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MULTIDISCIPLINARY CONSULTING ENGINEERS

W370: WICKLOW FIRE STATIONS

SITE REPORT - BALTINGLASS

For
Wicklow County Council

19 June 2023

NOTICE

DOCUMENT CONTROL & HISTORY

OCSC Job No: W370	Project Code	Originator	Zone Volume	Level	File Type	Role Type	Number	Status / Suitability Code	Revision
	W370	OCSC	BG	XX	RP	C	0001	S4	P01

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P01	S4	Fintan Molloy	RM	SD	19/06/2023

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1 LOCATION & DESIGN STATEMENT

LOCATION & TOPOLOGICAL SURVEY

The site for the proposed Baltinglass Fire Station was selected by Wicklow Fire Service at Sli na Slaine.
The site location map below is included in the Stage 1 document pack Drg No 22119-BG_PA_01-01.

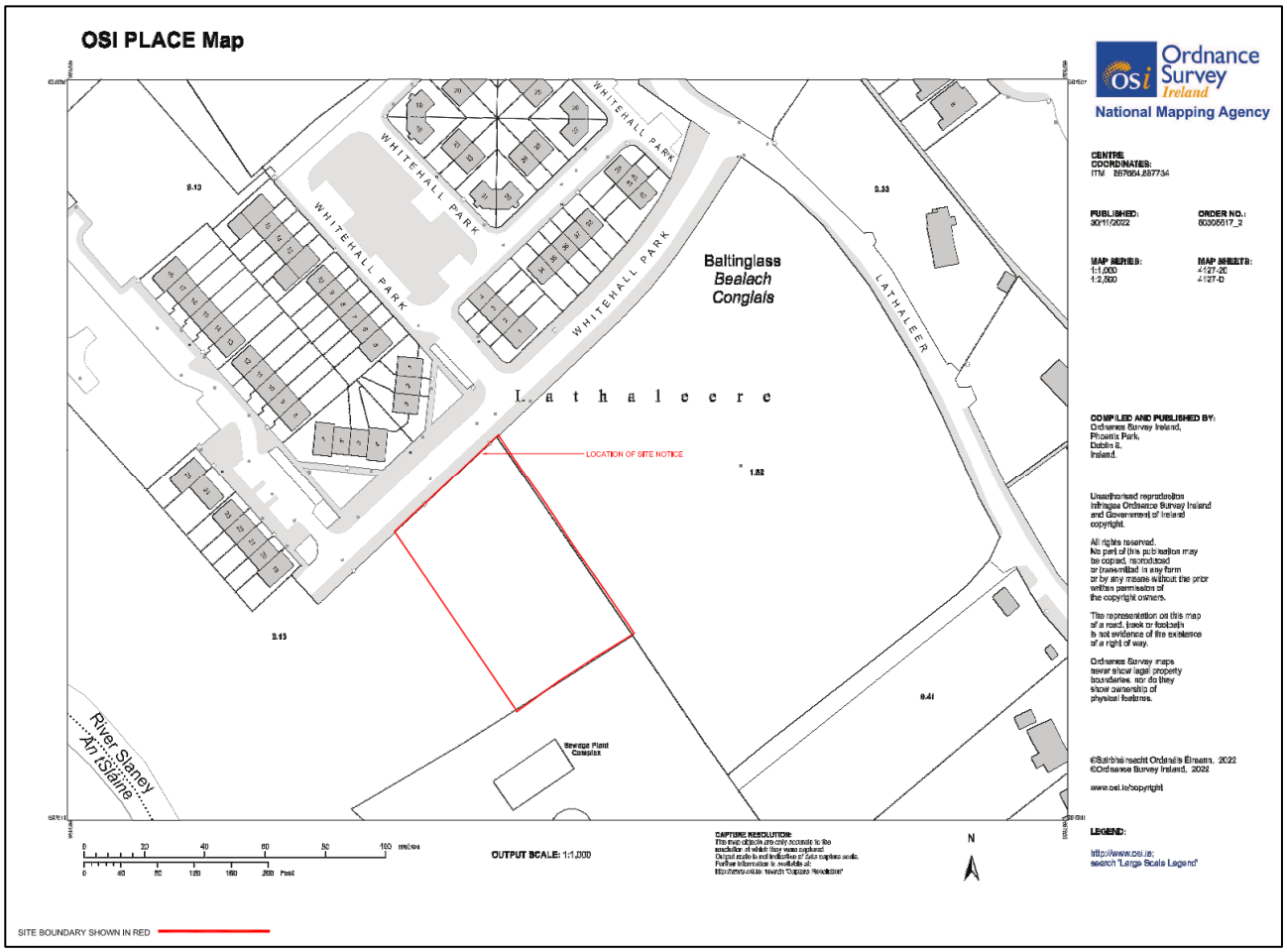

Figure 1: Extract from NODE Site Location Plan Drg No 22119-BG_PA_01-01

Causeway Geotech were engaged by OCSC on behalf of WCC to carry out a topographical survey; details are included in the Stage 1 pack, Drg No 2217_T_Baltinglass_Rev0.

Figure 2: Causeway Geotech Topographical survey, Drg 2217_T_Baltinglass_Rev0

DESIGN STATEMENT

The Stage 1 information includes a Design Statement from NODE Architecture including sections on Site Appraisal, Design Principles and Building Design. This statement includes a number of 3D visualisations/renderings.

Figure 3: Extract from NODE Architecture Design Statement, Doc No 22119-BG_PA_Design Statement

2 INITIAL RISK SCREENING

ECOLOGY AND ENVIRONMENT

The following screening reports have been carried out and are included in the Stage 1 submission documents:

- Ecological Impact Assessment (EclA) report, document W370-OCSC-BG-ZZ-RP-YE-803. The conclusion of the report is:

  "The proposed construction of a new fire station, a fire training tower, a concrete water tank for fire training and associated lighting, drainage, and entrance infrastructure in Baltinglass, County Wicklow will have no significant impacts on both the immediate vicinity and protected areas such as SACs and SPAs.

  There will be a permanent loss of some habitat within the site but, as these are commonly occurring and widespread habitats within the area, the loss will not be significant. Given the nature of the development, its scale and the localised and temporary nature of the construction effects identified as potential sources, it is concluded that the proposed project is not foreseen to give rise to any significant adverse effects on any designated European sites, alone or in combination with other plans or projects."
- Appropriate Assessment (AA) screening report, document W370-OCSC-BG-ZZ-RP-YE-804. The conclusion of the report is:

  "There are no Natura 2000 sites located either within or directly adjacent to the site. The study area has an indirect hydrological link to the Slaney River Valley SAC via overland flow and via the municipal surface water drainage system which will receive surface water from the site following completion of construction and which discharges to the River Slaney. However, given the nature of the development, its scale, and the localised and temporary nature of the construction effects identified as potential sources, it is concluded that the proposed project is not foreseen to give rise to any significant adverse effects on any designated European sites, alone or in combination with other plans or projects.

  This evaluation is made in view of the conservation objectives of the habitats or species for which these sites have been designated. Consequently, a Stage Two Appropriate Assessment is not required for the project."
- Environmental Impact Assessment (EIA) screening report, document W370-OCSC-BG-ZZ-RP-YE-805

  "Based on the size, nature and scale of the proposed project, it is considered that the overall impact on the receiving environment will be low subject to implementation of all mitigation measures detailed in the CEMP (Construction Environmental Management Plan)."

Table 1: Environmental Impact Assessment of Projects Screening Checklist

Checklist	Response
Will there be a large change in environmental conditions?	No
Will new features be out-of-scale with the existing environment?	No
Will the impact be unusual in the area or particularly complex?	No
Will the impact extend over a large area?	No
Will there be any potential for transboundary impact?	No, subject to implementation of the CEMP.
Will many people be affected?	Minor, short-term impacts. Overall positive impact in creating this essential service.
Will many receptors of other types (fauna and flora, businesses, facilities) be affected?	There will be a short time impact on flora and fauna during the works; however, this will be reduced subject to implementation of an appropriate CEMP.
Will valuable or scarce features or resources be affected?	No
Is there a risk that environmental standards will be breached?	No, subject to implementation of an appropriate CEMP.
Is there a risk that protected sites, areas, and features will be affected?	No, subject to implementation of mitigation measures.
Is there a high probability of the effect occurring?	No
Will the impact continue for a long time?	Temporary to short term.
Will the effect be permanent rather than temporary?	No
Will the impact be continuous rather than intermittent?	Temporary to short-term during construction.
If it is intermittent, will it be frequent rather than rare?	-
Will the impact be irreversible?	No
Will it be difficult to avoid, or reduce or repair or compensate for the effect?	No

HAZAEDOUS MATERIALS

A review of OSI and other historical maps suggests that the site has remained undeveloped for at least the past 150 years.

The ground investigation included assessment and testing of samples for waste classification which is covered in section 7.5 and Appendix I of the report. It concludes that the soil can be classified as non-hazardous material and that "the laboratory results of the WAC testing indicate that the soils from the site are suitable for disposal as inert waste to an appropriate licenced facility". This comes with the usual proviso that "potential areas of localised contamination outside the areas of the investigation cannot be discounted".

ARCHEOLOGY

A review of OSI and other historical maps suggests that the site has remained undeveloped for at least the past 150 years.
The Baltinglass town plan 2022-2028 zones the site category E – Employment, the objective being "to provide for the development of enterprise and employment".
It is not considered that an archaeological assessment will be required.

FLOOD

A stage 1 Flood Risk Assessment has been carried out and the report, W370-OCSC-BG-XX-RP-C-0010, is included in the stage 1 submission pack.
It concludes that the site is not at risk of flooding from Fluvial, Coastal, Pluvial or Groundwater sources.

Table 3.2 of the PSFRM Guidelines, reproduced in *Figures 5* below, illustrates the types of development that are considered appropriate to each flood zone, and those that would be required to meet the criteria of a Justification Test, which establishes the criteria under which desirable development of a site within a floodplain may be warranted.

Table 3: Matrix of Vulnerability Vs. Flood Zone

	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable Development	Justification Test	Justification Test	Appropriate
Less Vulnerable Development	Justification Test	Appropriate	Appropriate
Water-compatible Development	Appropriate	Appropriate	Appropriate

Therefore, based on the table above, *Highly Vulnerable Development*, such as the essential infrastructure like Fire Stations is classified as **'appropriate'** if it is located within Flood Zone C.

Figure 4: Extract from Flood Risk Assessment Report, W370-OCSC-BG-XX-RP-C-0010

3 Ground Investigation

FIELD WORK

A geotechnical and ground investigation of sub-soil conditions in the proposed development area has been carried out by Causeway Geotech Ltd under the instruction of OCSC, on behalf of Wicklow County Council.

The fieldwork conducted between 19th and 24th April 2023 comprised the following.

- Six dynamic probes (DP)
- Seven machine-dug trial pits (TP).
- Infiltration test performed in two trial pits.
- Indirect California Bearing Ration CBR test at six locations.

Figure 4 shows the location of the DP and TP

Figure 5: Trial Pit and Dynamic Probe locations

LABORATORY WORK

Samples from the fieldwork investigations were subjected to laboratory testing which comprised:

- 3 No. The moisture content of the soil
- 3 No. Liquid and plastic limits of soil
- 3 No. Particle size grading
- 2 No. California Bearing Ratio (CBR)
- 3 No. pH value of soil
- 3 No. Sulphate content water extract.

FINDINGS

The full ground investigation report is included in the Stage 1 information but what follows is a synopsis of the main findings.
"Made ground was recorded in all the trial pits except TP04 and TP05. The depth of the fill was ranging from 0 to 0.6 mbgl. This consisted of stiff brown slightly sandy slightly gravelly clay soil with some brick fragments and rare sheets of plastics.

Fluvial deposits were encountered, typically medium-dense sands and gravels interspersed with layers of sandy gravelly clay or silt, with cobble content ranging from low to medium to high below topsoil (0.6m to 3mbgl). Hard rock/weathered stone was not encountered in the trial pits.

The suitable bearing stratum depths are suggested based on the dynamic probe test. The findings suggest that spread foundations are considered suitable with estimated allowable bearing pressure (ABP) between 100kPa and 150 kPa achievable at depths between 1.2m and 1.5m in medium-dense sand gravel. Some places indicate even higher ABP (TP03DP 250kPa), however TP01 and TP02 did not encounter competent strata to 3.50 to 4.00 mbgl, with blows of 0-3 indicated in the upper 3.00-4.00m. This indicates that traditional shallow foundation would not be suitable for any structural elements proposed for this location and alternate foundation solutions should be sought, such as piled foundation or raft foundation; it is intended to carry out further trial pits at stage two to confirm the extent of this poor ground. Construction recommendations on the foundation type and corresponding ABP, and suitable stratum depths are stated in Table 1. As the made ground is relatively thin across the site (>0.6m) a ground-bearing slab would be suitable, the made ground is to be excavated and replaced, and tested with engineered fill as per earthwork specification.

BEARING CAPACITY

Table 2: Construction Recommendations

Borehole	Depth below EGL* to suitable bearing stratum	Estimated ABP (kPa)	Strata description	Foundation type	Ground floor construction	Groundwater
TP/DP01	>4.00m**	125-150	Assumed medium dense SAND/GRAVEL	Piled	Suspended	Not encountered to 3.30m
TP/DP02	>3.50m**	125-150	Assumed medium dense SAND/GRAVEL	Piled	Suspended	Not encountered to 3.00m
TP/DP03	2.00m	250-300	Dense GRAVEL	Trench fill (with trench support and possible sump pumping)	Suspended	Not encountered to 2.80m
TP/DP04	1.20m	100-125	Medium dense GRAVEL	Strip & Pad	Ground bearing	Not encountered to 2.60m
TP/DP05	1.50m	150-175	Medium dense GRAVEL	Strip & Pad	Ground bearing	Not encountered to 2.00m
TP/DP06	1.20m	150-175	Medium dense SAND	Strip & Pad	Ground bearing	Not encountered to 2.60m

*Existing Ground Level
**Strata assumed to be dense sand/gravel from geological mapping

Given the above, the proposed solution includes:

- a suspended ground floor slab in the accommodation area but a ground supported slab in the appliance bay.
- Strip and pad foundations generally but with significant trench fill at the eastern side of the building.

A more detailed study will be carried out during stage 2 and potentially additional ground investigations will be required to optimise the foundation designs.

Findings from the CBR test reveal that upper strata across the site would be suitable for the placement of road makeup layers as most areas across the site have CBR values in excess of 4.1% at the depth below topsoil or made ground, with the exception of TP05, which indicated a CBR value of 1.9% at a depth of 0.6mbgl.
As the trial pit at TP05 suggests competent ground at 1.5 mbgl, it is recommended that further testing should be undertaken either at stage 2 or during the course of construction, and any area indicating lower CBR values than expected will have a capping layer and sub-base layer at thicknesses according to figure 5 below.

TABLE 1: CAPPING LAYER DEPTH

THE MINIMUM REQUIRED THICKNESS OF NON-FROST SUSCEPTIBLE CAPPING MATERIAL IS SHOWN HEREUNDER:

CBR SUBGRADE (%)	<2.5	2.5	3	4	5-15	>15
THICKNESS OF CAPPING LAYER (mm)	SPECIALIST GEOTECHNICAL ADVISE REQUIRED	600	350	300	250	150

A TOTAL OF 4 CBR TESTS ARE TO BE CARRIED OUT UNDER ROAD SURFACES AT LOCATIONS SPECIFIED BY THE ENGINEER

Figure 6: Capping layer depth v CBR Test Results, see Drg W370-OCSC-BG-XX-DR-C-0701

SOIL PERMEABILITY

The findings from the soakaway test indicate that the low permeability fine-grained soils in SA01 are considered to be poor infiltration media and would be deemed unsuitable for the implementation of infiltration drainage systems. The rates of infiltration in TP02 however, coupled with the soil description imply that the subsoil at this location may be considered suitable media for an infiltration drainage system, Table 3 indicates the recorded infiltration rates. This information has informed our drainage strategy, see Drainage report W370-OCSC-BG-XX-RP-C-00xx.

Table 3: Summary of Soakaway Test Results

GI Location	Strata	Infiltration rate (m/h)
TP02	Sandy silty GRAVEL	0.101
SA01	Sandy gravelly CLAY	0.019

HAZARDOUS MATERIALS

The laboratory test of the waste classification indicates that the soils from the site are suitable for disposal as inert waste to an appropriately licensed facility. CBR test undertaken on samples at 1.00 m indicates relatively high values of 25% and 38% indicating that the granular soils present would be suitable for re-use as a fill on site. Seasonal variation in the groundwater table will affect the natural moisture content of these soils and will affect their suitability for re-use.

GROUNDWATER

Groundwater was not encountered during the excavation of trial pits or soakaway pits.

4 SERVICES

WATER, DRAINAGE AND SEWAGE DISPOSAL

Existing records for the local area have been obtained from Irish Water and additional site investigation works were commissioned.
The full report W370-OCSC-BG-XX-C-0011 is part of the Stage 1 submission but based on the received data and the conducted site investigation, it is established that there is:

- An existing wastewater network running north of the site along the White Hall Park Road. The said existing network is 225 mm diameter and drains to the Baltinglass WWTP.
- An existing 100 mm diameter watermain running north of the site running along the White Hall Park Road.
- An existing surface water pipe running in the close vicinity (approximately 25m) from the western boundary of the proposed development. The existing pipe is 225 mm diameter and ultimately drains to the river Slaney.
- The proposed site is suited for infiltration solutions for the surface water drainage.

Further information regarding the proposed design is available in the report.

ELECTRICITY

Contact has been made with ESB and ESB Network maps obtained for the site.
From review of the ESB maps, Baltinglass has ESB infrastructure in the vicinity of the site with overhead lines as shown below. An ESB connection will be made to local ESB substation this will be agreed with ESB when the Application is made. The site will have an ESB incoming connection point.

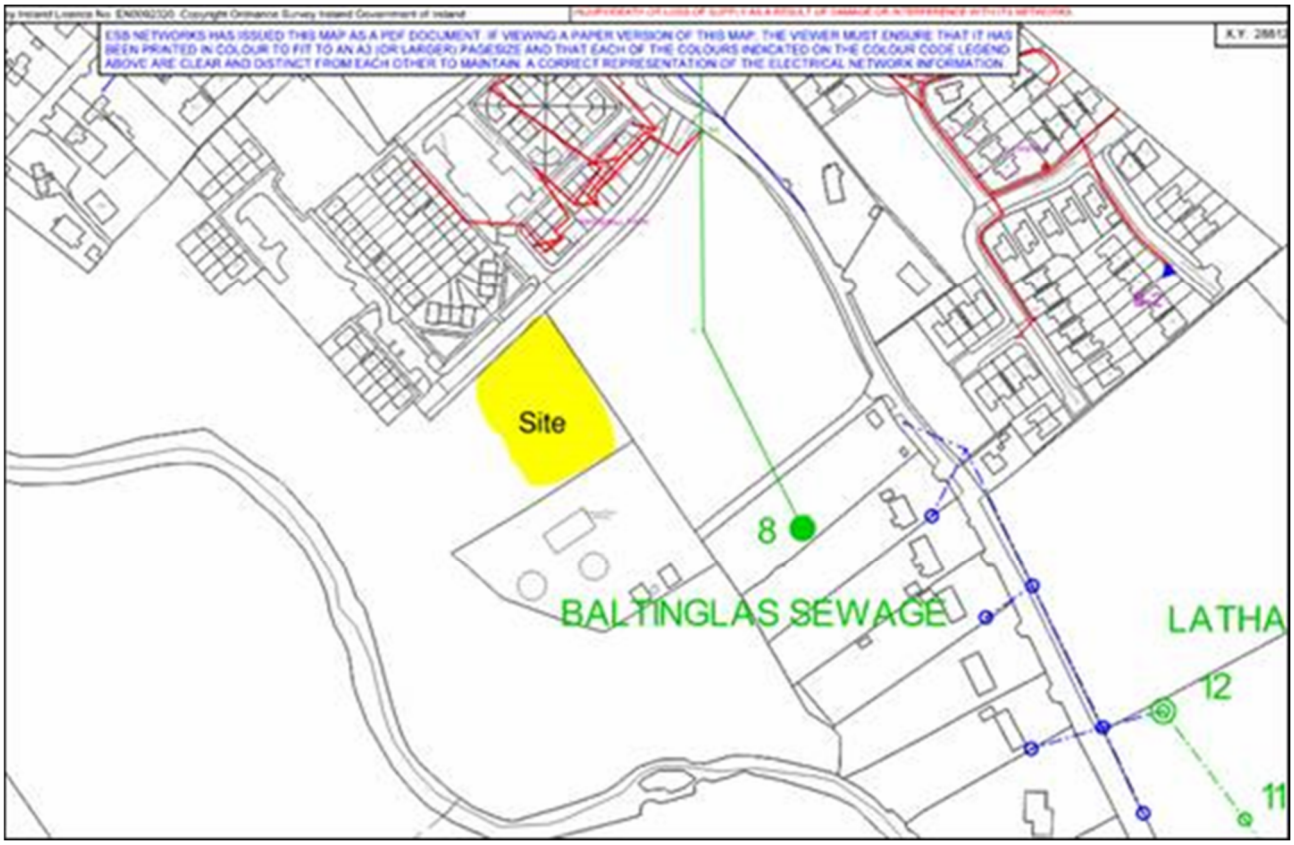

Figure 7: ESB Networks Infrastructure

GAS

Contact has been made with GNI and Gas Network maps obtained for the site.

From review of the GNI map, there is no gas infrastructure in the vicinity of the site. The closest existing line is a medium pressure line across the Slaney River.

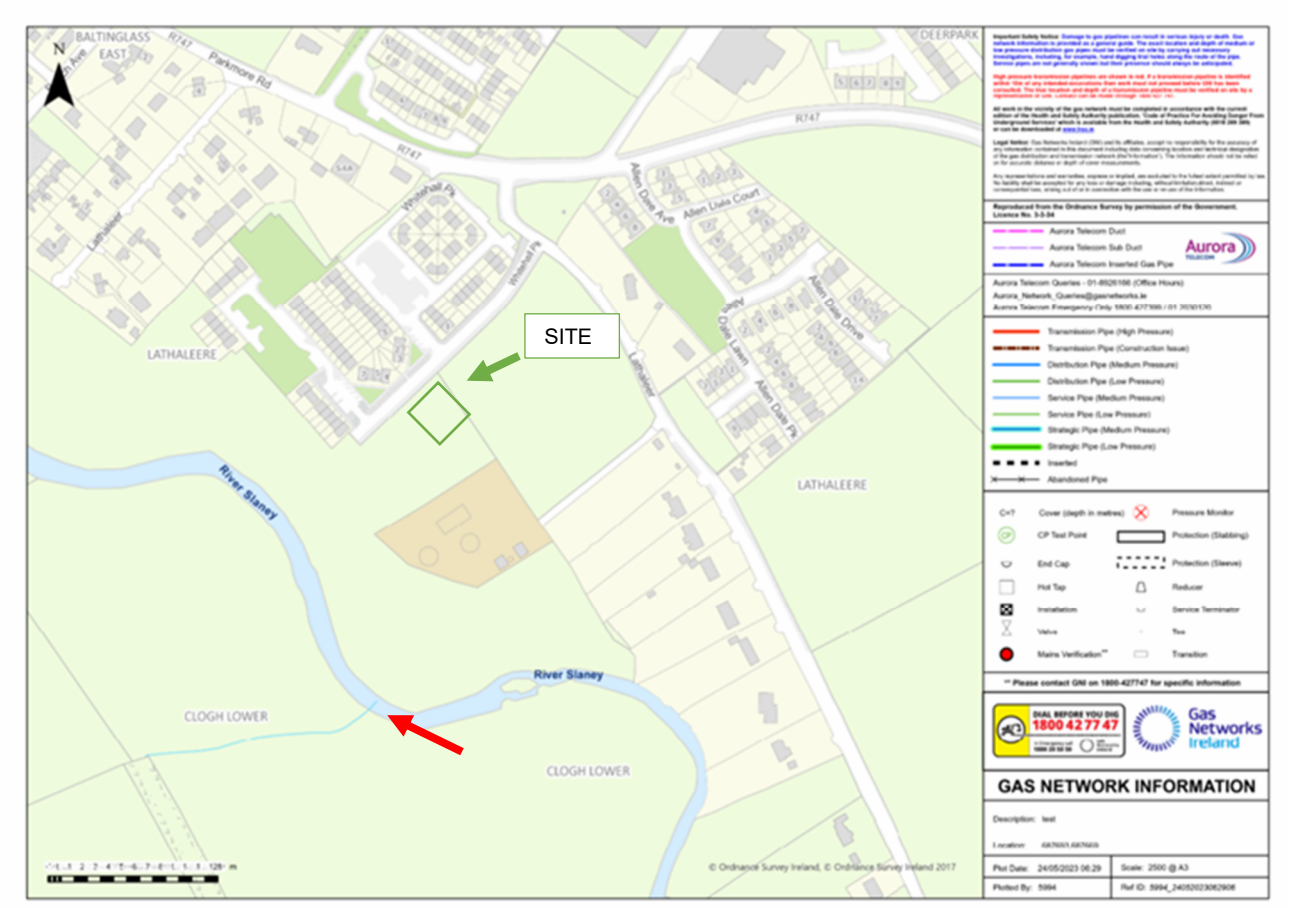

Figure 8: GNI map showing the closest existing gas line to site.

OTHER SERVICES

We have engaged with telecommunications providers and can confirm the availability of broadband infrastructure adjacent to the site as shown below in Figure 8.

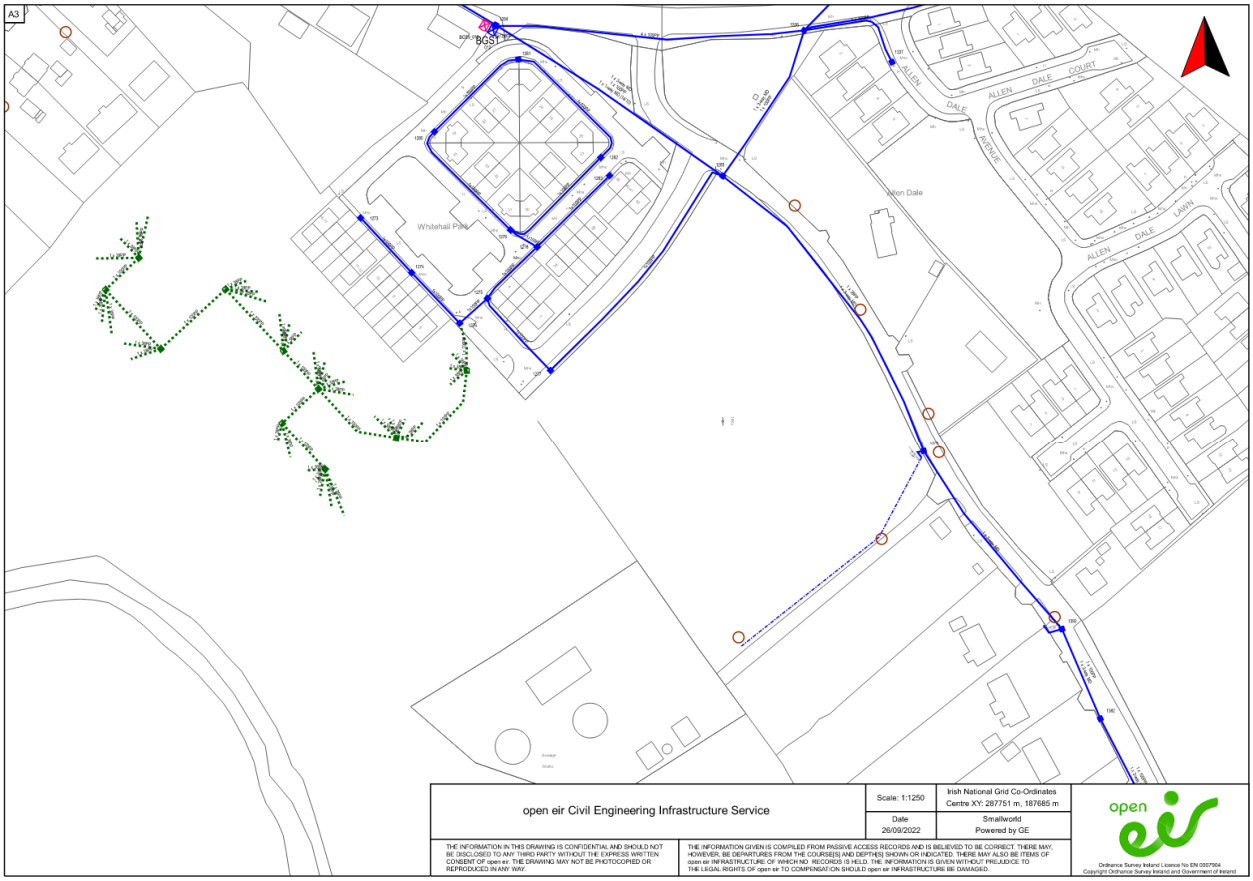

Figure 9: Open EIR Civil Engineering Infrastructure

5 ACCESS

ROAD DESIGN

The extent of roads associated with the project are limited in scale and have been designed in accordance with the key standards including the Design Manual for Urban Roads and Streets (DMURS) and the National Cycle Manual (NCM). The key design aspects are summarised as follows:

The proposed development includes 2 no. new entrances on the south eastern side of Sli na Slainte, to facilitate access to the proposed parking area, hardstanding area to the rear and proposed structure where the fire tenders will be stored. This will involve modification of the existing footpath and cycle track to facilitate. The former will be facilitated by installation of drop kerb crossings with tactile paving provided. The latter will see the cycle track ramp down to road level across the proposed entrances before ramping back up, in accordance with the National Cycle Manual detail for transition from cycle track to cycle lane and for side roads general arrangement. Corner radii at the proposed entrances are reduced to between 1-3m in line with Section 4.3.3 of DMURS.

An assessment of visibility splays for the proposed entrances has been carried out in accordance with Section 4.4.5 of DMURS which confirms there is sufficient visibility from each.

The internal road is short in length, facilitating access to car parking and the training yard. As a result, its width is 6m to allow sufficient space to manoeuvre to and from the perpendicular spaces proposed. Swept path analysis has been carried out for a typical fire tender to confirm it can access, egress and manoeuvre within the site appropriately.

Refer to the following drawings for further detail:

- W370-OCSC-BG-XX-DR-C-0702 (General Arrangement of Proposed Roads);
- W370-OCSC-BG-XX-DR-C-0703 (Roads Details & Sections);
- W370-OCSC-BG-XX-DR-C-0731 (Swept Path Analysis – Fire Tender);

In terms of traffic impact, the trips associated with the proposed facility will be low given the expected workforce. Emergency vehicle movements, while essential, will be similarly low relative to typical traffic levels on the wider public road network. On that basis, the associated traffic impact is considered to be negligible.

6 COST REPORT

A preliminary budget has been produced by Murray & Gillespie Quantity Surveyors.

This is summarised in the Cost Plan on form FSC2 attached in Appendix A: Cost Plan – Form FSC2.

7 VERIFICATION

This report was compiled and verified by:

Fintan Molloy CEng MIEI

Senior Engineer

O'Connor Sutton Cronin & Associates

Appendix A COST PLAN – FORM FSC2

FORM FSC 2 **FIRE STATION CONSTRUCTION - COST PLAN**

FIRE AUTHORITY _____

FIRE STATION BALTINGLASS FIRE STATION

SUMMARY COST PLAN

Element Groups	Element Group Cost €	Element Group Cost per m² of floor area €	Comments
(19) Building Substructure	170,213.20	547.31	
(29) Building Structure / CONTINGENCY	303,309.00	975.27	INCL 50K CONTINGENCY
(39) Building Structure Completion	125,478.00	403.47	
(49) Building Finishes	449,511.70	1445.38	
(59) Building Services (Piped and Ducted)	124,500.00	400.32	
(69) Building Services (Mainly Electrical)	134,500.00	432.48	
(79) Building Fittings	127,050.00	408.52	
(90) Siteworks / TRAINING TOWER	515,657.50	1,658.06	INCLS TRAINING TOWER
(0-) Project - indirect costs (preliminaries, insurance, etc.)	210,000.00	675.24	
Sub Total	2,160,219.40	6,946.04	
Add for VAT	291,629.62		
Total Building Cost	2,451,849.02		
Other Costs: (I) Consultants' Fees			
(ii) Site Acquisition			
(iii) Legal Costs			
(iv) Miscellaneous Costs (Specify)			
Total Project Cost			

Return this form with Standard Cost Plan (National Standard Building Elements)

Signed _____
County Secretary/Town Clerk

Date _____

Contact Person _____

Tel. No. _____

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