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Cork Line Level Crossings Project

Co. Cork

Geophysical Survey Report

Licence 20R0239

XC201 Thomastown: 557517, 624576
XC212 Ballycoskery: 554660, 617609
XC215 Shinanagh: 553064, 614670
XC219 Buttevant: 553338, 609771

Prepared for Iarnród Éireann

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PROJECT DETAILS

Project	Geophysical Survey for Cork Line Level Crossings Project
Licence No.	20R0239
Townland(s)	County Cork: Ballycoskery, Ballynageragh, Creggane and Bregoge County Limerick: Effin
RMP No.	CO008-69 – (Church) CO007- 119001- (Castle - unclassified) & CO008-035- (Moated Site)
ITM Ref.	XC201 Thomastown: 557517, 624576 XC212 Ballycoskery: 554660, 617609 XC215 Shinanagh: 553064, 614670 XC219 Buttevant: 553338, 609771
Land Use	Pasture
Survey Type	Fluxgate Gradiometer
Instrument	Bartington Grad 601-2
Sample/Traverse interval	0.25m/0.5m
Archaeologist	Donald Murphy
Report Authors	Donald Murphy and Robert Breen
Planning Ref.	Pre-planning
Client	Iarnród Éireann
Report Date	14th December 2020
ACSU Ref.	2058

SUMMARY

This report details the results of a geophysical survey conducted on four areas located along the Cork to Dublin Railway Line between Buttevant in County Cork and Kilmallock in County Limerick; XC201 Thomastown (557517, 624576); XC212 Ballycoskery (554660, 617609); XC215 Shinanagh (553064, 614670) and XC219 Buttevant (553338, 609771).

The geophysical survey was carried out at a pre-planning stage to inform the preparation of an Environmental Impact Assessment Report (EIAR) in relation to the Cork Line Level Crossings Project.

The survey was carried out to assess the archaeological potential of the four areas. The surveyed area extends across 11.3 hectares and consists of 22 fields used currently for cattle grazing.

There are three sites listed in the Record of Monuments and Places (RMP) in close proximity to the proposed development; a church (CO008-69) located to the west of the survey area at XC212 Ballycoskery; a Castle-unclassified (CO007-119001) located in the vicinity of the survey area at Ballynageragh townland (XC215 Shinanagh) and a moated site (CO008-035-) just south of the survey area at XC212 Ballycoskery.

The geophysical survey was conducted by Donald Murphy and Robert Breen of Archaeological Consultancy Services Unit Ltd. (ACSU) under licence 20R0239 issued by the Department of Culture, Heritage and the Gaeltacht in consultation with the National Museum of Ireland. The site consists of 22 fields. However, 3 fields in Buttevant were deemed unfit for survey due to being flooded.

Anomalies of definite or potential archaeological origin were identified in the surveys at XC212 Ballycoskery, XC215 Shinanagh and XC219 Buttevant. All sites produced evidence for land use in the form of field boundaries and cultivation activity which may suggest further archaeological potential at these sites. Significant archaeological remains were identified adjacent to the RMP Castle (CO007-119001) located in the townland of Ballynageragh (XC215 Shinanagh).

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1. BACKGROUND & AIMS TO SURVEY

This report details the results of a Geophysical Survey conducted on four areas located along the Cork to Dublin railway line between Buttevant in County Cork and Kilmallock in County Limerick (Figures 1, 2). The survey was carried out to assess the archaeological potential of the four areas that form part of the alternative options for the Cork Line Level Crossings Project. The Project involves the removal/upgrading of seven separate level crossings located along the Cork to Dublin rail line in order to reduce health and safety risks associated with the interface between road users and rail traffic. The survey areas are located near four level crossings as follows: XC201 Thomastown (557517, 624576); XC212 Ballycoskery (554660, 617609); XC215 Shinanagh (553064, 614670) and XC219 Buttevant (553338, 609771). There are two sites listed in the Record of Monuments and Places (RMP) within close proximity to two of the survey areas; a church (CO008-69) located to the west of the survey area at XC212 Ballycoskery; a moated site (CO008-035-) also in the townland of Ballycoskery and a Castle-unclassified (CO007-119001) located in the vicinity of the survey area at Ballynageragh townland (XC215 Shinanagh).

The geophysical survey was conducted by Donald Murphy and Robert Breen of Archaeological Consultancy Services Unit Ltd. (ACSU) under licence 20R0239 issued by the Department of Culture, Heritage and the Gaeltacht in consultation with the National Museum of Ireland. A full detailed gradiometer survey of each area was undertaken using a Bartington GRAD 601-2 dual-sensor fluxgate gradiometer system. A total combined area of 11.3 Hectares was surveyed.

The objectives of the geophysical survey were 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; and
- incorporate all of the above in a report to the Client.

The findings of the survey will help inform the planning process and the scope of any future works at the four areas.

2. DESCRIPTION OF SURVEY AREAS

All four survey areas are located in green fields which are all used for pasture. The survey areas at XC201 Thomastown, XC212 Ballycoskery and XC219 Buttevant are relatively flat and all three areas were extremely wet after a prolonged period of heavy rain before the survey took place. The western portion of the survey area at XC219 Buttevant was actually flooded and could not be surveyed. At XC215 Shinanagh the land slopes from north to south with drier land on the hill at the north end but waterlogged towards the south.

At Thomastown shallow well drained mineral (mainly acidic) soils overly a bedrock geology of undifferentiated carboniferous limestone. The soils at Ballycoskery consist of poorly drained mineral soils above a dark muddy limestone and shale which is part of the Ballysteen formation. At Shinanagh the soils vary from peaty poorly drained mineral soils at the north end to alluvial marl at the south end and the bedrock varies from sandstone, mudstone and thin limestone at the north end to dark muddy limestone and shale at the south end. At Buttevant, a pale grey massive mud-grade limestone bedrock is overlain by peaty poorly drained mineral soils (Geological Survey of Ireland Spatial Resources, Public Data Viewer Series).

3. METHODOLOGY

A full detailed gradiometer survey was undertaken at each of the four areas using a Bartington GRAD 601-2 dual-sensor fluxgate gradiometer system. A detailed survey was conducted with a sample interval of 0.25m and a traverse interval of 0.5m for all the survey areas with variations in the magnetic field between -100nT to +107.834nT. The survey grids measured 10m by 10m and were set out on the ground using a Trimble Geo7x with 1cm accuracy using the Irish Transverse Mercator projection (ITM). Fieldwork, data processing and reporting adhered to the most up-to-date guidelines for conducting archaeo-geophysical surveys (Schmidt et al. 2016; Chartered Institute for Archaeologists 2014; AHDS n.d; Bonsall 2014). The magnetometer was calibrated in the field in accordance with the manufacturers instructions. The survey data was logged to a laptop computer and archived to the company's cloud servers and internal servers. The data was then processed using Geoplot 3.0 software.

Processing included:

- clipping of the range to enhance weaker anomalies,
- removal of striping where required
- edge matching of adjacent survey panels
- interpolation of the data from 0.5m to 0.25m traverse spacing to enhance the quality

4. CONDITIONS OF SURVEY

Weather conditions during the survey period were relatively dry with just two wet days but a prolonged period of wet weather in advance of the survey resulted in the fields being very wet with standing water in some areas. At XC219 Buttevant the three most westerly fields (Fields 1-3) could not be surveyed due to flooding. The presence of livestock in all areas before the survey took place resulted in all fields being relatively rough underfoot which resulted in the grids being surveyed at a slower pace than normal. This had no impact on the survey results however.

5. ARCHAEOLOGICAL BACKGROUND

5.1 Archaeological & Historical Background

Earlier prehistoric period (c.8000–2200 BC)

From prehistoric times onwards, the areas around the Ballyhoura Hills have been significant. These represent a series of steep hills that reach a maximum height of 528 m OD at Seafin (Doody 2008). The areas of the proposed development extend along the westernmost side of these hills, through which the River Awbeg, a tributary of the River Blackwater, also flows.

County Cork and County Limerick were subject to human settlement since Mesolithic times (c. 8000–4000 BC) when early hunter-gatherer communities would have exploited the rivers, lakes and other natural resources around them. As there are no monuments associated with the Mesolithic period, and associated settlement sites can be difficult to locate in the landscape, establishing a detailed picture of the lifestyle of these Mesolithic people must often reply on scatters of diagnostic stone tools. At Kilcummer, Co. Cork, for example, the discovery of a scatter of microliths, overlooking the junction of the Rivers Blackwater and Awbeg, suggests an Early Mesolithic presence, although subsequent excavation did not reveal any significant in situ deposits (Woodman 2015, 205–6). A reappraisal of excavated material from a ring barrow at Rathjordan near Lough Gur in County Limerick also turned up some microliths, while both Earlier and Later Mesolithic human remains and artefacts were recovered from Killuragh Cave in County Limerick (ibid., 79).

The Neolithic period (c. 4000–2500 BC) saw the gradual spread of farming throughout Europe, which appears to have also brought with it the custom of communal burial in great stone structures known as megalithic tombs. The cultivation of crops and the husbandry of livestock brought necessary changes in the lifestyle of the people, including the development of more long-term dwellings and extensive woodland clearances for farmland. There are two megalithic structures (LI055-039---- and LI055-040----) recorded east of the Dublin–Cork Railway Line in the townland of Jamestown, on the northern slope of the Ballyhoura Hills. At Pepperhill, south-west of Buttevant, the remains of a possible Neolithic house (CO016-226001-) were excavated in 1986 during the construction of the Bruff-Mallow gas pipeline (Gowen 1988, 44–51).

Stone circles, stone alignments and standing stones were also markers of important locations during the early prehistoric period and there are several standing stones recorded in the surrounding townlands, including Curraghcloonabro East (CO002-085----); Rathgoggan South (CO003-020----); Lisballyhay (CO008-071----); Walshestown (CO016-075001-); Bregoge (C016-208----); Velvetstown (CO017-006002-); Kilcolman East (CO017-023----); Ballyellis (CO017-034----); Spital (CO017-118----); Rathclare (CO017-120---- and CO017-126----) and Ballynaboola (CO008-012002-). Many of these may date to the later Neolithic to earlier Bronze Age and are long understood to mark important places, including burials, boundaries and routeways. At Ballynaboola, for example, the standing stone was dislodged during forestry operations in the proximity to a cluster of three cist burials (CO008-012001-,003- and 004-) containing cremated bones, although its original location is not known. That at Walshestown was nearly 10 m west of a burial ground (CO016-075002-) and that at Velvetstown was c. 50 m north-east of a possible earthwork (CO017-006001-).

Later prehistoric period (c.2200 BC–AD 400)

From the beginning of the Bronze Age (c. 2200–800 BC), inhumation and cremation burials were deposited in pits and stone-lined cists. Many of these burials were accompanied by food vessels and urns, and sometimes copper, bronze or worked stone objects. These sites are often represented by a single grave with no above-ground markers, but others were placed in mounds or barrows. At Rathgoggan South, a possible pit burial was discovered in 1986 during the construction of the Bruff-Mallow gas pipeline, comprising an oval pit filled with abundant charcoal and flecks of burnt bone (Gowen 1988, 179). As mentioned above, three cists were uncovered at Ballynaboola, north-west of Newtown, and although little information survives they appear to have contained cremated bone and may date to this period. A series of barrow monuments are also recorded in the surrounding townlands, including Gortskagh (CO002-016----); Ardnageehy (CO007-052----); Castlewrixon South (CO008-028---- and CO008-032----); Garrane (CO008-062----, -063---- and -064----) and Kilcolman West (CO017-037002-). Notably, the cluster of barrows at Garrane is just north of the three Ballynaboola cists. Several mounds and ring-ditches are also recorded in the area, some of which may also represent barrow monuments. While these monument types frequently date to the Bronze Age, barrow monuments also continued into the Iron Age (c. 800 BC–AD 400).

Burnt mounds (also known as fulachtaí fia) comprise the most commonly discovered evidence for prehistoric settlement across Ireland and represent the use of pyrolithic technology to boil water, with those noted close to a trough generally interpreted as cooking/industrial sites (Hawkes 2018). They generally consist of a low mound of charcoal-enriched soil mixed with an abundance of heat-shattered stones, commonly forming a horseshoe shape in proximity to a trough, and are found in low-lying marshy areas or close to streams, springs and other water sources. Often these sites have been ploughed out and survive as a spread of heat-shattered stones with no surface expression. Analysis of these sites indicates that the tradition originated in the Early Neolithic and continued intermittently until sometime on the mid-first millennium BC, with a concentration of use in the Middle and Late Bronze Age (ibid., 115). A large number of burnt mounds are recorded in the surrounding townlands, including one (CO008-061----) directly beside the Garrane barrows and a cluster of six burnt mounds (CO017-037001-, 003-, 004-, 005-, 006-, 007-) surrounding the Kilcolman West barrow and another (CO008-031----) just south of one of the Castlewrixon South barrows. Many of these burnt mounds are known from on-site surveys, aerial photography and local information, but others have been excavated. Two examples at Rathgoggan South (CO003-015001- and 002-),

just south-east of Charleville, and a further two sites at Shinanagh (CO007-131001- and 002-), comprised spreads of burnt mound material (Gowen 1988, 179). The latter two sites are north of one of the areas (XC215 Shinanagh) and highlight the possibility of similar sites being uncovered in this landscape.

Iron Age occupation has traditionally been difficult to identify in Ireland but recent excavations and research has greatly increased the number of sites and finds across the country (see Corlett & Potterton 2012). Alongside burnt mounds, roundhouses, cereal-drying kilns, metalworking sites and burials in ring-ditches and flat graves have also been increasingly discovered. For example, to the east of the development area, on the southern side of the Galty Mountains, an embanked ring-ditch associated with cremated bone and nine blue glass beads and two pieces of fused glass was dated to the Middle Iron Age, while a nearby circular structure with associated smithing heath was similarly dated (McQuade & Molloy 2012). Both sites, in the townland of Knockcommane, Co. Limerick, were excavated in advance of the construction of the N8 Cashel–Mitchelstown Road Improvement Scheme.

Early Medieval (c. AD 400–1100)

It is suggested that from at least the fifth century AD, significant increases in population were brought about by new agricultural practices. Pollen records dated to this period suggest a huge upsurge in grasses and weeds associated with the development of pasture and arable farming (Aalen et al. 1997, 44). During this period, the development of new plough types and horizontal watermills were two innovations that would have provided farming communities with increased levels of agricultural production. This evidence for economic growth is best seen in the widespread distribution of early medieval (c. AD 400–1100) settlement sites, which occurred as dispersed defended homesteads on lakes (crannógs) and across the wider landscape as 'ringforts' or raths (O'Sullivan et al. 2013). A rath is generally defined by an earthen bank, formed by material thrown up from a fosse or ditch located immediately outside the bank. Comparable enclosures constructed of stone are referred to as cashels. Generally, raths vary in size from 25–50 m in diameter and are usually circular in plan but can also be oval or D-shaped. Some have more than one bank and ditch but such examples are rarer than the simpler or univallate type. Raths generally contain houses and ancillary buildings, with excavated examples revealing evidence for activities related to agriculture as well as small-scale craft and industry. Generally, the internal structures would have been made of perishable materials such as wood and straw, however, stone was also used, particularly in cashels. Rural settlement sites such as these were also positioned within wider agricultural landscapes, with many recent excavations uncovering evidence for field systems related to cultivated crops and livestock management, as well as ancillary activities such as processing cereals and iron-working practices (see Corlett & Potterton 2011).

There are a high number of recorded enclosures and raths in the surrounding townlands and in close proximity to the proposed development areas. In the environs of the survey area at Ballycoskery there is a number of such monuments (f. ex. CO008-033, CO008-034, CO008-005, CO008-039, CO008-040). According to local information, the eastern side of the ringfort (CO008-040----) was levelled in 1984 but related sub-surface features may remain preserved in situ. Geophysical survey (Licence no. 20R0017) undertaken in this area in 2020 resulted in identification of a number of features of archaeological and potential archaeological significance. The anomalies identified may be associated with the partially levelled ringfort and/or with other phases of settlement and agricultural activity within the site including remains of a possible avenue/droveway linking with a small circular enclosure. At Bregoge, Co. Cork, a ringfort – rath (CO016-211----) is just west of the survey area at XC219 Buttevant, and similarly, at Effin, Co. Limerick, an enclosure (LI047-045----) is directly east of the survey area at XC201 Thomastown. Both of these have the potential to identify associated archaeological features.

Overall, as the wider landscape is dominated by ringforts/raths, this is indicative of a strong early medieval presence in the area. It is notable, however, that in some areas, particularly the west of Ireland, 'ringforts' were also being built and occupied into the medieval period, while others have evidence for later re-used (FitzPatrick 2009), suggesting that some of these unexcavated enclosures could be later in date.

Late Medieval (c. AD 1100–1600) to Post-Medieval (c. AD 1600–1800)

Charleville, from the Irish Ráth Luirc or An Ráth, would have been extensively occupied during the early medieval period due to the rich agricultural land in this area, known as the Golden Vale. The old name for the area, Rathcogan or Ráth an Ghogánaigh, is reputed to relate to Miles de Cogan, who was granted lands here in 1177 following the Norman invasion (Binchy 1962). During the Elizabethan Munster Plantation, the present town was founded and named Charleville under Royal Charter in 1671 (Flynn 2011, 5). With his residence subsequently burnt in 1690 by the Irish under the command of the Duke of Berwick.

Buttevant was similarly founded during the Anglo-Norman period, with the name representing a corruption of a French word for outpost (Flynn 2011, 5). On the southern side of Buttevant, overlooking the River Awbeg to the east, is the remains of a 13th-century Anglo-Norman masonry castle (CO017-054001-) built by the de Barrys, who were also granted a fair and market at Buttevant in 1234 (Power et al. 2000, 517). There are also several mottes and moated sites within the surrounding townlands, both suggesting the remains of Anglo-Norman sites built in the late 12th/early 13th century and the late 13th/early 14th century respectively. A moated site (CO008-035----) at Ballycoskery, Co. Cork, for example, is directly south and west of the area (XC212 Ballycoskery) proposed for Geophysical Survey. It comprises a rectangular area measuring nearly 40 m by 30 m defined by an earthen bank with an external ditch (ibid., 493).

At XC215 Shinanagh, the northern extent of an area of the proposed Geophysical Survey is in close proximity to the site of a castle (CO007-119001-) situated on a north-facing slope 600 m north-east of the River Awbeg and known as Rathmore Castle. Although no surface trace remains it was reputedly a castle of the Roches that was destroyed in the 17th century (Power et al. 2000, 509). An excavation directly to the east in 1986 uncovered a deposit of burnt stone, stake- and post-holes, pits, a sunken hearth and agricultural furrows/drains, a fragment of a rotary quern stone and corroded bronze and iron objects, all probably related to the use of the castle (Gowen 1988, 136–40).

While there are no medieval monastic remains within the environs of the development sites, there is a church and graveyard (CO007-12001- and 002-), with a nearby holy well (CO007-121----), in the townland of Imphrick, adjacent to the southern extent of the survey area at XC215 Shinanagh. This parish church is probably late medieval in date (15th/16th century), would have been attached to the diocese of Cloyne and was reported as 'in ruins' in 1615 (Power et al. 2000, 552, 561). It may, however, be built on the foundation of an earlier church, as suggested by a listing in the Papal Taxation of 1291 (ibid., 561). The associated graveyard is enclosed by a low earthen bank but is densely overgrown with the earliest recorded monument a vault dated 1757 (ibid., 584). The holy well, now located on the opposite side of the railway track, is north-east of the church site and depicted as Tobernadeecla (St Declan's Well) on the first edition 6-inch OS map of 1844 (surveyed 1840) and the 25-inch OS map of 1905 (surveyed 1903). Locally this is known to cure sore eyes with a feast day on 24 July (https://holywellscorkandkerry.com/gazeteer/).

The first railways were built in Ireland in the early 1880s, with the Great Southern & Western Railway (GS&WR) originally built to connect Dublin with Cashel but later extended to the city of Cork. Many of the associated railway stations and other buildings are an important part of the history of the railway in Ireland and, notably, one such structure, a store/warehouse built c. 1870 (NIAH Reg. No. 20803040), is located in the vicinity of an area of the proposed geophysical survey (XC219 Buttevant).

5.2 Recorded Monuments

There are two sites listed in the Record of Monuments and Places (RMP) and Sites and Monuments Record (sites within close proximity to the proposed development areas; church (CO008-69) located to the west of the survey area at XC212 Ballycoskery; and Castle-unclassified (CO007-119001) located in the vicinity of the survey area at XC215 Shinanagh. Many additional recorded monuments are located in the surrounding area and together these sites provide a good indication of the archaeological potential of the region.

The following is a list of the nearest Recorded Monuments located within the surrounding area (Figure 2). These descriptions are derived from the National Monuments Service Archaeological Survey Database (http://webgis.archaeology.ie/historicenvironment/).

Table 1: Recorded Monuments in the environs of the site

RMP/SMR No	Class/Site Type	Townland	Description
CO008-069----	Church	BALLYCOSKERY	In village of Ballyhay. Indicated on 1842 OS 6-inch map as rectangular structure (long axis E-W) with projection at E end, named 'Newtown R. C. Chapel'. Modernised rectangular church with five round-headed windows in each side wall; round-headed window over modern porch on W gable; gabled sacristy at E end; second rectangular structure added to N end of sacristy. Date plaque inscribed 'AD 1831' on W gable. Interior has fine classical reredos with composite fluted columns supporting a segmental pediment behind the altar, flanked by doors into sacristy.
CO008-035----	Moated site	BALLYCOSKERY	In undulating pasture. Rectangular area (39.1m N-S; 28.3m E-W) enclosed by earthen bank (int. H 0.75m; ext. H 0.5m) to N, E and S, with external fosse (D 1.3m); truncated to W by deep wide ditch associated with railway line. Interior partially overgrown. Depicted as hachured rectangular enclosure (c. 55m E-W; c. 45m N-S) on 1842 OS 6-inch map, before building of railway line.
CO008-036----	House - vernacular house	BALLYCOSKERY	No description available.
CO007-119001-	Castle - unclassified	BALLYNAGERAGH	On N-facing slope, c. 600m NE of Awbeg River. No visible surface trace of castle. According to local tradition (Grove White 1905-25, vol. 3, 186), 'stones of the old castle were used in building Castle Harrison house'. Castle of the Roches (Healy 1988, 305), reputedly destroyed in 17th century (ibid.).
CO007-119002-	Excavation - miscellaneous	BALLYNAGERAGH	Discovered in 1986 during construction of Bruff-Mallow gas pipeline (Gowen 1988, 136-40). Occupation site, possibly related to Rathmore Castle (14287) c. 90m to W. Excavated area (7.5m x 4m) produced 23 features. Largest feature was shallow depression (F23) (4.6m x max. 1.2m; D 0.5m); this was filled with large burnt stones overlaid by black soil, possibly burnt in situ; three groups of stake and small post-holes just inside SE edge. Arc of four shallow pits (F6, 8, 10, 14) to E and NE of F23. Feature F14 (1.85m x 1.5m; D 0.54m), vertical-sided and flat-based, contained some charcoal and burnt clay in fill; F8, immediately to NW, was a sunken hearth (1.8m x 1.5m; D 0.3m); F10 and F6 to NW (both 2.4m x 0.7m; D c. 0.2m) had clean uniform fills. Pits cut by at least three phases of linear features at varying alignments which were mostly interpreted as agricultural in origin. Finds included fragment of rotary quern, and corroded bronze and iron.
CO016-211----	Ringfort - rath	BREGOGE	In tillage, on gentle NE-facing slope. Depicted as hachured bivallate circular enclosure on 1842 OS 6-inch map; as hachured circular raised area on 1905 and 1937 OS 6-inch maps. Heavily overgrown circular area (diam. c. 30m) enclosed by earthen bank (int. H 1.1m; ext. H 0.4m); external fosse (D 1.1m). Bank heavily overgrown all round; lower on S side (int. H 0.4m). Interior cut into hillslope to S. Triangular depression (4.1m x 7m; D 0.7m) in NE quadrant of interior.
CO016-212----	Enclosure	BREGOGE	Depicted as small roughly square field (c. 18m NNE-SSW; c. 18m WNW-ESE) on 1842 OS 6-inch map, abutting E side of field boundary. In flat marshland, c. 100m SW of Awbeg River. Levelled. To W, low field boundary survives with stream flowing on its W side; N and E sides defined by slight scarp. Interior is dry and used for rough grazing.
LI047-045----	Enclosure	THOMASTOWN	No description available.

5.3 Protected Structures and National Inventory of Architectural Heritage (NIAH)

There are no protected structures listed in the Cork County Development Plan 2013-2019 or Limerick County Council Development Plan 2010-2016 located within or in the immediate vicinity of any of the proposed areas. A structure listed within the National Inventory of Architectural Heritage (NIAH) is located adjacent to and on the east side of the railway track adjacent to the survey area at XC219 Buttevant. This structure is a Store/warehouse (NIAH Reg. No. 20803040). The nearest protected structure to this area is described as a Farm House close to the Former Barracks (RPS ID 988) and is located c. 175m southeast.

The survey area at Ballycoskery is located just east of Saint Mary's Roman Catholic Church (Reg. No. 20900804), while a protected structure – listed within the Limerick County Development Plan 2010-2016 - 'Murphy's' representing a Thatched Building (Reg. No 359, Ref. No D47(B)); is located c. 210m west of the survey area at XC201 Thomastown, Co. Limerick.

5.4 Previous Archaeological Investigations

An examination into previously excavated sites in the vicinity of the proposed survey areas indicates that several archaeological investigations have been conducted within the wider area, many of which did not reveal any archaeological remains but those that did are outlined in Table 1.

The details of these investigations are derived from the Summary Accounts of Archaeological Excavations in Ireland (www.excavations.ie).

Two fulachta fiadh (CO007-131002-, CO007-131001) were discovered during the construction of the Bruff-Mallow gas pipeline. Of particular note are two excavations located in the vicinity of two of the survey areas in XC215 Shinanagh and XC219 Buttevant. In the townland of Ballynageragh, to the east of the survey area at Shinanagh, an occupation site was discovered during the Bruff-Mallow gas pipeline work, possibly related to Rathmore Castle, and is now scheduled for inclusion in the RMP (CO007-119002-). In the townland of Creggane (Licence no. 14E0333) in 2014, the investigations uncovered a series of prehistoric features in an area east of the proposed survey area at XC219 Buttevant.

Table 2: Previous excavations in the environs of the site

Townland/Site	Licence No.	RMP No.	Director(s)	Investigation type	Site type
Coraliss	93E0136	CO003-008	Rose M. Cleary	Archaeological testing.	Pit containing animal bone and kerbed hearth, in vicinity of ringfort.
Kilcolman Castle, Kilcolman Middle	94E0108	CO0017-041001 and 002	Eric Klingelhofer	Archaeological excavation.	Architectural and stratigraphic details of a 15th-century tower house and bawn.
35 Main Street, Charleville	03E0080	CL002-064 & CL002-065001 and 002	Colm Moloney	Archaeological monitoring.	Post-medieval rubbish pit.

Townland/Site	Licence No.	RMP No.	Director(s)	Investigation type	Site type
Richmond Street, Buttevant	03E0704, 03E0704 ext.	CO017-053001	Avril Purcell	Archaeological monitoring and excavation.	Post-medieval stone-built wall and paving stones.
Kerry Lane, Buttevant	05E0350, 05E0350 ext.	N/A	Annette Quinn	Archaeological testing and excavation.	Medieval pits, ditch and cereal-drying kiln.
Scart	10E0196	N/A	Rob O'Hara	Archaeological testing.	Three ring-ditches and a smithing hearth.
Creggane	14E0333	N/A	Miriam Carroll	Archaeological monitoring and excavation.	Two possible Bronze Age structures, stake- and post-hole clusters, pits and a hearth.
Buttevant	C000825; E004896	CO017-053004	Eamonn Cotter	Archaeological excavation.	Architectural and stratigraphic details of a 13th-century Franciscan friary.
Ballybeg Priory, Ballybeg West	C000826; E004897	CO017-059001	Eamonn Cotter	Archaeological excavation.	Architectural and stratigraphic details of a 13th-century Augustinian priory.

5.5 Cartographic Evidence

Ordnance Survey maps of the areas were examined in order to identify any possible archaeological features and to trace the development of the site during the nineteenth and early twentieth centuries. No buildings are depicted within the proposed survey areas on either the first edition Ordnance Survey (OS) 6-inch maps (Figure 3, 4, 5) or on the (OS) 25-inch maps (Figure 6, 7, 8); the only exception is the survey area at XC215 Shinanagh where on the 1840 map (Figure 4) within the north part of the site two buildings are shown, one is depicted as rectangular, the other is a small square structure located within a yard. There is no sign of these by the time of the 1903 map (Figure 7).

The survey area at XC212 Ballycoskery on the 1st edition OS map of 1840 (Figure 5) is located within five fields, a minor road is depicted running roughly east west and connecting two major roads running north west. On the north side of this minor road, *Newtown R.C Chapel* is depicted with minor buildings associated with it. A rectangular area, that appears to be enclosed by an earthen bank and perhaps a fosse is shown to the south of the site and represents a Moated site (CO008-035). A group of buildings is depicted at the location of the current House - vernacular house (CO008-036). By the time of the 1903 map (Figure 8) the area is transformed, the site is divided by the railway line, the minor road now runs over the train tracks at 'Level Crossing' and between two junctions; *Dooley's*

Cross Roads to the east and *Chapell Cross Roads* to the west. The Newtown R.C Chapel is now labelled as *St. Mary's R.C. Chapel* with *Burial Gd*. A *Parochial House* is depicted on the north side of the minor road, and on the south side and in an area adjacent to the site two rectangular and one L shaped building are shown. The site is shown as within three fields as currently. The west extent of the earthen bank/fosse of the previously mentioned Moated site (CO008-035) is shown truncated by the railway line.

The survey area at XC215 Shinanagh runs across parts of nine fields on the 1840 map (Figure 4). A feature that appears to be an avenue is depicted running northwest southeast towards a well labelled as '*Tobernasmear*'; there appears to be three additional approaches to the well; from northeast; northwest and southwest at that time. However, by the time of the 1903 map (Figure 7) the well is depicted as a spring, and the approaches to the well from the southeast and southwest appear to be shown as wet ditches. A boundary within the south part of the site, running in the northeast south west direction is also depicted as a wet ditch flowing towards Awbeg River to the south of the site.

The survey area at XC219 Buttevant is depicted as located within three fields, with a townland boundary marked by a stream or a wet ditch running north towards Awbeg River and within the site on the 1840 map (Figure 5). The site is located south and adjacent to a road running roughly east-west. *Bregoge New Br.* is labelled. The west field appears to be wet ground; a path or an access road is shown running along the west boundary of the eastern most field. To the west of the site a Ringfort (CO016-211) is depicted as a bivallate circular enclosure; further to the west Arden House is shown. The site is transformed by the time of the 1903-04 map with the railway line and *Buttevant Station*, *Goods Shed* (now NIAH structure Reg. No 20803040) and a number of associated buildings and structures (*Cattle Pens*) depicted. The Level Crossing over the railway line is shown and *Bregoge New Bridge* is also labelled. The west field is depicted as wet ground with two ditches running within it.

The survey area at XC201 Thomastown is depicted as within five fields on both of the OS maps; on the 1839 map the enclosure (LI047-045) to the east of the site is depicted with hachures as a circular area, by the time of the 1900 map (Figure 6) the south part of the monument is shown truncated by the railway line.

6. METHOD OF DATA INTERPRETATION

Interpretation of the results was made by examination of the raw data as greyscale images, XY trace, relief, and data plots. Archived raw data is presented in Figures 12, 14, 18 & 20 and an interpretation is presented in Figures 13, 16, 19 & 21.

7. SURVEY RESULTS

The geophysical survey was conducted by Donald Murphy and Robert Breen of Archaeological Consultancy Services Unit Ltd (ACSU) between 17th November and 4th December under licence 20R0239. The survey area consisted of 22 fields used currently for pasture and cattle grazing. The geophysical survey could not be carried out in fields, 1, 2, and 3 in the Townland of Bregoge (XC219 Buttevant) as they were deemed unfit for survey due to flooding.

Anomalies of definite or potential archaeological origin were identified in the surveys at XC212 Ballycoskery, XC215 Shinanagh and XC219 Buttevant. All sites produced evidence for land use in the form of field boundaries and cultivation activity which may suggest further archaeological potential at these sites also. Significant archaeological remains were identified adjacent to Recorded Monument Castle-unclassified (CO007-119001) in the townland of Ballynageragh (XC215 Shinanagh).

The majority of the fields were bounded by hedges and post and wire fences, and this causes some interference along the edge of the surveyed areas. At XC215 Shinanagh the gas pipeline is clearly visible at the north end of the survey area. Throughout the survey areas small-scale ferrous responses were evident in the results and are likely to represent modern metal debris contained within the topsoil.

Table 3: Geophysical Survey Results from XC201 Thomastown

Townland	Effin		
ITM Co-ordinates	557517, 624576		
Area Surveyed	36,040 m^2		
Figure Numbers	Figures 12 & 13		
Anomaly Ref.	**Form/Nature of Anomaly**	**Possible Source(s) of Anomaly**	**Description**
A, B	Faint Trends	Land Drainage	East-west and north-south aligned weak trends representing possible land drains leading to waterlogged area in field
C	Weak Negative Linear	Former Field Boundary	Linear anomaly measuring c. 90m in length representing a probable field boundary aligned northwest-southeast
D	Weak Negative Linear	Former Field Boundary	Linear anomaly measuring c. 50m in length representing probable field boundary aligned southwest-northeast
E	Multiple 'Pit' type responses	? Archaeology	A number of negative anomalies that may be of archaeological significance and represent cut features of archaeological potential (postholes, pit etc) but may also be natural in origin (stone sockets etc.)
F	Positive Linear	Former Field Boundary	Linear anomaly measuring c. 70m in length representing a probable removed field boundary aligned west southwest-east northeast. Could have been a continuation of the existing field hedge further east
G	Faint Trend	Agricultural	Weak trend aligned northwest-southeast representing a linear of possible agricultural origin, perhaps a farm access track, former boundary or related to cultivation
H	Faint Trend	Agricultural	Weak trend aligned west southwest- east northeast representing a linear of possible agricultural origin
I	'Pit' type responses	? Archaeology	Negative anomaly that may be of archaeological significance and could represent cut features of archaeological potential (pits) or may be natural in origin

Table 4: Geophysical Survey Results from XC215 Shinanagh

Townland	Ballynageragh		
ITM Co-ordinates	553064, 614670		
Area Surveyed	45,865 m²		
Figure Numbers	Figures 14-17		
Anomaly Ref.	**Form/Nature of Anomaly**	**Possible Source(s) of Anomaly**	**Description**
B	Negative linear	Field boundary	Linear anomaly representing field boundary roughly north-south aligned. Continuation of existing boundary further south before being modified.
C	Negative linear anomalies	Archaeology	Series of linear anomalies including curving anomaly extending outside of survey area, that may represent a small enclosure
D	Negative linear anomalies	Archaeology / Field boundary	Former field boundary identifiable on the Historic 6 inch map along with a series of curvilinear anomalies representing probable ditches enclosing the castle to the west; circular anomalies E and G that might represent houses or small enclosures/barrows with associated anomalies that may be of archaeological significance and represent cut features of archaeological potential (pits, postholes) or may be natural in origin. The anomalies are al likely associated with and represent an enclosure adjacent to the farm in the northwest corner where RMP – Castle Unclassified (CO007-119001) is documented.
A	Ferrous response	Service	Gas pipeline
F	Negative linears	Cultivation	A number of parallel linear anomalies, northwest-southeast aligned probably representing cultivation
G	Negative circular anomaly	Archaeology	A circular anomaly that might represent a house or small enclosure/barrow/ring-ditch
H	Negative linear	? Archaeology	Linear anomaly northwest southeast oriented.
I	Negative linear	Archaeology	Part of a possible rectilinear anomaly consisting of two parallel curvilinear anomalies, possibly associated with RMP – Castle Unclassified (CO007-119001)
J	Negative linear	? Archaeology	A series of parallel linear anomalies southwest – north east aligned and two parallel linear anomalies roughly north – south aligned
K	Negative linear	Archaeology	Curving linear anomaly aligned approximately north-south. Probably associated with anomalies surrounding castle.

Anomaly Ref.	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
L	Negative & positive anomalies	? Archaeology	Possible former field boundary or archaeological feature
N	Negative linear	Field Boundary	Linear anomaly, southeast– northwest aligned likely representing a former field boundary
O	Negative linear	? Archaeology	Possible sub-rectangular enclosure measuring 20m in length by 16m in width
P	Negative linears	? Archaeology	Two linear anomalies northeast – southwest and northwest – southeast aligned
R	Negative linear	? Archaeology	L -shaped anomaly that may be of archaeological significance
S	Negative linear	? Archaeology	Linear anomaly representing possible field boundary roughly northwest -southeast aligned or could be of archaeological significance
Q	Negative linears	? Archaeology	Two Linear anomalies northeast-southwest aligned that may be of archaeological significance
T	Negative linears	Cultivation	Series of linear features that probably represent cultivation ridges
U	Negative linear	Field boundary	Probable former field boundary
X	Positive linear anomaly	? Archaeology	N-S aligned field drain associated with 'Spring' annotated on OSi 25 inch map. Could be of antiquity.
V	Negative linears	Cultivation	Series of parallel linear anomalies northeast – southwest aligned representing likely cultivation ridges
W	Positive linear anomaly	? Archaeology	Possible curving anomaly which is a continuation of X in field 5 and likely representing a drain leading from the spring in Field 5
A1	Trend	Agricultural	Weak trend roughly northeast-southwest oriented
Y	Ferrous	Service	Service duct leading from well and pumphouse to north south-east towards farm
C1	Negative linears and trends	? Archaeology	Curving anomalies and trends with associated series of anomalies that may be of archaeological significance and represent cut features of archaeological potential
D1	Negative curvilinear	? Archaeology	Incomplete semi-circular anomaly that may represent a small enclosure/barrow
E1	Negative linear	Field Boundary	Likely former field boundary
F1	Pit type responses	? Archaeology	A series of anomalies that may be of archaeological significance and represent cut features of archaeological potential

Anomaly Ref.	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
G1	Negative linear	Field boundary	Two parallel linear anomalies roughly northwest – southeast aligned that are likely agricultural in origin
H1	Negative linear	Field boundary	Linear anomaly northeast – southwest aligned – possibly related to agricultural activity
I1	Pit type responses	? Archaeology	A series of anomalies that may be of archaeological significance and represent features of archaeological potential such as pits or cut features

Table 5: Geophysical Survey Results from XC212 Ballycoskery

Townland	Ballycoskery		
ITM Co-ordinates	554660, 617609		
Area Surveyed	24,020 m^2		
Figure Numbers	Figures 18-19		
Anomaly Ref.	**Form/Nature of Anomaly**	**Possible Source(s) of Anomaly**	**Description**
A	Strong Negative Linear Anomaly	Archaeology	L shaped anomaly representing a sub-rectangular ditched enclosure of possible archaeological significance. Measures 20m east-west by 16m north-south. Could represent a small paddock associated with the adjacent farmyard to the west or could be of archaeological significance.
B	Negative Linear	Field boundary	Linear anomaly representing probable field boundary aligned roughly north-south
C	Negative trends	Agricultural	Series of 3 parallel weak trends aligned roughly north south – may represent previous sub-divisions of the field
D	Positive trend	Agricultural	Weak linear anomaly, aligned northwest-southeast - likely to be of agricultural origin
E	Negative trend	Agricultural	Two parallel weak linear anomalies aligned north northeast - south southwest – likely to be of agricultural origin
F	Positive linear band	? Archaeology	Possible curving feature which could represent natural geology or could be of archaeological significance. Curves away from rather than towards the moated site to the southwest.
G	Positive linear anomaly	? Archaeology	Two Linear anomalies aligned roughly east - west that may represent a former field boundary but could alternatively be related to the moated site in the southwest corner of the field

Anomaly Ref.	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
H	Negative linear	Cultivation	A series of parallel linear anomalies aligned roughly north – south, likely representing remains of cultivation ridges
I	Negative linear	Cultivation	A number of parallel linear anomalies aligned roughly north – south, likely representing remains of cultivation ridges
J	Positive linear anomaly	Field boundary	Two Linear anomalies representing probable field boundaries aligned roughly east - west
P	Negative curvilinear response	? Archaeology	Curvilinear anomaly of possible archaeological significance. May represent an arcing ditch of c. 18m in length
K	Positive linear	Field boundary	Linear anomaly representing probable field boundary aligned northeast - southwest
M	Positive linear	Field boundary	Linear anomaly representing probable field boundary aligned northeast - southwest
N	Positive linear anomaly	Archaeology	Series of linear anomalies consisting of two parallel northwest – southeast oriented features and possible internal sub-divisions - likely representing field boundary and/or old path/road.
L, O	Negative Linears	Cultivation	Linear anomalies, aligned roughly northwest – south east located in the southwest and east part of the field, representing probable remains of cultivation ridges

Table 6: Geophysical Survey Results from XC219 Buttevant

Townland(s)	Bregoge & Creggane		
ITM Co-ordinates	553338, 609771		
Area Surveyed	7,880 m^2		
Figure Numbers	Figures 20-21		
Anomaly Ref.	**Form/Nature of Anomaly**	**Possible Source(s) of Anomaly**	**Description**
D	Faint Trend	Agricultural	Linear trend aligned roughly north south
A	Negative Linear anomaly	Field boundary	Linear anomaly, east – west oriented representing possible former field boundary
B	Negative linear	? Archaeology	L-shaped negative linear anomaly that may represent a small sub-rectangular feature measuring c. 15m in length by 10m in width

Anomaly Ref.	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
C	Negative curvilinear	? Archaeology	Series of curvilinears that may represent an enclosure measuring 55m in diameter, but could alternatively also be associated with former field boundaries
F	Negative curvilinear	? Archaeology	Incomplete semi-circular anomaly that could be of archaeological significance but could also be representative of the underlying geology
G	Negative 'pit' type response	? Archaeology	Three large anomalies that might represent possible pits of archaeological significance, located within incomplete semi-circular anomaly F
E	Negative Linear	? Archaeology	Weak Linear anomaly northeast – southwest oriented

8. DISCUSSION & CONCLUSIONS

The survey area consisted of 19 fields used currently for pasture and cattle grazing. The geophysical survey could not be carried out in fields, 1, 2, and 3 in the Townland of Bregoge (XC219 Buttevant) as they were flooded at the time of survey.

Anomalies of definite or potential archaeological origin were identified in the surveys at XC212 Ballycoskery, XC215 Shinanagh and XC219 Buttevant. All sites produced evidence for land use in the form of field boundaries (Anomalies C, D & F at XC201 Thomastown; Anomalies B, N, U, E1, G1, H1 at XC215 Shinanagh; Anomalies B, J, K & M at XC212 Ballycoskery and Anomaly A at XC219 Buttevant) and cultivation activity was identified at Shinanagh & Ballycoskery (Anomalies F, T & V at XC215 Shinanagh and Anomalies H, I, L & O at XC212 Ballycoskery) which may suggest further archaeological potential at these sites also. Significant archaeological remains were identified adjacent to Recorded Monument Castle-unclassified (CO007-119001) in the townland of Ballynageragh (XC215 Shinanagh-Anomalies C-D, G, I & K). A series of curvilinear anomalies representing probable ditches were identified adjacent to the castle site (Anomaly D) and included circular anomalies that might represent houses or small enclosures/barrows/ring ditches (Anomalies E & G) with associated negative anomalies (F1 & I1) that may represent cut features of archaeological potential (pits, postholes etc). The anomalies may be associated with and represent an enclosure adjacent to the existing farm in the northwest corner where RMP – Castle Unclassified (CO007-119001) is documented. The castle is known as Rathmore castle which may indicate that it originally stood within a large ditched enclosure.

The survey also produced several anomalies throughout the survey areas that may be of archaeological significance and may represent cut features of archaeological potential such as pits and postholes (a typical example is Anomaly E at XC201 Thomastown) or they may be natural in origin resulting from tree throws, stone sockets or natural depressions in the subsoil.

Several linear anomalies most likely represent field boundaries or land drains, some of which are depicted on the Ordnance Survey Maps of 1836 or 1908 (Part of Anomaly D at XC215 Shinanagh). Curvilinear trends may represent internal agricultural features such as drainage or ploughing works or could be natural in origin and derive from geological or geomorphic processes. In a number of locations a series of linear trends were identified that most likely represent the remnants of cultivation practices such as ploughing and ridge and furrow activity (the best example is represented by Anomalies H, I, L & O at XC212 Ballycoskery).

9. RECOMMENDATIONS

In the event that any further works are planned for these four survey areas, it is recommended that the field boundaries, the linear anomalies, curvilinear trends as well as the positive archaeological anomalies identified are all investigated further through a programme of archaeological testing in advance of any development to fully assess their archaeological significance.

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Cartographic Sources

Down Survey of Ireland 1656

Extract from 1st edition Ordnance Survey (OS) 6-inch map (survey 1836- published 1839),

Extract from 3rd edition Ordnance Survey (OS) 25-inch map (surveyed 1908 – published 1910)

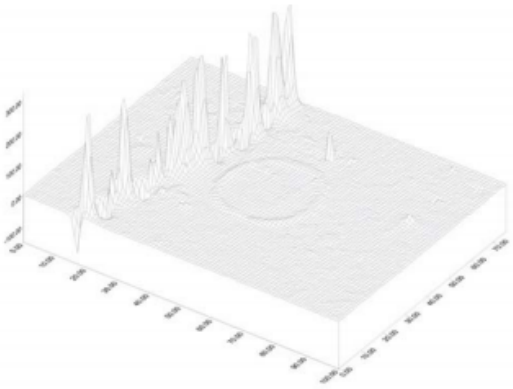
Appendix 1 - Summary Technical Information & Glossary of Terms

Fluxgate Gradiometer Survey: Surveys are undertaken using the Bartington Grad 601-2 survey instrument which was specifically designed for archaeological prospection. It includes sensors that are highly stable, minimizing requirements for excess data processing. The instrument has a vertical 1 m sensor separation permitting finite resolution of buried archaeological features. Surveys can be undertaken in scan or detailed (zig-zag traverse) modes for reconnaissance or high-density mapping. The fluxgate enables reliable flexibility during fieldwork. Frequent realignment of the instruments and zero drift correction ensure a constant high quality of data. Extremely sensitive, these instruments can detect variations in soil magnetism to 0.1nT, affording diverse application throughout a variety of archaeological, soil morphological and geological conditions. The instrument can be employed in both commercial and research-based investigations allowing for completion of projects within short timescales. Regular grid sample densities from standard 1600 readings to 12800 readings per 20m by 20m grid are permitted. A constant high quality of data is assured by experienced field staff operating in accordance with English Heritage Research & Professional Guidelines No. 1, *Geophysical Survey In Archaeological Field Evaluation* (David 1995).

Bartington Grad 601-single axis dual sensor gradiometer.

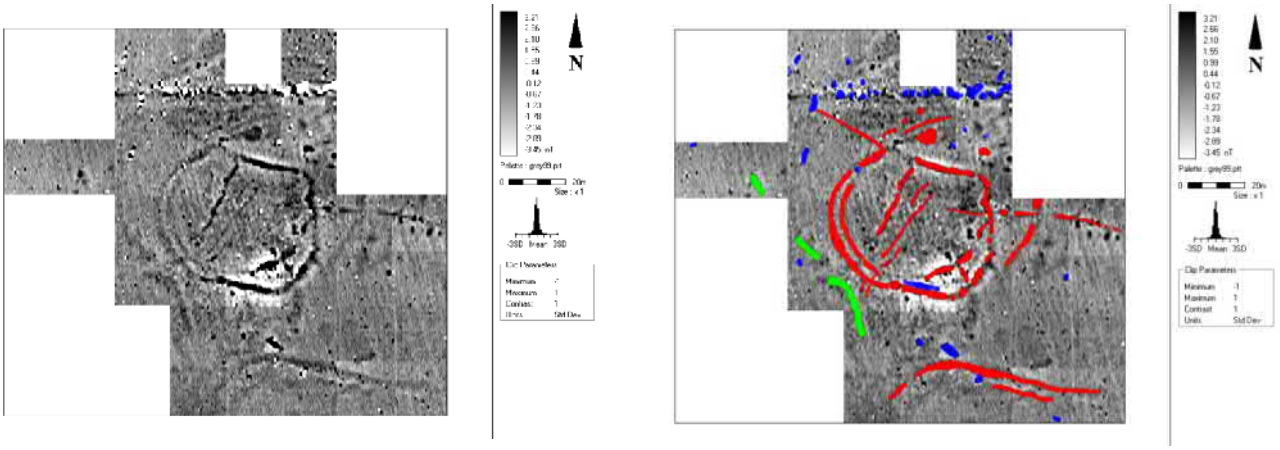
Data Display Formats

XY Trace: The data are presented as a series of linear traces, enabling a semi-profile display of the respective anomalies along the X and Y axes. This display option is essential for distinguishing between modern ferrous materials (buried metal debris) and potential archaeological responses. The XY trace plot provides a linear display of the magnitude of the response within a given data set.



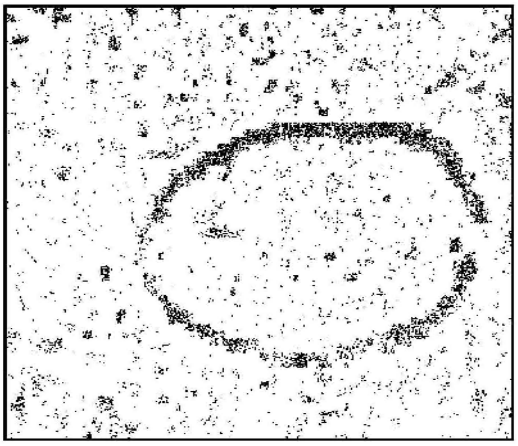
XY Trace of enclosure site

Greyscale: As with dot density plots, the greyscale format assigns a cell to each datum according to its location on the grid. The display of each data point is conducted at very fine increments, allowing the full range of values to be displayed within the given data set. This display method also enables the identification of discrete responses that may be at the limits of instrument detection.



Early medieval enclosure greyscale

Dot Density Plot : Each datum is assigned a cell in which the intensity or number of dots displayed is proportional to the magnitude of the individual response. The visibility or presentation of responses within a given survey area is governed by numeric parameters specific to both soil morphological and archaeological conditions observed on site. Typically, the range of weak to strong responses is manifested by a low to high level of dot density. The format is useful for displaying gradiometer and resistance data particularly for identifying low-level responses.



Dot Density plot of oval shaped enclosure

Glossary of Interpretation Terms

Archaeology: This category refers to responses usually supported by comparative archaeological evidence (i.e., photographic transcriptions, excavation, etc.). The term is generally associated with significant concentrations of former settlement, such as ditched enclosures, storage pits and associated features.

Archaeology ?:This term corresponds to anomalies that display typical archaeological patterns where no record of comparative archaeological evidence is available. In some cases, it may prove difficult to distinguish between these and evidence of more recent activity also visible in the data.

Industrial: Such anomalies generally possess a strong magnetic response and may equate with archaeological features such as kilns, furnaces, concentrations of fired debris and associated industrial debris.

Area of Increased Magnetic Response: These responses often lack any distinctive archaeological form, and it is therefore difficult to assign any specific interpretation. The resulting responses are site specific, possibly associated with concentrations of archaeological debris or more recent disturbance to underlying archaeological features.

Trend :This category refers to low-level magnetic responses barely visible above the magnetic background of the soil. Interpretation is tentative, as these anomalies are often at the limits of instrument detection.

Ploughing/Ridge & Furrow : Visible as a series of linear responses, these anomalies equate with recent cultivation trends.

Natural?: Resulting from localised natural variations in the magnetic background of the subsoil, these responses are often recorded in areas of low-lying land prone to flooding.

Ferrous : These anomalies exhibit a typically strong magnetic response, often referred to as 'iron spikes,' and are the result of modern metal debris located within the topsoil.

Area of Strong Magnetic Disturbance: This term refers to large-scale magnetic interference from existing services or structures. The extent of this interference may in some cases obscure anomalies of potential archaeological interest.

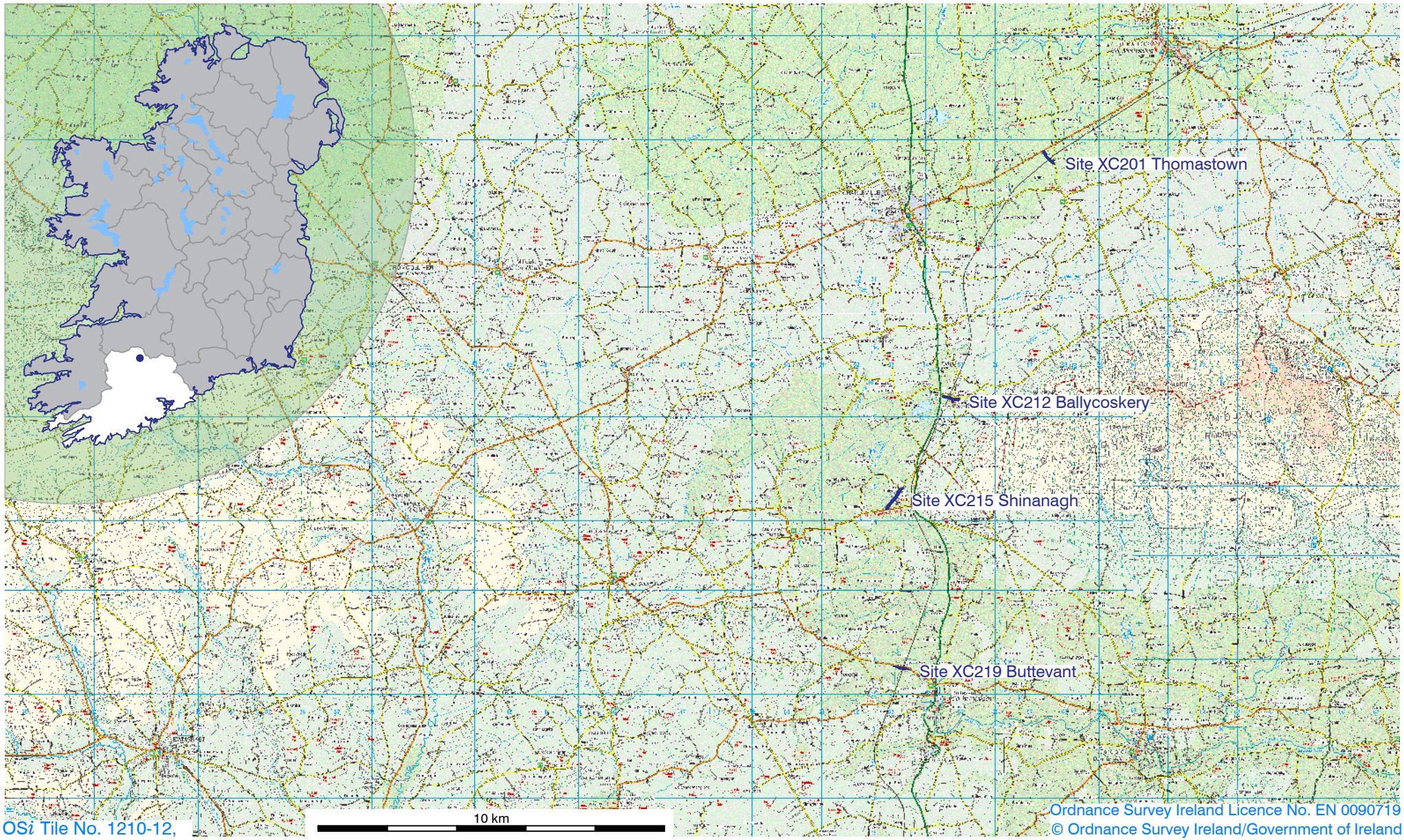


Figure 1: Location of sites

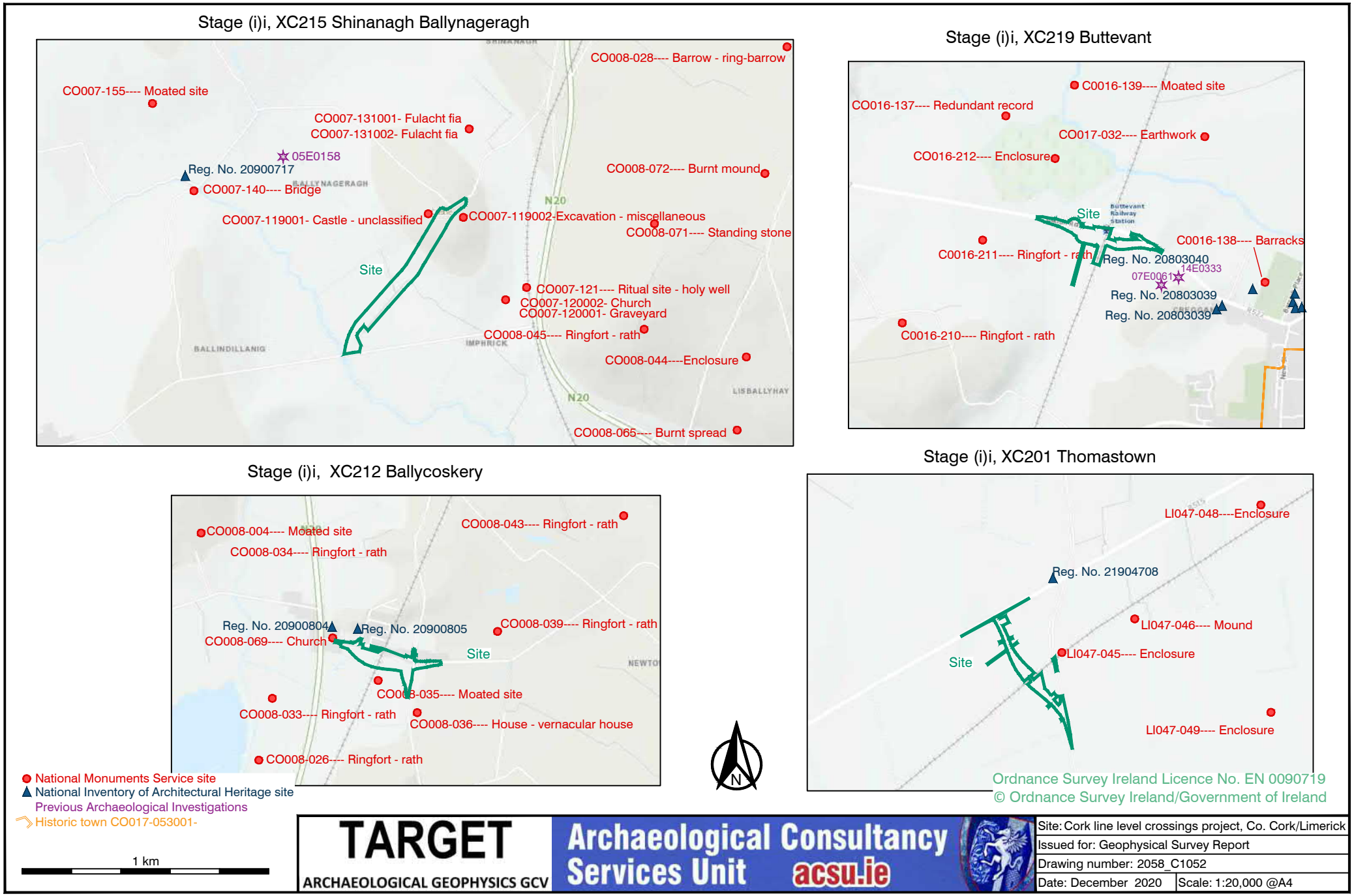
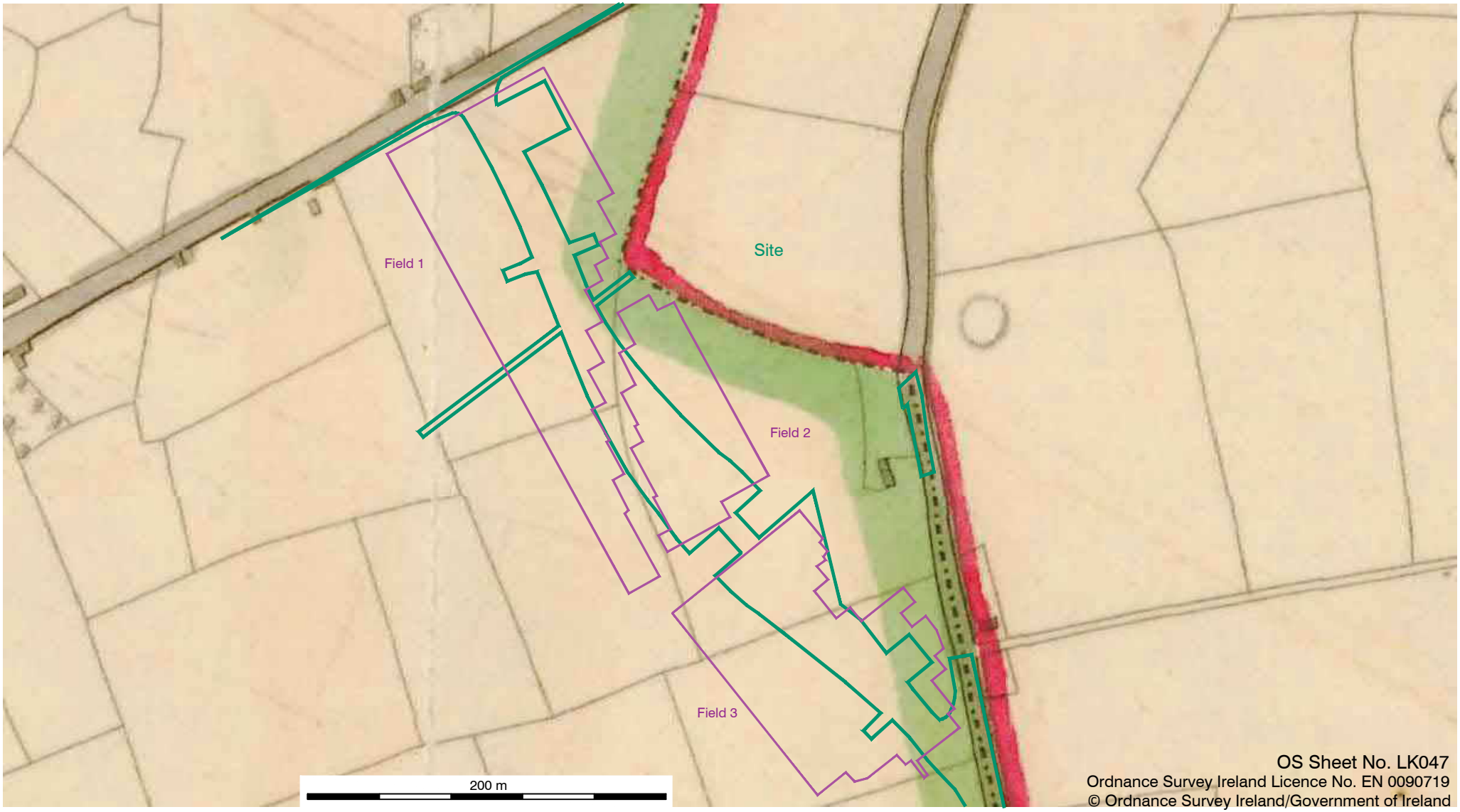


Figure 2: Location of site, previous archaeological investigations and nearby *Sites and Monuments Record* sites

Stage (i)i, XC201 Thomastown



Geophysical survey areas

N

TARGET
ARCHAEOLOGICAL GEOPHYSICS GCV

Archaeological Consultancy Services Unit acsu.ie

Site: Cork Line Level Crossings Project, Co. Cork/Limerick	
Issued for: Geophysical Survey Report	
Drawing number: 2058_C1053	
Date: December 2020	Scale: 1:3,000 @A4

Figure 3: Extract from 1st edition Ordnance Survey (OS) 6-inch map (surveyed 1839 - published 1844), showing location of site and geophysical survey areas

Stage (i)i, XC215 Shinanagh Ballynageragh

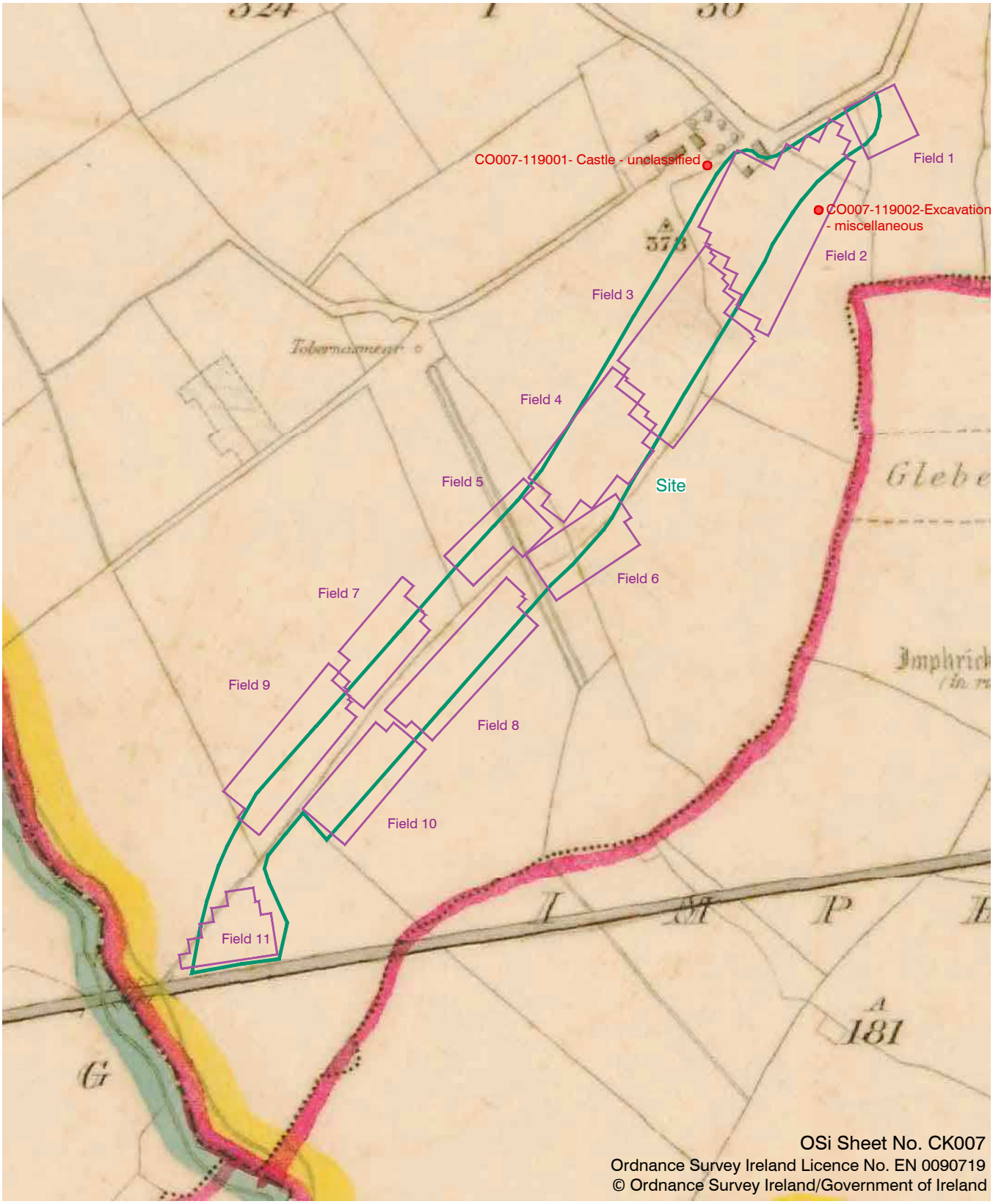
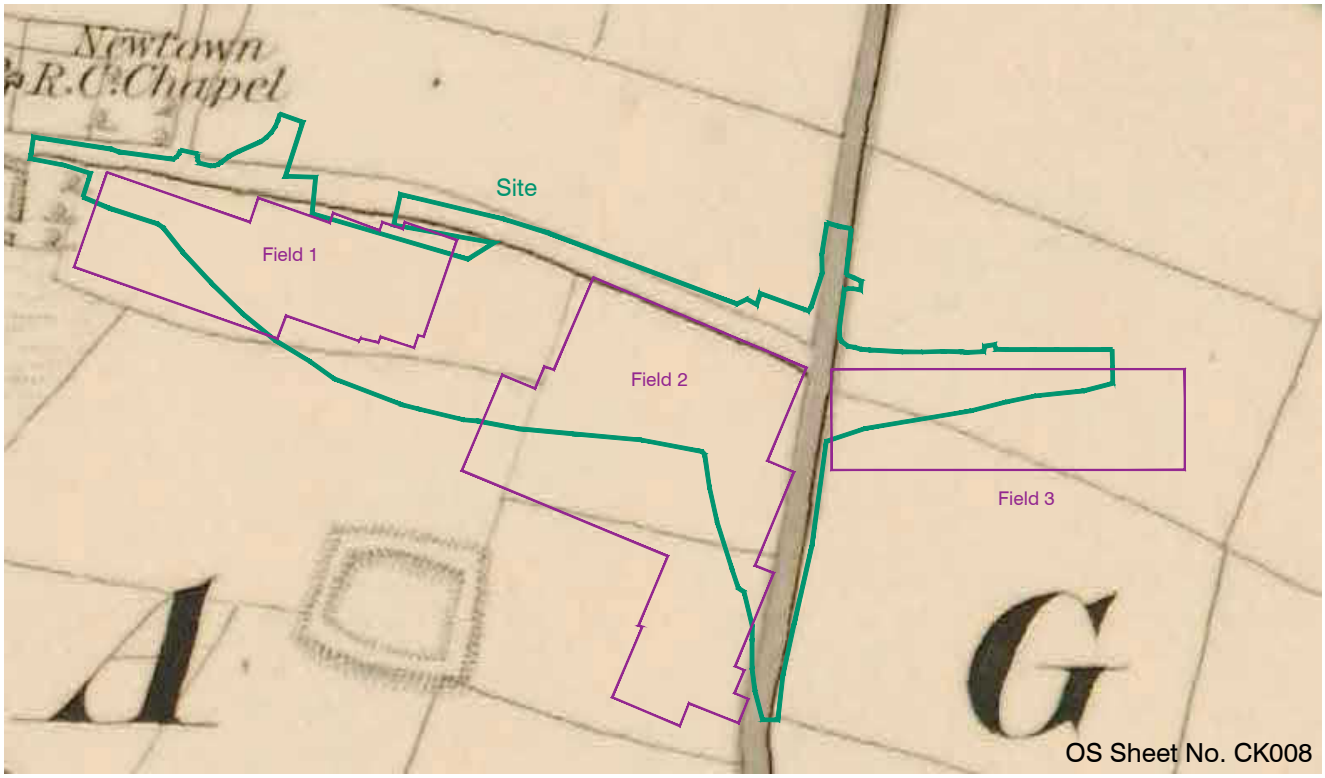
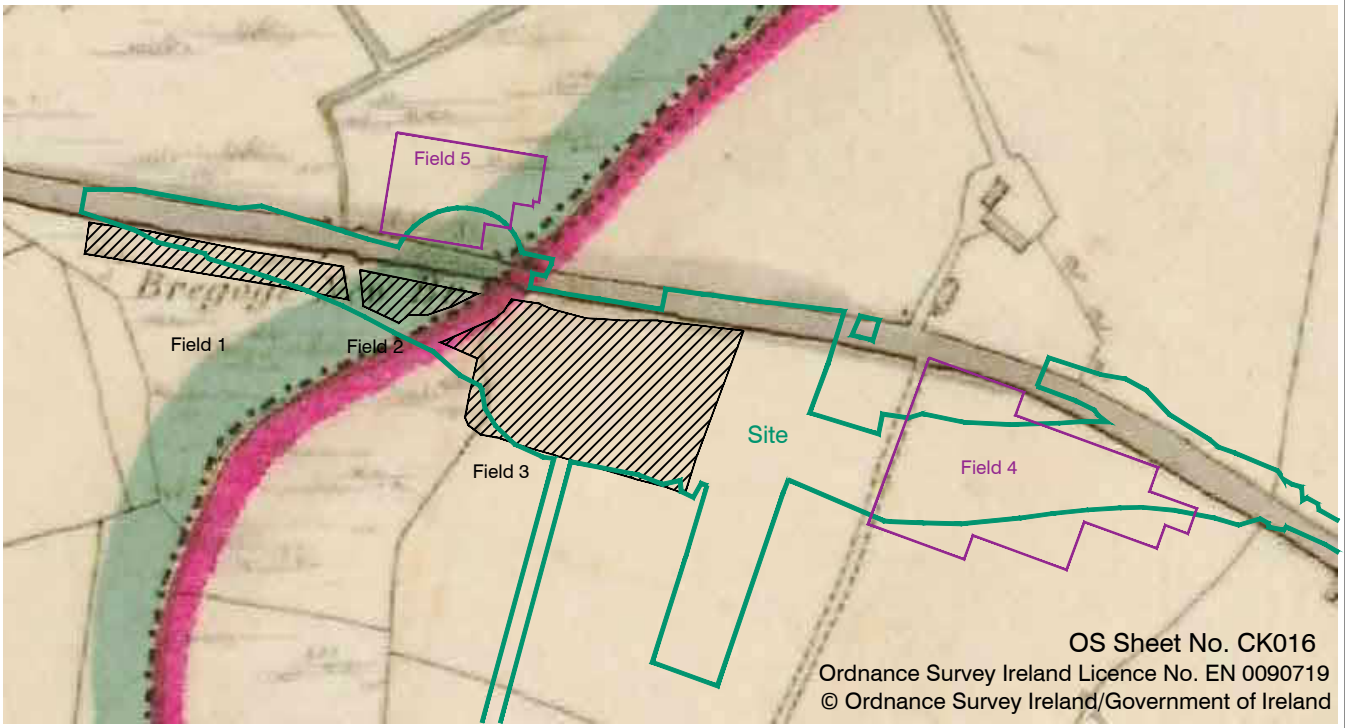


Figure 4: Extract from 1st edition Ordnance Survey (OS) 6-inch map (surveyed 1840 - published 1844), showing location of site and geophysical survey areas

Stage (i)i, XC212 Ballycoskery



Stage (i)i, XC219 Buttevant



TARGET
ARCHAEOLOGICAL GEOPHYSICS GCV

N

Proposed geophysical survey areas
Geophysical survey areas

200 m

Archaeological Consultancy Services Unit acsu.ie

Site: Cork Line Level Crossings Project, Co. Cork/Limerick	
Issued for: Geophysical Survey Report	
Drawing number: 2058_C1055	
Date: October 2020	Scale: 1:3,000 @A4

Figure 5: Extract from 1st edition Ordnance Survey (OS) 6-inch map (surveyed 1840 - published 1844), showing location of sites and geophysical survey areas

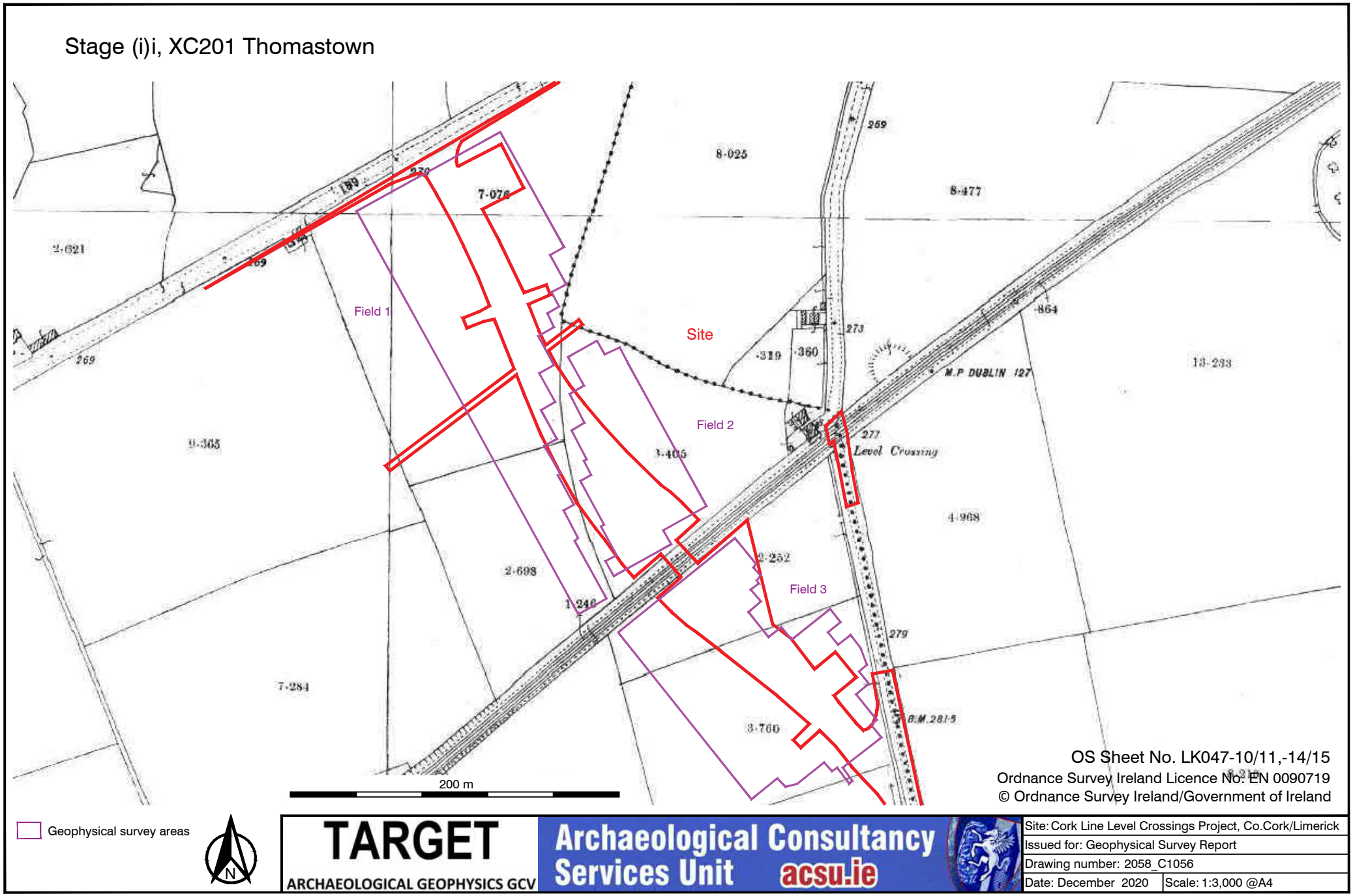


Figure 6: Extract from 3rd edition Ordnance Survey (OS) 25-inch map (surveyed 1900 - published 1901), showing location of site and geophysical survey areas

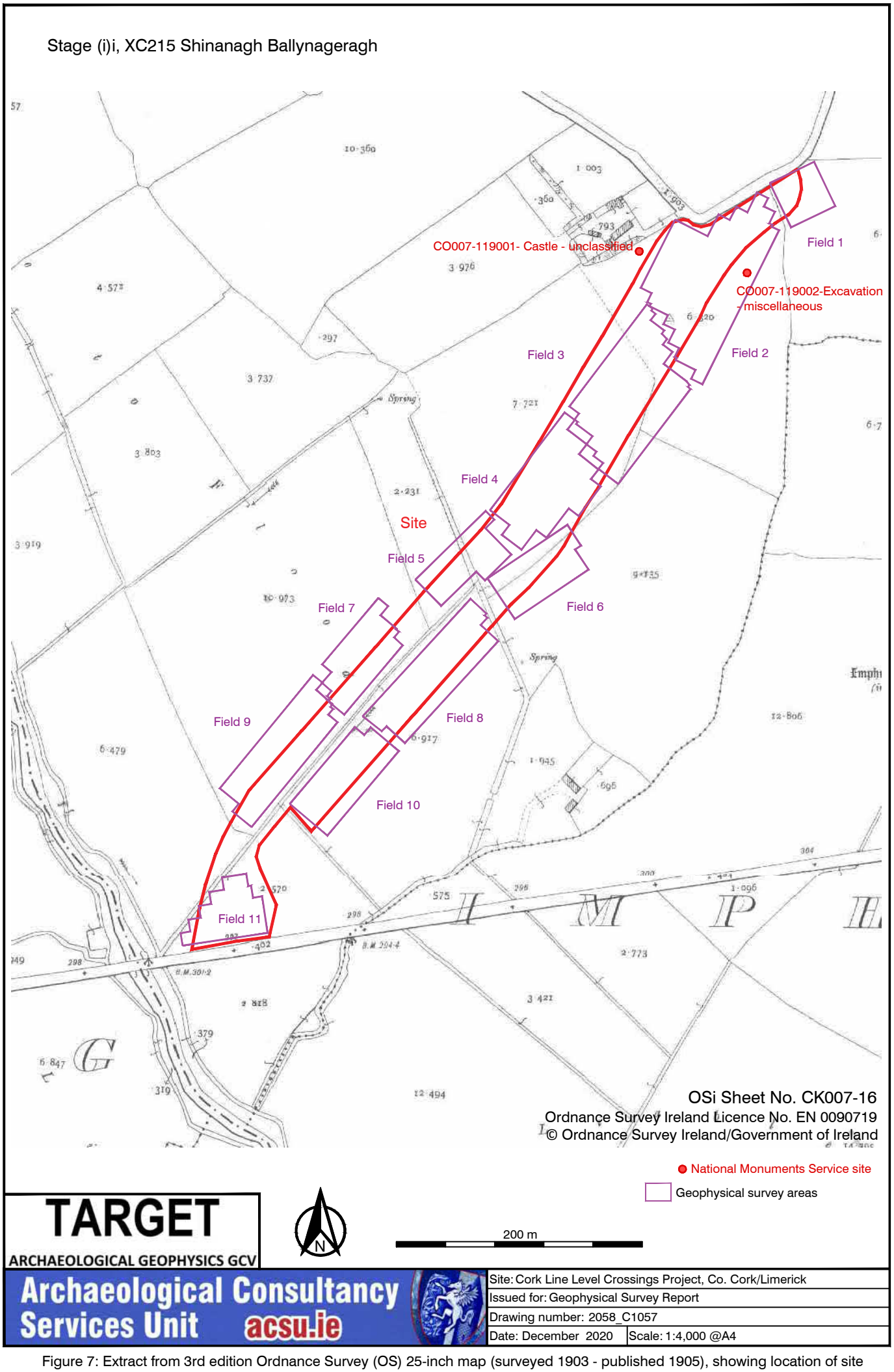
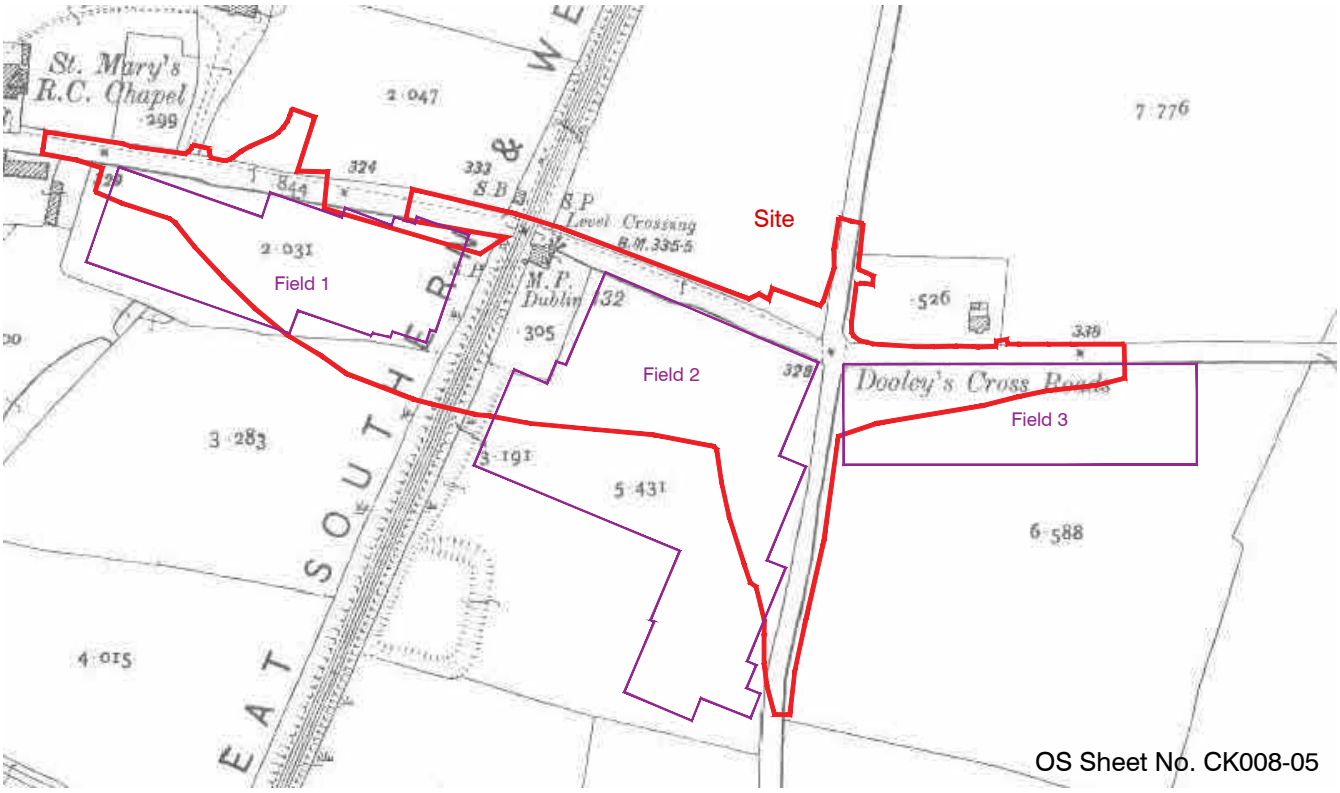
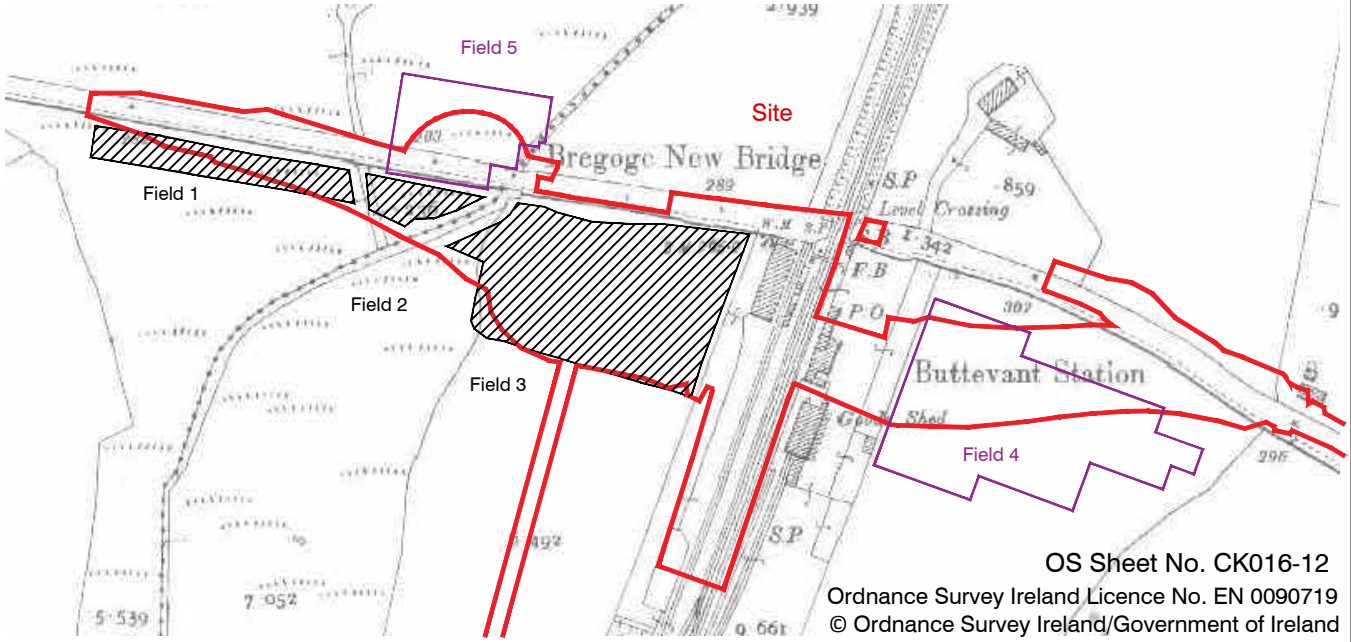


Figure 7: Extract from 3rd edition Ordnance Survey (OS) 25-inch map (surveyed 1903 - published 1905), showing location of site and geophysical survey areas

Stage (i)i, XC212 Ballycoskery



Stage (i)i, XC219 Buttevant



Proposed geophysical survey areas
Geophysical survey areas

200 m

TARGET
ARCHAEOLOGICAL GEOPHYSICS GCV

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Site: Cork Line Level Crossings Project, Co. Cork/Limerick	
Issued for: Geophysical Survey Report	
Drawing number: 2058_C1058	
Date: December 2020	Scale: 1:3,000 @A4

Figure 8: Extract from 3rd edition Ordnance Survey (OS) 25-inch map (surveyed 1903-04 - published 1904-05), showing location of site and geophysical survey areas

Figure 9: Aerial view of site, showing location of geophysical survey areas

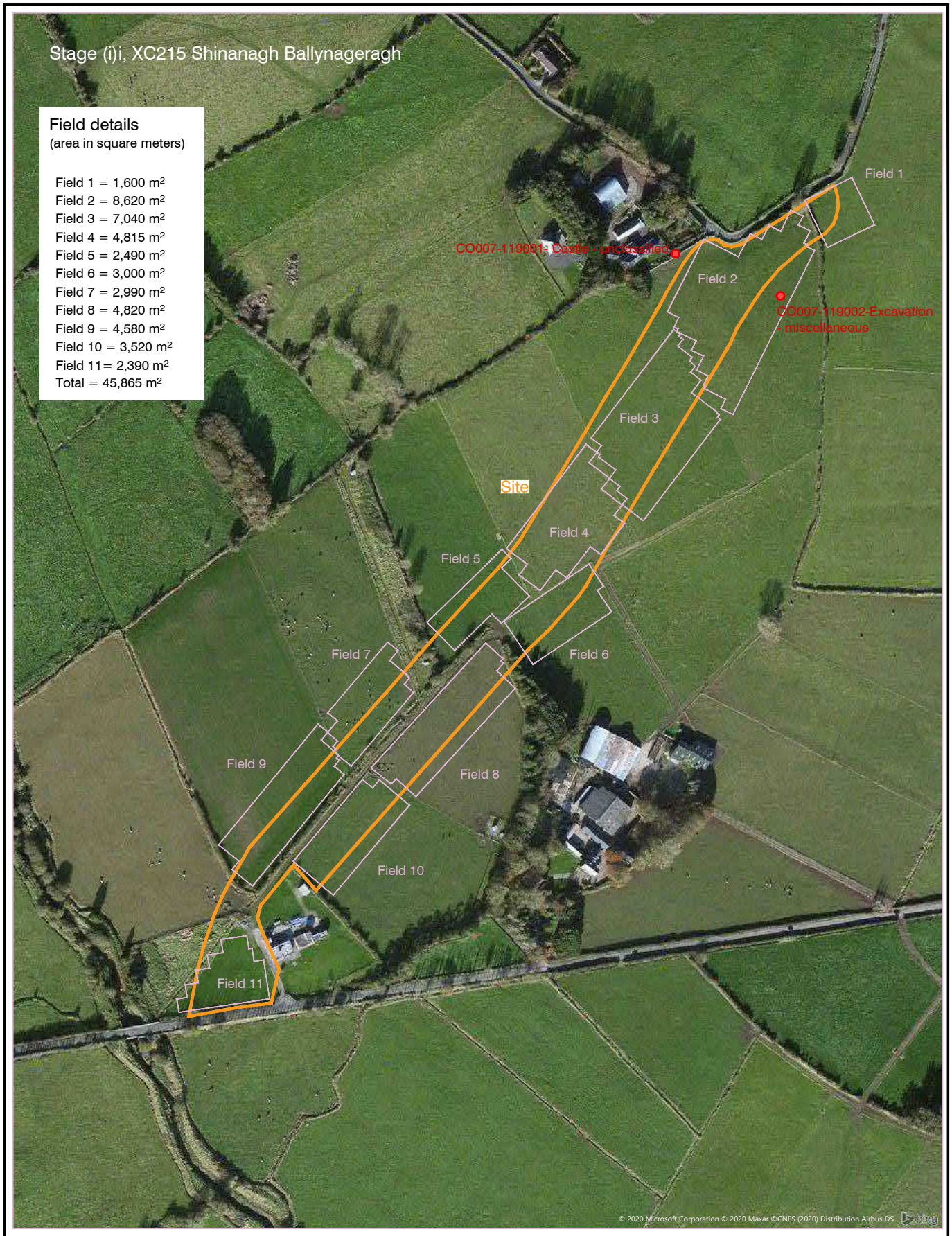

Figure 10: Aerial view of site, showing location of geophysical survey areas

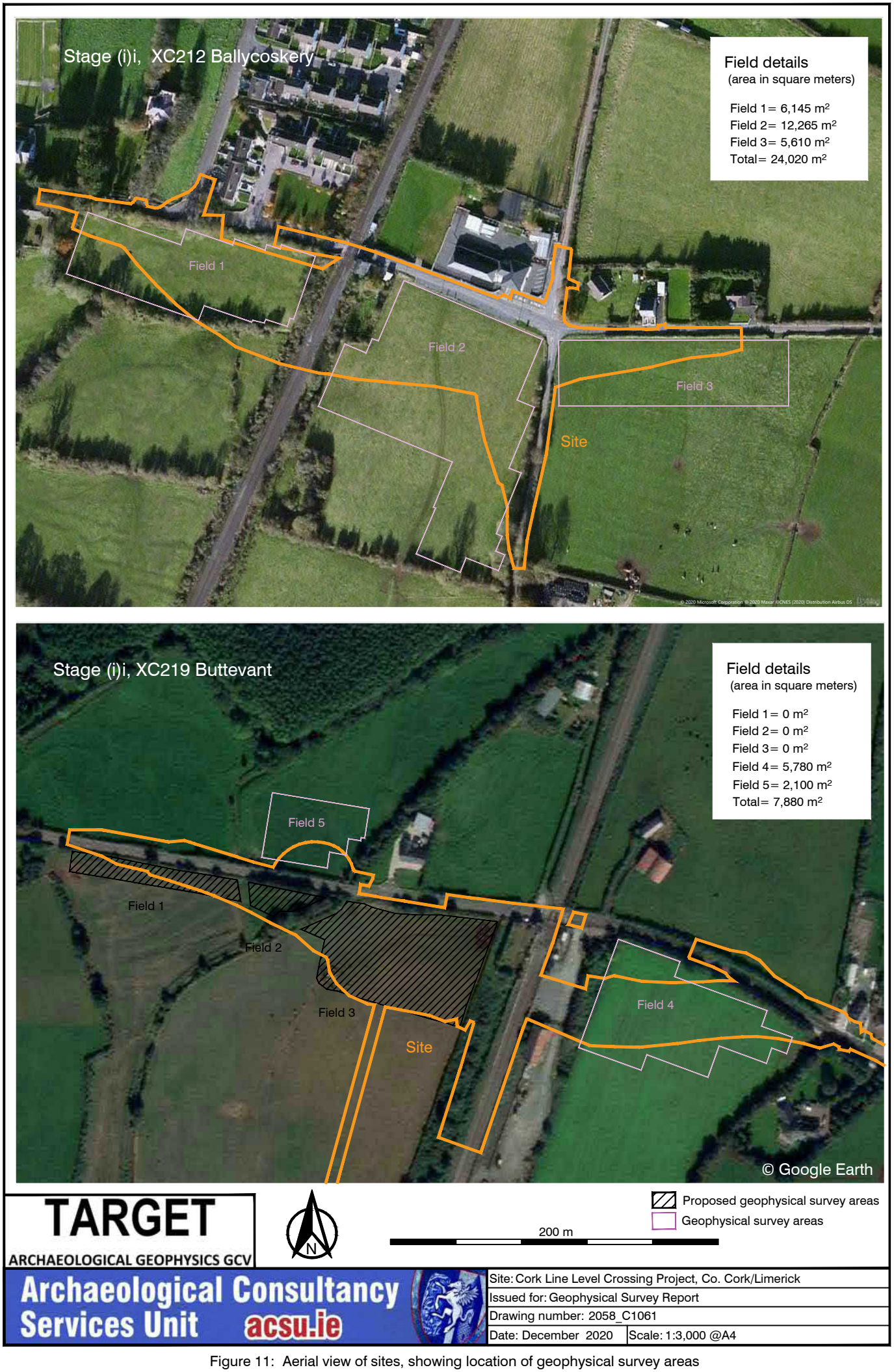

Figure 11: Aerial view of sites, showing location of geophysical survey areas

Stage (i)i, XC201 Thomastown

Site

Field 1

Field 2

Field 3

100 nT
71.43
42.86
14.29
-14.29
-42.86
-71.43
-100 nT

200 m

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Geophysical survey areas

N

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Site: Cork Line Level Crossings Project, Co.Cork/Limerick	
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Drawing number: 2058_C1062	
Date: December 2020	Scale: 1:2,200 @A3

Figure 12: Aerial view of site XC201 Thomastown, showing geophysical survey results (greyscale image)

Geophysical survey areas

N

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Drawing number: 2058_C1063	
Date: December 2020	Scale: 1:2,200 @A3

Figure 13: Geophysical survey interpretation of site XC201 Thomastown

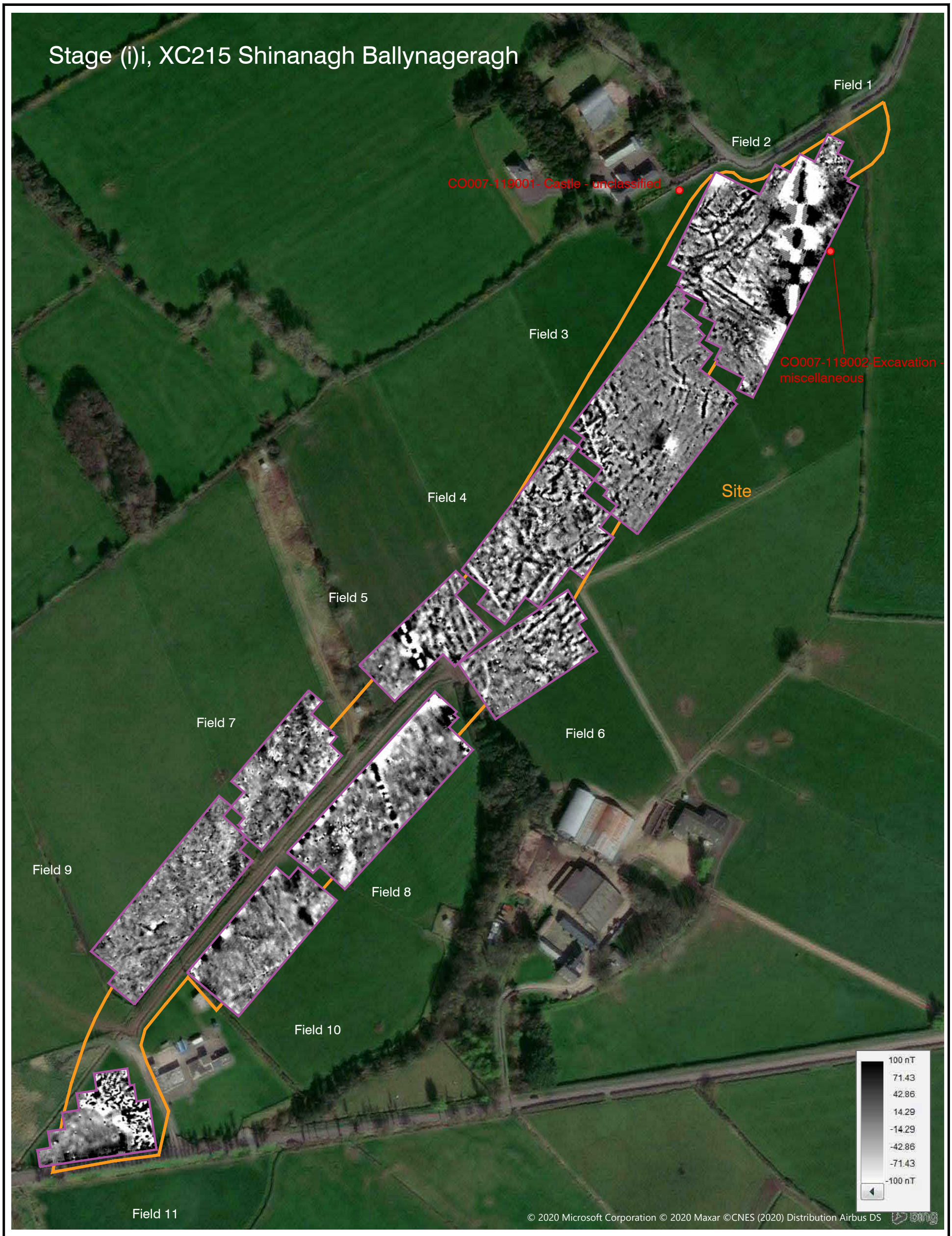

Figure 14: Aerial view of site XC215 Shinanagh Ballynageragh, showing geophysical survey results (greyscale image)

Stage (i)i, XC215 Shinanagh Ballynageragh

Field 1

Field 2

CO007-119001- Castle - unclassified

CO007-119002 Excavation - miscellaneous

Site

Field 3

Field 4

100 nT
71.43
42.86
14.29
-14.29
-42.86
-71.43
-100 nT

100 m

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National Monuments Service site

Geophysical survey areas

N

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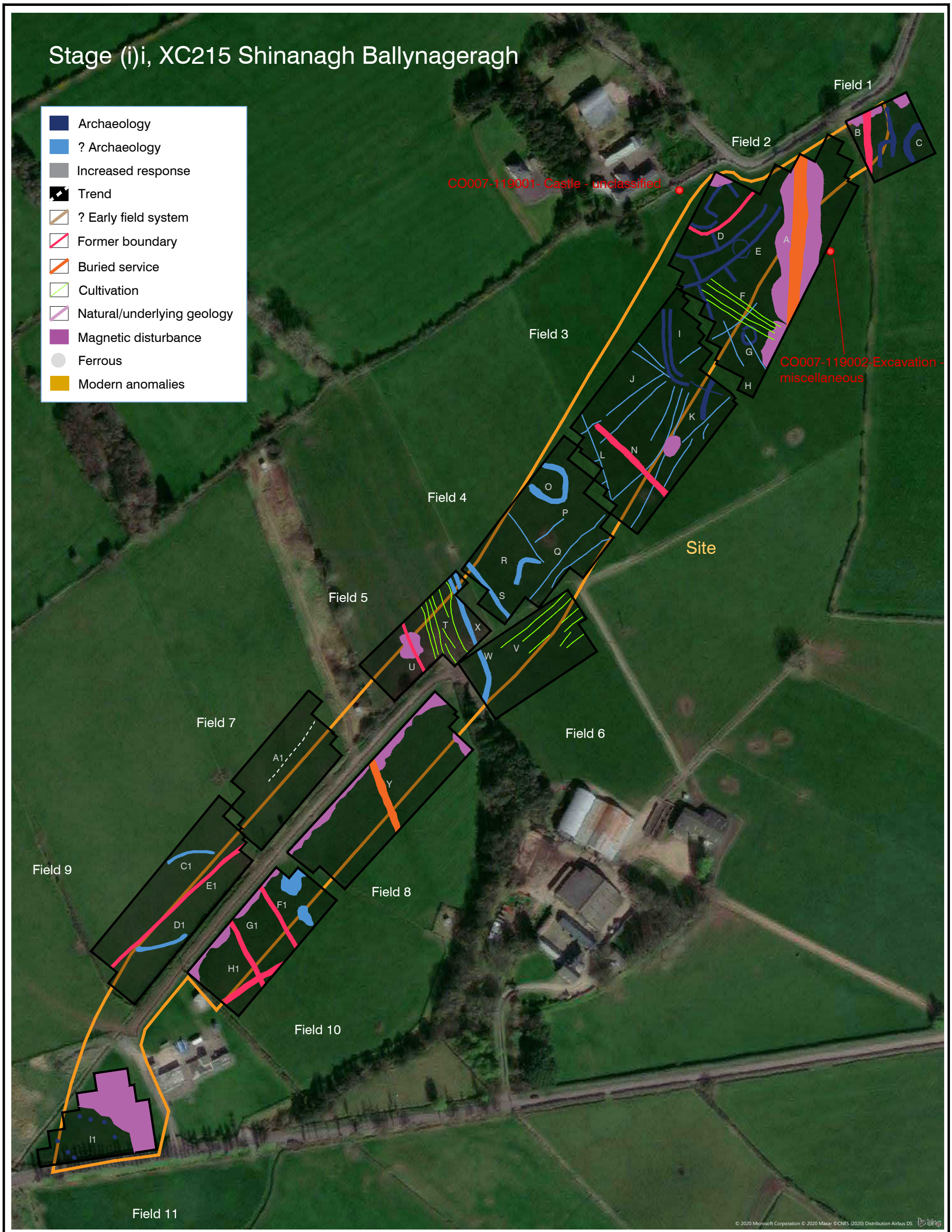
Site: Cork Line Level Crossings Project, Co.Cork/Limerick	
Issued for: Geophysical Survey Report	
Drawing number: 2058_C1065	
Date: December 2020	Scale: 1:1,200 @A3

Figure 15: Close up of geophysical survey results of site XC215 Shinanagh Ballynageragh, fields 1 to 4



TARGET
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Site: Cork Line Level Crossings Project, Co. Cork/Limerick	
Issued for: Geophysical Survey Report	
Drawing number: 2058_C1066	
Date: December 2020	Scale: 1:2,200 @A3

Figure 16: Aerial view of site XC215 Shinanagh Ballynageragh, showing interpretation of geophysical survey

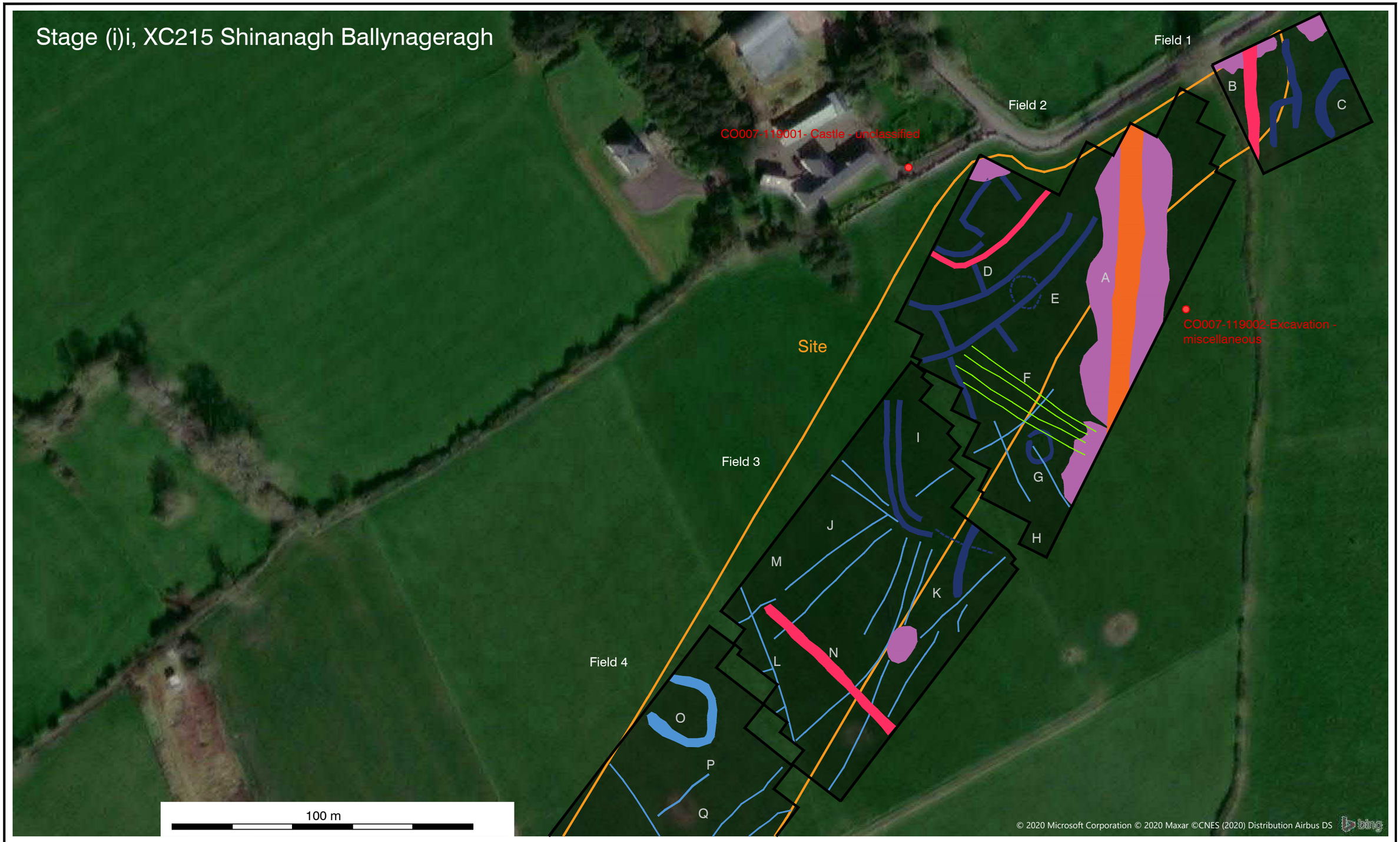

Figure 17: Close up of geophysical survey interpretation of site XC215 Shinanagh Ballynageragh, fields 1 to 4

Stage (i)i, XC212 Ballycoskery

Field 1

Field 2

Site

Field 3

100 nT
71.43
42.86
14.29
-14.29
-42.86
-71.43
-100 nT

100 m

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Geophysical survey areas

N

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Site: Cork Line Level Crossings Project, Co.Cork/Limerick	
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Drawing number: 2058_C1068	
Date: December 2020	Scale: 1:1,500 @A3

Figure 18: Aerial view of site XC212 Ballycoskery, showing geophysical survey results (greyscale image)

Stage (i)i, XC212 Ballycoskery

Archaeology
? Archaeology
Increased response
Trend
? Early field system
Former boundary
Buried service
Cultivation
Natural/underlying geology
Magnetic disturbance
Ferrous
Modern anomalies

A
B
C
Field 1
D
E
F
G
H
Field 2
Site
I
J
P
K
L
M
N
O
Field 3

100 m

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Geophysical survey areas

N

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Drawing number: 2058_C1069	
Date: December 2020	Scale: 1:1,500 @A3

Figure 19: Geophysical survey interpretation of site XC212 Ballycoskery

Stage (i)i, XC219 Buttevant

Field 5

Field 1

Field 2

Field 3

Field 4

Site

100 nT
71.43
42.86
14.29
-14.29
-42.86
-71.43
-100 nT

Proposed geophysical survey areas

Geophysical survey areas

100 m

N

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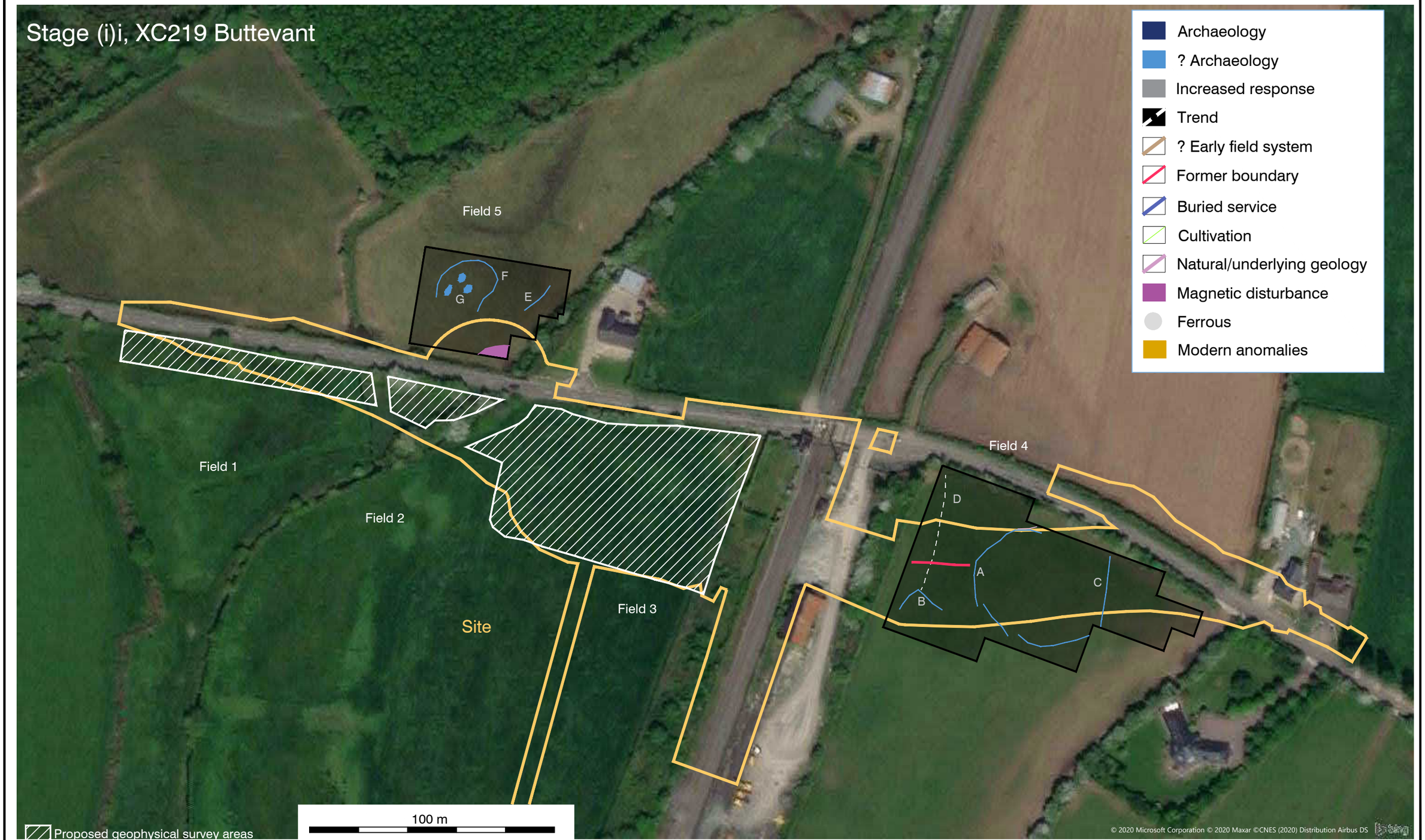
Site: Cork Line Level Crossings Project, Co.Cork/Limerick
Issued for: Geophysical Survey Report
Drawing number: 2058_C1070
Date: December 2020 | Scale: 1:1,500 @A3

Figure 20: Aerial view of site XC219 Buttevant, showing geophysical survey results (greyscale image)



TARGET
ARCHAEOLOGICAL GEOPHYSICS GCV

Archaeological Consultancy Services Unit acsu.ie

Site: Cork Line Level Crossings Project, Co.Cork/Limerick	
Issued for: Geophysical Survey Report	
Drawing number: 2058_C1071	
Date: December 2020	Scale: 1:1,500 @A3

Figure 21: Geophysical survey interpretation of site XC219 Buttevant