HAYES HIGGINS PARTNERSHIP
CHARTERED ENGINEERS • PROJECT MANAGERS

Civil Engineering Services Report

For

Development at Skenagun Infill Project,

Castledermot, Athy, Co. Kildare

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Engineers Ireland cpd Accredited Company
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IHEEM

Contents

DOCUMENT CONTROL SHEET

	Client	Kildare County Council							
	Project Title	Skenagun Infill Project, Castledermott, Athy							
	Project Ref.	23D039							
	Document Title	Planning Report							
	Document No.	23D039-PR 01							
	This Document Comprises	DCS	PD	TOC	Text	-	-	-	Appendices
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Revision	Status	Author	Reviewed By	Approved By	Issue Dates
P	Planning	FS	LM	DH	February 2024

1. Introduction

Hayes Higgins Partnership has been commissioned to prepare a Civil Engineering Services Report for the proposed development Skenagun Infill Project, Castledermott, Athy.

This report was compiled after reviewing the available information on drainage and water supply, reviewing the adjoining developer drawings, and other available information from public bodies. It contains information on the design of the surface water and foul drainage systems to be constructed for the proposed development.

The design of both the surface water and foul drainage systems has been carried out in accordance with the following:

- The Greater Dublin Regional Code of Practice for Drainage Works
- Technical Guidance Document H of the Building Regulations
- The Greater Dublin Strategic Drainage Study (GDSDS)
- DOE Recommendations for Site Development Works for Housing Areas
- BS 8301:1985, Code of practice for Building Drainage
- BS EN 752 External building drainage
- Irish Water Code of Practice and Standard Details (Water & Wastewater)
- South Dublin County Council Sustainable Drainage Explanatory Design & Evaluation Guide 2022
- Kildare CPD 2023-2029
- Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas
- The SuDS Manual (C753)

The foul drainage system for the proposed development is a gravity feed system within the site falling to an existing line. The proposed surface water drainage system is a gravity feed drainage system to a soakaway on site. The surface water system is designed to take the runoff generated by a 1 in 100 year storm event (+30%).

2. Proposed Site

The site in question is located at Shenagun, Castledermot, Co. Kildare. The existing site is a greenfield site predominantly with a small semi-detached house located in the north-east corner and measures approximately 0.24 ha. The topography of the site shows a relatively flat site. The site is bound by residential units to the north and south. Proposed on the site is a new single dwelling and extension to the existing dwelling. Both are single storey. The development will be accessed from the existing road.

3. Surface Water Drainage

Local Authorities require that all developments must include a sustainable urban drainage system, SuDS. There are no surface water sewers in the public area accessible to this site. Permeable paving will be used in the parking areas. A soakaway system is to be used to deal with the surface from the developed site. A soakaway in the rear gardens will be provided for each dwelling. A gravity feed surface water system will fall to the soakaways. The permeable paving will allow natural infiltration within the parking areas. The roof areas will be served by the soakways. The main surface sewers in the proposed development are to consist of 150mm diameter uPVC pipes. Given there is no surface water line currently serving the site the surface run-off is naturally infiltrating, we will be maintaining this approach. The site investigation (contained in Appendix D) noted the site is not suitable for a soakaway however given the current surface run-off to the green areas this will be maintained. The soakways are designed with a low infiltration rate and oversized slightly to accommodate limited infiltration. To alleviate any possible risk of flood the storage is designed for a 1 in 100 year storm (+30%). A 30% increase in runoff due to global warming is included. All possible SuDs mechanisms have been explored, refer to the justification matrix for SuDs in Appendix E. The surface water drains have been designed in accordance with BS EN 752, Code of Practice for Drainage Outside Buildings. Details of the proposed surface water drainage system are shown in Hayes Higgins Partnership drawing within Appendix A and calculations within Appendix B.

4. Foul Water Drainage

The foul drainage system has been designed in accordance with Irish Water Code of Practice and Standard Details for Wastewater, BS 8301:1985, Code of Practice for Building Drainage and the current Building Regulations and Irish Water Code of Practice. The foul drainage system for the development is a gravity feed system falling to an existing foul manhole. The development will not result in a significant increase in foul discharge from the site on the public sewer and we do not anticipate any capacity problems. The main foul sewers in the proposed development are to consist of 100mm diameter uPVC pipes with fall to be chosen throughout to minimise the risk of blockages and to aid maintenance. A Pre-Connection Enquiry form was submitted to Irish Water and A Confirmation of Feasibility received. Refer to appendix C. Irish Water have confirmed the development is feasible without upgrade by Irish Water. Details of the proposed foul sewer system for this site are shown in Hayes Higgins Partnership drawing within Appendix A. Calculations are provided within Appendix B.

5. Water Supply System

There is an existing 100mm diameter UPVC water main on the road east of the site. A service connection from the line is currently contained within the site. This connection will be maintained. This line will be extended as needed to suit. In accordance with requirements air valves and scour valves will be provided around the site as necessary. Hydrants will be provided as directed by the Fire Safety Certificate and Technical Guidance Document B of the Building Regulations 2006. Water saving devices including aerated taps and low water usage appliances will be used in the proposed development in accordance

with best practice. The water supply system has been designed and will be installed in accordance with Irish Water Code of Practice and Standard Details for Water. A Pre-Connection Enquiry form was submitted to Irish Water and A Confirmation of Feasibility received. Refer to appendix C. Irish Water have confirmed the development is feasible without upgrade by Irish Water. The proposed watermain layout and details are shown on Hayes Higgins Partnership drawing within Appendix A.

6. Flood Risk Assessment

A flood risk assessment was undertaken to identify possible sources of flooding and the risk posed to the development, and separately the risk posed to surrounding areas as a result of the development. www.floodinfo.ie was reviewed and the site has not been subjected to previous flooding from the information contained. The site is situated far enough away from the sea not to be subjected to coastal or fluvial. The adjacent public sewers are running down the slope away from the site and have sufficient invert to alleviate the risk. It is intended that all surface water run off generated by the 1in100 year storm will be dealt with via the permeable paving and soakway. Due to all of these factors the risk of flooding is minimal.

7. Services Design Summary

The proposed Surface water drainage system has been set up to ensure that adequate self-cleansing velocities are obtained, in accordance with the Building Regulations, and to comply fully with the Greater Dublin Regional Code of Practice for Drainage Works. The SuDS design for the site is in compliance with current guidelines. Similarly, the proposed Foul drainage system has been set up to ensure that adequate self-cleansing velocities are obtained for partial flows under design loading, in accordance with the Building Regulations and Irish Water Code of Practice and Standard Details for Water & Wastewater.

Appendix A – Proposed Layout Drawings

Appendix B – Drainage Calculations

Job Title: Castledermot **Job Number:** 23D039
Calculation by: LM **Date:** Jan-24
Checked by:

Soakway Design: BRE Digest 365 1-100+30%

	Storm Frequency & Duration	Rainfall (mm)	I Inflow imper. area (m3)	O Outflow from soakaway during rainfall (m3)	Sreq Allowing for infiltration (m3)	Sufficient storage required	ts50 Time to empty half storage vol. (hours)	ts50 < 24 hours
5	M100-5	16.38	2.10	0.02	2.1	pass	4.1	pass
10	M100-10	22.88	2.93	0.04	2.9	pass	5.7	pass
15	M100-15	26.91	3.44	0.06	3.4	pass	6.7	pass
30	M100-30	33.28	4.26	0.13	4.1	pass	8.2	pass
60	M100-60	41.08	5.26	0.25	5.0	pass	9.9	pass
120	M100-120	50.83	6.51	0.50	6.0	pass	11.9	pass
240	M100 - 4hr	71.11	9.10	1.01	8.1	pass	16.1	pass
360	**M100-6 hr**	80.47	**10.30**	**1.51**	**8.8**	**pass**	**17.4**	**pass**
720	M100-12 hr	108.68	13.91	3.02	10.9	pass	21.6	pass

Run-off 0 l/s
Imp. Area 128 m^2 Roof

Soakaway Details

width	10		
depth	1		
length	25		
as50	35	volume	250
		actual vol	100
filtration	0.00000200 m/s	(GRANULAR 40% voids)	

Job Title: Castledermot **Job Number:** 23D039
Calculation by: LM **Date:** Jan-24
Checked by: DH

Proposed Foul Drainage: BS 8301 1985

RESIDENTIAL

SITE COMPRISES

No. of Apartments/houses = 1

DETERMINE AVERAGE DAILY FLOW

Assume foul discharge for each dwelling = 650 litres/day

Average Residential Daily Flow = 0.008 l/s

DESIGN FOR PEAK FOUL FLOW

Assume 26 Discharge Units/Apartment/house - Table 4 BS 8301

Therefore, No. of Discharge Units = 26

PEAK FLOW = 3.0612 l/s - Fig.2 BS 8301

no. people	2	1 person	200 litres/day	
total DU from calc 1937/65 units = 30 average per unit				
total DU from calc 1 bed	18	75	1350	
total DU from calc 2 bed	33	72	2376	
			3726	25.3469388
			0.1	
no. showers	1 flow		0.1	

COLEBROOK - WHITE FORMULA

Q = 3.06 **l/s**

ks = 1.5 **mm**

Kinematic viscosity @ 15 degrees Celsius = 1.141 x 10^{-6} m^2/s

Self Cleansing Velocity= 0.75 m/s

Use 150 **mm Pipe**
@ 1 in 60 **Gradient**

Q = 20.00 **l/s** -

v = 1.132 **m/s** -

Appendix C – Irish Water Confirmation of Feasibility

CONFIRMATION OF FEASIBILITY

Uisce Éireann
Bosca OP448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

Donnacha Reynolds

Kildare County Council
Aras Chil Dara
Devoy Palace
Naas
Kildare
W91X77F

12 June 2023

Our Ref: CDS23004227 Pre-Connection Enquiry
479 Skenagun, Athy, Kildare

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Irish Water has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Multi/Mixed Use Development of 2 unit(s) at 479, Skenagun, Athy, Kildare, (the **Development)**.

Based upon the details provided we can advise the following regarding connecting to the networks;

Water Connection	-	Feasible without infrastructure upgrade by Irish Water
Wastewater Connection	-	Feasible without infrastructure upgrade by Irish Water

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Irish Water.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

Stiúrthóirí / Directors: Tony Keohane (Chairman), Niall Gleeson (CEO), Christopher Banks, Fred Barry, Gerard Britchfield, Liz Joyce, Patricia King, Eileen Maher, Cathy Mannion, Michael Walsh
Oifig Chláraithe / Registered Office: Teach Colvill, 24–26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24–26 Talbot Street, Dublin 1 D01 NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Irish Water is a designated activity company, limited by shares.
Uimhir Chláraithe in Éirinn / Registered in Ireland No.: 530363
IW-H-P-MD
REV013

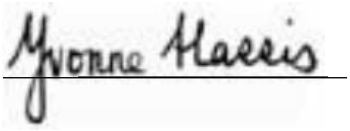
Where can you find more information?

- **Section A -** What is important to know?

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Irish Water's network(s). This is not a connection offer and capacity in Irish Water's network(s) may only be secured by entering into a connection agreement with Irish Water.

For any further information, visit **www.water.ie/connections, email newconnections@water.ie** or contact 1800 278 278**.**

Yours sincerely,



Yvonne Harris
Head of Customer Operations

Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Irish Water's network(s). • Before the Development can connect to Irish Water's network(s), you must submit a connection application and be granted and sign a connection agreement with Irish Water.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Irish Water connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Irish Water's network(s), including works in the public space, must be carried out by Irish Water*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Irish Water's network(s)?	• Requests for maps showing Irish Water's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with ***the Irish Water Connections and Developer Services Standard Details and Codes of Practice,*** available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

Appendix D – SuDs Matrix Document

SUDS/Green Infrastructure feasibility checklist – 23D039 – February 2024

SuDS Measures	Measures to be used on this site	Rationale for selecting/not selecting measure
Source Control		
Swales	N	There is limited space within the site for same.
Tree Pits	N	Tree pits maybe included in landscape design – to be reviewed. Not included in the SuDs calculations, but they will contribute.
Rainwater Butts	TBC	Usage will be reviewed with architect and client.
Rainwater harvesting	TBC	Will be reviewed with the architect and client to see if it is a viable option.
Soakaways	Y	Included for hardstanding roof.
Infiltration trenches	N	Not required.
Permeable pavement	Y	Permeable surfacing will be provided to allow infiltration directly to the ground within car parking.
Green Roofs	N	Not viable due to nature of development
Filter strips	N	Filter strips maybe included in landscape design – to be reviewed. Not included in the SuDs calculations, but they will contribute.
Bio-retention systems/Raingardens	N	Not viable due to nature of development
Blue Roofs	N	Not cost effective over the lifespan due to maintenance.
Filter Drain	N	Not currently proposed.
Site Control		
Detention Basins	N	No available room on site for large bodies of water and poses a potential drowning hazard.
Retentions basins	N	No available room on site for large bodies of water and poses a potential drowning hazard.
Regional Control		
Ponds	N	No available room on site for large bodies of water and poses a potential drowning hazard
Wetlands	N	No available room on site for large bodies of water and poses a potential drowning hazard.
Other		
Petrol/Oil interceptor	N	Not required.
Attenuation tank – only as a last resort where other measures are not feasible	N	Not required.

Appendix E – Site Investigation

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Catherinestown House,
Hazelhatch Road,
Newcastle,
Co. Dublin.
D22 YD52

Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

Ground Investigations Ireland

Skenagun Castledermot

Kildare County Council

Ground Investigation Report

January 2024

Directors: Fergal McNamara (MD), James Lombard, Conor Finnerty, Aisling McDonnell & Barry Sexton
Ground Investigations Ireland Limited | Registered in Ireland Company Regsitration No.: 405726

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DOCUMENT CONTROL SHEET

Project Title	Skenagun Castledermot
Engineer	Hayes Higgins
Client	Kildare County Council
Project No	13167-09-23
Document Title	Ground Investigation Report

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
A	Final	C Ess	S Kealy	S Kealy	Dublin	16 January 2024

Ground Investigations Ireland Ltd. present the results of the fieldworks and laboratory testing in accordance with the specification and related documents provided by or on behalf of the client The possibility of variation in the ground and/or groundwater conditions between or below exploratory locations or due to the investigation techniques employed must be taken into account when this report and the appendices inform designs or decisions where such variation may be considered relevant. Ground and/or groundwater conditions may vary due to seasonal, man-made or other activities not apparent during the fieldworks and no responsibility can be taken for such variation. The data presented and the recommendations included in this report and associated appendices are intended for the use of the client and the client's geotechnical representative only and any duty of care to others is excluded unless approved in writing.

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

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APPENDICES

1.0 Preamble

On the instructions of Hayes Higgins Engineers, a site investigation was carried out by Ground Investigations Ireland Ltd., in October 2023 at the site of the proposed housing development in Skenagun Castledermot.

2.0 Overview

2.1. Background

It is proposed to construct a new housing development with associated services, access road, and car parking at the proposed site. The site is currently greenfield and is situated in Skenagun, Castledermot. The proposed construction is envisaged to consist of conventional foundations and pavement make up with some local excavations for services and plant.

2.2. Purpose and Scope

The purpose of the site investigation was to investigate subsurface conditions utilising a variety of investigative methods in accordance with the project specification. The scope of the work undertaken for this project included the following:

- Visit project site to observe existing conditions
- Carry out 5 No. Trial Pits to a maximum depth of 3.30m BGL
- Carry out 2 No. Soakaways to determine a soil infiltration value to BRE digest 365
- Report with recommendations

3.0 Subsurface Exploration

3.1. General

During the ground investigation a programme of intrusive investigation specified by the Consulting Engineer was undertaken to determine the sub surface conditions at the proposed site. Regular sampling and in-situ testing was undertaken in the exploratory holes to facilitate the geotechnical descriptions and to enable laboratory testing to be carried out on the soil samples recovered during excavation and drilling.
The procedures used in this site investigation are in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007) and B.S. 5930:2015.

3.2. Trial Pits

The trial pits were excavated using a 5T tracked excavator at the locations shown in the exploratory hole location plan in Appendix 1. The locations were checked using a CAT scan to minimise the potential for encountering services during the excavation. The trial pits were sampled, logged and photographed by an

Engineering Geologist prior to backfilling with arisings. Notes were made of any services, inclusions, pit stability, groundwater encountered and the characteristics of the strata encountered and are presented on the trial pit logs which are provided in Appendix 2 of this Report.

3.3. Soakaway Testing

The soakaway testing was carried out in selected trial pits at the locations shown in the exploratory hole location plan in Appendix 1. These pits were carefully excavated and filled with water to assess the infiltration characteristics of the proposed site. The pits were allowed to drain and the drop in water level was recorded over time as required by BRE Digest 365. The pits were logged prior to completing the soakaway test and were backfilled with arising's upon completion. The soakaway test results are provided in Appendix 3 of this Report.

3.4. Surveying

The exploratory hole locations have been recorded using a KQ GEO Technologies KQ-M8 System which records the coordinates and elevation of the locations to ITM or Irish National Grid as required by the project specification. The coordinates and elevations are provided on the exploratory hole logs in the appendices of this Report.

4.0 Ground Conditions

4.1. General

The ground conditions encountered during the investigation are summarised below with reference to insitu and laboratory test results. The full details of the strata encountered during the ground investigation are provided in the exploratory hole logs included in the appendices of this report.

The sequence of strata encountered were relatively consistent across the site and generally comprised;

- Topsoil
- Made Ground
- Cohesive Deposits
- Granular Deposits

TOPSOIL: Topsoil was encountered in all the exploratory holes and was present to a maximum depth of 0.30m BGL.

MADE GROUND: Made Ground deposits were encountered beneath the Topsoil in TP05 and were present to a depth of between 0.25m and 1.0m BGL. These deposits were described as *brown slightly sandy gravelly CLAY.*

COHESIVE DEPOSITS: Cohesive deposits were encountered beneath the Topsoil or Made Ground and were described typically as *firm brown gravelly CLAY with low cobble content* overlying a *firm brown sandy gravelly CLAY with low cobble and boulder content*. The secondary sand and gravel constituents varied across the site and with depth. The strength of the cohesive deposits stayed consistent with depth and was firm up to a maximum of 3.30m BGL. These deposits had some, occasional or frequent cobble and boulder content where noted on the exploratory hole logs.

GRANULAR DEPOSITS: Granular deposits were encountered below the base of the cohesive deposits and were typically described as *greyish brown slightly clayey gravelly SAND.* The secondary sand/gravel and silt/clay constituents varied across the site and with depth, while low or moderate cobble and boulder content was also present where noted on the exploratory hole logs.
The estimated strength of the granular deposits was typically medium dense in the majority of the exploratory holes. It should be noted that in one of the trial pits where granular deposits and groundwater was encountered, the pit experienced instability. This was described either as side wall spalling or as side wall collapse in the remarks section at the base of the trial pit logs.

4.2. Groundwater

Groundwater strikes are noted on the exploratory hole logs where they occurred. We would point out that these exploratory holes did not remain open for sufficiently long periods of time to establish the hydrogeological regime and groundwater levels would be expected to vary with the tide, time of year, rainfall, nearby construction and other factors.

5.0 Recommendations & Conclusions

5.1. General

The recommendations given and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between exploratory hole locations, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for conditions which have not been revealed by the exploratory holes. Limited information has been provided at the ground investigation stage and any designs based on the recommendations or conclusions should be completed in accordance with the current design codes, taking into account the variation and the specific details contained within the exploratory hole logs.

5.2. Foundations

An allowable bearing capacity of 75 kN/m^2 is recommended for conventional strip or pad foundations on the firm cohesive deposits at a depth of 1.0m BGL.

A ground bearing floor slab is recommended to be based on the firm or firm to stiff cohesive deposits with an appropriate depth of compacted hardcore specified by the consulting engineer and in accordance with the limits and guidelines in SR21:2014 +A1:2016 and/or NRA SRW CL808 Type E granular stone fill.
Where the depth of Made Ground/Soft deposits exceeds 0.9m then suspended floor slabs should be considered.

5.3. Excavations

Short term temporary excavations in the cohesive deposits will remain stable for a limited time only and will require to be appropriately battered or the sides supported if the excavation is below 1.25m BGL or is required to permit man entry.
Excavations in the Made Ground will require to be appropriately battered or the sides supported due to the low strength of these deposits.
Any excavations which penetrate the granular deposits will require to be appropriately battered or the sides supported and are likely to require dewatering due to the groundwater seepages noted in the exploratory hole logs in the Appendices of this Report.

The groundwater and stability noted on the trial pit logs should be consulted when determining the most appropriate construction methods for excavations. Generally, where significant excavations are required in water bearing granular deposits a cut-off wall may be more cost effective than extensive dewatering. An assessment by a specialist dewatering contractor is recommended to determine the most cost effective approach to the proposed excavation.

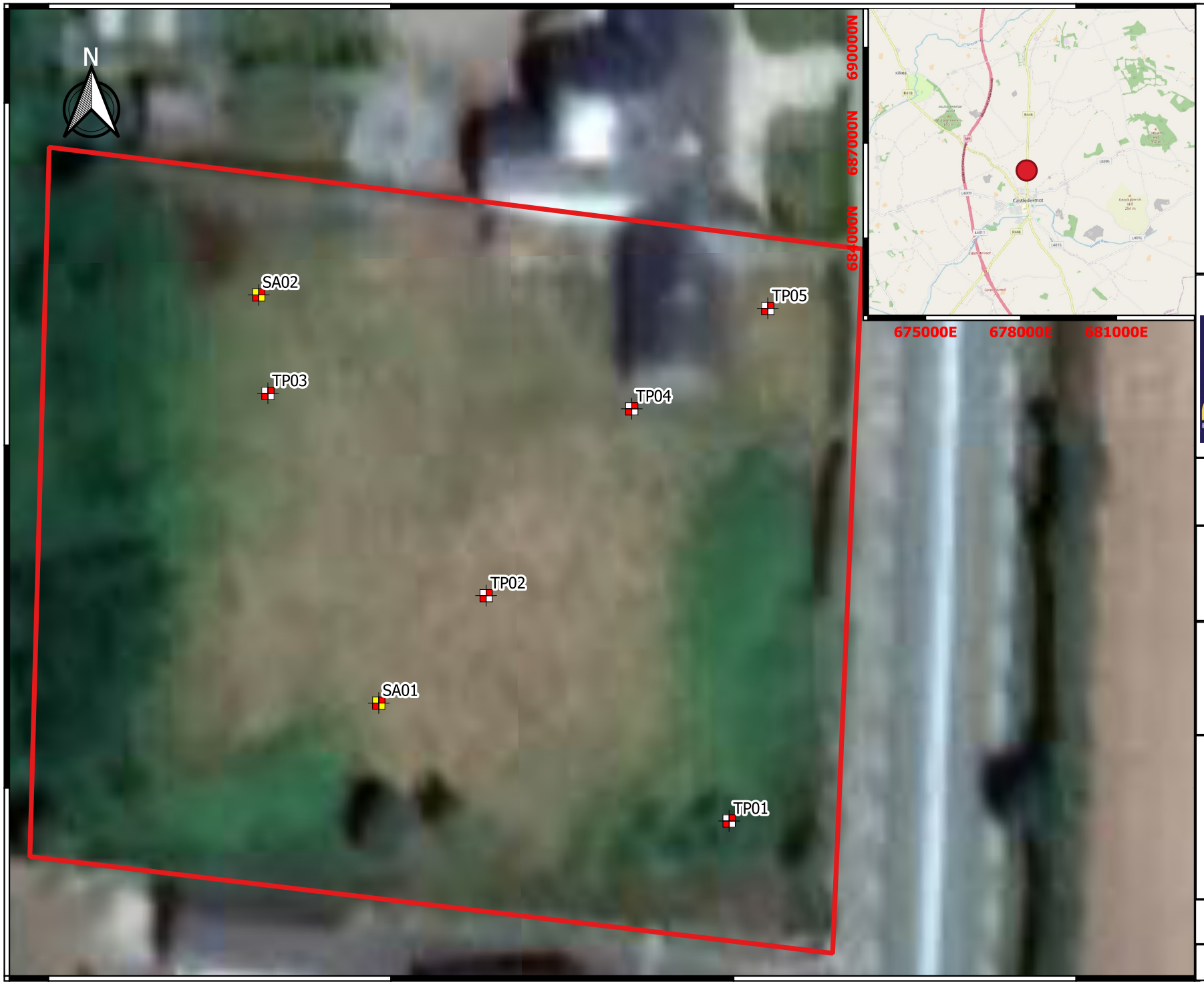
Excavations in the upper cohesive deposits are expected to be excavatable with conventional excavation equipment.
Any waste material to be removed off site should be disposed of to a suitably licenced landfill.

5.4. Soakaway Design

At the locations of SA01 and SA02 the water level dropped too slowly to allow calculation of ‘f’ the soil infiltration rate. These locations are therefore not recommended as suitable for soakaway design and construction.

The recommendations provided in this report should be verified in the design of the proposed buildings, using the full details of the loading conditions and taking into consideration the allowable tolerable settlements/movements that the building can accommodate. The founding strata should be inspected and verified by a suitably qualified engineer prior to construction of the building foundations.

APPENDIX 1 - Site Location Plan



Site Location
Site Boundary
Soakaway
Trial Pit

Client:

HAYES HIGGINS PARTNERSHIP

Project Code:
13167-09-23

Project Title:
Skenagun Castledermot

Drawing Title:
Figure 1 Site Location Plan

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road

0 2 4 6 8 10 m

Drawn By: CE

Date: 24/11/2023

APPENDIX 2 – Trial Pit Records

www.gii.ie

Ground Investigations Ireland Ltd
www.gii.ie

Site Skenagun Castledermot			**Trial Pit Number** SA01
Machine : 5T Excavator **Method :** Trial Pit	**Dimensions** 2.10m x 0.40m x 1.80m (L x W x D)	**Ground Level (mOD)** 80.97	**Client** Kildare County Council	**Job Number** 13167-09-23
	Location 678159.3 E 686124.9 N	**Dates** 05/10/2023	**Engineer** Hayes Higgins	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	Brown slightly sandy slightly gravelly TOPSOIL with rootlets.		
				80.77	0.20			
					(0.40)	Firm brown slightly sandy gravelly CLAY. Gravels are fine to coarse subangular to subrounded.		
				80.37	0.60			
					(1.20)	Firm light brown slightly sandy gravelly CLAY. Gravels are fine to coarse subangular to subrounded.		
				79.17	1.80			
						Complete at 1.80m		

Plan

Remarks

No groundwater encountered.
Trial pit sidewalls stable.
Trial pit complete at 1.80m BGL.
Soakaway test carried out in trial pit upon completoin.
Trial pit backfilled upon completion of soakaway test.

Scale (approx)	Logged By	Figure No.
1:25	AM	13167-09-23.SA01

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site Skenagun Castledermot			**Trial Pit Number** SA02
Machine : 5T Excavator **Method :** Trial Pit	**Dimensions** 2.50m x 0.40m x 1.90m (L x W x D)	**Ground Level (mOD)** 80.91	**Client** Kildare County Council	**Job Number** 13167-09-23
	Location 678152.3 E 686148.8 N	**Dates** 05/10/2023	**Engineer** Hayes Higgins	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Dark brown slightly sandy slightly gravelly TOPSOIL with rootlets.		
				80.61	0.30	Firm brown slightly sandy slightly gravelly CLAY. Gravels are fine to coarse subangular to subrounded.		
					(0.90)			
				79.71	1.20	Firm light brown slightly sandy gravelly slightly silty CLAY. Gravels are fine to coarse subangular to subrounded.		
					(0.70)			
				79.01	1.90	Complete at 1.90m		

Plan

Remarks

No groundwater encountered.
Trial pit sidewalls stable.
Trial Pit complete at 1.90m BGL.
Soakaway test carried out in trial pit upon completion.
Trial pit backfilled upon completion of soakaway test.

Scale (approx)	Logged By	Figure No.
1:25	AM	13167-09-23.SA02

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Site Skenagun Castledermot			**Trial Pit Number** TP01
Machine : 5T Excavator **Method :** Trial Pit	**Dimensions** 2.50m x 1.10m x 2.80m (L x W x D)	**Ground Level (mOD)** 81.37	**Client** Kildare County Council	**Job Number** 13167-09-23
	Location 678179.8 E 686118 N	**Dates** 05/10/2023	**Engineer** Hayes Higgins	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.25)	Brown slightly sandy slightly gravelly TOPSOIL with roots, rootlets and fragments of plastic.		
				81.12	0.25			
0.50	B1				(0.55)	Firm brown gravelly CLAY. Gravels are fine to coarse subangular to subrounded.		
				80.57	0.80			
1.10	B2				(1.10)	Firm light brown gravelly CLAY with low subangular to subrounded cobble content. Gravels are fine to coarse subangular to subrounded.		
				79.47	1.90			
2.00	B3				(0.90)	Medium dense light brown slightly clayey gravelly SAND with low subrounded cobbles. Gravels are fine to coarse subangular to subrounded.		
				78.57	2.80			
2.80	B4					Complete at 2.80m		

Plan

Remarks

No groundwater encountered.
Trial pit sidewalls stable.
Trial pit complete at 2.80m BGL.
Trial pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	AM	13167-09-23.TP01

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Site Skenagun Castledermot			**Trial Pit Number** TP02
Machine : 5T Excavator **Method :** Trial Pit	**Dimensions** 2.80m x 1.00m x 3.30m (L x W x D)	**Ground Level (mOD)** 81.07	**Client** Kildare County Council	**Job Number** 13167-09-23
	Location 678165.6 E 686131.2 N	**Dates** 05/10/2023	**Engineer** Hayes Higgins	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with rootlets.		
				80.77	0.30	Firm brown slightly sandy gravelly CLAY. Gravels are fine to coarse subangular to subrounded.		
					(0.90)			
				79.87	1.20	Firm light brown sandy gravelly CLAY with low subrounded cobble and boulder content. Gravels are fine to coarse subangular to subrounded.		
1.40	B1							
					(2.10)			
3.30	B2			77.77	3.30	Complete at 3.30m		

Plan

Remarks

No groundwater encountered.
Trial pit sidewalls stable.
Trial pit complete at 3.30m BGL.
Trial pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	AM	13167-09-23.TP02

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Site Skenagun Castledermot			**Trial Pit Number** TP03
Machine : 5T Excavator **Method :** Trial Pit	**Dimensions** 3.20m x 1.10m x 3.10m (L x W x D)	**Ground Level (mOD)** 81.02	**Client** Kildare County Council	**Job Number** 13167-09-23
	Location 678152.8 E 686143 N	**Dates** 05/10/2023	**Engineer** Hayes Higgins	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Dark brown slightly sandy slightly gravelly TOPSOIL with rootlets.		
				80.72	0.30			
0.50	B1				(1.00)	Firm brown slightly gravelly CLAY. Gravels are fine to coarse subangular to subrounded.		
				79.72	1.30			
1.50	B2				(1.60)	Firm light brown sandy gravelly CLAY with low subrounded cobble content and gravel lense at 1.40m BGL. Gravels are fine to coarse subangular to subrounded.		
				78.12	2.90			
3.00	B3				(0.20)	Medium dense greyish brown slightly gravelly SAND. Gravels are fine to coarse subangular to subrounded.		
				77.92	3.10			
						Complete at 3.10m		

Plan

Remarks

No groundwater encountered.
Trial pit sidewalls stable.
Trial pit complete at 3.10m BGL.
Trial pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	AM	13167-09-23.TP03

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Site Skenagun Castledermot			**Trial Pit Number** TP04
Machine : 5T Excavator **Method :** Trial Pit	**Dimensions** 2.50m x 1.10m x 2.80m (L x W x D)	**Ground Level (mOD)** 81.35	**Client** Kildare County Council	**Job Number** 13167-09-23
	Location 678174.1 E 686142.1 N	**Dates** 05/10/2023	**Engineer** Hayes Higgins	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Dark brown slightly sandy slightly gravelly TOPSOIL with rootlets.		
				81.05	0.30	Firm brown slightly sandy gravelly CLAY with low subrounded cobble content. Gravels are fine to coarse subangular to subrounded.		
					(1.20)			
1.20	B1							
				79.85	1.50	Firm brown slightly sandy gravelly CLAY. Gravels are fine to coarse subangular to subrounded.		
					(0.20)			
				79.65	1.70	Medium dense greyish brown slightly clayey gravelly SAND. Gravels are fine to coarse subangular to subrounded.		
			Moderate(1) at 2.20m.		(1.10)			▽1
2.80	B2			78.55	2.80	OBSTRUCTION: Sidewall instability/collapse.		
						Complete at 2.80m		

Plan

Remarks

Groundwater encountered at 2.20m BGL with moderate inflow.
Trial pit sidewalls spalling and collapsing below 2.20m BGL.
Trial pit complete at 2.80m BGL. Obstructed due to sidewall instability.
Trial pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	AM	13167-09-23.TP04

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Site Skenagun Castledermot			**Trial Pit Number** TP05
Machine : 5T Excavator **Method :** Trial Pit	**Dimensions** 3.10m x 1.10m x 3.00m (L x W x D)	**Ground Level (mOD)** 81.39	**Client** Kildare County Council	**Job Number** 13167-09-23
	Location 678182 E 686147.9 N	**Dates** 05/10/2023	**Engineer** Hayes Higgins	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.25)	Dark brown slightly sandy slightly gravelly TOPSOIL with rootlets.		
				81.14	0.25	MADE GROUND: Brown slightly sandy gravelly CLAY. Gravels are fine to coarse subangular to subrounded.		
0.50	B1				(0.75)			
				80.39	1.00	Firm light brown slightly sandy gravelly CLAY. Gravels are fine to coarse subangular to subrounded.		
					(0.40)			
				79.99	1.40	Loose to medium dense brownish grey gravelly SAND with low subangular cobbles. Gravels are fine to coarse subangular to subrounded.		
1.50	B2				(1.60)			
3.00	B3			78.39	3.00	Complete at 3.00m		

Plan

Remarks

No groundwater encountered.
Trial pit sidewalls stable.
Trial pit complete at 3.0m BGL.
Trial pit backfilled upon completion.

Scale (approx)	Logged By	Figure No.
1:25	AM	13167-09-23.TP05

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APPENDIX 3 – Soakaway Records

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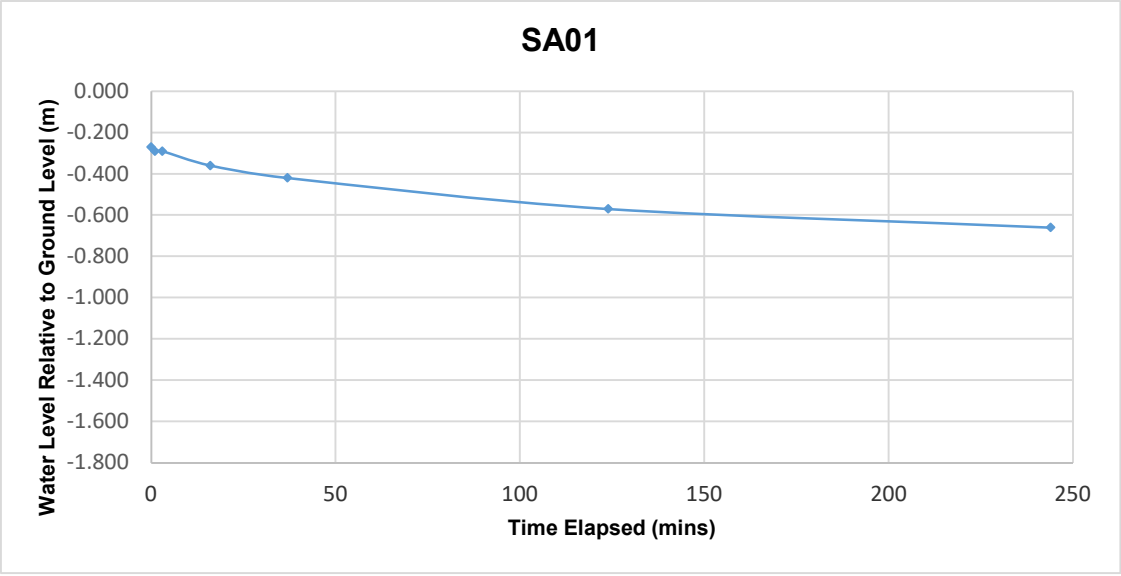
SA01

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 1.20m x 0.40m x 1.80m (L x W x D)

Date	Time	Water level (m bgl)
05/10/2023	0	-0.270
05/10/2023	1	-0.290
05/10/2023	3	-0.290
05/10/2023	16	-0.360
05/10/2023	37	-0.420
05/10/2023	124	-0.570
05/10/2023	244	-0.660

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.27	1.800	1.530	0.6525	1.4175



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SA02

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.5m x 0.40m x 1.90m (L x W x D)

Date	Time	Water level (m bgl)
05/10/2023	0	-0.220
05/10/2023	1	-0.250
05/10/2023	2	-0.260
05/10/2023	27	-0.400
05/10/2023	59	-0.500
05/10/2023	140	-0.660
05/10/2023	232	-0.760

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.22	1.900	1.680	0.64	1.48