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## Introduction

### Background

- 6.1 This chapter of the Environmental Impact Assessment Report (EIAR) provides a description of the existing geological setting at the regional and local scale, an assessment of the impact of the proposed development on the geological features of the area and also other land and soils aspects of the development.
- 6.2 The proposed development will consist of:
- extension of the existing quarry over an extraction area of c. 12.5 hectares to a level of minus 35 mOD;
  - extraction and processing of limestone using the industry standard blasting and processing techniques in place at the existing quarry;
  - provision of overburden storage area;
  - provision of a vehicular tunnel underneath the local road to link the extension area to the existing quarry;
  - operation landscaping including perimeter screening berms around the proposed extension area;
  - restoration of the quarry to natural habitat after-uses; and
  - all related ancillary site works within an overall application area of c. 22.3 hectares, and all for a period of 35 years and a further 2 years to complete final restoration of the site.
- The proposed development, in conjunction with the existing quarry permitted under planning ref. 21/6983 (ACP Ref. ABP-313-903-22), will result in a combined extraction capacity of 500,000 tonnes per annum. The permitted extraction capacity of the existing quarry area will remain unchanged.

### Scope of Work / EIA Scoping

- 6.3 This EIAR is based on a desk study of the site / surrounding area using published geological data, site inspections of the existing adjacent quarry operations, site ground investigation data including boreholes and available information provided to SLR by Breedon Ireland.

### Consultations / Consultees

- 6.4 A number of sources of information were consulted in the preparation of this EIAR Chapter for Land, Soils and Geology. The sources of information consulted are outlined below in this EIAR.

### Author

- 6.5 This EIAR chapter relating to Land, Soils and Geology was prepared by:
- Silas Rowe, BSc.; and
  - Peter Glanville BA, MSc, EurGeol, PGeo, MCIWEM.

## Limitations / Difficulties Encountered

- 6.6 This EIAR has been prepared based on available desktop and site-specific information. No specific limitations or difficulties were encountered in the preparation of this EIAR.

## Regulatory Background

### EU Directives

- 6.7 The following European Union (EU) Directive relate to Land, Soils and Geology at the site in this EIAR:
- Environmental Impact Assessment Directive (2011/92/EU);
  - Environmental Impact Assessment Directive (2014/52/EU);
  - The management of waste from extractive industries (2006/21/EC); and
  - Environmental Liability Directive (2004/35/EC).
- 6.8 The EU EIA Directive regulates the information impact assessment process and information in this EIAR. The management of waste Directive and the Environmental Liability Directive regulates the activities at the site.

### Irish Legislation

- 6.9 The following legislation relating to Land, Soils and Geology at the site in this EIAR:
- No. 349 of 1989, European Communities (Environmental Impact Assessment) Regulations, and subsequent amendments (S.I. No. 84 of 1994, S.I. No. 352 of 1998, S.I. No. 93 of 1999, S.I. No. 450 of 2000 and S.I. No. 538 of 2001);
  - S.I. No. 473 of 2011, European Union (Environmental Impact Assessment and Habitats) Regulations 2011;
  - S.I. No. 584 of 2011, European Union (Environmental Impact Assessment and Habitats) (No.2) Regulations 2011;
  - The Planning and Development Acts, 2000 to 2009; and
  - The Planning and Development (Amendment) Act 2010, S.I. 600 of 2001 Planning and Development Regulations and subsequent amendments including, S.I. No. 364 of 2005 and S.I. 685 of 2006.
- 6.10 The above legislation regulates the information contained in an EIAR and planning at the site.

## Planning Policy and Development Control

- 6.11 The following Planning Policy and Development Control relating to Land, Soils and Geology at the site in this EIAR is set out in the:
- Cork County Development Plan 2022-2028.
- 6.12 The County Development Plan sets out conservation objectives in relation to soils mineral reserves in the county:
- 6.13 **CDP Objective BE 15-10: Soils**

- *Ensure the protection and conservation of the soils in County Cork by encouraging sustainable management practices and the reuse of brownfield lands.*
- *Identify areas of poorer soil in the County acknowledge their potential value for wildlife, and respect their limitations, particularly in terms of their assimilative properties to prevent pollution.*

6.14 In the Cork County Development Plan 2022-2028, the Planning Authority recognises the essential role of Aggregates and the need for the preparation of a County Minerals Strategy which will support a sustainable extractive industry during the lifetime of the County Development Plan; therefore CDP includes specific objectives to this regard:

6.15 **EC :8-16 Safeguarding Mineral Reserves**

- *Protect and safeguard the county's natural mineral resources from inappropriate development, by seeking to prevent incompatible land uses that could be located elsewhere, from being located in the vicinity of the resource, since the extraction of minerals and aggregates is resource based.*
- *Prepare a Minerals Strategy Plan to support a sustainable extractive industry during the lifetime of the plan. This strategy will be prepared taking account of environmental, nature, conservation, heritage, landscape, and other planning considerations.*

## Guidelines

6.16 The following guidelines relating to Land, Soils and Geology and have been used in the preparation of this EIAR:

- DoEHLG, 2010. Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities;
- Environmental Protection Agency, 2003. Advice Notes on current practice (in the preparation of Environmental Impact Statements);
- Environmental Protection Agency Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018);
- Geological Survey of Ireland, Irish Concrete Federation, 2008. Geological Heritage Guidelines for the Extractive Industry;
- Institute of Geologists of Ireland, 2002. Geology in Environmental Impact Statements, A Guide;
- Institute of Geologists of Ireland, 2007. Recommended collection, presentation and interpretation of geological and hydrogeological information for quarry developments;
- Institute of Geologists of Ireland, 2013. Guidelines for the preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements;
- National Roads Authority, 2008. Environmental Impact Assessment of National Road Schemes - A Practical Guide; and
- National Roads Authority, 2008. Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

6.17 The above guidelines are relevant to the preparation of a Land, Soils and Geology section of this EIAR.

## Technical Standards

- 6.18 The following Technical Standard relating to Land, Soils and Geology at the site in this EIAR:
- British Standards (2015). Code of Practice for Site Investigations BS5930:2015
- 6.19 The BS code of practice was used in the description of the subsoils encountered in the boreholes at the site and in the description of subsoils during the drilling programmes at the site.

## Receiving Environment

### Study Area

- 6.20 The study area for this Land, Soils and Geology section of the EIAR comprises two principal geographic areas:
- the proposed development site; and
  - the immediate surrounding area within approximately 5 km of the application site boundary.
- 6.21 For the purposes of this assessment, the study area comprises the application site the surrounding area up to 5 km to reflect the sensitivity of the land, soils and geology; this is in line with the Institute of Geologists of Ireland's (IGI) guidelines (2013).
- 6.22 The IGI guidelines state that the minimum distance of 5 km should be reviewed in the context of the geological / hydrogeological environment as well as the scale of development and increased to reflect the sensitivity of the subsurface in a limestone karst environment.
- 6.23 The figures for Chapter 6 are depicted at a scale of 1:50,000, and they accurately represent the surrounding environment within a distance of up to 5 km from the Rossmore landholding boundary.

### Baseline Study Methodology

- 6.24 The baseline study undertaken for Land, Soils and Geology, here involves a review of published literature and information, a review of available information from Breendon Ireland in relation to the site including resource boreholes, trial pits, and a geophysical survey across the extension lands, the findings from site inspections, and the context of the site within the surrounding area.
- 6.25 This section describes the receiving environment at and in the immediate vicinity of the site using the available baseline information gathered, specifically the:
- Context** of the receiving environment - location/ magnitude/ spatial extent and trends of the environmental factors;
- Character** of the receiving environment - distinguishing aspects of the environment being considered here;
- Significance** of the receiving environment - the quality, value or designation is assigned to the existing environment; and
- Sensitivity** of the receiving environment - how sensitive is the aspect of the environment to change.

- 6.26 The baseline study is a qualitative assessment of the available information based on professional experience.

## Sources of Information

- 6.27 The following Table 6-1 summarises all sources of information consulted in the preparation of the receiving environment baseline study for Land, Soils and Geology:

**Table 6.1:  
Regional Data Consultation**

| Data                                                | Dataset                                                                                                                                                                                                                    |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Soils</b>                                        | <ul style="list-style-type: none"> <li>Irish Soils Information System - Teagasc</li> </ul>                                                                                                                                 |
| <b>Subsoil Geology</b>                              | <ul style="list-style-type: none"> <li>Teagasc/GSI/EPA Subsoil Mapping</li> </ul>                                                                                                                                          |
| <b>Bedrock Geology</b>                              | <ul style="list-style-type: none"> <li>GSI Data Viewer - Bedrock Geology</li> </ul>                                                                                                                                        |
| <b>Protected Areas,<br/>Environmental Pressures</b> | <ul style="list-style-type: none"> <li>Environmental Protection Agency,</li> <li>Irish Geological Heritage Programme (<a href="http://www.gsi.ie">www.gsi.ie</a>);</li> <li>National Parks and Wildlife Service</li> </ul> |
| <b>Site surveys across extension area</b>           | <ul style="list-style-type: none"> <li>Resource borehole drilling</li> <li>Trial Pitting</li> <li>Geophysical survey</li> </ul>                                                                                            |

## Site Inspections

- 6.28 SLR geologists / geotechnical engineers have undertaken a number of inspections of the existing quarry and extension area as part of carrying out geological investigations and geotechnical assessments for the quarry. Most geological investigation works were carried out in 2024.

## Site Investigations

- 6.29 Site investigations have been undertaken at the site including geophysical survey, trial pits and geological boreholes.

## Geophysical Survey

- 6.30 APEX Geophysics Limited was requested by Breedon Ireland to carry out a geophysical investigation at Rossmore, Co. Cork. The survey was carried out on 15th - 24th April 2024 involving the collection of EM31 conductivity readings, eight ERT profiles (R1 to R8) and eleven seismic refraction profiles (S1 – S11). Summary borehole and well data have been plotted on the relevant ERT 2024 profiles
- 6.31 A surface layer of gravelly CLAY, clayey SAND/GRAVEL, and silty to 'clean' SAND/GRAVEL has been interpreted on all profiles. Thicknesses generally range from 1 m to 10 m. The silty and 'clean' SAND/GRAVEL in the south and southwest ranges from 1 to 10 m averaging around 5 m. According to the survey, the thickness of superficial deposits

vary from 5-10m in the north of the site, thinning to 1-5m in the centre, the deposit thickens back to 5-10m in the south.

- 6.32 An upper layer of highly to moderately weathered rock with an average thickness of 3 m has been taken across the site. Deeper weathering, fracturing and clay infill possibly associated with karstic solution weathering also occurs at a number of locations. These features are most prominent in the northern part of the site.

### Trial Pit Survey

- 6.33 In October 2024 SLR oversaw a ground investigation across the area to determine the underlying superficial geology. A total of eleven trial pits were excavated, logged, and photographed with representative samples taken from each. Trial pit logs have been provided (see [Appendix 6-B: Trial Pit Logs](#)).
- 6.34 The material recovered from the trial pits ranged from a silty fine-grained SAND to a sandy GRAVEL with cobbles and boulders, located mainly to the southern lands of the study area, close to the lagoon and the existing quarry. The trial pits carried out in the study area confirmed the soil deposits described in the geophysical survey, showing more SAND & GRAVEL material to the south of the site.
- 6.35 The northern part of the site consists predominantly of glacial till.
- 6.36 Each of the trial pits, with the exception of 24-ROS-TP05, terminated on presumed bedrock. The depth to bedrock recorded in the trial pits varied from 0.9m to 3.9m. Maximum depths were recorded in TP02 and TP05 in the north and south of the site at 3.9m and >3.9m, respectively. Minimum depths were recorded in the more central TP04 and TP09 at 0.9m and 1.1m respectively. The thickness of this deposit is less than assumed in the geophysical report.

### Borehole Survey

- 6.37 Five rotary core boreholes (24-ROS-01 to 24-ROS-05) were drilled to 95 - 100 m bgl under supervision by SLR in 2024, refer to Appendix 6-C for borehole logs.

**Table 6.2: Summary Borehole Details (2024 Boreholes)**

| Borehole ID | Location           | Easting | Northing | Borehole Depth (m) | Depth to Bedrock (m) | Description                                                                  |
|-------------|--------------------|---------|----------|--------------------|----------------------|------------------------------------------------------------------------------|
| 24-ROS-01   | Southeastern field | 582809  | 571019   | 95                 | 6                    | Strong, massive to bedded Limestone with rare karst areas                    |
| 24-ROS-02   | Southwestern field | 582644  | 571108   | 95                 | 6                    | Strong, massive to bedded Limestone with rare dolomitization and weathering. |

| Borehole ID | Location              | Easting | Northing | Borehole Depth (m) | Depth to Bedrock (m) | Description                                                |
|-------------|-----------------------|---------|----------|--------------------|----------------------|------------------------------------------------------------|
| 24-ROS-03   | Central eastern field | 582799  | 571232   | 100                | 3.25                 | Strong, massive to bedded Limestone.                       |
| 24-ROS-04   | Central western field | 582606  | 571307   | 95                 | 7.3                  | Strong, massive to bedded Limestone with rare karst areas. |
| 24-ROS-05   | Northwestern field    | 582581  | 571415   | 71                 | 6.2                  | Strong, massive Limestone with frequent karst areas.       |

- 6.38 The rock is described as generally strong, massive, blueish grey bioclastic LIMESTONE with calcite veining, occasional bioclastic debris, and minor weathering with trace orange staining on fracture surfaces. There are occasional zones of fractured rock with poor recovery and infill soil.
- 6.39 All boreholes record continuous massive to bedded vertical sections of the Little Island Formation. Boreholes 24-ROS-01, 24-ROS-03, and 24-ROS-04 all recorded >80% recovery of high quality limestone.
- 6.40 Thickness of karst is greatest in the northern boreholes, 24-ROS-04 and 24-ROS-05, with the latter having a total karst thickness of >20m.
- 6.41 According to the borehole logs, depths to bedrock varies from 6m in the south of the site to 7.3m in the north. The most laterally central location, 24-ROS-03, records a minimum depth to bedrock of 3.25m. This concurs with the findings from the trial pitting and geophysical survey that superficial deposits thin towards the centre.
- 6.42 Boreholes 24-ROS-04 and 24-ROS-05, located in the north of the site recorded up to 1.3m of poorly recovered red/purple sandstone fragments, further indicating that the northern part of the site consists of glacial till.
- 6.43 In addition, eleven trial wells were drilled vertically across the site to better ascertain the water level and water flow of the underlying geology of the study area. These recorded predominantly the Little Island Formation along with intermittent karst areas. The Karst features in these trial wells are also thicker in the northerly wells.
- 6.44 The investigation confirms that the study area is almost entirely underlain by high quality limestones of the Little Island Formation. A small intersection of Clashavodig Formation consisting of more thinly bedded dark grey siliceous bioclastic limestones is present in the northern part of the site. Due to its very steeply dipping nature it was not fully encountered in borehole 24-ROS-04 or 24-ROS-05. However, examined drilled returns from trial well BBH1 indicated its presence towards the base of this hole.

## Land Baseline

- 6.45 Land refers to the 'land take' required for the proposed development. Land can be considered to be a resource with a beneficial use to society, for example agricultural land use, extractive industry land use or urban residential land use.

- 6.46 Within the EIA EU Directive (2014/52/EU) Land is recognised as a 'natural resource' and the Directive also refers to the importance of the sustainable use of soil and the need to address the unsustainable increase in settlement areas over time ('land take'). Therefore, the issues of land as both a natural resource and land take must be considered in an assessment.
- 6.47 The introduction section to the EU Directive (2014/52/EU) notes that the:  
*'final document of the United Nations Conference on Sustainable Development held in Rio de Janeiro on 20-22 June 2012, which recognises the economic and social significance of good land management, including soil, and the need for urgent action to reverse land degradation. Public and private projects should therefore consider and limit their impact on land, particularly as regards land take, and on soil, including as regards organic matter, erosion, compaction and sealing; appropriate land use plans and policies at national, regional and local level are also relevant in this regard'.*
- 6.48 The Corine land cover mapping is a standardised inventory of land cover across Europe which is split into 44 different land cover classes. The latest 2018 Corine land cover mapping for Ireland is based on the interpretation of satellite imagery and national in-situ vector data. Land cover is mapped to the standard CORINE classification system and data specifications.
- 6.49 The Corine land cover mapping reflects land use at the time of survey, in this case the latest available land cover data for Ireland is 2018. The land cover types in the vicinity of the site are shown in [Figure 6.1](#) below. The Corine Land cover classifies the land at the site as an Agricultural Area of Non-irrigated arable land.
- Within a 5km radius of the site, several other landcover types exist:
- Agricultural areas – pastures
  - Heterogeneous agricultural areas
  - Coastal Wetlands
  - Marine Waters
  - Forest
  - Artificial Surfaces
- 6.50 Just west of the proposed extension area is the existing permitted quarry with associated ancillary facilities for asphalt and readymix concrete production; therefore, the surrounding lands are already in use for extraction and associated production purposes.
- 6.51 The extraction of Limestone rock at the site is a tied resource land use activity, as it is dependent on the location and suitability of suitable materials for asphalt, readymix and ground limestone production, and therefore the Limestone material may be considered to be a natural resource.
- 6.52 The Cork County Development Plan (2022-2028) recognises that extractive industry is generally located in rural areas and can only be developed where the resources occur.
- 6.53 The County Development Plan addresses mineral extraction in the county and sets out a number of objectives for the mineral industry related to the land use and resource nature of extractive industries in the County. The plan recognises that mineral extraction and the aggregate industry are important to the economy of the county in terms of employment generation and providing raw materials to the construction industry.
- 6.54 Development Plan Objective EE 12-1 is to safeguard mineral reserves states that it is an objective to:

*Protect and safeguard the county's natural mineral resources from inappropriate development, by seeking to prevent incompatible land uses that could be located elsewhere, from being located in the vicinity of the resource, since the extraction of minerals and aggregates is resource based.*

- 6.55 Development Plan Objective EE 12-2 relates to a mineral strategy for the county Mineral Strategy and states that:
- Consideration will be given to the desirability of preparing a Minerals Strategy to support a sustainable extractive industry during the lifetime of the plan.
- 6.56 It is understood that no specific minerals strategy has been prepared for Cork County to date.
- 6.57 The development plan recognises that mineral extraction is an important part of the economy and that suitable mineral reserves are a natural resource-based material, are finite and are a tied landuse, depending on where they occur and that the material is a tied or resource-based land use.
- 6.58 The plan therefore seeks to protect and safeguard natural mineral resources from inappropriate development, by seeking to prevent incompatible land uses that could be located elsewhere.
- 6.59 In terms of land take, the proposed quarry extension will result in loss of c. 12.5 hectares of agricultural land at this location.
- 6.60 The soils from the site excavated as part of the existing development will be retained and stored on site and will be reinstated as part of the final restoration.

## Soils Baseline

- 6.61 Soil is the top layer of the earth's crust and is formed by mineral particles, organic matter, water, air and living organisms. Soil is an extremely complex, variable and living medium and its characteristics are a function of parent subsoil or bedrock materials, climate, relief and the actions of living organisms over time.
- 6.62 Soil formation is an extremely slow process and can take thousands of years to evolve; soil can be considered essentially as a non-renewable resource.
- 6.63 As the interface between the earth, the air and the water, soil performs many vital functions; it supports food and other biomass production (forestry, biofuels etc.) by providing anchorage for vegetation and storing water and nutrients long enough for plants to absorb them. Soil also stores, filters and transforms other substances including carbon and nitrogen, and has a role supporting habitats serving as a platform for human activity.

## National soils

- 6.64 The Irish Soil Information System (ISIS) project was undertaken by the EPA and Teagasc and has gathered together existing information and data from soil survey work in Ireland, which has been augmented with new field data, leading to the production of a new national soil map at a scale of 1:250,000 ([www.teagasc.ie/soils](http://www.teagasc.ie/soils)).
- 6.65 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.

- 6.66 The soil association in the vicinity of the site is classified as the Clashmore Soil Association (1100N), see [Figure 6.2](#) ~~Figure 6.2~~, which is characterised by 'Coarse loamy drift with siliceous stones'.
- 6.67 The Clashmore Soil Association is comprised of a total of eight separate Soil Series which include soil series that have developed on glacial drift comprised predominantly of siliceous stones.
- 6.68 Soil within the vicinity of the site is predominantly classified as the Clashmore Soil Association Group. However, approximately 1km southeast of the site, the soil is classified as tidal marsh. 1.3km west of the site, there is a large area of soil classified as Marine Alluvium.

## Site soils

- 6.69 The soil association at the site is classified by Teagasc as belonging to the Clashmore Series (reference 1100CM). This is described as 'Coarse loamy drift with siliceous stones', see [Figure 6.2](#) ~~Figure 6.2~~.
- 6.70 The soils at the existing quarry to the west of the site have previously been removed to allow for the extraction of rock and development of processing plant.
- 6.71 Trial Pitting across the site indicates that Topsoil occurs at a depth range of 0.10m - 0.30m across the trial pit locations.

## Subsoils Baseline

### Regional Subsoils

- 6.72 The Quaternary (Subsoil) deposits were deposited during the last 2 million years, and essentially comprise the unconsolidated materials overlying the bedrock. The two main types of quaternary subsoils in Ireland are glacial till, deposited at the base of ice sheets, and sand and gravel deposits associated with the melting of the ice sheets which are generally termed glaciofluvial outwash sands and gravels. Other extensive quaternary subsoils in Ireland include peat, river alluvium and coastal process deposits. Most Quaternary subsoils in Ireland were deposited since the maximum of the last glaciation, the Midlandian, which occurred approximately 17,000 years ago.
- 6.73 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 and field mapping and sampling.
- 6.74 According to EPA mapping, subsoil at and immediately surrounding the site apart from to the south and west is till derived from Devonian sandstones. To the south and west, the bedrock is at surface where the existing extraction has removed the subsoil.
- 6.75 Subsoil within the vicinity of the site is predominantly till derived from Devonian sandstones. However, approximately 1km southeast of the site there are Estuarine silts and clays. 1.3km west of the site, there is a large area of both gravels derived from limestones, and alluvium, see [Figure 6.3](#) ~~Figure 6.3~~.

### Site subsoils

- 6.76 The depths to bedrock recorded from trial pitting, see paragraph 6.39, shows thinning of superficial deposits towards the centre of the site from up to 3.7m in the north and south to

approximately 0.7m in the centre, see Figure 6.5. Findings from both the trial pitting and boreholes indicate that glacial till predominates the northern part of the site, see paragraph [6.356-38](#) and [6.426-46](#). The geophysical survey and trial pits confirmed that there is more SAND and GRAVEL in the south of the site, see paragraph [6.346-37](#).

## Bedrock Geology Baseline

- 6.77 The GSI online geology map shows major geological faults running north south from 2km to the west of the site, see [Figure 6.4](#)~~Figure 6.4~~.
- 6.78 The southern part of the site is underlain by the Carboniferous Little Island Formation, comprised of massive and crinoidal fine Limestone, see [Figure 6.4](#)~~Figure 6.4~~. The formation is described by the GSI as '*a uniform succession of crinoidal biomicrite limestones (wackestones) and massive unbedded calcilutite limestones of mudbank facies. The top of the formation is highly crinoidal and passes up to poorly-bedded wackestones of the Clashavodig Formation*'.
- 6.79 The Little Island Formation is stratigraphically overlain in the northern part of the site by the Carboniferous Clashavodig Formation Limestone. The Clashavodig Formation is described by the GSI as '*a variable sequence of poorly-bedded to well bedded calcilutite wackestone limestones, skeletal peloidal and oolitic limestones and cherty calcilutite limestones*'.

## Local Geology

- 6.80 GSI mapping suggests bedrock geology in the north of the site is predominated by the Clashavodig Formation. According to the site investigation, this may be an overestimation as it was only encountered in a single trial well at its base, see paragraph [6.446-48](#). Accordingly, the site area is almost entirely underlain by the Little Island Formation, see paragraph [6.446-48](#).

## Karst Geology

- 6.81 According to the GSI, the bedrock in the vicinity of the site is classified as a Regionally Important Aquifer which is karstified. The site is located within the Midleton groundwater body (GWB) which includes the Regionally Important karstified Aquifer. The aquifer is mapped as 'Diffuse'; conduits are not expected.
- 6.82 Karstification most often occurs in the upper bedrock layers and along certain fractures, fissures and joints, at the expense of others; there are numerous surface karst features in the limestones in the east Cork Region ([www.gsi.ie](http://www.gsi.ie)). However, Karst features such as cave systems, sinking streams, springs, swallow holes and other collapse features, common in the Midleton GWB, are known to extend below present sea levels and are estimated to extend to depths of up to 50 m to 60 m below O.D. Malin Head. Groundwater flows in these features will be through faults and joints formed by deformation that were subsequently enlarged by karstification.
- 6.83 The GSI database ([www.gsi.ie](http://www.gsi.ie)) shows the closest known karst features to the site are two landforms east of the extension area. Goat Hole cave is located approximately 600 m to the east, and a spring is located approximately 900 m east of the quarry; both karst features are in Ballintubbrid West townland.
- 6.84 No significant karst features have been encountered at the adjacent existing Breedon Rossmore quarry. Some very minor karst-type fissures are visible in the upper bench at the existing quarry; however, no such features are visible in the lower bench at the quarry indicating karstification is limited in depth to the top few metres of the bedrock.

- 6.85 There are no known geological faults at the adjacent existing Breedon Rossmore quarry, and this has been confirmed during the site inspection.
- 6.86 The geophysical survey undertaken at the site indicated an upper layer of highly to moderately weathered bedrock with an interpreted average thickness of c. 3m across the site. The survey also identified some deeper weathering, fracturing and clay infill possibly associated with karstic solution weathering at a number of locations, which are most prominent in the northern part of the site.
- 6.87 The boreholes undertaken at the site indicate that the thickness of karst is greatest in the northern boreholes (24-ROS-04 and 24-ROS-05).

### Geological Heritage Baseline

- 6.88 The Geological Survey of Ireland (GSI) Irish Geological Heritage (IGH) Programme has identified geological heritage sites in Ireland. The IGH programme has not identified any geological heritage sites at or within 5 km of the proposed development at Rossmore ([www.gsi.ie](http://www.gsi.ie)).
- 6.89 There are no County Geological Heritage sites within 5 km of the site at Rossmore.

### Designated Sites

- 6.90 There is one SAC site within 5km of the site. This is the Great Island Channel SAC (Site Code 001058) which is, at its nearest point, c. 140m south of the southwest corner of the site. The Great Island Channel SAC is designated primarily for its habitat and ecological status. Namely, the Tidal Mudflats and Sandflats, and the Atlantic Salt Meadows.

### Sensitive Receptors

- 6.91 In terms of land, soils and geology baseline considered here the sensitive receptors are land, soils and bedrock.

## Impact Assessment

### Evaluation Methodology

- 6.92 The evaluation of impacts of the proposed development is based on a methodology similar to that outlined in the:
- National Roads Authority (2009) 'Guidelines for the Assessment of Geology, Hydrology and Hydrogeology for National Road Schemes'; and
  - IGI (2013) 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'.

### Evaluation of Impacts

- 6.93 This assessment focuses on the potential impact of the proposed development on the land, soils, and geology at the site. It specifically describes the significance and sensitivity of the receiving environment.

- 6.94 Construction impacts will include soil stripping and vegetation removal across the lands. Operational impacts will include the removal of rock from the proposed quarry extension area.
- 6.95 The importance of existing land, soil, and geology attributes identified at the application site is assessed in Table 6.3 below.

**Table 6.3: Importance of Land, Soil and Geology Attributes**

| Attribute           | Status / Occurrence                                                                                                                                                                         | Importance                                                                                                                                                                                                                            |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Land                | The proposed development is for the extension of the existing quarry and an extension to quarry. The extension area comprises greenfield lands that are currently in agricultural use.      | Established land use at the existing adjacent quarry is based on a proven economic reserve of limestone resource.<br><br>The existing greenfield land is only of Low importance given its strictly local scale importance.            |
| Soils               | The soils at the site are predominantly loamy drift soils, these are widespread in the region around the site. The loamy drift soils are considered to be of Low importance or sensitivity. | The soils are considered to be of Low importance at the local scale only. These soils are used for pasture and arable land across the region. Given the relatively limited site area, the soils are not considered to be significant. |
| Subsoils            | Any sandstone till at the site will be removed.<br>The subsoils do not have any designated status.                                                                                          | The subsoils are considered to be of Low importance at the local scale. Sandstone tills are the most widespread subsoil type found in County Cork and therefore are not considered to be significant.                                 |
| Geology             | The limestone resource is in situ at this site. The Limestone is a finite resource within the east Cork and Waterford region which is resource tied.                                        | In terms of the proposed development, the Bedrock geology is considered to be of High importance at the local and regional scale as a resource for the long term supply of aggregates to Cork and the surrounding region.             |
| Geological Heritage | There are no Geological Heritage Sites at or within 5 km of the site.                                                                                                                       | No geological sites in the vicinity – very low importance.                                                                                                                                                                            |

- 6.96 The magnitude of the potential impacts of the proposed development on the Land, Soils and Geology attributes is assessed in [Table 6.4](#).

**Table 6.4: Significance of Impacts on Land, Soil and Geology with no Mitigation**

| Attribute           | Impact of Proposal on Land, Soil and Geology                                                                                                                   | Magnitude of Potential Impact                                                                                                                                     |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Land                | Residual loss of c. 12.5 hectares of agricultural land.                                                                                                        | Not Significant only with the residual loss of a relatively limited land area.                                                                                    |
|                     | The restored lands at the site will allow the return of the worked-out area to a beneficial ecological after-use area.                                         | Neutral with restoration of the worked-out area to a beneficial ecological after-use area.                                                                        |
| Soils               | Removal of soil over the extension area. The removed soils will be placed into a temporary storage area and screening berms as part of the restoration scheme. | Not Significant, as the soils to be removed will be reused on site for final restoration works.                                                                   |
| Subsoils            | Removal of till subsoils as part of overburden removal over the extension area.                                                                                | Not Significant as the subsoils to be removed will be reused on site for final restoration works.                                                                 |
| Geology             | Permanent extraction of limestone bedrock from proposed extension area.                                                                                        | Significant. Permanent extraction of proven economic limestone resource, a long-term secure supply of construction materials for Cork and the surrounding region. |
| Geological Heritage | There are no Geological Heritage Sites within the site vicinity.                                                                                               | Insignificant.                                                                                                                                                    |

### Indirect Impacts

- 6.97 It is considered that there will be no indirect impacts on Land, Soils or Geology as a result of the proposed quarry extension at the site.

### Unplanned Events

- 6.98 Unplanned events within the application site, such as accidents, have the potential to impact on the land, soils and geology adjoining the site.
- 6.99 Ground instability, particularly the long-term stability of quarry faces, has the potential to impact on adjoining lands. Operations at the site will continue to adhere to the Health and Safety Authority Safe Quarry Guidelines (2020) in relation to the Safety Health and Welfare at Work (Quarries) Regulations 2008 (As Amended) and this will limit the potential for unplanned events such as instability of quarry faces or instability in adjacent lands. With the continued compliance with these regulations, it is considered unlikely that instability of quarry faces would result in an impact on the land, soils, and geology at the site.

## Human Health

- 6.100 From a land, soils and geology perspective, any potential impacts on human health from the extraction and processing of the extracted rock at the site would not be via the land-use, soils and geology pathways but via other pathways such as air and water, which are addressed in the relevant chapters of this EIAR.

## Cumulative Impacts

- 6.101 The proposed development includes an extension to the existing permitted quarry which will remain in continued use as well as the associated existing ancillary facilities for the processing of aggregates. There is a separate quarry operation located to the west of the existing quarry. There are no other developments within the vicinity of the site that would result in cumulative impacts.
- 6.102 Baseline monitoring (noise, dust, vibration and traffic) includes the operations of the existing two quarries and cumulative impacts, if any, are covered under each EIAR topic chapter.

## Interaction with Other Impacts

- 6.103 Interaction between Land, Soils & Geology and Water is addressed in EIAR Chapter 7 – Surface Water & Groundwater.

## ‘Do-nothing Scenario’

- 6.104 If the proposed quarry extension is not permitted, the proposed extension site will remain undeveloped in its current agricultural land use.

## Mitigation Measures

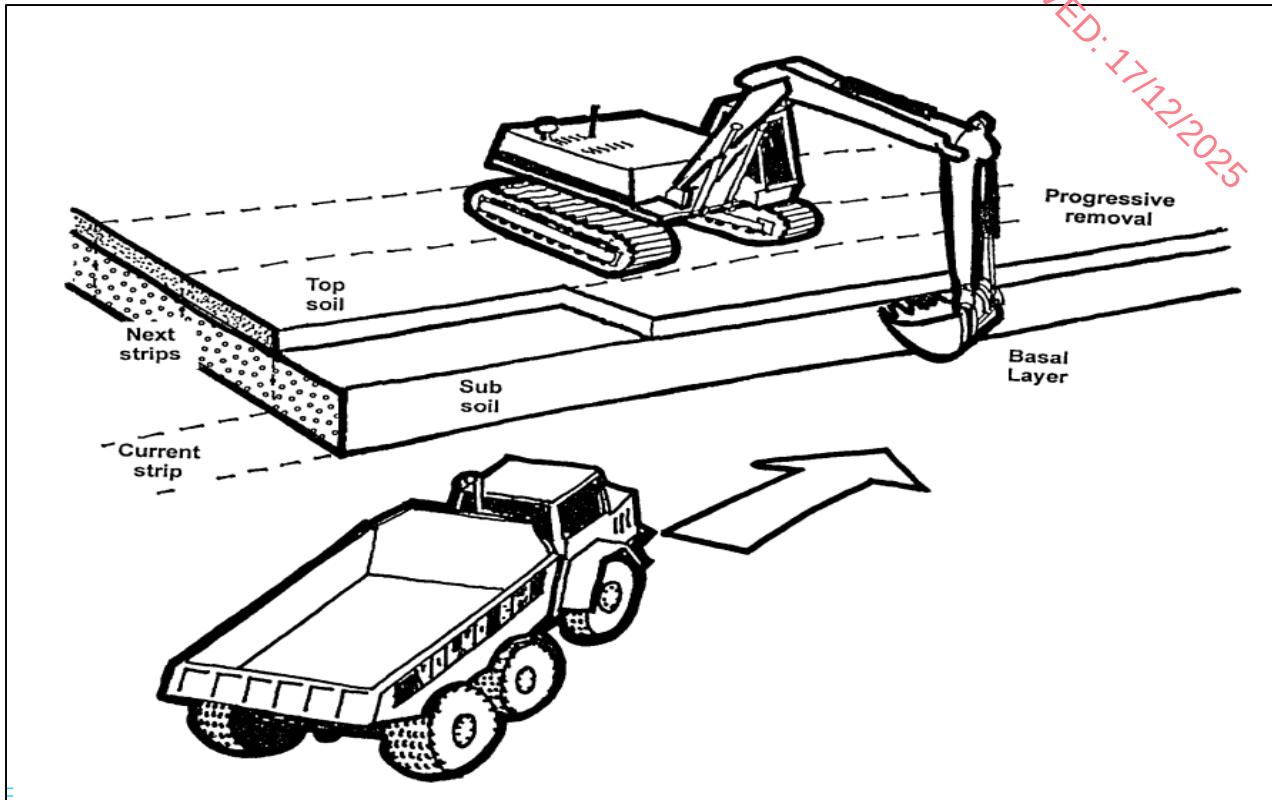
- 6.105 Mitigation measures are outlined here for the construction, operational and restoration stages of the proposed development.

## Construction & Operational Stage

- 6.106 Soils will be managed on-site in line with best practice national guidelines (National Roads Authority, 2006) and Specification for Road Works Series 600 – Earthworks (Transport Infrastructure Ireland, March 2013).
- 6.107 During the construction stage the topsoil will be stripped off and placed into dedicated landscaping berms/bunds along boundaries where they will provide the most benefit in terms of acoustic and visual screening. The soils will be stripped and stored in accordance with best practice guidance including MAFF (2000) *Good Practice for Handling Soils (Sheet 1 and Sheet 2)*.
- 6.108 The soil handling method can affect the quality of the restoration through severe soil deformation (compression and smearing); this is primarily caused through trafficking, the effects of which increases with increasing soil wetness.
- 6.109 Good practice measures will be implemented at the site to preserve the structure and integrity of the soils and limit the effects of erosion on the stored soil during excavation and storage.

- 6.110 The key operational points to ensure avoidance of severe soil deformation and to minimise compaction using excavators and dump trucks are as follows:
- the dump trucks must only operate on the 'basal'/non-soil layer, and their wheels must not, on any circumstances, run on to the soil layer(s);
  - the excavator should only operate on the topsoil layer;
  - the adoption of a bed/strip system avoids the need for the trucks to travel on the soil layers; and
  - the machines are to only work when ground conditions enable their maximum operating efficiency.
- 6.111 For soil stripping with excavators and dump trucks:
- the area to be stripped is to be protected from in-flow of water, ponding etc. Wet sites should be drained in advance;
  - if significant rainfall occurs during operations, the stripping must be suspended;
  - all machines must be always in a safe and efficient working condition. The machines are to only work when ground conditions enable their maximum operating efficiency. The operation is to be suspended before traction becomes a problem and haul routes fail;
  - the operation should follow a detailed stripping plan showing soil units to be stripped, haul routes and the phasing of vehicle movements;
  - the soil layer should be stripped to its natural thickness without incorporating material from the lower subsoil layers;
  - the haul routes and soil storage areas must be defined, and should be stripped first;
  - the excavator is only to work on the topsoil layer; the dump trucks are only to travel on the basal/formation layer; and
  - stripping is to be undertaken by the excavator standing on the surface of the topsoil and digging the topsoil to its maximum depth and loading into dump trucks. The dump trucks draw alongside the exposed soil profile, standing and travelling only on the basal layer, see Diagram 6.1.

Diagram 6.1: Removal of Topsoil: Stripping Using Excavator and Dump Truck (MAFF 2000)

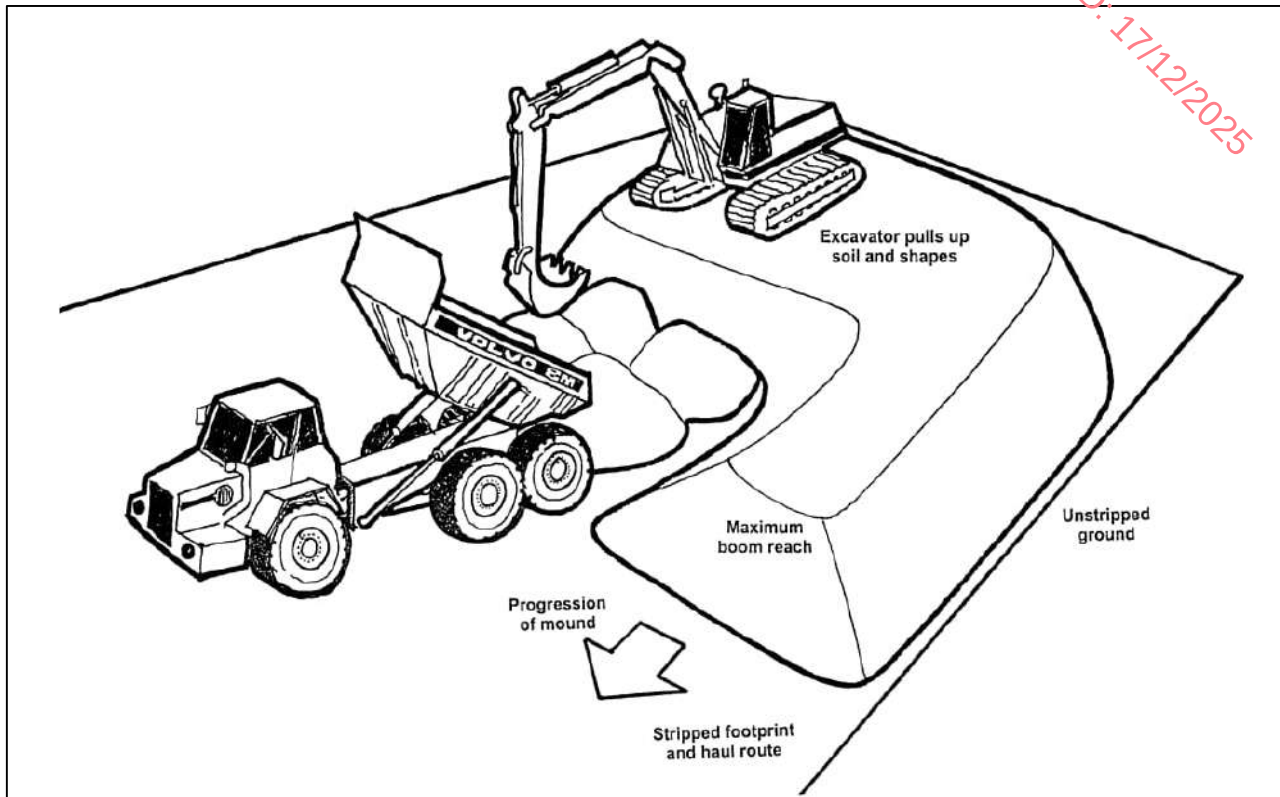


6.112 In order to avoid compaction single-tier mounds are preferred to multi-tier mounds for soil storage as it avoids the need for trafficking on the soil being stored.

6.113 For the building of soil storage mounds with excavators and dump trucks:

- the mounds should be sited on dry ground, not in hollows and should not disrupt local surface drainage. Where necessary, mounds should be protected from run-off/ponding by a cut-off ditch. Where the storage mound is in a hollow due to the removal of surface soils, measures should be undertaken to ensure that water is not able to pond within the storage area;
- the dump trucks must only travel within the haul route and operational areas. The trucks should enter the storage area, reverse and back-tip the soil load starting at the furthest point of the mound from the point of access. The excavator pulls up the soil into a mound of the required dimensions. The excavator operates by standing on the mound (see Diagram 6.2) below). The excavator bucket can be used to shape and firm the sides as the mound is progressively formed to promote the shedding of rain; particularly at the end of each day, but also on the onset of rain during the day. This should include any exposed incomplete surfaces;
- the process is repeated with the tipping of soil against the forming mound, and without wheels traversing onto previously tipped material;
- work should stop in wet conditions with measures undertaken to prevent ponding at the base of the mound and on the basal layer. At the start of each day ensure there is no ponding on the basal layers and operating areas; and
- topsoil storage mounds will not exceed 2 m in height.

Diagram 6.2: Soil Storage Mound / Screening Berm Construction Using Excavator and Dump Truck (MAFF 2000)



- 6.114 Stockpiles of soil will be re-vegetated where they are in place for a sufficient length of time to justify such a measure. The re-handling of soil material will be minimised as much as possible to preserve the integrity of the topsoil material. This is also an economically prudent practice.
- 6.115 During the operation stage the bedrock will be extracted using industry standard blasting techniques. Processing of the extracted rock will be carried out using the existing processing plant.
- 6.116 Operations within the extraction area will adhere to the Health and Safety Authority Safe Quarry Guidelines (2020) in relation to the Safety Health and Welfare at Work (Quarries) Regulations 2008 (As Amended) and this will limit the potential for unplanned events such as instability of quarry faces or instability in adjacent lands.
- 6.117 No other specific mitigation measures are required at the site in terms of land, soil and geology at this stage.

## Restoration Stage

- 6.118 Soil stored on site will be reused in the restoration plan, refer to EIAR Figure 2-4. Soil handling and placement during the restoration stage will be carried out in accordance with the procedures set out for the construction and operational stages above.

### Residual Impact Assessment

- 6.119 The residual impacts on land, soil and geology are those impacts which remain following the implementation of the mitigation measures outlined above.
- 6.120 The residual impact on land will be a loss of c.12.5 hectares of agricultural land within the proposed extension area. Considering the limited area and extent of agricultural lands in the region the residual impact will be Not Significant.
- 6.121 The soil and subsoil will be reused within the site as part of the final restoration, and the residual impact will be Not Significant.
- 6.122 There will be a residual impact on the geology with permanent extraction of the limestone within the c. 12.5 hectare extension area. A long-term secure supply of limestone is critical for the local and regional construction industry. The volume of limestone extraction is very small in comparison to the overall resource in the Cork and surrounding region. The residual impact will be Not Significant.
- 6.123 Considering the above the overall residual impact on the land, soils and subsoils, and geology will be Not Significant.

### Monitoring

- 6.124 No monitoring is required in respect of Land, Soils and Geology.

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### REFERENCES

- Geological Survey of Ireland, 2007, 1:100,000 Bedrock Geology of Ireland (Digital-Map).
- Institute of Geologists of Ireland (2013) 'Guidelines for the preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'.
- Cork County Development Plan, 2022 - 2028.
- MAFF (2000) GOOD PRACTICE GUIDE FOR HANDLING SOILS Sheet 1: Soil Stripping with Excavators and Dump Trucks
- MAFF (2000) GOOD PRACTICE GUIDE FOR HANDLING SOILS Sheet 2: Building Soil Storage Mounds with Excavators and Dump Trucks
- TEAGASC MANUAL ON DRAINAGE - and Soil Management 2nd Edition, 2022
- National Roads Authority (2006) A Guide to Landscape Treatments for National Road Schemes in Ireland
- Teagasc, 2004, Ireland Subsoil Parent Materials Map (digital version).
- Teagasc, 2007, Ireland Soils Map (digital version).
- Transport Infrastructure Ireland (March 2013). Specification for Road Works Series 600 -Earthworks

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### FIGURES

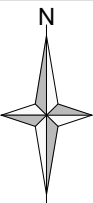
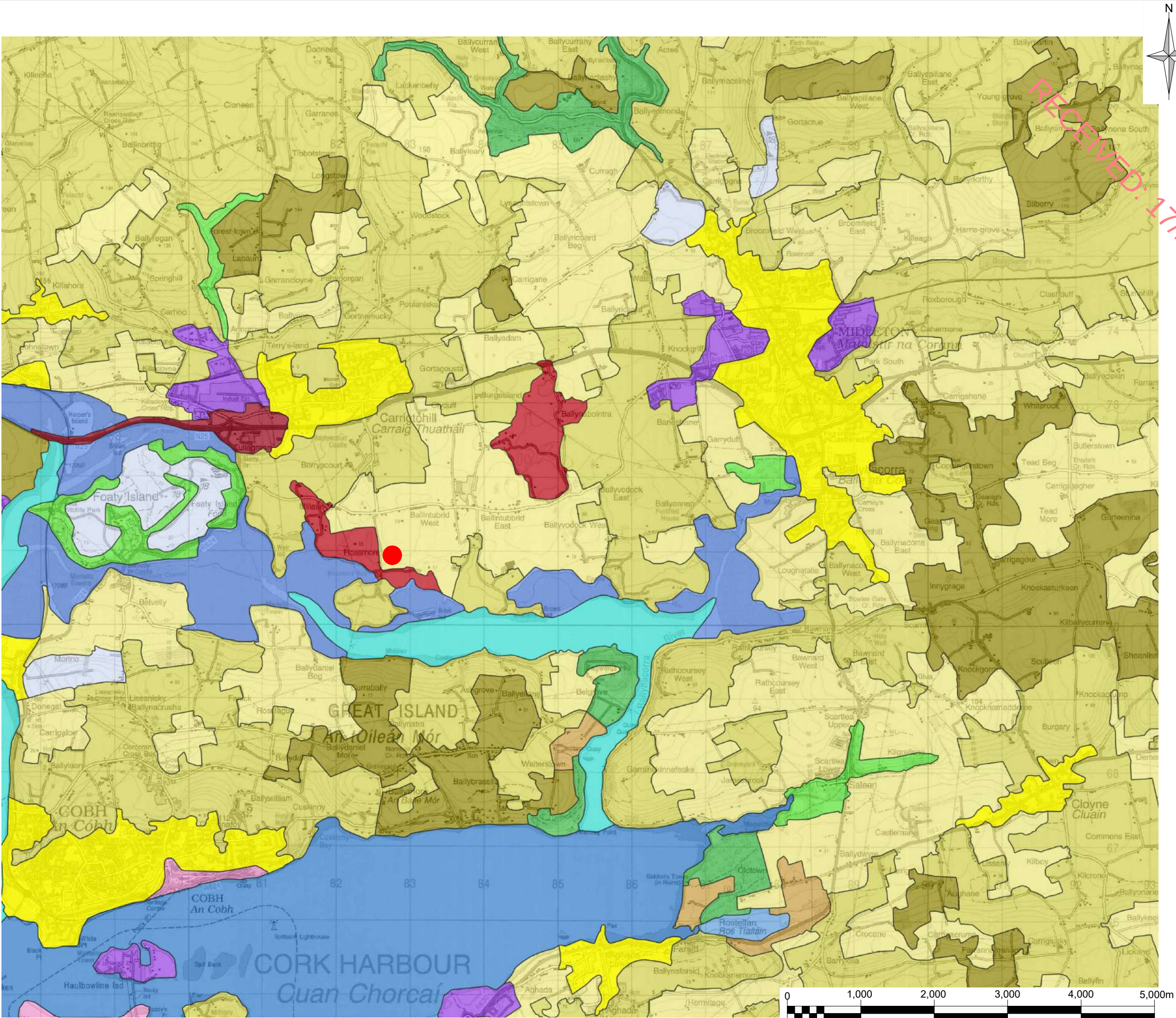
Figure 6.1: Land Cover Map

Figure 6.2: Soil Association Map

Figure 6.3: Subsoil Map

Figure 6.4: Bedrock Geology

Figure 6.5: GI Locations



**Notes:**  
1. EXTRACT FROM ORDNANCE SURVEY DISCOVERY SERIES MAP NO. 80, 81 & 87.

**Legend:**

Site Location

**Land Use Cover**

Broad-leaved forest

Complex cultivation patterns

Coniferous forest

Discontinuous urban fabric

Estuaries

Industrial or commercial units

Intertidal flats

Land principally occupied by agriculture, with significant areas of natural vegetation

Mineral extraction sites

Mixed forest

Non-irrigated arable land

Pastures

Port areas

Road and rail networks and associated land

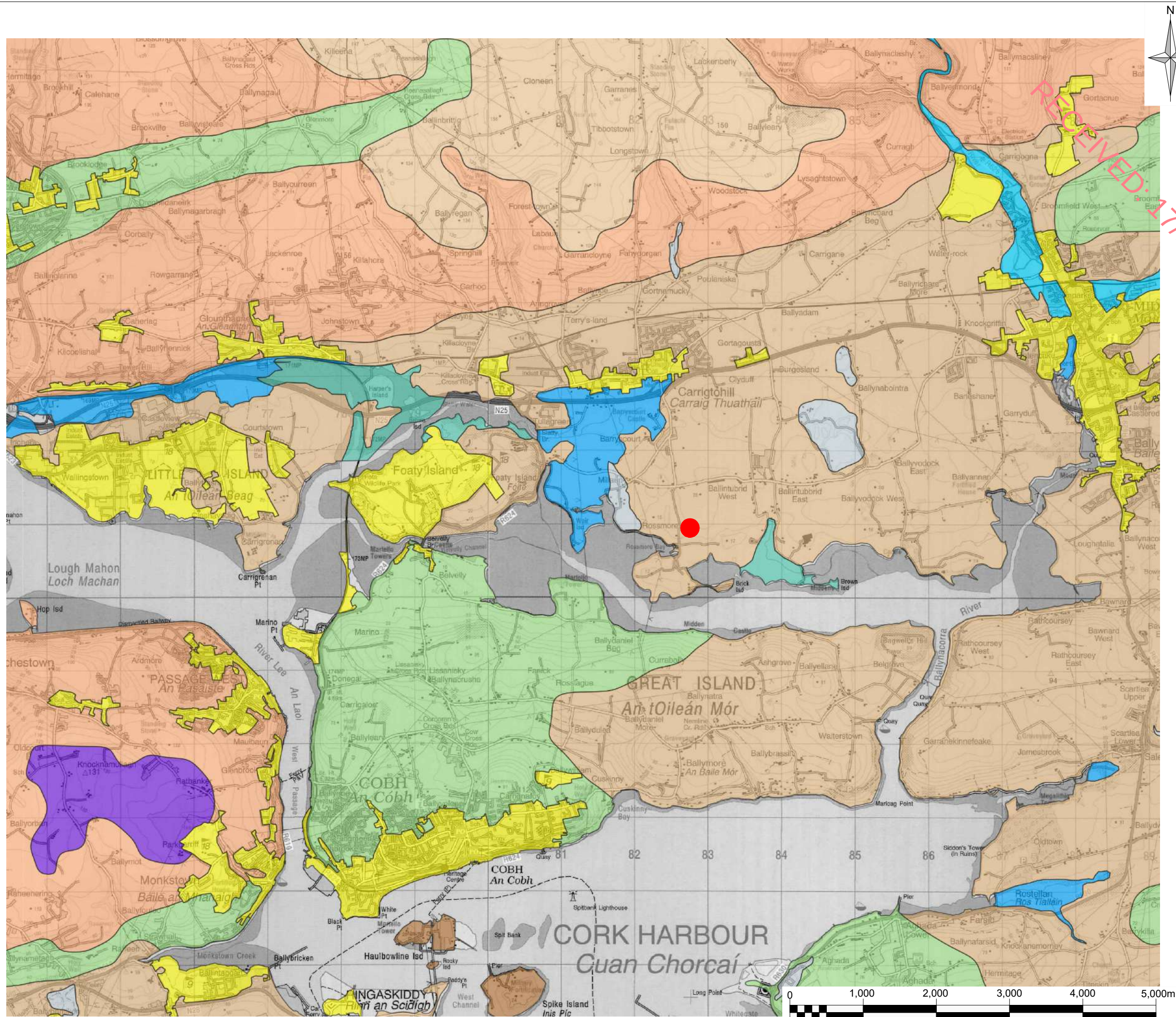
Salt marshes

Sea and ocean

Sport and leisure facilities

|                                                                                                                                                                       |                      |                                        |                         |     |                  |
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| Drawing Status & Suitability Code<br><b>FINAL</b>                                                                                                                     |                      |                                        |                         |     |                  |
| Client<br><b>BREEDON MATERIALS LTD.</b>                                                                                                                               |                      |                                        |                         |     |                  |
| Project<br><b>QUARRY EXTENSION AT<br/>ROSSMORE QUARRY,<br/>ROSSMORE, CARRIGTWOHILL, CO. CORK</b>                                                                      |                      |                                        |                         |     |                  |
| Drawing Title<br><b>LAND COVER MAP</b>                                                                                                                                |                      |                                        |                         |     |                  |
| Scale<br><b>1:50,000 @ A3</b>                                                                                                                                         |                      | SLR Project No.<br><b>065403.00001</b> |                         |     |                  |
| Designed<br><b>EW</b>                                                                                                                                                 | Drawn<br><b>EW</b>   | Checked<br><b>TP</b>                   | Authorised<br><b>TP</b> |     |                  |
| Date<br><b>09/25</b>                                                                                                                                                  | Date<br><b>09/25</b> | Date<br><b>09/25</b>                   | Date<br><b>09/25</b>    |     |                  |
| Drawing Number<br><b>FIGURE 6-1</b>                                                                                                                                   |                      |                                        |                         |     | Rev.<br><b>0</b> |

\\slr.local\au\Offices\IE\Dublin\SLR DATA\SLR Projects\00984 Logan Materials Ltd\065403 Rossmore Quarry Extension PAE\AR\Volume2 EIA\Report Figs Append\06 Land Use and Geology\Drawings\065403.00001.0 FIG 6-1 RO Land Cover Map.dwg 26/09/2025



|  |               |
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|  | <b>Notes:</b> |
|--|---------------|

1. EXTRACT FROM ORDNANCE SURVEY DISCOVERY  
SERIES MAP NO. 80, 81 & 87.

**Legend:**



Site Location

## Soils

- Marine alluvium (05MAR)
- River alluvium (05RIV)
- Puckane (0660c)
- Ross Carbery (0900e)
- Clonroche (1100a)
- Clashmore (1100n)
- Broomhill (1100s)
- Island
- Rock
- Tidal marsh
- Urban

|     |            |      |    |     |    |
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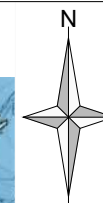
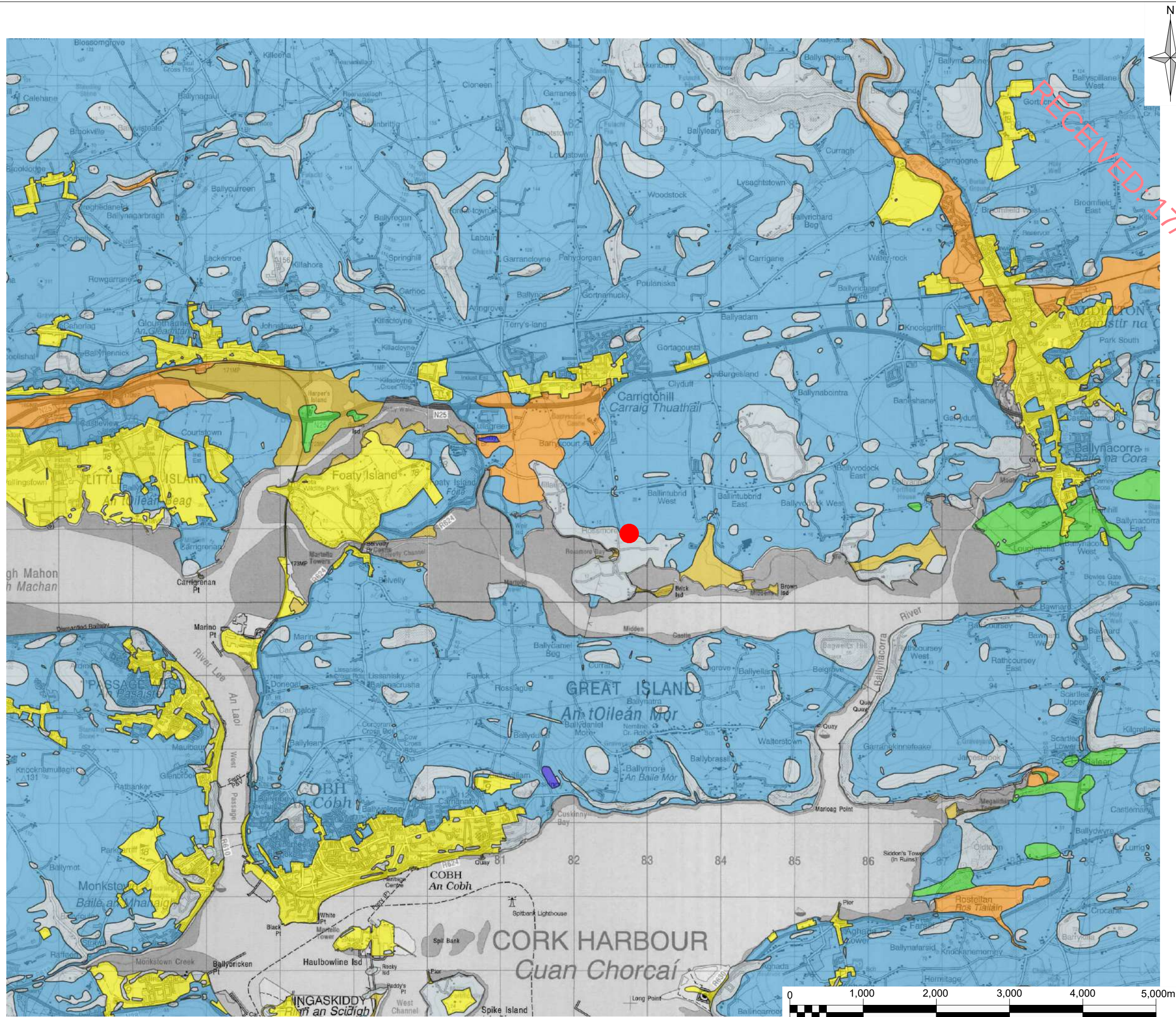
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SOILS ASSOCIATION MAP

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Drawing Number  
**FIGURE 6-2**



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1. EXTRACT FROM ORDNANCE SURVEY DISCOVERY  
SERIES MAP NO. 80, 81 & 87.

**Legend:**

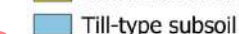


Site Location

### Subsoils



 Concreted or artificial surface



 Sands and gravels deposited by glaciers



Water

|     |            |      |    |     |    |
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Drawing Title  
**SUBSOILS MAP**

Scale  
1:50,000

@ A3

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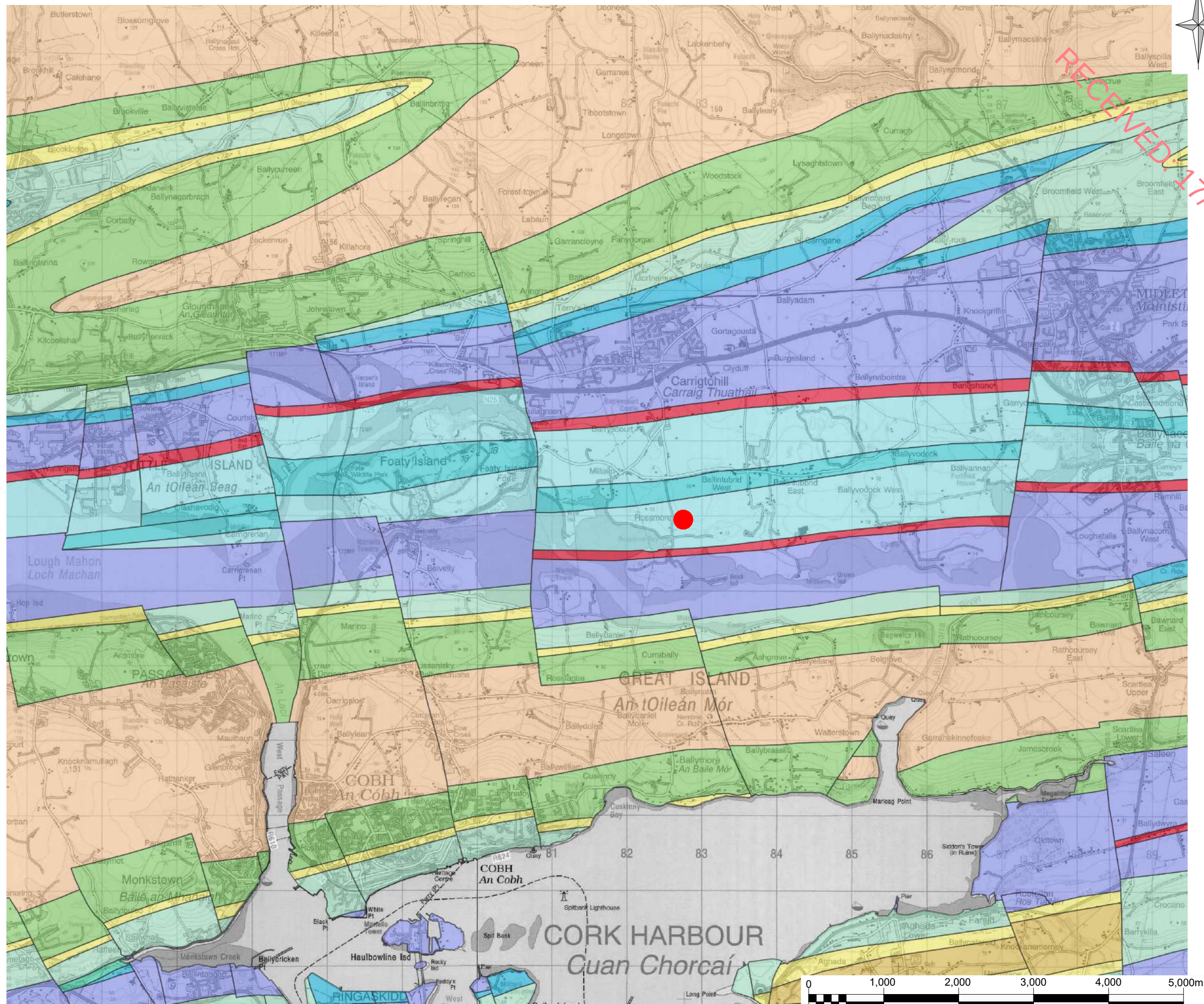
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Drawing Number  
**FIGURE 6-3**

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| Notes: |
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1. EXTRACT FROM ORDNANCE SURVEY DISCOVERY  
SERIES MAP NO. 80, 81 & 87.

**Legend:**



## Bedrock Geology

-  Ballyknock Member
-  Ballysteen Formation
-  Ballytrasna Formation
-  Clashavodig Formation
-  Cork Red Marble Formation
-  Cuskinny Member
-  Gyleen Formation
-  Little Island Formation
-  Loughbeg Formation
-  Old Head Sandstone Formation
-  Pigs Cove Member
-  Waulsortian Limestones

|     |            |      |    |     |      |
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| Rev | Amendments | Date | By | Chk | Auth |
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ROSSMORE, CARRIGTWOHILL, CO. CORK

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|  | Drawing Title |

Drawing Title  
**BEDROCK GEOLOGY MAP**

Scale  
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SLR Project No.  
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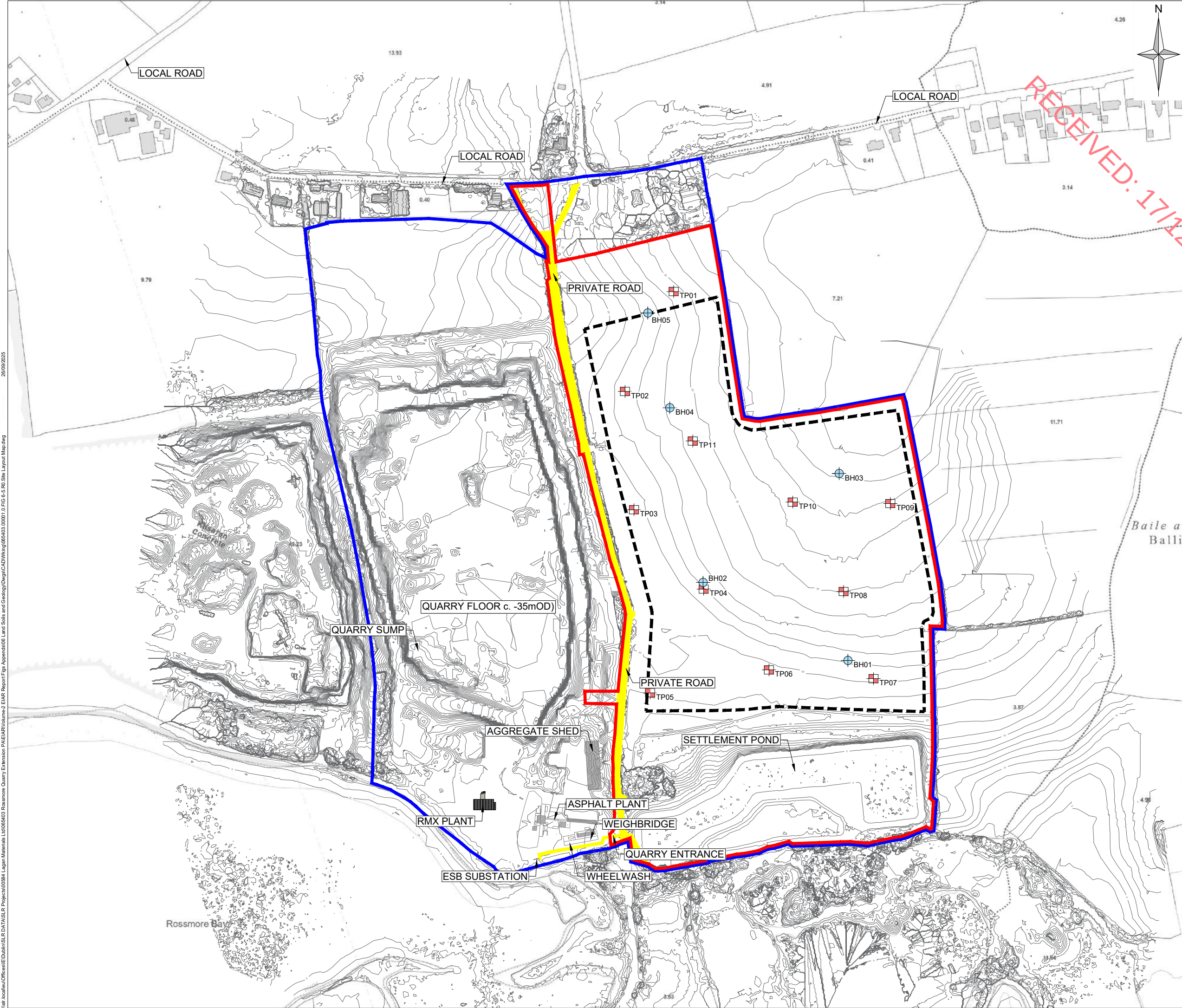
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**FIGURE 1**

ev.



**Notes:**

1. FOR PLANNING PURPOSED ONLY.

2. MAPPING EXTRACT FROM DIGITAL ORDNANCE SURVEY 1:2,500 SCALE MAPPING.

**MAP SERIES:**

1:2,500  
1:2,500  
1:2,500  
1:2,500

**MAP SHEETS:**

6386-A  
6386-B  
6386-C  
6386-D

**Legend:**

LAND INTEREST BOUNDARY (c. 43.7 Ha)

PLANNING APPLICATION AREA (c. 22.3 Ha)

EXTRACTION AREA (c. 12.5 Ha)

EXISTING WAYLEAVE

BOREHOLE LOCATIONS

TRIAL PIT LOCATIONS

|                                                                              |            |                 |            |      |      |
|------------------------------------------------------------------------------|------------|-----------------|------------|------|------|
| Rev                                                                          | Amendments | Date            | By         | Chk  | Auth |
| <div><br/>www.slrconsulting.com</div>                                        |            |                 |            |      |      |
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| QUARRY EXTENSION AT<br>ROSSMORE QUARRY,<br>ROSSMORE, CARRIGTWOHILL, CO. CORK |            |                 |            |      |      |
| Drawing Title                                                                |            |                 |            |      |      |
| SITE LAYOUT MAP                                                              |            |                 |            |      |      |
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| EW                                                                           | EW         | TP              | TP         |      |      |
| Date                                                                         | Date       | Date            | Date       |      |      |
| 09/25                                                                        | 09/25      | 09/25           | 09/25      |      |      |
| Drawing Number                                                               |            |                 |            | Rev. |      |
| FIGURE 6-5                                                                   |            |                 |            | 0    |      |

I:\at\_local\au\Offices\IEDublin\SLR DATA\SLR Projects\00584 Logan Materials Ltd\065403 Rossmore Quarry Extension\PAE\PAE\Volume2 EIAF Report Figs\Appendix06 Land Sale and Geology\Drawings\CAD\Wing\065403.00001.0 FIG 6-5 RD Site Layout Map.dwg 26/09/2025

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## APPENDICES

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## Appendix 6-A: Geophysical Survey Report

AGP24052\_01

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**REPORT  
ON THE  
GEOPHYSICAL INVESTIGATION  
2024  
AT  
ROSSMORE, CARRIGTWOHILL  
Co. CORK  
FOR  
THE BREEDON GROUP**



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THE FINDINGS OF THIS REPORT ARE THE RESULT OF A GEOPHYSICAL SURVEY USING NON-INVASIVE SURVEY TECHNIQUES CARRIED OUT AT THE GROUND SURFACE. INTERPRETATIONS CONTAINED IN THIS REPORT ARE DERIVED FROM A KNOWLEDGE OF THE GROUND CONDITIONS, THE GEOPHYSICAL RESPONSES OF GROUND MATERIALS AND THE EXPERIENCE OF THE AUTHOR. APEX GEOPHYSICS LTD. HAS PREPARED THIS REPORT IN LINE WITH BEST CURRENT PRACTICE AND WITH ALL REASONABLE SKILL, CARE AND DILIGENCE IN CONSIDERATION OF THE LIMITS IMPOSED BY THE SURVEY TECHNIQUES USED AND THE RESOURCES DEVOTED TO IT BY AGREEMENT WITH THE CLIENT. THE INTERPRETATIVE BASIS OF THE CONCLUSIONS CONTAINED IN THIS REPORT SHOULD BE TAKEN INTO ACCOUNT IN ANY FUTURE USE OF THIS REPORT.

| PROJECT NUMBER                                                     | AGP24052                           |               |                            |
|--------------------------------------------------------------------|------------------------------------|---------------|----------------------------|
|                                                                    |                                    |               |                            |
| AUTHOR                                                             | CHECKED                            | REPORT STATUS | DATE                       |
| EURGEOL PETER O'CONNOR P.GEO.,<br>M.SC (GEOPHYSICS), DIP. EIA MGT. | TONY LOMBARD M.SC.<br>(GEOPHYSICS) | V.01          | 18 <sup>TH</sup> JUNE 2024 |

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## 1. EXECUTIVE SUMMARY

APEX Geophysics Limited was requested by the Breedon Group to carry out a geophysical investigation at Rossmore, Co. Cork. The objectives of the investigation were to estimate the depth and the extent of a karst feature encountered during drilling, indicate the presence of other karst features, estimate overburden thickness, indicate type and quality of the bedrock, outline weathered and fractured zones.

The site is located off the N25, c. 1.5 km south of Carrigtwohill and extends to c. 16.5 ha of agricultural land. Site topography ranges from c. 17 mOD to c. 30 mOD. Sand/gravel and rock have been extracted from the south of the site. Clay filled fissures in the exposed faces and a surface subsidence feature were noted.

The Geological Survey of Ireland (GSI) Geology map shows limestone of the Little Island Formation in the south and limestone of the Clashavodig Formation in the north. The Quaternary map shows till derived from Devonian sandstones with subcropping/outcropping rock in the southwest. The rock formations are both classified as a 'Regionally Important Aquifer - Karstified (diffuse). The watertable is at around 2 - 3 mOD.

A 2009 geophysical survey indicated overburden thicknesses greater than 5 m in the north of the site with between 2 and 3.5 m in the centre-south. A surface layer of weathered/fractured limestone was interpreted across the site, locally deeper in places. The Little Island Formation was considered to have potential for use as crushed aggregate while the Clashvodic Limestone was more weathered and fractured. A total of 14 wells and 32 boreholes have been drilled on or very close to the site at various stages. Rotary core and well logs data have been provided. The rock is described as generally strong, massive, blueish grey bioclastic LIMESTONE.

The 2024 survey was carried out on the 15<sup>th</sup> - 24<sup>th</sup> April, 2024 involving the collection of EM31 conductivity readings, eight ERT profiles (R1 to R8) and eleven seismic refraction profiles (S1 – S11). Summary borehole and well data have been plotted on the relevant ERT 2024 profiles

A surface layer of gravelly CLAY, clayey SAND/GRAVEL, and silty to 'clean' SAND/GRAVEL has been interpreted on all 2024 profiles. Thicknesses generally range from 1 m to 10 m. The silty and 'clean' SAND/GRAVEL in the south and southwest ranges from 1 to 10 m averaging around 5 m and has economic potential. Trial pits to confirm the gravel/rock boundary are recommended.

The 2024 geophysical data indicate a generally strong to very strong, moderately-slightly weathered/fractured LIMESTONE in the centre-south of the site with good potential for the production of crushed aggregate with localised areas of increased weathering, fracturing and clay infill. Weathering/fracturing and overburden thickness increases to the north.

An upper layer of highly to moderately weathered rock with an average thickness of 3 m has been taken across the site. Deeper weathering, fracturing and clay infill possibly associated with karstic solution weathering also occurs at a number of locations. These features are most prominent in the northern part of the site.

A potential LIMESTONE resource zone has been outlined excluding the main deep weathering/karst features in the north and volumes estimated (7.4 m.t. over 3 benches and 8.8 ha). A potential resource estimation of 0.3 m.t has been made for the SAND/GRAVEL deposits. Further investigation by trial pitting is recommended and additional drilling and resistivity should also be considered. The geophysical report should be reviewed after completion of any further direct investigation, provision of well log information, testing and topography.

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## 2. INTRODUCTION

APEX Geophysics Limited was requested by the Breedon Group to carry out a geophysical investigation at a site at Rossmore, Co. Cork to provide information on the extent of a karst feature encountered during drilling and to identify any other potential karst features across the site.

### 2.1 Survey Objectives

The objectives of the investigation were to:

- estimate the depth and the extent of the karst feature encountered,
- indicate presence of other karst features,
- estimate overburden thickness,
- indicate type and quality of the bedrock,
- indicate depth to bedrock,
- indicate weathered and fractured zones.

### 2.2 Site Background

The site is located off the N25, approximately 1.5 km south of Carrigtwohill (Fig. 2.1A) and is separated by a road from an existing quarry to the west that is in the ownership of the client.

The site is outlined in red on Fig. 2.1A below and extends to c. 16.5 ha consisting of agricultural land (Fig. 2.1B). Site topography ranges from c. 17 mOD to c. 30 mOD rising gradually to the north and east. Sand/gravel and rock have been extracted from an area of around 4.5 ha in the south of the site. Clay filled fissures with an apparent N-S trend are visible in the rock face (Fig. 2.1C) and a subsidence feature was noted in the area north of the face (Fig. 2.1D). Clay filled fissures are also visible in the quarry to the west.

The site was previously surveyed by APEX in 2009 (APEX, 2009).



Figure 2.1A. Site location.

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*Figure 2.1B. Profile R2 looking east.*



*Figure 2.1C. Looking north at previously extracted sand/gravel and limestone – clay filled fissures in face.*



*Figure 2.1D. Subsidence feature in south of site.*

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### 2.2.1 Geology

The Geological Survey of Ireland (GSI) 1:100k Bedrock Geology map for the area (GSI, 2018) shows the site as underlain by rocks of the massive and crinoidal fine limestone of the Little Island Formation in the south and by oolitic, peloidal, cherty, fine limestone of the Clashavodig Formation in the north (Fig. 2.2). There are two karst features shown c. 750m to the east.



Figure 2.2. Geological map for the survey area.

### 2.2.2 Soils

The Quaternary sediments map for the area (GSIa, 2019) indicates that the site is dominated by till derived from Devonian sandstones with subcropping/outcropping rock in the southwest corner of the site (Fig. 2.3).



Figure 2.3: GSI subsoil map.

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### 2.2.3 Groundwater

The Little Island Formation and the Clashavodig Formation are both classified as a 'Regionally Important Aquifer - Karstified (diffuse)' (GSIc, 2019), see Fig. 2.4.



Fig 2.4: Bedrock aquifer.

The groundwater vulnerability (GSIb, 2019) is classified as 'high' to 'extreme' to 'rock at or near surface' across the site (Fig. 2.5).



Fig 2.5. Groundwater vulnerability classification for the survey area (survey area in red).

#### 2.2.4 Historical Data

The historical 6-inch sheet for the area (Fig. 2.6) records 'lumps of gray crystalline limestone' outcropping in the north of the site. The map also shows 'pale gray limestone' to the north of the site.



Fig 2.6: The historical 6-inch map.

#### 2.2.5 Geophysical Data

A geophysical survey was carried out in 2009 (APEX, 2009) and the interpreted data indicated overburden thicknesses greater than 5 m in the north of the site with between 2 and 3.5 m in the south and centre. Gravel deposits were indicated in the southwest of the site.

A surface layer of weathered/fractured limestone was interpreted across the site with Clashvodig Limestone in the north and Little Island Formation in the south. The resistivity and seismic data indicated that the Little Island Formation had potential for use as crushed aggregate while the Clashvodig Limestone is more weathered and fractured. Further investigation by drilling and geophysics was recommended.

#### 2.2.6 Borehole Data

Five rotary core boreholes (24-ROS-01 to 24-ROS-05) were drilled to 95 - 100 m bgl by SLR in 2024 and summary logs have been plotted on the relevant ERT profiles. Borehole locations are shown on Drawing AGP24052\_01. The rock is described as generally strong, massive, blueish grey bioclastic LIMESTONE with calcite veining, occasional bioclastic debris, and minor weathering with trace orange staining on fracture surfaces. There are occasional zones of fractured rock with poor recovery and infill soil.

A total of 14 wells have been drilled on or close to the site at various stages between 2005 and 2024. Logs are available for Wells A and C from 2005, MW03 and MW04 from 2008, logs for SP1-SP5 from 2024 together with field notes for BBH1-BBH3 from 2024. Approximate locations of all wells have been plotted on Drawing AGP24052\_01 and summary logs drawn on relevant ERT profiles.

BBH1 records overburden and weathered rock sections to around 18 m bgl with 'dark limestone' noted at depth while BBH3 encountered what appears to be good limestone below 11.5 m. BBH3 is reported as having rock between 12 and 25 m bgl and was terminated in clay at 45 m bgl.

The SP1-SP5 series of wells records depth to competent limestone varying from 3.1 to 7.9 m with frequent clay fractures noted to 13.5 m on SP1 and to 21 m on SP5. Limestone/mudstone is noted on SP1 and there is a reference to 'shaley' limestone on SP3.

Twenty-seven boreholes were drilled across the site at sometime prior to 2009 but only locations and depth to rock information is available for these at the time of writing. The borehole locations are shown on Drawing AGP24052\_01 and the recorded depths to bedrock have been plotted on the relevant ERT profile.

The watertable is at around 2 mOD based on the levels recorded in the monitoring wells and was measured at 3.3 mOD in the flooded area to the south.

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### 2.3 Survey Rationale

The investigation consisted of EM31 ground conductivity, 2D Electrical Resistivity Tomography (ERT) and Seismic Refraction.

**EM** ground conductivity mapping operates on the principle of inducing currents in conductive substrata and measuring the resultant secondary electro-magnetic field. The strength of this secondary EM field is calibrated to give apparent ground conductivity in milliSiemens/metre (mS/m). This technique provides information on the shallow (0-6m) variation of the superficial deposits and outline the shallow bedrock.

**ERT** images the resistivity of the materials in the subsurface along a profile to produce a cross-section showing the variation in resistivity with depth, depending on the length of the profile. Each cross-section will be interpreted to determine the material type along the profile at increasing depth, based on the typical resistivities returned for Irish ground materials.

**Seismic Refraction** profiling measures the velocity of refracted seismic waves through the overburden and rock material and allows an assessment of the thickness and quality of the materials present to be made. Stiffer and stronger materials usually have higher seismic velocities while soft, loose or fractured materials have lower velocities. Readings are taken using geophones connected via multi-core cable to a seismograph.

As with all geophysical methods the results are based on indirect readings of the subsurface properties. The effectiveness of the proposed approach will be affected by variations in the ground properties. Further information on the detailed methodology employed in this investigation is given in **APPENDIX A: DETAILED GEOPHYSICAL METHODOLOGY**.

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### 3. RESULTS

The 2024 survey was carried out on the 15<sup>th</sup> - 24<sup>th</sup> April 2024 involving the collection of EM conductivity readings, eight ERT profiles (R1 to R8) and eleven seismic refraction profiles (S1 – S11). ERT profiles R4, R5 and R6 were recorded using both gradient array (50 m depth range) and pole-dipole array (95 m depth range). The geophysical survey locations from both survey phases (2009 and 2024) are shown on Drawing AGP24052\_01 (Appendix B). The geophysical results and interpretation are presented on Drawings AGP24052\_R1 to AGP24052\_R8 and are summarised on Drawing AGP24052\_03 (Appendix B).

#### 3.1 EM Ground Conductivity Mapping

The EM results (Drawing AGP20182\_02, Appendix B) are indicative of the bulk conductivity of the ground materials from 0 - 6.0m bgl. The recorded conductivity values ranged from 0.5 to 8.5 mS/m and have been generally interpreted in conjunction with the ERT, seismic and borehole data as follows:

| Conductivity (mS/m) | Interpretation                                                                           |
|---------------------|------------------------------------------------------------------------------------------|
| 0.5 – 3.0           | Thin overburden over silty SAND/GRAVEL and ‘clean’ SAND/GRAVEL, local shallow LIMESTONE. |
| 3.0 – 4.5           | < 5m predominantly clayey SAND/GRAVEL over LIMESTONE                                     |
| 4.5 – 8.5           | > 5m predominantly gravelly CLAY over LIMESTONE                                          |

#### 3.2 Modelled ERT

The modelled resistivity values have been interpreted on the following basis:

| Resistivity (Ohm-m) | Interpretation                                      |
|---------------------|-----------------------------------------------------|
| 100 - 250           | Gravelly CLAY                                       |
| 250 – 500           | Clayey SAND/GRAVEL                                  |
| 500 – 1,500         | Silty and ‘clean’ SAND/GRAVEL                       |
| 500 – 1,250         | Highly - moderately weathered/ fractured LIMESTONE  |
| 1250 – 7,000        | Moderately – slightly weathered/fractured LIMESTONE |

*Similar resistivity ranges to the 2009 have been used for ease of comparison.*

#### 3.3 Seismic refraction profiling

The seismic refraction data has been interpreted on the following basis:

| Layer | P-wave Velocity (m/s) | Interpretation                                                                                                                                 |
|-------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | 194 – 550             | Soft-firm gravelly CLAY, Loose-medium dense SAND/GRAVEL                                                                                        |
| 2     | 727 – 1,900           | Medium dense – very dense silty and clayey SAND/GRAVEL, firm – very stiff sandy gravelly CLAY, highly-moderately weathered/fractured LIMESTONE |
| 3A    | 2,908 – 3,500         | Moderately weathered LIMESTONE, (locally highly – moderately weathered).                                                                       |
| 3B    | 3,550 – 5,600         | Slightly weathered – fresh, strong to very strong LIMESTONE.                                                                                   |

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## 4. DISCUSSION

### 4.1 Overburden

A surface layer of gravelly CLAY, clayey SAND/GRAVEL, and silty to 'clean' SAND/GRAVEL has been interpreted on all profiles. Thicknesses range from 1 m to 15 m locally with thicknesses in the north of the site generally between 5 and 10 m and thicknesses in the centre of the site between 1 and 5 m. Thicknesses in the south of the site increase again to between 5 and 10 m.

The predominant overburden types in the north and centre of the site are gravelly CLAY and clayey SAND/GRAVEL with the silty and 'clean' SAND/GRAVEL in the south and southwest of the site.

### 4.2 Sand and Gravel

The interpreted silty and 'clean' SAND/GRAVEL in the south and southwest can be seen at the southern end of ERT profiles R4, R5 and R6 and the western end of R7 and R8. Thicknesses range from 1 to 10 m averaging around 5 m. An overburden/topsoil thickness of 1 m has been assumed. An EM31 ground conductivity of 3 mS/m or less has been used to outline the prospective SAND/GRAVEL area.

The silty and 'clean' SAND/GRAVEL material should have economic potential as it will be removed to expose the underlying LIMESTONE in any future development and also it has been previously worked immediately to the south. Pockets of clayey SAND/GRAVEL with a higher fines content will also be encountered in the centre of the site and elsewhere, and this may also be economic to process once the washing/screening plant is in place.

**Note.** Non-saturated or 'dry' SAND/GRAVEL has similar resistivity values to 'clean' limestone such as the Little Island Formation and where one is in direct contact with the other it can be difficult to define the boundary between them based on resistivity data alone. This occurs in a number of areas, mostly in the centre-south of the site and these locations have been highlighted on Profiles R3, R4, R5, R7 and R8. The borehole data in these areas record a marginally deeper rock level but the type of material encountered above rock level is not stated. Trial pits at these locations are recommended to confirm the interpretation.

### 4.3 Bedrock

LIMESTONE bedrock is indicated by the resistivity and seismic data and confirmed by the borehole logs. Resistivity values are typical of a 'clean' LIMESTONE and seismic velocity values (3,550 – 5,600 m/s) indicate a generally strong to very strong, moderately-slightly weathered/fractured LIMESTONE with good potential for the production of crushed aggregate. Localised areas of lower resistivity and lower bedrock seismic velocities (2900 - 3500 m/s) coincide with zones of increased weathering, fracturing and clay infill.

The rock appears more susceptible to weathering, fracturing and infill in the north of the site and this change appears to coincide with the transition from Little Island Formation in the south to Clashavodig Formation in the north. 'Dark grey Limestone/Mudstone' was recorded on Well SP1 located over the Clashavodig Formation.

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#### 4.4 Weathered/fractured Rock and Karst

An upper layer of highly to moderately weathered rock with resistivity values between 500 and 1,250 Ohm-m and between 1 and 15 m thick locally has been interpreted on all profiles. An average thickness of 3 m has been taken across the site.

The weathered/fractured rock material extends significantly at depth in a number of locations and these have been interpreted as deep weathering, fracturing and clay infill possibly associated with karstic solution weathering. These features are most prominent at the northern end of ERT profiles R4, R5 and R6 and similar but less extensive features can also be seen on profiles R1, R2, R7 and R8 and at the southern end of R4. The location of these features has been plotted on Drawing AGP24052\_03 where they show an approximate WNW-ESE alignment in places.

The approximate location of Well BBH3 which is reported as having rock between 12 and 25 m bgl and was terminated in clay at 45 m bgl coincides with the margins of the localised bedrock depression in the centre of R2 and R4 ('no rock' was also noted on the corresponding pre-2009 borehole). This feature persists at depth on both the gradient and pole-dipole array versions but at resistivity values > 1250 Ohm-m which suggests it is a well-developed but relatively localised feature. Similar poorer quality weathered rock was recorded on wells BBH1 and SP5.

There is no apparent correlation on Profile R7 with the observed surface subsidence feature (Fig. 2.1D).

A potential resource zone has been outlined excluding the weathering/karst feature at BBH3 described above and terminating in the north at the significant weathering/karst feature that runs across Profiles R4, R5 and R6. This zone contains three interpreted weathering/karst features which should be considered for investigation by drilling. Infill resistivity profiles in this zone should also be considered.

Overall agreement with the 2009 geophysical data is good apart from some minor changes due to the different array types used. The karst feature encountered in BBH3 was indicated at the northern end of R2 from 2009.

#### 4.5 Resource Estimation

A potential resource volume of LIMESTONE has been estimated for (Drawing AGP24052\_03 and Table 4.1). This is subject to satisfactory results from exploratory drilling and physical, mechanical and chemical testing.

Volumes have been estimated across 3 x 15 m benches. This bench configuration is outlined for the purpose of preliminary volume estimation only.

Volumes have allowed for a stand-off of 40 m from the site boundary. An allowance for 3 m thick weathered layer at the top of the rock and 10% waste at all levels has been made.

**Note 1.** The volumes have been calculated using average levels obtained during the ERT survey. They should be revised when a detailed topographic map becomes available.

**Note 2.** Full ERT coverage to the base of proposed Bench 3 (around -27 mOD) was achieved on all profiles. The pole-dipole versions of profiles R4, R5 and R6 have a depth penetration of c. 95 m and these and the 2024 boreholes show potential for an additional two benches (4 and 5) at depth, subject to hydrogeological considerations.

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| Rossmore Potential Resource Estimate |                  |                  |                                 |                                     |                                  |         |                                                                  |
|--------------------------------------|------------------|------------------|---------------------------------|-------------------------------------|----------------------------------|---------|------------------------------------------------------------------|
|                                      | Thickness<br>(m) | Area<br>(sq. m.) | Overburden<br>Volume<br>(cu.m.) | Weathered<br>rock volume<br>(cu.m.) | Rock<br>Volume<br>(cu.m.)        | Waste % | Tonnes<br>(Weathered)<br>(@2.0 t./cu.m) Tonnes<br>(@2.5 t./cu.m) |
| <b>LIMESTONE</b>                     |                  |                  |                                 |                                     |                                  |         |                                                                  |
| Overburden Bench 1                   | 5                | 88,862           | 444,310                         |                                     |                                  |         |                                                                  |
| Bench 1 (weathered)                  | 3                | 88,862           |                                 | 266,586                             |                                  |         | 533,172                                                          |
| Bench 1                              | 12               | 88,862           |                                 |                                     | 1,066,344                        | 10      | 213,269 2,399,274                                                |
| Bench 2                              | 15               | 78,884           |                                 |                                     | 1,183,260                        | 10      | 236,652 2,662,335                                                |
| Bench 3                              | 15               | 69,422           |                                 |                                     | 1,041,330                        | 10      | 208,266 2,342,993                                                |
| <b>TOTALS</b>                        |                  |                  | <b>444,310</b>                  | <b>266,586</b>                      | <b>3,290,934</b>                 |         | <b>1,191,359 7,404,602</b>                                       |
|                                      | Thickness<br>(m) | Area<br>(sq. m.) | Overburden<br>Volume<br>(cu.m.) |                                     | Sand/Gravel<br>Volume<br>(cu.m.) |         | Sand/Gravel<br>Tonnes<br>(@1.8 t./cu.m)                          |
| <b>SAND/GRAVEL</b>                   |                  |                  |                                 |                                     |                                  |         |                                                                  |
| Overburden Bench 1                   | 1                | 43,537           | 43,537                          |                                     |                                  |         |                                                                  |
| <b>SAND/GRAVEL</b>                   | <b>5</b>         | <b>43,537</b>    |                                 |                                     | <b>217,685</b>                   |         | <b>391,833</b>                                                   |

Table 4.1

#### 4.6 Sand/Gravel Resource Estimation

A potential resource estimation has also been made for the SAND/GRAVEL deposits indicated by the geophysical data in the southwest of the site. An overburden thickness of 1 m has been assumed and an average SAND/GRAVEL thickness of 4 m has been taken. The results are shown in Table 4.1 above.

**Note 3.** The 4 m thickness used in the volume estimation may have to be changed depending on the resolution of the ambiguity in resistivity values between the non-saturated sand/gravel and the clean Little Island Limestone referred to in Section 4.2 above being resolved.

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## 5. RECOMMENDATIONS

Further investigation by trial pitting is recommended to confirm soil type and depth to bedrock, and to obtain sand/gravel samples. Testing should be carried out to establish the physical, mechanical and chemical properties. Proposed trial pit locations are:

| No.  | Easting  | Northing | Target                         |
|------|----------|----------|--------------------------------|
| PTP1 | 582632.6 | 571427.2 | soil type and depth to bedrock |
| PTP2 | 582546.2 | 571313.4 | sand/gravel                    |
| PTP3 | 582828.4 | 571301.9 | soil type and depth to bedrock |
| PTP4 | 582565.0 | 571200.8 | sand/gravel                    |
| PTP5 | 582622.1 | 571091.6 | soil type and depth to bedrock |
| PTP6 | 582601.5 | 571003.2 | soil type and depth to bedrock |
| PTP7 | 582722.5 | 571022.8 | sand/gravel                    |
| PTP8 | 582820.8 | 571003.8 | soil type and depth to bedrock |

Drilling of the possible karst features outlined by the geophysical survey in the centre-south of the site should be considered along with infill resistivity profiling.

The geophysical report should be reviewed after completion of any further direct investigation, provision of well log information and testing.

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GS Ib, 2019;  
Groundwater Vulnerability Shapefile. <http://www.gsi.ie/Mapping.htm>

GS Ic, 2019;  
Bedrock Aquifer Shapefile. <http://www.gsi.ie/Mapping.htm>

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## **APPENDIX A: DETAILED GEOPHYSICAL METHODOLOGY**

A combination of geophysical techniques was used to provide a high quality interpretation and reduce any ambiguities, which may otherwise exist.

### **EM Ground Conductivity Mapping**

#### **Principles**

This is an electromagnetic technique used to investigate lateral variations in overburden material and to assist with the indication of the depth to bedrock. This method operates on the principle of inducing currents in conductive substrata and measuring the resultant secondary electro-magnetic field. The strength of this secondary EM field is calibrated to give apparent ground conductivity in milliSiemens/metre (mS/m). Readings over material such as organic waste and peat give high conductivity values while readings over dry materials with low clay mineral content such as gravels, limestone or quartzite give low readings. The EM31 survey technique determines the apparent conductivity of the different overburden layers from 0-6m bgl depending on the dipole mode used.

#### **Data collection**

The EM31 equipment used was a GF CMD-4 conductivity meter equipped with data logger. This instrument features a real time graphic display of the previous 20 measurement points to monitor data quality and results. Conductivity and in-phase values were recorded across the site. Local conditions and variations were recorded.

#### **Data processing**

The conductivity and in-phase field readings were downloaded, contoured and plotted using the SURFER 12 program (Golden Software, 2015). Data which was affected by metallic objects was removed. Assignment of material types and possible anomaly sources was carried out, with cross-reference to other data.

### **Electrical Resistivity Tomography (ERT)**

Electrical Resistivity Tomography was carried out to provide information on lateral variations in the overburden material as well as on the underlying overburden and bedrock.

#### **Principles**

This surveying technique makes use of the Gradient and pole-dipole resistivity array. The 2D-resistivity profiling method records a large number of resistivity readings in order to map lateral and vertical changes in material types. This method involves the use of electrodes connected to a resistivity meter, using computer software to control the process of data collection and storage.

#### **Data Collection**

Profiles were recorded using a ABEM LS4 resistivity meter, imaging software, four 20 takeout multicore cables and up to 80 stainless steel electrodes. Saline solution was used at the electrode/ground interface in order to gain a good electrical contact required for the technique to work effectively. The recorded data were processed and viewed immediately after surveying.

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### **Data Processing**

The field readings were stored in computer files and inverted using the RES2DINV package (Geotomo Software, 2006) with up to 5 iterations of the measured data carried out for each profile to obtain a 2D-depth model of the resistivities.

The inverted 2D resistivity models and corresponding interpreted geology are displayed on the accompanying drawings alongside the processed seismic sections. Profiles have been contoured using the same contour intervals and colour codes. Distance is indicated along the horizontal axis of the profiles.

## **Seismic Refraction Profiling**

### **Principles**

This method measures the velocity of refracted seismic waves through the overburden and rock material and allows an assessment of the thickness and quality of the materials present to be made. Stiffer and stronger materials usually have higher seismic velocities while soft, loose or fractured materials have lower velocities.

Seismic profiling measures the p-wave velocity ( $V_p$ ) of refracted seismic waves through the overburden and rock material and allows an assessment of the thickness and quality of the materials present to be made. Stiffer and stronger materials usually have higher  $V_p$  velocities while soft, loose or fractured materials have lower  $V_p$  velocities. Readings are taken using geophones connected via multi-core cable to a seismograph.

### **Data Collection**

A Geode high resolution 24 channel digital seismograph, 24 10HZ vertical geophones and a 10 kg hammer were used to provide first break information, with a 24 take-out cable. Equipment was carried and operated by a two-person crew.

Readings are taken using geophones connected via multi-core cable to a seismograph. The depth of resolution of soil/bedrock boundaries is determined by the length of the seismic spread, typically the depth of resolution is about one third the length of the profile. (eg. 69m profile ~23m depth, 33m profile ~ 11m depth).

### **Data Processing**

First break picking in digital format was carried out using the FIRSTPIX software program to construct p-wave ( $V_p$ ) traveltimes plots for each spread. Velocity phases were selected from these plots using the GREMIX software program and were used to calculate the thickness of individual velocity units. Topographic data were input. Material types were assigned and estimation made of material properties. The processed seismic data are displayed in Appendix C.

GREMIX interprets seismic refraction data as a laterally varying layered earth structure. It incorporates the slope-intercept method, parts of the Plus-Minus Method of Hagedoorn (1959), Time-Delay Method, and features the Generalized Reciprocal Method (GRM) of Palmer (1980). Up to four layers can be mapped; one deduced from direct arrivals and three deduced from refractions. Phantomming of all possible travel time pairs can be carried

Approximate errors for  $V_p$  velocities are estimated to be  $\pm 10\%$ . Errors for the calculated layer thicknesses are of the order of  $\pm 20\%$ . Possible errors due to the "hidden layer" and "velocity inversion" effects may also occur (Soske, 1959).

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**Spatial Relocation**

All the geophysical investigation locations were acquired using a Trimble Geo 7X high-accuracy GNSS handheld system using the settings listed below. This system allows collection of GPS data with c.20mm accuracy.

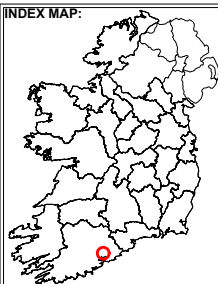
|                                   |                           |
|-----------------------------------|---------------------------|
| <b>Projection:</b>                | Irish Transverse Mercator |
| <b>Datum:</b>                     | IRENET95                  |
| <b>Coordinate units:</b>          | Metres                    |
| <b>Altitude units:</b>            | Metres                    |
| <b>Survey altitude reference:</b> | MSL                       |
| <b>Geoid model:</b>               | OGSM15 Malin              |

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**APPENDIX B: DRAWINGS**

The information derived from the geophysical investigation is presented in the following drawings:

|             |                                                 |        |      |
|-------------|-------------------------------------------------|--------|------|
| AGP24052_01 | Geophysical Locations                           | 1:3000 | @ A4 |
| AGP24052_02 | EM31 Ground Conductivity (mS/m)                 | 1:3000 | @ A4 |
| AGP24052_03 | Summary Interpretation Map                      | 1:3000 | @ A4 |
| AGP24052_R1 | ERT Profile R1 and Seismic Profile S7           | 1:2000 | @ A4 |
| AGP24052_R2 | ERT Profile R2 and Seismic Profile S1           | 1:2000 | @ A4 |
| AGP24052_R3 | ERT Profile R3 and Seismic Profile S8           | 1:2000 | @ A4 |
| AGP24052_R4 | ERT Profile R4 and Seismic Profiles S4, S11, S8 | 1:2500 | @ A4 |
| AGP24052_R5 | ERT Profile R5 and Seismic Profiles S3, S6      | 1:2500 | @ A4 |
| AGP24052_R6 | ERT Profile R6 and Seismic Profiles S2, S5,     | 1:2500 | @ A4 |
| AGP24052_R7 | ERT Profile R7 and Seismic Profiles S9          | 1:2000 | @ A4 |
| AGP24052_R8 | ERT Profile R8                                  | 1:2000 | @ A4 |

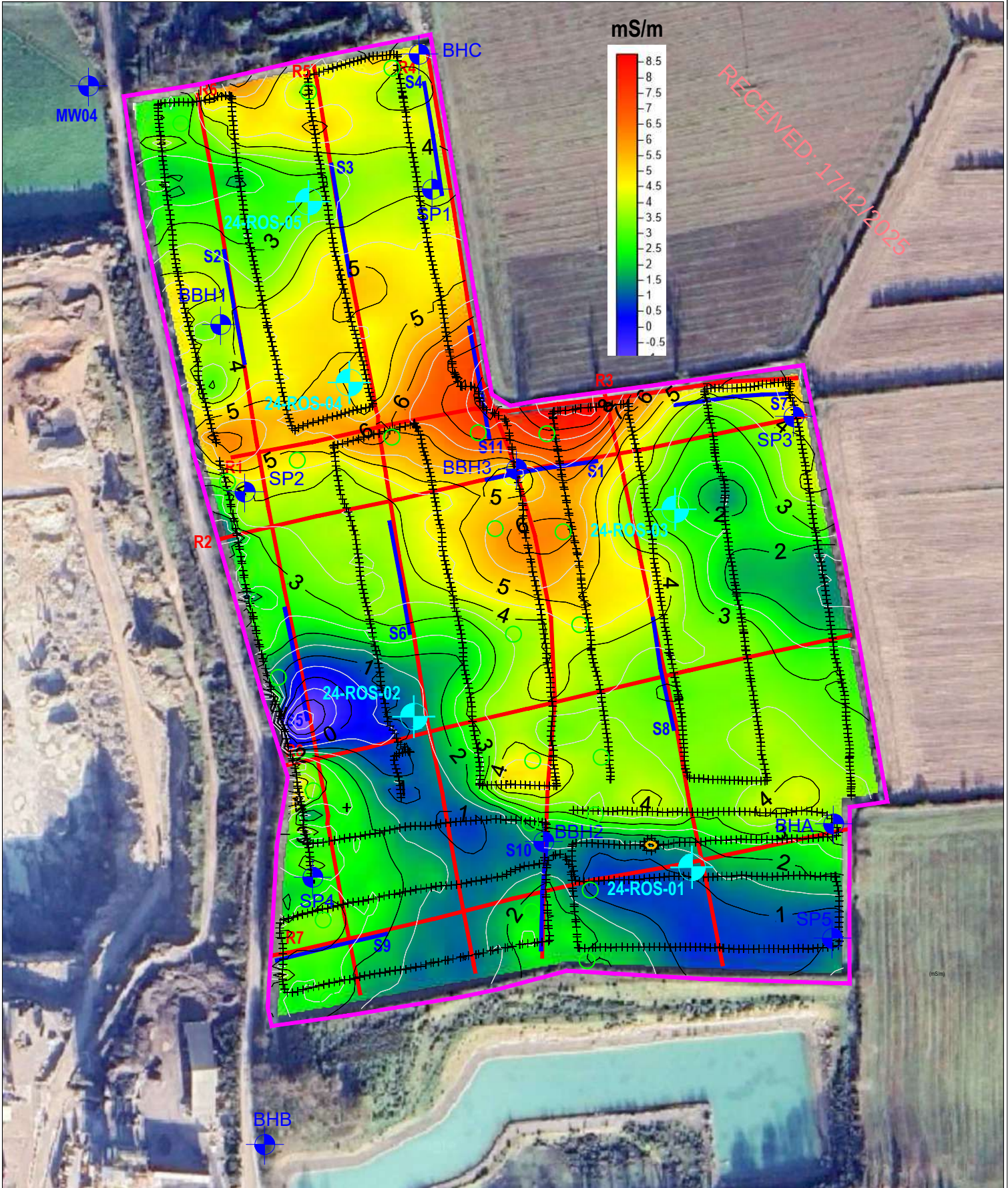


**LEGEND:**

-  Site  
 + EM conductivity reading  
 Monitoring Well  
 2D resistivity profile (2009)  
 Seismic refraction profile (2009)  
 2D resistivity profile (2024)  
 Seismic refraction profile (2024)  
 Borehole (2009)  
 Borehole (2024)  
 Subsidence

The information displayed here is to be used in conjunction with AGP24052\_01  
Report on the Geophysical Investigation at Rossmore, Co.Cork for Breedon  
Group, APEX Geophysics Ltd. 18th June 2024.

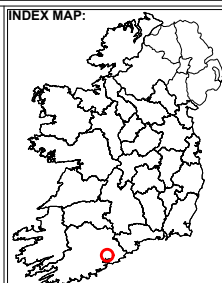
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|---------------------------------------------------|------------|-----------|----------|
| PROJECT: ROSSMORE EXTENSION<br>GEOPHYSICAL SURVEY |            |           |          |
| CLIENT.: BREEDON GROUP                            |            |           |          |
| DRAWING NO.: AGP24052_01                          |            |           |          |
| SCALE: AS INDICATED @ A4                          |            |           |          |
| DATE: 18-06-2024                                  |            |           |          |
| Version:                                          | Date:      | Drawn By: | Checked: |
| 001                                               | 18-06-2024 | MN        | POC      |
|                                                   |            |           |          |
|                                                   |            |           |          |
|                                                   |            |           |          |



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INDEX MAP:



LEGEND:

- Site
- EM conductivity reading
- Monitoring Well
- Borehole (2009)
- Borehole (2024)
- Subsidence
- 2D resistivity profile (2009)
- Seismic refraction profile (2009)
- 2D resistivity profile (2024)
- Seismic refraction profile (2024)

The information displayed here is to be used in conjunction with AGP24052\_01  
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PROJECT: ROSSMORE EXTENSION  
GEOPHYSICAL SURVEY

CLIENT: BREEDON GROUP

DRAWING NO: AGP24052\_02

SCALE: AS INDICATED @ A4

DATE: 18-06-2024

| Version: | Date:      | Drawn By: | Checked: |
|----------|------------|-----------|----------|
| 001      | 18-06-2024 | MN        | POC      |
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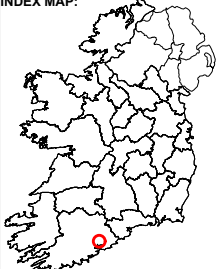




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INDEX MAP:



LEGEND:

- Gravelly CLAY (> 5 m) over LIMESTONE
- Clayey SAND/GRAVEL (< 5 m) over LIMESTONE
- Silty and 'Clean' SAND/GRAVEL over LIMESTONE
- Local shallow LIMESTONE
- Weathered LIMESTONE/possible karst feature
- Proposed Trial Pit
- Potential SAND/GRAVEL Resource
- Potential LIMESTONE Resource

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PROJECT: ROSSMORE EXTENSION  
GEOPHYSICAL SURVEY

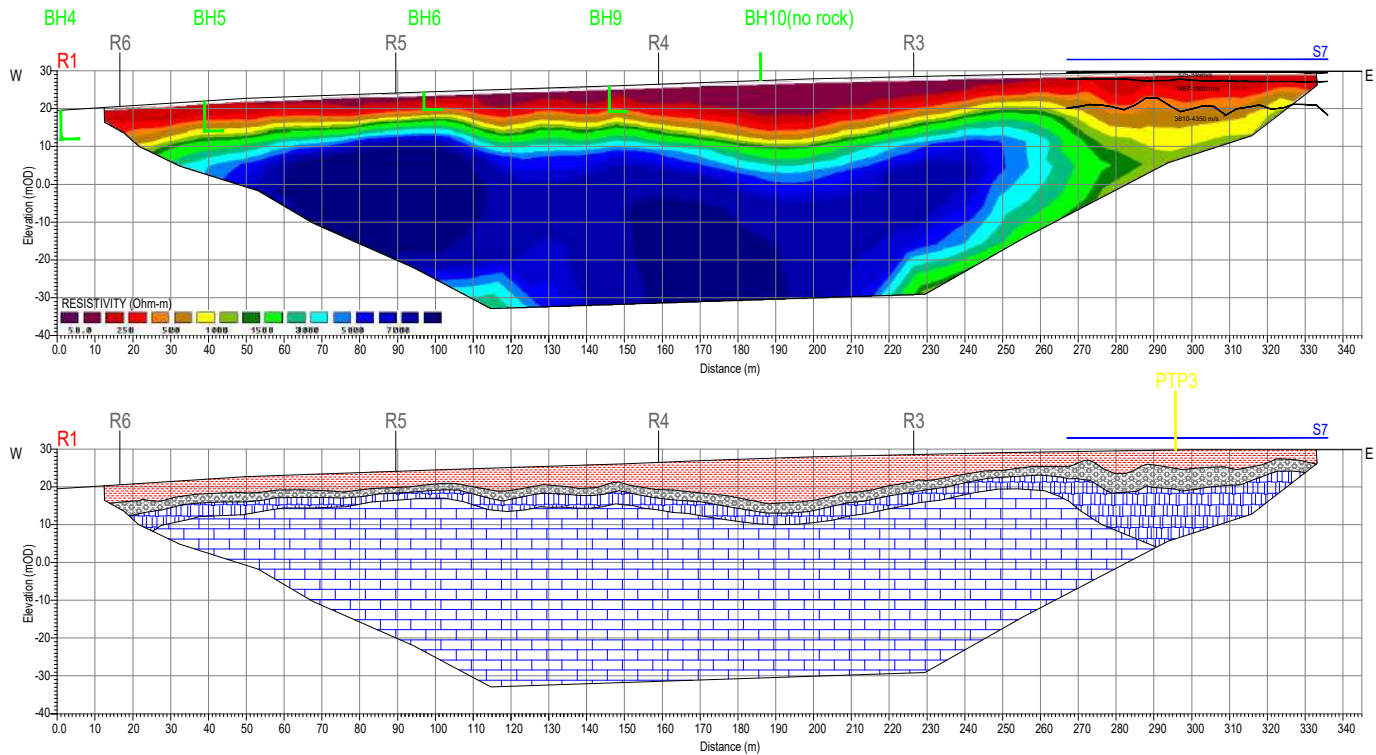
CLIENT.: BREEDON GROUP

DRAWING NO.: AGP24052\_02

SCALE: AS INDICATED @ A4

DATE: 18-06-2024

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|----------|------------|-----------|----------|
| 001      | 18-06-2024 | MN        | POC      |
|          |            |           |          |
|          |            |           |          |



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- LEGEND:**
- Seismic refraction layer with interpreted P-wave velocity
  - Soft-Firm-Stiff sandy gravelly CLAY
  - Loose - Medium dense silty and clean SAND/GRAVEL
  - Medium dense - Dense clayey SAND/GRAVEL
  - Highly-Moderately Weathered/Fractured LIMESTONE
  - Moderately - Slightly Weathered/Fractured - LIMESTONE
  - Ambiguity in Sand/Gravel/Rock boundary
  - 24-R05-01 Summary Borehole Log (2024)
  - BH10 Depth to Bedrock (2009 boreholes)
  - PTP1 Proposed Trial Pit

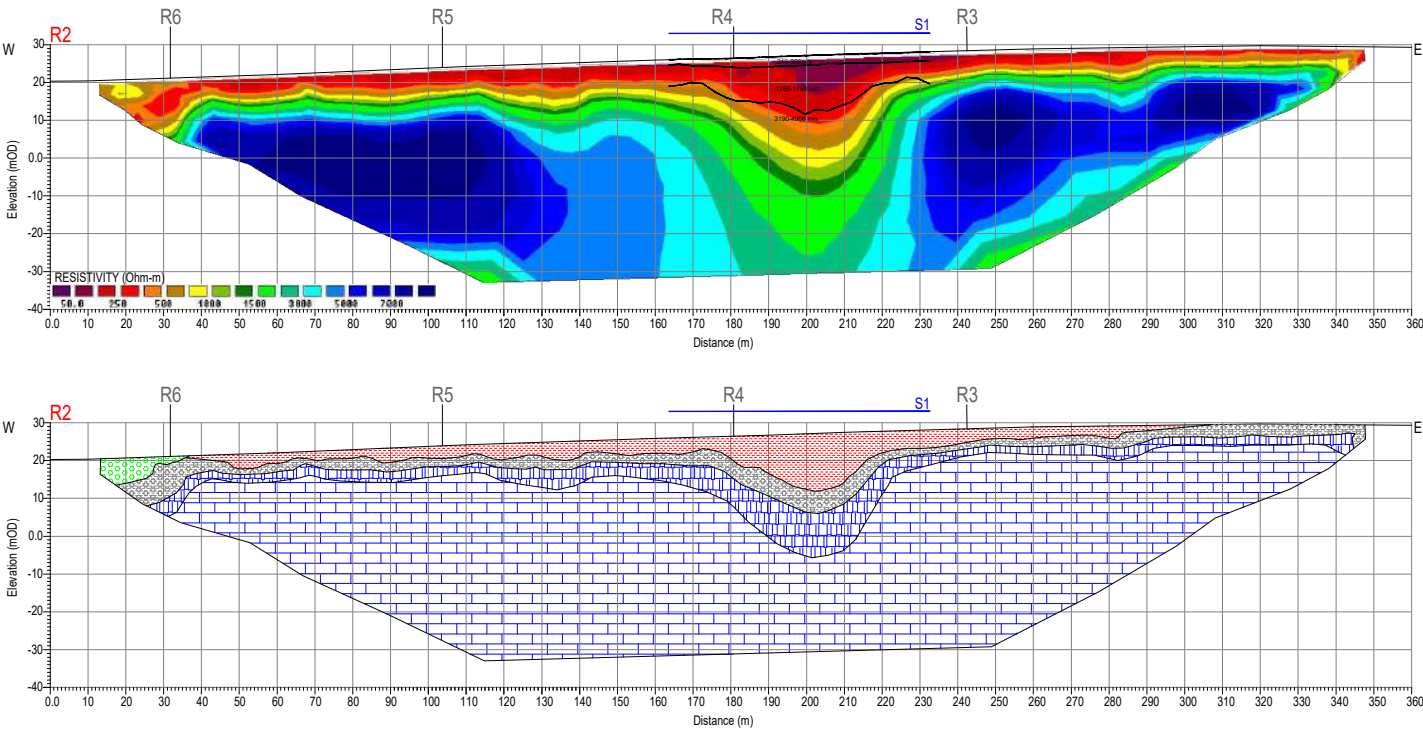
The information displayed here is to be used in conjunction with AGP24052\_01 Report on the Geophysical Investigation at Rossmore, Co. Cork for Breedon Group, APEX Geophysics Ltd. 18th June 2024.



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|             |                                          |           |          |
|-------------|------------------------------------------|-----------|----------|
| PROJECT:    | ROSSMORE EXTENSION<br>GEOPHYSICAL SURVEY |           |          |
| CLIENT:     | BREEDON GROUP                            |           |          |
| DRAWING NO: | AGP24052_R1                              |           |          |
| SCALE:      | AS INDICATED @ A4                        |           |          |
| DATE:       | 18-06-2024                               |           |          |
| Version:    | Date:                                    | Drawn By: | Checked: |
| 01          | 18-06-2024                               | MN        | POC      |
|             |                                          |           |          |
|             |                                          |           |          |



**LEGEND:**

- Seismic refraction layer with interpreted P-wave velocity
- Soft-Firm-Stiff sandy gravelly CLAY
- Loose - Medium dense silty and 'clean' SAND/GRAVEL
- Medium dense - Dense clayey SAND/GRAVEL
- Highly-Moderately Weathered/Fractured LIMESTONE
- Moderately - Slightly Weathered/Fractured - LIMESTONE
- Ambiguity in Sand/Gravel/Rock boundary
- 24-ROS-01 Summary Borehole Log (2024)
- BH10 Depth to Bedrock (2009 boreholes)
- PTP1 Proposed Trial Pit

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PROJECT: ROSSMORE EXTENSION  
GEOPHYSICAL SURVEY

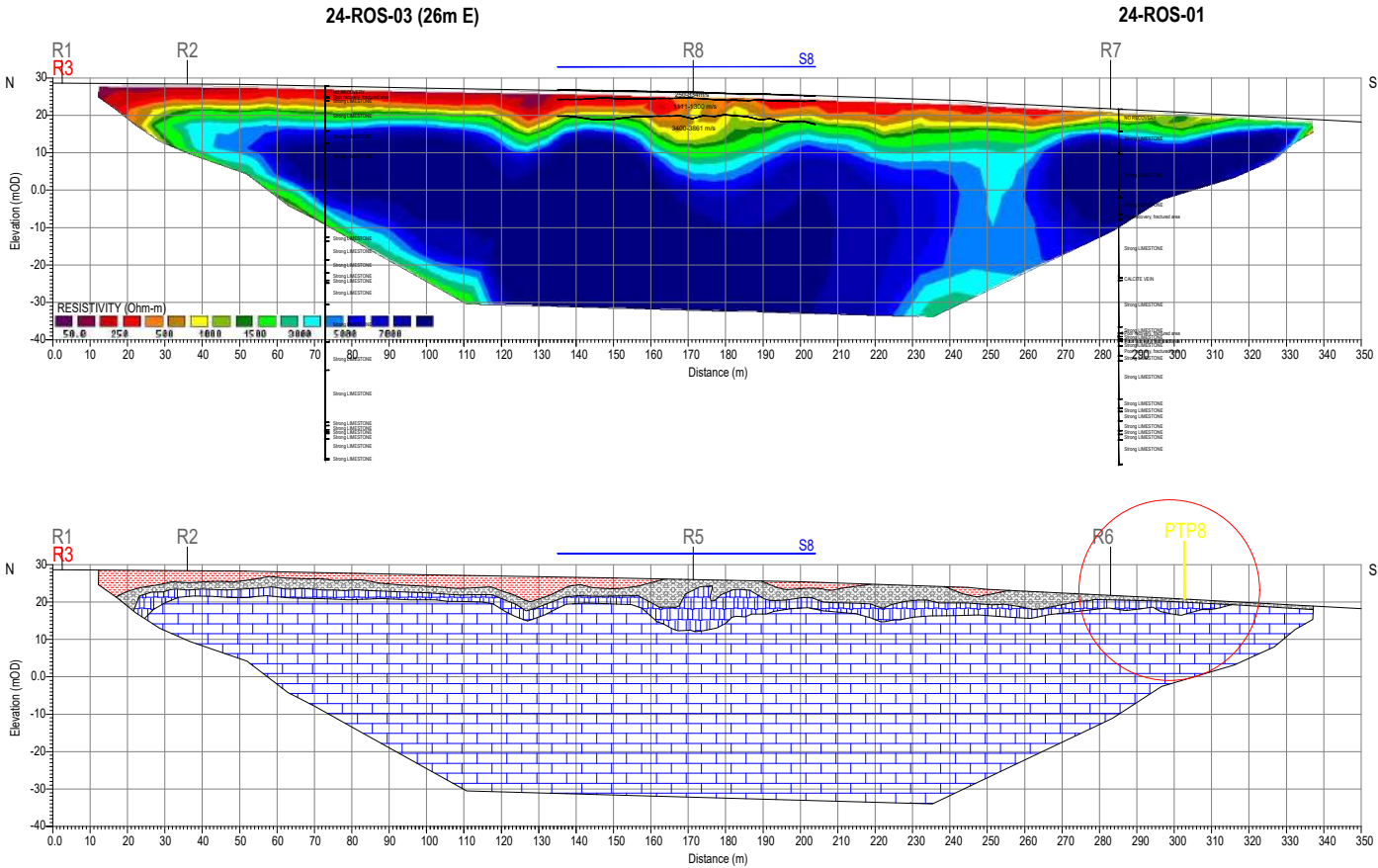
CLIENT: BREEDON GROUP

DRAWING NO: AGP24052\_R2

SCALE: AS INDICATED @ A4

DATE: 18-06-2024

| Version: | Date:      | Drawn By: | Checked: |
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| 01       | 18-06-2024 | MN        | POC      |
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- LEGEND:
- Seismic refraction layer with interpreted P-wave velocity
  - Soft-Firm-Stiff sandy gravelly CLAY
  - Loose - Medium dense silty and 'clean' SAND/GRAVEL
  - Medium dense - Dense clayey SAND/GRAVEL
  - Highly-Moderately Weathered/Fractured LIMESTONE
  - Moderately - Slightly Weathered/Fractured - LIMESTONE
  - Ambiguity in Sand/Gravel/Rock boundary
  - 24-ROS-01 Summary Borehole Log (2024)
  - BH10 Depth to Bedrock (2009 boreholes)
  - PTP1 Proposed Trial Pit

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PROJECT: ROSSMORE EXTENSION GEOPHYSICAL SURVEY

CLIENT: BREEDON GROUP

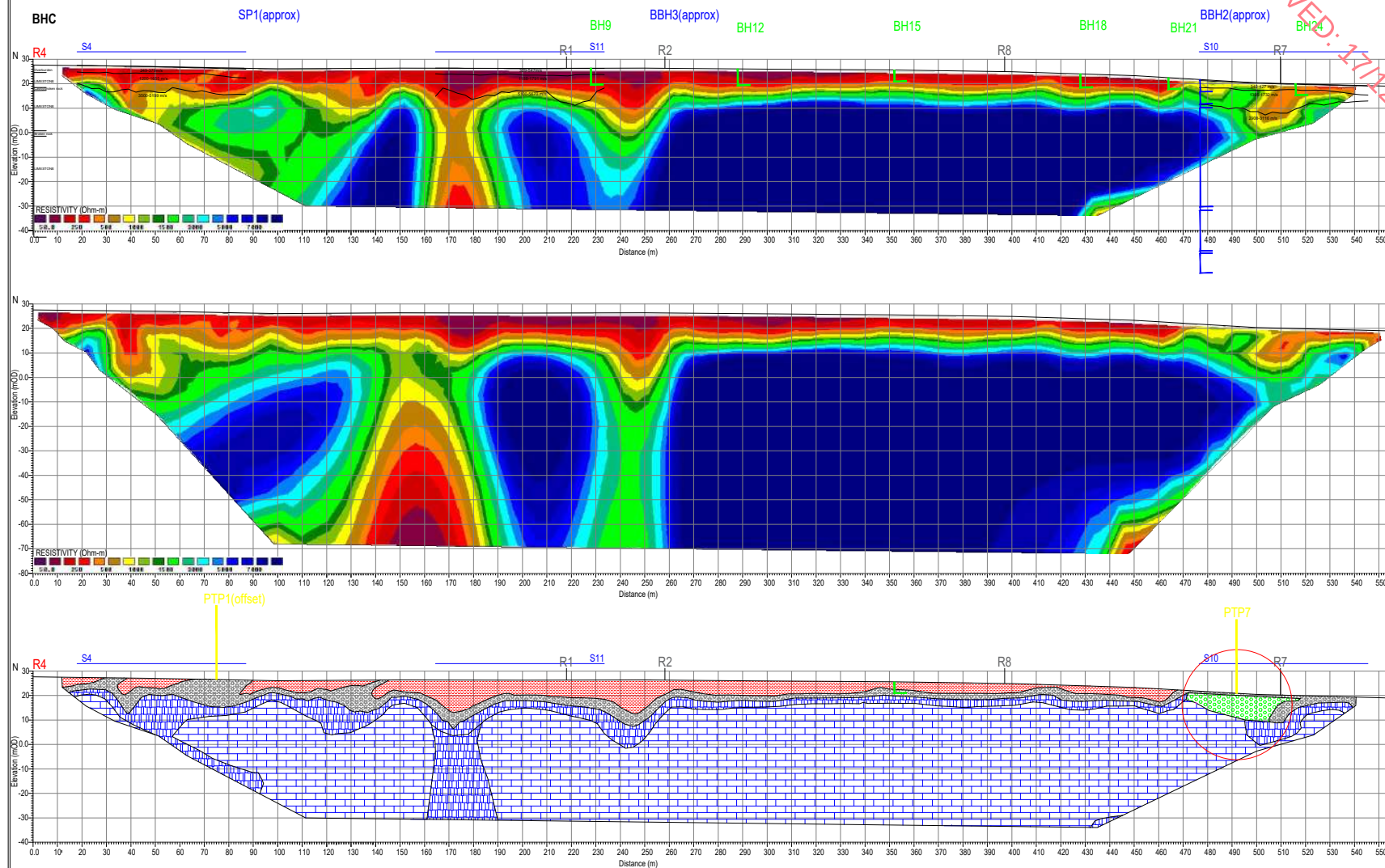
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SCALE: AS INDICATED @ A4

DATE: 18-06-2024

| Version: | Date:      | Drawn By: | Checked: |
|----------|------------|-----------|----------|
| 01       | 18-06-2024 | MN        | POC      |
|          |            |           |          |
|          |            |           |          |

RESULTS & INTERPRETATION - RESISTIVITY PROFILE R4 & SEISMIC PROFILES S4, S11& S10  
SCALE 1:2500



- LEGEND:**
- Seismic refraction layer with interpreted P-wave velocity
  - Soft-Firm-Stiff sandy gravelly CLAY
  - Loose - Medium dense silty and 'clean' SAND/GRAVEL
  - Medium dense - Dense clayey SAND/GRAVEL
  - Highly-Moderately Weathered/Fractured LIMESTONE
  - Moderately - Slightly Weathered/Fractured - LIMESTONE
  - Ambiguity in Sand/Gravel/Rock boundary
  - Summary Borehole Log (2024)
  - Depth to Bedrock (2009 boreholes)
  - Proposed Trial Pit

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PROJECT: ROSSMORE EXTENSION  
GEOPHYSICAL SURVEY

CLIENT: BREEDON GROUP

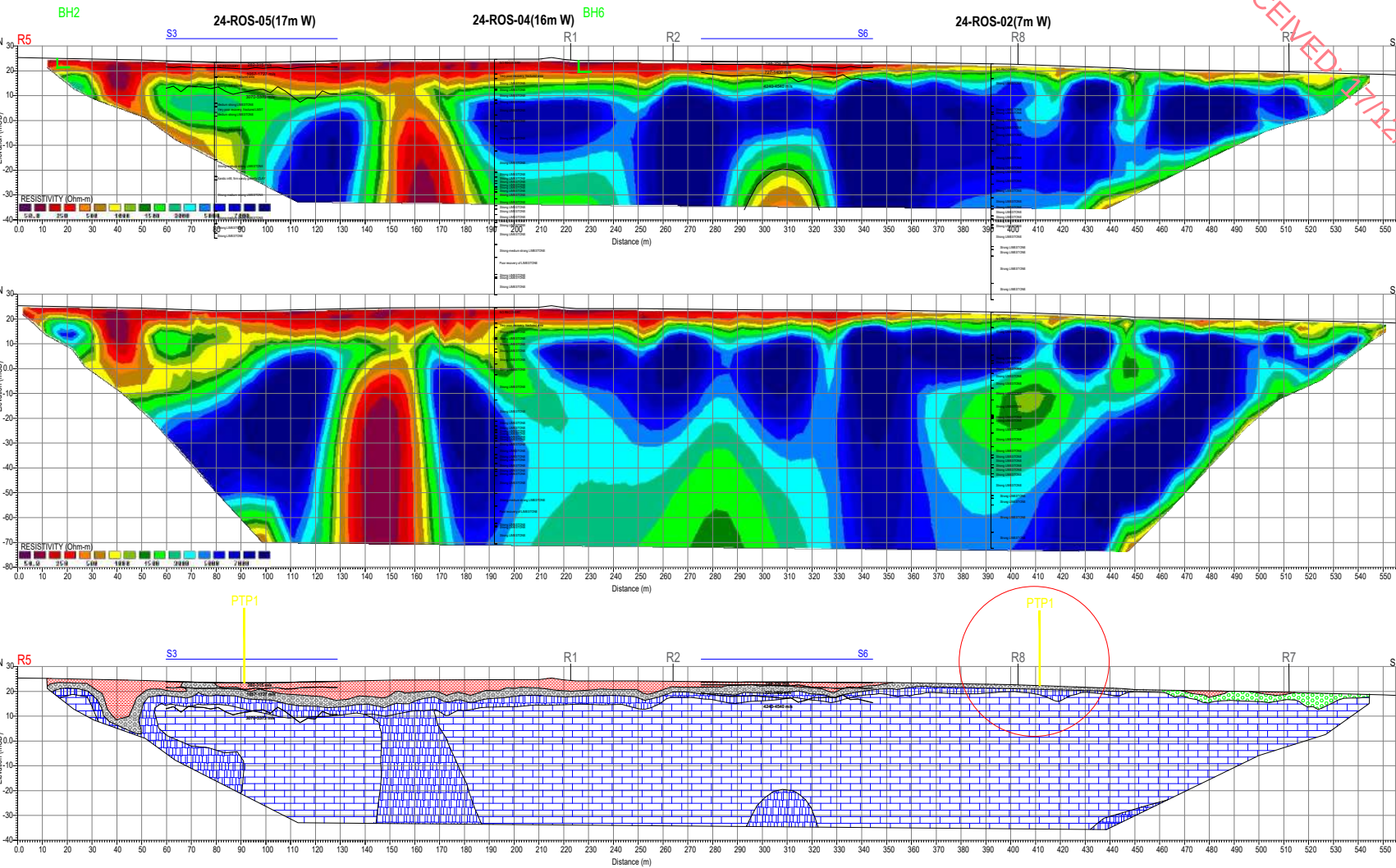
DRAWING NO: AGP24052\_R4

SCALE: AS INDICATED @ A4

DATE: 18-06-2024

| Version: | Date:      | Drawn By: | Checked: |
|----------|------------|-----------|----------|
| 01       | 18-06-2024 | MN        | POC      |

RESULTS & INTERPRETATION - RESISTIVITY PROFILE R5 & SEISMIC PROFILES S3 & S6  
SCALE 1:2500



- LEGEND:**
- Seismic refraction layer with interpreted P-wave velocity (1254-1288 m/s)
  - Soft-Firm-Stiff sandy gravelly CLAY
  - Loose - Medium dense silty and 'clean' SAND/GRAVEL
  - Medium dense - Dense clayey SAND/GRAVEL
  - Highly-Moderately Weathered/Fractured LIMESTONE
  - Moderately - Slightly Weathered/Fractured - LIMESTONE
  - Ambiguity in Sand/Gravel/Rock boundary
  - 24-ROS-01 Summary Borehole Log (2024)
  - BH10 Depth to Bedrock (2009 boreholes)
  - PTP1 Proposed Trial Pit

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PROJECT: ROSSMORE EXTENSION  
GEOPHYSICAL SURVEY

CLIENT: BREEDON GROUP

DRAWING NO: AGP24052\_R5

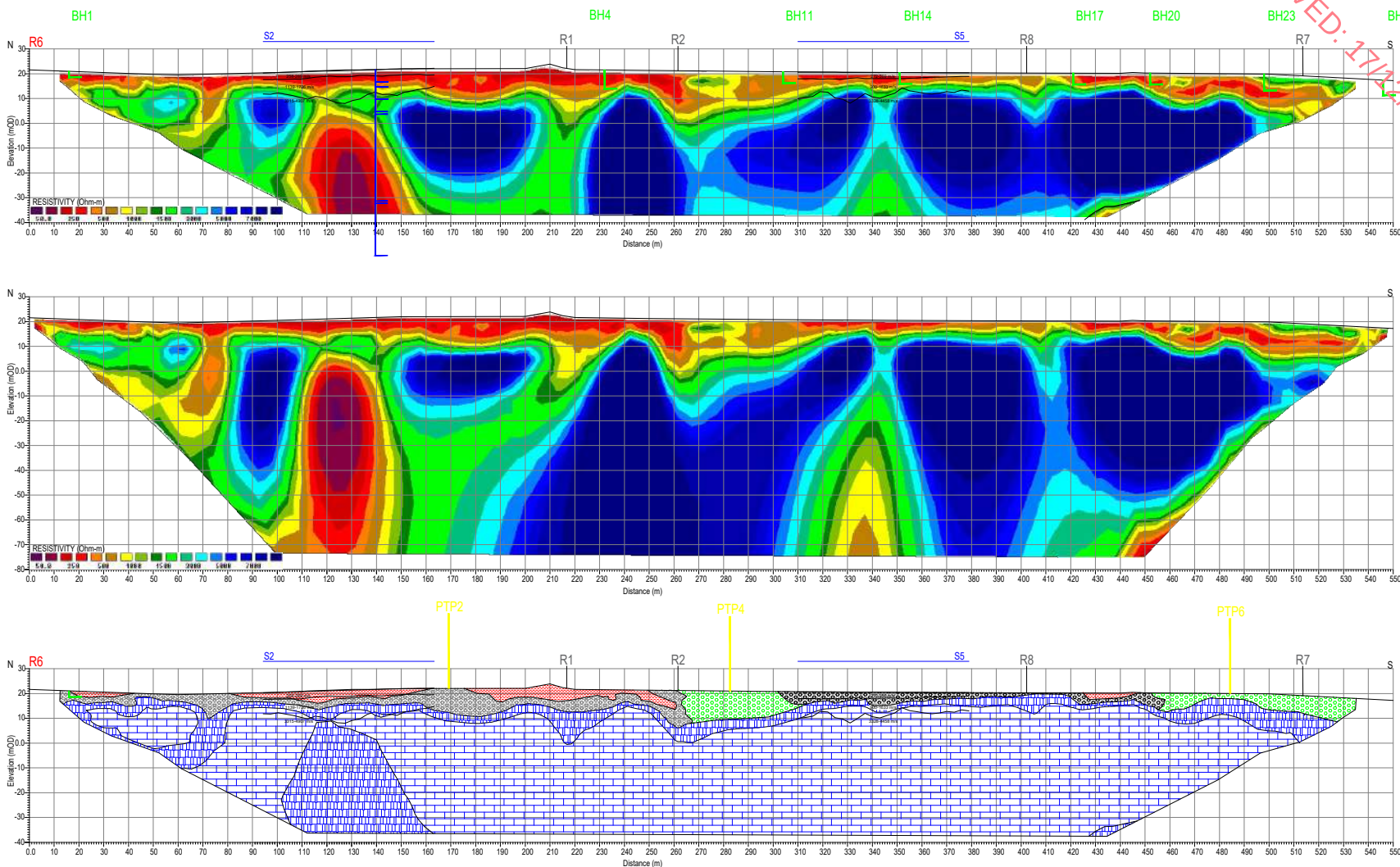
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DATE: 18-06-2024

| Version: | Date:      | Drawn By: | Checked: |
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|--|--|--|--|
|  |  |  |  |
|  |  |  |  |

RESULTS & INTERPRETATION - RESISTIVITY PROFILE R6 & SEISMIC PROFILES S2 & S5  
SCALE 1:2500



**LEGEND:**

|  |                                                           |
|--|-----------------------------------------------------------|
|  | Seismic refraction layer with interpreted P-wave velocity |
|  | Soft-Firm-Stiff sandy gravelly CLAY                       |
|  | Loose - Medium dense silty and 'clean' SAND/GRAVEL        |
|  | Medium dense - Dense clayey SAND/GRAVEL                   |
|  | Highly-Moderately Weathered/Fractured LIMESTONE           |
|  | Moderately - Slightly Weathered/Fractured - LIMESTONE     |
|  | Ambiguity in Sand/Gravel/Rock boundary                    |
|  | 24ROS-01 Summary Borehole Log (2024)                      |
|  | BH10 Depth to Bedrock (2009 boreholes)                    |
|  | PTP1 Proposed Trial Pit                                   |

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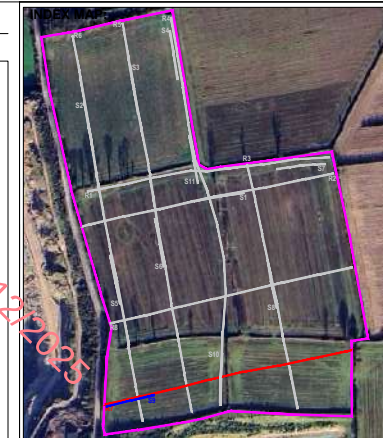
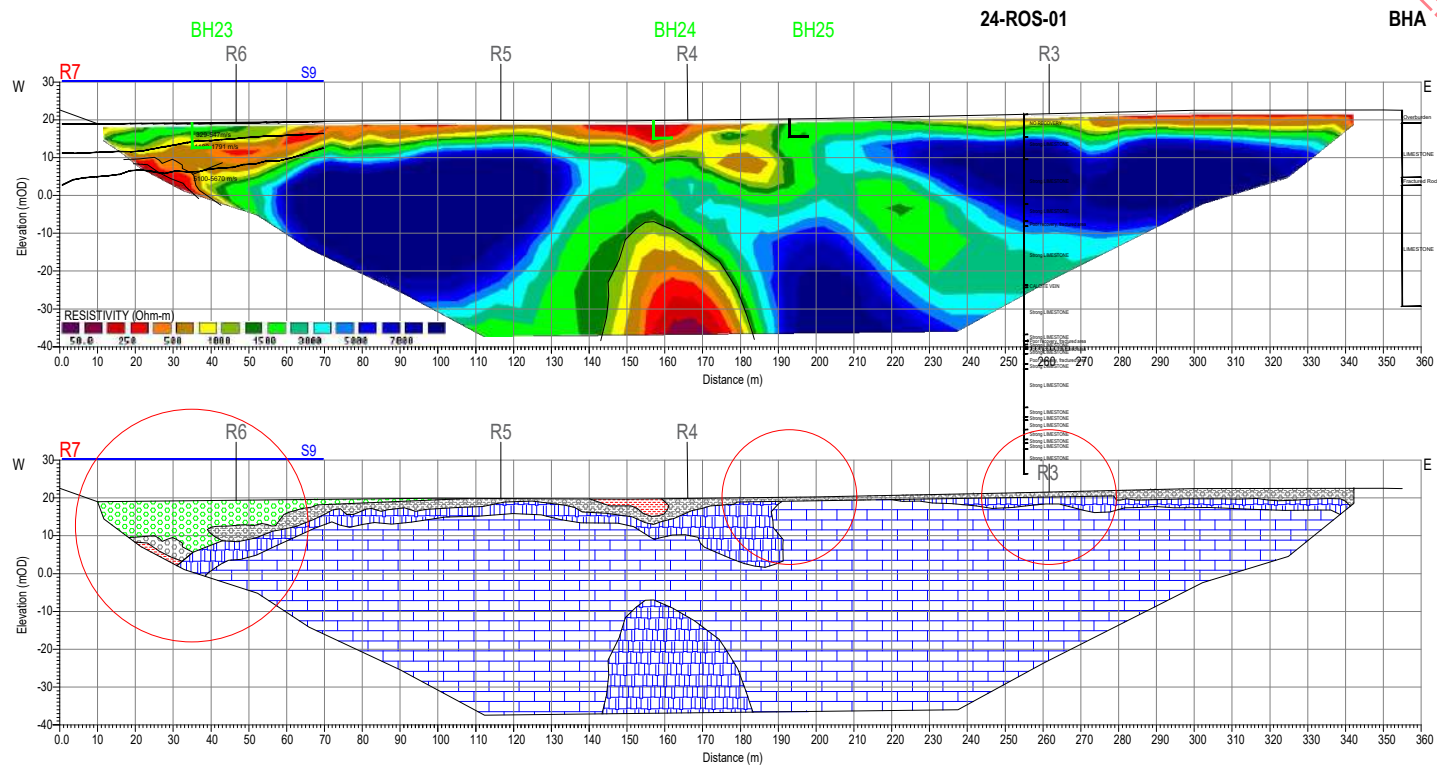
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|             |                                       |           |          |
|-------------|---------------------------------------|-----------|----------|
| PROJECT:    | ROSSMORE EXTENSION GEOPHYSICAL SURVEY |           |          |
| CLIENT:.    | BREEDON GROUP                         |           |          |
| DRAWING NO: | AGP24052_R6                           |           |          |
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| DATE:       | 18-06-2024                            |           |          |
| Version:    | Date:                                 | Drawn By: | Checked: |
| 01          | 18-06-2024                            | MN        | POC      |
|             |                                       |           |          |
|             |                                       |           |          |

# RESULTS & INTERPRETATION - RESISTIVITY PROFILE R7 & SEISMIC PROFILE S9

SCALE 1:2000



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PROJECT: ROSSMORE EXTENSION  
GEOPHYSICAL SURVEY

CLIENT: BREEDON GROUP

DRAWING NO: AGP24052\_R7

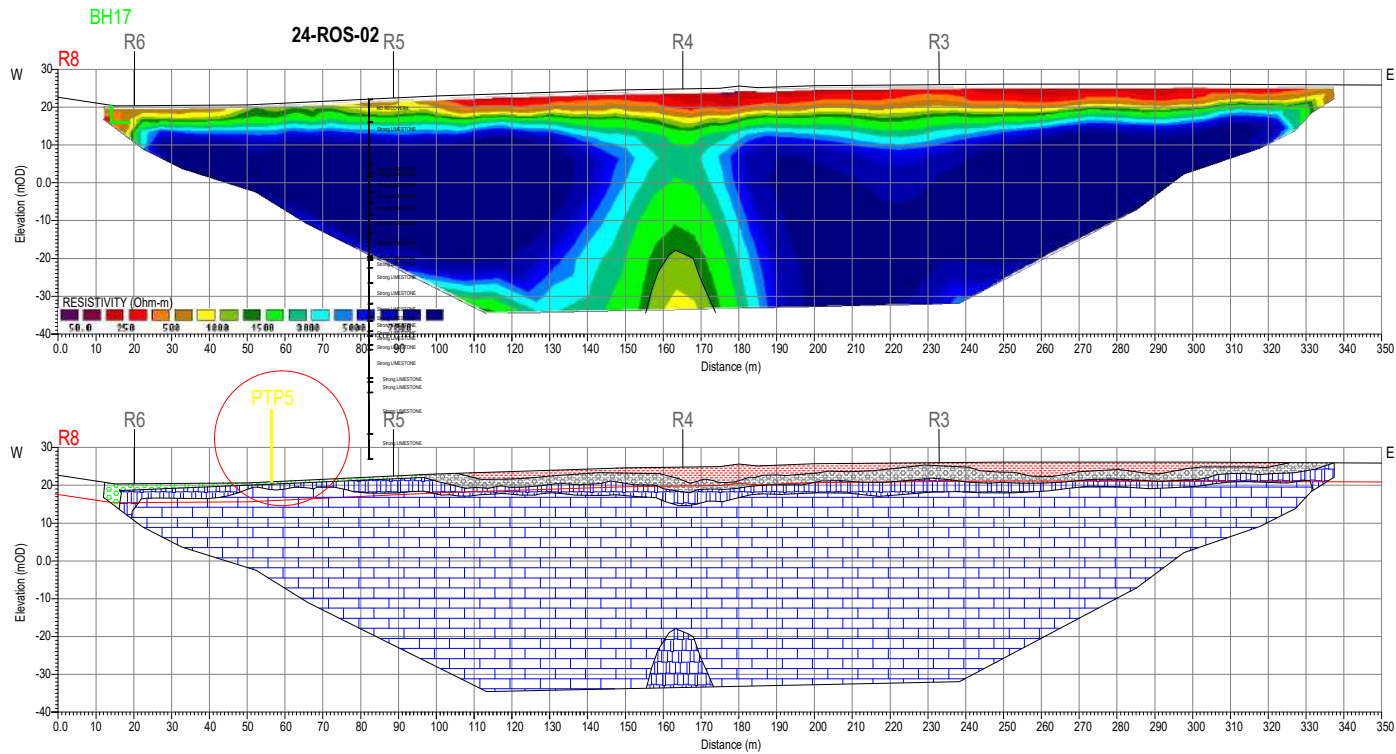
SCALE: AS INDICATED @ A4

DATE: 18-06-2024

| Version: | Date:      | Drawn By: | Checked: |
|----------|------------|-----------|----------|
| 01       | 18-06-2024 | MN        | POC      |
|          |            |           |          |
|          |            |           |          |

# RESULTS & INTERPRETATION - RESISTIVITY PROFILE R8

SCALE 1:2000



**LEGEND:**

- Seismic refraction layer with interpreted P-wave velocity
- Soft-Firm-Stiff sandy gravelly CLAY
- Loose - Medium dense silty and 'clean' SAND/GRAVEL
- Medium dense - Dense clayey SAND/GRAVEL
- Highly-Moderately Weathered/Fractured LIMESTONE
- Moderately - Slightly Weathered/Fractured - LIMESTONE
- Ambiguity in Sand/Gravel/Rock boundary
- 24-ROS-01 Summary Borehole Log (2024)
- BH10 Depth to Bedrock (2009 boreholes)
- PTP1 Proposed Trial Pit

The information displayed here is to be used in conjunction with AGP24052\_01 Report on the Geophysical Investigation at Rossmore, Co. Cork for Breedon Group, APEX Geophysics Ltd. 18th June 2024.

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PROJECT: ROSSMORE EXTENSION GEOPHYSICAL SURVEY

CLIENT: BREEDON GROUP

DRAWING NO: AGP24052\_R8

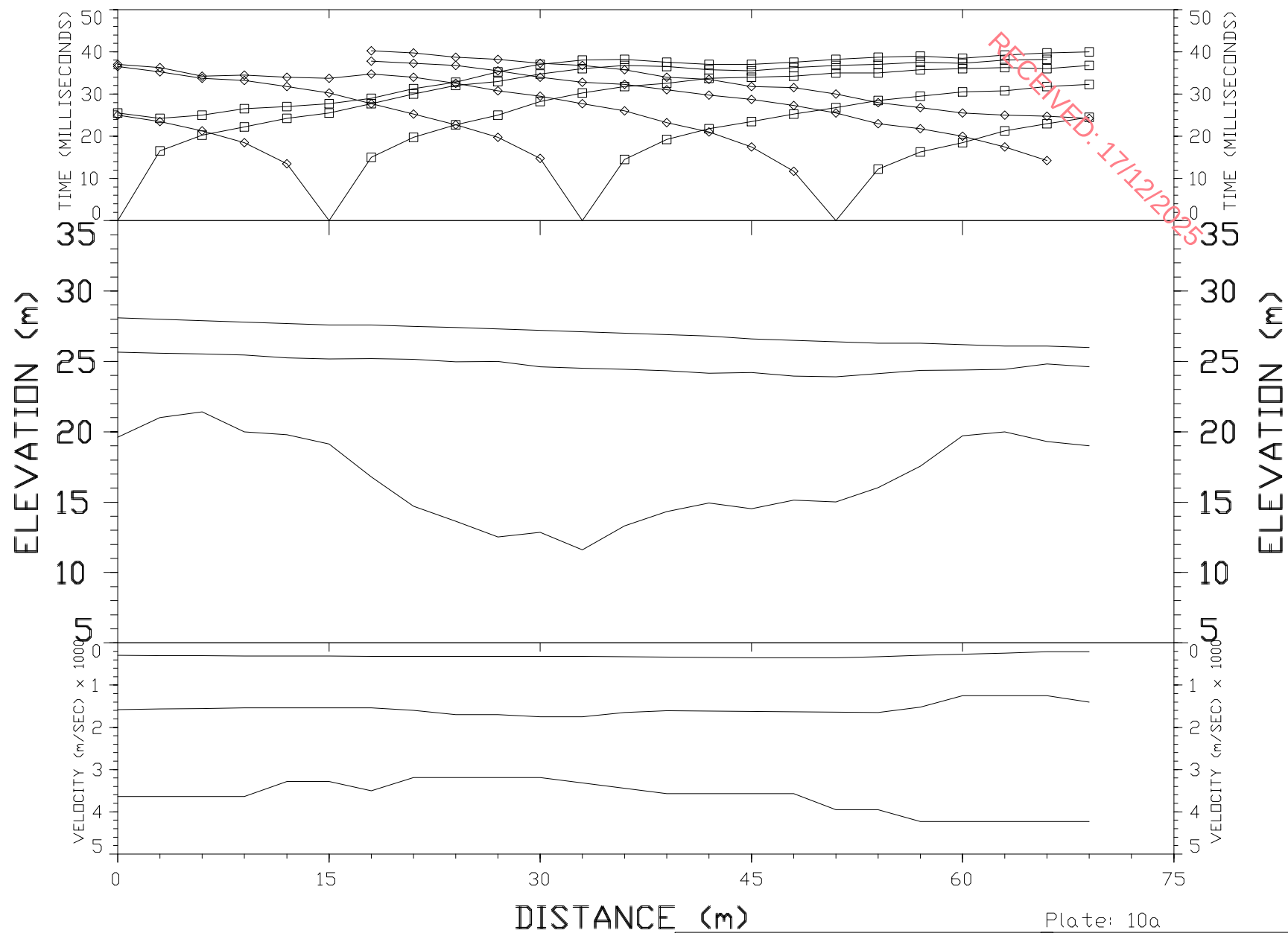
SCALE: AS INDICATED @ A4

DATE: 18-06-2024

| Version: | Date:      | Drawn By: | Checked: |
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| 01       | 18-06-2024 | MN        | POC      |
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|          |            |           |          |

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## **APPENDIX C: SEISMIC PLATES**



Breedon Group

by: Apex Geophysics Ltd.,

Data Set S1

Date: Mar. 2024

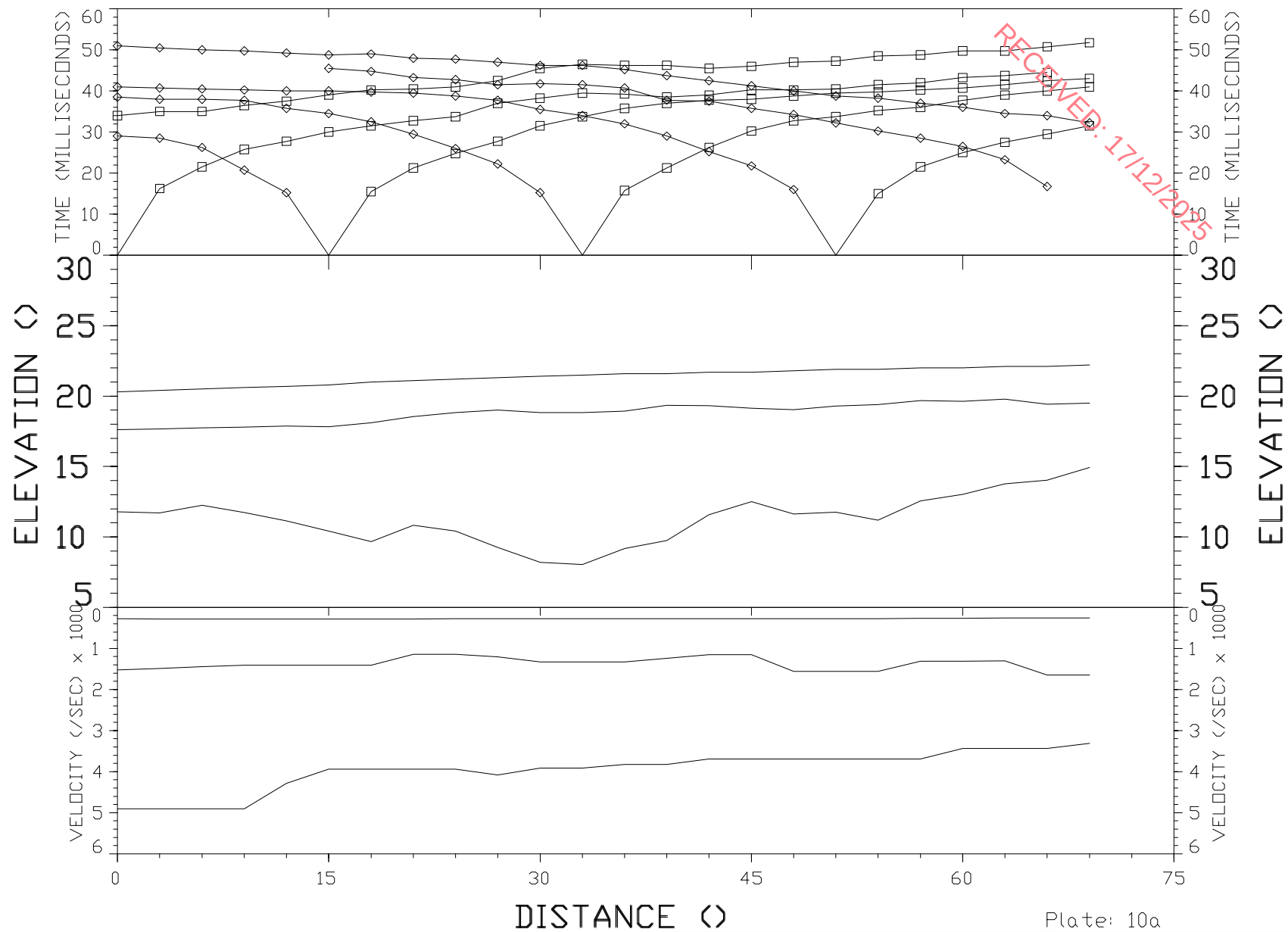
Equipment: Geode

Spread: S1

AGP24052

Rossmore  
Cork

Azimuth:



Breedon Group

by: APEX Geophysics Ltd.

Data Set S2

Date: Apr. 2024

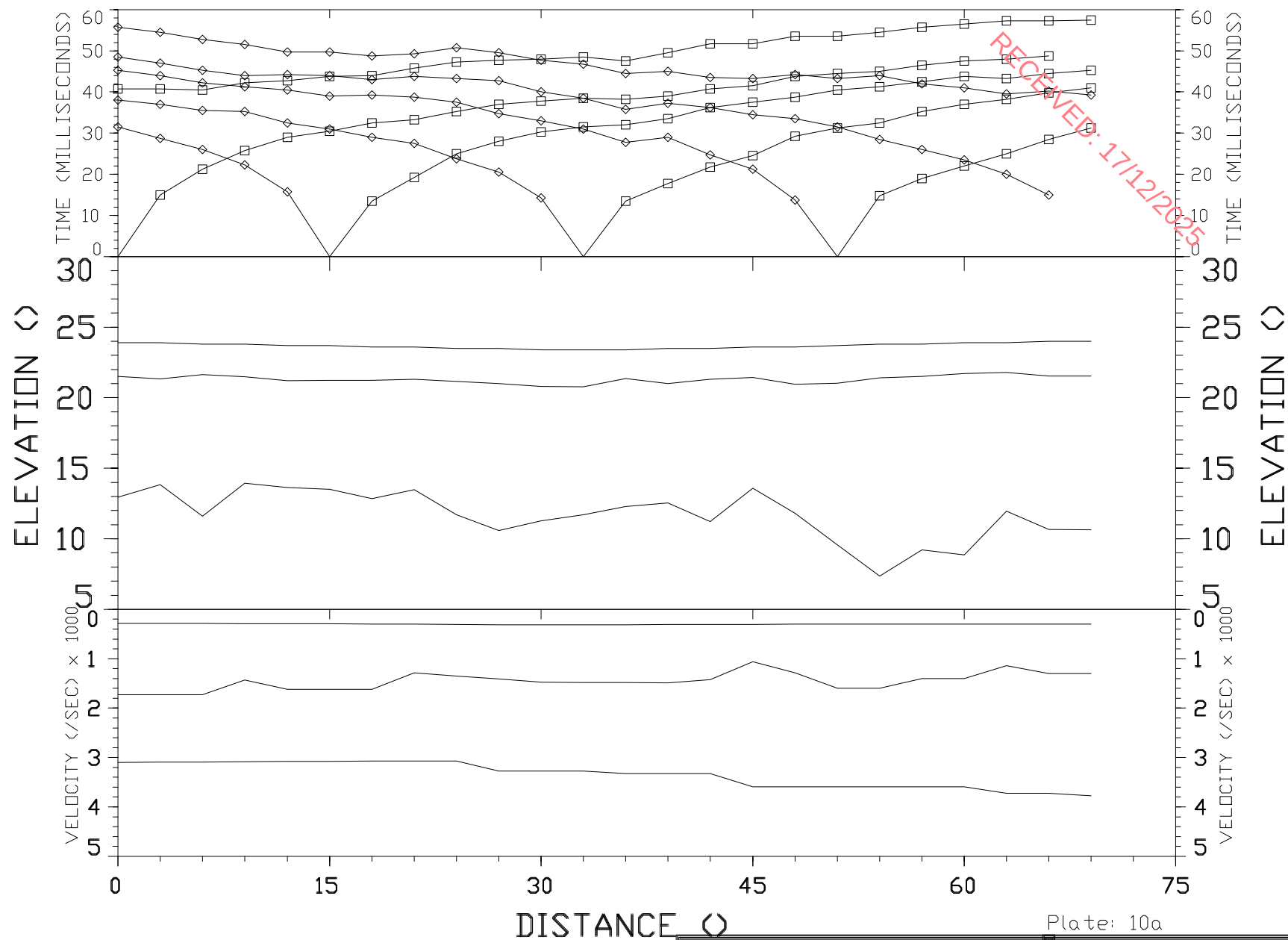
Equipment: Geode

Spread: S2

AGP24052

Rossmore  
Cork

Azimuth:



Breedon Group

by: APEX Geophysics Ltd.

Data Set S3

Date: Apr. 2024

Equipment: Geode

Spread: S3

AGP24052

Rossmore  
Cork

Azimuth:

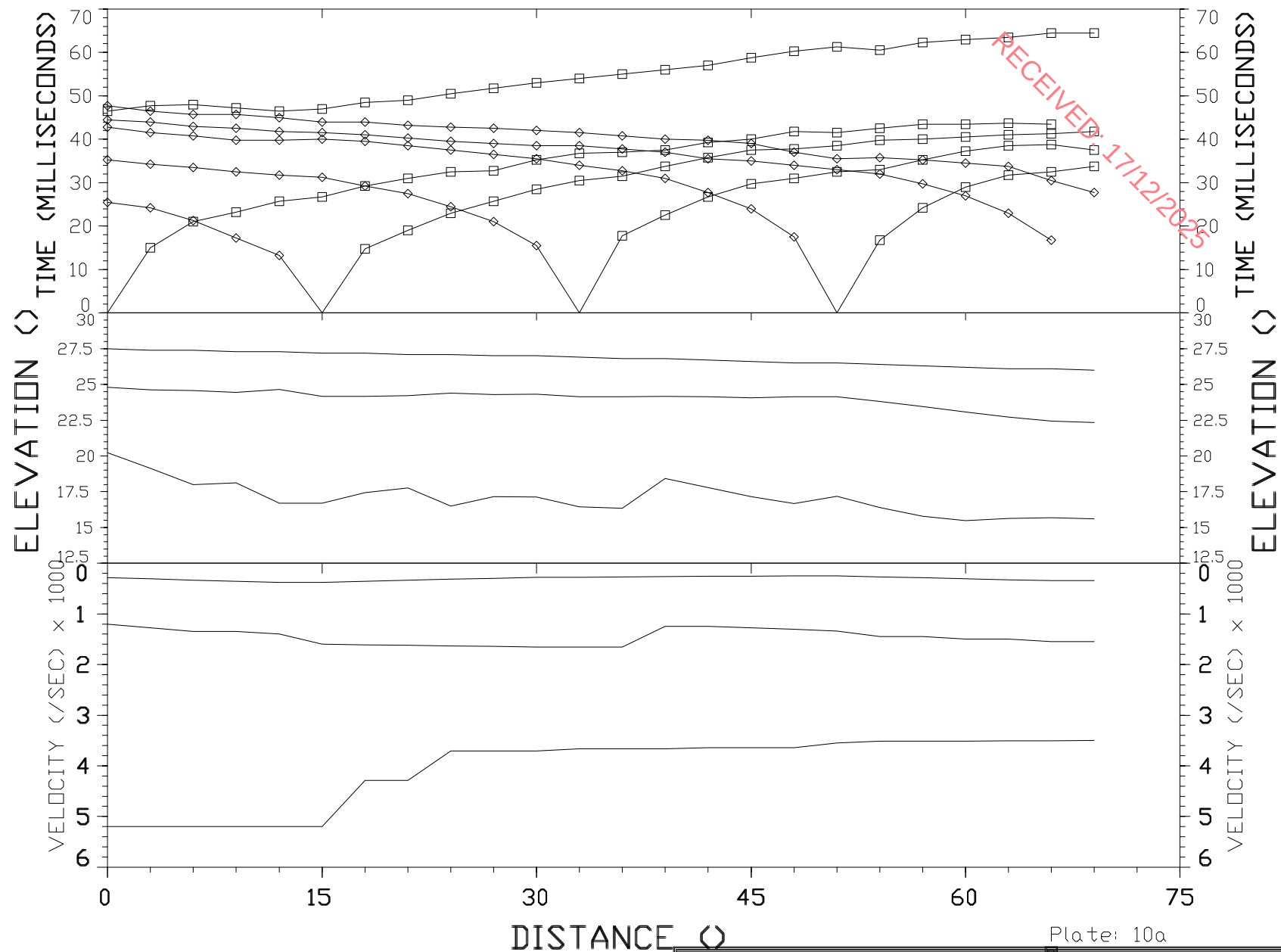


Plate: 10a

Breedon Group

AGP24052

by: APEX Geophysics Ltd.

Rossmore

Data Set S4

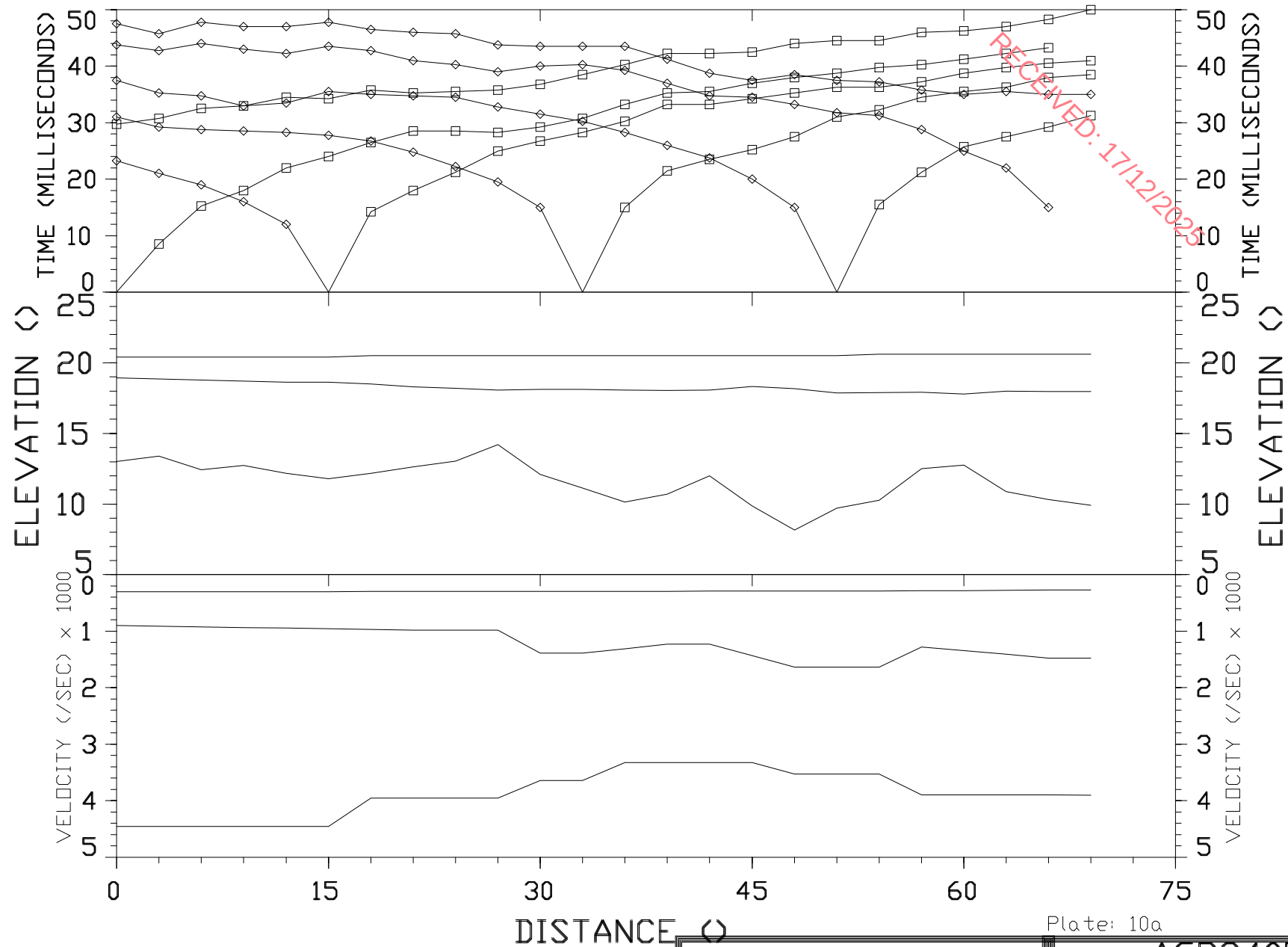
Date: Mar. 2024

Cork

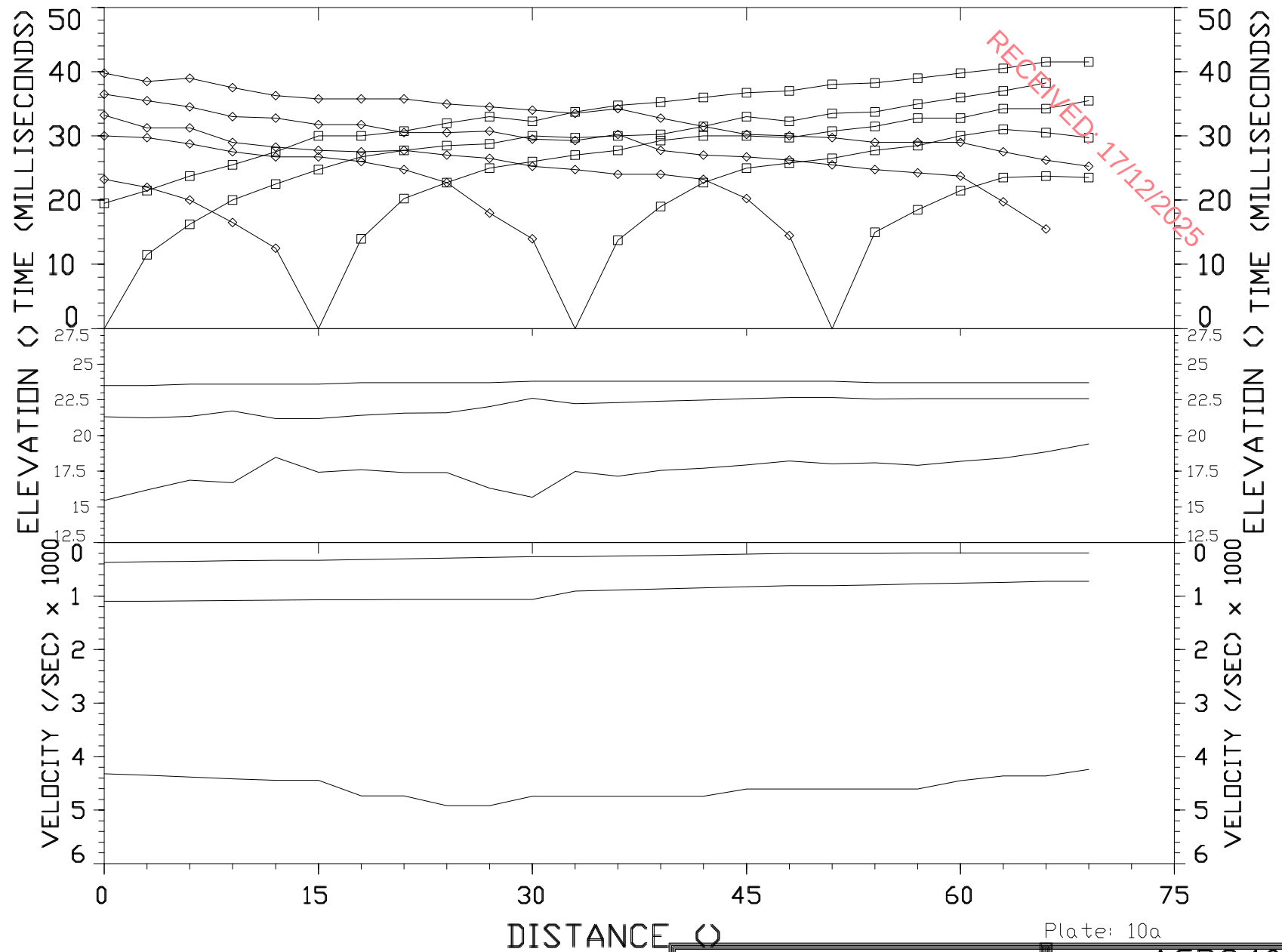
Equipment: Geode

Spread: S4

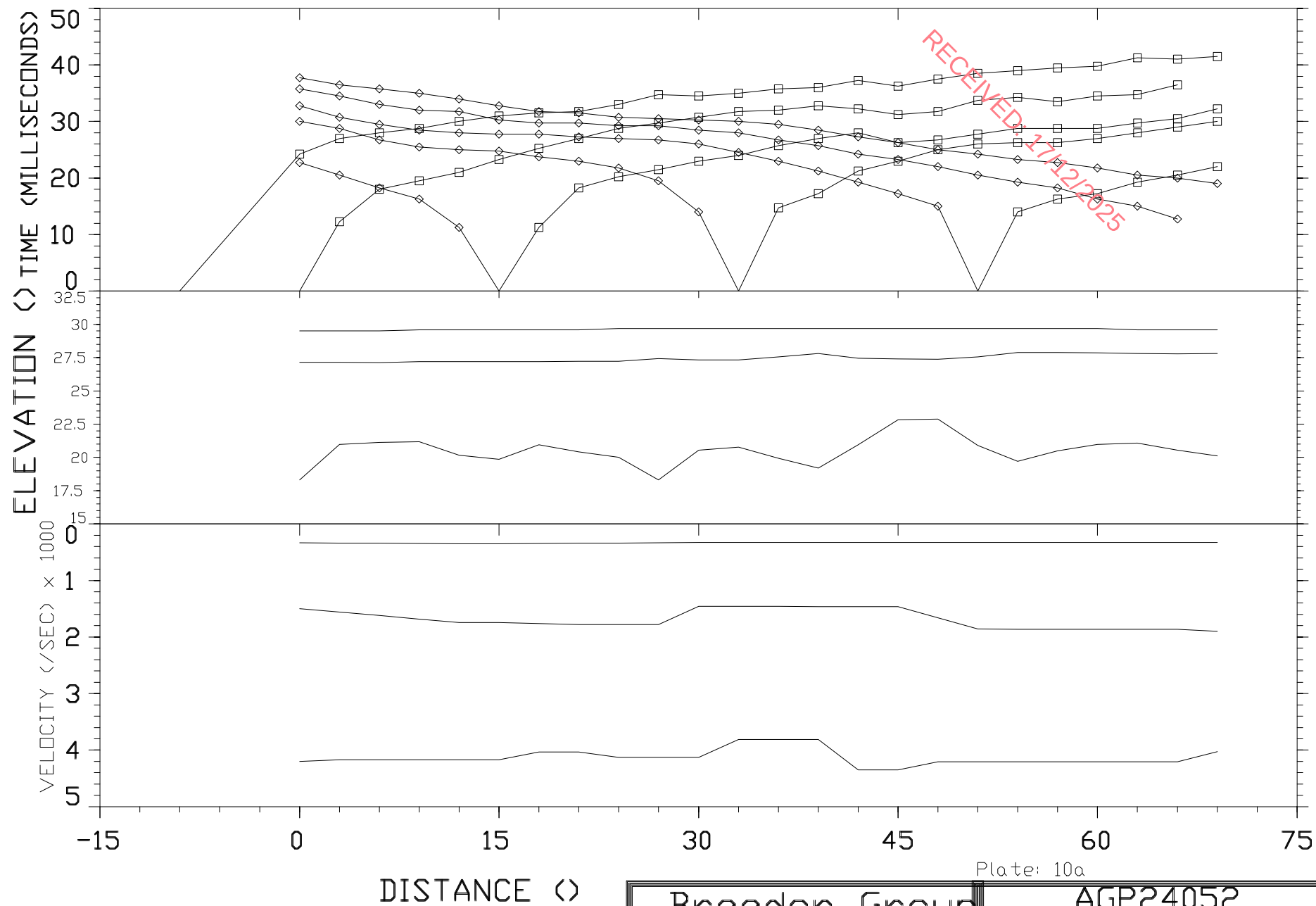
Azimuth:



|                          |                 |          |
|--------------------------|-----------------|----------|
| Breedon Group            |                 | AGP24052 |
| by: APEX Geophysics Ltd. |                 | Rossmore |
| Data Set S5              | Date: Apr. 2024 | Cork     |
| Equipment: Geode         | Spread: S5      | Azimuth: |



|                          |                 |          |
|--------------------------|-----------------|----------|
| Breedon Group            |                 | AGP24052 |
| by: APEX Geophysics Ltd. |                 | Rossmore |
| Data Set: S6             | Date: Mar. 2024 | Cork     |
| Equipment: Geode         | Spread: S6      | Azimuth: |



|                          |                 |          |
|--------------------------|-----------------|----------|
| Breedon Group            |                 | AGP24052 |
| by: APEX Geophysics Ltd. |                 | Rossmore |
| Data SetS7               | Date: Mar. 2024 | Cork     |
| Equipment: Geode         | Spread: S2      | Azimuth: |

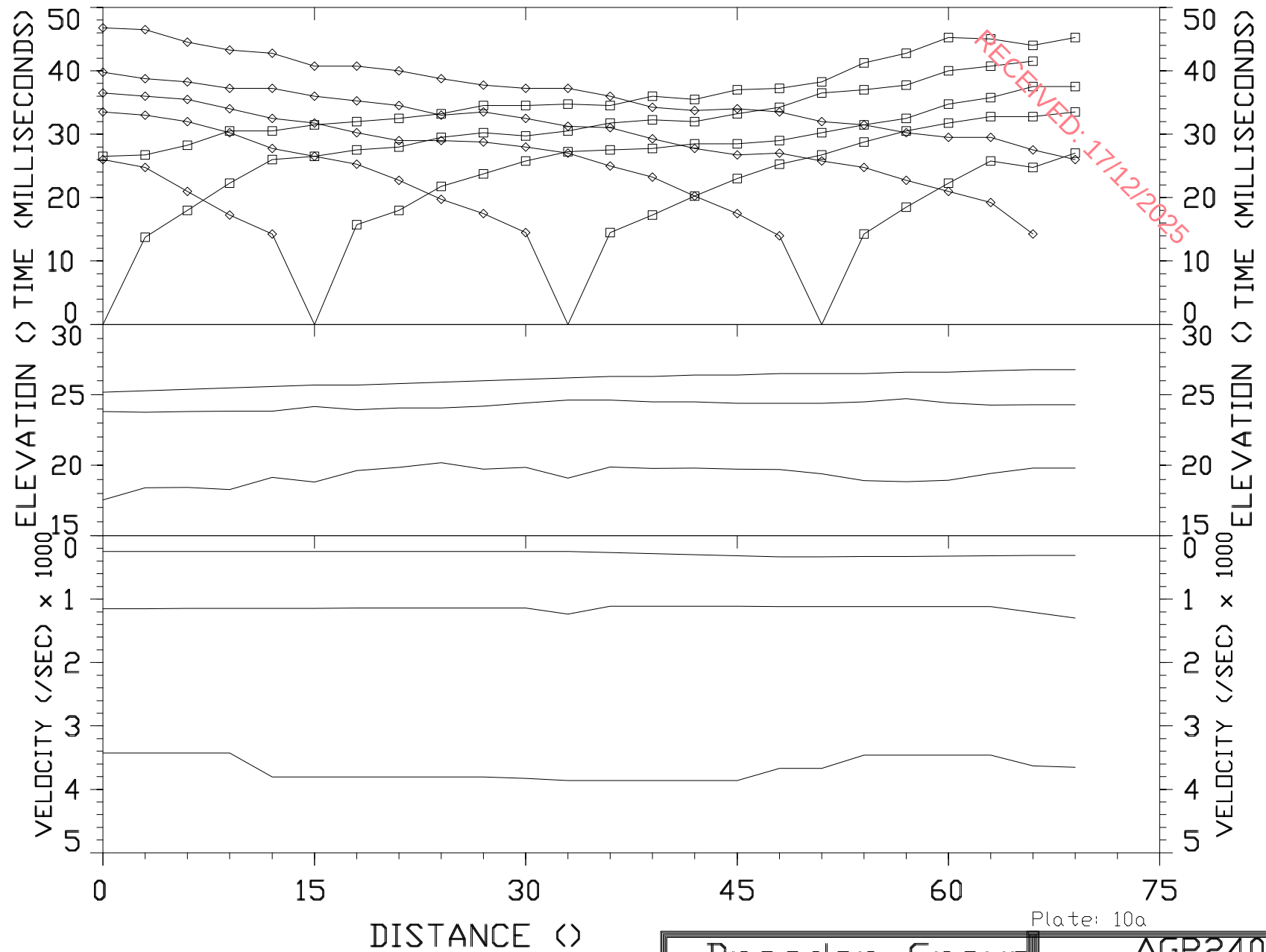
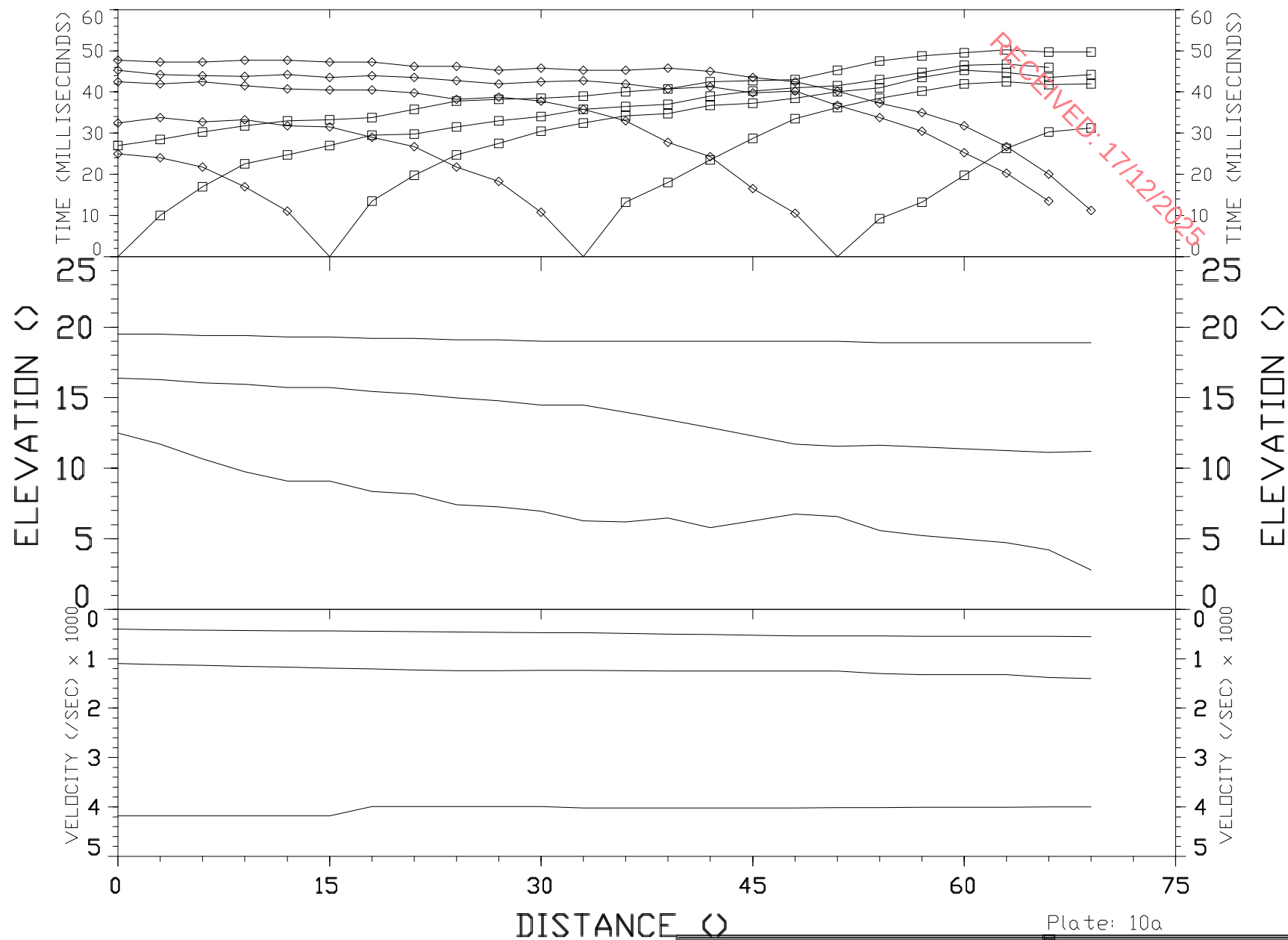


Plate: 10a

|                           |                 |          |  |
|---------------------------|-----------------|----------|--|
| Breedon Group             |                 | AGP24052 |  |
| by: APEX Geophysics, Ltd. |                 | Rossmore |  |
| Data Set: S8              | Date: Mar. 2024 | Cork     |  |
| Equipment: Geode          | Spread: S8      | Azimuth: |  |



Breedon Group

by: APEX Geophysics Ltd.

Data Set S9

Date: Apr. 2024

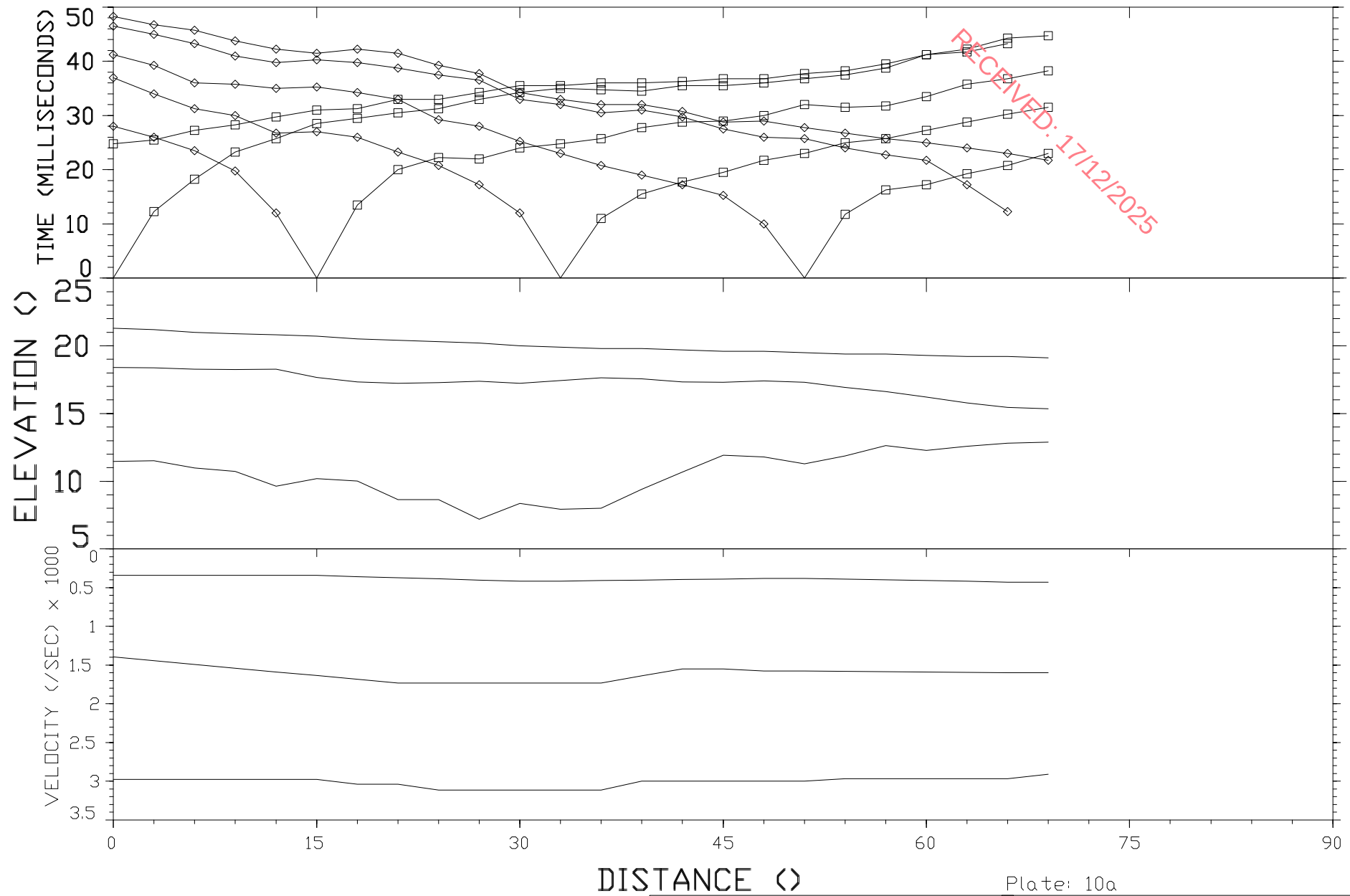
Equipment: Geode

Spread: S9

AGP24052

Rossmore  
Cork

Azimuth:



|                          |                 |          |
|--------------------------|-----------------|----------|
| Breedon Group            |                 | AGP24052 |
| by: APEX Geophysics Ltd. |                 | Rossmore |
| Data Set S10             | Date: Apr. 2024 | Cork     |
| Equipment: Geode         | Spread: S10     | Azimuth: |

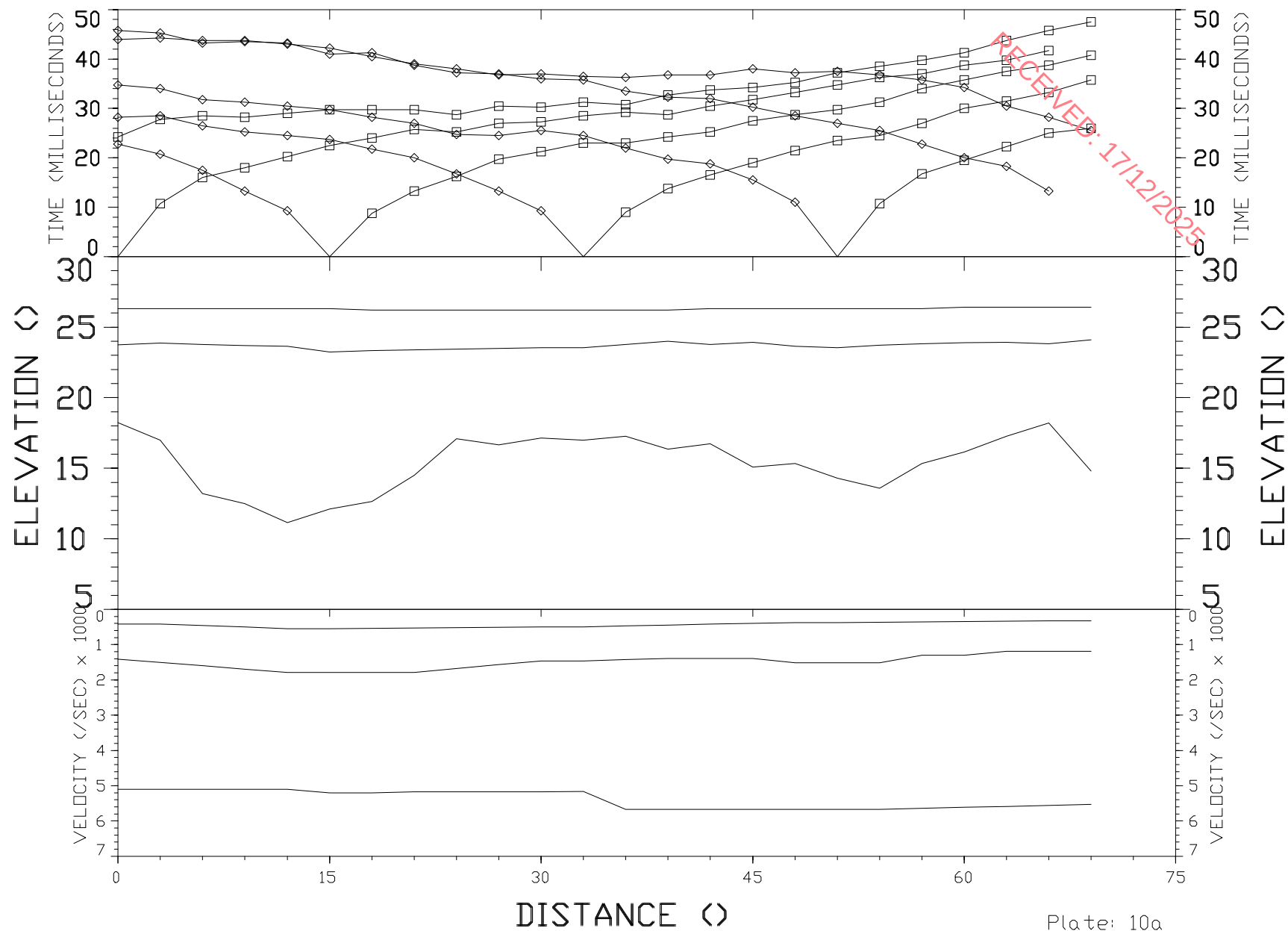


Plate: 10a

Breedon Group

AGP24052

by: APEX Geophysics Ltd.

Rossmore  
Cork

Data Set S11

Date: Mar. 2024

Equipment: Geode

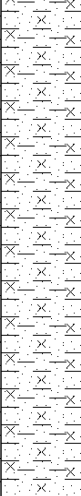
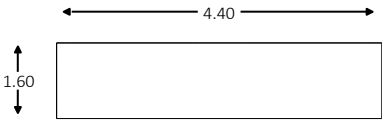
Spread: S11

Azimuth:

RECEIVED: 17/12/2025

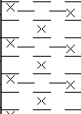
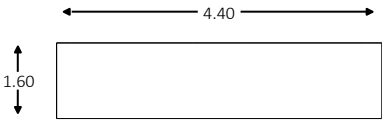
RECEIVED: 17/12/2025

## Appendix 6-B: Trial Pit Logs

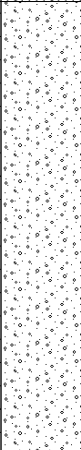
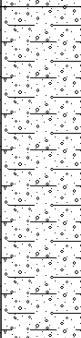
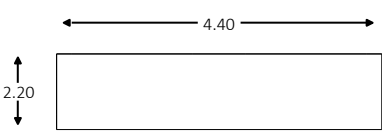
|                                                                                                                                                                                  |        |                                              |             |                          |               |                                                                                                                                                                                                             |                   |                                                                                                                                                         |  |                             |                        |                                                                                     |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------|-------------|--------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------|------------------------|-------------------------------------------------------------------------------------|--|
| TRIAL PIT LOG                                                                                                                                                                    |        |                                              |             |                          |               |                                                                                                                                                                                                             |                   |                                                                                                                                                         |  | TRIAL PIT No<br>24-ROS-TP01 |                        |                                                                                     |  |
| Client:<br>Breedon Materials Ltd.                                                                                                                                                |        |                                              |             |                          |               |                                                                                                                                                                                                             |                   |                                                                                                                                                         |  |                             |                        |  |  |
| Project:<br>Rossmore Ground Investigation                                                                                                                                        |        |                                              |             |                          |               |                                                                                                                                                                                                             |                   |                                                                                                                                                         |  |                             |                        |                                                                                     |  |
| Project No:<br>501.065463.00001.                                                                                                                                                 |        |                                              |             | Date:<br>08/10/2024      |               | Ground Level:<br>27.00m                                                                                                                                                                                     |                   | Co-ordinates:<br>E582610 N571439                                                                                                                        |  | Sheet<br>1 of 1             |                        |                                                                                     |  |
| SAMPLES & TESTS                                                                                                                                                                  |        |                                              |             | Water                    | STRATA        |                                                                                                                                                                                                             |                   |                                                                                                                                                         |  |                             | Instrument<br>Backfill |                                                                                     |  |
| Depth                                                                                                                                                                            | Sample | Test Type                                    | Test Result |                          | Reduced Level | Legend                                                                                                                                                                                                      | Depth (Thickness) | DESCRIPTION                                                                                                                                             |  |                             |                        |                                                                                     |  |
| 1.30                                                                                                                                                                             | B      |                                              |             |                          | 26.75         |                                                                                                                            | (0.25)<br>0.25    | Topsoil with rootlets.                                                                                                                                  |  |                             |                        |                                                                                     |  |
|                                                                                                                                                                                  |        |                                              |             |                          | 26.60         |                                                                                                                            | (0.15)<br>0.40    | Soft to firm, light brown, slightly gravelly, sandy, very clayey SILT. Sand is mid to fine grained. Clasts are angular to subrounded.                   |  |                             |                        |                                                                                     |  |
|                                                                                                                                                                                  |        |                                              |             |                          |               |                                                                                                                           | (2.30)            | Soft to firm, dark brown, slightly gravelly, sandy, very clayey SILT. Sand is mid to fine grained. Clasts are angular to subrounded. Hard rock at 2.7m. |  |                             |                        |                                                                                     |  |
| 2.70                                                                                                                                                                             | B      |                                              |             |                          | 24.30         |                                                                                                                          | 2.70              | Trial Pit Complete at 2.70m                                                                                                                             |  |                             |                        |                                                                                     |  |
| GENERAL REMARKS:<br>Bedrock at 2.7m                                                                                                                                              |        |                                              |             |                          |               | <div>Trial Pit Dimensions:<br/><br/>Shoring/Support: N/A<br/>Stability: Stable pit. Slightly unstable from 2.3m.</div> |                   |                                                                                                                                                         |  |                             |                        |                                                                                     |  |
| KEY<br>V = Hand Vane Shear Strength<br>PP = Pocket Penetrometer Shear Strength<br>J = Jar Sample<br>D = Disturbed Sample<br>B = Large Bulk Sample<br>HS = Head Space Measurement |        |                                              |             |                          |               |                                                                                                                                                                                                             |                   |                                                                                                                                                         |  |                             |                        |                                                                                     |  |
| All dimensions in metres<br>Scale 1:33                                                                                                                                           |        | Contractor: N/A<br>Plant: Standard Excavator |             | Method: Trial pit/trench |               | Logged By:<br>SS                                                                                                                                                                                            |                   | Approved By:<br>TM                                                                                                                                      |  |                             |                        |                                                                                     |  |
| LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020                                                                                                              |        |                                              |             |                          |               |                                                                                                                                                                                                             |                   |                                                                                                                                                         |  |                             |                        |                                                                                     |  |

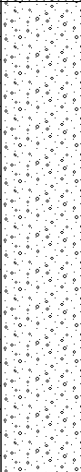
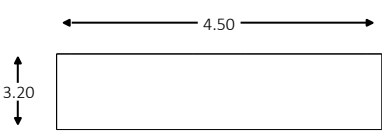
|                                                                                                                                                                                  |        |                                              |             |                     |                          |                         |                   |                                                                                                                                                                                                 |  |                                                                                                      |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------|-------------|---------------------|--------------------------|-------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------|--|
| TRIAL PIT LOG                                                                                                                                                                    |        |                                              |             |                     |                          |                         |                   |                                                                                                                                                                                                 |  | TRIAL PIT No<br>24-ROS-TP02                                                                          |  |
| Client:<br>Breedon Materials Ltd.                                                                                                                                                |        |                                              |             |                     |                          |                         |                   |                                                                                                                                                                                                 |  |                                                                                                      |  |
| Project:<br>Rossmore Ground Investigation                                                                                                                                        |        |                                              |             |                     |                          |                         |                   |                                                                                                                                                                                                 |  |                                                                                                      |  |
| Project No:<br>501.065463.00001.                                                                                                                                                 |        |                                              |             | Date:<br>08/10/2024 |                          | Ground Level:<br>23.00m |                   | Co-ordinates:<br>E582555 N571326                                                                                                                                                                |  | Sheet<br>1 of 1                                                                                      |  |
| SAMPLES & TESTS                                                                                                                                                                  |        |                                              |             | Water               | STRATA                   |                         |                   |                                                                                                                                                                                                 |  | Instrument<br>Backfill                                                                               |  |
| Depth                                                                                                                                                                            | Sample | Test Type                                    | Test Result |                     | Reduced Level            | Legend                  | Depth (Thickness) | DESCRIPTION                                                                                                                                                                                     |  |                                                                                                      |  |
| 1.60                                                                                                                                                                             | B      |                                              |             |                     | 22.80                    |                         | (0.20) 0.20       | Topsoil with rootlets.                                                                                                                                                                          |  |                                                                                                      |  |
|                                                                                                                                                                                  |        |                                              |             |                     |                          |                         | (2.40)            | Soft to firm, brown, slightly sandy, slightly gravelly, silty CLAY with occasional nodules of white sand/silt.                                                                                  |  |                                                                                                      |  |
|                                                                                                                                                                                  |        |                                              |             |                     | 20.40                    |                         | 2.60              | Firm to stiff, brown to dark brown, slightly sandy, silty, gravelly CLAY. Clasts are angular to subangular, with occasional weathered bedrock fragments and rounded cobbles. Hard rock at 3.9m. |  |                                                                                                      |  |
| 3.20                                                                                                                                                                             | B      |                                              |             |                     | 19.10                    |                         | 3.90              | Trial Pit Complete at 3.90m                                                                                                                                                                     |  |                                                                                                      |  |
| GENERAL REMARKS:<br>Bedrock at 3.9m                                                                                                                                              |        |                                              |             |                     |                          |                         |                   |                                                                                                                                                                                                 |  | <div>Trial Pit Dimensions:<br/><br/>Shoring/Support: N/A<br/>Stability: Slightly unstable pit.</div> |  |
| KEY<br>V = Hand Vane Shear Strength<br>PP = Pocket Penetrometer Shear Strength<br>J = Jar Sample<br>D = Disturbed Sample<br>B = Large Bulk Sample<br>HS = Head Space Measurement |        |                                              |             |                     |                          |                         |                   |                                                                                                                                                                                                 |  |                                                                                                      |  |
| All dimensions in metres<br>Scale 1:33                                                                                                                                           |        | Contractor: N/A<br>Plant: Standard Excavator |             |                     | Method: Trial pit/trench |                         |                   | Logged By:<br>SS                                                                                                                                                                                |  | Approved By:<br>TM                                                                                   |  |
| LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020                                                                                                              |        |                                              |             |                     |                          |                         |                   |                                                                                                                                                                                                 |  |                                                                                                      |  |

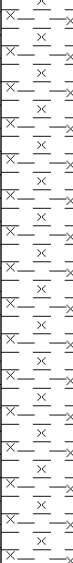
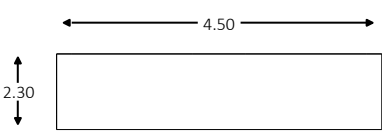


|                                                                                                                                                                                  |        |           |                                              |       |                         |                                                                                                                                                                                 |                                  |                                                                                                                     |                  |                             |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------|----------------------------------------------|-------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------|-----------------------------|--------------------|
| TRIAL PIT LOG                                                                                                                                                                    |        |           |                                              |       |                         |                                                                                                                                                                                 |                                  |                                                                                                                     |                  | TRIAL PIT No<br>24-ROS-TP04 |                    |
| Client:<br>Breedon Materials Ltd.                                                                                                                                                |        |           |                                              |       |                         |                                                                                                                                                                                 |                                  |                                                                                                                     |                  |                             |                    |
| Project:<br>Rossmore Ground Investigation                                                                                                                                        |        |           |                                              |       |                         |                                                                                                                                                                                 |                                  |                                                                                                                     |                  |                             |                    |
| Project No:<br>501.065463.00001.                                                                                                                                                 |        |           | Date:<br>08/10/2024                          |       | Ground Level:<br>17.00m |                                                                                                                                                                                 | Co-ordinates:<br>E582645 N571100 |                                                                                                                     |                  | Sheet<br>1 of 1             |                    |
| SAMPLES & TESTS                                                                                                                                                                  |        |           |                                              | Water | STRATA                  |                                                                                                                                                                                 |                                  |                                                                                                                     |                  | Instrument<br>Backfill      |                    |
| Depth                                                                                                                                                                            | Sample | Test Type | Test Result                                  |       | Reduced Level           | Legend                                                                                                                                                                          | Depth (Thickness)                | DESCRIPTION                                                                                                         |                  |                             |                    |
| 1                                                                                                                                                                                |        |           |                                              |       | 16.70                   |                                                                                                | (0.30)<br>0.30                   | Topsoil with rootlets.                                                                                              |                  |                             |                    |
|                                                                                                                                                                                  |        |           |                                              |       |                         |                                                                                                | (0.60)<br>0.60                   | Soft to firm, dark brown, slightly gravelly, silty CLAY with common weathered bedrock fragments. Hard rock at 0.9m. |                  |                             |                    |
|                                                                                                                                                                                  |        |           |                                              |       | 16.10                   |                                                                                                | 0.90                             | Trial Pit Complete at 0.90m                                                                                         |                  |                             |                    |
| 2                                                                                                                                                                                |        |           |                                              |       |                         |                                                                                                                                                                                 |                                  |                                                                                                                     |                  |                             |                    |
| 3                                                                                                                                                                                |        |           |                                              |       |                         |                                                                                                                                                                                 |                                  |                                                                                                                     |                  |                             |                    |
| 4                                                                                                                                                                                |        |           |                                              |       |                         |                                                                                                                                                                                 |                                  |                                                                                                                     |                  |                             |                    |
| GENERAL REMARKS:<br>Bedrock at 0.9m                                                                                                                                              |        |           |                                              |       |                         | <div>Trial Pit Dimensions:<br/><br/>Shoring/Support: N/A<br/>Stability: Shallow pit.</div> |                                  |                                                                                                                     |                  |                             |                    |
| KEY<br>V = Hand Vane Shear Strength<br>PP = Pocket Penetrometer Shear Strength<br>J = Jar Sample<br>D = Disturbed Sample<br>B = Large Bulk Sample<br>HS = Head Space Measurement |        |           |                                              |       |                         |                                                                                                                                                                                 |                                  |                                                                                                                     |                  |                             |                    |
| All dimensions in metres<br>Scale 1:33                                                                                                                                           |        |           | Contractor: N/A<br>Plant: Standard Excavator |       |                         | Method: Trial pit/trench                                                                                                                                                        |                                  |                                                                                                                     | Logged By:<br>SS |                             | Approved By:<br>TM |
| LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020                                                                                                              |        |           |                                              |       |                         |                                                                                                                                                                                 |                                  |                                                                                                                     |                  |                             |                    |

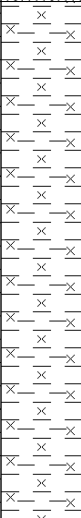
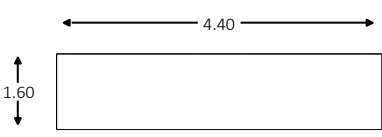
|                                                                                                                                                                                  |        |                                              |                     |       |                                                                                                                 |        |                                  |                                                                                                                                                                              |  |                             |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------|---------------------|-------|-----------------------------------------------------------------------------------------------------------------|--------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------|--|
| TRIAL PIT LOG                                                                                                                                                                    |        |                                              |                     |       |                                                                                                                 |        |                                  |                                                                                                                                                                              |  | TRIAL PIT No<br>24-ROS-TP05 |  |
| Client:<br>Breedon Materials Ltd.                                                                                                                                                |        |                                              |                     |       |                                                                                                                 |        |                                  |                                                                                                                                                                              |  |                             |  |
| Project:<br>Rossmore Ground Investigation                                                                                                                                        |        |                                              |                     |       |                                                                                                                 |        |                                  |                                                                                                                                                                              |  |                             |  |
| Project No:<br>501.065463.00001.                                                                                                                                                 |        |                                              | Date:<br>08/10/2024 |       | Ground Level:<br>18.00m                                                                                         |        | Co-ordinates:<br>E582584 N570982 |                                                                                                                                                                              |  | Sheet<br>1 of 1             |  |
| SAMPLES & TESTS                                                                                                                                                                  |        |                                              |                     | Water | STRATA                                                                                                          |        |                                  |                                                                                                                                                                              |  | Instrument<br>Backfill      |  |
| Depth                                                                                                                                                                            | Sample | Test Type                                    | Test Result         |       | Reduced Level                                                                                                   | Legend | Depth (Thickness)                | DESCRIPTION                                                                                                                                                                  |  |                             |  |
| 0.90<br>1<br>2<br>2.40<br>3<br>3.50<br>4                                                                                                                                         | B      |                                              |                     |       | 17.80                                                                                                           |        | (0.20)<br>0.20                   | Topsoil with rootlets.                                                                                                                                                       |  |                             |  |
|                                                                                                                                                                                  |        |                                              |                     |       |                                                                                                                 |        | (1.00)                           | Loose to very loose, brown to light brown, slightly clayey, sandy GRAVEL with common cobbles and boulders. Sand is fine to coarse grained. Clasts are rounded to subrounded. |  |                             |  |
|                                                                                                                                                                                  |        |                                              |                     |       | 16.80                                                                                                           |        | 1.20                             | Very loose, dark brown, slightly silty, gravelly SAND with common cobbles and boulders. Sand is fine to mid grained. Clasts are rounded to subrounded.                       |  |                             |  |
|                                                                                                                                                                                  |        |                                              |                     |       |                                                                                                                 |        | (1.50)                           |                                                                                                                                                                              |  |                             |  |
|                                                                                                                                                                                  |        |                                              |                     |       | 15.30                                                                                                           |        | 2.70                             | Soft to firm, brown, slightly sandy, slightly gravelly CLAY with rare cobbles and boulders. Clasts are rounded. Collapsed at 3.9m.                                           |  |                             |  |
|                                                                                                                                                                                  |        |                                              |                     |       |                                                                                                                 |        | (1.20)                           |                                                                                                                                                                              |  |                             |  |
|                                                                                                                                                                                  |        |                                              |                     |       | 14.10                                                                                                           |        | 3.90                             | Trial Pit Complete at 3.90m                                                                                                                                                  |  |                             |  |
| GENERAL REMARKS:<br>Collapsed at 3.9m                                                                                                                                            |        |                                              |                     |       | <div>Trial Pit Dimensions:<br/><br/>Shoring/Support: N/A<br/>Stability: Unstable pit, collapsing at 3.9m.</div> |        |                                  |                                                                                                                                                                              |  |                             |  |
| KEY<br>V = Hand Vane Shear Strength<br>PP = Pocket Penetrometer Shear Strength<br>J = Jar Sample<br>D = Disturbed Sample<br>B = Large Bulk Sample<br>HS = Head Space Measurement |        |                                              |                     |       |                                                                                                                 |        |                                  |                                                                                                                                                                              |  |                             |  |
| All dimensions in metres<br>Scale 1:33                                                                                                                                           |        | Contractor: N/A<br>Plant: Standard Excavator |                     |       | Method: Trial pit/trench                                                                                        |        |                                  | Logged By:<br>SS                                                                                                                                                             |  | Approved By:<br>TM          |  |
| LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020                                                                                                              |        |                                              |                     |       |                                                                                                                 |        |                                  |                                                                                                                                                                              |  |                             |  |

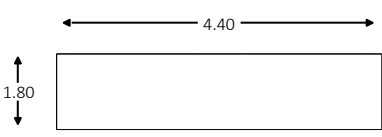
|                                                                                                                                                                                  |        |           |                                              |       |                                                                                                                                                                                                             |                                                                                     |                                  |                                                                                                                                                                                             |                  |                                                                                               |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------|----------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------------------------------------------------------------------------------------|--------------------|
| TRIAL PIT LOG                                                                                                                                                                    |        |           |                                              |       |                                                                                                                                                                                                             |                                                                                     |                                  |                                                                                                                                                                                             |                  | TRIAL PIT No<br>24-ROS-TP06                                                                   |                    |
| Client:<br>Breedon Materials Ltd.                                                                                                                                                |        |           |                                              |       |                                                                                                                                                                                                             |                                                                                     |                                  |                                                                                                                                                                                             |                  | <br>1 of 1 |                    |
| Project:<br>Rossmore Ground Investigation                                                                                                                                        |        |           |                                              |       |                                                                                                                                                                                                             |                                                                                     |                                  |                                                                                                                                                                                             |                  |                                                                                               |                    |
| Project No:<br>501.065463.00001.                                                                                                                                                 |        |           | Date:<br>08/10/2024                          |       | Ground Level:<br>14.00m                                                                                                                                                                                     |                                                                                     | Co-ordinates:<br>E582719 N571008 |                                                                                                                                                                                             | Sheet            |                                                                                               |                    |
| SAMPLES & TESTS                                                                                                                                                                  |        |           |                                              | Water | STRATA                                                                                                                                                                                                      |                                                                                     |                                  |                                                                                                                                                                                             |                  | Instrument<br>Backfill                                                                        |                    |
| Depth                                                                                                                                                                            | Sample | Test Type | Test Result                                  |       | Reduced Level                                                                                                                                                                                               | Legend                                                                              | Depth (Thickness)                | DESCRIPTION                                                                                                                                                                                 |                  |                                                                                               |                    |
| 1.40                                                                                                                                                                             | B      |           |                                              |       | 13.75                                                                                                                                                                                                       |    | (0.25)<br>0.25                   | Topsoil with rootlets.                                                                                                                                                                      |                  |                                                                                               |                    |
|                                                                                                                                                                                  |        |           |                                              |       |                                                                                                                                                                                                             |   | (1.95)                           | Loose to very loose, brown to light brown, slightly clayey, very sandy GRAVEL with common cobbles and occasional boulders. Sand is mid to coarse grained. Clasts are rounded to subrounded. |                  |                                                                                               |                    |
|                                                                                                                                                                                  |        |           |                                              |       | 11.80                                                                                                                                                                                                       |  | (1.50)                           | Loose, brown, sandy, very clayey GRAVEL with common cobbles and boulders. Clasts are rounded to subangular. Hard rock at 3.7m.                                                              |                  |                                                                                               |                    |
|                                                                                                                                                                                  |        |           |                                              |       | 10.30                                                                                                                                                                                                       |  | 3.70                             | Trial Pit Complete at 3.70m                                                                                                                                                                 |                  |                                                                                               |                    |
| GENERAL REMARKS:<br>Bedrock at 3.7m                                                                                                                                              |        |           |                                              |       | <div>Trial Pit Dimensions:<br/><br/>Shoring/Support: N/A<br/>Stability: Stable pit, slightly unstable from 3.2m.</div> |                                                                                     |                                  |                                                                                                                                                                                             |                  |                                                                                               |                    |
| KEY<br>V = Hand Vane Shear Strength<br>PP = Pocket Penetrometer Shear Strength<br>J = Jar Sample<br>D = Disturbed Sample<br>B = Large Bulk Sample<br>HS = Head Space Measurement |        |           |                                              |       |                                                                                                                                                                                                             |                                                                                     |                                  |                                                                                                                                                                                             |                  |                                                                                               |                    |
| All dimensions in metres<br>Scale 1:33                                                                                                                                           |        |           | Contractor: N/A<br>Plant: Standard Excavator |       |                                                                                                                                                                                                             | Method: Trial pit/trench                                                            |                                  |                                                                                                                                                                                             | Logged By:<br>SS |                                                                                               | Approved By:<br>TM |
| LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020                                                                                                              |        |           |                                              |       |                                                                                                                                                                                                             |                                                                                     |                                  |                                                                                                                                                                                             |                  |                                                                                               |                    |

|                                                                                                                                                                                  |        |                                              |             |                          |               |                                                                                                                                                                                  |                   |                                                                                                                                                                                                         |  |                             |                        |                                                                                     |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------|-------------|--------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------|------------------------|-------------------------------------------------------------------------------------|--|
| TRIAL PIT LOG                                                                                                                                                                    |        |                                              |             |                          |               |                                                                                                                                                                                  |                   |                                                                                                                                                                                                         |  | TRIAL PIT No<br>24-ROS-TP07 |                        |                                                                                     |  |
| Client:<br>Breedon Materials Ltd.                                                                                                                                                |        |                                              |             |                          |               |                                                                                                                                                                                  |                   |                                                                                                                                                                                                         |  |                             |                        |  |  |
| Project:<br>Rossmore Ground Investigation                                                                                                                                        |        |                                              |             |                          |               |                                                                                                                                                                                  |                   |                                                                                                                                                                                                         |  |                             |                        |                                                                                     |  |
| Project No:<br>501.065463.00001.                                                                                                                                                 |        |                                              |             | Date:<br>08/10/2024      |               | Ground Level:<br>16.00m                                                                                                                                                          |                   | Co-ordinates:<br>E582838 N570998                                                                                                                                                                        |  | Sheet<br>1 of 1             |                        |                                                                                     |  |
| SAMPLES & TESTS                                                                                                                                                                  |        |                                              |             | Water                    | STRATA        |                                                                                                                                                                                  |                   |                                                                                                                                                                                                         |  |                             | Instrument<br>Backfill |                                                                                     |  |
| Depth                                                                                                                                                                            | Sample | Test Type                                    | Test Result |                          | Reduced Level | Legend                                                                                                                                                                           | Depth (Thickness) | DESCRIPTION                                                                                                                                                                                             |  |                             |                        |                                                                                     |  |
| 1.10                                                                                                                                                                             | B      |                                              |             |                          | 15.75         |                                                                                                 | (0.25)<br>0.25    | Topsoil with rootlets.                                                                                                                                                                                  |  |                             |                        |                                                                                     |  |
|                                                                                                                                                                                  |        |                                              |             |                          |               |                                                                                                | (2.05)            | Loose to very loose, light brown to brown, slightly clayey, very sandy GRAVEL with occasional cobbles and boulders. Sand is mid to coarse grained. Clasts are rounded to subrounded. Hard rock at 2.3m. |  |                             |                        |                                                                                     |  |
| 2.30                                                                                                                                                                             | B      |                                              |             |                          | 13.70         |                                                                                                                                                                                  | 2.30              | Trial Pit Complete at 2.30m                                                                                                                                                                             |  |                             |                        |                                                                                     |  |
| 3                                                                                                                                                                                |        |                                              |             |                          |               |                                                                                                                                                                                  |                   |                                                                                                                                                                                                         |  |                             |                        |                                                                                     |  |
| 4                                                                                                                                                                                |        |                                              |             |                          |               |                                                                                                                                                                                  |                   |                                                                                                                                                                                                         |  |                             |                        |                                                                                     |  |
| GENERAL REMARKS:<br>Bedrock at 2.3m                                                                                                                                              |        |                                              |             |                          |               | <div>Trial Pit Dimensions:<br/><br/>Shoring/Support: N/A<br/>Stability: Unstable pit.</div> |                   |                                                                                                                                                                                                         |  |                             |                        |                                                                                     |  |
| KEY<br>V = Hand Vane Shear Strength<br>PP = Pocket Penetrometer Shear Strength<br>J = Jar Sample<br>D = Disturbed Sample<br>B = Large Bulk Sample<br>HS = Head Space Measurement |        |                                              |             |                          |               |                                                                                                                                                                                  |                   |                                                                                                                                                                                                         |  |                             |                        |                                                                                     |  |
| All dimensions in metres<br>Scale 1:33                                                                                                                                           |        | Contractor: N/A<br>Plant: Standard Excavator |             | Method: Trial pit/trench |               | Logged By:<br>SS                                                                                                                                                                 |                   | Approved By:<br>TM                                                                                                                                                                                      |  |                             |                        |                                                                                     |  |
| LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020                                                                                                              |        |                                              |             |                          |               |                                                                                                                                                                                  |                   |                                                                                                                                                                                                         |  |                             |                        |                                                                                     |  |

|                                                                                                                                                                                  |        |                                              |             |                          |               |                                                                                                                                                                                                           |                   |                                                                                                                               |  |                             |                        |                                                                                     |  |
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| TRIAL PIT LOG                                                                                                                                                                    |        |                                              |             |                          |               |                                                                                                                                                                                                           |                   |                                                                                                                               |  | TRIAL PIT No<br>24-ROS-TP08 |                        |                                                                                     |  |
| Client:<br>Breedon Materials Ltd.                                                                                                                                                |        |                                              |             |                          |               |                                                                                                                                                                                                           |                   |                                                                                                                               |  |                             |                        |  |  |
| Project:<br>Rossmore Ground Investigation                                                                                                                                        |        |                                              |             |                          |               |                                                                                                                                                                                                           |                   |                                                                                                                               |  |                             |                        |                                                                                     |  |
| Project No:<br>501.065463.00001.                                                                                                                                                 |        |                                              |             | Date:<br>08/10/2024      |               | Ground Level:<br>21.00m                                                                                                                                                                                   |                   | Co-ordinates:<br>E582804 N571098                                                                                              |  | Sheet<br>1 of 1             |                        |                                                                                     |  |
| SAMPLES & TESTS                                                                                                                                                                  |        |                                              |             | Water                    | STRATA        |                                                                                                                                                                                                           |                   |                                                                                                                               |  |                             | Instrument<br>Backfill |                                                                                     |  |
| Depth                                                                                                                                                                            | Sample | Test Type                                    | Test Result |                          | Reduced Level | Legend                                                                                                                                                                                                    | Depth (Thickness) | DESCRIPTION                                                                                                                   |  |                             |                        |                                                                                     |  |
| 1.10                                                                                                                                                                             | B      |                                              |             |                          | 20.90         |                                                                                                                          | (0.10)0.10        | Topsoil with rootlets.                                                                                                        |  |                             |                        |                                                                                     |  |
|                                                                                                                                                                                  |        |                                              |             |                          |               |                                                                                                                         | (2.60)            | Firm, brown, slightly gravelly, silty CLAY with rare cobbles and weathered bedrock fragments towards base. Hard rock at 2.7m. |  |                             |                        |                                                                                     |  |
|                                                                                                                                                                                  |        |                                              |             |                          | 18.30         |                                                                                                                                                                                                           | 2.70              | Trial Pit Complete at 2.70m                                                                                                   |  |                             |                        |                                                                                     |  |
| 3                                                                                                                                                                                |        |                                              |             |                          |               |                                                                                                                                                                                                           |                   |                                                                                                                               |  |                             |                        |                                                                                     |  |
| 4                                                                                                                                                                                |        |                                              |             |                          |               |                                                                                                                                                                                                           |                   |                                                                                                                               |  |                             |                        |                                                                                     |  |
| GENERAL REMARKS:<br>Bedrock at 2.7m                                                                                                                                              |        |                                              |             |                          |               | <div>Trial Pit Dimensions:<br/><br/>Shoring/Support: N/A<br/>Stability: Stable pit, slightly unstable from 2m.</div> |                   |                                                                                                                               |  |                             |                        |                                                                                     |  |
| KEY<br>V = Hand Vane Shear Strength<br>PP = Pocket Penetrometer Shear Strength<br>J = Jar Sample<br>D = Disturbed Sample<br>B = Large Bulk Sample<br>HS = Head Space Measurement |        |                                              |             |                          |               |                                                                                                                                                                                                           |                   |                                                                                                                               |  |                             |                        |                                                                                     |  |
| All dimensions in metres<br>Scale 1:33                                                                                                                                           |        | Contractor: N/A<br>Plant: Standard Excavator |             | Method: Trial pit/trench |               | Logged By:<br>SS                                                                                                                                                                                          |                   | Approved By:<br>TM                                                                                                            |  |                             |                        |                                                                                     |  |
| LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020                                                                                                              |        |                                              |             |                          |               |                                                                                                                                                                                                           |                   |                                                                                                                               |  |                             |                        |                                                                                     |  |

| TRIAL PIT LOG                                                                                                                                                                    |        |                                              |                     |       |                                                                                                          |        |                                  |                                                                                                                                             |                        | TRIAL PIT No<br>24-ROS-TP09                    |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------|---------------------|-------|----------------------------------------------------------------------------------------------------------|--------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------------------------------------|--|
| Client:<br>Breedon Materials Ltd.                                                                                                                                                |        |                                              |                     |       |                                                                                                          |        |                                  |                                                                                                                                             |                        | <div>RECEIVED: 17/12/2025</div> <div>SLR</div> |  |
| Project:<br>Rossmore Ground Investigation                                                                                                                                        |        |                                              |                     |       |                                                                                                          |        |                                  |                                                                                                                                             |                        |                                                |  |
| Project No:<br>501.065463.00001.                                                                                                                                                 |        |                                              | Date:<br>08/10/2024 |       | Ground Level:<br>21.00m                                                                                  |        | Co-ordinates:<br>E582857 N571198 |                                                                                                                                             | Sheet<br>1 of 1        |                                                |  |
| SAMPLES & TESTS                                                                                                                                                                  |        |                                              |                     | Water | STRATA                                                                                                   |        |                                  |                                                                                                                                             | Instrument<br>Backfill |                                                |  |
| Depth                                                                                                                                                                            | Sample | Test Type                                    | Test Result         |       | Reduced Level                                                                                            | Legend | Depth (Thick-ness)               | DESCRIPTION                                                                                                                                 |                        |                                                |  |
| 0.90                                                                                                                                                                             | B      |                                              |                     |       | 20.70                                                                                                    |        | (0.30)<br>0.30                   | Topsoil with rootlets.                                                                                                                      |                        |                                                |  |
|                                                                                                                                                                                  |        |                                              |                     |       |                                                                                                          |        | (0.80)<br>1.10                   | Firm, brown to dark brown, slightly gravelly, silty CLAY with rare white cobbles and common weathered bedrock fragments. Hard rock at 1.1m. |                        |                                                |  |
|                                                                                                                                                                                  |        |                                              |                     |       | 19.90                                                                                                    |        |                                  | Trial Pit Complete at 1.10m                                                                                                                 |                        |                                                |  |
| 1                                                                                                                                                                                |        |                                              |                     |       |                                                                                                          |        |                                  |                                                                                                                                             |                        |                                                |  |
| 2                                                                                                                                                                                |        |                                              |                     |       |                                                                                                          |        |                                  |                                                                                                                                             |                        |                                                |  |
| 3                                                                                                                                                                                |        |                                              |                     |       |                                                                                                          |        |                                  |                                                                                                                                             |                        |                                                |  |
| 4                                                                                                                                                                                |        |                                              |                     |       |                                                                                                          |        |                                  |                                                                                                                                             |                        |                                                |  |
| GENERAL REMARKS:<br>Bedrock at 1.1m                                                                                                                                              |        |                                              |                     |       | <div>Trial Pit Dimensions:</div> <div></div> <div>Shoring/Support: N/A<br/>Stability: Shallow pit.</div> |        |                                  |                                                                                                                                             |                        |                                                |  |
| KEY<br>V = Hand Vane Shear Strength<br>PP = Pocket Penetrometer Shear Strength<br>J = Jar Sample<br>D = Disturbed Sample<br>B = Large Bulk Sample<br>HS = Head Space Measurement |        |                                              |                     |       |                                                                                                          |        |                                  |                                                                                                                                             |                        |                                                |  |
| All dimensions in metres<br>Scale 1:33                                                                                                                                           |        | Contractor: N/A<br>Plant: Standard Excavator |                     |       | Method: Trial pit/trench                                                                                 |        |                                  | Logged By:<br>SS                                                                                                                            |                        | Approved By:<br>TM                             |  |
| LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020                                                                                                              |        |                                              |                     |       |                                                                                                          |        |                                  |                                                                                                                                             |                        |                                                |  |

|                                                                                                                                                                                  |        |                                              |             |                          |               |                                                                                                                                                                                |                   |                                                                                                                                                                           |  |                             |                        |                                                                                     |  |
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| TRIAL PIT LOG                                                                                                                                                                    |        |                                              |             |                          |               |                                                                                                                                                                                |                   |                                                                                                                                                                           |  | TRIAL PIT No<br>24-ROS-TP10 |                        |                                                                                     |  |
| Client:<br>Breedon Materials Ltd.                                                                                                                                                |        |                                              |             |                          |               |                                                                                                                                                                                |                   |                                                                                                                                                                           |  |                             |                        |  |  |
| Project:<br>Rossmore Ground Investigation                                                                                                                                        |        |                                              |             |                          |               |                                                                                                                                                                                |                   |                                                                                                                                                                           |  |                             |                        |                                                                                     |  |
| Project No:<br>501.065463.00001.                                                                                                                                                 |        |                                              |             | Date:<br>08/10/2024      |               | Ground Level:<br>20.00m                                                                                                                                                        |                   | Co-ordinates:<br>E582746 N571199                                                                                                                                          |  | Sheet<br>1 of 1             |                        |                                                                                     |  |
| SAMPLES & TESTS                                                                                                                                                                  |        |                                              |             | Water                    | STRATA        |                                                                                                                                                                                |                   |                                                                                                                                                                           |  |                             | Instrument<br>Backfill |                                                                                     |  |
| Depth                                                                                                                                                                            | Sample | Test Type                                    | Test Result |                          | Reduced Level | Legend                                                                                                                                                                         | Depth (Thickness) | DESCRIPTION                                                                                                                                                               |  |                             |                        |                                                                                     |  |
| 1.60                                                                                                                                                                             | B      |                                              |             |                          | 19.75         |                                                                                               | (0.25)<br>0.25    | Topsoil with rootlets.                                                                                                                                                    |  |                             |                        |                                                                                     |  |
|                                                                                                                                                                                  |        |                                              |             |                          |               |                                                                                              | (2.25)            | Soft to firm, brown, slightly sandy, slightly gravelly, silty CLAY with rare nodules of white sand/silt, and weathered bedrock fragments towards base. Hard rock at 2.5m. |  |                             |                        |                                                                                     |  |
|                                                                                                                                                                                  |        |                                              |             |                          | 17.50         |                                                                                             | 2.50              | Trial Pit Complete at 2.50m                                                                                                                                               |  |                             |                        |                                                                                     |  |
| 3                                                                                                                                                                                |        |                                              |             |                          |               |                                                                                                                                                                                |                   |                                                                                                                                                                           |  |                             |                        |                                                                                     |  |
| 4                                                                                                                                                                                |        |                                              |             |                          |               |                                                                                                                                                                                |                   |                                                                                                                                                                           |  |                             |                        |                                                                                     |  |
| GENERAL REMARKS:<br>Bedrock at 2.5m                                                                                                                                              |        |                                              |             |                          |               | <div>Trial Pit Dimensions:<br/><br/>Shoring/Support: N/A<br/>Stability: Stable pit.</div> |                   |                                                                                                                                                                           |  |                             |                        |                                                                                     |  |
| KEY<br>V = Hand Vane Shear Strength<br>PP = Pocket Penetrometer Shear Strength<br>J = Jar Sample<br>D = Disturbed Sample<br>B = Large Bulk Sample<br>HS = Head Space Measurement |        |                                              |             |                          |               |                                                                                                                                                                                |                   |                                                                                                                                                                           |  |                             |                        |                                                                                     |  |
| All dimensions in metres<br>Scale 1:33                                                                                                                                           |        | Contractor: N/A<br>Plant: Standard Excavator |             | Method: Trial pit/trench |               | Logged By:<br>SS                                                                                                                                                               |                   | Approved By:<br>TM                                                                                                                                                        |  |                             |                        |                                                                                     |  |
| LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020                                                                                                              |        |                                              |             |                          |               |                                                                                                                                                                                |                   |                                                                                                                                                                           |  |                             |                        |                                                                                     |  |

|                                                                                                                                                                                  |        |                                              |                     |       |                                                                                                                                                                                                           |                                                                                     |                                  |                                                                                                                                              |                        |                                                                                                             |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------|---------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------|--|
| TRIAL PIT LOG                                                                                                                                                                    |        |                                              |                     |       |                                                                                                                                                                                                           |                                                                                     |                                  |                                                                                                                                              |                        | TRIAL PIT No<br>24-ROS-TP11                                                                                 |  |
| Client:<br>Breedon Materials Ltd.                                                                                                                                                |        |                                              |                     |       |                                                                                                                                                                                                           |                                                                                     |                                  |                                                                                                                                              |                        | <br>RECEIVED: 17/12/2025 |  |
| Project:<br>Rossmore Ground Investigation                                                                                                                                        |        |                                              |                     |       |                                                                                                                                                                                                           |                                                                                     |                                  |                                                                                                                                              |                        |                                                                                                             |  |
| Project No:<br>501.065463.00001.                                                                                                                                                 |        |                                              | Date:<br>08/10/2024 |       | Ground Level:<br>21.00m                                                                                                                                                                                   |                                                                                     | Co-ordinates:<br>E582632 N571269 |                                                                                                                                              | Sheet<br>1 of 1        |                                                                                                             |  |
| SAMPLES & TESTS                                                                                                                                                                  |        |                                              |                     | Water | STRATA                                                                                                                                                                                                    |                                                                                     |                                  |                                                                                                                                              | Instrument<br>Backfill |                                                                                                             |  |
| Depth                                                                                                                                                                            | Sample | Test Type                                    | Test Result         |       | Reduced Level                                                                                                                                                                                             | Legend                                                                              | Depth (Thickness)                | DESCRIPTION                                                                                                                                  |                        |                                                                                                             |  |
| 1.90                                                                                                                                                                             | B      |                                              |                     |       | 20.75                                                                                                                                                                                                     |    | (0.25)<br>0.25                   | Topsoil with rootlets.                                                                                                                       |                        |                                                                                                             |  |
|                                                                                                                                                                                  |        |                                              |                     |       |                                                                                                                                                                                                           |                                                                                     | (2.45)                           | Firm, brown to dark brown, slightly gravelly CLAY with rare boulders.                                                                        |                        |                                                                                                             |  |
|                                                                                                                                                                                  |        |                                              |                     |       | 18.30                                                                                                                                                                                                     |                                                                                     | 2.70                             | Firm to stiff, brown, slightly sandy, gravelly CLAY with common cobbles and rare boulders. Clasts are rounded to angular. Hard rock at 3.1m. |                        |                                                                                                             |  |
|                                                                                                                                                                                  |        |                                              |                     |       | 17.90                                                                                                                                                                                                     |  | (0.40)<br>3.10                   | Trial Pit Complete at 3.10m                                                                                                                  |                        |                                                                                                             |  |
| 2.90                                                                                                                                                                             | B      |                                              |                     |       |                                                                                                                                                                                                           |                                                                                     |                                  |                                                                                                                                              |                        |                                                                                                             |  |
| 4                                                                                                                                                                                |        |                                              |                     |       |                                                                                                                                                                                                           |                                                                                     |                                  |                                                                                                                                              |                        |                                                                                                             |  |
| GENERAL REMARKS:<br>Bedrock at 3.1m                                                                                                                                              |        |                                              |                     |       | <div>Trial Pit Dimensions:<br/><br/>Shoring/Support: N/A<br/>Stability: Stable pit, slightly unstable from 2m.</div> |                                                                                     |                                  |                                                                                                                                              |                        |                                                                                                             |  |
| KEY<br>V = Hand Vane Shear Strength<br>PP = Pocket Penetrometer Shear Strength<br>J = Jar Sample<br>D = Disturbed Sample<br>B = Large Bulk Sample<br>HS = Head Space Measurement |        |                                              |                     |       |                                                                                                                                                                                                           |                                                                                     |                                  |                                                                                                                                              |                        |                                                                                                             |  |
| All dimensions in metres<br>Scale 1:33                                                                                                                                           |        | Contractor: N/A<br>Plant: Standard Excavator |                     |       | Method: Trial pit/trench                                                                                                                                                                                  |                                                                                     |                                  | Logged By:<br>SS                                                                                                                             | Approved By:<br>TM     |                                                                                                             |  |
| LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020                                                                                                              |        |                                              |                     |       |                                                                                                                                                                                                           |                                                                                     |                                  |                                                                                                                                              |                        |                                                                                                             |  |

RECEIVED: 17/12/2025

RECEIVED: 17/12/2025

## Appendix 6-C: Borehole Logs

|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-----------|--------------------|-----------------------------|--------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------|------------------|---------------|--------------------|--|
|  |          | Rotary Cored Borehole Log |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                               | Borehole No.<br><b>24-ROS-01</b><br>Sheet 1 of 10 |            |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |           |                    |                             |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |           |                    |                             |              | Coordinates: E: 582809.94 N: 571019.09 |                                                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |           |                    | Plant: N/A                  |              | Level: 22.00mAOD                       |                                                                                                                                                                                                               | Vertical Scale: 1:51                              |            |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                           |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |           |                    |                             |              |                                        |                                                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        | No Recovery.                                                                                                                                                                                                  |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 0.00 - 6.00               | 0        |               |                           |           |                    | 6.00                        | 16.00        |                                        | Strong, massive to bedded, blueish grey biomicritic LIMESTONE with minor calcite veins (<5cm wide), regular alternation of thin pale grey beds, with rare weathering and brown staining on fracture surfaces. |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 6.00 - 9.00               | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
| Borehole Continued on Next Page                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |           |                    | Inclination and Orientation |              |                                        |                                                                                                                                                                                                               | Drilling Flush Details                            |            |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth     | Depth Water        | Depth Top                   | Depth Base   | Inclination                            | Orientation                                                                                                                                                                                                   | Depth Top                                         | Depth Base | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 95.00                                                                            | 64       |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                               |                                                   |            | Logged By:<br>SS |               | Approved By:<br>TM |  |

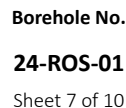
|                |            |              |
|----------------|------------|--------------|
| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

|                                                                                                                    |          |                           |          |           |                           |             |                    |              |              |                                        |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
|--------------------------------------------------------------------------------------------------------------------|----------|---------------------------|----------|-----------|---------------------------|-------------|--------------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------|---------------|--------------------|--|
|                                    |          | Rotary Cored Borehole Log |          |           |                           |             |                    |              |              |                                        |                                                                                                                                                                                                                                  | Borehole No.<br><b>24-ROS-01</b><br>Sheet 3 of 10 |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                                                            |          |                           |          |           | Client: The Breedon Group |             |                    |              |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
| Project No: 501.065463.00001                                                                                       |          |                           |          |           | Contractor: IDL           |             |                    |              |              | Coordinates: E: 582809.94 N: 571019.09 |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
| Location: Rossmore Quarry                                                                                          |          |                           |          |           | Hole Type: RC             |             |                    | Plant: N/A   |              | Level: 22.00mAOD                       |                                                                                                                                                                                                                                  | Vertical Scale: 1:51                              |                  |               |                    |  |
| Well                                                                                                               | Water    | Depth (mbgl)              | Coring   |           |                           | Type / FI   | Testing / Sampling | Depth (mbgl) | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                              |                                                   |                  |               |                    |  |
|                                                                                                                    |          |                           | TCR      | SCR       | RQD                       |             |                    |              |              |                                        |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
|                                                                                                                    |          |                           |          |           |                           |             |                    |              |              |                                        | Strong, massive to bedded, mid grey biomicritic LIMESTONE with minor calcite veins (<10cm wide), regular alternation of thin pale grey beds, and rare to very rare weathering with orange and red staining on fracture surfaces. |                                                   |                  |               |                    |  |
|                                                                                                                    |          | 21                        |          |           |                           |             |                    |              |              |                                        |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
|                                                                                                                    |          | 22                        |          |           |                           |             |                    |              |              |                                        | 23.20 - 23.30 Blueish grey interval with random veining.                                                                                                                                                                         |                                                   |                  |               |                    |  |
|                                                                                                                    |          | 23                        |          |           |                           |             |                    |              |              |                                        |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
|                                                                                                                    |          | 21.00 - 24.00             | 100      |           |                           |             |                    |              |              |                                        | Strong, massive to bedded, pale grey biomicritic LIMESTONE with minor to trace calcite veins (<1.5cm wide), regular alternation of thin pale grey beds, and trace weathering with rare yellow staining on fracture surfaces.     |                                                   |                  |               |                    |  |
|                                                                                                                    |          | 24                        |          |           |                           |             |                    |              |              |                                        |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
|                                                                                                                    |          | 25                        |          |           |                           |             |                    |              |              |                                        | Poor recovery, fractured area.                                                                                                                                                                                                   |                                                   |                  |               |                    |  |
|                                                                                                                    |          | 26                        |          |           |                           |             |                    |              |              |                                        |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
|                                                                                                                    |          | 24.00 - 27.00             | 98       |           |                           |             |                    |              |              |                                        | Strong, massive to bedded, pale to mid grey biomicritic LIMESTONE with trace calcite veins (<2.5cm wide), occasional alternation of                                                                                              |                                                   |                  |               |                    |  |
|                                                                                                                    |          | 27                        |          |           |                           |             |                    |              |              |                                        |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
|                                                                                                                    |          | 28                        |          |           |                           |             |                    |              |              |                                        | Borehole Continued on Next Page                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
|                                                                                                                    |          | 29                        |          |           |                           |             |                    |              |              |                                        |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
|                                                                                                                    |          | 27.00 - 30.00             | 73       |           |                           |             |                    |              |              |                                        |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
|                                                                                                                    |          | 30                        |          |           |                           |             |                    |              |              |                                        |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
| Hole Diameter      Casing Diameter      Shift Details      Inclination and Orientation      Drilling Flush Details |          |                           |          |           |                           |             |                    |              |              |                                        |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
| Depth Base                                                                                                         | Diameter | Depth Base                | Diameter | Date Time | Depth                     | Depth Water | Depth Top          | Depth Base   | Inclination  | Orientation                            | Depth Top                                                                                                                                                                                                                        | Depth Base                                        | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 95.00                                                                                                              | 64       |                           |          |           |                           |             |                    |              |              |                                        |                                                                                                                                                                                                                                  |                                                   |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                                                         |          |                           |          |           |                           |             |                    |              |              |                                        |                                                                                                                                                                                                                                  |                                                   | Logged By:<br>SS |               | Approved By:<br>TM |  |

|                |            |              |
|----------------|------------|--------------|
| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

|                                                                                                                    |          |                           |          |           |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                     |                                                   |            |               |               |                 |
|--------------------------------------------------------------------------------------------------------------------|----------|---------------------------|----------|-----------|---------------------------|-----------|--------------------|--------------|--------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------|---------------|---------------|-----------------|
|                                    |          | Rotary Cored Borehole Log |          |           |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                     | Borehole No.<br><b>24-ROS-01</b><br>Sheet 5 of 10 |            |               |               |                 |
| Project: Rossmore Geological Assessment                                                                            |          |                           |          |           | Client: The Breedon Group |           |                    |              |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                     |                                                   |            |               |               |                 |
| Project No: 501.065463.00001                                                                                       |          |                           |          |           | Contractor: IDL           |           |                    |              |              | Coordinates: E: 582809.94 N: 571019.09 |                                                                                                                                                                                                                                     |                                                   |            |               |               |                 |
| Location: Rossmore Quarry                                                                                          |          |                           |          |           | Hole Type: RC             |           |                    | Plant: N/A   |              | Level: 22.00mAOD                       |                                                                                                                                                                                                                                     | Vertical Scale: 1:51                              |            |               |               |                 |
| Well                                                                                                               | Water    | Depth (mbgl)              | Coring   |           |                           | Type / FI | Testing / Sampling | Depth (mbgl) | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                 |                                                   |            |               |               |                 |
|                                                                                                                    |          |                           | TCR      | SCR       | RQD                       |           |                    |              |              |                                        |                                                                                                                                                                                                                                     |                                                   |            |               |               |                 |
|                                                                                                                    |          | 39.00 - 42.00             |          |           |                           |           |                    |              |              |                                        | Strong, massive to bedded, pale to mid grey biomicritic LIMESTONE with trace calcite veins (<2.5cm wide), occasional alternation of thin pale grey beds, and trace weathering with orange and yellow staining on fracture surfaces. |                                                   |            |               |               |                 |
|                                                                                                                    |          | 41 100                    |          |           |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                     |                                                   |            |               |               |                 |
|                                                                                                                    |          | 42 42.00 - 45.00          |          |           |                           |           |                    |              |              |                                        | Massive calcite vein with trace mid grey cracks/veins, trace weathering and rare vuggy texture.                                                                                                                                     |                                                   |            |               |               |                 |
|                                                                                                                    |          | 44 100                    |          |           |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                     |                                                   |            |               |               |                 |
|                                                                                                                    |          | 45 45.00 - 48.00          |          |           |                           |           |                    | 45.15 -23.15 |              |                                        | Strong, massive to bedded, pale grey biomicritic LIMESTONE with minor calcite veins (<10cm wide), trace weathering and orange staining on fracture surfaces.<br><br>46.50 - 46.65 6.5cm wide calcite vein.                          |                                                   |            |               |               |                 |
|                                                                                                                    |          | 46 100                    |          |           |                           |           |                    | 45.75 -23.75 |              |                                        |                                                                                                                                                                                                                                     |                                                   |            |               |               |                 |
|                                                                                                                    |          | 47 48.00 - 51.00          |          |           |                           |           |                    |              |              |                                        | Borehole Continued on Next Page                                                                                                                                                                                                     |                                                   |            |               |               |                 |
|                                                                                                                    |          | 49 100                    |          |           |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                     |                                                   |            |               |               |                 |
| Hole Diameter      Casing Diameter      Shift Details      Inclination and Orientation      Drilling Flush Details |          |                           |          |           |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                     |                                                   |            |               |               |                 |
| Depth Base                                                                                                         | Diameter | Depth Base                | Diameter | Date Time |                           | Depth     | Depth Water        | Depth Top    | Depth Base   | Inclination                            | Orientation                                                                                                                                                                                                                         | Depth Top                                         | Depth Base | Flush Type    | Flush Min (%) | Flush Max (%)   |
| 95.00                                                                                                              | 64       |                           |          |           |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                     |                                                   |            |               |               |                 |
| Remarks: Vertical hole.                                                                                            |          |                           |          |           |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                     |                                                   |            | Logged By: SS |               | Approved By: TM |

|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-----------|--------------------|-----------------------------|--------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------|------------|------------------|---------------|--------------------|--|
|  |          | Rotary Cored Borehole Log |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        | Borehole No.<br><b>24-ROS-01</b><br>Sheet 6 of 10 |            |            |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |           |                    |                             |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |           |                    |                             |              | Coordinates: E: 582809.94 N: 571019.09 |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |           |                    | Plant: N/A                  |              | Level: 22.00mAOD                       |                                                                                                                                                                                                                                                                                                                                                        | Vertical Scale: 1:51                              |            |            |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        | <div>Strong, massive to bedded, pale grey biomicritic LIMESTONE with minor calcite veins (&lt;10cm wide), trace weathering and orange staining on fracture surfaces.</div> <div>51.60 - 51.85 &lt;10cm wide calcite vein.</div> <div>53.20 - 53.30 6cm wide calcite vein.</div> <div>53.85 - 54.45 Yellowish brown, slightly weathered interval.</div> |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 51                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 52                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 51.00 - 54.00             | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 53                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 54                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 55                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 54.00 - 57.00             | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 56                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 57                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        | <div>Strong, massive to bedded, slightly yellowish grey biomicritic LIMESTONE with trace veins (&lt;1cm) and a large calcite vein (35cm) on top of the interval, with minor weathering and orange and brown staining on fracture surfaces.</div> <div>58.20 - 58.55 35cm wide calcite vein.</div>                                                      |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 58                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 57.00 - 60.00             | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 59                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 58.20                     |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          | 60.00                     |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        | Borehole Continued on Next Page                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |           |                    | Inclination and Orientation |              |                                        |                                                                                                                                                                                                                                                                                                                                                        | Drilling Flush Details                            |            |            |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth     | Depth Water        | Depth Top                   | Depth Base   | Inclination                            | Orientation                                                                                                                                                                                                                                                                                                                                            | Depth Top                                         | Depth Base | Flush Type | Flush Min (%)    | Flush Max (%) |                    |  |
| 95.00                                                                            | 64       |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |            | Logged By:<br>SS |               | Approved By:<br>TM |  |



|                                         |       |                                 |          |                 |          |               |                           |              |              |                             |                                |                                        |                                                                                                                                                                            |                        |                                |                  |               |                    |                                                                                                                                                                                                      |
|-----------------------------------------|-------|---------------------------------|----------|-----------------|----------|---------------|---------------------------|--------------|--------------|-----------------------------|--------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------|------------------|---------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project: Rossmore Geological Assessment |       |                                 |          |                 |          |               | Client: The Breedon Group |              |              |                             |                                | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                            |                        |                                |                  |               |                    |                                                                                                                                                                                                      |
| Project No: 501.065463.00001            |       |                                 |          |                 |          |               | Contractor: IDL           |              |              |                             |                                | Coordinates: E: 582809.94 N: 571019.09 |                                                                                                                                                                            |                        |                                |                  |               |                    |                                                                                                                                                                                                      |
| Location: Rossmore Quarry               |       |                                 |          |                 |          |               | Hole Type: RC             |              |              | Plant: N/A                  |                                |                                        | Level: 22.00mAOD                                                                                                                                                           |                        | Vertical Scale: 1:51           |                  |               |                    |                                                                                                                                                                                                      |
| Well                                    | Water | Depth (mbgl)                    | Coring   |                 |          | Type / FI     | Testing / Sampling        | Depth (mbgl) | Level (mAOD) | Legend                      | Stratum Description            |                                        |                                                                                                                                                                            |                        |                                |                  |               |                    |                                                                                                                                                                                                      |
|                                         |       |                                 | TCR      | SCR             | RQD      |               |                           |              |              |                             |                                |                                        |                                                                                                                                                                            |                        |                                |                  |               |                    |                                                                                                                                                                                                      |
|                                         |       | 60.00 - 63.00                   | 93       |                 |          |               |                           | 60.85        | -38.85       |                             | Poor recovery, fractured area. |                                        |                                                                                                                                                                            |                        |                                |                  |               |                    |                                                                                                                                                                                                      |
|                                         |       |                                 |          |                 |          |               |                           | 61.55        | -39.55       |                             |                                |                                        | Strong, massive to bedded, slightly yellowish grey biomicritic LIMESTONE with trace veins, and minor weathering with orange and brown staining on fracture surfaces.       |                        |                                |                  |               |                    |                                                                                                                                                                                                      |
|                                         |       |                                 |          |                 |          |               |                           | 62.00        | -40.00       |                             |                                |                                        | Poor recovery, fractured area.                                                                                                                                             |                        |                                |                  |               |                    |                                                                                                                                                                                                      |
|                                         |       | 63.00 - 66.00                   | 32       |                 |          |               |                           |              |              | 63.30                       | -41.30                         |                                        | Strong, massive to bedded, slightly yellowish grey biomicritic LIMESTONE with trace veins, and minor weathering with orange and brown staining on fracture surfaces.       |                        |                                |                  |               |                    |                                                                                                                                                                                                      |
|                                         |       |                                 |          |                 |          |               |                           |              |              | 66.00                       | -44.00                         |                                        |                                                                                                                                                                            |                        | Poor recovery, fractured area. |                  |               |                    |                                                                                                                                                                                                      |
|                                         |       |                                 |          |                 |          |               |                           |              |              |                             |                                |                                        |                                                                                                                                                                            |                        |                                | 67.35            | -45.35        |                    | Strong, massive to bedded, pale grey to slightly yellowish grey biomicritic LIMESTONE with occasional alternation of thin pale grey beds, and minor to trace weathering with very rare red staining. |
|                                         |       | 66.00 - 69.00                   | 100      |                 |          |               |                           |              |              |                             |                                |                                        | Strong, massive to bedded, pale to mid grey biomicritic LIMESTONE with minor to trace calcite veins, and rare weathering with very rare red staining on fracture surfaces. |                        |                                |                  |               |                    |                                                                                                                                                                                                      |
|                                         |       |                                 |          |                 |          |               |                           |              |              |                             |                                |                                        |                                                                                                                                                                            |                        |                                |                  |               |                    |                                                                                                                                                                                                      |
|                                         |       |                                 |          |                 |          |               |                           |              |              |                             |                                |                                        |                                                                                                                                                                            |                        |                                |                  |               |                    |                                                                                                                                                                                                      |
|                                         |       | Borehole Continued on Next Page |          |                 |          |               |                           |              |              |                             |                                |                                        |                                                                                                                                                                            | 70                     |                                |                  |               |                    |                                                                                                                                                                                                      |
|                                         |       | Hole Diameter                   |          | Casing Diameter |          | Shift Details |                           |              |              | Inclination and Orientation |                                |                                        |                                                                                                                                                                            | Drilling Flush Details |                                |                  |               |                    |                                                                                                                                                                                                      |
|                                         |       | Depth Base                      | Diameter | Depth Base      | Diameter | Date Time     |                           | Depth        | Depth Water  | Depth Top                   | Depth Base                     | Inclination                            | Orientation                                                                                                                                                                | Depth Top              | Depth Base                     | Flush Type       | Flush Min (%) | Flush Max (%)      |                                                                                                                                                                                                      |
|                                         |       | 95.00                           | 64       |                 |          |               |                           |              |              |                             |                                |                                        |                                                                                                                                                                            |                        |                                |                  |               |                    |                                                                                                                                                                                                      |
|                                         |       | Remarks:<br>Vertical hole.      |          |                 |          |               |                           |              |              |                             |                                |                                        |                                                                                                                                                                            |                        |                                | Logged By:<br>SS |               | Approved By:<br>TM |                                                                                                                                                                                                      |

|                                                                                  |          |                           |          |               |                           |            |                    |                             |              |                                        |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|------------|--------------------|-----------------------------|--------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------|------------------|---------------|--------------------|--|
|  |          | Rotary Cored Borehole Log |          |               |                           |            |                    |                             |              |                                        |                                                                                                                                                                            | Borehole No.<br><b>24-ROS-01</b><br>Sheet 8 of 10 |            |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |            |                    |                             |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |            |                    |                             |              | Coordinates: E: 582809.94 N: 571019.09 |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |            |                    | Plant: N/A                  |              | Level: 22.00mAOD                       |                                                                                                                                                                            | Vertical Scale: 1:51                              |            |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI  | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |            |                    |                             |              |                                        |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 69.00 - 72.00             |          |               |                           |            |                    |                             |              |                                        | Strong, massive to bedded, pale to mid grey biomicritic LIMESTONE with minor to trace calcite veins, and rare weathering with very rare red staining on fracture surfaces. |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 71 100                    |          |               |                           |            |                    |                             |              |                                        |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 72                        |          |               |                           | C @ 71.75m |                    |                             |              |                                        | 72.95 - 73.50 Major calcite veining.                                                                                                                                       |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 72.00 - 75.00             |          |               |                           |            |                    |                             |              |                                        |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 74                        |          |               |                           |            |                    |                             |              |                                        |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 75                        |          |               |                           |            |                    |                             |              |                                        |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 75.00 - 78.00             |          |               |                           |            |                    |                             |              |                                        |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 77                        |          |               |                           |            |                    |                             |              |                                        |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 78                        |          |               |                           |            | 77.50              | -55.50                      |              |                                        | Strong, massive to bedded, pale grey biomicritic LIMESTONE with trace calcite veins.                                                                                       |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 78.00 - 81.00             |          |               |                           |            |                    |                             |              |                                        |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 79 100                    |          |               |                           |            |                    |                             |              |                                        |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 79.95                     |          |               |                           |            |                    |                             |              |                                        |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |            |                    |                             |              |                                        | Borehole Continued on Next Page                                                                                                                                            |                                                   |            |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |            |                    | Inclination and Orientation |              |                                        |                                                                                                                                                                            | Drilling Flush Details                            |            |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth      | Depth Water        | Depth Top                   | Depth Base   | Inclination                            | Orientation                                                                                                                                                                | Depth Top                                         | Depth Base | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 95.00                                                                            | 64       |                           |          |               |                           |            |                    |                             |              |                                        |                                                                                                                                                                            |                                                   |            |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |            |                    |                             |              |                                        |                                                                                                                                                                            |                                                   |            | Logged By:<br>SS |               | Approved By:<br>TM |  |

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| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

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| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | CS         | TH           |

|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
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|  |          | Rotary Cored Borehole Log |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          | Borehole No.<br><b>24-ROS-02</b><br>Sheet 1 of 10 |            |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |           |                    |                             |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |           |                    |                             |              | Coordinates: E: 582644.47 N: 571108.66 |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |           |                    | Plant: N/A                  |              | Level: 23.00mAOD                       |                                                                                                                                                                                          | Vertical Scale: 1:51                              |            |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                      |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        | No Recovery.                                                                                                                                                                             |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 0.00 - 6.00               | 0        |               |                           |           |                    | 6.00                        | 17.00        |                                        | Strong, massive to bedded, pale blueish grey biomicritic LIMESTONE with trace calcite veins (<1cm wide), and minor weathering with trace brown and yellow staining on fracture surfaces. |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 6.00 - 9.00               | 77       |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          | Borehole Continued on Next Page                   |            |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |           |                    | Inclination and Orientation |              |                                        |                                                                                                                                                                                          | Drilling Flush Details                            |            |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth     | Depth Water        | Depth Top                   | Depth Base   | Inclination                            | Orientation                                                                                                                                                                              | Depth Top                                         | Depth Base | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 95.00                                                                            | 64       |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            | Logged By:<br>SS |               | Approved By:<br>TM |  |

|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
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|  |          | Rotary Cored Borehole Log |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          | Borehole No.<br><b>24-ROS-02</b><br>Sheet 2 of 10 |            |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |           |                    |                             |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |           |                    |                             |              | Coordinates: E: 582644.47 N: 571108.66 |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |           |                    | Plant: N/A                  |              | Level: 23.00mAOD                       |                                                                                                                                                                                          | Vertical Scale: 1:51                              |            |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                      |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 9.00 - 12.00              |          |               |                           |           |                    |                             |              |                                        | Strong, massive to bedded, pale blueish grey biomicritic LIMESTONE with trace calcite veins (<1cm wide), and minor weathering with trace brown and yellow staining on fracture surfaces. |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 11                        | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 12.00 - 15.00             |          |               |                           |           |                    |                             |              |                                        | 15.35 - 15.75 Major calcite veining.                                                                                                                                                     |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 13                        | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 15.00 - 18.00             |          |               |                           |           |                    |                             |              |                                        | Strong, massive to bedded, mid grey biomicritic LIMESTONE with trace calcite veins and trace orange staining on fracture surfaces.                                                       |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 16                        | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 18.00 - 21.00             |          |               |                           |           |                    |                             |              |                                        | Strong, massive to bedded, pale blueish grey biomicritic LIMESTONE with trace weathering and orange staining on fracture surfaces.                                                       |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 17                        | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
| Borehole Continued on Next Page                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |           |                    | Inclination and Orientation |              |                                        |                                                                                                                                                                                          | Drilling Flush Details                            |            |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth     | Depth Water        | Depth Top                   | Depth Base   | Inclination                            | Orientation                                                                                                                                                                              | Depth Top                                         | Depth Base | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 95.00                                                                            | 64       |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                          |                                                   |            | Logged By:<br>SS |               | Approved By:<br>TM |  |

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| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

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| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

|                                                                                  |          |                           |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
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|  |          | Rotary Cored Borehole Log |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                | Borehole No.<br><b>24-ROS-02</b><br>Sheet 5 of 10 |                  |                    |               |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |             |                    |                             |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |             |                    |                             |              | Coordinates: E: 582644.47 N: 571108.66 |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |             |                    | Plant: N/A                  |              | Level: 23.00mAOD                       |                                                                                                                                                                                                                                                                | Vertical Scale: 1:51                              |                  |                    |               |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI   | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                            |                                                   |                  |                    |               |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          | 39.00 - 42.00             |          |               |                           |             |                    |                             |              |                                        | Strong, massive to bedded, blueish grey biomicritic LIMESTONE with trace calcite veins and very rare yellow staining on fracture surfaces.                                                                                                                     |                                                   |                  |                    |               |  |
|                                                                                  |          | 41                        | 100      |               |                           |             |                    | 41.30                       | -18.30       |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          |                           |          |               |                           |             |                    | 41.70                       | -18.70       |                                        | Strong, massive to bedded, pale grey biomicritic LIMESTONE with minor calcite veins (<3cm wide).                                                                                                                                                               |                                                   |                  |                    |               |  |
|                                                                                  |          |                           |          |               |                           |             |                    | 42.15                       | -19.15       |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          | 42                        |          |               |                           |             |                    | 42.55                       | -19.55       |                                        | Strong, massive to bedded, blueish grey biomicritic LIMESTONE with major calcite veins (<7cm wide).                                                                                                                                                            |                                                   |                  |                    |               |  |
|                                                                                  |          |                           |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          | 42.00 - 45.00             |          |               |                           |             |                    |                             |              |                                        | Strong, massive to bedded, blueish grey biomicritic LIMESTONE with rare calcite veins.                                                                                                                                                                         |                                                   |                  |                    |               |  |
|                                                                                  |          | 44                        | 100      |               |                           |             |                    | 44.50                       | -21.50       |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          |                           |          |               |                           |             |                    |                             |              |                                        | Strong, massive to bedded, pale blueish grey to pale brownish grey biomicritic LIMESTONE with minor calcite veins (1.5cm wide), major weathering with brown patches, and brown and orange staining on fracture surfaces, with occasional karstic clay infills. |                                                   |                  |                    |               |  |
|                                                                                  |          | 45                        |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          |                           |          |               |                           |             |                    |                             |              |                                        | Strong, massive to bedded, mid grey biomicritic LIMESTONE with weathered/dolomitized brown patches, minor calcite veins, and minor weathering with orange and brown staining on fracture surfaces.                                                             |                                                   |                  |                    |               |  |
|                                                                                  |          | 46                        |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          | 45.00 - 48.00             |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          | 47                        | 100      |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          |                           |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          | 48                        |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          | 48.00 - 51.00             |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          | 49                        | 100      |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          |                           |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
|                                                                                  |          |                           |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
| Borehole Continued on Next Page                                                  |          |                           |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |             |                    | Inclination and Orientation |              |                                        |                                                                                                                                                                                                                                                                | Drilling Flush Details                            |                  |                    |               |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     | Depth                     | Depth Water | Depth Top          | Depth Base                  | Inclination  | Orientation                            | Depth Top                                                                                                                                                                                                                                                      | Depth Base                                        | Flush Type       | Flush Min (%)      | Flush Max (%) |  |
| 95.00                                                                            | 64       |                           |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   |                  |                    |               |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |             |                    |                             |              |                                        |                                                                                                                                                                                                                                                                |                                                   | Logged By:<br>SS | Approved By:<br>TM |               |  |

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| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

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| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

|                                                                                  |          |                                                                                                                                                                                |          |               |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
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|  |          | Rotary Cored Borehole Log                                                                                                                                                      |          |               |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           | Borehole No.<br><b>24-ROS-02</b><br>Sheet 8 of 10 |            |                  |               |                                 |        |
| Project: Rossmore Geological Assessment                                          |          |                                                                                                                                                                                |          |               | Client: The Breedon Group |                                                                                                                                                                                      |                    |                             |              | Dates: 20/05/2024 - 22/05/2024                                                    |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
| Project No: 501.065463.00001                                                     |          |                                                                                                                                                                                |          |               | Contractor: IDL           |                                                                                                                                                                                      |                    |                             |              | Coordinates: E: 582644.47 N: 571108.66                                            |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
| Location: Rossmore Quarry                                                        |          |                                                                                                                                                                                |          |               | Hole Type: RC             |                                                                                                                                                                                      |                    | Plant: N/A                  |              | Level: 23.00mAOD                                                                  |                                                                                                                                                                                           | Vertical Scale: 1:51                              |            |                  |               |                                 |        |
| Well                                                                             | Water    | Depth (mbgl)                                                                                                                                                                   | Coring   |               |                           | Type / FI                                                                                                                                                                            | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                                                            | Stratum Description                                                                                                                                                                       |                                                   |            |                  |               |                                 |        |
|                                                                                  |          |                                                                                                                                                                                | TCR      | SCR           | RQD                       |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
|                                                                                  |          | 69.00 - 72.00                                                                                                                                                                  |          |               |                           |                                                                                                                                                                                      |                    |                             |              |  | Strong, massive to bedded, pale grey to pale blueish grey biomicritic LIMESTONE with trace calcite veins (<3cm wide), and very rare weathering with orange staining on fracture surfaces. |                                                   |            |                  |               |                                 |        |
|                                                                                  |          | 71                                                                                                                                                                             | 100      |               |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               | 71                              |        |
|                                                                                  |          | 72                                                                                                                                                                             |          |               |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               | 72                              |        |
|                                                                                  |          | 73                                                                                                                                                                             |          |               |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               | 73                              |        |
|                                                                                  |          | 72.00 - 75.00                                                                                                                                                                  | 100      |               |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               | 73.65                           | -50.65 |
| 74                                                                               |          |                                                                                                                                                                                |          | 74            |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
| 75                                                                               |          |                                                                                                                                                                                |          | 74.80         | -51.80                    | Strong, massive to bedded, pale grey to pale blueish grey biomicritic LIMESTONE with minor calcite veins (<1cm wide), and rare weathering with orange staining on fracture surfaces. |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
| 76                                                                               |          |                                                                                                                                                                                |          | 75            |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
| 75.00 - 78.00                                                                    | 100      |                                                                                                                                                                                |          | 76            |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
| 77                                                                               |          |                                                                                                                                                                                |          | 77            |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
| 77.50                                                                            | -54.50   | Strong, massive to bedded, mid grey biomicritic LIMESTONE with minor calcite veins (<10cm wide), and rare weathering with orange and dark brown staining on fracture surfaces. |          |               |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
| 78                                                                               |          |                                                                                                                                                                                |          |               |                           |                                                                                                                                                                                      |                    |                             | 78           |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
| 79                                                                               | 100      |                                                                                                                                                                                |          |               |                           |                                                                                                                                                                                      |                    |                             | 79           |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
| 78.00 - 81.00                                                                    |          |                                                                                                                                                                                |          |               |                           |                                                                                                                                                                                      |                    |                             | 80           |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
|                                                                                  |          |                                                                                                                                                                                |          |               |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               | Borehole Continued on Next Page |        |
| Hole Diameter                                                                    |          | Casing Diameter                                                                                                                                                                |          | Shift Details |                           |                                                                                                                                                                                      |                    | Inclination and Orientation |              |                                                                                   |                                                                                                                                                                                           | Drilling Flush Details                            |            |                  |               |                                 |        |
| Depth Base                                                                       | Diameter | Depth Base                                                                                                                                                                     | Diameter | Date Time     |                           | Depth                                                                                                                                                                                | Depth Water        | Depth Top                   | Depth Base   | Inclination                                                                       | Orientation                                                                                                                                                                               | Depth Top                                         | Depth Base | Flush Type       | Flush Min (%) | Flush Max (%)                   |        |
| 95.00                                                                            | 64       |                                                                                                                                                                                |          |               |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            |                  |               |                                 |        |
| Remarks:<br>Vertical hole.                                                       |          |                                                                                                                                                                                |          |               |                           |                                                                                                                                                                                      |                    |                             |              |                                                                                   |                                                                                                                                                                                           |                                                   |            | Logged By:<br>SS |               | Approved By:<br>TM              |        |

|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-------------|-----------------------------|--------------|--------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|------------|---------------|-----------------|
|  |          | Rotary Cored Borehole Log |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          | Borehole No.<br>24-ROS-02<br>Sheet 9 of 10 |            |               |                 |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |             |                             |              |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |             |                             |              |              | Coordinates: E: 582644.47 N: 571108.66 |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |             |                             | Plant: N/A   |              | Level: 23.00mAOD                       |                                                                                                                                                                                                                                                                                                                                          | Vertical Scale: 1:51                       |            |               |                 |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI   | Testing / Sampling          | Depth (mbgl) | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                                                                                                      |                                            |            |               |                 |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        | <div>Strong, massive to bedded, mid grey biomicritic LIMESTONE with minor calcite veins (&lt;10cm wide), and rare weathering with orange and dark brown staining on fracture surfaces.</div> <div>81</div> <div>82</div> <div>83</div> <div>84</div> <div>85</div> <div>86</div> <div>87</div> <div>88</div> <div>89</div> <div>90</div> |                                            |            |               |                 |
|                                                                                  |          | 81                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          | 81.00 - 84.00             | 100      |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          | 82                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          | 83                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          | 84                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          | 85                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          | 86                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          | 87                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          | 88                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          | 89                        |          |               |                           |             |                             |              |              |                                        | <div>Strong, massive to bedded, pale grey biomicritic LIMESTONE with major to minor calcite veins (&lt;3cm wide), and very rare weathering with yellow staining on fracture surfaces.</div> <div>86.70 - 86.90 Major calcite vein.</div> <div>88.50</div> <div>89</div> <div>90</div>                                                    |                                            |            |               |                 |
|                                                                                  |          | 87.00 - 90.00             | 100      |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          | 88                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          | 89                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          | 90                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
| Borehole Continued on Next Page                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |             | Inclination and Orientation |              |              |                                        | Drilling Flush Details                                                                                                                                                                                                                                                                                                                   |                                            |            |               |                 |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     | Depth                     | Depth Water | Depth Top                   | Depth Base   | Inclination  | Orientation                            | Depth Top                                                                                                                                                                                                                                                                                                                                | Depth Base                                 | Flush Type | Flush Min (%) | Flush Max (%)   |
| 95.00                                                                            | 64       |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            |               |                 |
| Remarks: Vertical hole.                                                          |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                          |                                            |            | Logged By: SS | Approved By: TM |

|                |            |              |
|----------------|------------|--------------|
| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
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|  |          | Rotary Cored Borehole Log |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Borehole No.<br><b>24-ROS-03</b><br>Sheet 1 of 10 |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |             |                             |              |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |             |                             |              |              | Coordinates: E: 582799.96 N: 571232.04 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |             |                             | Plant: N/A   |              | Level: 29.00mAOD                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Vertical Scale: 1:51                              |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI   | Testing / Sampling          | Depth (mbgl) | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        | <div>RECEIVED: 17/12/2025</div> <div>No Recovery.</div> <div>Poor recovery, fractured area with minor purple rock fragments.</div> <div>Strong, massive to bedded, blueish grey biomicritic LIMESTONE with minor weathering and orange staining on fracture surfaces.</div> <div>Strong, massive to bedded, pale grey biomicritic LIMESTONE with trace calcite veins (&lt;1.5cm wide), rare alternation of thin pale grey beds, and trace weathering with orange and brown staining on fracture surfaces.</div> <div>4.15 - 4.65 Fractured non-intact interval.</div> <div>7.10 - 7.35 Fractured non-intact interval.</div> |                                                   |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
| Borehole Continued on Next Page                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |             | Inclination and Orientation |              |              |                                        | Drilling Flush Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                   |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     | Depth                     | Depth Water | Depth Top                   | Depth Base   | Inclination  | Orientation                            | Depth Top                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Depth Base                                        | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 100.00                                                                           | 64       |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   | Logged By:<br>SS |               | Approved By:<br>TM |  |

|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |                  |               |                    |  |
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|  |          | Rotary Cored Borehole Log |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Borehole No.<br><b>24-ROS-03</b><br>Sheet 2 of 10 |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |             |                             |              |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |             |                             |              |              | Coordinates: E: 582799.96 N: 571232.04 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |             |                             | Plant: N/A   |              | Level: 29.00mAOD                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Vertical Scale: 1:51                              |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI   | Testing / Sampling          | Depth (mbgl) | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                   |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |                  |               |                    |  |
|                                                                                  |          | 9.00 - 12.00              |          |               |                           |             |                             |              |              |                                        | Strong, massive to bedded, pale grey biomicritic LIMESTONE with trace calcite veins (<1.5cm wide), rare alternation of thin pale grey beds, and trace weathering with orange and brown staining on fracture surfaces.                                                                                                                                                                                                                                                                              |                                                   |                  |               |                    |  |
|                                                                                  |          | 11                        | 100      |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 11                                                |                  |               |                    |  |
|                                                                                  |          | 12.00 - 15.00             |          |               |                           |             |                             | 12.00        | 17.00        |                                        | Strong, massive to bedded, slightly yellowish pale grey biomicritic LIMESTONE with minor calcite veins (<5cm wide), rare alternation of thin pale grey beds, and minor weathering with orange and brown staining on fracture surfaces.                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
|                                                                                  |          | 13                        | 100      |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 13                                                |                  |               |                    |  |
|                                                                                  |          | 15.00 - 18.00             |          |               |                           |             |                             | 15.30        | 13.70        |                                        | Strong, massive to bedded, pale grey to pale blueish grey biomicritic LIMESTONE with minor calcite veins (<15cm wide), occasional alternation of thin pale grey beds, occasional slightly yellowish pale grey slightly weathered intervals, and trace weathering with orange and brown staining on fracture surfaces.<br><br>16.45 - 16.60 Major calcite vein.<br><br>17.40 - 17.50 Blueish grey interval.<br><br>17.85 - 17.90 Blueish grey interval.<br><br>18.95 - 19.25 Major calcite veining. |                                                   |                  |               |                    |  |
|                                                                                  |          | 16                        | 100      |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 16                                                |                  |               |                    |  |
|                                                                                  |          | 17                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 17                                                |                  |               |                    |  |
|                                                                                  |          | 18                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 18                                                |                  |               |                    |  |
|                                                                                  |          | 18.00 - 21.00             |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 19                                                |                  |               |                    |  |
|                                                                                  |          | 19                        | 100      |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 19                                                |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 20                                                |                  |               |                    |  |
| Borehole Continued on Next Page                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |             | Inclination and Orientation |              |              |                                        | Drilling Flush Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                   |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     | Depth                     | Depth Water | Depth Top                   | Depth Base   | Inclination  | Orientation                            | Depth Top                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Depth Base                                        | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 100.00                                                                           | 64       |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   | Logged By:<br>SS |               | Approved By:<br>TM |  |

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| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

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|----------------|------------|--------------|
| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

|                                                                                  |       |                           |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
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|  |       | Rotary Cored Borehole Log |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Borehole No.<br><b>24-ROS-03</b><br>Sheet 5 of 10 |  |  |  |
| Project: Rossmore Geological Assessment                                          |       |                           |        |     | Client: The Breedon Group |           |                    |              |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
| Project No: 501.065463.00001                                                     |       |                           |        |     | Contractor: IDL           |           |                    |              |              | Coordinates: E: 582799.96 N: 571232.04 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
| Location: Rossmore Quarry                                                        |       |                           |        |     | Hole Type: RC             |           |                    | Plant: N/A   |              | Level: 29.00mAOD                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Vertical Scale: 1:51                              |  |  |  |
| Well                                                                             | Water | Depth (mbgl)              | Coring |     |                           | Type / FI | Testing / Sampling | Depth (mbgl) | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                   |  |  |  |
|                                                                                  |       |                           | TCR    | SCR | RQD                       |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 39.00 - 42.00             |        |     |                           |           |                    | 40.40        | -11.40       |                                        | Strong, massive to bedded, pale grey to pale blueish grey biomicritic LIMESTONE with minor calcite veins (<15cm wide), occasional alternation of thin pale grey beds, occasional slightly yellowish pale grey slightly weathered intervals, and trace weathering with orange and brown staining on fracture surfaces.<br>Strong, massive to bedded, pale blueish grey biomicritic LIMESTONE with rare calcite veins, occasional alternation of thin pale grey beds, and trace weathering with orange staining on fracture surfaces. |                                                   |  |  |  |
|                                                                                  |       | 41                        | 100    |     |                           |           |                    | 41.50        | -12.50       |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 42                        |        |     |                           |           |                    |              |              |                                        | Strong, massive to bedded, pale grey to pale blueish grey biomicritic LIMESTONE with rare calcite veins, occasional alternation of thin pale grey beds, occasional slightly yellowish pale grey slightly weathered intervals, and trace weathering with orange and brown staining on fracture surfaces.<br><i>41.70 - 42.00 Fractured non-intact interval.</i><br><i>42.50 - 42.70 Fractured non-intact interval.</i><br><i>43.20 - 43.30 Fractured non-intact interval.</i><br><i>44.00 - 44.20 Fractured non-intact interval.</i> |                                                   |  |  |  |
|                                                                                  |       | 43                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 44                        | 100    |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 45                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 46                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 47                        | 100    |     |                           |           |                    | 46.50        | -17.50       |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 48                        |        |     |                           |           |                    |              |              |                                        | Strong, massive to bedded, pale blueish grey biomicritic LIMESTONE with rare calcite veins, occasional alternation of thin pale grey beds, and trace weathering with orange and brown staining on fracture surfaces.                                                                                                                                                                                                                                                                                                                |                                                   |  |  |  |
|                                                                                  |       | 49                        | 100    |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 50                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 51                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 52                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 53                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 54                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 55                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 56                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 57                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 58                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 59                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 60                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 61                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 62                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 63                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 64                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 65                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 66                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 67                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 68                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 69                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 70                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 71                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 72                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 73                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 74                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 75                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 76                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 77                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 78                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 79                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 80                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 81                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 82                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 83                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 84                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 85                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 86                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 87                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 88                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 89                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 90                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 91                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 92                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 93                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 94                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 95                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 96                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 97                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 98                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 99                        |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 100                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 101                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 102                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 103                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 104                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 105                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 106                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 107                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 108                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 109                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 110                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 111                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 112                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 113                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 114                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 115                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 116                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 117                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 118                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 119                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 120                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 121                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 122                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 123                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 124                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 125                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 126                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 127                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 128                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 129                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 130                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 131                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 132                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 133                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 134                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 135                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 136                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 137                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 138                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 139                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 140                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 141                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 142                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 143                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 144                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 145                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 146                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 147                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 148                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 149                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 150                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 151                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 152                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 153                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 154                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 155                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 156                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 157                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 158                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 159                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 160                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 161                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 162                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 163                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 164                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 165                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 166                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 167                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 168                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 169                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 170                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 171                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 172                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 173                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 174                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 175                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 176                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 177                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 178                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 179                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 180                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 181                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 182                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 183                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 184                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 185                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 186                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 187                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 188                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 189                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 190                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 191                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 192                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 193                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 194                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 195                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 196                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 197                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 198                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 199                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 200                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 201                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 202                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 203                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 204                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 205                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 206                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 207                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 208                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 209                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 210                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 211                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 212                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 213                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 214                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 215                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 216                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 217                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 218                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 219                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 220                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 221                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 222                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 223                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 224                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 225                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 226                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 227                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 228                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 229                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 230                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 231                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 232                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 233                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 234                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 235                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 236                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 237                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 238                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 239                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 240                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |
|                                                                                  |       | 241                       |        |     |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |  |  |  |

|                |            |              |
|----------------|------------|--------------|
| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |                  |               |                    |  |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-------------|-----------------------------|--------------|--------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------|---------------|--------------------|--|
|  |          | Rotary Cored Borehole Log |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Borehole No.<br><b>24-ROS-03</b><br>Sheet 7 of 10 |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |             |                             |              |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |             |                             |              |              | Coordinates: E: 582799.96 N: 571232.04 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |             |                             | Plant: N/A   |              | Level: 29.00mAOD                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Vertical Scale: 1:51                              |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI   | Testing / Sampling          | Depth (mbgl) | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                   |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        | <p>Strong, massive to bedded, pale blueish grey to blueish grey biomicritic LIMESTONE with minor calcite veins (&lt;10cm), regular alternation of thin pale grey beds, and trace weathering with orange staining on fracture surfaces.</p> <p>62.70 - 63.00 Pale brown interval.</p> <p>68.40 - 68.50 &lt;10cm calcite vein.</p> <p>Strong, massive to bedded, mid grey to blueish grey biomicritic LIMESTONE with rare calcite veins, regular alternation of thin pale grey beds, and rare weathering with orange staining on fracture surfaces.</p> |                                                   |                  |               |                    |  |
|                                                                                  |          | 61                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 61                                                |                  |               |                    |  |
|                                                                                  |          | 60.00 - 63.00             | 100      |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 62                                                |                  |               |                    |  |
|                                                                                  |          | 62                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 62                                                |                  |               |                    |  |
|                                                                                  |          | 63                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 63                                                |                  |               |                    |  |
|                                                                                  |          | 64                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 64                                                |                  |               |                    |  |
|                                                                                  |          | 63.00 - 66.00             | 100      |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 65                                                |                  |               |                    |  |
|                                                                                  |          | 65                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 65                                                |                  |               |                    |  |
|                                                                                  |          | 66                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 66                                                |                  |               |                    |  |
|                                                                                  |          | 67                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 67                                                |                  |               |                    |  |
|                                                                                  |          | 66.00 - 69.00             | 100      |               |                           |             |                             |              |              |                                        | 68                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |                  |               |                    |  |
|                                                                                  |          | 68                        |          |               |                           |             |                             |              |              |                                        | 68                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |                  |               |                    |  |
|                                                                                  |          | 68.50                     |          |               |                           |             |                             |              |              |                                        | 69                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |                  |               |                    |  |
|                                                                                  |          | 69                        |          |               |                           |             |                             |              |              |                                        | 69                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        | 70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |                  |               |                    |  |
| Borehole Continued on Next Page                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |             | Inclination and Orientation |              |              |                                        | Drilling Flush Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                   |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     | Depth                     | Depth Water | Depth Top                   | Depth Base   | Inclination  | Orientation                            | Depth Top                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Depth Base                                        | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 100.00                                                                           | 64       |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   | Logged By:<br>SS |               | Approved By:<br>TM |  |

|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-----------|--------------------|-----------------------------|--------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------|------------------|---------------|--------------------|
|  |          | Rotary Cored Borehole Log |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         | Borehole No.<br><b>24-ROS-03</b><br>Sheet 8 of 10 |            |                  |               |                    |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |           |                    |                             |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |           |                    |                             |              | Coordinates: E: 582799.96 N: 571232.04 |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |           |                    | Plant: N/A                  |              | Level: 29.00mAOD                       |                                                                                                                                                                                                                         | Vertical Scale: 1:51                              |            |                  |               |                    |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                     |                                                   |            |                  |               |                    |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
|                                                                                  |          | 69.00 - 72.00             |          |               |                           |           |                    |                             |              |                                        | Strong, massive to bedded, mid grey to blueish grey biomicritic LIMESTONE with rare calcite veins, regular alternation of thin pale grey beds, and rare weathering with orange staining on fracture surfaces.           |                                                   |            |                  |               |                    |
|                                                                                  |          | 71 100                    |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
|                                                                                  |          | 72                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
|                                                                                  |          | 73                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
|                                                                                  |          | 72.00 - 75.00             |          |               |                           |           |                    |                             |              |                                        | Strong, massive to bedded, blueish grey to mid grey biomicritic LIMESTONE with minor calcite veins (<15cm), regular alternation of thin pale grey beds, and trace weathering with orange staining on fracture surfaces. |                                                   |            |                  |               |                    |
|                                                                                  |          | 74 100                    |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
|                                                                                  |          | 75                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
|                                                                                  |          | 76                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
|                                                                                  |          | 75.00 - 78.00             |          |               |                           |           |                    |                             |              |                                        | 78.25 - 78.50 Major calcite veining.                                                                                                                                                                                    |                                                   |            |                  |               |                    |
|                                                                                  |          | 77 100                    |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
|                                                                                  |          | 78                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
|                                                                                  |          | 79                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
|                                                                                  |          | 78.00 - 81.00             |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
|                                                                                  |          | 80                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
| Borehole Continued on Next Page                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |           |                    | Inclination and Orientation |              |                                        |                                                                                                                                                                                                                         | Drilling Flush Details                            |            |                  |               |                    |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth     | Depth Water        | Depth Top                   | Depth Base   | Inclination                            | Orientation                                                                                                                                                                                                             | Depth Top                                         | Depth Base | Flush Type       | Flush Min (%) | Flush Max (%)      |
| 100.00                                                                           | 64       |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            |                  |               |                    |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                         |                                                   |            | Logged By:<br>SS |               | Approved By:<br>TM |

|                                                                                  |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
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|  |       | Rotary Cored Borehole Log |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Borehole No.<br><b>24-ROS-03</b><br>Sheet 9 of 10 |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
| Project: Rossmore Geological Assessment                                          |       |                           |        |            | Client: The Breedon Group |           |                    |              |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
| Project No: 501.065463.00001                                                     |       |                           |        |            | Contractor: IDL           |           |                    |              |              | Coordinates: E: 582799.96 N: 571232.04 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
| Location: Rossmore Quarry                                                        |       |                           |        |            | Hole Type: RC             |           |                    | Plant: N/A   |              | Level: 29.00mAOD                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Vertical Scale: 1:51                              |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
| Well                                                                             | Water | Depth (mbgl)              | Coring |            |                           | Type / FI | Testing / Sampling | Depth (mbgl) | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
|                                                                                  |       |                           | TCR    | SCR        | RQD                       |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
|                                                                                  |       |                           |        |            |                           |           |                    |              |              |                                        | <div>Strong, massive to bedded, blueish grey to mid grey biomicritic LIMESTONE with minor calcite veins (&lt;15cm), regular alternation of thin pale grey beds, and trace weathering with orange staining on fracture surfaces.</div> <div>81.00 - 84.00 100</div> <div>83.20 - 83.45 &lt;25cm major calcite vein.</div> <div>84.00 - 87.00 100</div> <div>85.30 - 85.80 Pale grey to pale brownish grey interval with occasional mid grey mottling.</div> <div>87.00 - 90.00 100</div> <div>Borehole Continued on Next Page</div> |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
|                                                                                  |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
|                                                                                  |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
|                                                                                  |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
|                                                                                  |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
|                                                                                  |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
|                                                                                  |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
|                                                                                  |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
|                                                                                  |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
|                                                                                  |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
| Hole Diameter                                                                    |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Casing Diameter                                   |  | Shift Details |  |            | Inclination and Orientation |             |  |             | Drilling Flush Details |           |  |            |  |            |  |               |  |                 |  |
| Depth Base                                                                       |       | Diameter                  |        | Depth Base |                           | Diameter  |                    | Date Time    |              | Depth                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Depth Water                                       |  | Depth Top     |  | Depth Base |                             | Inclination |  | Orientation |                        | Depth Top |  | Depth Base |  | Flush Type |  | Flush Min (%) |  | Flush Max (%)   |  |
| 100.00                                                                           |       | 64                        |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  |               |  |                 |  |
| Remarks: Vertical hole.                                                          |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |  |               |  |            |                             |             |  |             |                        |           |  |            |  |            |  | Logged By: SS |  | Approved By: TM |  |

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| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-----------|--------------------|-----------------------------|--------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------|------------------|---------------|--------------------|--|
|  |          | Rotary Cored Borehole Log |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                               | Borehole No.<br><b>24-ROS-04</b><br>Sheet 1 of 10 |            |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |           |                    |                             |              | Dates: 20/05/2024 - 22/05/2024                                                      |                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |           |                    |                             |              | Coordinates: E: 582606.16 N: 571307.49                                              |                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |           |                    | Plant: N/A                  |              | Level: 26.00mAOD                                                                    |                                                                                                                                                                               | Vertical Scale: 1:51                              |            |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                                                              | Stratum Description                                                                                                                                                           |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |           |                    |                             |              |                                                                                     |                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                                                                     | No Recovery.                                                                                                                                                                  |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 0.00 - 6.00               | 0        |               |                           |           |                    | 6.00                        | 20.00        |                                                                                     | Very poor recovery, fractured area with major purple rock fragments.                                                                                                          |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 6.00 - 9.00               | 65       |               |                           |           |                    | 7.80                        | 18.20        |  | Strong, massive to bedded, pale grey to white biomicritic LIMESTONE with major calcite veins (<20cm wide) and very rare weathering with orange staining on fracture surfaces. |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                               | Borehole Continued on Next Page                   |            |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |           |                    | Inclination and Orientation |              |                                                                                     |                                                                                                                                                                               | Drilling Flush Details                            |            |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth     | Depth Water        | Depth Top                   | Depth Base   | Inclination                                                                         | Orientation                                                                                                                                                                   | Depth Top                                         | Depth Base | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 95.00                                                                            | 64       |                           |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                               |                                                   |            |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                               |                                                   |            | Logged By:<br>SS |               | Approved By:<br>TM |  |

|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                          |                                            |            |                  |               |                    |  |
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|  |          | Rotary Cored Borehole Log |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                          | Borehole No.<br>24-ROS-04<br>Sheet 2 of 10 |            |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |           |                    |                             |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                          |                                            |            |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |           |                    |                             |              | Coordinates: E: 582606.16 N: 571307.49 |                                                                                                                                                                                                                                                          |                                            |            |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |           |                    | Plant: N/A                  |              | Level: 26.00mAOD                       |                                                                                                                                                                                                                                                          | Vertical Scale: 1:51                       |            |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                      |                                            |            |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                          |                                            |            |                  |               |                    |  |
|                                                                                  |          | 9.00 - 12.00              |          |               |                           |           |                    |                             |              |                                        | Strong, massive to bedded, pale grey to white biomicritic LIMESTONE with major calcite veins (<20cm wide) and very rare weathering with orange staining on fracture surfaces.                                                                            |                                            |            |                  |               |                    |  |
|                                                                                  |          | 11                        | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                          |                                            |            |                  |               |                    |  |
|                                                                                  |          | 12.00                     |          |               |                           |           |                    | 14.00                       |              |                                        | Strong, white to pale grey LIMESTONE with major calcite veins.                                                                                                                                                                                           |                                            |            |                  |               |                    |  |
|                                                                                  |          | 12.45                     |          |               |                           |           |                    | 13.55                       |              |                                        |                                                                                                                                                                                                                                                          |                                            |            |                  |               |                    |  |
|                                                                                  |          | 12.00 - 15.00             |          |               |                           |           |                    |                             |              |                                        | Strong, massive to bedded, pale grey to slightly pale brownish grey biomicritic LIMESTONE with major calcite veins (<8cm wide) and very rare weathering with trace orange staining on fracture surfaces.<br>12.60 - 13.00 Fractured non-intact interval. |                                            |            |                  |               |                    |  |
|                                                                                  |          | 14                        | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                          |                                            |            |                  |               |                    |  |
|                                                                                  |          | 15.00 - 18.00             |          |               |                           |           |                    | 9.50                        |              |                                        | Strong, massive to bedded, pale grey to yellowish grey biomicritic LIMESTONE with trace calcite veins and trace weathering with orange staining on fracture surfaces.                                                                                    |                                            |            |                  |               |                    |  |
|                                                                                  |          | 17                        | 100      |               |                           |           |                    | 8.30                        |              |                                        |                                                                                                                                                                                                                                                          |                                            |            |                  |               |                    |  |
|                                                                                  |          | 18.00 - 21.00             |          |               |                           |           |                    |                             |              |                                        | Strong, massive to bedded, pale grey biomicritic LIMESTONE with minor calcite veins (<3cm wide) and very rare weathering with orange staining on fracture surfaces.                                                                                      |                                            |            |                  |               |                    |  |
|                                                                                  |          | 19                        | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                          |                                            |            |                  |               |                    |  |
| Borehole Continued on Next Page                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                          |                                            |            |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |           |                    | Inclination and Orientation |              |                                        |                                                                                                                                                                                                                                                          | Drilling Flush Details                     |            |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth     | Depth Water        | Depth Top                   | Depth Base   | Inclination                            | Orientation                                                                                                                                                                                                                                              | Depth Top                                  | Depth Base | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 95.00                                                                            | 64       |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                          |                                            |            |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                          |                                            |            | Logged By:<br>SS |               | Approved By:<br>TM |  |

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| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

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| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

|                                                                                  |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                   |                                                   |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
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|  |       | Rotary Cored Borehole Log |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                   | Borehole No.<br><b>24-ROS-04</b><br>Sheet 5 of 10 |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
| Project: Rossmore Geological Assessment                                          |       |                           |        |            | Client: The Breedon Group |           |                    |              |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                   |                                                   |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
| Project No: 501.065463.00001                                                     |       |                           |        |            | Contractor: IDL           |           |                    |              |              | Coordinates: E: 582606.16 N: 571307.49 |                                                                                                                                                                                                                                                   |                                                   |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
| Location: Rossmore Quarry                                                        |       |                           |        |            | Hole Type: RC             |           |                    | Plant: N/A   |              | Level: 26.00mAOD                       |                                                                                                                                                                                                                                                   | Vertical Scale: 1:51                              |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
| Well                                                                             | Water | Depth (mbgl)              | Coring |            |                           | Type / FI | Testing / Sampling | Depth (mbgl) | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                               |                                                   |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       |                           | TCR    | SCR        | RQD                       |           |                    |              |              |                                        |                                                                                                                                                                                                                                                   |                                                   |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 39.00 - 42.00             |        |            |                           |           |                    |              |              |                                        | Strong to medium strong, massive to bedded, mid grey to blueish grey biomicritic LIMESTONE with minor calcite veins (<5cm wide), rare alternation of thin pale grey beds, and trace weathering with orange and red staining on fracture surfaces. |                                                   |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 41                        | 100    |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                   | 41                                                |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 42                        |        |            |                           |           |                    |              |              |                                        | 41.90 - 42.10 Pale brownish grey interval.                                                                                                                                                                                                        | 42                                                |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 42.00 - 45.00             |        |            |                           |           |                    |              |              |                                        | 42.45 - 42.55 <3cm calcite vein.                                                                                                                                                                                                                  |                                                   |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 43                        |        |            |                           |           |                    |              |              |                                        | 43.10 - 43.50 Pale brownish grey interval.                                                                                                                                                                                                        | 43                                                |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 44                        |        |            |                           |           |                    |              |              |                                        | 44.10 - 44.40 Major calcite veins.                                                                                                                                                                                                                | 44                                                |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 45                        |        |            |                           |           |                    |              |              |                                        | 45.20 - 45.25 Major calcite veins.                                                                                                                                                                                                                | 45                                                |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 45.55                     |        |            |                           |           |                    | -19.55       |              |                                        | Strong to medium strong, massive, pale grey to blueish grey biomicritic LIMESTONE with major calcite veining, and minor weathering with orange and brown staining on fracture surfaces.                                                           | 46                                                |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 46                        |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                   | 47                                                |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 45.00 - 48.00             |        |            |                           |           |                    |              |              |                                        | Strong, massive to bedded, mid grey to blueish grey biomicritic LIMESTONE with minor calcite veins (<3cm wide).                                                                                                                                   | 47                                                |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 47                        | 100    |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                   | 48                                                |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 47.45                     |        |            |                           |           |                    | -21.45       |              |                                        | Strong, massive, pale grey to pale brownish grey biomicritic LIMESTONE with major calcite veining, and rare orange staining on fracture surfaces.                                                                                                 | 48                                                |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 48                        |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                   | 49                                                |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 49                        | 100    |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                   | 49                                                |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 48.00 - 51.00             |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                   | 50                                                |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
|                                                                                  |       | 50.00                     |        |            |                           |           |                    | -24.00       |              |                                        | Borehole Continued on Next Page                                                                                                                                                                                                                   |                                                   |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
| Hole Diameter                                                                    |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                   |                                                   |  | Casing Diameter  |  | Shift Details      |  |             | Inclination and Orientation |             |  |           | Drilling Flush Details |            |  |            |  |               |  |               |  |
| Depth Base                                                                       |       | Diameter                  |        | Depth Base |                           | Diameter  |                    | Date Time    |              | Depth                                  |                                                                                                                                                                                                                                                   | Depth Water                                       |  | Depth Top        |  | Depth Base         |  | Inclination |                             | Orientation |  | Depth Top |                        | Depth Base |  | Flush Type |  | Flush Min (%) |  | Flush Max (%) |  |
| 95.00                                                                            |       | 64                        |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                   |                                                   |  |                  |  |                    |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |
| Remarks:<br>Vertical hole.                                                       |       |                           |        |            |                           |           |                    |              |              |                                        |                                                                                                                                                                                                                                                   |                                                   |  | Logged By:<br>SS |  | Approved By:<br>TM |  |             |                             |             |  |           |                        |            |  |            |  |               |  |               |  |

|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-----------|--------------------|-----------------------------|--------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------|------------------|---------------|--------------------|--|
|  |          | Rotary Cored Borehole Log |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Borehole No.<br><b>24-ROS-04</b><br>Sheet 6 of 10 |            |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |           |                    |                             |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |           |                    |                             |              | Coordinates: E: 582606.16 N: 571307.49 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |           |                    | Plant: N/A                  |              | Level: 26.00mAOD                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Vertical Scale: 1:51                              |            |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        | <div>RECEIVED: 17/12/2025</div> <div>Strong, massive, white CALCITE VEINING with minor blueish grey LIMESTONE.</div> <div>51.70 - 51.90 Major calcite veins.</div> <div>Strong, massive, pale grey to pale brownish grey biomicritic LIMESTONE with minor calcite veining (&lt;3cm wide), and rare orange staining on fracture surfaces.</div> <div>Strong to medium strong, massive, mid grey biomicritic LIMESTONE with major calcite veining, and trace weathering with orange and brown staining on fracture surfaces.</div> <div>Strong, massive, white CALCITE VEINING with minor pale grey and blueish grey LIMESTONE.</div> <div>54.20 - 54.50 Pale blueish grey interval.</div> <div>Strong, massive, mid grey to blueish grey biomicritic LIMESTONE with major calcite veining, and very rare weathering with trace orange and brown staining on fracture surfaces.</div> <div>Strong, massive, white CALCITE VEINING with minor pale grey and blueish grey LIMESTONE.</div> |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 51                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 51.00 - 54.00             | 100      |               |                           |           | 51.45              | -25.45                      |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 52                        |          |               |                           |           | 52.35              | -26.35                      |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 53                        |          |               |                           |           | 53.50              | -27.50                      |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 54                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 55                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 54.00 - 57.00             | 100      |               |                           |           | 56.20              | -30.20                      |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 56                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 57                        |          |               |                           |           | 59.00              | -33.00                      |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 58                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 57.00 - 60.00             | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 59                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        | Borehole Continued on Next Page                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |           |                    | Inclination and Orientation |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Drilling Flush Details                            |            |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth     | Depth Water        | Depth Top                   | Depth Base   | Inclination                            | Orientation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Depth Top                                         | Depth Base | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 95.00                                                                            | 64       |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                   |            | Logged By:<br>SS |               | Approved By:<br>TM |  |

|                |            |              |
|----------------|------------|--------------|
| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-----------|--------------------|-----------------------------|--------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------|------------------|---------------|--------------------|--|
|  |          | Rotary Cored Borehole Log |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        | Borehole No.<br><b>24-ROS-04</b><br>Sheet 8 of 10 |            |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |           |                    |                             |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |           |                    |                             |              | Coordinates: E: 582606.16 N: 571307.49 |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |           |                    | Plant: N/A                  |              | Level: 26.00mAOD                       |                                                                                                                                                                                                                                                                        | Vertical Scale: 1:51                              |            |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                                    |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 69.00 - 72.00             |          |               |                           |           |                    |                             |              |                                        | Strong, massive to bedded, pale grey to pale blueish grey biomicritic LIMESTONE with minor calcite veining (<5cm wide), and trace weathering with orange staining on fracture surfaces.                                                                                |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 71                        | 93       |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 72                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 73                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 72.00 - 75.00             |          |               |                           |           |                    |                             |              |                                        | Non-intact, partially recovered interval of strong to medium strong, massive to bedded, pale grey to pale brownish grey biomicritic LIMESTONE with occasional mid grey mottling, major moderate to high weathering and brown and orange staining on fracture surfaces. |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 74                        | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 75                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 76                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 75.00 - 78.00             |          |               |                           |           |                    |                             |              |                                        | Poor recovery of pale grey to brownish grey LIMESTONE with                                                                                                                                                                                                             |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 77                        | 67       |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 78                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 79                        | 90       |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 78.00 - 81.00             |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          | 79.80                     |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
| Borehole Continued on Next Page                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |           |                    | Inclination and Orientation |              |                                        |                                                                                                                                                                                                                                                                        | Drilling Flush Details                            |            |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth     | Depth Water        | Depth Top                   | Depth Base   | Inclination                            | Orientation                                                                                                                                                                                                                                                            | Depth Top                                         | Depth Base | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 95.00                                                                            | 64       |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                        |                                                   |            | Logged By:<br>SS |               | Approved By:<br>TM |  |

|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-----------|--------------------|-----------------------------|--------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------|------------|------------------|---------------|--------------------|--|
|  |          | Rotary Cored Borehole Log |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    | Borehole No.<br><b>24-ROS-04</b><br>Sheet 9 of 10 |            |            |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |           |                    |                             |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |           |                    |                             |              | Coordinates: E: 582606.16 N: 571307.49 |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |           |                    | Plant: N/A                  |              | Level: 26.00mAOD                       |                                                                                                                                                                                                                                                                                                                                                                    | Vertical Scale: 1:51                              |            |            |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                                                                                                                                |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        | <p>Poor recovery of pale grey to brownish grey LIMESTONE with moderate to high weathering and occasional clay infills, and orange staining on fracture surfaces.</p> <p>80.00 - 81.00 30cm of blueish grey highly weathered LIMESTONE with occasional clay infills.</p> <p>81.00 - 84.00 50</p> <p>84.00 - 87.00 37</p> <p>87.00 - 90.00 100</p> <p>C @ 89.75m</p> |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        | Borehole Continued on Next Page                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |           |                    | Inclination and Orientation |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    | Drilling Flush Details                            |            |            |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth     | Depth Water        | Depth Top                   | Depth Base   | Inclination                            | Orientation                                                                                                                                                                                                                                                                                                                                                        | Depth Top                                         | Depth Base | Flush Type | Flush Min (%)    | Flush Max (%) |                    |  |
| 95.00                                                                            | 64       |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                                                                                                                                                                                    |                                                   |            |            | Logged By:<br>SS |               | Approved By:<br>TM |  |

|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-----------|--------------------|-----------------------------|--------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------|---------------|---------------|-----------------|--|
|  |          | Rotary Cored Borehole Log |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     | Borehole No.<br><b>24-ROS-04</b><br>Sheet 10 of 10 |            |               |               |                 |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |           |                    |                             |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |           |                    |                             |              | Coordinates: E: 582606.16 N: 571307.49 |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |           |                    | Plant: N/A                  |              | Level: 26.00mAOD                       |                                                                                                                                                                     | Vertical Scale: 1:51                               |            |               |               |                 |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                 |                                                    |            |               |               |                 |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        | Strong, massive to bedded, pale grey to blueish grey biomicritic LIMESTONE with minor calcite veins, and rare weathering with orange staining on fracture surfaces. |                                                    |            |               |               |                 |  |
|                                                                                  |          | 91                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          | 90.00 - 93.00             | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          | 92                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          | 93                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          | 93.00 - 95.00             | 100      |               |                           |           |                    |                             |              |                                        | 94.60 - 95.00 Major calcite vein.                                                                                                                                   |                                                    |            |               |               |                 |  |
|                                                                                  |          | 94                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        | Borehole Complete at 95.00m                                                                                                                                         |                                                    |            |               |               |                 |  |
|                                                                                  |          | 95                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          | 96                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          | 97                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          | 98                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          | 99                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          | 100                       |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |           |                    | Inclination and Orientation |              |                                        |                                                                                                                                                                     | Drilling Flush Details                             |            |               |               |                 |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth     | Depth Water        | Depth Top                   | Depth Base   | Inclination                            | Orientation                                                                                                                                                         | Depth Top                                          | Depth Base | Flush Type    | Flush Min (%) | Flush Max (%)   |  |
| 95.00                                                                            | 64       |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
| Remarks: Vertical hole.                                                          |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            |               |               |                 |  |
|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                     |                                                    |            | Logged By: SS |               | Approved By: TM |  |

|                                                                                 |          |                           |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
|---------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-----------|--------------------|-----------------------------|--------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|------------|------------------|---------------|--------------------|--|
|  |          | Rotary Cored Borehole Log |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         | Borehole No.<br><b>24-ROS-05</b><br>Sheet 1 of 8 |            |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                         |          |                           |          |               | Client: The Breedon Group |           |                    |                             |              | Dates: 20/05/2024 - 22/05/2024                                                      |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
| Project No: 501.065463.00001                                                    |          |                           |          |               | Contractor: IDL           |           |                    |                             |              | Coordinates: E: 582581.87 N: 571415.11                                              |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
| Location: Rossmore Quarry                                                       |          |                           |          |               | Hole Type: RC             |           |                    | Plant: N/A                  |              | Level: 25.00mAOD                                                                    |                                                                                                                                                                                                         | Vertical Scale: 1:51                             |            |                  |               |                    |  |
| Well                                                                            | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                                                              | Stratum Description                                                                                                                                                                                     |                                                  |            |                  |               |                    |  |
|                                                                                 |          |                           | TCR      | SCR           | RQD                       |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
|                                                                                 |          |                           |          |               |                           |           |                    |                             |              |                                                                                     | No Recovery.                                                                                                                                                                                            |                                                  |            |                  |               |                    |  |
|                                                                                 |          | 1                         |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
|                                                                                 |          | 2                         |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
|                                                                                 |          | 3                         | 0        |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
|                                                                                 |          | 4                         |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
|                                                                                 |          | 5                         |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
|                                                                                 |          | 6                         |          |               |                           |           |                    | 6.00                        | 19.00        |                                                                                     |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
|                                                                                 |          |                           |          |               |                           |           |                    | 6.20                        | 18.80        |                                                                                     | Poor recovery, fractured area with purple rock fragments.                                                                                                                                               |                                                  |            |                  |               |                    |  |
|                                                                                 |          | 7                         |          |               |                           |           |                    |                             |              |  | Strong, massive, blueish grey bioclastic LIMESTONE with minor to trace calcite veins (<1.5cm wide), occasional bioclastic debris, and minor weathering with trace orange staining on fracture surfaces. |                                                  |            |                  |               |                    |  |
|                                                                                 |          | 8                         |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
|                                                                                 |          | 9                         |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
|                                                                                 |          | 10                        |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
| Borehole Continued on Next Page                                                 |          |                           |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
| Hole Diameter                                                                   |          | Casing Diameter           |          | Shift Details |                           |           |                    | Inclination and Orientation |              |                                                                                     |                                                                                                                                                                                                         | Drilling Flush Details                           |            |                  |               |                    |  |
| Depth Base                                                                      | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth     | Depth Water        | Depth Top                   | Depth Base   | Inclination                                                                         | Orientation                                                                                                                                                                                             | Depth Top                                        | Depth Base | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 71.00                                                                           | 64       |                           |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                      |          |                           |          |               |                           |           |                    |                             |              |                                                                                     |                                                                                                                                                                                                         |                                                  |            | Logged By:<br>SS |               | Approved By:<br>TM |  |

|                                                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-----------|--------------------|-----------------------------|--------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|------------|------------------|---------------|--------------------|
|  |          | Rotary Cored Borehole Log |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         | Borehole No.<br><b>24-ROS-05</b><br>Sheet 2 of 8 |            |                  |               |                    |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |           |                    |                             |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |           |                    |                             |              | Coordinates: E: 582581.87 N: 571415.11 |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |           |                    | Plant: N/A                  |              | Level: 25.00mAOD                       |                                                                                                                                                                                                         | Vertical Scale: 1:51                             |            |                  |               |                    |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI | Testing / Sampling | Depth (mbgl)                | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                     |                                                  |            |                  |               |                    |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
|                                                                                  |          | 9.00 - 12.00              |          |               |                           |           |                    |                             |              |                                        | Strong, massive, blueish grey bioclastic LIMESTONE with minor to trace calcite veins (<1.5cm wide), occasional bioclastic debris, and minor weathering with trace orange staining on fracture surfaces. |                                                  |            |                  |               |                    |
|                                                                                  |          | 11                        | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
|                                                                                  |          | 12                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
|                                                                                  |          | 12.00 - 15.00             |          |               |                           |           |                    |                             |              |                                        | Medium strong, massive, pale grey to blueish grey bioclastic LIMESTONE with trace calcite veins and weathered fissures towards the bottom, with orange staining on fracture surfaces.                   |                                                  |            |                  |               |                    |
|                                                                                  |          | 14                        | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
|                                                                                  |          | 15                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
|                                                                                  |          | 15.00 - 18.00             |          |               |                           |           |                    |                             |              |                                        | Very poor recovery, fractured area of highly weathered LIMESTONE.                                                                                                                                       |                                                  |            |                  |               |                    |
|                                                                                  |          | 16                        | 100      |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
|                                                                                  |          | 17                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
|                                                                                  |          | 16.65                     |          |               |                           |           | 8.35               |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
|                                                                                  |          | 18.00                     |          |               |                           |           | 7.00               |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
|                                                                                  |          | 18                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
|                                                                                  |          | 18.00 - 21.00             |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
|                                                                                  |          | 19                        | 30       |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
|                                                                                  |          | 20                        |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
| Borehole Continued on Next Page                                                  |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |           |                    | Inclination and Orientation |              |                                        |                                                                                                                                                                                                         | Drilling Flush Details                           |            |                  |               |                    |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     |                           | Depth     | Depth Water        | Depth Top                   | Depth Base   | Inclination                            | Orientation                                                                                                                                                                                             | Depth Top                                        | Depth Base | Flush Type       | Flush Min (%) | Flush Max (%)      |
| 71.00                                                                            | 64       |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            |                  |               |                    |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |           |                    |                             |              |                                        |                                                                                                                                                                                                         |                                                  |            | Logged By:<br>SS |               | Approved By:<br>TM |

|                |            |              |
|----------------|------------|--------------|
| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | CS         | TH           |

|                |            |              |
|----------------|------------|--------------|
| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   |                                                  |                  |                    |               |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-------------|-----------------------------|--------------|--------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|------------------|--------------------|---------------|
|  |          | Rotary Cored Borehole Log |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   | Borehole No.<br><b>24-ROS-05</b><br>Sheet 5 of 8 |                  |                    |               |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |             |                             |              |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                                   |                                                  |                  |                    |               |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |             |                             |              |              | Coordinates: E: 582581.87 N: 571415.11 |                                                                                                                                                                                                                                                                   |                                                  |                  |                    |               |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |             |                             | Plant: N/A   |              | Level: 25.00mAOD                       |                                                                                                                                                                                                                                                                   | Vertical Scale: 1:51                             |                  |                    |               |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI   | Testing / Sampling          | Depth (mbgl) | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                               |                                                  |                  |                    |               |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   |                                                  |                  |                    |               |
|                                                                                  |          | 39.00 - 42.00             |          |               |                           |             |                             |              |              |                                        | Non-intact core with fragmented intervals of strong to medium strong, massive, mid grey to blueish grey bioclastic LIMESTONE with trace calcite veins (<3cm wide) and very rare pink veins.                                                                       |                                                  |                  |                    |               |
|                                                                                  |          | 41                        | 100      |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   | 41                                               |                  |                    |               |
|                                                                                  |          | 42                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   | 42                                               |                  |                    |               |
|                                                                                  |          | 43                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   | 43                                               |                  |                    |               |
|                                                                                  |          | 42.00 - 45.00             |          |               |                           |             |                             |              |              |                                        | 44.90 - 44.95 Orangish brown, gravelly CLAY infill.                                                                                                                                                                                                               |                                                  |                  |                    |               |
|                                                                                  |          | 44                        | 100      |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   | 44                                               |                  |                    |               |
|                                                                                  |          | 45                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   | 45                                               |                  |                    |               |
|                                                                                  |          | 46                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   | 46                                               |                  |                    |               |
|                                                                                  |          | 45.00 - 48.00             |          |               |                           |             |                             | 46.15        | -21.15       |                                        | Karstic infill. Firm, brown, sandy gravelly CLAY.                                                                                                                                                                                                                 |                                                  |                  |                    |               |
|                                                                                  |          | 47                        | 67       |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   | 47                                               |                  |                    |               |
|                                                                                  |          | 48                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   | 48                                               |                  |                    |               |
|                                                                                  |          | 49                        |          |               |                           |             |                             |              |              |                                        | Non-intact core with poor recovery of medium strong, massive, pale grey, blueish grey and pale brownish grey LIMESTONE with minor calcite veining (<3cm wide), occasional mid grey patches, and minor weathering with trace orange staining on fracture surfaces. |                                                  |                  |                    |               |
|                                                                                  |          | 48.00 - 51.00             |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   | 49                                               |                  |                    |               |
|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   | 50                                               |                  |                    |               |
| Borehole Continued on Next Page                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   |                                                  |                  |                    |               |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |             | Inclination and Orientation |              |              |                                        | Drilling Flush Details                                                                                                                                                                                                                                            |                                                  |                  |                    |               |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     | Depth                     | Depth Water | Depth Top                   | Depth Base   | Inclination  | Orientation                            | Depth Top                                                                                                                                                                                                                                                         | Depth Base                                       | Flush Type       | Flush Min (%)      | Flush Max (%) |
| 71.00                                                                            | 64       |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   |                                                  |                  |                    |               |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                   |                                                  | Logged By:<br>SS | Approved By:<br>TM |               |

|                |            |              |
|----------------|------------|--------------|
| Remarks:       | Logged By: | Approved By: |
| Vertical hole. | SS         | TM           |

|                                                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                  |               |                    |  |
|----------------------------------------------------------------------------------|----------|---------------------------|----------|---------------|---------------------------|-------------|-----------------------------|--------------|--------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|---------------|--------------------|--|
|  |          | Rotary Cored Borehole Log |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Borehole No.<br>24-ROS-05<br>Sheet 7 of 8 |                  |               |                    |  |
| Project: Rossmore Geological Assessment                                          |          |                           |          |               | Client: The Breedon Group |             |                             |              |              | Dates: 20/05/2024 - 22/05/2024         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                  |               |                    |  |
| Project No: 501.065463.00001                                                     |          |                           |          |               | Contractor: IDL           |             |                             |              |              | Coordinates: E: 582581.87 N: 571415.11 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                  |               |                    |  |
| Location: Rossmore Quarry                                                        |          |                           |          |               | Hole Type: RC             |             |                             | Plant: N/A   |              | Level: 25.00mAOD                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Vertical Scale: 1:51                      |                  |               |                    |  |
| Well                                                                             | Water    | Depth (mbgl)              | Coring   |               |                           | Type / FI   | Testing / Sampling          | Depth (mbgl) | Level (mAOD) | Legend                                 | Stratum Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                           |                  |               |                    |  |
|                                                                                  |          |                           | TCR      | SCR           | RQD                       |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                  |               |                    |  |
|                                                                                  |          |                           |          |               |                           |             |                             | 60.15        | -35.15       |                                        | Non-intact core with poor recovery of medium strong, massive, pale grey, blueish grey and pale brownish grey LIMESTONE with minor calcite veining (<3cm wide), occasional mid grey patches, and minor weathering with trace orange staining on fracture surfaces.<br>Non-intact core with fragmented intervals of strong to medium strong, massive, pale grey to blueish grey LIMESTONE with trace calcite veins (<2cm wide) and very rare pink veins, and trace weathering with light orange staining on fracture surfaces. |                                           |                  |               |                    |  |
|                                                                                  |          | 61                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                  |               | 61                 |  |
|                                                                                  |          | 60.00 - 63.00             | 77       |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 62                                        |                  |               |                    |  |
|                                                                                  |          | 62                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 62                                        |                  |               |                    |  |
|                                                                                  |          | 63                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 63                                        |                  |               |                    |  |
|                                                                                  |          | 64                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 64                                        |                  |               |                    |  |
|                                                                                  |          | 63.00 - 66.00             | 100      |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 65                                        |                  |               |                    |  |
|                                                                                  |          | 65                        |          |               |                           |             |                             | 65.20        | -40.20       |                                        | Strong, massive, blueish grey LIMESTONE with trace white and pale brown calcite veins, and rare weathering with orange staining on fracture surfaces.                                                                                                                                                                                                                                                                                                                                                                        |                                           |                  |               |                    |  |
|                                                                                  |          | 66                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                  |               | 66                 |  |
|                                                                                  |          | 67                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 67                                        |                  |               |                    |  |
|                                                                                  |          | 66.00 - 69.00             | 100      |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 68                                        |                  |               |                    |  |
|                                                                                  |          | 68                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 68                                        |                  |               |                    |  |
|                                                                                  |          | 69                        |          |               |                           |             |                             | 69.00        | -44.00       |                                        | Strong, massive, yellowish grey to mid grey LIMESTONE with brown and white calcite veins (<1cm wide).                                                                                                                                                                                                                                                                                                                                                                                                                        |                                           |                  |               |                    |  |
|                                                                                  |          | 70                        |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                  |               | 70                 |  |
| Borehole Continued on Next Page                                                  |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                  |               |                    |  |
| Hole Diameter                                                                    |          | Casing Diameter           |          | Shift Details |                           |             | Inclination and Orientation |              |              |                                        | Drilling Flush Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                           |                  |               |                    |  |
| Depth Base                                                                       | Diameter | Depth Base                | Diameter | Date Time     | Depth                     | Depth Water | Depth Top                   | Depth Base   | Inclination  | Orientation                            | Depth Top                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Depth Base                                | Flush Type       | Flush Min (%) | Flush Max (%)      |  |
| 71.00                                                                            | 64       |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                  |               |                    |  |
| Remarks:<br>Vertical hole.                                                       |          |                           |          |               |                           |             |                             |              |              |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           | Logged By:<br>SS |               | Approved By:<br>TM |  |

|                                                                                  |       |                           |        |     |                           |           |                    |              |              |                                                                                   |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
|----------------------------------------------------------------------------------|-------|---------------------------|--------|-----|---------------------------|-----------|--------------------|--------------|--------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--|--|--|--|---------------|--|-----------------|--|
|  |       | Rotary Cored Borehole Log |        |     |                           |           |                    |              |              |                                                                                   |                                                                                                                                          | Borehole No.<br><b>24-ROS-05</b><br>Sheet 8 of 8 |  |  |  |  |               |  |                 |  |
| Project: Rossmore Geological Assessment                                          |       |                           |        |     | Client: The Breedon Group |           |                    |              |              | Dates: 20/05/2024 - 22/05/2024                                                    |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
| Project No: 501.065463.00001                                                     |       |                           |        |     | Contractor: IDL           |           |                    |              |              | Coordinates: E: 582581.87 N: 571415.11                                            |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
| Location: Rossmore Quarry                                                        |       |                           |        |     | Hole Type: RC             |           |                    | Plant: N/A   |              | Level: 25.00mAOD                                                                  |                                                                                                                                          | Vertical Scale: 1:51                             |  |  |  |  |               |  |                 |  |
| Well                                                                             | Water | Depth (mbgl)              | Coring |     |                           | Type / FI | Testing / Sampling | Depth (mbgl) | Level (mAOD) | Legend                                                                            | Stratum Description                                                                                                                      |                                                  |  |  |  |  |               |  |                 |  |
|                                                                                  |       |                           | TCR    | SCR | RQD                       |           |                    |              |              |                                                                                   |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
|                                                                                  |       | 93                        |        |     |                           |           |                    |              |              |  | Strong, massive, yellowish grey to mid grey LIMESTONE with brown and white calcite veins (<1cm wide).<br><br>Borehole Complete at 71.00m |                                                  |  |  |  |  |               |  |                 |  |
|                                                                                  |       | 71                        |        |     |                           |           | 71.00              | -46.00       |              |                                                                                   |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
|                                                                                  |       | 72                        |        |     |                           |           |                    |              |              |                                                                                   |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
|                                                                                  |       | 73                        |        |     |                           |           |                    |              |              |                                                                                   |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
|                                                                                  |       | 74                        |        |     |                           |           |                    |              |              |                                                                                   |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
|                                                                                  |       | 75                        |        |     |                           |           |                    |              |              |                                                                                   |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
|                                                                                  |       | 76                        |        |     |                           |           |                    |              |              |                                                                                   |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
|                                                                                  |       | 77                        |        |     |                           |           |                    |              |              |                                                                                   |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
|                                                                                  |       | 78                        |        |     |                           |           |                    |              |              |                                                                                   |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
|                                                                                  |       | 79                        |        |     |                           |           |                    |              |              |                                                                                   |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
|                                                                                  |       | 80                        |        |     |                           |           |                    |              |              |                                                                                   |                                                                                                                                          |                                                  |  |  |  |  |               |  |                 |  |
| Remarks: Vertical hole.                                                          |       |                           |        |     |                           |           |                    |              |              |                                                                                   |                                                                                                                                          |                                                  |  |  |  |  | Logged By: SS |  | Approved By: TM |  |