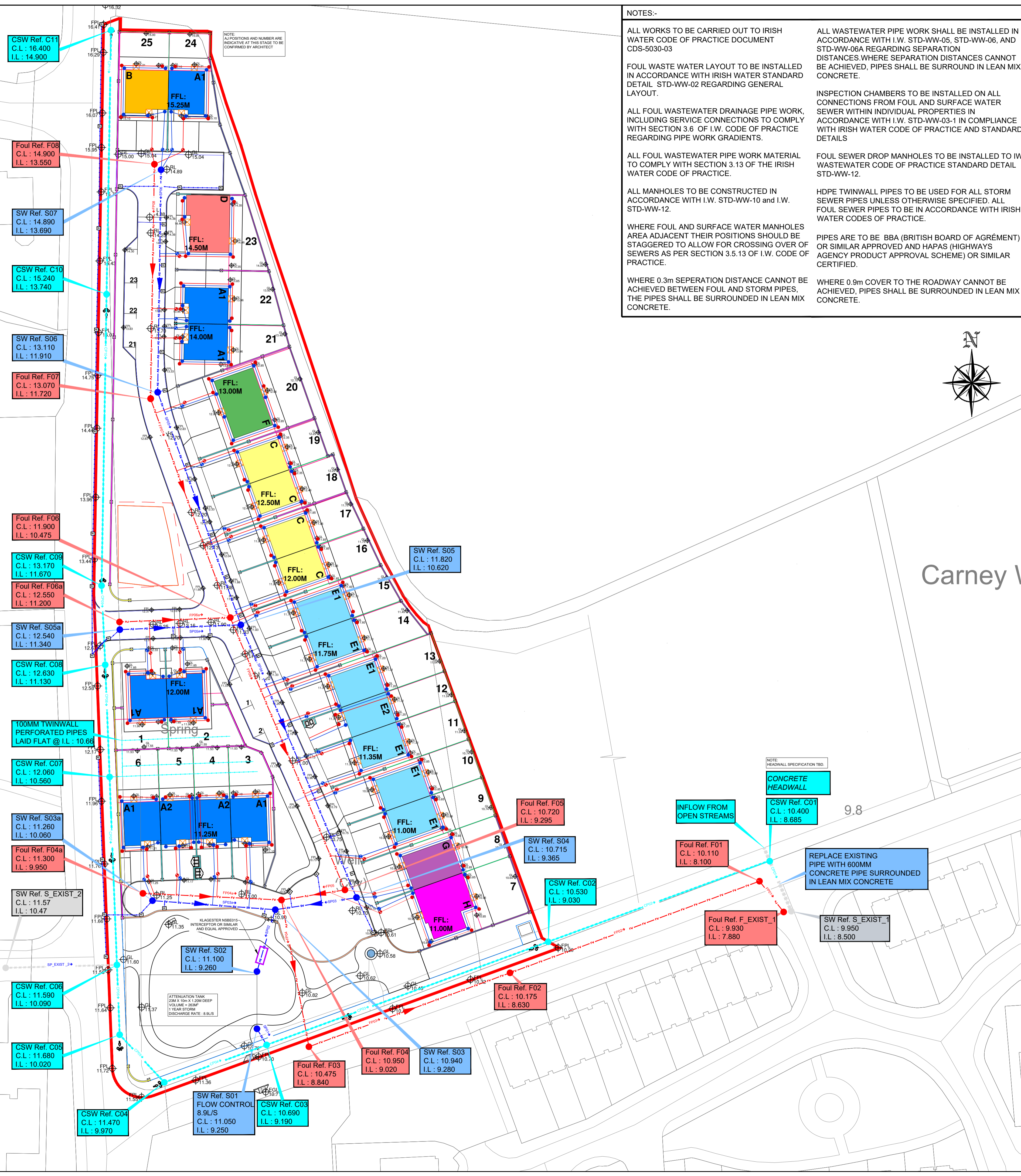
Connections and Developer Services
Design and Construction Requirements for Self-Lay Developments
July 2020 (Revision 4)
Revision No. 05/2020/04



NOTE: CONTRACTOR IS TO REFER TO REVISION 4 OF THE IRISH WATER STANDARD DETAILS DATED JULY 2020 FOR WASTEWATER INFRASTRUCTURE DETAILS. THIS BOOKLET HAS BEEN INCLUDED IN PART OF THE CIVIL/STRUCTURAL PACKAGE.

STORM WATER SYSTEM					
PIPE ID	UPSTREAM NODE	DOWNSTREAM NODE	LENGTH (M)	SLOPE (1:X)	DIA. (MM)
CP11	C11	C10	51.777	44.6	600
CP10	C10	C09	57.131	27.6	600
CP09	C09	C08	15.541	28.8	600
CP08	C08	C07	21.996	38.6	600
CP07	C07	C06	36.88	78.5	600
CP06	C06	C05	13.697	195.7	600
CP05	C05	C04	12.81	256.2	600
CP04	C04	C03	21.359	27.4	600
CP03	C03	C02	58.798	367.5	600
CP02	C02	C01	46.236	134	600
CP01	C01	S_EXIST_1	10.691	71.3	600
SP07	S07	S06	43.617	24.5	225
SP06	S06	S05	48.429	37.5	225
SP05a	S05a	S05	23.753	33	225
SP05	S05	S04	58.061	46.3	300
SP04	S04	S03	16.105	189.5	450
SP03a	S03a	S03	24.138	30.9	300
SP03	S03	S02	12.636	631.8	450
SP02	S02	S01	11.234	1123.4	300
SP01	S01	C03	3.686	61.4	300
SP_EXIST_2	S_EXIST_2	C06	21.82	57.4	300

FOUL WATER SYSTEM					
PIPE ID	UPSTREAM NODE	DOWNSTREAM NODE	LENGTH (M)	SLOPE (1:X)	DIA. (MM)
FP08	F08	F07	45.989	25.1	150
FP07	F07	F06	45.651	34.2	150
FP06a	F06a	F06	21.738	26.7	150
FP06	F06	F05	57.922	53.1	225
FP05	F05	F04	12.596	45.8	225
FP04a	F04a	F04	27.208	29.3	150
FP04	F04	F03	29.261	162.6	225
FP03	F03	F02	42.019	200.1	225
FP02	F02	F01	52.114	98.3	225
FP01	F01	F_EXIST_1	7.677	34.9	300



NOTES:-

ALL WORKS TO BE CARRIED OUT TO IRISH WATER CODE OF PRACTICE DOCUMENT CDS-5030-03

FOUL WASTE WATER LAYOUT TO BE INSTALLED IN ACCORDANCE WITH IRISH WATER STANDARD DETAIL STD-WW-02 REGARDING GENERAL LAYOUT.

ALL FOUL WASTE WATER DRAINAGE PIPE WORK INCLUDING SERVICE CONNECTIONS TO COMPLY WITH SECTION 3.6 OF I.W. CODE OF PRACTICE REGARDING PIPE WORK GRADIENTS.

ALL FOUL WASTE WATER PIPE WORK MATERIAL TO COMPLY WITH SECTION 3.13 OF THE IRISH WATER CODE OF PRACTICE.

WHERE FOUL AND SURFACE WATER MANHOLES AREA ADJACENT THEIR POSITIONS SHOULD BE STAGGERED TO ALLOW FOR CROSSING OVER OF SEWERS AS PER SECTION 3.5.13 OF I.W. CODE OF PRACTICE.

WHERE 0.3m SEPERATION DISTANCE CANNOT BE ACHIEVED BETWEEN FOUL AND STORM PIPES, THE PIPES SHALL BE SURROUNDED IN LEAN MIX CONCRETE.

ALL WASTEWATER PIPE WORK SHALL BE INSTALLED IN ACCORDANCE WITH I.W. STD-WW-05, STD-WW-06, AND STD-WW-06A REGARDING SEPERATION DISTANCES.WHERE SEPERATION DISTANCES CANNOT BE ACHIEVED, PIPES SHALL BE SURROUND IN LEAN MIX CONCRETE.

INSPECTION CHAMBERS TO BE INSTALLED ON ALL CONNECTIONS FROM FOUL AND SURFACE WATER SEWER WITHIN INDIVIDUAL PROPERTIES IN ACCORDANCE WITH I.W. STD-WW-03-1 IN COMPLIANCE WITH IRISH WATER CODE OF PRACTICE AND STANDARD DETAILS

FOUL SEWER DROP MANHOLES TO BE INSTALLED TO IW WASTEWATER CODE OF PRACTICE STANDARD DETAIL STD-WW-12.

HDPE TWINWALL PIPES TO BE USED FOR ALL STORM SEWER PIPES UNLESS OTHERWISE SPECIFIED. ALL FOUL SEWER PIPES TO BE IN ACCORDANCE WITH IRISH WATER CODES OF PRACTICE.

PIPES ARE TO BE BBA (BRITISH BOARD OF AGREMENT) OR SIMILAR APPROVED AND HAPAS (HIGHWAYS AGENCY PRODUCT APPROVAL SCHEME) OR SIMILAR CERTIFIED.

WHERE 0.9m COVER TO THE ROADWAY CANNOT BE ACHIEVED, PIPES SHALL BE SURROUNDED IN LEAN MIX CONCRETE.

NOTES

GENERAL NOTES:

- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
- ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
- ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
- THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.

LEGEND

SITE BOUNDARY shown thus	
PROPOSED 1200MM D400 STORM MANHOLE shown thus	
PROPOSED 1200MM D400 STORM CULVERT MANHOLE WITH SUMP/SILT TRAP shown thus	
PROPOSED STORM WATER NETWORK shown thus	
PROPOSED 1200MM D400 FOUL MANHOLE shown thus	
PROPOSED FOUL NETWORK shown thus	
PROPOSED SURFACE WATER CONNECTIONS shown thus	
PROPOSED FOUL WATER CONNECTIONS shown thus	
PROPOSED STORM/FOUL WATER AJs shown thus	
PROPOSED STORM/FOUL WATER BOUNDARY BOX TO IW-STD-WW-13 shown thus	
PROPOSED ROAD GULLIES shown thus	
EXISTING STORM WATER PIPE shown thus	
PROPOSED CULVERT TO BE SURROUNDED IN LEAN MIX CONCRETE TO IW-STD-WW-08 TYPE D SURROUND shown thus	

Red Line Area:-
10,844 m² 1.084 Hectares

ITM Co-Ordinates of site:- 565696, 843573
Irish Grid Co-Ordinates: 165737, 343569

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OS Ireland Map No. 0848-C, 0848-D

P.01	Issued for COSTING	PC	EM	EM	17.08.23
Rev.	Modifications	By	Chkd	Aprvd	Date

Layout Ref.:
File P:\Jod-jobs\6972 Carney Housing\700 Drawings\703 Planning\01 WIP\6972-JOD-XX-ZZ-DR-C-200-001 SW FW Layout.dwg

Client
Sligo County Council
Comhairle Chontae Shligigh

Project
PROPOSED HOUSING DEVELOPMENT AT CARNEY, CO. SLIGO

Stage
PLANNING

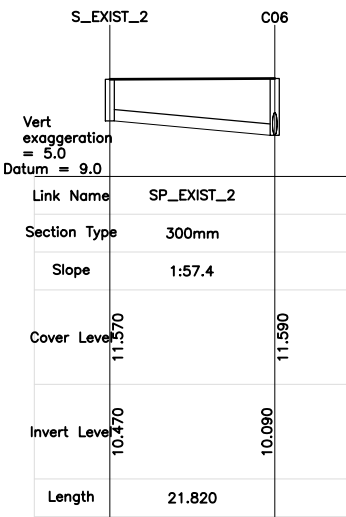
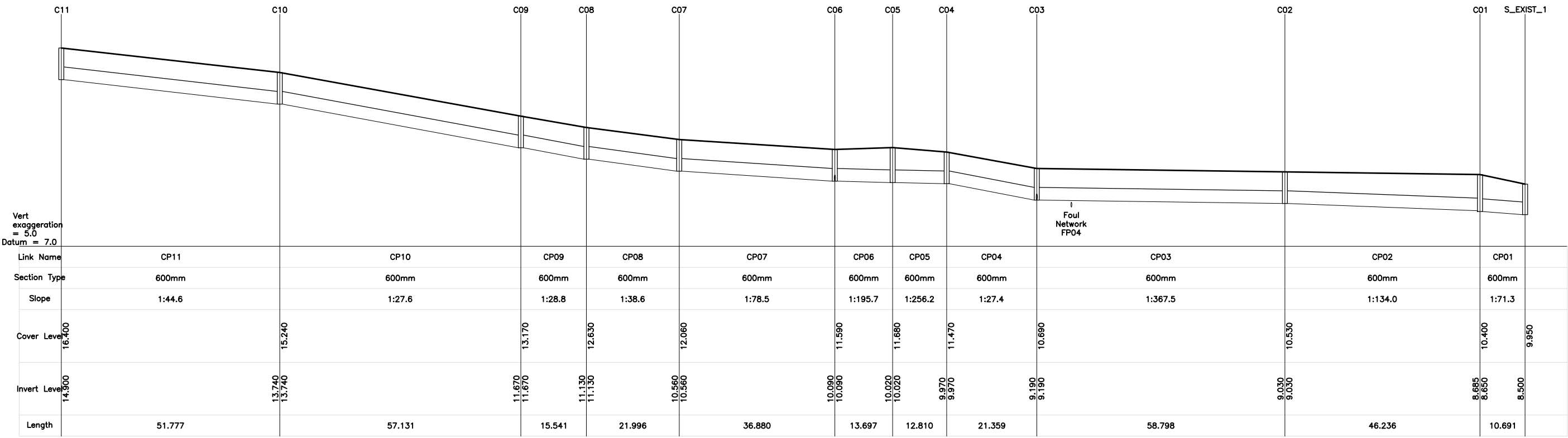
Title
PROPOSED STORM AND FOUL WATER LAYOUT

Scale
1:400 @ A1

Surveyed	Drawn	Checked	Date
OSI	PC	EM	AUG '23

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CONSULTING ENGINEERS,
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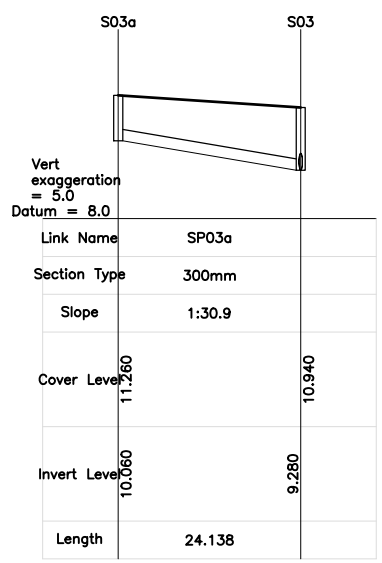
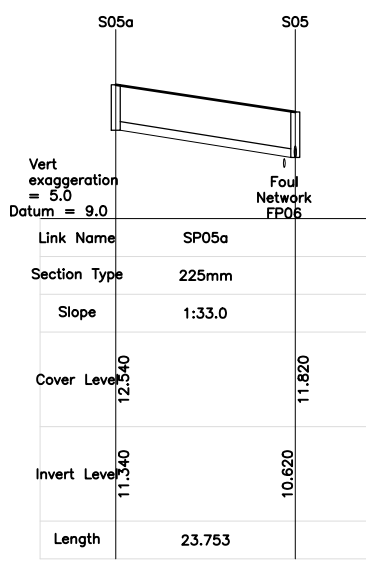
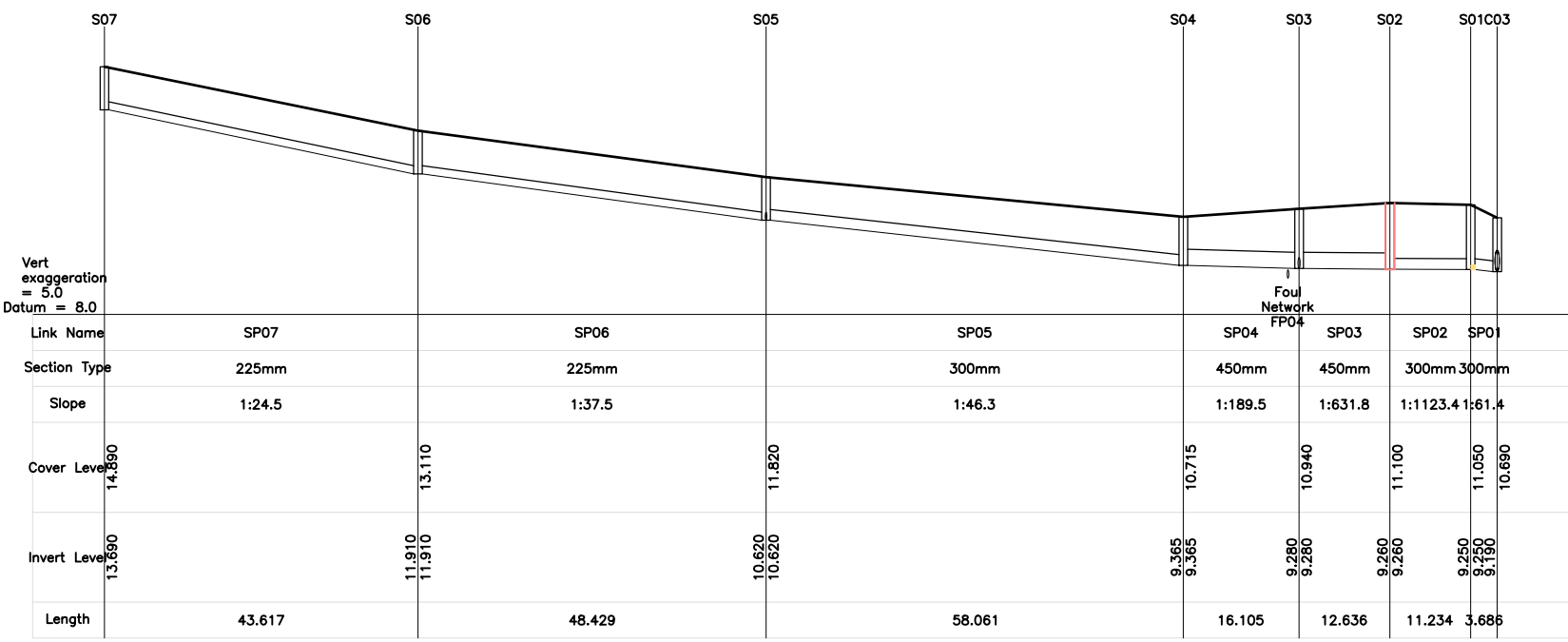
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Revision P.01



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- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
 - ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
 - ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
 - THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES.
 - ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD.
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS. CONTRACTOR TO VERIFY THE ACCURACY OF THIS PROPOSAL TO THE ENGINEER AND ALLOW FOR MINOR CORRECTIONS AS DEEMED NECESSARY WITH A REASONABLE TIMEFRAME.

Wastewater Infrastructure Standard Details
Connections and Developer Services
Design and Construction Requirements for Self-Lay Development
July 2020 (Revised 4)
www.waterreregulation.ie

NOTE: CONTRACTOR IS TO REFER TO REVISION 4 OF THE IRISH WATER STANDARD DETAILS DATED JULY 2020 FOR WASTEWATER INFRASTRUCTURE DETAILS.



P.01	Issued for COSTING	PC	EM	17.08.23
rev.	modifications	by	chkd	date
Layout Ref.:				
file	P:\Jod-jobs\6972 Carney Housing\700 Drawings\703 Planning\01 WIP\6972-JOD-XX-ZZ-DR-C-200-002-003 SW FW Longsections.dwg			

client
 Sligo County Council
 Comhairle Chontae Shligigh

project
 PROPOSED HOUSING DEVELOPMENT
 AT CARNEY, CO. SLIGO

stage
 PLANNING

title
 PROPOSED STORM SEWER AND
 CULVERT SECTIONS

scale
 HORIZ: 1:1000, VERT: 1:200 @ A3

surveyed	drawn	checked	date
	PC	EM	AUG '23

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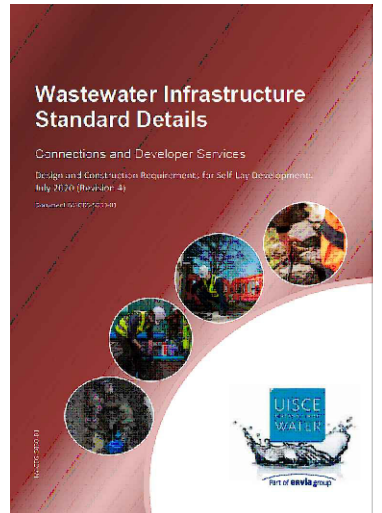
drawing no.	revision
6972-JOD-XX-ZZ-DR-C-200-002	P.01

NOTES

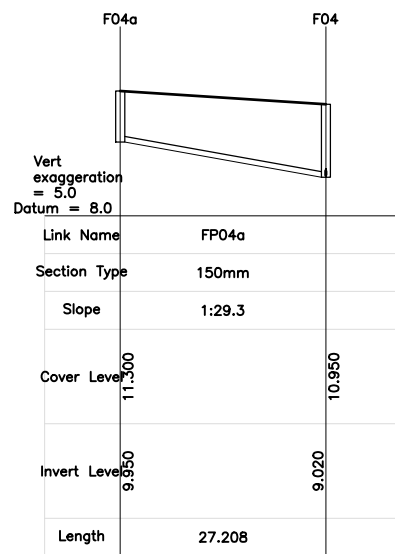
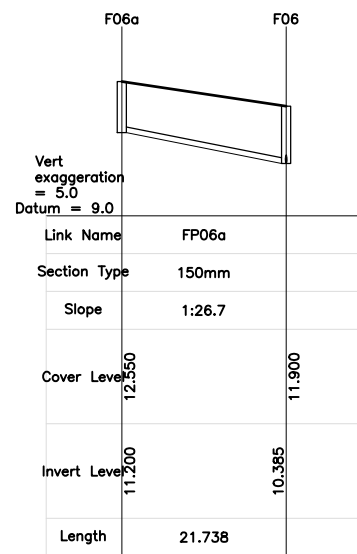
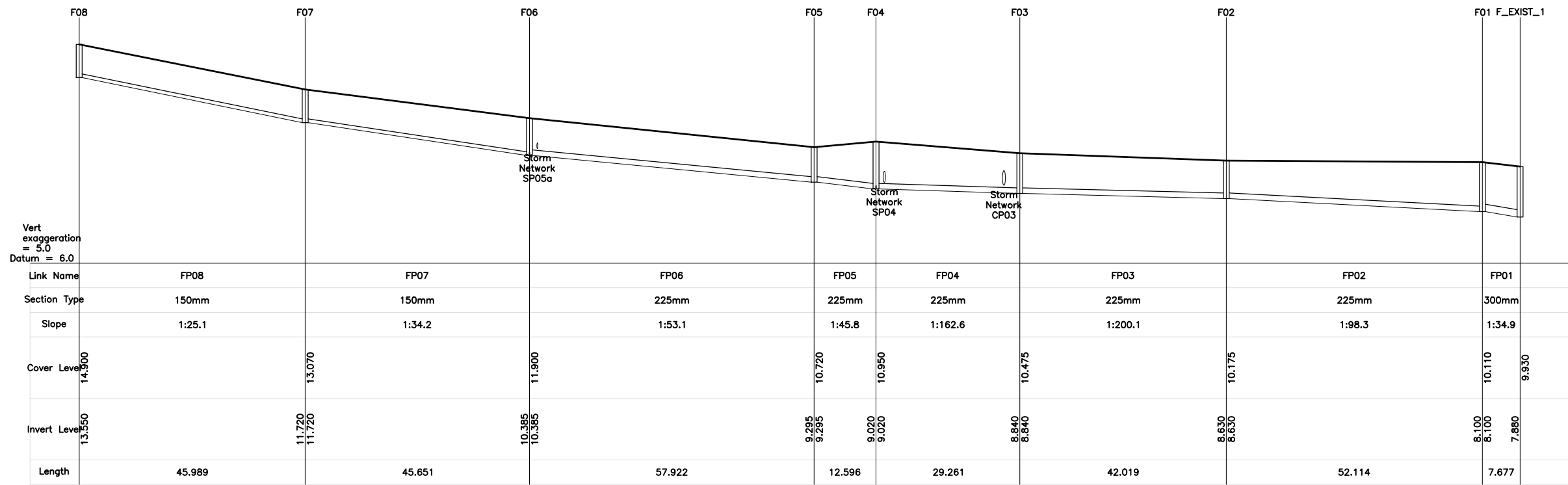
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LEGEND



NOTE: CONTRACTOR IS TO REFER TO REVISION 4 OF THE IRISH WATER STANDARD DETAILS DATED JULY 2020 FOR WASTEWATER INFRASTRUCTURE DETAILS.



P.01	Issued for COSTING	PC	EM	17.08.23
rev.	modifications	by	chkd	date

Layout Ref.:
file P:\jod-jobs\6972 Carney Housing\700 Drawings\703 Planning\01 WIP\6972-JOD-XX-ZZ-DR-C-200-002-003 SW FW Longsections.dwg

client
Sligo County Council
Comhairle Chontae Shligigh

project
PROPOSED HOUSING DEVELOPMENT
AT CARNEY, CO. SLIGO

stage
PLANNING

title
PROPOSED FOUL WATER SEWER
SECTIONS

scale
HORIZ: 1:1000, VERT: 1:200 @ A3

surveyed	drawn	checked	date
	PC	EM	AUG '23

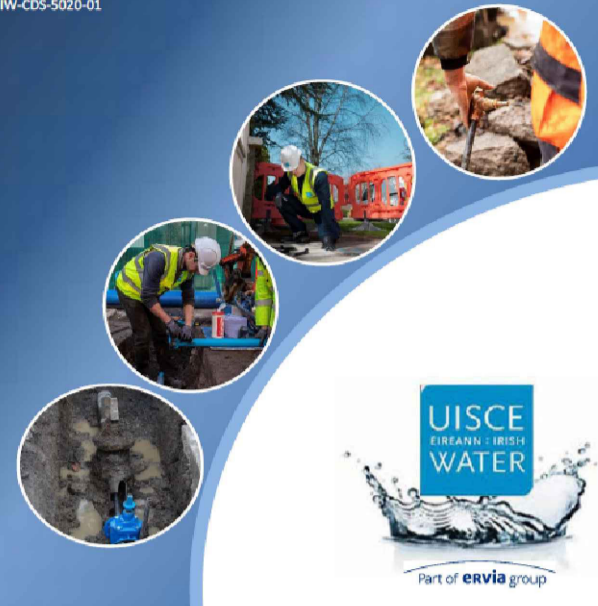
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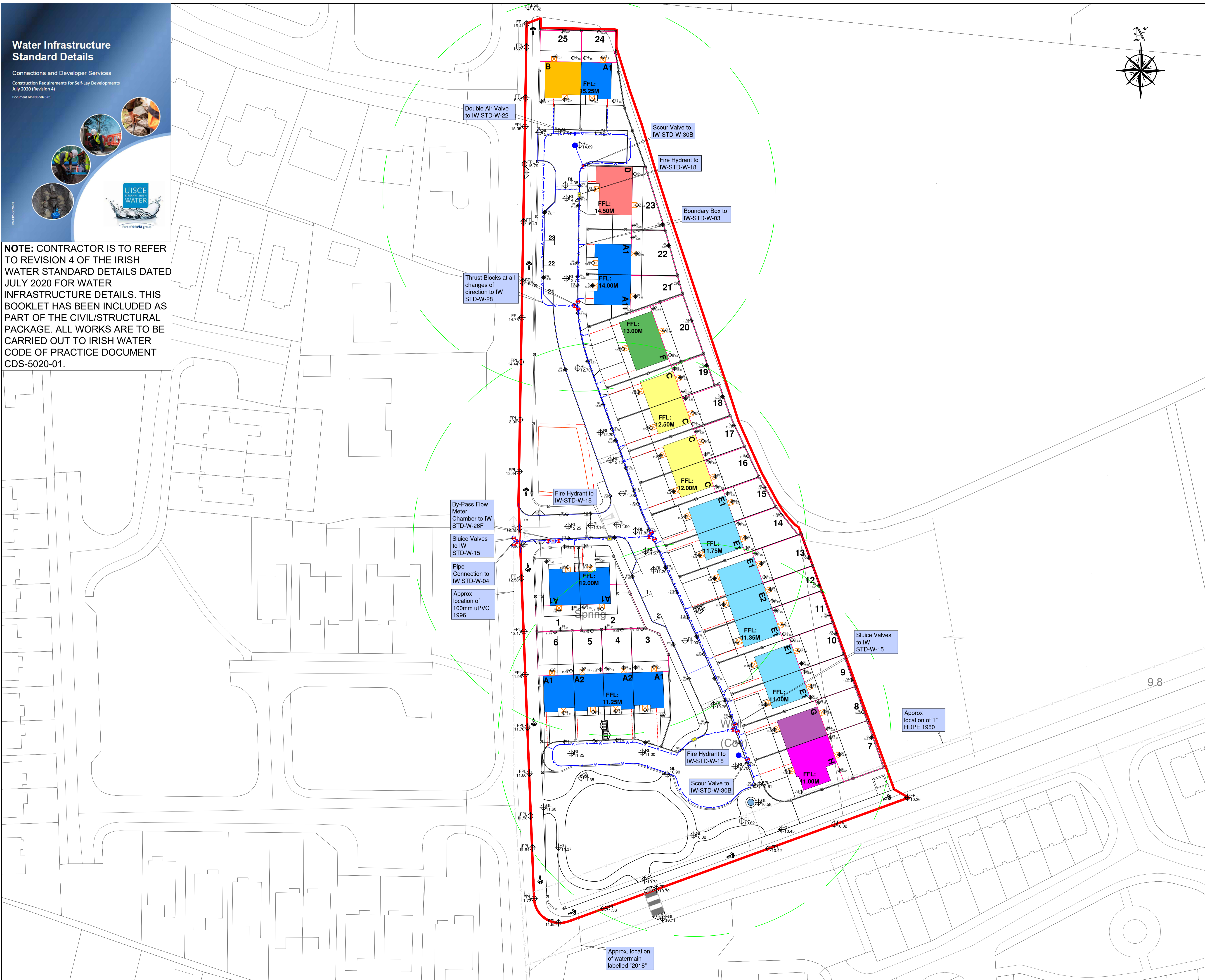
drawing no. 6972-JOD-XX-ZZ-DR-C-200-003 revision P.01

Water Infrastructure Standard Details

Connections and Developer Services
Construction Requirements for Self-Lay Developments
July 2020 (Revision 4)
Document IW-CDS-5020-01



NOTE: CONTRACTOR IS TO REFER TO REVISION 4 OF THE IRISH WATER STANDARD DETAILS DATED JULY 2020 FOR WATER INFRASTRUCTURE DETAILS. THIS BOOKLET HAS BEEN INCLUDED AS PART OF THE CIVIL/STRUCTURAL PACKAGE. ALL WORKS ARE TO BE CARRIED OUT TO IRISH WATER CODE OF PRACTICE DOCUMENT CDS-5020-01.



NOTES

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LEGEND

- SITE BOUNDARY shown thus
- WATERMAIN SUPPLY Ø 110mm OUTSIDE DIAMETER PE100. PIPE MATERIAL SHALL BE IN COMPLIANCE WITH IRISH WATER SECTION 3.9 OF THE CODE OF PRACTICE.
- PROPOSED WATER SUPPLY CONNECTION WITH BOUNDARY BOX TO I.W. STD-W-03 shown thus
- FIRE HYDRANT TO I.W. STD-W-18 shown thus (3 No. Hyd)
- SLUICE VALVE TO I.W. STD-W-15-2 shown thus (14 No. SV's)
- SCOUR VALVE TO I.W. STD-W-30B shown thus (2 No. SC.V's)
- BY-PASS FLOW METER TO STD-W-26F shown thus
- DOUBLE AIR VALVE TO I.W. STD-W-22 shown thus (1 No. AV)
- EXISTING WATERMAIN
- HYDRANT 46M RADIUS shown thus

Red Line Area:-
10,844 m² 1.084 Hectares

ITM Co-Ordinates of site:- 565696, 843573
Irish Grid Co-Ordinates: 165737, 343569
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OS Ireland Map No. 0848-C, 0848-D

P.02	Site plan revised	PC	MF	MF	09.08.23
P.01	Issued for COSTING	PC	MF	MF	08.08.23
Rev.	Modifications	By	Chkd	Aprvd	Date

Layout Ref.:
File P:\Jod-jobs\6972 Carney Housing\700 Drawings\703 Planning\01 WIP\6972-JOD-XX-ZZ-DR-C-200-007 WM Layout.dwg

Client Sligo County Council
Comhairle Chontae Shligigh

Project
PROPOSED HOUSING DEVELOPMENT
AT CARNEY, CO. SLIGO

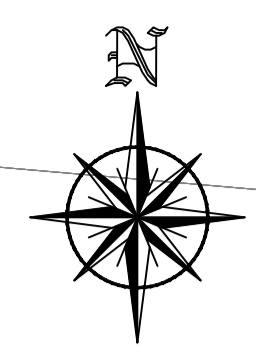
Stage
PLANNING
Title
PROPOSED WATERMAIN LAYOUT

Scale
1:400 @ A1

Surveyed	Drawn	Checked	Date
OSI	PC	MF	AUG '23

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Drawing No.	Revision
6972-JOD-XX-ZZ-DR-C-200-007	P.02



NOTES

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LEGEND

- LEGEND**
- SITE BOUNDARY shown thus
 - PROPOSED 345MM PRECAST CONCRETE CHANNEL KERB shown thus
 - PROPOSED ROAD GULLY shown thus
 - PROPOSED BUFF COLOURED TACTILE PAVING (400MMX400MM) (See TII CC-SCD-05030) shown thus
 - PROPOSED DIRECTION OF FALL / CAMBER shown thus
 - PROPOSED ROAD LEVEL shown thus
 - PROPOSED ROAD KERB shown thus
 - PROPOSED DROP KERB shown thus
 - PROPOSED HOMEZONE OUTLINE shown thus

NOTES :

All YIELD and STOP signage line markings are to be thermo plastic and conform with the Department of Transport, Tourism and Sport Traffic Sign Manual.

All line markings are to be thermo plastic and in accordance with the Department of Transport, Tourism and Sport Traffic Sign Manual.

All signage to conform with the with the Department of Transport, Tourism and Sport Traffic Sign Manual.

Red Line Area:-
10,844 m² 1.084 Hectares

ITM Co-Ordinates of site:- 565696, 843573
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Rev.	Modifications	By	Chkd/Prvd	Date	
Layout Ref.:					
File	P:\Jod-jobs\6972 Carney Housing\700 Drawings\703 Planning\01 WIP\6972-JOD-XX-ZZ-DR-C-200-008-009 Road Layout And Construction Detail.dwg				

Client
 Sligo County Council
 Comhairle Chontae Shligigh

Project
 PROPOSED HOUSING DEVELOPMENT
 AT CARNEY, CO. SLIGO

Stage
 PLANNING

Title
 PROPOSED ROAD LAYOUT

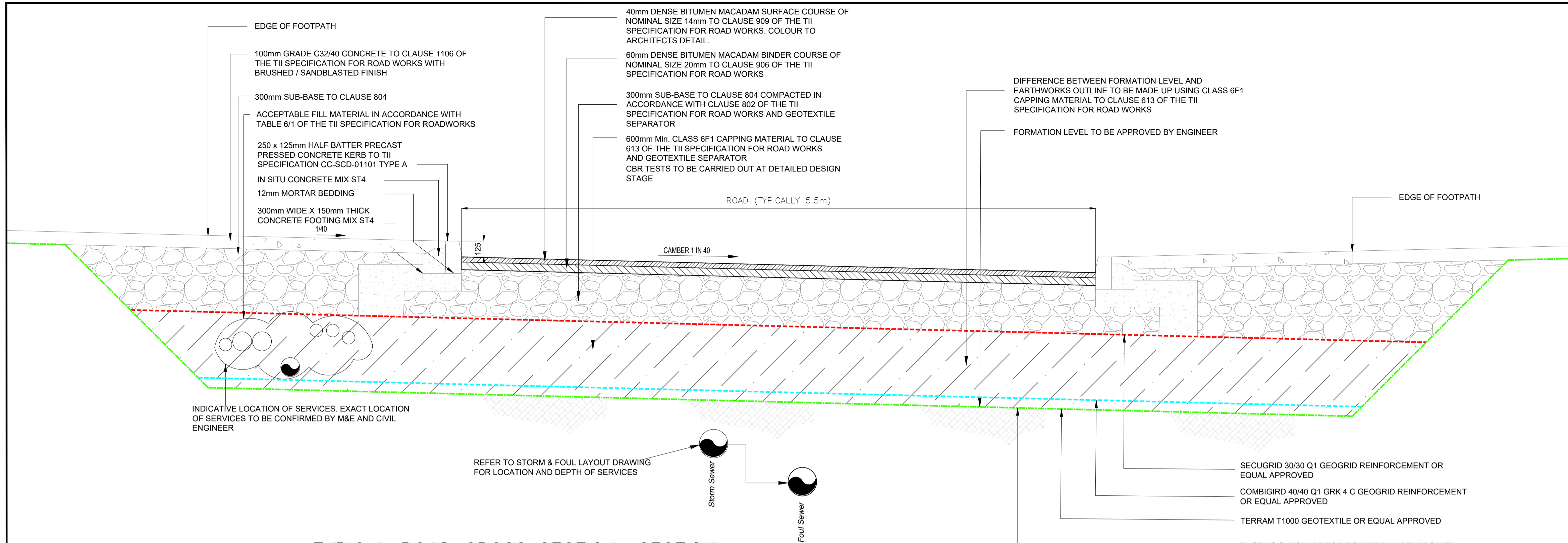
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Surveyed	Drawn	Checked	Date
OSI	PC	XX	AUG '23

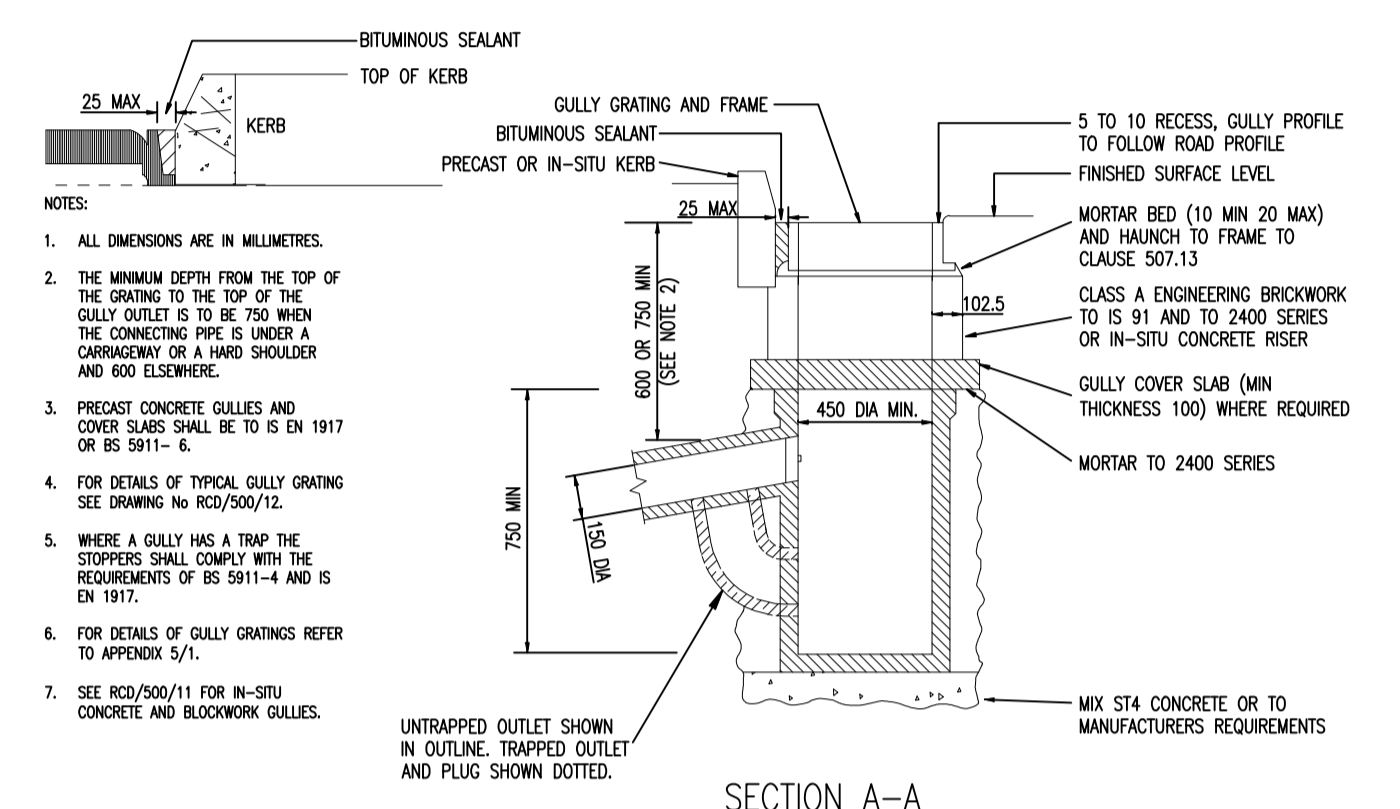
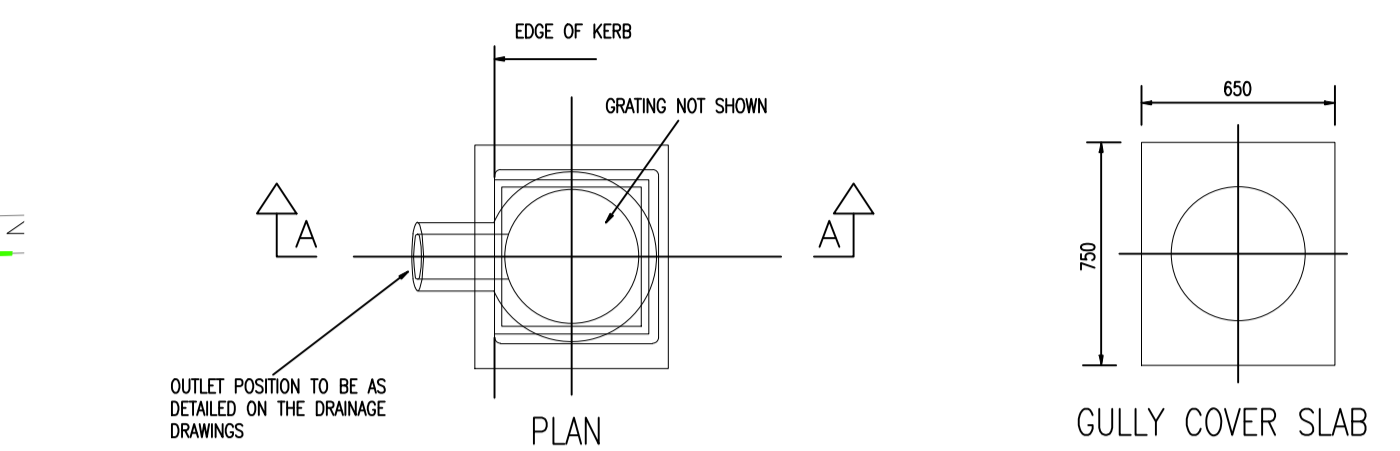
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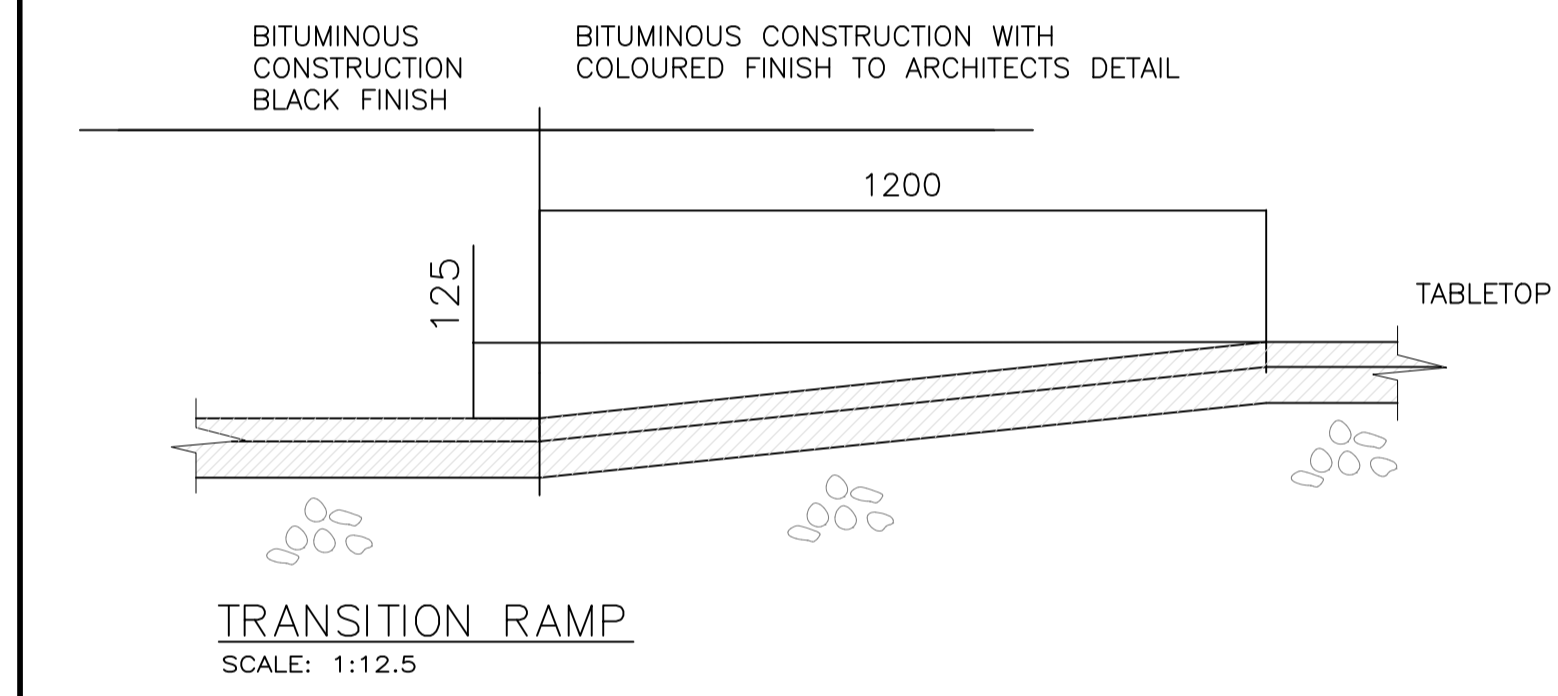
Drawing No.	Revision
6972-JOD-XX-ZZ-DR-C-200-008	P.01



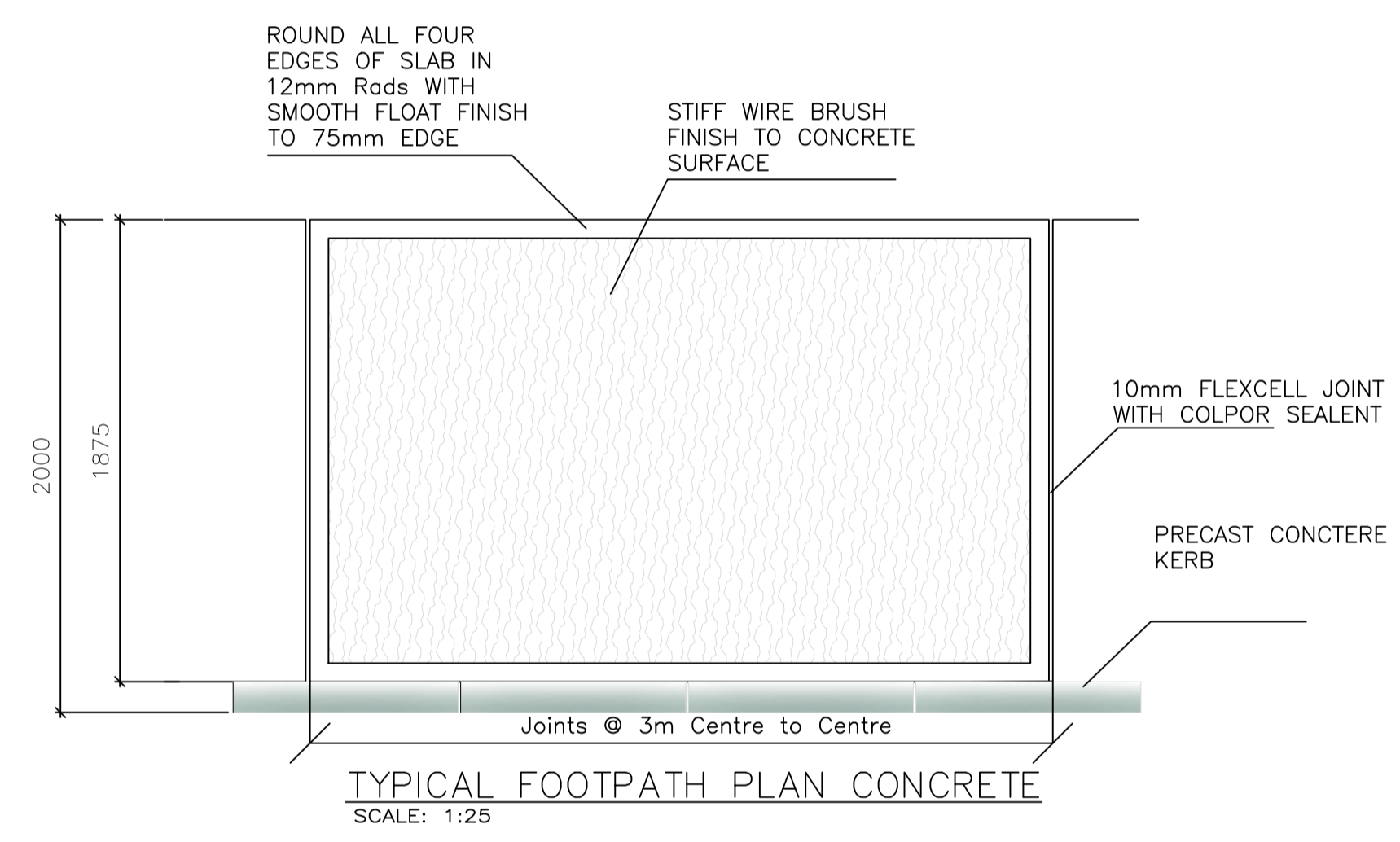
TYPICAL ROAD CROSS SECTION: SECTION A-A
SCALE: 1:20



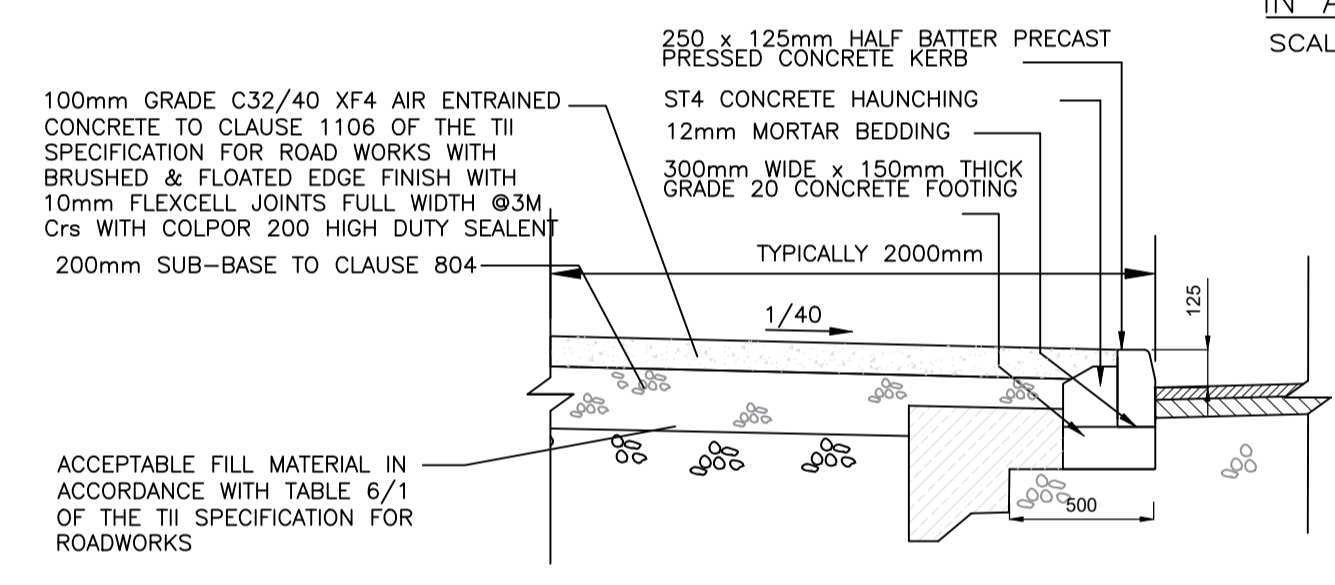
TYPICAL ROAD GULLY DETAIL
IN ACCORDANCE WITH TII DETAIL RCD 500/10
SCALE: NOT TO SCALE



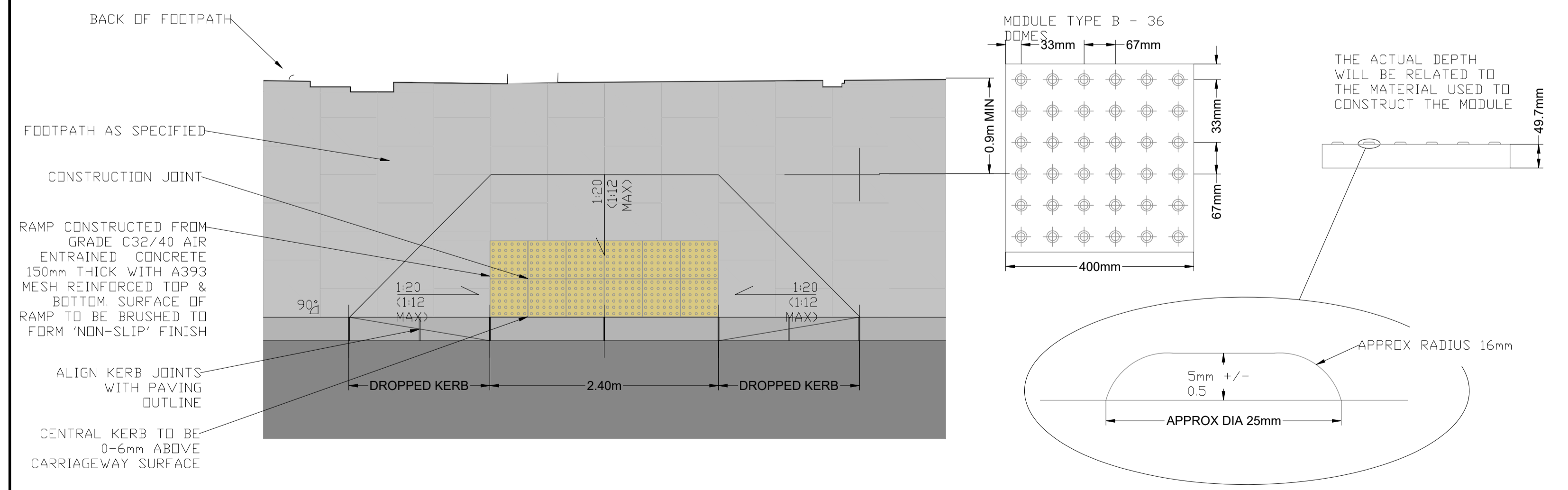
TRANSITION RAMP
SCALE: 1:12.5



TYPICAL FOOTPATH PLAN CONCRETE
SCALE: 1:25



TYPICAL CONCRETE FOOTPATH CROSS SECTION
SCALE: 1:20



DROPPED KERB GEOMETRY AND EXCERPT FROM TII - TACTILE AND PAVING DETAILS AND RECOMMENDED GRADIENTS AT UNCONTROLLED PEDESTRIAN CROSSING CC-SCD-05136

- NOTES:
1. THE TACTILE DOMES ON THE TILES MUST BE LINED UP TO GIVE THE DIRECTION OF TRAVEL IN ORDER TO CROSS THE CARRIAGEWAY STRAIGHT
 2. UTILITY CABINETS/CHAMBERS MUST NOT BE LOCATED WITHIN THE TACTILE PAVING AREA
 3. REFER TO TACTILE PAVING GUIDANCE DOCUMENTATION
 4. TACTILE BLISTER PAVING SHALL BE BEDDED ON 25 MM MOIST SAND/CEMENT MORTAR (3:1), JOINTS FILLED WITH 4:1 MIX WITHIN 2mm OF THE PAVING SURFACE

- LEGEND
- TACTILE PAVING 400x400 BUFF FINISH (5mm JOINT)
 - TACTILE TO BE LAID SO BLISTER PATTERN IS IN LINE WITH CROSSING

NOTES

GENERAL NOTES:

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Rev.	Modifications	By	Chkd	Aprvd	Date
Layout Ref.:					
File	P:\Jod-jobs\6972 Carney Housing\700 Drawings\703 Planning\01 WIP\6972-JOD-XX-ZZ-DR-C-200-008-009 Road Layout And Construction Detail.dwg				

Client
Sligo County Council
Comhairle Chontae Shligigh

Project
PROPOSED HOUSING DEVELOPMENT
AT CARNEY, CO. SLIGO

Stage
PLANNING

Title
PROPOSED ROAD CONSTRUCTION
DETAILS AND SECTIONS

Scale
AS SHOWN @ A1

Surveyed	Drawn	Checked	Date
OSI	PC	MF	AUG '23

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Drawing No.	Revision
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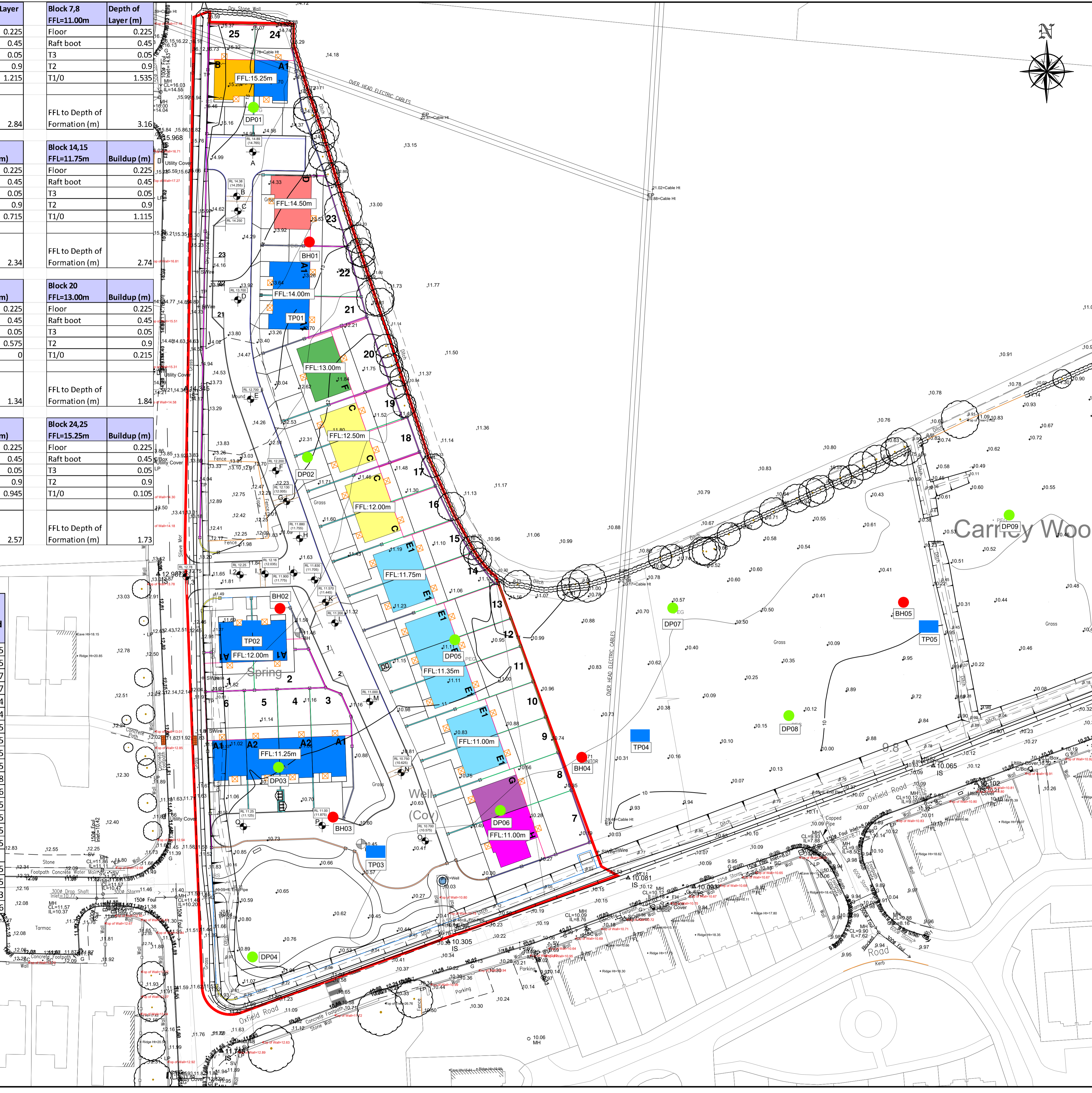
Block 1,2	Depth of Layer (m)	Block 3,4,5,6	Depth of Layer (m)	Block 7,8	Depth of Layer (m)
FFL=12.00m		FFL = 11.25m		FFL=11.00m	
Floor	0.225	Floor	0.225	Floor	0.225
Raft boot	0.45	Raft boot	0.45	Raft boot	0.45
T3	0.05	T3	0.05	T3	0.05
T2	0.9	T2	0.9	T2	0.9
T1/0	1.755	T1/0	1.215	T1/0	1.535
FFL to Depth of Formation (m)	3.38	FFL to Depth of Formation (m)	2.84	FFL to Depth of Formation (m)	3.16

Block 9,10	Buildup (m)	Block 11,12,13	Buildup (m)	Block 14,15	Buildup (m)
FFL=11.00m		FFL = 11.35m		FFL=11.75m	
Floor	0.225	Floor	0.225	Floor	0.225
Raft boot	0.45	Raft boot	0.45	Raft boot	0.45
T3	0.05	T3	0.05	T3	0.05
T2	0.9	T2	0.9	T2	0.9
T1/0	1.535	T1/0	0.715	T1/0	1.115
FFL to Depth of Formation (m)	3.16	FFL to Depth of Formation (m)	2.34	FFL to Depth of Formation (m)	2.74

Block 16,17	Buildup (m)	Block 18,19	Buildup (m)	Block 20	Buildup (m)
FFL=12.00m		FFL=12.50m		FFL=13.00m	
Floor	0.225	Floor	0.225	Floor	0.225
Raft boot	0.45	Raft boot	0.45	Raft boot	0.45
T3	0.05	T3	0.05	T3	0.05
T2	0.225	T2	0.575	T2	0.9
T1/0	0	T1/0	0	T1/0	0.215
FFL to Depth of Formation (m)	0.84	FFL to Depth of Formation (m)	1.34	FFL to Depth of Formation (m)	1.84

Block 21,22	Buildup (m)	Block 23	Buildup (m)	Block 24,25	Buildup (m)
FFL=14.00m		FFL=14.50m		FFL=15.25m	
Floor	0.225	Floor	0.225	Floor	0.225
Raft boot	0.45	Raft boot	0.45	Raft boot	0.45
T3	0.05	T3	0.05	T3	0.05
T2	0.9	T2	0.9	T2	0.9
T1/0	0.445	T1/0	0.945	T1/0	0.105
FFL to Depth of Formation (m)	2.07	FFL to Depth of Formation (m)	2.57	FFL to Depth of Formation (m)	1.73

Node	Road Level	Depth of RL to Formation (mOD)	Surface, subbase and capping min. buildup (m)	6F1 Fill Required (m)
A	14.765	13.52	0.8	0.445
B	14.255	12.38	0.8	1.075
C	14.250	12.38	0.8	1.07
D	13.700	11.93	0.8	0.97
E	12.700	11.16	0.8	0.74
F	12.200	11.16	0.8	0.24
G	12.005	11.16	0.8	0.045
H	11.755	9.62	0.8	1.335
J	11.705	9.62	0.8	1.285
K	11.445	9.62	0.8	1.025
L	11.200	9.62	0.8	0.78
M	11.000	7.84	0.8	2.36
N	10.625	7.84	0.8	1.985
O	10.575	7.84	0.8	1.935
P	10.875	8.67	0.8	1.405
Q	11.125	8.41	0.8	1.915
I	11.775	9.62	0.8	1.355
I.1	12.035	9.62	0.8	1.615
I.2	12.25	9.62	0.8	1.83
I.3	12.78	9.62	0.8	2.36



NOTES

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LEGEND

TRIAL PIT LOCATION shown thus ■ TP01

BOREHOLE LOCATION shown thus ● BH01

DYNAMIC PROBE LOCATION shown thus ● DP01

PROPOSED ROAD LEVEL shown thus A

PROPOSED FINISHED FLOOR LEVEL shown thus FFL:15.25m

Red Line Area:-
10,844 m² 1.084 Hectares

ITM Co-Ordinates of site:- 565696, 843573
Irish Grid Co-Ordinates: 165737, 343569

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OS Ireland Map No. 0848-C, 0848-D

P.01	Issued for COSTING	PC	EM	EM	17.08.23
Rev.	Modifications	By	Chkd	Aprvd	Date

Client: Sligo County Council
Comhairle Chontae Shligigh

Project: PROPOSED HOUSING DEVELOPMENT AT CARNEY, CO. SLIGO

Stage: PLANNING

Title: PROPOSED EXCAVATION TO FORMATION DEPTH PLAN

Scale: 1:400 @ A1

Surveyed	Drawn	Checked	Date
OSI	PC	XX	AUG '23

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Drawing No. 6972-JOD-XX-ZZ-DR-C-200-012
Revision P.01

APPENDIX II
TRIAL HOLES

IRISH DRILLING LIMITED

LOUGHREA, CO. GALWAY, IRELAND



CONTRACT DRILLING
SITE INVESTIGATION

Phone: (091) 841 274
Fax: (091) 847 687

email: info@irishdrilling.ie

PROPOSED HOUSING DEVELOPMENT AT CARNEY, CO. SLIGO

DRAFT

SITE INVESTIGATION REPORT

Sligo County Council,
County Hall,
Riverside,
Sligo.

Jennings O' Donovan,
Consulting Engineers,
Finisklin,
Sligo.

	Prepared by	Approved by	Rev. Issue Date:	Revision No.
	Ronan Killeen	Declan Joyce	13 th July 2023	23_SO_102/01
<u>Signature</u>				

FOREWORD

The borehole, probe and trial pit sample records have been compiled from an examination of the samples by a Geotechnical Engineer and from the Drillers' descriptions. The fieldwork was carried out in accordance with IS EN 1997-2 and BS5930, 2015 Code of Practice for Site Investigations with precedence given to IS EN 1997-2 where applicable.

The report presents an opinion on the configuration of the strata within the site based on the borehole and trial pit sample results. The assumptions, though reasonable, are given for guidance only and no liability can be accepted for changes in conditions not revealed by the boreholes and trial pits.

Contents:

1.0	Introduction
2.0	The Site & Geology
3.0	Fieldwork
4.0	Laboratory Testing
5.0	Ground Conditions
5.1	Groundwater
6.0	Geotechnical Review
6.0.1	Foundations
6.0.2	Access Road and Pavements
6.0.3	Chemical tests
7.0	Excavations
8.0	Stability of Cuttings / Embankments
Appendix 1	Borehole Records (Cable Percussive)
Appendix 2	Trial Pit Records
Appendix 3	Dynamic Probe Records
Appendix 4	Groundwater Readings
Appendix 5a	Plate Bearing Test Results
Appendix 5b	Soil Infiltration Tests
Appendix 6	Laboratory Test Results
Appendix 7	Photographs (Trial Pits)
Appendix 8	'As Built' Drawing
Appendix 9	AGS Data

1.0 Introduction.

Irish Drilling Ltd. (IDL) was instructed by Jennings O' Donovan Consulting Engineers, on behalf of Donegal County Council, to carry out a site investigation at the site of a proposed Housing Development.

This site investigation was carried out to provide detailed geotechnical information of the underlying ground conditions at the proposed development.

The fieldwork commenced on April 20th 2023 and was completed on May 29th 2023.

2.0 The Site & Geology

The site is located at Carney, County Sligo.

The site is agricultural in nature and the fieldwork was carried out predominantly on farmlands. An archaeological survey of the site was carried out prior to commencement of the geotechnical investigation.

A Site Plan, prepared by the client's representatives and showing approximate 'As-Built' fieldwork locations, is included with this report.

The following were the main published information sources used:
Geological Map of Ireland: 1:500,000 scale map series.

Site investigation data is available as point source data along the proposed route, and the majority of the ground in between the points can only be assumed to follow the characteristics of the nearest available data.

Overview of Subsoil Geology

Peat:

The deposition of peat occurred in post-glacial periods and is generally associated with the start of warmer and wetter climatic conditions. Peat is an unconsolidated usually dark brown to black organic material comprising a mixture of decomposed and undecomposed plant matter that accumulated in an acidic waterlogged environment. Peat has an extremely high-water content generally averaging over 90% by volume.

Glacial Till:

Glacial Till is what was often referred to as Boulder Clay. It is a diverse material that is largely deposited sub-glacially and has a wide range of characteristics due to the variety of parent materials and different processes of deposition. Tills are tightly packed, unsorted, heterogeneous, unbedded, and can have a wide range of particle sizes and types, which are often but not exclusively angular or sub-angular.

The type of parent material plays a critical role in providing the particles that create different subsoil permeability with sandstones giving rise to a high proportion of sand sized grains in the till matrix.

Solid Geology

The Geological Map of Ireland: (GSI 1:100,000 scale map series) indicate that the site is underlain by the Carboniferous Limestone Formation.

Ground conditions encountered during the completion of the fieldwork were typical and as expected for this region and predominantly consisted of Glacial Tills.

The Glacial Tills in general consisted of slightly gravelly sandy silt/clay with cobbles and boulders and/or silty sands and/or gravels with cobbles and boulders.

3.0 Fieldwork.

The following plant was mobilised to site to carry out fieldwork operations:

- 1nr. Hitachi 130 Tracked Excavator.
- 1nr. Geotool DPH Rig.
- 1nr. Dando 2000 Cable Percussive Boring Rig.

Fieldwork carried out to date has included the following:

Six cable percussion (Shell & Auger) boreholes were completed using a Dando 2000 Cable Percussive Boring Rig. The boreholes were bored to 'refusal' or to depths as instructed by the client's representatives.

The borehole depths ranged from 1.40m to 5.00m below ground level.

In-Situ testing consisting of Standard Penetration Tests were carried out at regular intervals (predominantly 1.0m intervals) or as instructed by the client's representatives.

Disturbed bulk and jar soil samples were taken at each change in strata and at a maximum of 1.50m intervals.

A 50mm diameter standpipe was installed in the following borehole locations to allow for monitoring of groundwater levels over a prolonged period of time: BH 04.

A summary of water readings recorded during the fieldwork period is included with this report as Appendix 4.

Six trial pits were excavated on site using a tracked excavator.

The pits were logged and photographed by an Engineer with observations made on ground conditions, pit stability, water ingress and services encountered.

Small and bulk disturbed soil samples were recovered at each change in strata and returned to the laboratory and presented for testing.

In-Situ tests consisting of Plate Bearing Tests were also carried out at five trial pit locations and the records of these tests are included in Appendix 5a.

Four Soil Infiltration Tests were carried out at trial pit locations TP 01, 03, 05 and 06 and in accordance with BRE Digest 365 and the records of same are included as Appendix 5b.

Eleven dynamic probes (Dynamic Probe Heavy, DPH) were carried out to 'refusal' using a LMSR-V(k) Geotool Dynamic Probing Rig.

The dynamic probe was carried out to depths ranging from 0.80m to 2.90m below ground level.

The Dynamic Probing Rig involves the dropping of a 50 kg hammer onto rods from a standard height (500mm) and recording the number of blows it takes to penetrate the rods (with a cone tip) to depth of 100mm increments into the soil.

The dynamic probe engineering logs then graph the number of blow counts required to penetrate each 100mm incremental depth. The probe is considered to have encountered 'refusal' when a blow count of 25 does not achieve the full 100mm incremental depth.

The records of the dynamic probe tests are included with this report in Appendix 3.

Environmental soil samples were taken at the following fieldwork locations and presented to the specialist laboratory for environmental testing: TP 01 to TP 06.

Waste classification testing was carried out on the samples and the records of same are included with appendix 6.

The borehole, probe and trial pit locations were set out on site using a Trimble CU Bluetooth GPS Surveying Unit and the co-ordinates are included on the logs presented in the appendices.

All fieldwork co-ordinates are reported to Irish Transverse Mercator (ITM) with Reduced Levels recorded relative to Malin Head Datum and with an accuracy level of + or – 0.10m.

The fieldwork was carried out in accordance with IS EN 1997-2 and BS5930, 2015 Code of Practice for Site Investigations with precedence given to IS EN 1997-2 where applicable.

4.0 Laboratory Testing

Representative samples recovered from the boreholes and trial pit locations were scheduled for testing in the laboratory.

The test schedules were prepared by the Client's Engineer and included some or all of the following tests on disturbed and undisturbed soil samples:

- * Natural Moisture Content.
- * Atterberg Limits.
- * Particle Size Distribution.
- * Triaxial (Quick Undrained)

Groundwater samples were recovered from the standpipe installed at BH 04, on July 11th 2023. The test schedule also included the following tests on groundwater samples recovered from BH 04:

- Ph
- Sulphate Content
- Conductivity
- Sodium
- Potassium
- Calcium
- Chloride
- Alkanity
- Iron
- Manganese
- BTEX

The test schedules were carried out predominantly at the IDL Laboratory located at Loughrea, County Galway.

A number of specialist tests not available at the IDL laboratory were carried out by designated laboratories on a subcontract basis as follows:

Laboratory chemical and environmental tests were carried out by Alcontrol Laboratories, UK.

Soil samples in general were recovered from the completion of cable percussive boreholes and trial pits. The records of soil laboratory test results carried out on same are reported in Appendix 6.

The soil and rock descriptions as noted on the borehole and trial pit logs are in general visual descriptions as observed and logged by our Engineers and are described in accordance with IS EN 1997-2 and BS5930, 2015 Code of Practice for Site Investigations.

Soils descriptions (cohesive or otherwise) are also initially assessed based on the texture and 'feel' of the soil materials as witnessed by our Geotechnical Engineers and in accordance with IS EN 1997-2 and BS5930.

Where laboratory classification tests have been carried out on soil samples then these visual descriptions have been amended accordingly to take into account the results of these classification tests.

The records of all fieldwork, laboratory test results and photographs are included in the appendices of this Report.

5.0 Ground Conditions

Ground conditions encountered during the completion of the fieldwork generally consisted of soft organic peaty silt/clay overlying glacial tills.

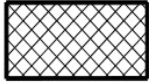
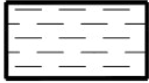





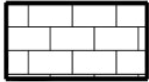

The Glacial Tills in general consisted of slightly gravelly sandy silt/clay with cobbles and boulders and/or silty sands and/or gravels with cobbles and boulders.

The dynamic probes also confirmed the extent of the soft to very soft soils with the following table summarising their depths:

<u>Probe Location:</u>	<u>Depth of Soft to Very Soft Soils (bgl):</u>
DP 01	G.L. to 0.60m
DP 02	G.L. to 0.90m
DP 03	G.L. to 1.40m
DP 04	G.L. to 1.40m
DP 05	G.L. to 1.70m
DP 06	G.L. to 1.60m
DP 07	G.L. to 1.40m
DP 08	G.L. to 0.90m
DP 09	G.L. to 0.80m
DP 10	G.L. to 0.60m
DP 11	G.L. to 1.10m

The following Key Legend Table details the symbology used on the engineering logs to describe ground conditions encountered:

Legend:

	Made ground=mg		Clay=cl
	Boulders and cobbles=b/c		Peat=p
	Gravel=g		Silty sand=s/si
	Sand=s		Rock=r
	Silt=si		

For detailed descriptions of the overburden encountered please refer to the engineering logs presented as Appendix 1 and Appendix 2.

5.1 Groundwater

Groundwater was not recorded in the borehole during fieldwork operations.

Groundwater was encountered in the following trial pits during excavations on April 20th 2023:

Borehole	Depth Below Ground Level (m)
TP 03	0.60m
TP 04	2.90m
TP 05	3.10m
TP 06	2.60m

Groundwater inflows may occur in many areas during the completion of excavations and the rate of inflow will vary with the permeabilities of the soils and rock.

The following table summarises typical permeability values:

Coefficient of Permeability (m/sec)

SOILS	
Gravel	$1 - 10^{-1}$
<i>Clean sands and sand-gravel mixtures</i>	$10^{-1} - 10^{-4}$
<i>Very fine sands, silts and silt/clay laminates</i>	$10^{-4} - 10^{-7}$
<i>Unfissured clays and silt/clay (>20% clay)</i>	$10^{-7} - 10^{-10}$
<i>Dessicated and fissured clays</i>	$10^{-1} - 10^{-7}$
ROCK	
<i>Heavily fractured rock</i>	$1 - 10^{-1}$
<i>Open-jointed rock</i>	$10^{-1} - 10^{-3}$
<i>Jointed rock</i>	$10^{-3} - 10^{-6}$

It should be noted that where cavities are encountered that local permeabilities are likely to be higher than those quoted above.

6.0 Geotechnical Review

6.0.1 Foundations

Due to the presence of very soft and soft soils frequently to depths of up to about 1.70m below ground level deep pad or strip foundations could be considered.

The following allowable bearing pressures may be adopted:

Location	Depth	Allowable Bearing Pressure
BH 01	1.10m	200kN/m ²
BH 02	2.00m	250kN/m ²
	3.00m	300kN/m ²
BH 03	1.20m	75kN/m ²
	2.00m	200kN/m ²
BH 04	2.00m	200kN/m ²
	2.70m	250kN/m ²
BH 05	2.00m	150kN/m ²
	3.00m	200kN/m ²
BH 06	1.00m	120kN/m ²
	2.00m	200kN/m ²
	3.00m	300kN/m ²

Dynamic probe records indicate very soft ground conditions predominantly up to 2.00m depth throughout the site (DP 1 to DP 20). Blow counts of 0, 1 and 2 indicate very soft ground conditions and for detailed records of the dynamic probes completed please refer to Appendix 4.

Buoyancy forces may be counteracted by using a thickened slab or by using tension piles socketed into the bedrock.

While the water table was encountered above the depths of the recommended pad or strip foundations, as described above, it would be prudent to allow the self-weight of foundations to

exceed buoyancy forces – bearing in mind that the water table may be at ground level at times of flooding or excessive rainfall.

Pad or strip foundations may be designed bearing on ‘sound’ strong to very strong bedrock using an allowable bearing pressure of 600kN/m².

Consideration could also be given to using piled foundations.

The length of pile will depend on the pile type and diameter, the design loads and the strength of the soils and rock.

Driven piles could be considered provided that the noise and vibration levels are within acceptable limits.

Obstructions in the form of boulders are likely to be encountered and it may be necessary to remove these obstructions.

If bored piles are used, difficulties may arise, particularly in the form of ‘boiling’ of the saturated granular deposits when boring below the water table.

If the overburden soils are unable to provide enough friction and end bearing for the proposed design loads it may be necessary to continue the piles down to bedrock.

The advice of specialist piling contractors should be sought with regard to the pile design and feasibility of their type of pile.

Any loose or soft pockets of overburden should be removed and replaced with compacted hardcore fill or ‘lean-mix’ concrete.

The following parameters are recommended for retaining structures (lateral earth pressures)

Strata	Unit Wt. saturated/dry kN/m ³	Cohesion (undrained) kPa	Angle of internal friction φ degrees
Fill	22/20	0	20
Loose Sand and Gravel	20/16	0	28
Dense Sand and Gravel	21/17	0	35
Soft slightly organic clay	16/10	20	0
Firm sandy clay	17/12	40	0
Firm to stiff glacial till	20/17	75	0
Stiff glacial till	20/17	100	0
Very stiff glacial till	20/17	200	0
Rock	23/23	1,000	30

6.0.2 Access Road and Pavements

In-Situ Plate Bearing Tests carried out at a number of trial pit locations indicate approximate CBR values as follows (refer to Appendix 5):

Trial Pit:	Depth below Ground Level (m)	CBR Value (%)
TP 02	0.50	0.9
TP 03	0.80	0.3
TP 04	0.60	0.3
TP 05	0.80	0.5
TP 06	0.80	0.9

Where soft or loose ground conditions are encountered and in particular where CBR values of less than 2% are encountered it would be prudent to place a geotextile such as Terram on the

subsoil and also possibly a geogrid to provide additional reinforcement and to reduce the amount of imported fill and minimise differential settlement under applied loads.

Pavements on broken rock or on rockhead may be designed using a CBR of 15%.

6.0.3 Chemical tests

The results of chemical tests indicate that most of the samples are in the DS-1 Category with regard to protection of concrete from chemical attack.

Protection to iron or alloy pipes may be required and it would be advisable to consult with the suppliers of pipes and other ducting to determine if the pH values encountered are acceptable and if protection or coating of the pipes is necessary.

7.0 Excavations

In the interest of safety, personnel should not be allowed enter unsupported excavations deeper than 1.0m.

Excavations are likely to be unstable and some form of side supports are likely to be required to maintain stable excavations.

Excavations in the overburden are also likely to be difficult with boulders and cobbles expected and the use of a heavy hydraulic breaker may be required to remove boulders particularly when working within the confines of a narrow trench.

The walls of excavations of depth in excess of 1 m (with the exception of excavations in compact rock) may be secured by means of:

- Producing the excavation with inclined (escarpment) walls
- Installation of shoring, sheeting or bracing to the vertical walls to prevent movement that could cause damage to adjacent services, pavements and structures

Furthermore, the following requirements are recommended:

- Where possible at the crest of excavations, rainwater should be directed away from the excavation.
- The escarpments should be checked after every rainfall and after a long break in work, as well as every time before starting work.
- Safe distances must be maintained between the excavations and existing buildings.
- The state of the lining or the escarpments must be inspected each time before works start in the excavation.

The use of sumps and pumping is highly likely to be required to deal with groundwater inflows.

8.0 Stability of cuttings/embankments

The construction of large embankments or stockpiling of excavated materials raises problems of stability if the induced stresses increase to levels approaching the in-situ shear strengths of the soil foundation. Checks on bearing capacity, slope stability and displacement are necessary. If embankments are built over soft soil the soil may be 'squeezed out' under the loads.

Ronan Killeen
Declan Joyce
Chartered Engineers
Irish Drilling Limited
July 13th 2023

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- (1) B.S.5930:(2015), Code of Practice for Site Investigation.
- (2) B.S.1377:(1990), Methods of Test for Soils for Civil Engineering Purposes.
- (3) B.S.8004:(1986), Foundations.
- (4) Terzaghi, K. and Peck, R.B (1967) Soil Mechanics in Engineering Practice, 2nd ed., John Wiley, New York
- (5) Tomlinson M.J. (1980) Foundation Design and Construction, 4th ed., Pitman, London.
- (6) Kauzenkamp, K.W., Roels, J.M. and Hoppener, C. (1993), Assessment of soil contamination: General criteria and site specific modifications. In contaminated soil '93. Fourth Int. TNO /KfK Conference on Contaminated Soil. F Arendt, G.J. Annokkee, R. Bosman and W.J. van den Brink (eds.). Kluwer Academic Publishers.
- (7) BRE Special Digest (1:2005) Concrete in aggressive ground.
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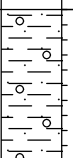



Appendix 01 Borehole Records (Cable Percussive)



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BOREHOLE LOG

Project Proposed Housing Development				Location Carney, Co Sligo		BOREHOLE No BH-01
Job No 2023SO102	Date 28-05-23 28-05-23	Ground Level (m OD) 13.48	Co-Ordinates () E 565,705.0 N 843,659.1			
Engineer Jennings O'Donovan			GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at:
						Sheet 1 of 1 Status DRAFT

SAMPLES & TESTS			Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.50-1.00	B1				(1.10)	Firm greyish brown sandy gravelly CLAY.		
1.10	SPT	50 for 10 mm (25, 50)	12.38		1.10	Obstruction as possible mudstone rock.		
1.40	SPT	50 for 10 mm (25, 50)	12.08		1.40	BH terminated at 1.40m bgl. Refusal.		
1.40	D3							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
28-05-23	13.00	1.40	1.10	203		1.1	1.4	1:00			BH backfilled.

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used	Dando 2000		Driller JP	Logged By JP
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IDL AGS4 UK BH CARNEY HOUSING CP FILE 1 JUNE 8 2023 GPJ ID GINT AGS 4.0. 4.GDT 14/7/23



BOREHOLE LOG

Project Proposed Housing Development			Location Carney, Co Sligo			BOREHOLE No BH-02
Job No 2023SO102	Date 28-05-23 28-05-23	Ground Level (m OD) 11.62	Co-Ordinates () E 565,698.8 N 843,581.8			
Engineer Jennings O'Donovan			GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at:
						Sheet 1 of 1 Status DRAFT

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.50-1.00	B1				(1.10)	Firm brown silty CLAY.	
1.20	SPT	N = 7 (1, 1, 1, 2, 2, 2)	10.52		1.10	Soft brown silty gravelly CLAY.	
1.20-1.70	B3				(1.40)		
2.00	SPT	N = 46 (4, 5, 9, 11, 12, 14)			2.50	2.00m: becoming stiff.	
2.70	D5		9.12		(0.50)	Obstruction as black granite.	
3.00	SPT	50 for 10 mm (25, 50)	8.62		3.00	BH terminated at 3.00m bgl. Refusal.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
28-05-23	17.30	3.00	3.00	203		2.5	3	1:00			BH backfilled.

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used	Dando 2000	Driller JP	Logged By JP
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IDL AGS4 UK BH CARNEY HOUSING GP FILE 1 JUNE 8 2023 GPJ ID GINT AGS 4.0. 4.GDT 14/7/23



Irish drilling LTD

BOREHOLE LOG

Project Proposed Housing Development			Location Carney, Co Sligo		BOREHOLE No BH-03
Job No 2023SO102	Date 27-05-23 27-05-23	Ground Level (m OD) 10.67	Co-Ordinates () E 565,710.0 N 843,537.8		
Engineer Jennings O'Donovan			GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:
					Sheet 1 of 1 Status DRAFT

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.40-0.80	B1			(2.00)		Firm brown silty gravelly CLAY.	Instrument/ Backfill
1.20	SPT	N = 10 (1, 2, 2, 2, 3, 3)		(2.00)			
1.20-1.30	B3						
2.00	SPT	50 for 83 mm (20, 5, 38, 12)	8.67		2.00		
2.20	SPT	50 for 50 mm (25, 50)	8.47	(2.20)	2.20	Obstruction as black granite.	
						BH terminated at 2.20m bgl. Refusal.	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
27-05-23	13.00	2.20	2.00	203		2	2.2	1:00			BH backfilled.

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used	Dando 2000	Driller JP	Logged By JP
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IDL AGS4 UK BH CARNEY HOUSING GP FILE 1 JUNE 8 2023 GPJ ID GINT AGS 4.0. 4.GDT 14/7/23



BOREHOLE LOG

Project Proposed Housing Development				Location Carney, Co Sligo		BOREHOLE No BH-04			
Job No 2023SO102		Date 29-05-23 29-05-23		Ground Level (m OD) 10.55				Co-Ordinates () E 565,762.5 N 843,550.4	
Engineer Jennings O'Donovan				GROUNDWATER STRIKES		Water strikes: Rose to (@ 20 min.): Sealed at: 1st: dry 2nd: 3rd:		Sheet 1 of 1 Status DRAFT	

SAMPLES & TESTS			Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.50-1.00	B1			x			Firm brown silty gravelly CLAY.	
1.20	SPT	N = 8 (1, 1, 2, 2, 2, 2)		x	(2.70)			
1.20-1.70	B3			x			2.00m: becoming very stiff.	
2.00	SPT	N = 32 (3, 5, 7, 7, 8, 10)		x				
2.00-2.50	B5			x			Obstruction as black granite. BH terminated at 2.80m bgl. Refusal.	
2.70-2.80	B6		7.85	x	2.70			
2.80	SPT	50 for 5 mm (25, 50)	7.75	x	2.80			

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Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
29-05-23	10.00	2.80	2.80	203		2.7	2.8	1:00			50mm standpipe installed.

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used	Dando 2000		Driller JP	Logged By JP
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BOREHOLE LOG

Project Proposed Housing Development				Location Carney, Co Sligo		BOREHOLE No BH-05
Job No 2023SO102	Date 27-05-23 27-05-23	Ground Level (m OD) 10.30	Co-Ordinates () E 565,830.4 N 843,583.1			
Engineer Jennings O'Donovan			GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at:
						Sheet 1 of 1 Status DRAFT

SAMPLES & TESTS			Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.50-1.00	B1					Soft brown sandy gravelly CLAY.		
1.20	SPT	N = 4 (1, 1, 1, 1, 1, 1)						
1.20-1.70	B3							
2.00	SPT	N = 17 (2, 2, 3, 3, 4, 7)			(4.00)	2.00m; becoming stiff.		
2.00-2.50	B5							
2.80	D6							
3.00	SPT	N = 28 (3, 4, 4, 7, 7, 10)						
3.00-3.50	B8							
4.00	SPT	47 for 155 mm (18, 7, 20, 25, 2)	6.30		4.00	Firm dark brown sandy gravelly CLAY with cobbles.		
4.00-4.50	B10				(0.50)			
4.50	SPT	50 for 10 mm (25, 50)	5.80		4.50	BH terminated at 4.50m bgl. Refusal.		

IDL AGS4 UK BH CARNEY HOUSING GP FILE 1 JUNE 8 2023 GPJ ID GINT AGS 4.0 4.GDT 14/7/23

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
27-05-23	17.30	4.50	4.50	203		4	4.5	1:00			BH backfilled.

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used	Dando 2000	Driller JP	Logged By JP
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Irish drilling LTD

BOREHOLE LOG

Project Proposed Housing Development				Location Carney, Co Sligo		BOREHOLE No BH-06
Job No 2023SO102	Date 26-05-23 26-05-23	Ground Level (m OD) 10.67	Co-Ordinates () E 565,880.3 N 843,607.6			
Engineer Jennings O'Donovan			GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at:
						Sheet 1 of 1 Status DRAFT

SAMPLES & TESTS			Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.40-0.80	B1		9.77		0.90	Firm brown silty peaty CLAY.		
1.20 1.20-1.70	SPT B3	N = 17 (1, 0, 1, 4, 5, 7)			1.60	Medium dense sandy clayey GRAVEL.		
2.00 2.00-2.50 2.50-3.00	SPT B5 B6	N = 32 (4, 5, 7, 7, 9, 9)	8.17		2.50	2.00m: becoming dense.		
3.00 3.00-3.50	SPT B8	N = 42 (5, 7, 9, 9, 12, 12)			2.50	3.00m: becoming very stiff.		
3.80 4.00 4.00-4.50	D9 SPT B11	50 for 175 mm (18, 7, 19, 20, 11)			5.00			
5.00	SPT	50 for 15 mm (25, 50)	5.67		5.00	BH terminated at 5.00m bgl. Refusal.		

IDL AGS4 UK BH CARNEY HOUSING GP FILE 1 JUNE 8 2023 GP J ID GINT AGS 4.0 4.GDT 14/7/23

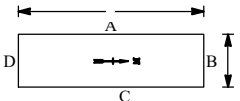
Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
26-05-23	17.30	5.00	5.00	203		4.5	5	1:00			BH backfilled.

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used Dando 2000	Driller JP	Logged By JP
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Appendix 02 Trial Pit Records

PROJECT: Proposed Carney Housing Development
LOCATION: Carney, Co Sligo
CLIENT: Sligo County Council
ENGINEER: Jennings O'Donovan
Co-ordinates: E 565,702.1 N 843,646.2
TRIALPIT: TP-01
Sheet 1 of 1
Rig: Hitachi 130
Rev: 1
Ground level: 13.03m O.D.
DATE: 20.4.23

GROUNDWATER
Water strikes: 1st: dry 2nd: 3rd:
Rose to after:
PIT DIRECTION: 0°
PIT DIMENSION: 3.00m * 1.00
LOGGED BY: DOR

Shoring/Support: N/A
Stability: Pit stable.

Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0						x x x x			Soft dark brown peaty SILT with roots.	
			S 1 S 2 S 3 S 4 B 5	0.50-1.00 0.50-1.00 0.50-1.00 0.50-1.00 0.50-1.00		x x x x x x x x x x x x x x x x x x x x	12.53	0.50	Firm to stiff brown gravelly SILT with occasional cobbles and occasional boulders. Cobbles are angular to subangular of limestone. Boulders are angular to subangular of limestone.	
1						END	11.93	1.10	TP terminated at 1.10m bgl. Obstruction as probable rock.	
2										
3										
4										
5										
6										
7										
8										
9										
10										

Remarks: Soil infiltration test expedited in TP. TP dry on excavation. TP backfilled with arisings.
Scale: 1:50

TRIALPIT_CARNEY HOUSING TPS FILE 1 REV1 JULY 7 2023.GPJ ID GINT AGS 4_0_4.GDT 14/7/23

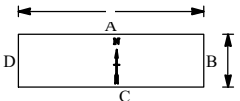
PROJECT: Proposed Carney Housing Development
LOCATION: Carney, Co Sligo
CLIENT: Sligo County Council
ENGINEER: Jennings O'Donovan

Co-ordinates:
 E 565,692.8 N 843,578.0

TRIALPIT: TP-02
Sheet 1 of 1
Rig: Hitachi 130
Rev: 1

Ground level: 11.77m O.D.
GROUNDWATER
 Water strikes: Rose to after:
 1st: dry
 2nd:
 3rd:

PIT DIRECTION: 90°
PIT DIMENSION: 3.00m * 1.00
LOGGED BY: DOR



Shoring/Support: N/A
 Stability: Pit stable.

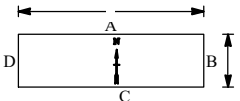
Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0									Firm brown gravelly organic SILT with occasional cobbles. Cobbles are subangular to subrounded of limestone.	
0.50			DATE	0.50					0.60m: becoming stiff.	
0.50-1.00			S 1	0.50-1.00			10.97	0.80	Firm brown gravelly SILT with occasional cobbles and occasional boulders. Cobbles are angular to subangular of limestone. Boulders are angular to subangular of limestone.	
0.50-1.00			S 2	0.50-1.00						
0.50-1.00			S 3	0.50-1.00						
0.50-1.00			S 4	0.50-1.00						
1.00-1.50			S 5	1.00-1.50						
1.00-1.50			S 6	1.00-1.50			10.17	1.60		
						END			TP terminated at 1.60m bgl. Obstruction as possible rock.	
2										
3										
4										
5										
6										
7										
8										
9										
10										

Remarks: TP dry on excavation. TP backfilled with arisings.

Scale: 1:50

TRIALPIT CARNEY HOUSING TPS FILE 1 REV1 JULY 7 2023.GPJ ID GINT AGS 4 0 4.GDT 14/7/23

PROJECT: Proposed Carney Housing Development		TRIALPIT: TP-03
LOCATION: Carney, Co Sligo		Sheet 1 of 1
CLIENT: Sligo County Council	Co-ordinates: E 565,719.0 N 843,530.5	Rig: Hitachi 130
ENGINEER: Jennings O'Donovan		Rev: 1
Ground level: 10.45m O.D.		DATE: 20.4.23

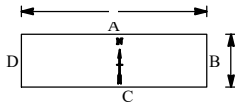
GROUNDWATER Water strikes: Rose to after: 1st: dry 2nd: 3rd:	PIT DIRECTION: 90° PIT DIMENSION: 3.00m * 1.00 LOGGED BY: DOR	 <p>Shoring/Support: N/A Stability: Pit unstable.</p>
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Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0									Soft dark blackish brown peaty SILT with roots.	
0.50-1.00		↓	S 1	0.50-1.00		x x x x	9.95	0.50	Soft brown organic gravelly SILT with occasional cobbles. Cobbles are subangular to subrounded of limestone.	[Pattern]
0.50-1.00			S 2	0.50-1.00		x x x x				
0.50-1.00			S 3	0.50-1.00		x x x x				
0.50-1.00			S 4	0.50-1.00		x x x x	9.35	1.10		
1.50-2.00			PLATE	0.80					Soft brown very gravelly SILT with frequent cobbles and frequent boulders. Cobbles are subangular to subrounded of limestone. Boulders are subangular to subrounded of limestone.	[Pattern]
1.50-2.00			D 5	1.50-2.00		x x x x				
1.50-2.00			D 6	1.50-2.00		x x x x				
2.00								2.00m: becoming firm.		
2.60							7.85	2.60		
3						END			TP terminated at 2.60m bgl. Obstruction as possible rock.	
4										
5										
6										
7										
8										
9										
10										

Remarks: Soil infiltration test expedited in TP. Moderate ingress of water at 0.60m bgl. TP backfilled with arisings.	Scale: 1:50
--	------------------------------

PROJECT: Proposed Carney Housing Development		TRIALPIT: TP-04
LOCATION: Carney, Co Sligo		Sheet 1 of 1
CLIENT: Sligo County Council	Co-ordinates: E 565,774.8 N 843,555.0	Rig: Hitachi 130
ENGINEER: Jennings O'Donovan		Rev: 1

Ground level: 10.48m O.D.	DATE: 20.4.23
GROUNDWATER Water strikes: Rose to after: 1st: dry 2nd: 3rd:	PIT DIRECTION: 90° PIT DIMENSION: 3.00m * 1.00 LOGGED BY: DOR



Shoring/Support: N/A
Stability: Pit stable.

Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							10.18	0.30	Soft dark brown gravelly SILT with roots.	
1			S 1 S 2 S 3 S 4 PLATE	0.50-1.00 0.50-1.00 0.50-1.00 0.50-1.00 0.60			9.48	1.00	Soft brown slightly gravelly organic SILT with rare cobbles. Cobbles are subangular to subrounded of limestone.	
2			5 6	2.00-2.50 2.00-2.50					Soft brown gravelly sandy SILT with occasional cobbles and rare boulders. Cobbles are subangular to subrounded of limestone. Boulders are subangular to subrounded of limestone. 2.20m: becoming firm.	
3			7 8	3.50-4.00 3.50-4.00			7.48	3.00	Very stiff grey gravelly SILT with occasional cobbles and occasional boulders. Cobbles are subangular to subrounded of limestone. Boulders are subangular to subrounded of limestone.	
4							5.98	4.50		
5						END			TP terminated at 4.50m bgl - maximum reach of excavator.	
6										
7										
8										
9										
10										

Remarks: Moderate ingress of water at 2.90m bgl. TP backfilled with arisings.	Scale: 1:50
--	-----------------------

PROJECT: Proposed Carney Housing Development
LOCATION: Carney, Co Sligo
CLIENT: Sligo County Council
ENGINEER: Jennings O'Donovan

Co-ordinates:
E 565,835.7 N 843,578.0

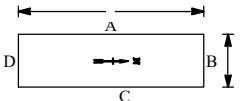
TRIALPIT: TP-05
Sheet 1 of 1
Rig: Hitachi 130
Rev: 1

Ground level: 10.06m O.D.
DATE: 20.4.23

GROUNDWATER
Water strikes: Rose to after:
1st: dry
2nd:
3rd:

PIT DIRECTION: 0°
PIT DIMENSION: 3.00m * 1.00
LOGGED BY: DOR

Shoring/Support: N/A
 Stability: Pit unstable. Sidewall collapse.



Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0						x x x x	9.66	0.40	Very soft dark brown peaty SILT with roots.	
1			ATE S 1 S 2 S 3 B 4	0.80 0.80-1.20 0.80-1.20 0.80-1.20 0.80-1.20		x x x x x x x x x x x x x x x x	8.86	1.20	Soft light brown organic gravelly SILT with occasional cobbles. Cobbles are subangular to subrounded of limestone. 1.10m: becoming firm.	
2			B 5	2.00-2.50		x x x x x x x x x x x x x x x x			Firm brown slightly sandy very gravelly SILT with frequent cobbles and frequent boulders. Cobbles are subangular to subrounded of limestone. Boulders are subangular to subrounded of limestone.	
3		↓	D 6 B 7	3.20-3.70 3.20-3.70		x x x x x x x x x x x x x x x x	7.06	3.00	Stiff grey gravelly SILT with occasional cobbles and occasional boulders. Cobbles are subangular to subrounded of limestone. Boulders are subangular to subrounded of limestone. 3.30m: becoming very stiff.	
4						END	6.36	3.70	TP terminated at 3.70m bgl. Unable to progress TP - sidewall collapse.	
5										
6										
7										
8										
9										
10										

Remarks: Soil infiltration test expedited in TP. Rapid ingress of water at 3.10m bgl. TP backfilled with arisings.

Scale:
1:50

PROJECT: Proposed Carney Housing Development
LOCATION: Carney, Co Sligo
CLIENT: Sligo County Council
ENGINEER: Jennings O'Donovan

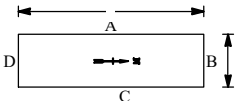
Co-ordinates:
 E 565,915.2 N 843,618.5

TRIALPIT: TP-06
Sheet 1 of 1
Rig: Hitachi 130
Rev: 1

Ground level: 10.89m O.D.
GROUNDWATER
 Water strikes: Rose to after:
 1st: dry
 2nd:
 3rd:

PIT DIRECTION: 0°
PIT DIMENSION: 3.00m * 1.00
LOGGED BY: DOR

Shoring/Support: N/A
 Stability: Pit slightly unstable.



Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							10.69	0.20	Soft dark brown SILT with roots.	
			S 1 S 2 S 3 S 4 S 5	0.50-1.00 0.50-1.00 0.50-1.00 0.50-1.00 1.00-1.50			10.09	0.80	Firm brown organic gravelly SILT with occasional cobbles. Cobbles are subrounded to subangular of limestone.	
1									Firm brown slightly sandy very gravelly SILT with frequent cobbles and frequent boulders. Cobbles are subangular to subrounded of limestone. Boulders are subangular to subrounded of limestone.	
2			B 6	2.00-2.50						
3							8.19	2.70	Stiff grey gravelly SILT with occasional cobbles and occasional boulders. Cobbles are subangular to subrounded of limestone. Boulders are subangular to subrounded of limestone.	
4			B 7 B 8	3.50-4.00 3.50-4.00					3.60m: becoming very stiff.	
							6.39	4.50		
						END			TP terminated at 4.50m bgl - maximum reach of excavator.	
5										
6										
7										
8										
9										
10										

Remarks: Soil infiltration test expedited in TP. Moderate ingress of water at 2.60m bgl. TP backfilled with arisings.

Scale: 1:50



Appendix 03

Dynamic Probe Records



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DYNAMIC PROBE LOG

Project Proposed Housing Development			Location Carney, Co Sligo		PROBE No DP-01
Job No 2023SO102	Date 21-04-23 21-04-23	Ground Level (m OD) 14.92	Co-Ordinates () E 565,693.2 N 843,687.5		
Engineer Jennings O'Donovan				Sheet 1 of 1 Status FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	0								
1	0								
1	5								
1	4								
1	2								
1	1								
1	7								
1	2								
1	25								Refusal. 25 blows for 0mm.
2									
3									
4									
5									
6									
7									

Hammer Wt (kg)	50	GENERAL REMARKS DP terminated at 1.40m bgl.
Hammer Drop (mm)	500	
Cone Dia (mm)	40	
Cone Type	DPH	
Damper		

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used	DPH Rig	Driller SS	Logged By SS
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AGS4 DYNAMIC PROBE CARNEY HOUSING DPS FILE 1 FINAL JUNE 8 2023.GPJ ID GINT AGS 4.0.4.GDT 14/7/23



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DYNAMIC PROBE LOG

Project Proposed Housing Development			Location Carney, Co Sligo		PROBE No DP-02
Job No 2023SO102	Date 21-04-23 21-04-23	Ground Level (m OD) 12.06	Co-Ordinates () E 565,704.6 N 843,613.7		
Engineer Jennings O'Donovan				Sheet 1 of 1 Status FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	0								
1	0								
1	1								
1	1								
1	2								
1	25	Refusal. 25 blows for 0mm.							Refusal. 25 blows for 0mm.
2									
3									
4									
5									
6									
7									

Hammer Wt (kg)	50		GENERAL REMARKS DP terminated at 0.90m bgl.
Hammer Drop (mm)	500		
Cone Dia (mm)	40		
Cone Type	DPH		
Damper			

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used	DPH Rig	Driller SS	Logged By SS
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AGS4 DYNAMIC PROBE CARNEY HOUSING DPS FILE 1 FINAL - JUNE 8 2023.GPJ ID GINT AGS4_0_4.GDT 14/7/23



Irish drilling LTD

DYNAMIC PROBE LOG

Project Proposed Housing Development			Location Carney, Co Sligo		PROBE No DP-03
Job No 2023SO102	Date 21-04-23 21-04-23	Ground Level (m OD) 10.91	Co-Ordinates () E 565,698.5 N 843,548.3		
Engineer Jennings O'Donovan				Sheet 1 of 1 Status FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	0								
0	0								
1	1								
1	1								
1	2								
1	2								
1	4								
2	2								
2	3								
2	4								
2	4								
2	5								
2	8								
2	9								
2	25	Refusal. 25 blows for 0mm.							
3									
4									
5									
6									
7									

AGS4 DYNAMIC PROBE CARNEY HOUSING DPS FILE 1 FINAL - JUNE 8 2023.GPJ ID GINT AGS 4.0.4.GDT - 14/7/23

Hammer Wt (kg)	50	GENERAL REMARKS DP terminated at 2.50m bgl.
Hammer Drop (mm)	500	
Cone Dia (mm)	40	
Cone Type	DPH	
Damper		

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used DPH Rig	Driller SS	Logged By SS
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DYNAMIC PROBE LOG

Project Proposed Housing Development			Location Carney, Co Sligo		PROBE No DP-04
Job No 2023SO102	Date 21-04-23 21-04-23	Ground Level (m OD) 11.08	Co-Ordinates () E 565,693.0 N 843,508.3		
Engineer Jennings O'Donovan				Sheet 1 of 1 Status FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	1								
1	2								
2	3								
3	4								
4	5								
5	6								
6	7								
7	8								
8	9								
9	10								
10	11								
11	12								
12	13								
13	14								
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84	85								
85	86								
86	87								
87	88								
88	89								
89	90								
90	91								
91	92								
92	93								
93	94								
94	95								
95	96								
96	97								
97	98								
98	99								
99	100								

Refusal. 25 blows for 0mm.

Hammer Wt (kg)	50	GENERAL REMARKS DP terminated at 2.30m bgl.
Hammer Drop (mm)	500	
Cone Dia (mm)	40	
Cone Type	DPH	
Damper		

AGS4 DYNAMIC PROBE CARNEY HOUSING DPS FILE 1 FINAL JUNE 8 2023.GPJ ID GINT AGS 4.0.4.GDT 14/7/23

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used DPH Rig	Driller SS	Logged By SS
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DYNAMIC PROBE LOG

Project Proposed Housing Development			Location Carney, Co Sligo		PROBE No DP-05
Job No 2023SO102	Date 21-04-23 21-04-23	Ground Level (m OD) 11.01	Co-Ordinates () E 565,735.7 N 843,575.2		
Engineer Jennings O'Donovan				Sheet 1 of 1 Status FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	0								
0	0								
1	0								
1	3								
1	6								
1	1								
1	1								
1	2								
1	3								
1	4								
1	9								
2	25								Refusal. 25 blows for 0mm.
3									
4									
5									
6									
7									

AGS4 DYNAMIC PROBE CARNEY HOUSING DPS FILE 1 FINAL JUNE 8 2023.GPJ ID GINT AGS 4.0.4.GDT 14/7/23

Hammer Wt (kg)	50	GENERAL REMARKS DP terminated at 2.00m bgl.
Hammer Drop (mm)	500	
Cone Dia (mm)	40	
Cone Type	DPH	
Damper		

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used	DPH Rig	Driller SS	Logged By SS
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Irish drilling LTD

DYNAMIC PROBE LOG

Project Proposed Housing Development				Location Carney, Co Sligo		PROBE No DP-06
Job No 2023SO102	Date 21-04-23 21-04-23	Ground Level (m OD) 10.44	Co-Ordinates () E 565,745.3 N 843,539.2			
Engineer Jennings O'Donovan					Sheet 1 of 1 Status FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	0								
0	0								
1	0								
	1								
	2								
	6								
2	4								
	3								
	5								
	9								
	4								
	4								
	14								
	7								
	10								
	25								Refusal. 25 blows for 0mm.
3									
4									
5									
6									
7									

AGS4 DYNAMIC PROBE CARNEY HOUSING DPS FILE 1 FINAL - JUNE 8 2023.GPJ ID GINT AGS 4_0_4.GDT - 14/7/23

Hammer Wt (kg)	50		GENERAL REMARKS DP terminated at 2.60m bgl.
Hammer Drop (mm)	500		
Cone Dia (mm)	40		
Cone Type	DPH		
Damper			

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used	DPH Rig	Driller SS	Logged By SS
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Irish drilling LTD

DYNAMIC PROBE LOG

Project Proposed Housing Development			Location Carney, Co Sligo		PROBE No DP-07
Job No 2023SO102	Date 21-04-23 21-04-23	Ground Level (m OD) 10.48	Co-Ordinates () E 565,781.7 N 843,581.9		
Engineer Jennings O'Donovan				Sheet 1 of 1 Status FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	0								
1	1								
2	2								
3	3								
4	4								
5	5								
6	6								
7	7								
8	8								
9	9								
10	10								
11	11								
12	12								
13	13								
14	14								
15	15								
16	16								
17	17								
18	18								
19	19								
20	20								
21	21								
22	22								
23	23								
24	24								
25	25								
26	26								
27	27								
28	28								
29	29								
30	30								

Refusal. 25 blows for 0mm.

Hammer Wt (kg)	50	GENERAL REMARKS DP terminated at 2.90m bgl.
Hammer Drop (mm)	500	
Cone Dia (mm)	40	
Cone Type	DPH	
Damper		

AGS4 DYNAMIC PROBE CARNEY HOUSING DPS FILE 1 FINAL JUNE 8 2023.GPJ ID GINT AGS4_0_4.GDT_147/23

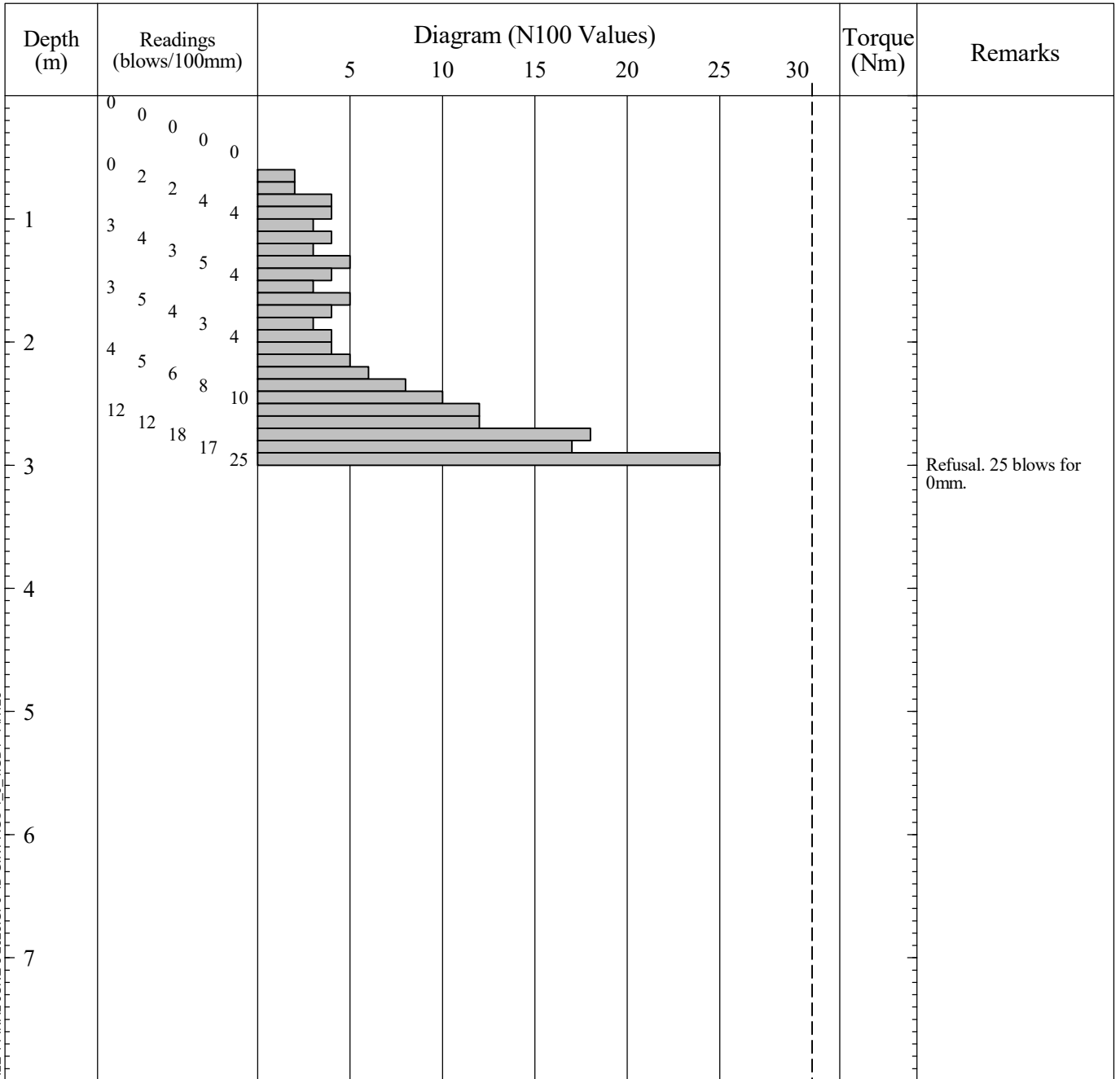
All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used DPH Rig	Driller SS	Logged By SS
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Irish drilling LTD

DYNAMIC PROBE LOG

Project Proposed Housing Development			Location Carney, Co Sligo		PROBE No DP-08
Job No 2023SO102	Date 21-04-23 21-04-23	Ground Level (m OD) 10.25	Co-Ordinates () E 565,806.2 N 843,559.2		
Engineer Jennings O'Donovan				Sheet 1 of 1 Status FINAL	



AGS4 DYNAMIC PROBE CARNEY HOUSING DPS FILE 1 FINAL - JUNE 8 2023.GPJ ID GINT AGS 4.0.4.GDT - 14/7/23

Hammer Wt (kg)	50		GENERAL REMARKS DP terminated at 2.90m bgl.
Hammer Drop (mm)	500		
Cone Dia (mm)	40		
Cone Type	DPH		
Damper			

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used DPH Rig	Driller SS	Logged By SS
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Irish drilling LTD

DYNAMIC PROBE LOG

Project Proposed Housing Development			Location Carney, Co Sligo		PROBE No DP-09
Job No 2023SO102	Date 21-04-23 21-04-23	Ground Level (m OD) 10.58	Co-Ordinates () E 565,852.7 N 843,601.5		
Engineer Jennings O'Donovan				Sheet 1 of 1 Status FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	0								
1	0								
	1								
	2								
	3								
	4								
	7								
	8								
2	8								
	10								
	11								
	10								
	8								
	10								
	15								
	25								Refusal. 25 blows for 0mm.
3									
4									
5									
6									
7									

AGS4 DYNAMIC PROBE CARNEY HOUSING DPS FILE 1 FINAL JUNE 8 2023.GPJ ID GINT AGS 4.0.4.GDT 14/7/23

Hammer Wt (kg)	50		GENERAL REMARKS DP terminated at 2.40m bgl.
Hammer Drop (mm)	500		
Cone Dia (mm)	40		
Cone Type	DPH		
Damper			

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used DPH Rig	Driller SS	Logged By SS
--	------------------------------	----------------------------------	---------------	-----------------



Irish drilling LTD

DYNAMIC PROBE LOG

Project Proposed Housing Development			Location Carney, Co Sligo		PROBE No DP-10
Job No 2023SO102	Date 21-04-23 21-04-23	Ground Level (m OD) 11.10	Co-Ordinates () E 565,902.9 N 843,641.8		
Engineer Jennings O'Donovan				Sheet 1 of 1 Status FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	1								
1	10 12 25								Refusal. 25 blows for 0mm.
2									
3									
4									
5									
6									
7									

Hammer Wt (kg)	50	GENERAL REMARKS DP terminated at 0.80m bgl.
Hammer Drop (mm)	500	
Cone Dia (mm)	40	
Cone Type	DPH	
Damper		

AGS4 DYNAMIC PROBE CARNEY HOUSING DPS FILE 1 FINAL JUNE 8 2023.GPJ ID GINT AGS 4.0.4.GDT 14/7/23

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used DPH Rig	Driller SS	Logged By SS
--	------------------------------	----------------------------------	---------------	-----------------



Irish drilling LTD

DYNAMIC PROBE LOG

Project Proposed Housing Development			Location Carney, Co Sligo		PROBE No DP-11
Job No 2023SO102	Date 21-04-23 21-04-23	Ground Level (m OD) 10.92	Co-Ordinates () E 565,914.8 N 843,594.4		
Engineer Jennings O'Donovan				Sheet 1 of 1 Status FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	1								
1	5								
1	12								
2	25								Refusal. 25 blows for 0mm.
3									
4									
5									
6									
7									

Hammer Wt (kg)	50	GENERAL REMARKS DP terminated at 1.90m bgl.
Hammer Drop (mm)	500	
Cone Dia (mm)	40	
Cone Type	DPH	
Damper		

All dimensions in metres Scale 1:50	Client: Sligo County Council	Method/ Plant Used DPH Rig	Driller SS	Logged By SS
--	------------------------------	----------------------------------	---------------	-----------------

AGS4 DYNAMIC PROBE CARNEY HOUSING DPS FILE 1 FINAL JUNE 8 2023.GPJ ID GINT AGS 4.0.4.GDT 14/7/23



Appendix 04

Groundwater Readings

IRISH DRILLING LTD. Loughrea Co. Galway Tel: (091) 841274 Fax: (091) 880861	Contract: Housing Development at Carney, County Sligo	
	Date: 13.07.2023 Tested by: DOR	Sheet No. 1 Checked: RK

Water Levels in Standpipes

Boreholes	Date		Type	Remarks
	02.06.2023	11.07.2023		
BH 04	1.08m	0.32m	50mm standpipe	

Remarks:
 All readings record depth from ground level to top of water level.



Appendix 05a

Plate Bearing Test Records

IRISH DRILLING LTD.

Loughrea Co. Galway

Tel: (091) 841274

Lab@IrishDrilling.ie

Contract: Carney Sligo

Client:

2023SO102

Engineer:

Date: 13/12/2021

Tested by: DOR

Checked: DCD

Plate Bearing Test: BS 1377:Part 9: 1990

Plate diameter (mm)

600

Pump E

Test Location Number:

TP 02

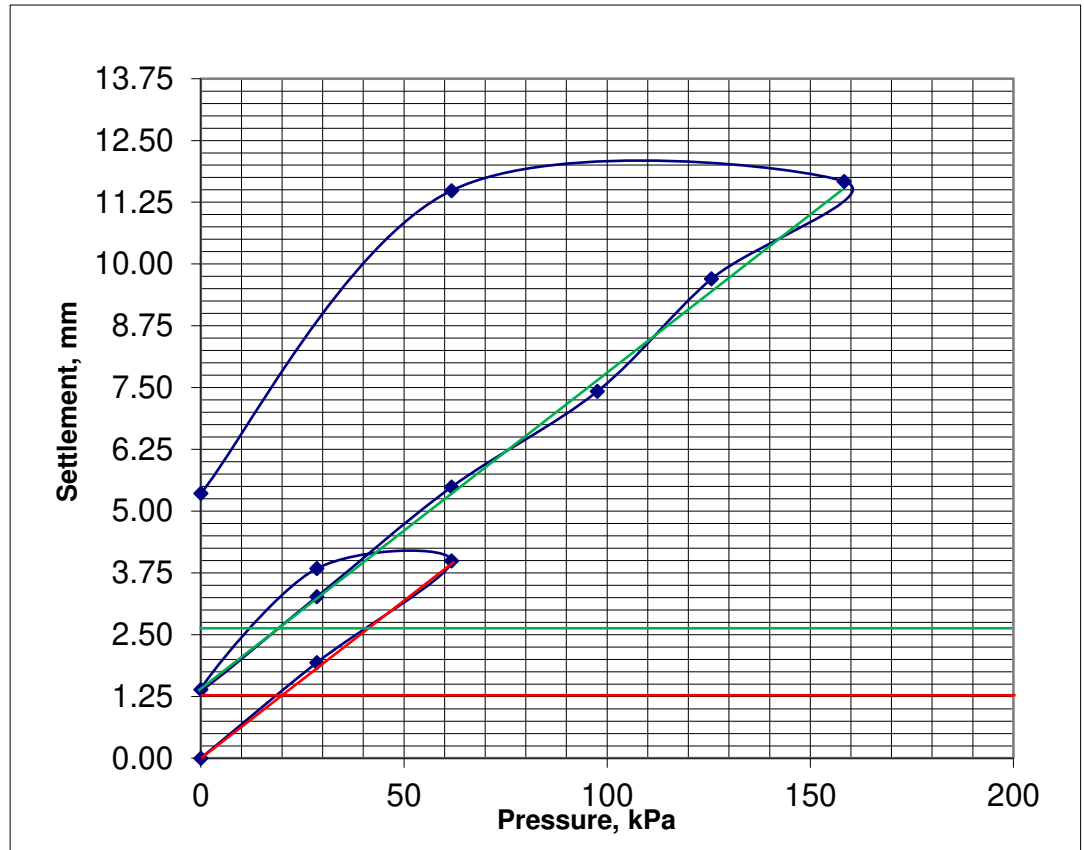
Depth / Level:

0.5m

Natural ground

PLATE TEST

Pressure kN/m ²	Settlement mm
0	0.00
28.6	1.94
61.7	3.99
28.6	3.84
0	1.39
28.6	3.27
61.7	5.49
97.6	7.42
125.7	9.70
158.4	11.67
61.7	11.49
0	5.36



Pressures to give 1.25mm settlement

Cycle 1

1.25

(y) Settlement mm

Cycle 2

1.25

20

(p) Pressure kN/m²

20

16.00

Gradient (p/y)

16.00

0.829

Correction factor (to 762mm plate)

0.829

13.26

(k_s) Modulus of subgrade reaction kPa/mm

13.26

0.9

Approximate CBR (%)*

0.9

$$CBR = 6.1 \times 10^{-8} \times (k_{762})^{1.733} \%$$

National Roads Authority, Design Manual for Roads and Bridges; Volume 7 Section 2, Part 2A HD25-26/10 (2010)*

<https://irishdrilling->

my.sharepoint.com/personal/lab_irishdrilling_ie/Documents/Documents/CurrentDocuments/2023/23SO102_CarneySligo/Carney.PLT(E600)Tp02@0.5

Print Date: 04/05/2023

IRISH DRILLING LTD.

Loughrea Co. Galway

Tel: (091) 841274

Lab@IrishDrilling.ie

Contract: Carney Sligo

Client:

2023SO102

Engineer:

Date: 20/04/2023

Tested by: DOR

Checked: DCD

Plate Bearing Test: BS 1377:Part 9: 1990

Plate diameter (mm)

600

Pump E

Test Location Number:

TP 03

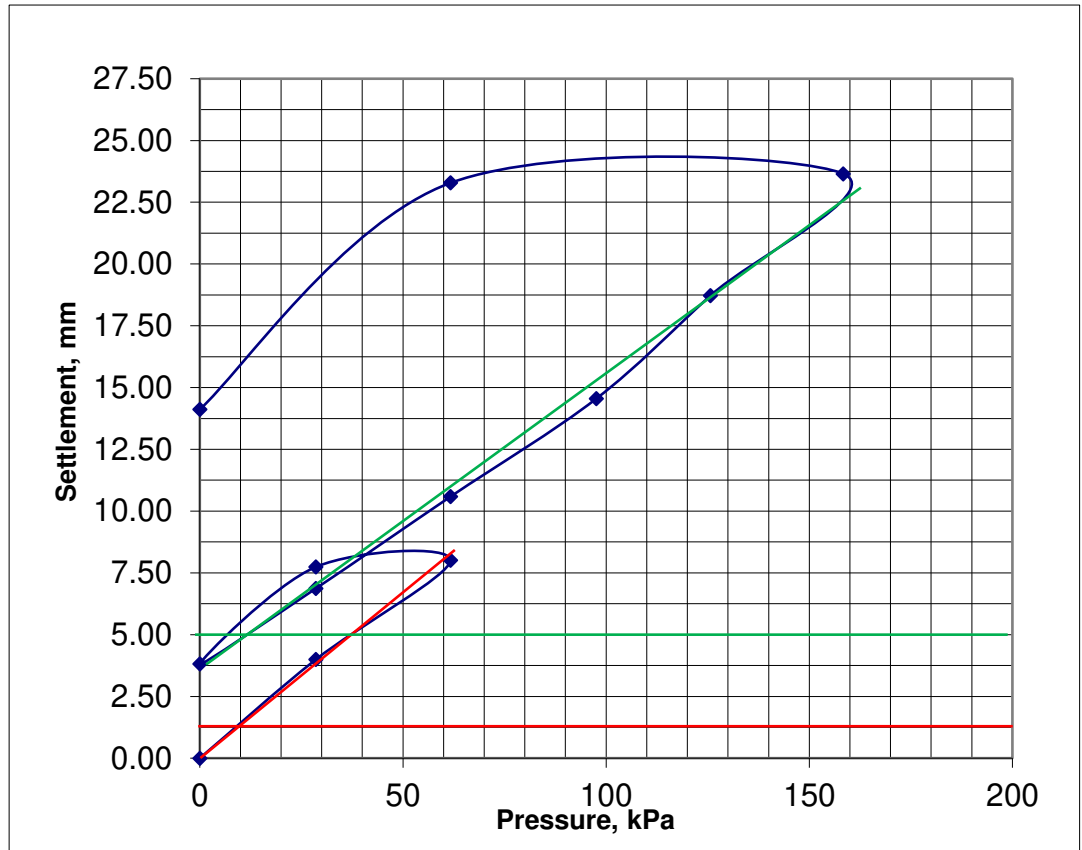
Depth / Level:

0.8m

Natural ground

PLATE TEST

Pressure kN/m ²	Settlement mm
0	0.00
28.6	4.00
61.7	8.02
28.6	7.74
0	3.81
28.6	6.87
61.7	10.59
97.6	14.55
125.7	18.73
158.4	23.65
61.7	23.28
0	14.12



Pressures to give 1.25mm settlement

Cycle 1

1.25

(y) Settlement mm

Cycle 2

1.25

10

(p) Pressure kN/m²

12

8.00

Gradient (p/y)

9.60

0.829

Correction factor (to 762mm plate)

0.829

6.63

(k_s) Modulus of subgrade
reaction kPa/mm

7.96

0.3

Approximate CBR (%)*

0.4

$$CBR = 6.1 \times 10^{-8} \times (k_{762})^{1.733\%}$$

National Roads Authority, Design Manual for Roads and Bridges; Volume 7 Section 2, Part 2A HD25-26/10 (2010)*

<https://irishdrilling->

my.sharepoint.com/personal/lab_irishdrilling_ie/Documents/Documents/CurrentDocuments/2023/23SO102_CarneySligo/Carney.PLT(E600)Tp03@0.8

Print Date: 04/05/2023

IRISH DRILLING LTD.

Loughrea Co. Galway

Tel: (091) 841274

Lab@IrishDrilling.ie

Contract: Carney Sligo

Client:

2023SO102

Engineer:

Date: 20/04/2023

Tested by: DOR

Checked: DCD

Plate Bearing Test: BS 1377:Part 9: 1990

Plate diameter (mm)

600

Pump E

Test Location Number:

TP 04

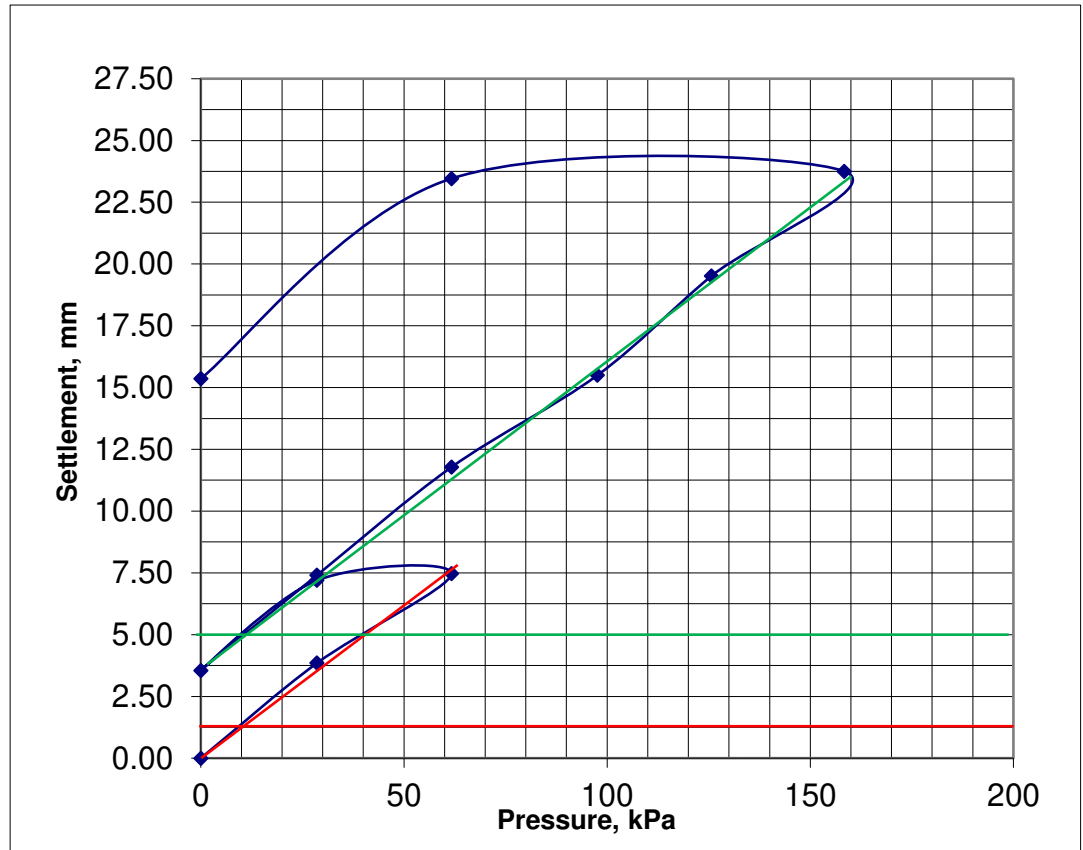
Depth / Level:

0.6m

Natural ground

PLATE TEST

Pressure kN/m ²	Settlement mm
0	0.00
28.6	3.85
61.7	7.47
28.6	7.20
0	3.55
28.6	7.41
61.7	11.78
97.6	15.50
125.7	19.52
158.4	23.75
61.7	23.46
0	15.36



Pressures to give 1.25mm settlement

Cycle 1

1.25

(y) Settlement mm

Cycle 2

1.25

10

(p) Pressure kN/m²

10

8.00

Gradient (p/y)

8.00

0.829

Correction factor (to 762mm plate)

0.829

6.63

(k_s) Modulus of subgrade
reaction kPa/mm

6.63

0.3

Approximate CBR (%)*

0.3

$$CBR = 6.1 \times 10^{-8} \times (k_{762})^{1.733} \%$$

National Roads Authority, Design Manual for Roads and Bridges; Volume 7 Section 2, Part 2A HD25-26/10 (2010)*

<https://irishdrilling->

[my.sharepoint.com/personal/lab_irishdrilling_ie/Documents/Documents/CurrentDocuments/2023/23SO102_CarneySligo/Carney.PLT\(E600\)Tp04@0.6](https://irishdrilling-my.sharepoint.com/personal/lab_irishdrilling_ie/Documents/Documents/CurrentDocuments/2023/23SO102_CarneySligo/Carney.PLT(E600)Tp04@0.6)

Print Date: 04/05/2023

IRISH DRILLING LTD.

Loughrea Co. Galway

Tel: (091) 841274

Lab@IrishDrilling.ie

Contract: Carney Sligo

Client:

2023SO102

Engineer:

Date: 20/04/2023

Tested by: DOR

Checked: DCD

Plate Bearing Test: BS 1377:Part 9: 1990

Plate diameter (mm)

600

Pump E

Test Location Number:

TP 05

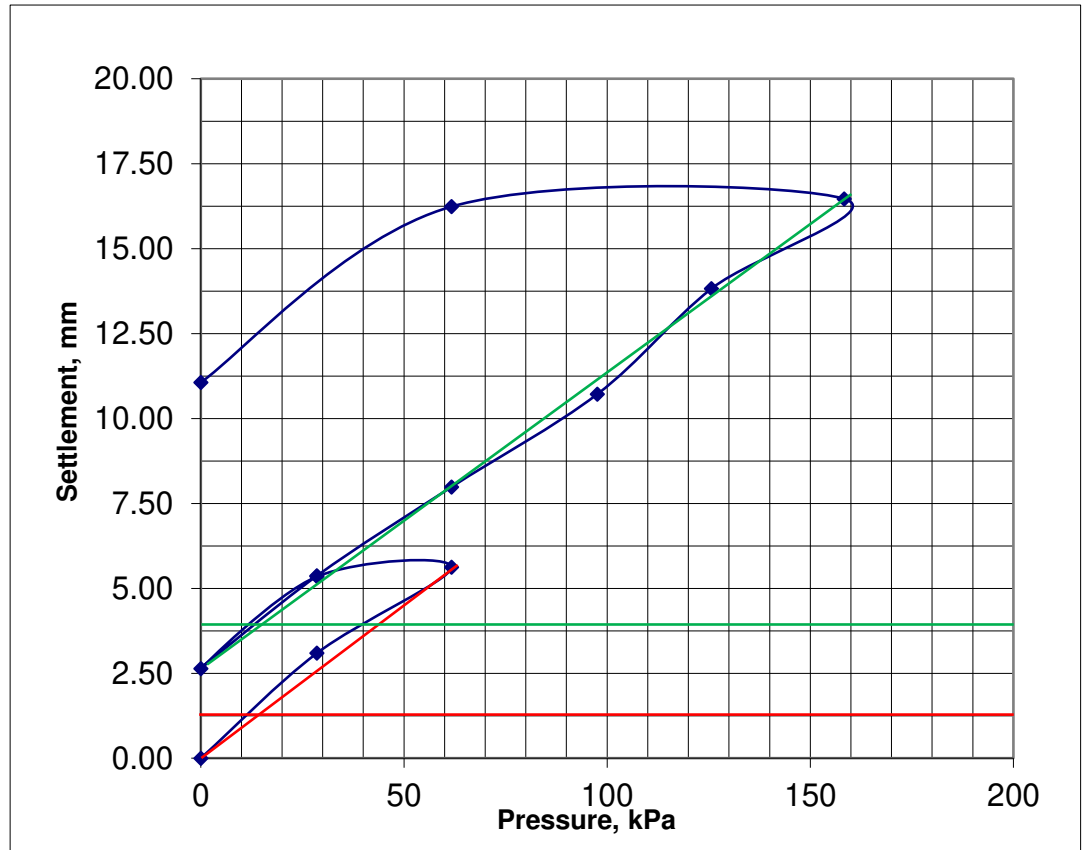
Depth / Level:

0.8m

Natural ground

PLATE TEST

Pressure kN/m ²	Settlement mm
0	0.00
28.6	3.09
61.7	5.62
28.6	5.35
0	2.64
28.6	5.37
61.7	7.98
97.6	10.72
125.7	13.82
158.4	16.46
61.7	16.24
0	11.06



Pressures to give 1.25mm settlement

Cycle 1

(y) Settlement mm

Cycle 2(p) Pressure kN/m²

Gradient (p/y)

Correction factor (to 762mm plate)

 (k_s) Modulus of subgrade
reaction kPa/mm

Approximate CBR (%)*

$$CBR = 6.1 \times 10^{-8} \times (k_{762})^{1.733} \%$$

National Roads Authority, Design Manual for Roads and Bridges; Volume 7 Section 2, Part 2A HD25-26/10 (2010)*

<https://irishdrilling->my.sharepoint.com/personal/lab_irishdrilling_ie/Documents/Documents/CurrentDocuments/2023/23SO102_CarneySligo/Carney.PLT(E60
0)Tp05@0.8

Print Date: 04/05/2023

IRISH DRILLING LTD.

Loughrea Co. Galway

Tel: (091) 841274

Lab@IrishDrilling.ie

Contract: Carney Sligo

Client:

2023SO102

Engineer:

Date: 20/04/2023

Tested by: DOR

Checked: DCD

Plate Bearing Test: BS 1377:Part 9: 1990

Plate diameter (mm)

600

Pump E

Test Location Number:

TP 06

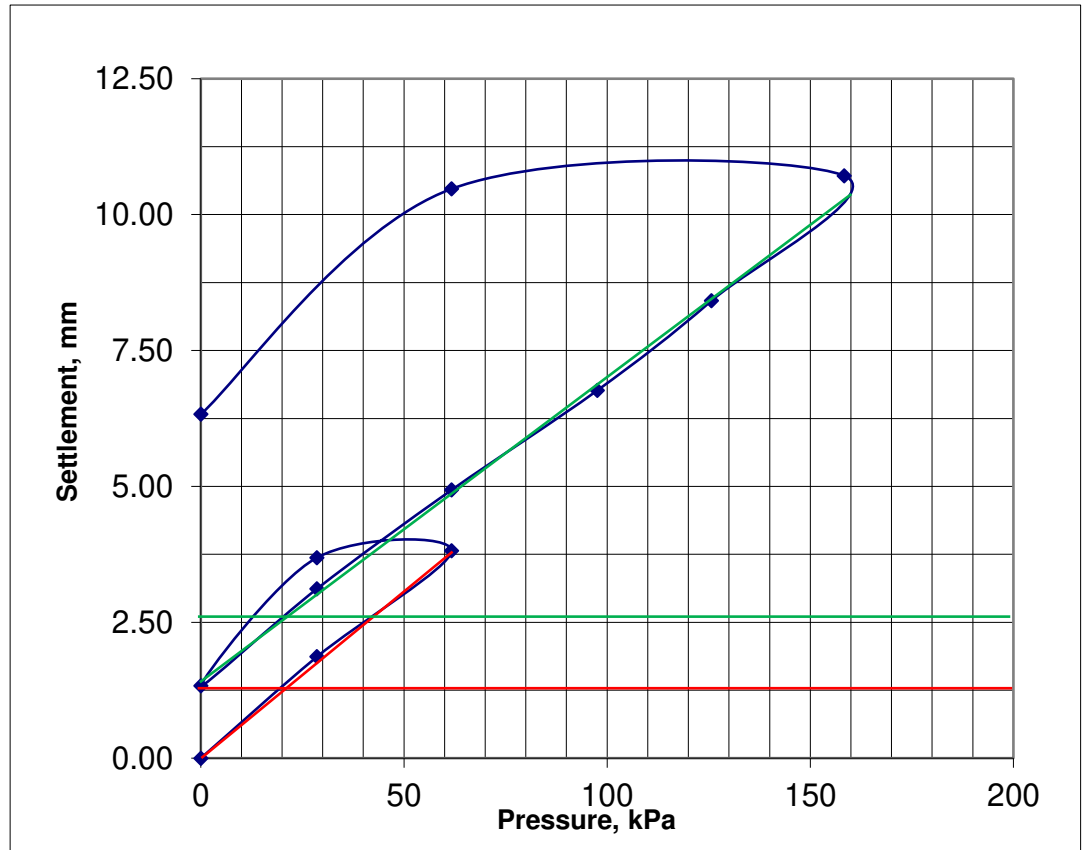
Depth / Level:

0.8m

Natural ground

PLATE TEST

Pressure kN/m ²	Settlement mm
0	0.00
28.6	1.87
61.7	3.82
28.6	3.69
0	1.33
28.6	3.12
61.7	4.93
97.6	6.77
125.7	8.42
158.4	10.71
61.7	10.47
0	6.33



Pressures to give 1.25mm settlement

Cycle 1

1.25

(y) Settlement mm

Cycle 2

1.25

20

(p) Pressure kN/m²

20

16.00

Gradient (p/y)

16.00

0.829

Correction factor (to 762mm plate)

0.829

13.26

(k_s) Modulus of subgrade
reaction kPa/mm

13.26

0.9

Approximate CBR (%)*

0.9

$$CBR = 6.1 \times 10^{-8} \times (k_{762})^{1.733} \%$$

National Roads Authority, Design Manual for Roads and Bridges; Volume 7 Section 2, Part 2A HD25-26/10 (2010)*

<https://irishdrilling->

my.sharepoint.com/personal/lab_irishdrilling_ie/Documents/Documents/CurrentDocuments/2023/23SO102_CarneySligo/Carney.PLT(E600)Tp06@0.8

Print Date: 04/05/2023



Appendix 05b

Soil Infiltration Test Records

IRISH DRILLING LTD.
Loughrea Co. Galway



Tel: (091) 841274 info@irishdrilling.ie

Contract: Carney Housing Development

Client: Sligo County Council

Engineer: JOD

Date: 21/04/2023

Tested by: DOR

INFILTRATION TEST - to BRE 365

TP 01

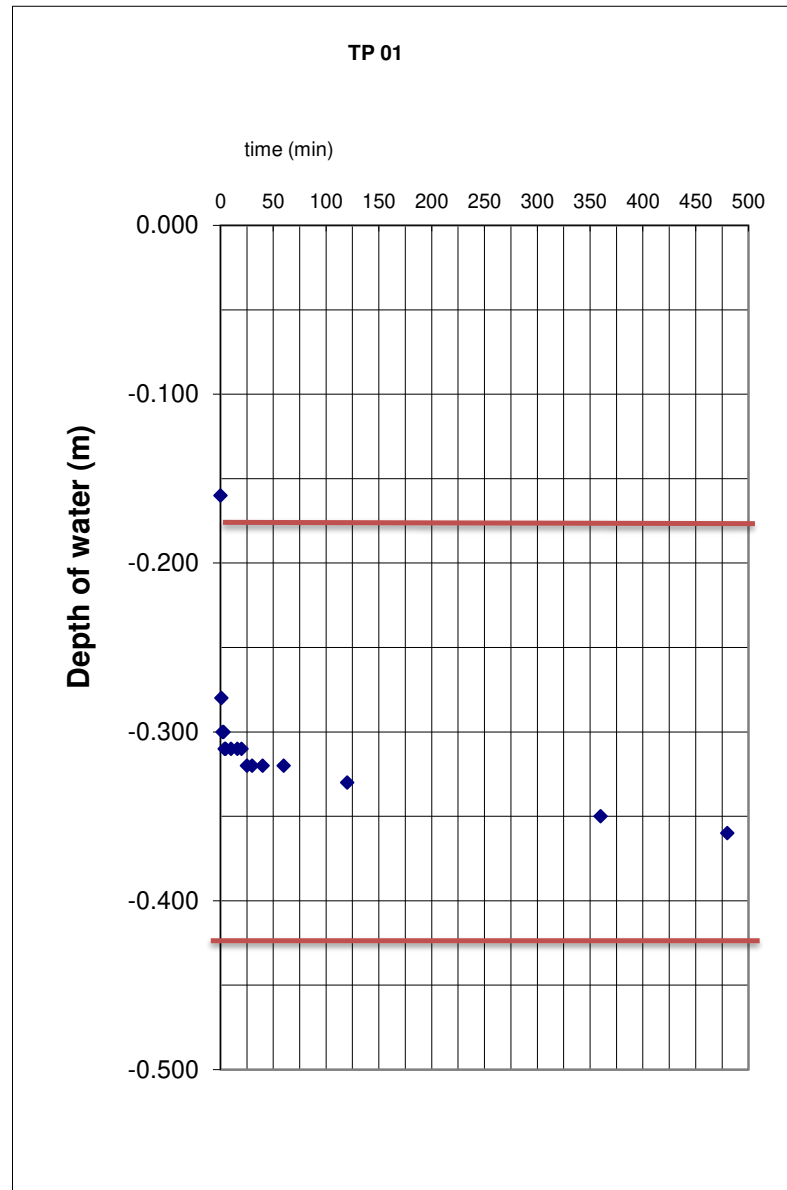
Top of water level: 0.16 m

Base of trial pit: 1.10 m

Dims. of trial pit: 2.8 x 1.2

1st FILL

time min	WL m
0	-0.160
1	-0.280
2	-0.300
3	-0.300
4	-0.310
5	-0.310
10	-0.310
16	-0.310
20	-0.310
25	-0.320
30	-0.320
40	-0.320
60	-0.320
120	-0.330
360	-0.350
480	-0.360



Result:

Soil Infiltration Rate = 1.12×10^{-5} m/s

T₂₅ interpolated.

T₇₅ interpolated.

IRISH DRILLING LTD.
Loughrea Co. Galway



Tel: (091) 841274 info@irishdrilling.ie

Contract: Carney Housing Development

Client: Sligo County Council

Engineer: JOD

Date: 21/04/2023

Tested by: DOR

INFILTRATION TEST - to BRE 365

TP 03

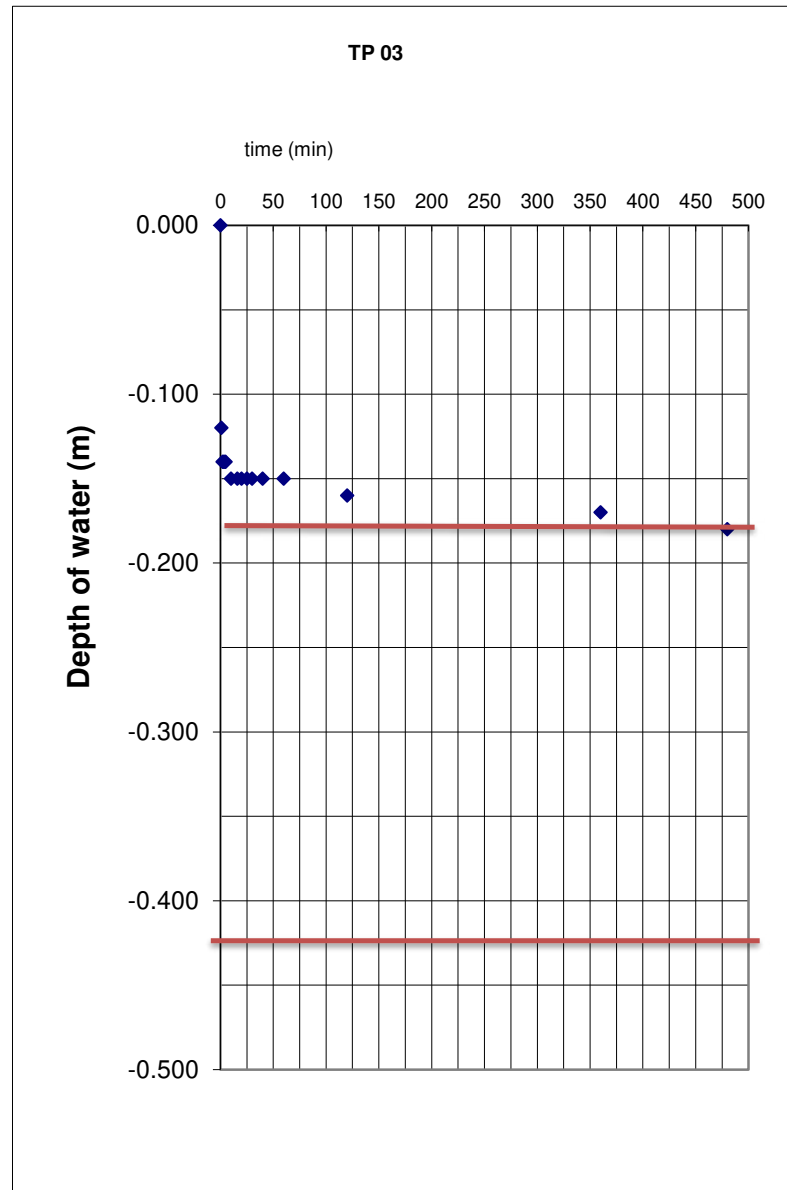
Top of water level: 0.00 m

Base of trial pit: 1.50 m

Dims. of trial pit: 2 x 1.5

1st FILL

time min	WL m
0	0.000
1	-0.120
2	-0.140
3	-0.140
4	-0.140
5	-0.140
10	-0.150
16	-0.150
20	-0.150
25	-0.150
30	-0.150
40	-0.150
60	-0.150
120	-0.160
360	-0.170
480	-0.180



Result:

Soil Infiltration Rate = 3.57×10^{-6} m/s

T₂₅ interpolated.

T₇₅ interpolated.

IRISH DRILLING LTD.
Loughrea Co. Galway



Tel: (091) 841274 info@irishdrilling.ie

Contract: Carney Housing Development

Client: Sligo County Council

Engineer: JOD

Date: 22/04/2023

Tested by: DOR

INFILTRATION TEST - to BRE 365

TP 05

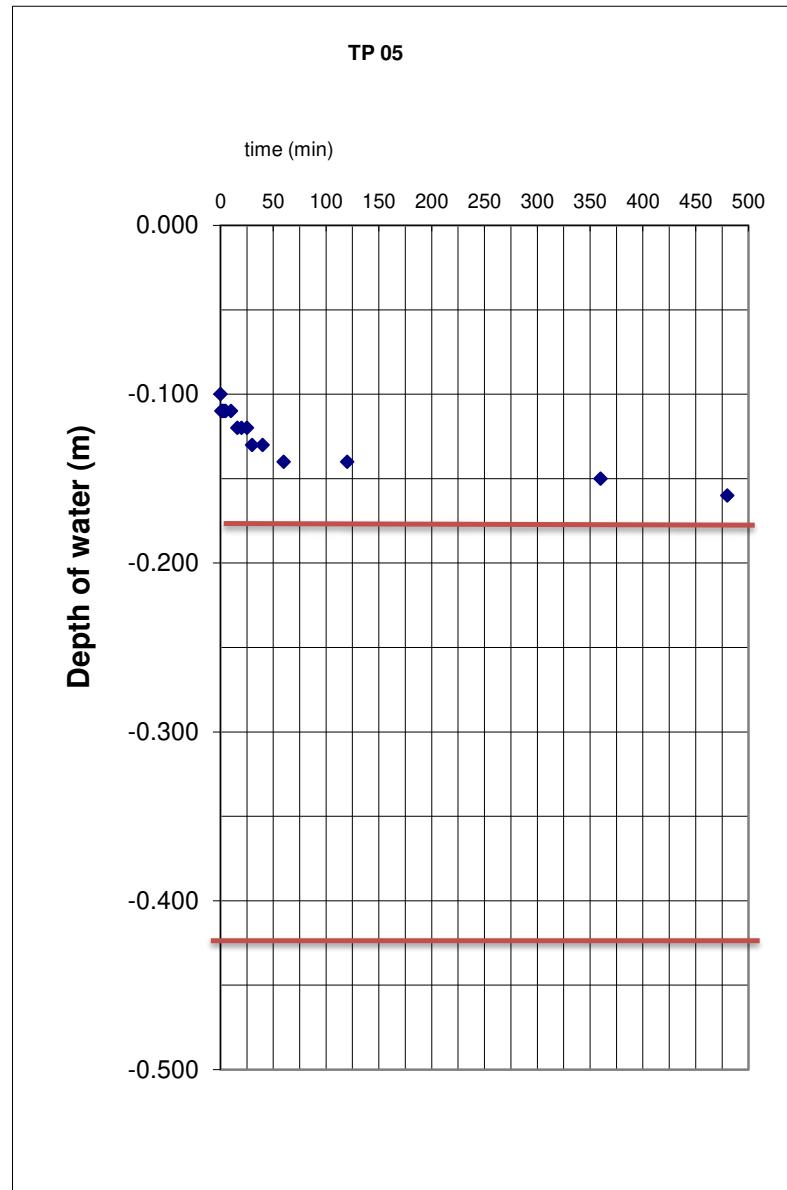
Top of water level: 0.10 m

Base of trial pit: 1.50 m

Dims. of trial pit: 2 x 1.5

1st FILL

time min	WL m
0	-0.100
1	-0.110
2	-0.110
3	-0.110
4	-0.110
5	-0.110
10	-0.110
16	-0.120
20	-0.120
25	-0.120
30	-0.130
40	-0.130
60	-0.140
120	-0.140
360	-0.150
480	-0.160



Result:

Soil Infiltration Rate = 3.40×10^{-6} m/s

T₂₅ interpolated.

T₇₅ interpolated.

IRISH DRILLING LTD.
Loughrea Co. Galway



Tel: (091) 841274 info@irishdrilling.ie

Contract: Carney Housing Development

Client: Sligo County Council

Engineer: JOD

Date: 22/04/2023

Tested by: DOR

INFILTRATION TEST - to BRE 365

TP 06

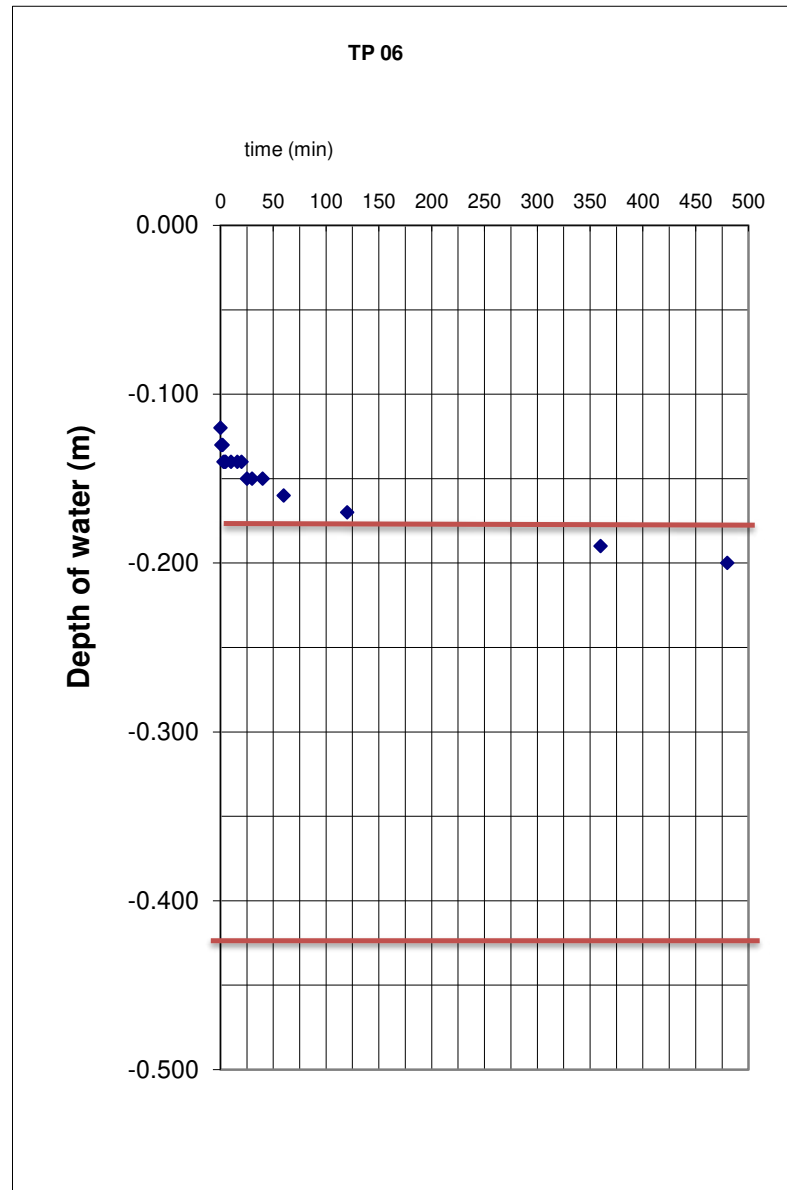
Top of water level: 0.12 m

Base of trial pit: 1.50 m

Dims. of trial pit: 1.7 x 1.4

1st FILL

time min	WL m
0	-0.120
1	-0.130
2	-0.130
3	-0.140
4	-0.140
5	-0.140
10	-0.140
16	-0.140
20	-0.140
25	-0.150
30	-0.150
40	-0.150
60	-0.160
120	-0.170
360	-0.190
480	-0.200



Result:

Soil Infiltration Rate = 3.86×10^{-6} m/s

T₂₅ interpolated.

T₇₅ interpolated.



Appendix 06

Laboratory Test Results



Unit 7-8 Hawarden Business Park
 Manor Road (off Manor Lane)
 Hawarden
 Deeside
 CH5 3US

Tel: (01244) 528777

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

Irish Drilling Limited
 Old Galway Road
 Loughrea
 Co. Galway

Attention: Dympna Darcy

CERTIFICATE OF ANALYSIS

Date of report Generation:	05 May 2023
Customer:	Irish Drilling Limited
Sample Delivery Group (SDG):	230426-65
Your Reference:	2023SO102
Location:	Carney Sligo
Report No:	687874
Order Number:	12425

We received 6 samples on Wednesday April 26, 2023 and 6 of these samples were scheduled for analysis which was completed on Friday May 05, 2023. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 230426-65
Client Ref.: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
27899672	TP01	ES1	0.50 - 0.50	20/04/2023
27899677	TP02	ES1	0.50 - 0.50	20/04/2023
27899684	TP03	ES1	0.50 - 0.50	20/04/2023
27899695	TP04	ES1	0.50 - 0.50	20/04/2023
27899701	TP05	ES1	0.80 - 0.80	20/04/2023
27899710	TP06	ES1	0.50 - 0.50	20/04/2023

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 230426-65
Client Ref.: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

Results Legend

- X Test
- N No Determination Possible

Sample Types -

- S - Soil/Solid
- UNS - Unspecified Solid
- GW - Ground Water
- SW - Surface Water
- LE - Land Leachate
- PL - Prepared Leachate
- PR - Process Water
- SA - Saline Water
- TE - Trade Effluent
- TS - Treated Sewage
- US - Untreated Sewage
- RE - Recreational Water
- DW - Drinking Water Non-regulatory
- UNL - Unspecified Liquid
- SL - Sludge
- G - Gas
- OTH - Other

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
27899672	TP01	ES1	0.50 - 0.50	60g VOC (ALE215) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210)	S
27899677	TP02	ES1	0.50 - 0.50	60g VOC (ALE215) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210)	S
27899684	TP03	ES1	0.50 - 0.50	60g VOC (ALE215) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210)	S
27899695	TP04	ES1	0.50 - 0.50	60g VOC (ALE215) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210)	S
27899701	TP05	ES1	0.80 - 0.80	60g VOC (ALE215) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210)	S
27899710	TP06	ES1	0.50 - 0.50	60g VOC (ALE215) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210)	S

Parameter	Method	NDPs: 0 Tests: 6	27899672	27899677	27899684	27899695	27899701	27899710
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
CEN Readings	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Coronene	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
EPH by GCxGC-FID	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Fluoride	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Loss on Ignition in soils	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
PAH by GCMS	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
PCBs by GCMS	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
pH	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 6	X	X	X	X	X	X



CERTIFICATE OF ANALYSIS

Validated

 SDG: 230426-65
 Client Ref.: 2023SO102

 Report Number: 687874
 Location: Carney Sligo

Superseded Report:

Results Legend	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type		
	X Test	N No Determination Possible											
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other			27899672		27899677		27899684		27899695		27899701		27899710
			TP01		TP02		TP03		TP04		TP05		TP06
			ES1		ES1		ES1		ES1		ES1		ES1
			0.50 - 0.50		0.50 - 0.50		0.50 - 0.50		0.50 - 0.50		0.80 - 0.80		0.50 - 0.50
			1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
			S	S	S	S	S	S	S	S	S	S	S
Phenols by HPLC (W)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X	X	X	X	X	
Sample description	All	NDPs: 0 Tests: 6	X	X	X	X	X	X	X	X	X	X	
Total Organic Carbon	All	NDPs: 0 Tests: 6	X	X	X	X	X	X	X	X	X	X	
VOC MS (S)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X	X	X	X	X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 230426-65
Client Ref.: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
27899672	TP01	0.50 - 0.50	Dark Brown	Sandy Clay Loam	Stones	Vegetation
27899677	TP02	0.50 - 0.50	Light Brown	Sandy Clay Loam	Stones	Vegetation
27899684	TP03	0.50 - 0.50	Light Brown	Sandy Silt Loam	Stones	Vegetation
27899695	TP04	0.50 - 0.50	Light Brown	Sandy Clay Loam	Stones	Vegetation
27899701	TP05	0.80 - 0.80	Dark Brown	Sandy Loam	Stones	Vegetation
27899710	TP06	0.50 - 0.50	Dark Brown	Sandy Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

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Client Ref.: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

Results Legend		Customer Sample Ref.	TP01	TP02	TP03	TP04	TP05	TP06
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	TP01	TP02	TP03	TP04	TP05	TP06
M	mCERTS accredited.		0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.80 - 0.80	0.50 - 0.50
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
diss.filt	Dissolved / filtered sample.		20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023
tot.unfilt	Total / unfiltered sample.		26/04/2023	26/04/2023	26/04/2023	26/04/2023	26/04/2023	26/04/2023
*	Subcontracted - refer to subcontractor report for accreditation status.		230426-65	230426-65	230426-65	230426-65	230426-65	230426-65
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		27899672	27899677	27899684	27899695	27899701	27899710
(F)	Trigger breach confirmed		ES1	ES1	ES1	ES1	ES1	ES1
1-4*§@	Sample deviation (see appendix)							
Component	LOD/Units		Method					
Moisture Content Ratio (% of as received sample)	%	PM024	29	25	25	18	11	25
Loss on ignition	<0.7 %	TM018	5.1	4.85	2.31	3.33	2.28	5.62
			M	M	M	M	M	M
Organic Carbon, Total	<0.2 %	TM132	0.75	0.76	0.214	0.317	0.302	1.2
			M	M	M	M	M	M
pH	1 pH Units	TM133	7.39	7.58	8.46	8.56	8.46	7.27
			M	M	M	M	M	M
PCB congener 28	<3 µg/kg	TM168	<3	<3	<3	<3	<3	<3
			M	M	M	M	M	M
PCB congener 52	<3 µg/kg	TM168	<3	<3	<3	<3	<3	<3
			M	M	M	M	M	M
PCB congener 101	<3 µg/kg	TM168	<3	<3	<3	<3	<3	<3
			M	M	M	M	M	M
PCB congener 118	<3 µg/kg	TM168	<3	<3	<3	<3	<3	<3
			M	M	M	M	M	M
PCB congener 138	<3 µg/kg	TM168	<3	<3	<3	<3	<3	<3
			M	M	M	M	M	M
PCB congener 153	<3 µg/kg	TM168	<3	<3	<3	<3	<3	<3
			M	M	M	M	M	M
PCB congener 180	<3 µg/kg	TM168	<3	<3	<3	<3	<3	<3
			M	M	M	M	M	M
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21	<21	<21	<21	<21	<21
ANC @ pH 4	<0.03 mol/kg	TM182	0.0635	0.0605	4.82	<0.03	1.97	0.0841
ANC @ pH 6	<0.03 mol/kg	TM182	<0.03	<0.03	0.0633	0.037	0.0595	<0.03
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410	<10	<10	<10	<10	<10	<10
Coronene	<200 µg/kg	TM410	<200	<200	<200	<200	<200	<200
EPH Surrogate % recovery**	%	TM415	105	102	101	97.6	96.4	94.6
Mineral Oil >C10-C40 (EH_2D_AL)	<5 mg/kg	TM415	<5	<5	<5	<5	<5	<5



CERTIFICATE OF ANALYSIS

Validated

SDG: 230426-65
Client Ref.: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

VOC MS (S)

Table with columns: Results Legend, Customer Sample Ref., TP01, TP02, TP03, TP04, TP05, TP06. Rows include components like Dibromofluoromethane, Toluene, Benzene, etc., with associated LOD/Units, Methods, and values.



CERTIFICATE OF ANALYSIS

Validated

SDG: 230426-65
Client Ref.: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.120
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Carney Sligo
Natural Moisture Content (%)	33.5
Dry Matter Content (%)	74.9

Case	
SDG	230426-65
Lab Sample Number(s)	27899672
Sampled Date	20-Apr-2023
Customer Sample Ref.	TP01 ES1
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.75
Loss on Ignition (%)	5.1
Sum of BTEX (mg/kg)	<0.04
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	7.39
ANC to pH 6 (mol/kg)	<0.03
ANC to pH 4 (mol/kg)	0.0635

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.0107	<0.0002	0.107	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00118	<0.001	0.0118	<0.01	0.5	10	70
Copper	0.0026	<0.0003	0.026	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00412	<0.0004	0.0412	<0.004	0.4	10	40
Lead	0.000921	<0.0002	0.00921	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00461	<0.001	0.0461	<0.01	4	50	200
Chloride	2.5	<2	25	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	59.7	<10	597	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	11	<3	110	<30	500	800	1000

Leach Test Information

Date Prepared	27-Apr-2023
pH (pH Units)	7.96
Conductivity (µS/cm)	78
Volume Leachant (Litres)	0.870

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
 Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

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CERTIFICATE OF ANALYSIS

Validated

SDG: 230426-65
Client Ref.: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.116
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Carney Sligo
Natural Moisture Content (%)	28.8
Dry Matter Content (%)	77.6

Case	
SDG	230426-65
Lab Sample Number(s)	27899677
Sampled Date	20-Apr-2023
Customer Sample Ref.	TP02 ES1
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.76
Loss on Ignition (%)	4.85
Sum of BTEX (mg/kg)	<0.04
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	7.58
ANC to pH 6 (mol/kg)	<0.03
ANC to pH 4 (mol/kg)	0.0605

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.00772	<0.0002	0.0772	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00106	<0.001	0.0106	<0.01	0.5	10	70
Copper	0.00363	<0.0003	0.0363	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00383	<0.0004	0.0383	<0.004	0.4	10	40
Lead	0.000502	<0.0002	0.00502	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	0.00128	<0.001	0.0128	<0.01	0.1	0.5	7
Zinc	0.0649	<0.001	0.649	<0.01	4	50	200
Chloride	7.6	<2	76	<20	800	15000	25000
Fluoride	0.51	<0.5	5.1	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	124	<10	1240	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	19.2	<3	192	<30	500	800	1000

Leach Test Information

Date Prepared	27-Apr-2023
pH (pH Units)	8.23
Conductivity (µS/cm)	163
Volume Leachant (Litres)	0.875

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
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CERTIFICATE OF ANALYSIS

Validated

SDG: 230426-65
Client Ref.: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.112
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Carney Sligo
Natural Moisture Content (%)	24.2
Dry Matter Content (%)	80.5

Case	
SDG	230426-65
Lab Sample Number(s)	27899684
Sampled Date	20-Apr-2023
Customer Sample Ref.	TP03 ES1
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.214
Loss on Ignition (%)	2.31
Sum of BTEX (mg/kg)	<0.04
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.46
ANC to pH 6 (mol/kg)	0.0633
ANC to pH 4 (mol/kg)	4.82

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.0142	<0.0002	0.142	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00137	<0.0003	0.0137	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00074	<0.0004	0.0074	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	0.00607	<0.001	0.0607	<0.01	0.1	0.5	7
Zinc	0.0113	<0.001	0.113	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	6	<2	60	<20	1000	20000	50000
Total Dissolved Solids	93.2	<10	932	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	8.57	<3	85.7	<30	500	800	1000

Leach Test Information

Date Prepared	27-Apr-2023
pH (pH Units)	7.94
Conductivity (µS/cm)	122
Volume Leachant (Litres)	0.878

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
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CERTIFICATE OF ANALYSIS

Validated

SDG: 230426-65
Client Ref.: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.107
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Carney Sligo
Natural Moisture Content (%)	18.9
Dry Matter Content (%)	84.1

Case	
SDG	230426-65
Lab Sample Number(s)	27899695
Sampled Date	20-Apr-2023
Customer Sample Ref.	TP04 ES1
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.317
Loss on Ignition (%)	3.33
Sum of BTEX (mg/kg)	<0.04
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.56
ANC to pH 6 (mol/kg)	0.037
ANC to pH 4 (mol/kg)	<0.03

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.0172	<0.0002	0.172	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00145	<0.0003	0.0145	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00151	<0.0004	0.0151	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	147	<10	1470	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	8.1	<3	81	<30	500	800	1000

Leach Test Information

Date Prepared	27-Apr-2023
pH (pH Units)	8.29
Conductivity (µS/cm)	192
Volume Leachant (Litres)	0.883

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
 Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

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CERTIFICATE OF ANALYSIS

Validated

SDG: 230426-65
Client Ref.: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.100
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Carney Sligo
Natural Moisture Content (%)	11.7
Dry Matter Content (%)	89.5

Case	
SDG	230426-65
Lab Sample Number(s)	27899701
Sampled Date	20-Apr-2023
Customer Sample Ref.	TP05 ES1
Depth (m)	0.80 - 0.80

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.302
Loss on Ignition (%)	2.28
Sum of BTEX (mg/kg)	<0.04
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.46
ANC to pH 6 (mol/kg)	0.0595
ANC to pH 4 (mol/kg)	1.97

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.0311	<0.0002	0.311	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.000338	<0.0003	0.00338	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000579	<0.0004	0.00579	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	86	<10	860	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.54	<3	35.4	<30	500	800	1000

Leach Test Information

Date Prepared	27-Apr-2023
pH (pH Units)	8.20
Conductivity (µS/cm)	113
Volume Leachant (Litres)	0.890

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
 Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

05/05/2023 05:49:53

05:49:40 05/05/2023



CERTIFICATE OF ANALYSIS

Validated

SDG: 230426-65
Client Ref.: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.111
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Carney Sligo
Natural Moisture Content (%)	23.8
Dry Matter Content (%)	80.8

Case	
SDG	230426-65
Lab Sample Number(s)	27899710
Sampled Date	20-Apr-2023
Customer Sample Ref.	TP06 ES1
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	1.2
Loss on Ignition (%)	5.62
Sum of BTEX (mg/kg)	<0.04
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	7.27
ANC to pH 6 (mol/kg)	<0.03
ANC to pH 4 (mol/kg)	0.0841

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000745	<0.0005	0.00745	<0.005	0.5	2	25
Barium	0.00448	<0.0002	0.0448	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00244	<0.001	0.0244	<0.01	0.5	10	70
Copper	0.0091	<0.0003	0.091	<0.003	2	50	100
Mercury Dissolved (CVAf)	0.0000107	<0.00001	0.000107	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00849	<0.0004	0.0849	<0.004	0.4	10	40
Lead	0.000754	<0.0002	0.00754	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	0.00105	<0.001	0.0105	<0.01	0.1	0.5	7
Zinc	0.00355	<0.001	0.0355	<0.01	4	50	200
Chloride	3.5	<2	35	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	37.2	<10	372	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	14.7	<3	147	<30	500	800	1000

Leach Test Information

Date Prepared	27-Apr-2023
pH (pH Units)	7.70
Conductivity (µS/cm)	50
Volume Leachant (Litres)	0.879

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
 Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

05/05/2023 05:49:53

05:49:40 05/05/2023



CERTIFICATE OF ANALYSIS

Validated

SDG: 230426-65
Client Ref.: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

Table of Results - Appendix

Method No	Description
PM024	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115	Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	Determination of Loss on Ignition
TM090	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Determination of Fluoride using the Kone Analyser
TM116	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	ELTRA CS800 Operators Guide
TM133	Determination of pH in Soil and Water using the GLpH pH Meter
TM152	Analysis of Aqueous Samples by ICP-MS
TM168	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM182	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	The determination of PAH in soil samples by GC-MS
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM259	Determination of Phenols in Waters and Leachates by HPLC
TM410	Determination of Coronene in soils by GCMS
TM415	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 230426-65
Client Ref.: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

Test Completion Dates

Lab Sample No(s) Customer Sample Ref.	27899672	27899677	27899684	27899695	27899701	27899710
	TP01	TP02	TP03	TP04	TP05	TP06
AGS Ref.	ES1	ES1	ES1	ES1	ES1	ES1
Depth	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.50 - 0.50	0.80 - 0.80	0.50 - 0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
ANC at pH4 and ANC at pH 6	03-May-2023	03-May-2023	03-May-2023	03-May-2023	03-May-2023	03-May-2023
Anions by Kone (w)	03-May-2023	03-May-2023	03-May-2023	03-May-2023	03-May-2023	03-May-2023
CEN 10:1 Leachate (1 Stage)	28-Apr-2023	28-Apr-2023	27-Apr-2023	27-Apr-2023	27-Apr-2023	27-Apr-2023
CEN Readings	03-May-2023	03-May-2023	04-May-2023	03-May-2023	03-May-2023	03-May-2023
Coronene	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023
Dissolved Metals by ICP-MS	03-May-2023	03-May-2023	03-May-2023	03-May-2023	03-May-2023	03-May-2023
Dissolved Organic/Inorganic Carbon	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023
EPH by GCxGC-FID	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023
Fluoride	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023
Loss on Ignition in soils	03-May-2023	03-May-2023	04-May-2023	03-May-2023	03-May-2023	03-May-2023
Mercury Dissolved	03-May-2023	03-May-2023	03-May-2023	03-May-2023	03-May-2023	03-May-2023
Moisture at 105C	27-Apr-2023	27-Apr-2023	27-Apr-2023	27-Apr-2023	27-Apr-2023	27-Apr-2023
PAH 16 & 17 Calc	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023
PAH by GCMS	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023
PCBs by GCMS	03-May-2023	03-May-2023	03-May-2023	03-May-2023	03-May-2023	03-May-2023
pH	05-May-2023	05-May-2023	05-May-2023	05-May-2023	05-May-2023	05-May-2023
pH Value of Filtered Water	03-May-2023	03-May-2023	05-May-2023	03-May-2023	03-May-2023	03-May-2023
Phenols by HPLC (W)	03-May-2023	03-May-2023	03-May-2023	02-May-2023	02-May-2023	03-May-2023
Sample description	27-Apr-2023	27-Apr-2023	27-Apr-2023	27-Apr-2023	27-Apr-2023	27-Apr-2023
Total Organic Carbon	04-May-2023	04-May-2023	04-May-2023	04-May-2023	04-May-2023	04-May-2023
VOC MS (S)	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023	02-May-2023



CERTIFICATE OF ANALYSIS

SDG: 230426-65
Client Ref: 2023SO102

Report Number: 687874
Location: Carney Sligo

Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Appendix 07

Trial Pit Photographs

Irish Drilling Ltd: Trial Pit Photos:



Figure 1 H:\2023 SO 102 Carney\TP 01 (1).JPG



Figure 3 H:\2023 SO 102 Carney\TP 01 Per Test.JPG



Figure 2 H:\2023 SO 102 Carney\TP 01 (2).JPG



Figure 4 H:\2023 SO 102 Carney\TP 02 (1).JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 5 H:\2023 SO 102 Carney\TP 02 (2).JPG



Figure 7 H:\2023 SO 102 Carney\TP 03 (2).JPG



Figure 6 H:\2023 SO 102 Carney\TP 03 (1).JPG



Figure 8 H:\2023 SO 102 Carney\TP 03 Per Test.JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 9 H:\2023 SO 102 Carney\TP 04 (1).JPG



Figure 11 H:\2023 SO 102 Carney\TP 05 (1).JPG



Figure 10 H:\2023 SO 102 Carney\TP 04 (2).JPG



Figure 12 H:\2023 SO 102 Carney\TP 05 (2).JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 13 H:\2023 SO 102 Carney\TP 05 Per Test.JPG



Figure 15 H:\2023 SO 102 Carney\TP 06 (2).JPG



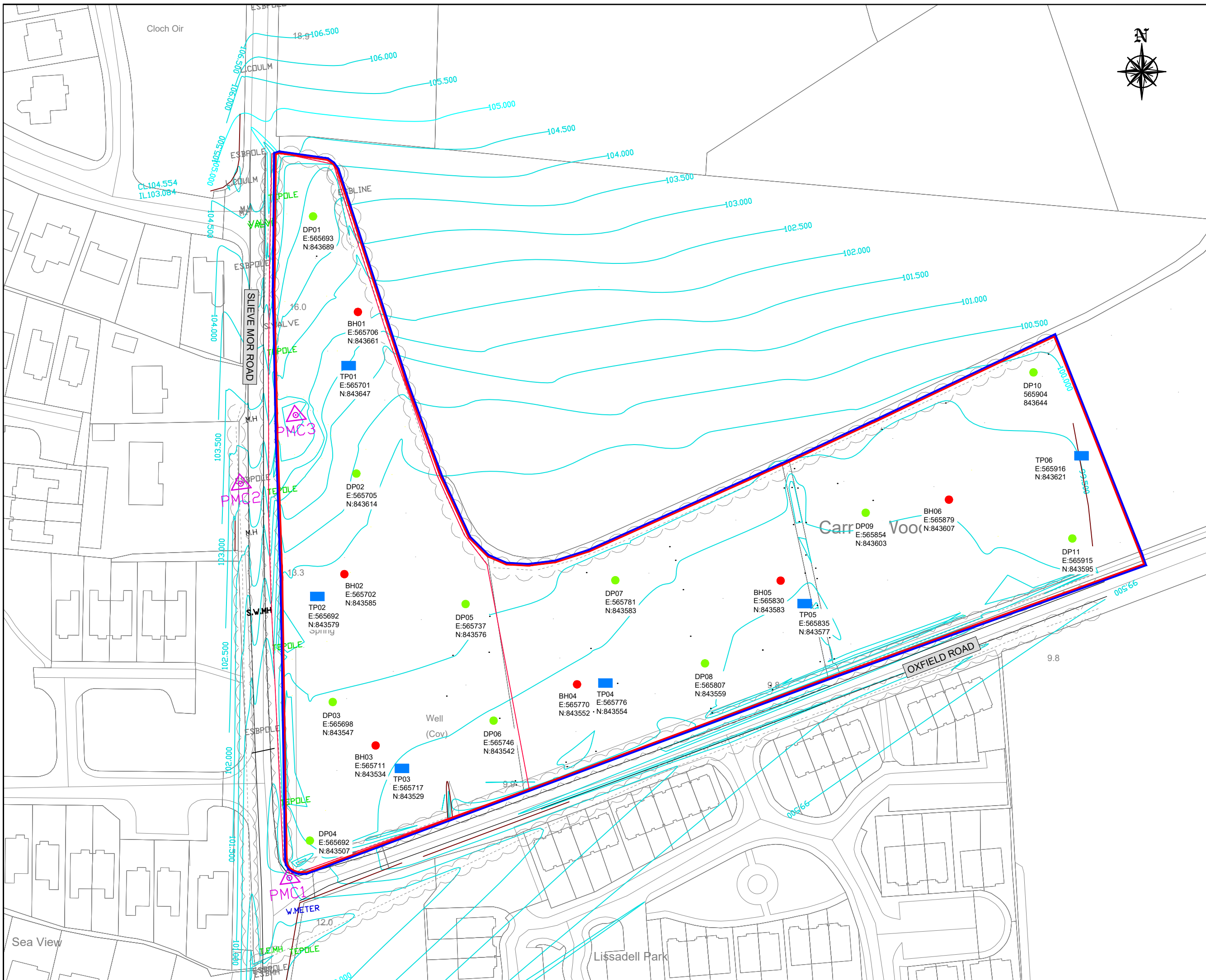
Figure 14 H:\2023 SO 102 Carney\TP 06 (1).JPG



Figure 16 H:\2023 SO 102 Carney\TP 06 Per Test.JPG



Appendix 08 Site Plan



NOTES

- GENERAL NOTES:**
- 1 FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
 - 2 ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
 - 3 ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
 - 4 THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.

LEGEND

- SITE BOUNDARY OUTLINE —
- LAND OWNERSHIP BOUNDARY OUTLINE —
- TRIAL PIT LOCATION (6 No.) ■ TP
- BOREHOLE LOCATION (6 No.) ● BH
- HEAVY DYNAMIC PROBE LOCATION (11 No.) ● DP

Red Line Area:-
21,537 m² 2.154 Hectares

ITM Co-Ordinates of site:-
565696, 843573

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OS Ireland Map No. 0848-C, 0848-D

T.01	Issued for SI TENDER	PC	MF	MF	08.02.23
Rev.	Modifications	By	Chkd	Aprvd	Date

Client Sligo County Council
Comhairle Chontae Shligigh

Project
**PROPOSED HOUSING DEVELOPMENT
AT CARNEY, CO. SLIGO**

Stage
PRELIMINARY

Title
EXISTING SITE LAYOUT MAP

Scale
1:1000

Surveyed	Drawn	Checked	Date
OSI	PC	MF	FEB '23

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Drawing No.	Revision
6972-JOD-XX-DR-C-100-002	T.01



Appendix 09

AGS Data

"GROUP", "BKFL"
 "HEADING", "LOCA_ID", "BKFL_TOP", "BKFL_BASE", "BKFL_DESC", "BKFL_LEG", "BKFL_DATE", "BKFL_REM", "FILE_FSET"
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APPENDIX III
METHOD STATEMENT



Sligo County Council
Comhairle Chontae Shligigh

Proposed Housing Development at Carney, Co. Sligo

Outline Method Statement

6972-JOD-XX-RP-C-0002

January 2024



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DOCUMENT APPROVAL

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DOCUMENT TITLE	Outline Method Statement	

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1 INTRODUCTION

This report has been prepared to give an outline construction method for the Carney, Co. Sligo. The proposed development consists of the construction of 25 no. new residential units. The dwellings are a mixture of semi-detached dwellings, detached dwellings, and terraced dwellings. The development also includes a village green, and a public open space by the burnt mound.

The proposed site, which consists of approximately 1.084 hectares, and is a greenfield site. The site is located in Carney, Co. Sligo, north of Oxfeld Rd and west of Slieve Mor road. It is proposed to access the site directly by vehicle from Slieve Mor at the western boundary of the site. There will be pedestrian traffic permeability at the southern boundary to Oxfeld road. A footpath / cycleway in line with the Sligo Active Travel route will be constructed along the western and southern boundary of the site as part of the works.

2 METHOD STATEMENT

This Method Statement is prepared to give an indicative outline construction methodology for the works associated with the proposed development.

The construction tasks will be as follows.

2.1 Site Clearance

- Set up site boundary fencing where required.
- Prepare Contractors compound including parking, offices, and welfare facilities.
- A small drain running along the western and southern boundaries of the site will be culverted in line with the *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters* (2016) prior to any other construction works occurring on site.
- Clear and stockpile topsoil on site, with clear delineation of the boundary of the spoil heap.
- Carry out bulk earthworks to bring site levels to design level.

2.2 Building Construction

- Excavate for foundations, pumping out groundwater into the culverted stormwater drain when necessary. If pumping is required it will be carried out in line with the *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters* (2016).
- Construct building strip foundations in accordance with the most current version of *HomeBond House Building Manual*.
- Construct service connections in accordance with the most current version of *HomeBond House Building Manual*.

- Construct rising walls and ground floor slabs in accordance with the most current version of *HomeBond House Building Manual*.
- Construct above ground portion of buildings in accordance with the most current version of *HomeBond House Building Manual*.

2.3 Site Services

- Construct main storm and foul water drainage runs including manholes in accordance with the *Irish Water (Uisce Éireann) Code of Practice*.
- Install attenuation tanks, petrol interceptor and flow control valve in accordance with the *Irish Water (Uisce Éireann) Code of Practice*.
- Construct tie-ins to existing Irish Water (Uisce Éireann) storm and foul public networks in accordance with the *Irish Water (Uisce Éireann) Code of Practice*.
- Construct watermain network in accordance with the *Irish Water (Uisce Éireann) Code of Practice*.
- Construct electrical ducting network in accordance with *I.S. 10101:2020 - National Rules for Electrical Installations Edition 5.0* and erect lighting columns in accordance with the *Code of Practice for Public Lighting ET211*.

2.4 Landscaping and Finishing

- Construct garden walls and fences.
- Place topsoil to gardens and public green spaces.
- Construct development roads, footpaths kerbing in accordance with the *TII Specification for Road Works*.
- Plant new trees and hedging in accordance with the Landscaping Plan (See Appendix III of the screening reports).
- Level and seed topsoil.

3 NOTES

The document should be read in conjunction with the associated drawings, layouts and specifications. This document is not intended to be used as a construction stage document.