

SOIL MANAGEMENT PLAN

**Strategic Housing Development at Ballykeefe,
Raheen, Co. Limerick**

Applicant: DW Raheen Developments Ltd.

SLR Ref: 501.00672.00003
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1.0 Introduction

DW Raheen Developments Ltd. are proposing to undertake a strategic housing development (SHD) at Ballykeefe, Raheen, Limerick.

The site is located in the Raheen area of Limerick City, to the east of the R510 – Regional Road, north of the Inis Mór residential estate and south-west of a disused railway line (i.e. the former railway connection between Limerick and what is now the Irish Cement site to the west of the N69). The proposed development area is approximately 10.44 ha in size and covers all or parts of 5 agricultural fields and associated hedgerows and scrub areas. This Soil Management Plan is provided to support the planning application for the development.

1.1 Purpose of the Report

The purpose of this report is to set out a soil management plan for the construction phase of the proposed development. This report should be read in conjunction with the Site Investigation Report (PGL, 2021) and the Construction Environmental Management Plan - CEMP (Hutch O'Malley, 2022) that are provided within the overall planning application documentation for the proposed development.

1.2 Structure of our Report

Section 2.0 of the report provides a summary of the proposed development. The ground conditions at the site are summarised in Section 3.0. The soil management plan is set out in Section 4.0.

1.3 Authors

The report has been prepared by SLR Consulting personnel:

Mr. Tim Paul (MSc, CEng, MIEI, MICE) Director, SLR Consulting. Mr. Paul is a chartered civil / environmental engineer. He has a postgraduate degree in geotechnical engineering and has over 35 years' experience in advising on geotechnical / ground engineering aspects of infrastructure, building & mining / minerals projects in Ireland and internationally.

2.0 Description of the Development

2.1 Overall Development

DW Raheen Developments Ltd. are seeking a ten year permission for a strategic housing development consisting of the provision of 384 residential house and apartment units on a ca. 10.44 hectare site located in Ballykeefe, Raheen, Co. Limerick.

The site is greenfield land that is enclosed by existing residential development to the south and east, the R510 to the west and open land to the north. Access to the site is provided by an existing entrance off a roundabout on the R510 regional road.

The proposed development will provide as follows:

- 202 no. housing units, comprising a variety of forms to include bungalows, detached, semi-detached and terraced houses. A mix of house sizes are proposed to include 20 no. two bedroom houses, 156 no. three bedroom houses and 26 no. four bedroom houses.
- 182 apartment and duplex units across 25 small scale blocks, 2 to 4 storeys in heights, throughout the development. The apartments and duplexes provide a mix of one, two, three and four bed units, comprising of 10 no. four bedroom duplex units, 10 no. three bedroom duplex units, 6 no. two bedroom duplex units, 18 no. three bedroom apartments, 92 no. two bedroom apartments and 46 no. one bedroom apartments.

The proposed development also includes;

- A childcare facility measuring 761.75m², providing 79 childcare places (55 full time and 24 after school places), located at the south-western edge of the development.
- The provision of 377 no. car parking spaces and 311 secured bicycle parking spaces.
- The provision of 3 no. ESB sub-stations, ancillary services and infrastructure works including foul and surface water drainage, attenuation areas, landscaped public open spaces (approximately 29,500m², or 28.2% of the total site area), landscaping, lighting, internal roads, cycle paths, and footpaths.

The site layout for the proposed development is shown on the drawing in Appendix A.

3.0 Overview of Ground Conditions

3.1 Regional Soils Mapping

3.1.1 Soils Mapping

The Irish Soil Information System (ISIS) project was undertaken by the Environmental Protection Agency (EPA) and Teagasc, and has gathered together existing information and data from soil survey work in Ireland, which has been augmented with a new field data, leading to the production of a new national soil map at a scale of 1:250,000 (www.teagasc.ie/soils).

The ISIS project has identified a number of Soil Associations across Ireland, which are each comprised of a range of soil types (or 'Series'), each of them different in properties, with different environmental and agronomic responses. For each soil type, the properties have been recorded in a database maintained by Teagasc.

The soil association in the vicinity of the site is classified as the Elton Soil Association (1000x), which is characterised by 'Fine loamy drift with limestones. The Elton Soil Association is described as comprising *Luvisols and Surface Water Gleys on drift with mixed limestone and siliceous stones*'¹. The Elton Soil Association is predominantly found in limestone lowland areas of Ireland and is extensive in Co. Limerick (Creamer *et. al.*, 2018). The Luvisols in this association are generally moderately drained, while the surface water gleys are generally moderately to poorly drained. There is a small area in the north of the site where the soil is classified as having derived from Tidal Marsh.

3.1.2 Subsoil Mapping

The subsoils across Ireland have been mapped on a national basis by Teagasc as part of the EPA Soil and Subsoil Mapping Project for the Irish Forestry Soils (IFS) project. The subsoil mapping was undertaken at a national basis using existing Quaternary Geology maps, Publications, remote sensing, field mapping and sampling.

The subsoils in the vicinity of the site have been mapped under the IFS project as glacial till deposits underlying most of the site, and marine estuarine material underlying a small portion of the north of the site. The glacial till deposits are described as having derived from limestone.

3.2 Site Topography

The existing ground levels across the site are shown on Hutch O'Malley Drawing C08 – Existing Site Levels. Ground levels typically range from 10 mOD to 4 mOD. There are areas of Made Ground located in the southwest and northwest of the site.

¹ EPA Report No. 130 (2014), Irish Soil Information System: Synthesis Report Appendix 3 - Soil Association List

3.3 Site Investigation

Priority Geotechnical Ltd. carried out a site investigation on the lands in July 2021. The scope of the investigation comprised:

- 8 no. cable percussive boreholes
- 3 no. rotary core boreholes
- 12 no. slit trenches
- 4 no. infiltration tests
- Insitu SPT tests
- Sampling
- Laboratory testing
- Reporting

Full details of the site investigation are provided in the Site Investigation Interpretative Report, Report Ref. P21161 (PGL, 2021) a copy of which is included with the planning application documentation.

3.4 Ground Conditions

3.4.1 Ground Profile

The site investigation indicates that the overall ground profile at the site comprises topsoil, underlain by glacial till and limestone bedrock. At the northernmost area of the site, soft estuarine clays are present. This ground profile is consistent with the regional soils mapping for the area. There are areas of Made Ground located in the southwestern and northwestern areas of the site.

3.4.2 Topsoil

The trial pit logs and slit trench logs indicate that the Topsoil thickness at the site is typically 0.2 metres (ranging from 0.1 to 0.25 metres). The material is typically described as “*Soft, dark brown organic slightly sandy CLAY*” and “*Brown, organic, gravelly CLAY with low cobble content*”.

3.4.3 Glacial Till

The borehole logs and trial pit logs indicate that the Glacial Till thickness at the site ranges from greater than 1.0 metre to greater than 3.3 metres. The material is typically described as “*Brown silty gravelly CLAY*”, “*Brown slightly sandy gravelly CLAY*” and “*very clayey very sandy GRAVEL*”.

3.4.4 Estuarine Clay

At the northernmost area of the site in slit trenches ST08 to ST11 “*soft black organic CLAY*” encountered.

3.4.5 Made Ground

Made Ground was observed in the southwestern and northwestern areas of the site. The Made Ground comprises primarily glacial till excavated as part of the construction of the R510 regional road / roundabout; catchment surface water drainage pipeline and the adjoining site to the south (refer to Appendix A – History of Site Regrading in the Construction Environmental Management Plan - CEMP (Hutch O'Malley, 2022)).

In the southwestern area in slit trenches (ST) ST03 localised concrete, timber, brick and general waste / construction waste was observed. In the northwestern area in ST08, ST08A, ST09, ST09A, ST10 and ST11 localised concrete timber, brick, metal was encountered (Refer to the Site Investigation Interpretative Report (PGL, 2021) a copy of which is included with the planning application documentation). On precautionary basis a number of samples of Made Ground were tested for asbestos. No asbestos was detected.

4.0 Soil Management Plan

4.1 Overall Approach

The levels for the proposed development are shown on Hutch O'Malley Drawing No C31 Road Design Site Levels. The development will be constructed on a phased basis, refer to the phasing layout shown on Gleeson McSweeney Drawing No. 1704-10-SLP-Ph Phasing Layout

In terms of soil management the main activities arising will comprise:

- i) Phased stripping and temporary storage of Topsoil, prior to its reuse in landscaping works for the development.
- ii) Excavation and reuse of Glacial Till subsoil to construct formation levels for the proposed development.
- iii) Excavation and reuse of the Made Ground within the development predominantly glacial till material. Removal of localised timber, metal, plastic etc. prior to reuse and transport of same off-site to a permitted / licenced waste facility.

There will be no requirement to excavate Estuarine Clay materials that are located at the northern area of the site.

Overall, there is small earthworks deficit for the overall development, and this will be addressed through importation of standard construction fill materials for sub-floors etc. in accordance with the engineering specification for the development.

4.2 Soil Management Measures

4.2.1 Topsoil

As part of the site development Topsoil will be stripped on a phased basis. Overall there is c. 14,700 cubic metres (m³) of Topsoil to be stripped, typically ranging from c. 1,200 m³ to 4,000 m³ per phase depending on the area of each phase of development.

The following soil management measures will be implemented for Topsoil on the site during the construction phase:

- i) Topsoil will be stripped on a phased basis in line with the phasing for the overall development.
- ii) The stripped topsoil material will be stored on a temporary basis on site prior to being reused in garden areas and landscaping / planting works for each phase of the development.
- iii) Topsoil will be stored separately from any other soil materials (e.g. glacial till) excavated / reused on site
- iv) Topsoil will be stored in temporary stockpile(s) less than 2 metres in height to prevent over-compaction of the material prior to reuse in the landscaping works.

- v) Best management practices for management of surface run-off / sediment control from these temporary stockpiles as detailed in Appendix B – Section 8.2 of the Construction Environmental Management Plan - CEMP (Hutch O'Malley, 2022) will be implemented on site during the construction phase of the development. These include use of silt fences, desilting basins and sediment traps.
- vi) Best management practices for wind erosion control relating to these temporary stockpiles as detailed in Appendix B – Section 8.3 of the Construction Environmental Management Plan - CEMP (Hutch O'Malley, 2022) will be implemented on site during the construction phase of the development. These include use of water sprays during periods of dry weather.

4.2.2 Glacial Till

Where required to achieve the formation levels for the development Glacial Till soil materials will be excavated and reused as a fill material on a phased basis in line with the phasing for the overall development.

The following soil management measures will be implemented for Topsoil on the site during the construction phase:

- i) The stripped Glacial Till will be stored on a temporary basis on site prior to being reused in filling operations for each phase, in accordance with the engineering specification for the development.
- ii) Best management practices for management of surface run-off / sediment control from these temporary stockpiles as detailed in Appendix B – Section 8.2 of the Construction Environmental Management Plan - CEMP (Hutch O'Malley, 2022) will be implemented on site during the construction phase of the development. These include use of silt fences, desilting basins and sediment traps.
- iii) Best management practices for wind erosion control relating to these temporary stockpiles as detailed in Appendix B – Section 8.3 of the Construction Environmental Management Plan - CEMP (Hutch O'Malley, 2022) will be implemented on site during the construction phase of the development. These include use of water sprays during periods of dry weather.

4.2.3 Made Ground

The areas of Made Ground are shown on Hutch O'Malley Drawing C08 – Existing Site Levels. As stated in Section 3.4.5 the Made Ground comprises primarily glacial till excavated as part of the construction of the R510 regional road / roundabout; catchment surface water drainage pipeline and the adjoining site to the south. It contains small, localised pieces of concrete, timber, brick, metal and general construction waste. Area 2 comprises a small volume of road surface plannings.

The following soil management measures will be implemented for Made Ground during the construction phase:

- i) Made Ground material located in Areas 1 and Area 3 (predominantly Glacial Till) will be reused as a subsoil material in gardens and landscaping for the proposed development
- ii) Made Ground material in Area 4 will be re-profiled / contoured in situ as part of the proposed development.
- iii) Made Ground in Area 2 (comprising road surface plannings) and localised concrete, brick, timber, plastic, metal present within the Made Ground in Areas 1, 3 and 4 will be removed, placed in a designated skip and removed off site by a licenced waste collection contractor to a licensed / permitted facility for recycling, reuse or disposal, refer to the CEMP Appendix B – Section 8.6.5 Solid Waste Management. Procedures will be implemented by the appointed Contractor to ensure that all such materials transported off-site are logged and tracked to the selected recovery, treatment and / or disposal facilities.
- iv) Best management practices for management of surface run-off / sediment control from these areas as detailed in Appendix B – Section 8.2 of the Construction Environmental Management Plan - CEMP (Hutch O'Malley, 2022) will be implemented on site during the construction phase of the development. These include use of silt fences, desilting basins and sediment traps.
- v) Best management practices for wind erosion control relating to these areas as detailed in Appendix B – Section 8.3 of the Construction Environmental Management Plan - CEMP (Hutch O'Malley, 2022) will be implemented on site during the construction phase of the development. These include use of water sprays during periods of dry weather.

4.2.4 Soils: Accidental Spill Prevention and Control

The best management practices set out in the CEMP – Appendix B Section 8.6.4 will be implemented in site during construction to prevent and control any accidental spillages.

Any hydrocarbon contaminated soil arising on site will be removed and transported to an off-site licenced treatment and disposal facility, for example the facility operated by ENVA at Portlaoise, Co. Laois (IE Licence Ref. W0184-02).

Procedures will be implemented by the appointed Contractor to ensure that all excavated materials transported off-site are logged and tracked to the selected recovery, treatment and / or disposal facilities.

4.3 Implementation of the Soil Management Plan

Prior to the commencement of the site development works a detailed method statement shall be prepared by the contractor for the works, incorporating the requirements set out in this Soil Management Plan. This method statement shall be reviewed by the appointed Environmental Consultant prior to commencement of the works.

References

PGL (2021). Raheen Housing Development, Raheen, Co. Limerick. Site Investigation Interpretative Report. Report Ref. No. P21161. November 2021.

Hutch O'Malley (2022). Residential Development, Ballykeefe, Raheen, Limerick, Construction Environmental Management Plan (CEMP).

APPENDIX A – DRAWINGS (SITE LAYOUT, EXISTING SITE LEVELS, ROAD DESIGN SITE LEVELS & PHASING LAYOUT)

Total no.: **384**
 Density:
 Total area of application site [in red] = 10.44 ha [**36.8**]









Total area of application site [in red] excluding flood zone = 9.53 ha.
 • Density in this case is **40.3**

Total area of application site [in red] excluding flood zone and creche = 9.34 ha.
 • Density in this case is **41.1**


Total area of zoned land = 8.60 ha.
 • Density in this case is **44.6**

LEGEND



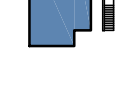



Houses:

-  13. 4 bed, detached, Type 'A'
-  1. 4 bed, detached, Type 'B'
-  12. 4 bed, semi-detached
-  9. 3 bed, dormer bungalow
-  14. 3 bed, semi-detached, Type 'A'
-  85. 3 bed, terrace, Type 'A'
-  48. 3 bed, terrace, Type 'B'
-  12. 2 bed, terrace

Retirement Homes:

-  8. 2 bed, retirement home

Apartments:

- "A1"**  10. 4 bed, own-door duplex units
10. 3 bed, own-door apartments
- "A2"**  8. 3 bed, own-door apartments
- "B"**  10. 3 bed, own-door duplex units
20. 2 bed, own-door apartments
- "C"**  18. 2 bed apartments
- "D"**  28. 2 bed apartments
14. 1 bed apartments
2 apartments in each Blocks D & E are 2 bed own-door duplex apartments.
- "E"**  32. 2 bed apartments
32. 1 bed apartments



Zoning line as per Local Area Plan
 • Open Space & Recreational to North
 • Residential Development Area to South

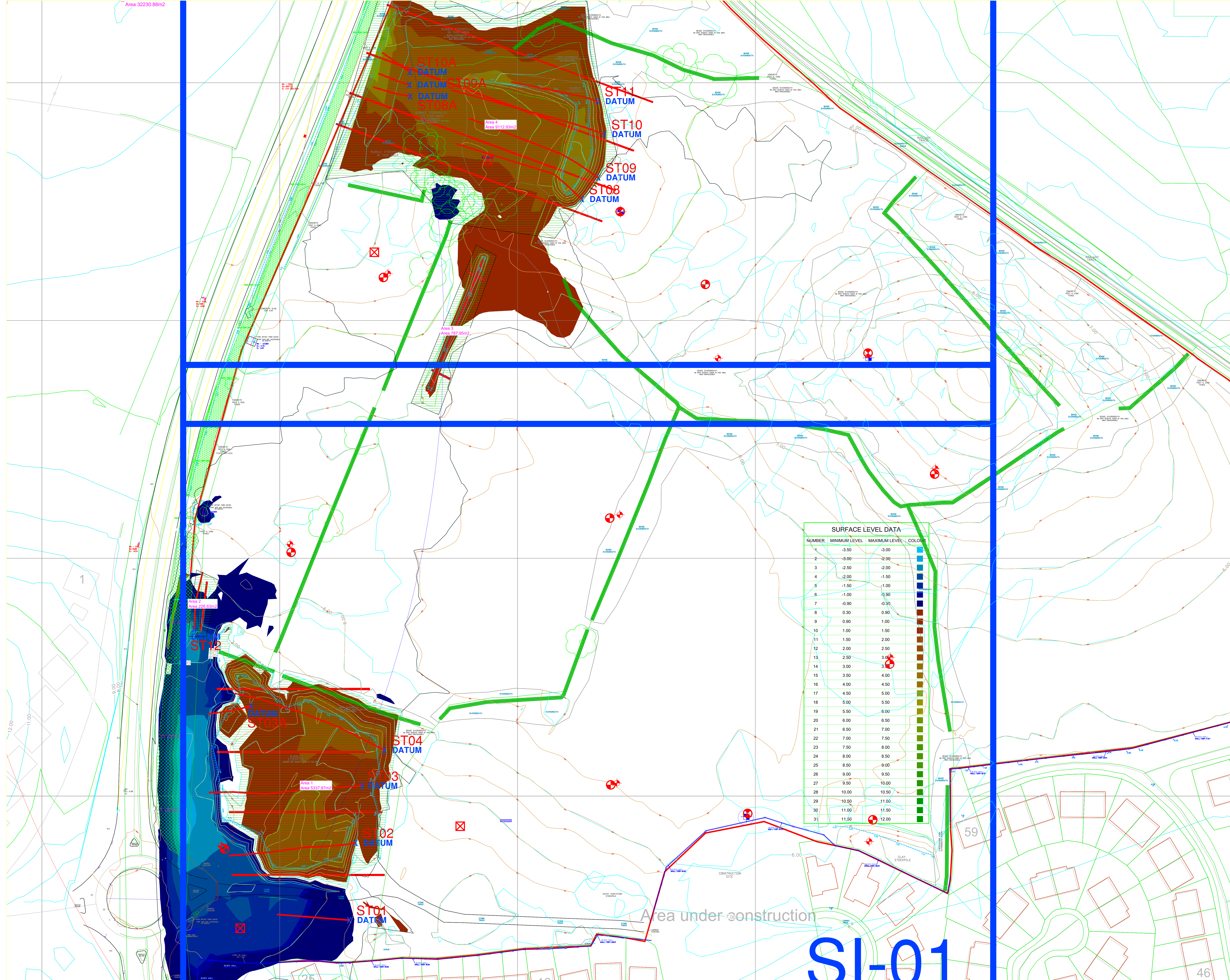
Ard Aulin Estate
 Inis Mor Estate
 Inis Lua Close Estate
 Whitethorn Estate
 Ballinvoher Estate
 Inis Lua Estate

Site Layout Plan
 Scale 1:1,000

Revision	Description	Date
1	Proposed residential development at Ballykeeffe, Raheen, Limerick. For: DW Raheen Developments Ltd.	December 2021
GLEESON MCSWEENEY Architects		
Project: Proposed residential development at Ballykeeffe, Raheen, Limerick. For: DW Raheen Developments Ltd.		Stage: Planning
Title: Site Layout Plan - Presentation		
Scale: 1:1,000 @ A1	Date: December 2021	Drg No. 1704-10-101
Drawn: M.M.	Rev:	
99 O'Connell St., Limerick T 061 412277 E info@gleesonmcsweeney.ie		

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Area 32230.88m²

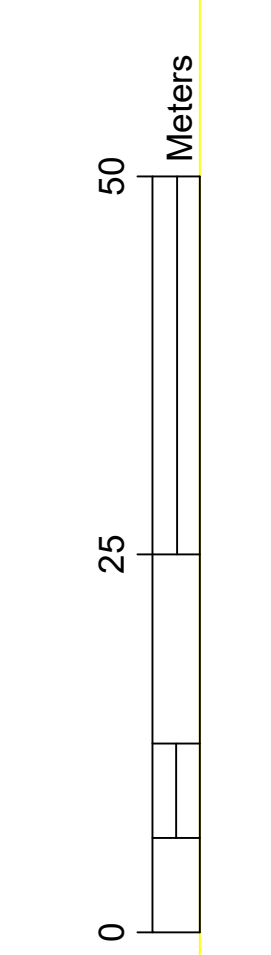
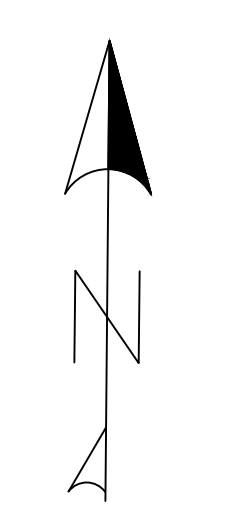


SURFACE LEVEL DATA			
NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOR
1	-3.50	-3.00	
2	-3.00	-2.50	
3	-2.50	-2.00	
4	-2.00	-1.50	
5	-1.50	-1.00	
6	-1.00	-0.50	
7	-0.90	-0.20	
8	0.30	0.90	
9	0.90	1.00	
10	1.00	1.50	
11	1.50	2.00	
12	2.00	2.50	
13	2.50	3.00	
14	3.00	3.50	
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16	4.00	4.50	
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28	10.00	10.50	
29	10.50	11.00	
30	11.00	11.50	
31	11.50	12.00	

REVISION DETAILS	DATE

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Issue:	INFORMATION
Project:	Housing Development Raheen, Limerick
Client:	Lawlor Burns & Associates
Drawing Title:	Existing Original Ground Levels
Scale:	1:500
Date:	28.09.18



Hutch O'Malley Consulting Engineers
 The Railway Station, Attyfin, Patrickswell, Co Limerick
 E-Mail: admin@hutchomalley.ie
 Phone: 061-320260

Project No.	Drawing No.	Revision
18112	C08	-

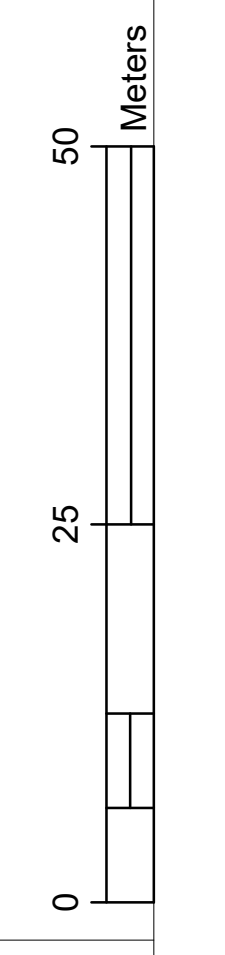
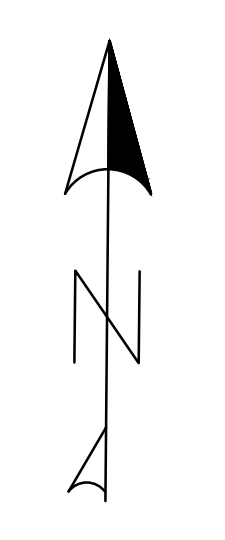
SI-01




REVISION DETAILS	DATE
C Revised Layout	03.12.21

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Issue:	PLANNING		
Project:	Housing Development Raheen, Limerick		
Client:	DW RAHEEN		
Drawing Title:	Road Design Site Levels		
Drawn:	Scale:	Checked:	Date:
CC	1:500	DOM	28.09.18
 Hutch O'Malley Consulting Engineers The Railway Station, Attyflin, Patrickswell, Co Limerick E-Mail: admin@hutchomalley.ie Phone: 061-320260			
Project No.	Drawing No.	Revision	
18112	C31	C	



- Phase 1
- Phase 2A
- Phase 2B
- Phase 3A
- Phase 3B
- Phase 4

Zoning line as per Local Area Plan
 • Residential Development Area to North
 • Existing Residential to South

Phasing Layout
 Scale 1:1,000

Revision	Description	Date
RIAI Practice Member 2021	GLEESON MCSWEENEY	
Project	Proposed residential development at Ballykeeffe, Raheen, Limerick. For: DW Raheen Developments Ltd.	Stage Planning
Title	Phasing Layout	[Site Area: 10.44 ha]
Scale	1:1,000 @ A1	Date December 2021
Drawn	M.M.	Rev 1704-10-104
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