JOHN CRONIN & ASSOCIATES
ARCHAEOLOGY | CONSERVATION | HERITAGE | PLANNING

Archaeological Assessment
Large-scale Residential Development (LRD), Broomfield West, Midleton, County Cork

Prepared by
John Cronin & Associates
3a Westpoint Trade Centre
Ballincollig
County Cork

On behalf of
Castle Rock Homes (Midleton) Limited
Gortnagark
Tullylease
Charleville
County Cork

November 2023

Document Control Sheet

Client	Castle Rock Homes (Midleton) Limited				
Project Title	Large-scale Residential Development (LRD), Broomfield West, Midleton, County Cork				
Document Title	Archaeological Assessment				
Document No.	n/a				
Document Comprises	*DCS*	*NTS*	*TOC*	*Pages*	59
	Y	N		*Appendices*	3

Rev	***Status***	***Author(s)***	***Reviewed By***	***Approved By***	***Office of Origin***	***Issue Date***
01	Draft	Peter Looney & John Cronin	Colm Chambers	John Cronin	Cork	15/08/23
02	Issue	Peter Looney & John Cronin	Colm Chambers	John Cronin	Cork	01/10/23
03	Final	Peter Looney & John Cronin	Colm Chambers	John Cronin	Cork	07/11/23

Contents

1. Introduction

John Cronin & Associates were commissioned to undertake an archaeological assessment based on (a) geophysical survey and (b) programme of archaeological test trenching within a proposed Large-scale Residential Development (LRD) site at Broomfield West, Midleton, County Cork (see **Figures 1** & **2** below).

Figure 1: *General location of subject site (Source: Ordnance Survey of Ireland)*

A comprehensive geophysical survey was carried out at the site by Dr. Ger Dowling in January 2023, under Detection Device Licence **23R0028**. Based on the results of the survey, Dr. Dowling concluded that the survey did not reveal any anomalies of clear archaeological interest. However, Dr Dowling did note that a '"pit-type" response and several other slender curvilinear anomalies [1—4] are of archaeological potential, though in the absence of supporting evidence, such an interpretation is tentative' (Dowling 2023). The programme of test trenching targeted those anomalies of archaeological potential identified from the results of the geophysical survey (see **Figure 5** below).

Methodology

This assessment commenced with a desktop survey which identified all known archaeological and other cultural heritage sites within the study area. The study area for this assessment consists of the proposed development site and lands within 500m of the site boundary. The desktop survey also endeavoured to identify any hereto now unrecorded features or areas of archaeological, architectural or cultural heritage significance. The desktop assessment was supplemented by a field survey of the proposed development site.

The principal sources reviewed for this assessment of the known archaeological resource were the files and records of the Archaeological Survey of Ireland (ASI).

In addition, the following sources were consulted:

- *Cartographic Sources* - The detail on cartographic sources can indicate past settlement and land use patterns in recent centuries and can also highlight the impact of modern developments and agricultural practices. This information can aid in the identification of the location and extent of unrecorded, or partially levelled, features of archaeological or architectural heritage interest. The cartographic sources examined for the area includes the 1st edition of the 6-inch Ordnance Survey (OS) maps (surveyed and published in the 1830s-40s) and the 25-inch OS maps (surveyed and published 1887-1913).

- *Aerial photography* – In parallel with the cartographic study, a review publicly-accessible aerial photographic sources from the Ordnance Survey, Google and Bing Maps was undertaken.

- *Database of Irish Excavation Reports* - The Database of Irish Excavation Reports contains summary accounts of all archaeological excavations carried out in Ireland (North and South) from 1970 to 2022.

A copy of the geophysical survey is presented in **Appendix 3** of this report; the survey is summarised in **Section 3** of the report. The results of the testing programme are summarised in **Section 4**, extracts from the photographic record are provided in **Appendix 1**, while the test trenches are described in detail in **Appendix 2** of this report.

2. Context

Location

The proposed development site comprises of two parcels of agricultural land. The site is located at the northern outskirts of Midleton, County Cork, *c.*1km north of Main Street. The site is bounded to the east by agricultural land, to the south by residential areas, to most of the west and north by a local road, while the Midleton Water Treatment Plant is located in an area to the west of the site but to the east of that road. The site is on a raised and exposed area of land, with views over Midleton, to the south, the southern end slopes considerably to the south. Sheep were grazing in the southern field at the time of the site visit.

Figure 2: *Location of development site (Source: Ordnance Survey of Ireland)*

Legal context

The administration of national policy in relation to archaeological heritage management is the responsibility of the National Monuments Service (NMS) which is currently based in the Department of Housing, Local Government and Heritage. Until October 2023, the National Monuments Act of 1930, and its Amendments, were the primary means of ensuring the satisfactory protection of the archaeological resource. They included several provisions that are applied to secure the protection of archaeological monuments. These included the designations of nationally significant sites as National Monuments, the Register of Historic Monuments, the Record of Monuments and Places, the Sites and Monuments Record, and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

On the 13th of October 2023, the Historic and Archaeological Heritage and Miscellaneous Provisions Bill 2023 was signed into law by President Michael D. Higgins. The new Act repeals existing legislation and institutes new provisions equipped to cater for the protection of historic heritage in a modern era.

The Act repeals the National Monuments Acts 1930 to 2014 and replace those Acts with provisions for the protection of historic heritage, provisions for the protection of archaeological heritage, provisions for the regulation of certain activities in the interests of such protection and provisions enabling the State to ratify or accede to certain international conventions which relate to such protection or regulation; to give effect to the EIA Directive and the Habitats Directive in relation to the carrying out of works at, on, in, under, to, or within the immediate surroundings of monuments; to give further effect to the Valletta Convention; to consequentially repeal or amend certain other enactments; to make miscellaneous amendments to the Foreshore Act 1933, the Lough Corrib Navigation Act 1945, the Planning and Development Act 2000, the Valuation Act 2001, the Local Government Act 2001, the Local Government Rates and other Matters Act 2019 and the Maritime Area Planning Act 2021; and to provide for related matters

The Act introduces the following innovative measures:

- newly discovered archaeological sites are afforded immediate legal protection, mirroring the existing system for archaeological objects and historic wrecks that are automatically protected without a need for formal designation or registration;
- a statutory reporting scheme for finds of monuments;
- a new 'Register of Monuments' will be established, replacing several overlapping designation and registration systems hitherto in operation;
- "World Heritage Property" is defined for the first time in Irish legislation;
- subject to certain exceptions, archaeological objects with no known owner will automatically become the property of the State;
- the Act provides the necessary provisions to allow for the ratification of two important international treaties, the 1970 UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property, and the 1995 UNIDROIT Convention on Stolen or Illegally Exported Cultural Objects;
- the Act enables the State to ratify the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage;
- an integrated licensing system whereby one licence can authorise a range of activities will be introduced and, for the first time, a statutory appeals process will be established to review licensing decisions, and
- a new civil enforcement procedure can be used as an alternative to, or to supplement, criminal proceedings.

The Act defines archaeology as "the study of past human societies of all periods, either as a whole or of various aspects of them, through the material remains of all forms, moveable and immoveable, left by those societies and the evidence of their environment, and includes the study of climatological, ecological, geological, geomorphological or pedological factors relevant to understanding the nature or context of those societies or the distribution or nature of their material remains, and "archaeological interest" shall be construed accordingly".

Section 14 of the Act provides for the establishment of a register to be known as the Register of Monuments. The Act sets out transitional provisions applicable to Register of Historic Monuments, Record of Monuments and Places and National Monuments.

The *Cork County Development Plan 2022-2028* outlines a number of policies and objectives related to archaeology. Of particular significance to this project are the following:

County Development Plan Objectives HE 16-9: Archaeology and Infrastructure Schemes
All large scale planning applications (i.e. development of lands on 0.5 ha or more in area or 1km or more in length) and Infrastructure schemes and proposed roadworks are subjected to an archaeological assessment as part of the planning application process which should comply with the Department of Arts, Heritage and the Gaeltacht's codes of practice. It is recommended that the assessment is carried out following pre planning consultation with the County Archaeologist, by an appropriately experienced archaeologist to guide the design and layout of the proposed scheme/development, safeguarding the archaeological heritage in line with Development Management Guidelines.

County Development Plan Objectives HE 16-13: Undiscovered Archaeological Sites
To protect and preserve previously unrecorded archaeological sites within County Cork as part of any development proposals. The Council will require preservation in situ to protect archaeological monuments discovered. Preservation by record will only be considered in exceptional circumstances.

Archaeological and historical context

There are no recorded archaeological monuments within a 500m radius of the site, the closest is a graveyard (CO065-096----), also in Broomfield West, which is located *c.*570m to the northwest.

In the Irish language, Broomfield West is called *Cnoc na nGabhar Thiar*. *Cnoc* translates as hill, while *gabhar* means goat. This name relates to the topography of the land and to historic pastoral activities in the area. This name does not give any indication of potential archaeological sites within the area. The name 'Cnocknygower' predates the use of Broomfield and was used as early as 1613 (logainm.ie).

Excavations Database

The Database of Irish Excavation Reports (available at excavations.ie) contains summary accounts of archaeological excavations undertaken in the Republic of Ireland and Northern Ireland from 1969 to present. There are no records within the database related to Broomfield West. There is one record which relates to a site in Broomfield East, as a site noted along the route of a pipeline. The site in Broomfield East was *c.*1.5km to the northeast of the subject site. Very little information is available on that site on the excavations database; (https://excavations.ie/report/2009/Cork/0020442/).

Cartographic Review

On the First Edition (1:10,560 or "6-inch") Ordnance Survey (OS) map (**Figure 3 -** surveyed in 1840), the road that currently bounds the west and north of the site was present. The subject site was formed by twelve separate land parcels (seven complete and four partial fields). The surrounding landscape was all depicted as similar agricultural land in small parcels. One small building was depicted within the site, at the current gateway from the road into the western side of the southern field.

Figure 3: *Subject site as shown on the 1st edition Ordnance Survey map (Source: Government of Ireland)*

The area was depicted in a generally similar manner on the later 1:2500 (or "25inch") edition OS map (**Figure 4 -** surveyed in 1901). Some of the internal field boundaries had been removed to create larger fields and, on this map, the subject site was formed by ten separate land parcels (six complete and four partial fields). The building that had been depicted on the earlier map was not depicted on the 1901 map.

Nothing was depicted on these maps that would indicate any previously unrecorded archaeological features.

A range of aerial photographs from 1995 to present were viewed. Nothing was identified on any of these images that would give indication of previously unrecorded archaeology on the site. The biggest change in that time was the expansion of Midleton and the development of residential estates to the south of the subject site**.**

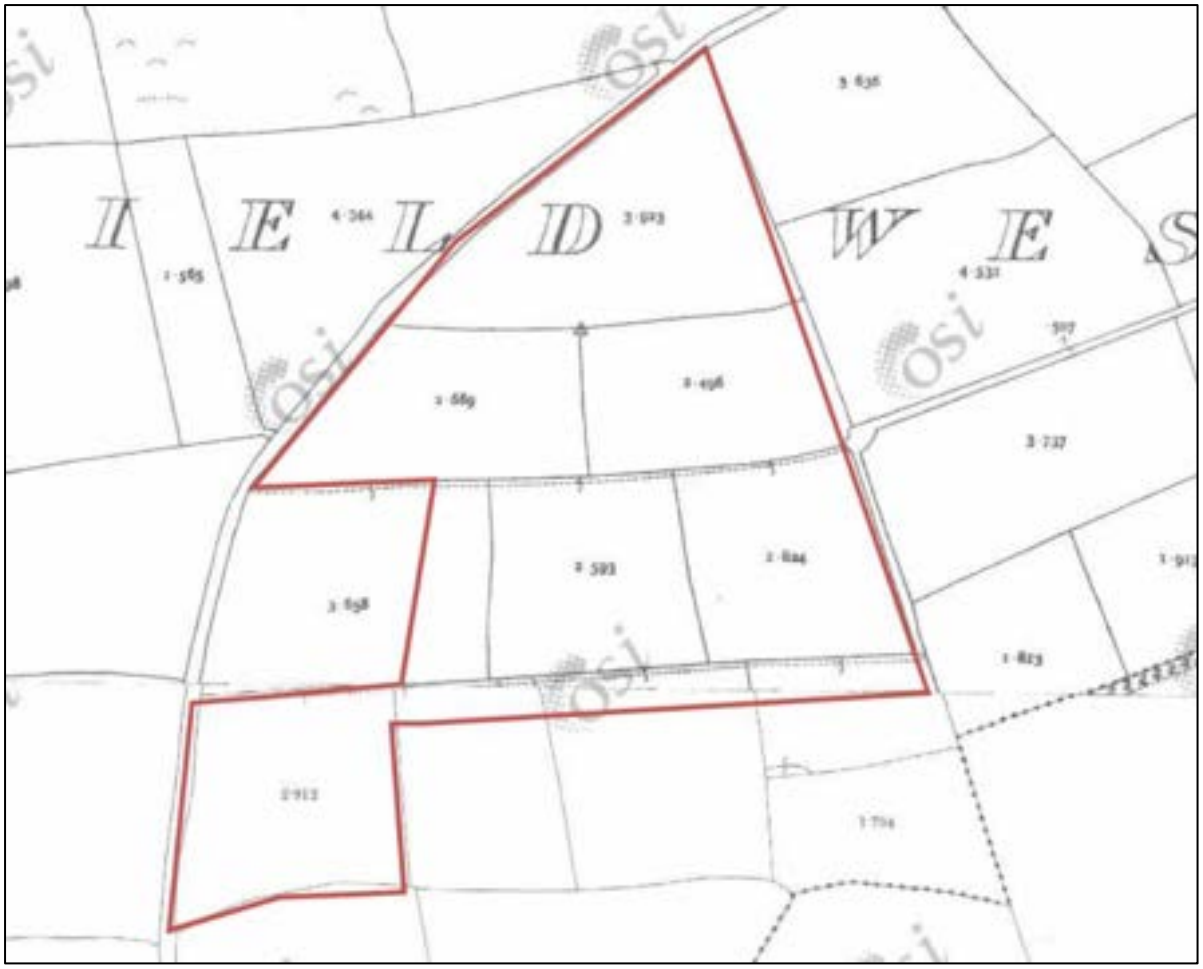

Figure 4: *Subject site as shown on the 25-inch edition Ordnance Survey Map (Source: Government of Ireland)*

3. Geophysical survey

A comprehensive geophysical survey of the site was carried out by Dr. Ger Dowling in January 2023, under detection device licence no. **23R0028** (Dowling 2023). A copy of the geophysical survey report is presented in **Appendix 3**.

Dr Dowling concluded that the survey did not reveal any anomalies of clear archaeological interest. A 'pit-type' response and several other slender curvilinear anomalies [1 - 4] are of archaeological potential, though in the absence of supporting evidence, such an interpretation is tentative. The subject programme of test trenching targeted those anomalies of archaeological potential (see **Figures 5** & **6** below), it also, as a precaution, targeted areas of disturbance that were identified as possibly being the result of quarrying and underlying geology.

***Figure 5**: Interpretative image based on the results of geophysical survey (after Dowling 2023)*

4. Archaeological testing programme

Archaeological testing was undertaken within the two agricultural fields at Broomfield West townland on Wednesday 28th and Thursday 29th of June 2023. Ten linear test trenches were excavated across the site (see **Figure 6** below). The trenches measured 25m to 80m in length and were excavated by a mechanical excavator, fitted with a 1.8m wide toothless grading bucket which operated under constant archaeological direction. No difficulties were encountered during testing and all trenches were excavated to the complete lengths outlined in the method statement which accompanied the licence application. A total of 490 linear meters of trenches were excavated, see **Table 1** below.

An underground, high pressure water pipe, runs southwards from the Midleton Water Treatment Plant, through the south-western portion of the site, as seen in the results of the geophysical survey (see **Figure 5**). Additional sub-surface infrastructure may also be present in this area. To avoid the potential impact on the town's water supply, no test trenches were excavated in this area.

The fields have been in use as agricultural grazing land to present. The machine driver who excavated the trenches was previously involved in the excavation of trial holes within the site, one of which was identified within **Trench 10**. Remnants of animal burrowing were identified in **Trench 5.** While evidence of agricultural activity was revealed in a number of the excavated trenches, **nothing of archaeological significance** was encountered during the testing programme. Specifically, none of the geophysical anomalies targeted were archaeological in nature.

Extracts from the photographic record are provided in **Appendix 1**, while each test trench is described in detail in **Appendix 2** to this report.

Table 1: *Test trenches and targeted anomalies*

Trench No.	*Length*	*Orientation*	*Targeting geophysical anomaly – see Figure 5*
T1	25m	ENE - WSW	Anomaly 3: narrow, curving positive
T2	80m	NNE - SSW	Quarry? /disturbed ground
T3	30m	ENE - WSW	Anomaly 1: strong positive 'pit-type' response and adjacent short positive curvilinear and Anomaly 2: arcuate positive trend
T4	70m	NNW - SSE	Anomaly 2: arcuate positive trend
T5	30m	NNE - SSW	Anomaly 4: short positive linear, Geology: broad, bifurcating, weakly positive–negative fluctuation
T6	35m	East - West	Positive trend, relict field boundary?
T7	25m	Northeast - Southwest	Geology: broad, bifurcating, weakly positive–negative fluctuation
T8	60m	NNW - SSE	Relict field boundary
T9	55m	NNW - SSE	Geology: broad, bifurcating, weakly positive–negative fluctuation Relict field boundary
T10	80m	WNW - ESE	Relict field boundary
Total	**490m**		

Figure 6: *Trenches excavated for this programme of archaeological testing (note the red-line indicate the alignment of overhead electric lines that pass over the subject site.*

5. Conclusions and recommendations

Conclusions

The subject lands have been assessed through a combination of desktop survey, site inspection, geophysical survey, and targeted archaeological testing. The geophysical survey did not reveal any anomalies of clear archaeological interest. A 'pit-type' response and several other slender curvilinear anomalies [labelled 1 – 4 on the survey results] were considered to be of ***archaeological potential***.

In June 2023, ten linear test trenches with a combined length of 490m were excavated across the subject site. Natural subsoil was identified at a depth of between 0.15m and 0.35m below the modern surface level. Evidence of agricultural activity and animal burrowing were encountered; however, **no artefacts, features or deposits of archaeological significance were revealed within the excavated test trenches.**

In conclusion, the absence of archaeological material from the excavated test trenches, along with the findings of the geophysical survey, the desktop review, and the elevated nature of the site, together indicate that there is ***very low potential for archaeological activity***.

Recommendations

Due to the lack of opportunity to test the south-western portion of the site, based on the presence of an underground water connection, it is recommended that any groundworks and site development works in the south-western portion of the site be archaeologically monitored under licence.

It should be noted that the above recommendations are subject to the approval of the National Monuments Service and Cork County Council.

6. References/sources

Cork County Development Plan 2022: https://www.corkcoco.ie/en/resident/planning-and-development/cork-county-development-plan-2022-2028 [Accessed on 09/05/2023]

Database of Irish Archaeological Excavations: http://www.excavations.ie/ [Accessed on 09/05/2023]

Dowling, G. 'Broomfield West, Midleton, County Cork', Unpublished archaeological geophysical survey. February 2023

Geohive Mapviewer Resource: http://www.geohive.ie/ [Accessed on 09/05/2023]

Government of Ireland's Historic Environment Viewer: http://webgis.archaeology.ie/historicenvironment/ [Accessed on 09/05/2023]

Heritage Map Viewer: https://heritagemaps.ie/WebApps/HeritageMaps/index.html [Accessed on 09/05/2023]

Trinity College Dublin. *Down Survey*. Available at: http://downsurvey.tcd.ie/ [Accessed on 09/05/2023]

Appendix 1: Testing programme photographs

***Plate 1**: Trench 1 facing east-northeast*

***Plate 2**: Trench 1 facing west-southwest*

***Plate 3**: Trench 2 facing south-southwest*

***Plate 4**: Trench 2 facing north-northeast*

***Plate 5**: Furrow identified within Trench 2, facing north-northeast*

***Plate 6**: Trench 3 facing east-northeast*

***Plate 7**: Trench 3 facing west-southwest*

***Plate 8**: Trench 4 facing south-southeast*

***Plate 9**: Trench 4 facing north-northwest*

***Plate 10**: Trench 5 facing north-northeast*

***Plate 11**: Trench 5 facing south-southwest*

***Plate 12**: Trench 6 facing East*

***Plate 13**: Trench 6 facing West*

***Plate 14**: Trench 7 facing northeast*

***Plate 15**: Trench 7 facing southwest*

***Plate 16**: Trench 8 facing north-northwest*

***Plate 17**: Trench 8 facing south-southeast*

***Plate 18**: Trench 9 facing south-southeast*

***Plate 19**: Trench 9 facing north-northwest*

***Plate 20**: Trench 10 facing east-southeast*

***Plate 21**: Trench 10 facing west-northwest*

Appendix 2: Description of test trenches

Trench ID	Tr1
Length	25m
Orientation	ENE - WSW
ITM co-ordinates	588089.786, 575200.877 588067.458, 575193.595
Description	The topsoil in this trench was a dark orangey brown sandy clayey silt with occasional to moderately frequent small sub-angular stones. It was 0.3 – 0.35m deep in this trench. The underlying subsoil was a mottled mix of light orangey brown and greyish brown clayey silt with a moderate frequency of angular limestone pebbles. The anomaly noted from the results of the geophysical survey and targeted by this trench, was identified as a shallow depression, with a modern ceramic sherd noted within its fill. An area with fragmentary charcoal pieces was identified but was deemed to relate to root burning. Nothing of archaeological significance was noted in this trench. **Plates 1 & 2**

Trench ID	Tr2
Length	80m
Orientation	NNE - SSW
ITM co-ordinates	588040.095, 575178.326 588038.702, 575097.456
Description	The topsoil in this trench was a dark orangey brown sandy clayey silt with occasional to moderately frequent small sub-angular stones. It was 0.2 – 0.3m deep in this trench. The underlying subsoil was a mottled mix of light orangey brown and greyish brown clayey silt with bands of angular limestone, particularly in the central and southern parts of the trench. Two linear features were identified, crossing the trench, these were 0.30m across, one was investigated and found to be 0.1m deep with a gentle U-shaped profile. These were running in a NNW-SSE direction and had been identified from the results of the geophysical survey. They most likely relate to agriculture. Nothing of archaeological significance was noted in this trench. **Plates 3, 4 & 5**

Trench ID	Tr3
Length	30m
Orientation	ENE - WSW
ITM co-ordinates	588144.529, 575172.874 588117.779, 575164.998
Description	The topsoil in this trench was a dark orangey brown sandy clayey silt with occasional to moderately frequent small sub-angular stones. It was 0.15 – 0.2m deep in this trench. The underlying subsoil was a mottled mix of light orangey brown and greyish brown clayey silt with bands of angular limestone. Nothing of archaeological significance was noted in this trench. **Plates 6 & 7**

Trench ID	Tr4

Length	70m
Orientation	NNW - SSE
ITM co-ordinates	588129.742, 575168.527 588152.962, 575105.889
Description	The topsoil in this trench was a dark orangey brown sandy clayey silt with occasional to moderately frequent small sub-angular stones. It was 0.2 – 0.35m deep in this trench. The underlying subsoil was a mottled mix of light orangey brown and greyish brown clayey silt with bands of angular limestone, areas of concentrated shale were noted towards the southern end of the trench. Nothing of archaeological significance was noted in this trench. **Plates 8 & 9**

Trench ID	**Tr5**
Length	30m
Orientation	NNE - SSW
ITM co-ordinates	588119.191, 575040.540 588114.918, 575011.459
Description	The topsoil in this trench was a dark orangey brown sandy clayey silt with occasional to moderately frequent small sub-angular stones. It was 0.2 – 0.3m deep in this trench. The underlying subsoil was a mottled mix of light orangey brown and greyish brown clayey silt with bands of angular limestone. A potential arced feature was noted towards the centre of the trench, the trench was extended to the east to ascertain whether the arc returned to form a circle, nothing was noted in the eastern extension. The arc was investigated but shown to lack any design or consistency. It was deemed to relate to animal burrowing activity. Nothing of archaeological significance was noted in this trench. **Plates 10 & 11**

Trench ID	**Tr6**
Length	35m
Orientation	East - west
ITM co-ordinates	588226.290, 575071.171 588182.976, 575064.785
Description	The topsoil in this trench was a dark orangey brown sandy clayey silt with occasional to moderately frequent small sub-angular stones. It was 0.2 – 0.3m deep in this trench. The underlying subsoil was a mottled mix of light orangey brown and greyish brown clayey silt with bands of angular limestone. Some ephemeral furrows were noted within the lower portion of the topsoil, these were orientated east to west and had been identified from the results of the geophysical survey. Nothing of archaeological significance was noted in this trench. **Plates 12 & 13**

Trench ID	**Tr7**
Length	25m
Orientation	Northwest - southeast
ITM co-ordinates	588213.979, 575037.883 588198.412, 575017.784

Description	The topsoil in this trench was a dark orangey brown sandy clayey silt with occasional to moderately frequent small sub-angular stones. It was 0.2 – 0.25m deep in this trench. The underlying subsoil was a mottled mix of light orangey brown and greyish brown clayey silt with bands of angular limestone, particularly concentrated in the centre of the trench. Nothing of archaeological significance was noted in this trench. **Plates 14 & 15**

Trench ID	**Tr8**
Length	60m
Orientation	NNW - SSE
ITM co-ordinates	588129.868, 575254.477 588156.793, 575202.399
Description	The topsoil in this trench was a dark orangey brown sandy clayey silt with occasional to moderately frequent small sub-angular stones. It was 0.15 – 0.2m deep in this trench. The underlying subsoil was a mottled mix of angular limestone with more confined areas of light orangey brown and greyish brown clayey silt. Nothing of archaeological significance was noted in this trench. **Plates 16 & 17**

Trench ID	**Tr9**
Length	55m
Orientation	NNW - SSE
ITM co-ordinates	588047.447, 575032.041 588071.391, 574983.614
Description	The topsoil in this trench was a dark orangey brown sandy clayey silt with occasional to moderately frequent small sub-angular stones. It was 0.25 – 0.35m deep in this trench. The underlying subsoil was a mottled mix of light orangey brown and greyish brown clayey silt with bands of angular limestone, these bands were particularly evident in the central portion of the trench. Nothing of archaeological significance was noted in this trench. **Plates 18 & 19**

Trench ID	**Tr10**
Length	80m
Orientation	NNW - SSE
ITM co-ordinates	588140.456, 575011.626 588220.945, 574976.160
Description	The topsoil in this trench was a dark orangey brown sandy clayey silt with occasional to moderately frequent small sub-angular stones. It was 0.2 – 0.25m deep in this trench. The underlying subsoil was a mottled mix of light orangey brown and greyish brown clayey silt with bands of angular limestone. The machine driver who excavated the trenches was previously involved in the excavation of trial holes within the site, one of these was identified towards the eastern end of this trench. This had been re-filled with stones, but the filling material contained modern inclusions such as plastic. Nothing of archaeological significance was noted in this trench. **Plates 20 & 21**

Appendix 3: Geophysical survey report

Prepared by Ger Dowling PhD MIAI

Geophysical Survey Report
Broomfield West, Midleton, Co. Cork

License No.: 23R0028
RMP: N/A

ITM : 588100, 575000

Ger Dowling, PhD MIAI
February 2023

Summary

This report details the results of a geophysical survey (Licence No.: 23R0023) at lands at Broomfield West, Midleton, Co. Clare. The survey was conducted as part of as part of a preliminary (pre-planning) archaeological investigation.

The investigation, comprising high resolution magnetic gradiometry, was implemented over two adjoining fields of pasture and covered an area of approximately 7.8 ha. in total size. This revealed several features of potential archaeological interest, as well as other remains indicative of past agriculture and land division. A possible area of disturbed ground (former quarry?) was also registered by the survey.

Survey details

Site Name: Broomfield West
Townland: Broomfield West
County: Cork

Parish: Midleton
Barony: Imokilly

RMP No.: N/A
ITM (centroid): 588100, 575000

Land use: Pasture
Geology: Flaser-bedded sandstone & mudstone (Cuskinny Member: Kinsale Formation)
Soils: Coarse loamy drift with siliceous stones (Ross Carbery Series)

Detection License No.: 23R0028
Planning Reference No.: N/A

Survey Type & Instrument: Fluxgate Gradiometer – Five-channel magnetometer
Sample/Transverse Interval: 0.05m/0.5m

Area Surveyed: *c*.7.8 ha.
Survey Date: 30 January 2023

License Holder: Ger Dowling
Report Author: Ger Dowling
Report Date: 01 February 2023

Contents

List of Tables

List of Figures

List of Plates

Abbreviations

AOD	Above Ordnance Datum
CO	Cork
GIS	Geographical Information Systems
GPS	Global Positioning System
ITM	Irish Transverse Mercator
nT	nanoTesla (unit of magnetic measurement)
OS	Ordnance Survey
RMP	Record of Monument and Places

Coordinate System

All GPS coordinates given in this report are in Irish Transverse Mercator (ITM)

1 Introduction

This report details the results of a geophysical survey (Licence No.: 23R0028) of lands at Broomfield West, Midleton, Co. Cork. The survey, comprising high resolution magnetic gradiometry, was focused on two adjoining fields of pasture and encompassed approximately 7.8 ha. in total size. The investigation was conducted as part of as part of a preliminary (pre-planning) archaeological investigation.

The site has not previously been subjected to geophysical survey and it was hoped that the investigation would identify and map any subsurface archaeology that may be present.

2 Site Location

The survey is located in the townland of Broomfield West, Co. Cork (Figure 1). The site, which lies on the northern edge of Midleton, is in the Barony of Imokilly and the Civil Parish of Midleton.[1]

[1] Https://www.logainm.ie/en/12476: accessed on 23 December 2022.

3 Survey Background

The survey was conducted was conducted in respect of a pre-planning study (archaeological reconnaissance).

4 Archaeological Background

4.1 Recorded/Known Archaeology

There are no recorded archaeological monuments within the lands of the survey area (Figure 2). The nearest recorded site is a Graveyard (SMR CO65-096) located nearly 600m to the northwest.[2]

Early historic maps show the survey area as farmland (Figures 3—4). A vernacular building and surrounding property plot are depicted on the first-edition six-inch Ordnance Survey Map (1837—1842) next to the road that skirts the survey area on the southwest (see Figure 3).

4.2 Previous Investigations

No recorded archaeological investigations have previously been conducted at the survey area.[3]

[2] Historic Environment Viewer (archaeology.ie): accessed on 23 December 2022.
[3] Https://excavations.ie: accessed on 23 December 2022.

5 Survey Location and Aims

The investigation, comprising high resolution magnetic gradiometry, focused on two adjoining fields of pasture and encompasses approximately 7.8 ha. in total size (Plates 1–3; Figure 5). The fields occupy the gently rounded summit and south-facing slope of a low rise (approx. 68m AOD) that offers extensive panoramic views of the surrounding landscape, especially southwards to the town of Midleton (Plate 4).

Separated by a hedgerow, the target lands are bounded on the west and north by a minor road that extends roughly northwards from the Broomfield residential estate. Immediately adjacent to the road, on the east, and surrounded on three sides by the survey area, is the Midleton Water Treatment Plant (Plate 5). The eastern boundary of the target lands is delimited by a hedgerow, with a residential estate located directly to the south. The wider landscape comprises a mixed urban and rural environment, with Midleton town to the south and farmland (tillage and pasture) to the north and east.

The underlying bedrock of the locality comprises sandstone, siltstone and mudstone (Central Clare Group).[4] The soils are dominated by fine loamy drift with siliceous stones (Kilrush Series).[5]

The geophysical investigation aimed to:

- identify any geophysical anomalies of possible archaeological origin within the specified survey area
- accurately locate these anomalies and present the findings in map form
- describe the anomalies and discuss their likely provenance in a written report
- incorporate all of the above in a report to the Client

[4] Geological Survey of Ireland Spatial Resources, Public Data Viewer Series: https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228 [Accessed 08 December 2022].

[5] Irish National Soils Map, 1:250,000k, V1b (2014): http://gis.teagasc.ie/soils/map.php [Accessed 08 December 2022].

6 Survey Methodology and Instrumentation

The survey involved high-resolution magnetic gradiometry survey (Table 1). This technique measures changes in the magnetic properties of the soil and is widely used in modern investigations due to its ability to detect a broad range of sub-surface archaeological remains, including ditches and pits, and industrial features associated with metalworking and pottery production.

The magnetic survey was conducted using a five-channel fluxgate gradiometer system combined with cm-precision GPS (georeferenced to Irish Transverse Mercator and Ordnance Datum). Mounted on a cart and pulled by a quad bike, the system records magnetometer and GPS data simultaneously into a single data file. The data capture strategy involved logging readings every 0.05m intervals along transects spaced 0.5m apart, with a maximum traverse width of 2.5m. The sampling strategy produces a high-resolution dataset, giving clarity to any archaeological features detected.

The highly accurate positioning of the survey data provides strong confidence when integrating the geophysical results with other datasets such as aerial imagery in GIS, and also ensures repeatability should further investigation of anomalies (e.g., test excavation) be required.

Table 1. Geophysical survey details

Technique	Instrumentation	Sensor spacing	Sample rate	Survey Area	Number of recorded data
Magnetic Gradiometry	Five-channel fluxgate gradiometer array	0.5m	40 Hz	*c*.7.8 ha.	397,158

7 Data Management, Processing and Interpretation

Gradiometry data was logged to a laptop computer and archived daily to an external hard drive. The collated data was processed using the following methodology:

- Real-time positioning of magnetometer data based on GPS measurements;
- Processing (Zero Mean Transect) of collated magnetometer data;
- Gridding (nearest neighbour interpolation); and
- Export of georeferenced greyscale images at optimum visual range

The processed data was imported into QGIS for final image production (Figures 6–8). Final geophysical datasets have been formatted as raster data models/GeoTiffs (projected to ITM, EPSG:2157) to enable subsequent geospatial analysis. Fieldwork, data processing and reporting adhered to the most up-to-date guidelines for conducting archaeo-geophysical surveys.[6] All geophysical raster datasets will be digitally archived to best practice.[7]

[6] Schmidt A., Linford P., Linford N., David, A., Gaffney C., Sarris A., and Fassbinder J. 2016. *EAC Guidelines for the Use of Geophysics in Archaeology*: *Questions to Ask and Points to Consider*. EAC Guidelines 2. [Online] Available from: https://f64366e3-8f7d-4b63-9edf5000e2bef85b.filesusr.com/ugd/881a59_fdb1636e95f64813a65178895aea87cf.pdf

[7] Niven, K. 2012. *Raster Images: A Guide to Good Practice*. Archaeology Data Service/Digital Antiquity, Guides to Good Practice. [Online] Available from: http://guides.archaeologydataservice.ac.uk/g2gp/RasterImg_Toc; & Schmidt, A. and Ernenwein, E. 2012. *Guide to Good Practice: Geophysical Data in Archaeology*. Oxford: Oxbow.

8 General Considerations and Complicating Factors

8.1 Access and Ground Conditions

The survey area comprises two large fields of pasture. The northern field, encompassing the summit of a low rise, is mostly flat, with a gentle downslope to the south. The lower, southern, field is more steeply sloped, giving way to a residential estate on the south and the Water Treatment Plant on the west. The eastern part of the two fields is traversed north to south by an overhead electricity wire. There were no obstacles to the survey.

8.2 Modern Interference

Numerous small-scale 'ferrous (dipolar) responses are evident in the results from the gradiometry survey. These are a common occurrence in magnetic data and in most cases represent modern metal debris contained within the topsoil.

Areas of magnetic disturbance deriving from survey in proximity to the Water Treatment Plant, houses, wire fences and field gates were recorded in places along the edges of the survey area. The line of a modern metal pipe extending southwards from the Water Treatment Plant was also identified by the survey.

8.3 Former Settlement and Land Use

Former settlement is indicated by a slender, rectilinear 'ditch-type' response (labelled '5' on Figure 7) recorded by the survey directly adjacent to the road in the southern field. This appears to represent the partial footprint of a property/garden plot associated with a vernacular building depicted on the first-edition six-inch Ordnance Survey Map (1837—1842; see Figure 3).

Several former field boundaries recorded on early historical maps were also mapped (for historical mapping see Figures 3 and 4). Although not recorded on the early maps, a narrow positive linear that can been seen in the dataset extending south to north across the eastern side of the two fields may also represent former field boundary; this is marked '?Relict field boundary' on Figure 7. Former cultivation is also apparent in the dataset as a series of slender, closely set, positive–negative linear anomalies. These overlap in places, attesting to different phases of tillage farming.

8.4 Possible Former Quarry/Disturbed Ground

A broad, amorphous area of positive magnetism detected by the survey extending eastwards from the road in the north field may represent the infilled remains of a quarry and/or some other form of disturbed ground. This interpretation is tentative.

8.5 Natural Geological and Soil Variation

Natural variations in the depth and composition of the underlying (near-surface) geology and soils probably accounts for the broad, bifurcating, weakly positive–negative fluctuation that extends east–west across the southern field.

The highly variable magnetic background response, characterised by multiple 'pit-type' responses and less coherent spreads or deposits of magnetically enhanced soils, likely reflects the impact of modern agriculture (tillage) and/or natural variations in the underlying soils.

9 Survey Results

Table 3. Survey results

Site name	Broomfield West		
ITM (centroid)	588100, 575000		
Area surveyed	*c*.7.8 ha.		
Figure Numbers	6–8		
Anomaly Number	***Form/nature of anomaly***	***Possible sources(s) of anomaly***	***Interpretative discussion***
1	Strong positive 'pit-type' response and adjacent short positive curvilinear	Possible archaeology/ modern	Possible pit/spread and potentially associated 'ditch-type' feature (*c*.5m in length N–S) directly to S. Anomalies potentially related to [2], some 7m to W. Magnetic strength of 'pit-type' response (up to 38nT) is suggestive of burnt/fired material, such as might be associated with a hearth- or oven-type archaeological feature. Tentative interpretation. A modern/ferrous origin also possible. ***See Figure 8 for detail***
2	Arcuate positive trend	Possible archaeology	Possible narrow ditch/trench. May be associated with [1]. Speculative interpretation. ***See Figure 8 for detail***
3	Narrow, curving positive	Possible archaeology/ agricultural	Possible narrow ditch/trench (length of chord *c*.28m N–S). May equally reflect a combination of slightly enhanced plough trends. ***See Figure 8 for detail***
4	Short positive linear	Possible archaeology/ agricultural	Possible ditch/trench, *c*.27m NW–SE. Interpretation as an archaeological feature is cautious, as anomaly traverses steepled sloped terrain. Could instead relate to agricultural activity; may be a field drain, for instance.
	Positive, negative and positive–negative–positive linears	Agricultural	Relict field boundaries. Marked on both the first-edition six-inch Ordnance Survey Map (1837—1842) and the first-edition 25-inch Ordnance Survey Map (1888—1913).

	Slender positive linear	Possible agricultural	Possible former field boundary. Extends N–S across the eastern part of the survey area for about 230m. Appears to connect with E–W relict field boundary in southern field.
5	'L-shaped' positive anomaly	Historic settlement	Probable partial footprint of rectilinear property/garden boundary (*c*.23m E—W by 22m N—S. Recorded on first-edition six-inch Ordnance Survey Map (1837—1842), where it is shown associated with a small building/structure. Not recorded on first-edition 25-inch Ordnance Survey Map (1888—1913).
	Positive trends	Possible archaeology/ agricultural/ modern	Possible ditches/drains.
	Multiple, closely spaced, parallel, positive–negative linears	Agricultural	Former cultivation, various orientations. Some examples overlap, reflecting different phases of tillage farming.
	Broad, amorphous area of positive magnetism	Possible archaeology/ agricultural/ modern	Possible infilled quarry or other form of disturbed ground. Extends over an area measuring some 135m E–W by 25m N–S. Precise nature and significance uncertain.
	Multiple 'pit-type' responses	Possible archaeology/ agricultural/natural	Responses likely represent combined 'noise' from localised soil/geological variation and/or disturbance from recent land use and modern ferrous debris. However, an archaeological for some anomalies within this group cannot be discounted.
	Multiple ferrous responses	Modern	Ferrous debris.
	Broad, bifurcating, weakly positive–negative fluctuation	Natural	Probable geology. Extends E–W across the centre of steeply sloped southern field.
	High-intensity, positive–negative linear	Modern	Buried ferrous pipe (*c*.90m in NW–SE length).
	Areas of magnetic disturbance	Modern	Disturbance from adjacent Water Treatment Plant, houses, pylons, field gates and post-and-wire fences.

10 Conclusion

The geophysical survey at Broomfield West did not reveal any anomalies of clear archaeological interest. A 'pit-type' response and several other slender curvilinear anomalies [1—4] are of archaeological potential, though in the absence of supporting evidence, such an interpretation is tentative. Former settlement is represented in the dataset by the partial outline of a rectilinear enclosure [5] that was mapped by the survey directly adjacent to the road in the southern field. This comprises a property/garden plot associated with a vernacular building depicted on first-edition six-inch Ordnance Survey Map (1837—1842).

Evidence for past agriculture is plentiful and includes a series of linear anomalies that reflect the levelled remains of field boundaries recorded on early historical maps. What may be a large area of disturbed ground (former quarry?) was also registered by the survey in the northern field; the precise nature and significance of the latter feature is uncertain. Natural variations in the underlying soils and geology likely accounts for many of less coherent spreads or deposits of magnetically enhanced soils registered by the survey across the target lands, as well as the broad, bifurcating, weakly positive–negative anomaly that extends east–west across the centre of the southern field. A modern (water?) pipe extending from the Water Treatment Plant was also recorded.

10.1 Statement of Indemnity

The geophysical properties of sub-surface features must contrast sufficiently with the surrounding soils/background variation to enable them to be detected and mapped using geophysical methods. As such, the clarity and definition of buried features can vary considerably, with some having well-defined signatures while others are only barely visible, or not discernible, in geophysical imagery. A lack of geophysical anomalies cannot be taken to imply the absence of archaeological features.

The interpretations presented here are invariably provisional and further work (e.g., test trenching) is required to fully assess the nature and archaeological potential of the anomalies identified by the present investigation.

11 Figures

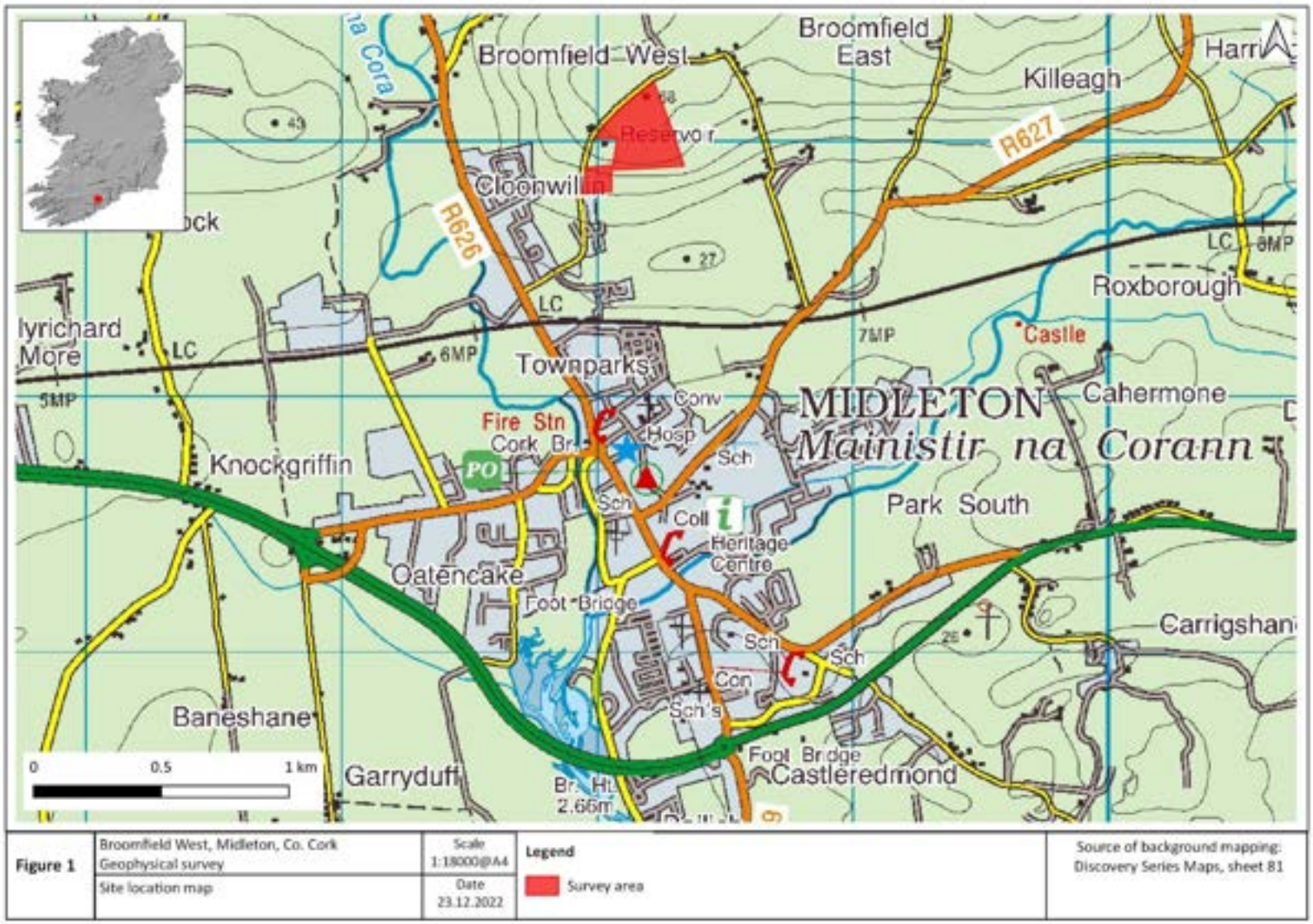

Figure 1. Site location map, showing survey area highlighted in red.

Figure 2. Location of recorded archaeological sites in the vicinity of the survey area.

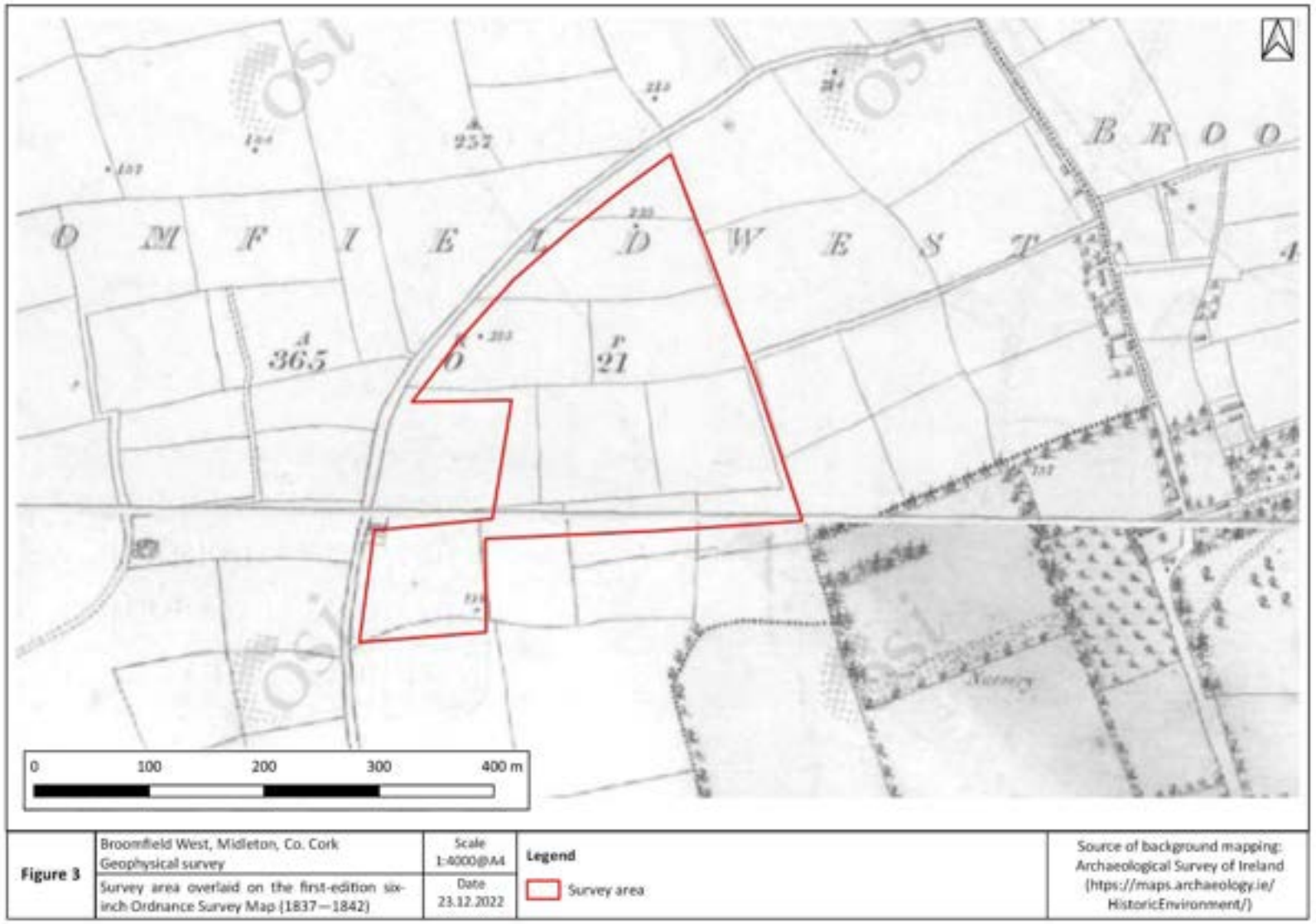

Figure 3. The survey area overlaid on the first-edition six-inch Ordnance Survey Map (1837—1842).

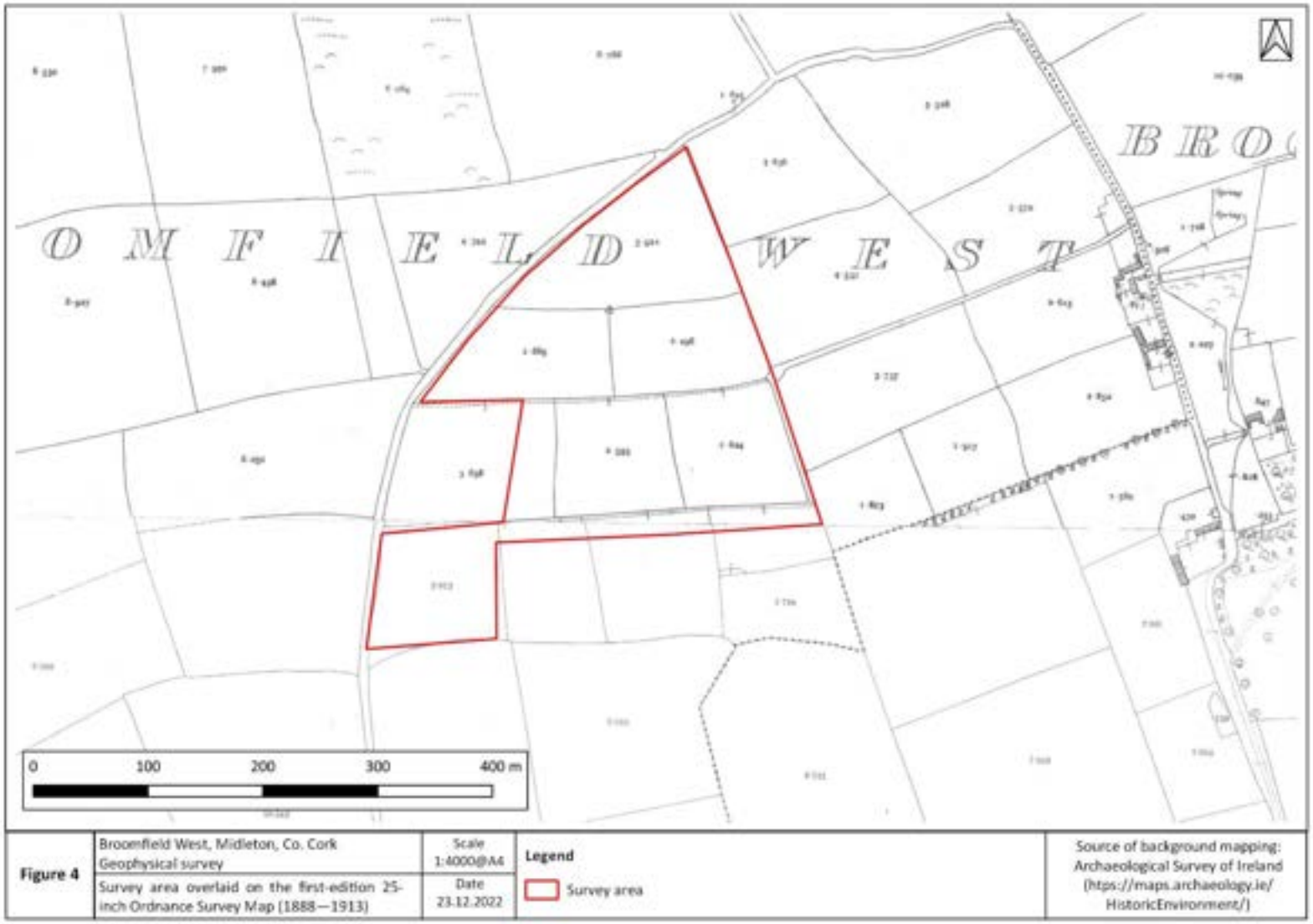

Figure 4. The survey area overlaid on the first-edition 25-inch Ordnance Survey Map (1888—1913).

Figure 5. Survey area.

Figure 6. Greyscale image of gradiometry results.

Figure 7. Interpretative plan showing principal geophysical anomalies.

Figure 8. Detail of anomalies [1]–[3].

12 Plates

Plate 1. Northern field, viewed from the west.

Plate 2. View southeast across the southern field.

Plate 3. Southwest corner of southern field, looking southwest.

Plate 4. Looking south over Midleton from the northern field.

Plate 5. Water Treatment Plant, viewed from the east.