An archaeological evaluation by fieldwalking and geophysical survey at Colchester Garrison PFI site, Colchester, Essex

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on behalf of
RMPA Services

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Contents

List of figures

1 Summary

A fieldwalking evaluation was conducted over a 62 hectare area of land which coincides with the arable areas of the Colchester Garrison PFI site in Colchester, Essex.

With the exception of large quantities of peg-tile (a result of manuring operations), only three classes of archaeological material were found in any quantity: burnt flint (prehistoric), Roman tile, and post-medieval pottery. The Essex fieldwalking methodology defines an archaeological site (or 'significant scatter') as two adjacent 20-metre boxes whose weight of finds is above +2 standard deviations above the mean. There were three such significant clusters of Roman tile, but none of any other materials. Apart from the significant scatters, there were also low-density spreads of struck flints, burnt flints and Roman tile, indicating periods of prehistoric and Roman activity. The relative concentrations of Roman tile are unlikely to indicate the precise position(s) of Roman buildings but probably reflect scatters resulting from the manuring of fields using material collected and stored at or in the immediate vicinity of Roman buildings.

The geophysical survey was undertaken concurrently with the fieldwalking. There were some instances where 'anomalies' detected by the geophysical survey were quite clearly archaeological features already known as cropmarks. This was particularly so of a number of double-ditched trackways. Where there was a direct correlation, the cropmark plots were corrected to the anomaly positions. In other cases, geophysical anomalies probably represent previously unknown archaeological features, perhaps field-boundaries, which add further detail to the picture of the late prehistoric and Roman landscape now being built up by these various archaeological survey techniques.

2 Introduction

2.1 The proposed development of the Colchester Garrison PFI site involves the building of a new 101 hectare garrison in the centre of the existing garrison lands (south of Abbey Field, north of Roman Barracks, and east of Kirkee and McMunn Barracks), the demolition of existing barracks, and the redevelopment of the areas released by demolition primarily for residential use.

2.2 A programme of archaeological evaluation appropriate to the archaeological sensitivity of this area (see below section 3) has been agreed between the MoD, RMPA Services, Colchester Borough Council, the Colchester Archaeological Trust (CAT), and RPS, the project archaeological consultants.

2.3 The evaluation comprises fieldwalking survey and geophysical survey (reported on here), and trial-trenching (yet to start, and to be reported on separately).

2.4 The fieldwalking survey was commissioned by RMPA Services and carried out by CAT from January to March 2002. Post-excavation work was carried out during the fieldwork and then up to May 22nd 2002.

2.5 Undertaken concurrently with the fieldwalking survey was a geophysical survey carried out by Bactec International Ltd. This survey is not yet complete, but the interim results are combined here with the fieldwalking results.

2.6 All work was carried out according to a Method Statement (MS/Garr 3) drawn up jointly with RPS and agreed with the Archaeology Officer of Colchester Borough Council (CBCAO). This report mirrors the standards and practices contained in Colchester Borough Council's *Guidelines on the standards and practice for archaeological fieldwork in the Borough of Colchester* (1999).

2.7 The project was monitored by the CBCAO and RPS.

2.8 Current land use of the survey area is arable.

2.9 National Grid Reference locations for the project area are: north edge (Area F) – TL 990 233; south edge (Area R west) – TL 988 229.

3 Archaeological background

3.1 Introduction

The archaeological and historical setting of the proposed development area has already been comprehensively explored in a desk-based assessment or DBA (CAT Report 97), and will only be summarised here. In relation to the areas examined by this fieldwalking survey, it is convenient to summarise the archaeological and historical remains in two categories: archaeological remains associated with the Iron Age *oppidum* and the cropmark sites.

3.2 Archaeological remains of the Iron Age *oppidum*

3.2.1 Much of the land south and south-west of Colchester's modern town centre falls within the pre-Roman *oppidum* of Camulodunum. The only above-ground traces of this *oppidum* are the linear banks and ditches of the defensive dykes which surrounded it. The garrison area occupies the eastern edge of the *oppidum*, and one of the defensive dykes (the Berechurch Dyke) crosses the extreme south-eastern edge of the Garrison (on the east edge of Roman Barracks and between Areas S1 and S2). Although some parts of the Berechurch Dyke are designated as Scheduled Ancient Monument, the length which passes through the Garrison is not scheduled. Design proposals for the new garrison include a green corridor to protect the affected length of Berechurch Dyke, which will prevent any impact on the monument from the development.

3.2.2 As presently understood, the *oppidum* had two centres of activity: at modern Gosbecks Farm (2km south-west of the Garrison), which was a late Iron Age and Roman rural farmstead (and possibly the home of Cunobelin); and Sheepen (2km north-west of the Garrison), which was the industrial and trading centre. It is possible that other such centres may be identified within the *oppidum* in the future.

3.2.3 Apart from these two large centres, it is likely that there were a number of smaller domestic and farming sites in the *oppidum* which await discovery. In fact, one such location may be associated with a Roman building discovered during investigations at Kirkee McMunn Barracks in 1994 (Shimmin 1998) and the area of cropmarks in the survey area (described and discussed in sections 3.3.1 and 9.3 below).

3.2.4 Archaeological potential for the late Iron Age includes the discovery of surface finds relating to isolated features or sites in the *oppidum*.

3.3 The cropmark sites

3.3.1 Over the southern part of the garrison area (south of a line drawn between Kirkee and McMunn Barracks and the modern Colchester Cemetery), a large area of cropmarks is recorded. While it is difficult to interpret these cropmarks before excavation, an informed interpretation based on previous excavation of similar features would indicate that they are probably late prehistoric and/or Romano-British in date, and represent the trackways, paddocks and field-boundaries of a rural settlement of that period. In some areas, the overlapping of the cropmarks suggests that more than one period or phase of activity is represented. At least one circular mark could represent an earlier prehistoric site. Other smaller discoveries are listed in the DBA (CAT Report 97).

3.3.2 Archaeological potential is for the discovery of surface finds relating to occupation sites associated with the cropmarks.

4 The fieldwalking survey

4.1 Aim

The aim of the fieldwalking survey was to collect and plot surface finds in order to establish whether there were any significant clusters (see section 5.2) of surface finds which might highlight the position of previously unknown archaeological sites.

4.2 The study area (Fig 1)

The study area was defined as all available arable land within the Colchester Garrison PFI site. In relation to Figure 1, this consists of Areas F, Q, DRI, G, M, P, R west and R east, and S1. Built areas within the barracks were excluded (Area ROM), as were areas of permanent grass (Areas C and E) and areas which consisted of mature tree belts and regenerated scrub (Area D) at the time of the survey.

4.3 Method (Fig 2)

4.3.1 The survey and reporting methodology followed the standard Essex methodology (Medlycott & Germany 1994). Thus the fieldwalking survey comprised a 10% surface collection achieved by collecting finds in 2m-wide corridors extending south to north over a 20m-square grid (Medlycott & Germany 1994). The grid was laid out by W S Atkins, and points were fixed every 50 metres, either as wooden pegs marked with grid co-ordinates or as bamboo canes (where requested by the farmer).

4.3.2 The survey area coincided with seven separate 1km squares, numbered A-G, although only a tiny sliver of square A was included in the survey area and no work took place in square E. Within each kilometre, the hectares were numbered in map fashion, that is starting with 1 in the bottom left (south-west) corner reaching up to 10 in the top left (north-west) corner, and then progressively on to 100 in the top right (north-east) corner. Thus a typical hectare was numbered B7 (kilometre B, hectare 7) or D20 (kilometre D, hectare 20). Within the hectares, the 20m-square boxes were numbered alphabetically, starting with A in the south-west corner and reaching up to Z in the north-east corner (25 boxes, omitting the letter O). Thus a typical 20m-box would be labelled B7C or D20F.

5 Results

5.1 Character of the assemblage

A total of 219.4kg of material was recovered for statistical analysis, which represents a low recovery rate, averaging 3.5kg/ha over the extensive area examined (62.12ha). Furthermore, the assemblage comprises a limited range of relatively robust artefact categories, reflecting the significant degree of attrition affecting artefacts within the ploughzone. Post-medieval pottery and peg-tile represented 74% of the total (162.77kg). The second largest component was Roman brick, tile and pottery which produced 23% of the total (51.870kg). Very small quantities of prehistoric (2%) and especially medieval (0.09%) material was recovered. Ceramic building material was the dominant component of both the post-medieval and Roman assemblages. Peg-tile represents 96.5% of the post-medieval component. Brick and tile represents 98.65% of the Roman component.

5.2 Quantification

5.2.1 The following types of finds were collected: prehistoric flints, burnt flints, prehistoric pottery, Roman pottery, Roman brick/tile, quern, marble, medieval pottery, post-medieval pottery, modern pottery, clay tobacco-pipe fragments, peg-tile, post-medieval and modern brick, post-medieval and modern glass, slag, coal, slate, oystershells, and sundry iron objects. The first ten of those finds groups are discussed below, and statistical analysis is given in section 14 below. The other finds groups are listed and quantified in the archive, but not discussed below. Peg-tile and modern glass were not retained.

5.2.2 Each finds type has been calculated in standard deviations (using the spreadsheet facility in Microsoft Works), and subsequently plotted by finds type. Thus Figures 3-9 show finds in the following weight categories:

< the mean weight
> the mean weight < 1SD
> the mean weight + 1SD, < 2SD
> the mean + 2SD

By common convention in the Essex fieldwalking system (Medlycott & Germany 1994), a single box with finds of > 2SD is not a significant cluster, such as might indicate the presence of an 'archaeological site', but two such adjacent boxes could be a significant cluster and this concentration may represent an archaeological site.

5.2.3 The condition of the field-surfaces, the extent of overgrowth and the state of the growing crop can all affect the quantities of finds collected. Therefore the condition of all the fields has been tabulated in the appendix (section 5).

5.3 Prehistoric finds (Figs 3-4)

Three classes of prehistoric material were collected, ie pottery, struck flints and burnt flints.

5.3.1 Pottery (Fig 3)
total collected: 2 sherds (10g)

Two sherds of prehistoric pottery were collected. Such small groups do not merit detailed comment.

5.3.2 Struck flints (Fig 3)
total collected: 192 pieces (1168g)

A total of 192 struck flints was collected. There was one 'significant concentration' (two adjacent boxes with +2SD) in hectare B21 (Area F). However, this statistic is caused by two adjacent boxes with a single heavy piece in each box, and not by a large group of material.

There was a second area of interest in hectares F10, D1 and D11 (in Area R east). Although there were no significant concentrations here, there was a general spread of material over approximately one hectare. However, the same comment applies; these are single heavy flints rather than a large group.

The struck flints were not found in association with any other finds type.

5.3.3 Burnt flints (Fig 4)
total collected: 185 pieces (3378g)

A total of 185 burnt flints was collected. Burnt flints are not intrinsically datable, but there is common consensus that they are most likely to be of prehistoric date.

Burnt flints were widespread within the southern half of the survey area (Area G and Area DRI and to their south), especially in Areas P, R west and G. Significant concentrations occurred at two points within these areas (in hectares F80 and D13).

Although the flints were not found at 'significant' weight, their widespread presence must indicate prehistoric activity in Area P and Area R west.

Collecting conditions were not as favourable in Area G as they were elsewhere. Therefore, the lower weights of material in that field should not be taken as proof of the absence of prehistoric activity.

5.4 Roman finds (Figs 5-7)
Classes of Roman material comprised brick, tile, pottery, and other finds.

5.4.1 Brick (Fig 5)
total collected: 76 pieces (7245g)

Roman brick was thinly spread over all parts of the survey area. There were no significant clusters.

5.4.2 Tile (Fig 6)
total collected: 733 pieces (43,950g)

Roman tile was the largest group of prehistoric or Roman material collected, with significant concentrations at three points. Generally speaking, the material was very widespread in Areas F, Q, R west and R east, and occurred at lower levels in Areas DRI, G, M and P. Although the tile is widespread, an attempt has been made in Figure 10 to show the main concentrations.

The question is how this material arrived here, and what it means. Two mechanisms are usually invoked; either it was ploughed up from underlying archaeological sites of Roman buildings, or it was spread on the fields with farmyard manure carted out from Roman sites on local farms ('manure scatter'). Where the site of a Roman building lies beneath the ploughsoil, one would expect to find a tight concentration of surface debris (brick, tile, *tesserae*, etc). The impression given is that there are no such tight concentrations of tile in the survey area. This finding is confirmed by the distribution of other building debris, ie the brick, *tesserae* and marble which are also widespread. In conclusion, though, the possibility of the tile spreads marking the site of Roman buildings cannot be ruled out, but the weight of evidence favours the tile being derived from manure scatters. The probable source of this material is discussed in section 6.3. Of course, this still implies that there are local sites of Roman farms (from which the tile is derived), but their locations are unknown.

5.4.3 Pottery (Fig 7)
total collected: 42 sherds (675g)

A total of 42 sherds of Roman pottery was collected. This is a surprisingly low quantity of Roman pottery, which cannot be explained by poor collecting conditions (since large volumes of burnt flint and Roman tile were collected). At face value, this indicates a lack of Roman activity or 'settlement sites' in the survey area.

5.4.4 Other finds (Figs 5, 7)

A single piece of Purbeck marble floor slab was collected from D11A (in Area R east). There were also six *tesserae* (floor cubes) and two pieces of quern. If the building debris (marble and *tesserae*) had been found in concentrations, then this would be evidence of the site of a previously unrecognised Roman building. However, they are not concentrated, and so they merely confirm the Roman activity shown by the general spread of brick, tile and to a lesser extent the pottery (see above, sections 5.3.1-5.3.3). As with the Roman brick, tile and pottery, the most likely scenario is that these scatters are representative of manuring practices, possibly from the previously identified Roman 'villa' site at Kirkee and McMunn Barracks (Area KIR).

5.5 Medieval finds

One class of medieval find was collected, ie pottery.

5.5.1 Pottery (Fig 8)

total collected: 21 sherds (207g)

Very small quantities of medieval pottery were collected in this survey. Such small groups do not merit detailed comment, except to make the point that the absence of large amounts of medieval pottery might be taken as evidence that the area was primarily pasture in medieval times (and not arable, where pottery might be released onto the fields as manure scatters).

5.6 Post-medieval and modern finds

5.6.1 Post-medieval pottery (Fig 9)

total collected: 447 sherds (5594g)

Post-medieval pottery was spread over most of the survey area, with slight concentrations in Area R west and Area Q.

It is conventional wisdom to interpret this post-medieval pottery as manure scatter, ie material brought out with farmyard manure and spread onto the fields, rather than ploughed up from below-ground archaeological sites.

5.6.2 Modern pottery (not plotted)

total collected: 614 sherds (4041g)

As with the post-medieval pottery (see above, section 6.4.1), it is conventional wisdom to interpret this modern pottery as manure scatter, ie material brought out with farmyard manure and spread onto the fields, rather than derived from below-ground archaeological sites. There is no reason to dispute this interpretation here.

5.6.3 Peg-tile (not plotted)

total collected: 7639 pieces (157,183g)

Although it may seem pointless to collect peg-tile, it is picked up in case it should turn out to be Roman brick or tile. The total collected was huge. The peg-tile is distributed fairly evenly across the survey area and is probably derived from manure scatter.

6 Fieldwalking conclusions (Fig 10)

6.1 Introduction

Figure 10 presents an overall view of the fieldwalking evidence. One important proviso is that less favourable collecting conditions may have suppressed the figures in part of the survey area, specifically the east side of Area F where the ploughed field had not been harrowed prior to fieldwalking. The results do not suggest that this had a significant effect on artefact recovery, but the information shown on Figure 10 should be considered with this proviso in mind.

6.2 Prehistoric period

Prehistoric material occurs, generally speaking, at low weights. Prehistoric pottery was found at almost meaningless weights (two sherds only). There was only one significant concentration of struck flint, in Area F. However, this statistic was produced by two heavy pieces and not by a large group. Burnt flint, also taken as a general indictor of prehistoric activity, was widely spread over the southern end of the survey area (Area R west and to a lesser extent Area P), but again, not at any great weight; there were no significant concentrations. The general impression given by the prehistoric material is that the struck flints are not present at sufficient weights to indicate any widespread activity (as represented by flint-knapping), but that the distribution of burnt flint indicates general prehistoric activity over the whole survey area, and is only concentrated in Area R west.

6.3 Roman period

Roman pottery was found at surprisingly low weights, and no conclusions can be drawn from its distribution. In contrast, Roman tile was widespread except in the central part of the survey area. The impression is that there are no tight concentrations of tile (or other Roman building debris) such as would indicate Roman building remains beneath the ploughsoil. Thus, though the presence of Roman buildings cannot be ruled out, the weight of evidence is in favour of the tile, brick and *tesserae* being derived from manure scatters. Of course, this still implies that there are sites of local Roman farms, and indeed the Roman building previously identified in Area KIR (Kirkee and McMunn Barracks) probably represents such a home farm.

6.4 Medieval period

Medieval pottery occurs at very low weights, and without significant clusters. Such small groups of material might be taken as evidence that the area was primarily pasture in medieval times (and not arable, where pottery might be released onto the fields as manure scatters).

6.5 Post-medieval and modern periods

The post-medieval and modern material collected in this survey (pottery and peg-tile) is almost certainly the result of manuring operations over the last three or four centuries, and has no other significance.

7 The geophysical survey

7.1 Introduction

The geophysical survey methodology is informed by the relevant English Heritage guidelines *Geophysical survey in archaeological field evaluation* (1994).

The survey is referenced to the established site grid, allowing co-ordination between the geophysical survey results, and those of future fieldwalking survey and trial-trenching evaluation.

The principal method statement for the conduct of the geophysical survey has been prepared by Bactec International Ltd: *Geophysical investigation: method statement for archaeological and ordnance investigation.* Relevant extracts of that method statement are given here (section 7.2).

7.2 Method

The survey will be conducted at 2-metre transects, with readings taken at 1-metre intervals.

The raw data will be collected by Bactec International Ltd and presented by them in an appropriate format to Dr T J Dennis of the University of Essex, who will process the data in an appropriate way on behalf of CAT.

The compilation of reports on the geophysical results will be carried out by CAT, with appropriate reference to the work of Bactec International Ltd and Dr Dennis. The reports will contain a plot of the processed data, with a matching interpretative figure. This will be accompanied by an interpretative text, with appropriate references and notes.

7.3 Geophysics data processing

by Dr T J Dennis

7.3.1 Source data format

The data is received from Bactec International Ltd in raw binary as Intel format 4-byte floating point values, and represent the total field as detected by the two caesium vapour sensors on the magnetometer. For this exercise, the precision is to 0.1 nanotesla (nT). Track starts in the data file are indicated by structures that hold integers representing start and end X-Y co-ordinates (in millimetres relative to a reference offset) and the number of samples in the track. The start of the file contains a two-integer header, typically giving the reference offset, in this case as OS Grid co-ordinates to a precision of 1m. The grid was set out with an accuracy within +/-0.10m.

7.3.2 Data processing

The absolute magnetic field values are of no interest in this application: features are indicated by small spatial variations in the field, so the initial stage of processing will involve calculation of the local average, and subtracting it from point sample values. A wide range of techniques can be used to do this, and which is appropriate depends on local conditions.

The simplest is to subtract the global average of the data in a given survey block, and adjust the amplitude of the residuals until a grayscale image can be generated. This gives a useful initial look at the data, but a number of factors normally make it unsatisfactory. These include:

(1) Large area (comparable with block area) spatial variations in the magnetic field, due for example to deep geological features.
(2) Thermal or other electrical drift in the sensors during a scanning run; this may be sufficient to exceed the dynamic range of the video display, which is typically quantized to 256 levels.
(3) Variations in field caused by change of orientation in track scanning, which is typically done in zig-zag fashion and causes stripes on the output image.
(4) Variations caused by the operator's stride pattern, which will be characteristically periodic.
(5) Random windage on the magnetometer frame, which can affect height over the ground.

Processing to overcome these factors involves smaller area averaging processes, which may be used in combination as required. (1) and (2) are handled successfully in this way. (3) is best corrected by along-track median filtering of the raw data, followed by subtraction as usual. However, there is a danger that this will mean the loss of genuine along-track features, so a variety of filter sizes, both one and two-dimensional, are typically tested, and will be used where appropriate. Stride effects, being periodic, can be successfully removed by Fourier-domain bandstop filtering of the interfering spatial frequencies. Other spatial filters can be used, such as Gaussian at the mean subtraction stage, or as a post lowpass (smoothing) filter. (5) cannot normally be distinguished from real ground effects and is best avoided at source.

7.3.3 Presentation of results

Results will be presented as large area grayscale images with a reference graticule overlaid by the individual 'tiles' from the scanned areas. Since the track spacing at 1 per metre is very different from the along-track sample density of 5 per metre, a final post-processing stage will be to generate the rescaled output mosaic image with the same sample density in both directions; 4 or 5 pixels/metre is normally satisfactory. The rescaling is done by a Gaussian filter, or bicubic interpolation, and is best performed after the mosaic has been generated, as this will conceal discontinuities at tile boundaries. Ideal lowpass (sin(x)/x) interpolation is an alternative, and gives better fine detail resolution, but suffers from the introduction of ringing artefacts at high-amplitude contrast boundaries.

7.3.4 Software

The software is written in 'C' by Dr T J Dennis of the Department of Electronic Engineering at the University of Essex, and runs on the Linux operating system. Facilities available under Linux, such as the Convert utility to do rescaling and compression, are used where necessary.

8 Geophysics and cropmark interpretation (Figs 12-18)

8.1 Introduction

In this section, an attempt will be made to interpret the results of the geophysical survey (plotted here as Figure 14). However, a more useful approach is to interpret the geophysical survey alongside the existing cropmark evidence. In fact, it has been found that the geophysical survey evidence can be used to correct the cropmarks, which were plotted from oblique photographs before the days of computer rectification of images.

8.2 Correction method

8.2.1 Figure 16 presents a combined plot of cropmarks and geophysical anomalies. The starting point for the generation of this figure was the cropmark plot drawn up by CAT for the large fold-out plan in *Camulodunum 2* (Hawkes & Crummy 1995). A few recently plotted marks were added to this for the cropmark plot reproduced as map 2 in the Garrison DBA (CAT Report 97). These new additions were the lines of a WWII tank-trap (Fig 16, no **37**) and a few parch marks (all of which are pipe- or service-trenches shown on Figs 10-12).

8.2.2 Comparing this plot with the geophysical anomalies revealed by the Bactec survey in 2002, it is clear that in many instances the geophysical anomalies are the same features as the cropmarks. This is especially so in the case of the double-ditched trackways and their

associated field systems. Where there is a clear correlation of this type, the geophysical survey anomaly has been taken to be the correct position of the anomaly/feature, and the cropmark plot has been corrected by dragging it to the correct position (ie the geophysical anomaly position). In some cases, this involves a correction of some tens of metres 'on the ground', ie away from its original plotted position. Nevertheless, the match between, for instance, the cropmarks and geophysical anomalies at **17** (Fig 16) inspires confidence that this is the correct procedure.

8.2.3 Less certain than the above, but still reasonably secure, is the correlation between more fragmentary landscape features (short lengths of ditches or field-corners) and geophysical anomalies. Where the correlation seems convincing, the cropmarks have (as above) been corrected to the anomaly position. A particularly good example of this is group **11** (Fig 16), where a good cropmark field-corner ties up with a larger group of geophysical anomalies to form a small field pattern.

8.2.4 In other cases, where there is no correlation between cropmarks and geophysical anomalies, it is felt that there is no basis for correcting the original cropmark plot.

8.3 Interpretation of cropmark/geophysical anomalies

8.3.1 Preliminary comments

Discussion and interpretation of cropmark features or geophysical anomalies is based on several assumptions: for instance, that parallel lines are contemporary, and that lines which appear to converge into a junction or join at a right angle are similarly contemporary. Of course it is impossible to prove or disprove these interpretations without large-scale trial-trenching and excavation in the appropriate areas. The following comments and interpretations are therefore reasonable interpretations of the available evidence, which will be confirmed or refuted only when a further stage of work is carried out (in this case, the trial-trenching evaluation).

8.3.2 Presentation of the evidence

Figure 13 shows the areas covered by the geophysical survey. The cropmarks are plotted separately on Figure 15, and the geophysical anomalies separately on Figure 14. A joint geophysical survey and cropmark plot with annotations is shown at a larger scale (Fig 16). The original processed data are shown as Figure 17. Before discussing the principal cropmarks, those of more recent origin are dealt with first (below).

8.3.2.1 Recent services

Some of the geophysical anomalies are so straight that they must be modern pipes or cables. These are shown printed in a different colour from archaeological anomalies on Figures 10-12.

8.3.2.2 World War I and World War II features

There is one mark (Fig 16, **37**) which the Essex Heritage Conservation Record (EHCR) describes as a WWII tank-trap. There is no reason to doubt that interpretation here. There is a prominent square anomaly lying centrally within the playing field area (north end of Areas E and F), and a circle on the east edge of Area O (Figs 17-18). Given the fact that the Ordnance Survey 1921 1:10560 sheet shows widespread buildings over this part of the Garrison, these marks are likely to belong to the WWI period or shortly after.

8.3.2.3 The coaxial field system part 1: Areas R, M, P, S

With the exception of the above two elements, the remainder of the cropmark/geophysical plot represents the elements of a field system comprising double-ditched trackways and associated fields.

The principal double-ditched trackway is no **1** on Figure 16. Trackway **2** joins it, and so must be contemporary. Trackway **3** is at right angles, and is presumably contemporary. Away from the trackways there are some marks which are definitely associated because they join or almost join (**8**), and others whose alignment makes them likely to be associated (**9**, **5**, **6**, **15**, **16**, **4**?, **7**?). These marks define a field system aligned south-west to north-east. In conventional archaeological parlance, this would be termed a coaxial field system.

Within this field system, one feature stands out. This is an open circle (**10**), tucked into the corner of the field defined by **1** and **2**. This could be a contemporary enclosure and a focus of occupation.

There are also other marks which either cut across various elements of the above field system (**11**, **12**, **13**), and therefore cannot be contemporary, or else they do not share the same alignment and are probably of a different period (**14**).

Away to the east, lines **38**-**40** are reasonably coherent parts of a field system. It is difficult to say whether these are part of the main field system.

8.3.2.4 The coaxial field system part 2: Areas G, DRI, E, F, C, Q, O

The northern part of the survey area has elements that also appear to be parts of a coaxial field system (Fig 16). Principal features are the double-ditched trackways. These include a particularly convincing group of marks (collectively no **17**) which includes **18**-**21**, and continues east as **22**. Marks which are at right angles and therefore presumably contemporary are **24** and **23**. Parallel with the main direction of **22**, no **25** may be part of the same system.

There is also a field system defined by trackway **26**/**27** in Areas DRI and Q. Its alignment shows that it is probably the same field system as **17** above; in fact, one could speculate that the two trackways join under the petrol station at the corner of Roman Barracks (ie south of Area DRI). Mark **28** is parallel to **27**, and so they are probably contemporary.

There is an additional stretch of trackway at **30**. It is difficult to say whether this is a replacement of or an addition to **26**. The alignment of trackway **29** is closer to **30** than to **29**; perhaps this suggests that the balance of evidence is in favour of **29**/**30** being a replacement trackway. Mark **34** is not convincingly associated with the trackways, being rather sinuous and not at right angles to them.

There are other sundry marks which are difficult to interpret: another short stretch of trackway at **31**, and a possible field-corner in the faint mark at **36** (this is broadly aligned with **17**). There are also a pair of lines at **42**-**43** in Area O. Whereas these do not appear to be modern, the amount of modern disturbance argues against features of any antiquity surviving in this part of the Garrison.

8.3.2.5 A note on field sizes

Assuming that the cropmark and geophysical survey lines do represent a field system, it should be possible to estimate the size of the fields. There are sufficient cropmark and geophysical lines here to allow some attempt at such a measurement, tabulated here.

reference cropmarks/ geophysical anomalies	field dimensions parallel with trackway	field dimensions away from trackway
3-**8**	330m	-
1-**9**	-	170m
1-**4**	-	175m
18-**21**	130m	-
21-**23**	150m	-
23-**24**	150m	-
18-**20**	100m	-
27-**28**	-	100m
29-**34**	140m	-

Without pushing the limits of speculation too far, a few points can be made. Where there are reasonable measurement to be had, fields are 100m (one example) or 170m to 175m deep from the trackways to the back field-boundary (two examples). In width parallel with the trackways, there are three sizes: 100m (one example); 130-150m (4 examples), and 330m (perhaps a ?double field: one example).

8.3.2.6 Cultivation marks

At the northern end of Area P, there are a number of marks lying parallel to the field-boundaries and approximately 5m apart. These seem to be too narrow to be the remains of a ridge-and-furrow system (a local example at Langenhoe was recently measured at 14m furrow to furrow). Further, the marks do not show the classic S-profile curve, and nor do they appear to turn sharply at the headland (field edge). Taking these characteristics into account, a recent agricultural origin for these marks seems likely.

9 Conclusions

9.1 For at least a thousand years before the construction and occupation of the major late Iron Age *oppidum* of Camulodunum, there had been human activity over the land now forming the southern part of Colchester Garrison. The evidence for this is the prehistoric struck flints and burnt flints collected during the fieldwalking survey. While the struck flints were not found at weights high enough to suggest prolonged or intensive activity, the burnt flints were found in sufficient numbers to suggest a wider scale of prehistoric activity, perhaps centred on the Bronze Age, over the survey area.

9.2 Later finds, principally the Roman pottery and tile, must be judged against a different background. By the late Iron Age and early Roman period, the survey area lay within the *oppidum*, in an area where the cropmark evidence suggests large areas of fields connected by trackways. While the cropmarks have yet to be tested by excavation, they are almost certainly contemporary with the *oppidum* and therefore late Iron Age or Roman in date.

9.3 As presently understood, the *oppidum* had two centres of activity: Gosbecks (the rural farmstead, and possibly the home of Cunobelin); and Sheepen (the industrial and trading centre). Apart from these two large centres, it is likely that there were smaller domestic and farming sites in the *oppidum* which await discovery. In fact, the cropmarks in the survey area may be the fields and trackways of one such farm or farms, possibly related to the Roman building identified during 1994 investigations at Kirkee McMunn Barracks (Shimmin 1998). The location of other similar farm buildings might be indicated by spreads of *tesserae* or other building debris, but there are no obvious concentrations of this material within the survey area. The correlation of evidence associated with the Roman hypocaust and structural features found under the east edge of the Kirkee and McMunn Barracks in 1994 is unique within the Garrison site. In addition to the structure, there is a cropmark of fields and trackways south-east of this site, and a spread of Roman tile in the field directly to its east (survey areas E, F). Within the investigated area, a number of ditches defining field edges or paddocks share precisely the same alignment as the cropmarks to the east. Except for the hypocaust, other details such as an oven indicate that this is a domestic site.

9.4 No Saxon material was collected from the survey area. However, Saxon pottery is very friable, and Saxon buildings (being constructed from organic materials) do not leave evidence like building debris to be picked up in fieldwalking survey. Therefore the absence of Saxon material is not evidence for the absence of Saxon activity.

9.5 Medieval pottery occurs at very low weights, and without significant clusters. Such small groups of material might be taken as evidence that the area was primarily pasture or waste in medieval times (and not arable, where pottery might be released onto the fields as manure scatters).

9.6 The post-medieval and modern material collected in this survey (pottery and peg-tile) is almost certainly the result of manuring operations over the last three or four centuries, and has no other significance.

10 Acknowledgements

The project was commissioned by RMPA Services on behalf of the MoD. Special thanks to Stephen Barnes and Ruari Maybank (RMPA Services) and Colonel Mike Foster (MoD). The project consultants were RPS; thanks to Ken Whittaker and Rob Masefield for support and advice, and to Chris Atkinson for plans supplied. The project was monitored by Martin Winter for Colchester Borough Council. Thanks to W S Atkins for establishing the site grid.

Thanks to the farmer John Lochore for access to the fields. Fieldwork was directed by Carl Crossan and carried out by Ben Holloway, Chris Lister, Laura Pooley, Nigel Rayner, Simon Rulton, David Sims and Pauline Skippins.

The geophysical survey was conducted by Bactec International Ltd. CAT would like to thank Bactec for all their assistance on site, and for the munitions briefings for CAT staff, forwarding data to Dr Dennis, and for documentation supplied.

11 References

Bactec International Ltd	2002	*Method statement on geophysical survey*
CAT Report 97	2000	*An archaeological desk-based assessment of the Colchester Garrison PFI site*, by Kate Orr
English Heritage	1994	*Geophysical survey in archaeological field evaluation*
Hawkes, C F C, & Crummy, P,	1995	*Camulodunum 2*, Colchester Archaeological Report **11**
Medlycott, M, & Germany, M,	1994	'Archaeological fieldwalking in Essex 1985-93: interim results', *Essex Archaeology and History*, **25**, 14-27
Shimmin, D,	1998	'A late Iron Age and Roman occupation site at Kirkee McMunn barracks, Colchester', *Essex Archaeology and History*, **29**, 260-69

12 Glossary

Bronze Age	period from *circa* 2000 BC to 700 BC
Iron Age	7th century BC to Roman invasion of AD 43
manure scatter	process whereby pottery (as domestic rubbish) is spread when manure is carted out onto the fields
medieval	from AD 1066 to Henry VIII
modern	19th and 20th centuries
NGR	National Grid Reference
post-medieval	after Henry VIII and up to Victorian
prehistoric	pre-Roman, or generally the years BC
Purbeck marble	marble used as floor slabs or decorative wall trim in Roman structures
quern	grinding-stone to convert grain to flour
Roman	the period from AD 43 to *circa* AD 430
Saxon	the period from *circa* AD 430 to AD 1066

13 Archive deposition

The finds and the paper and digital archive are held at the Colchester Archaeological Trust, 12 Lexden Road, Colchester, Essex CO3 3NF, but both will be permanently deposited with Colchester Museums under accession code 2002.8.

14 Statistical information

Key:

n = number of 20m boxes walked
Ex = total weight of individual finds type (ie Roman potsherds)
Ex2 = sum of weight of individual finds individually squared
μ = average weight of finds type
σ = standard deviation
+1σ = +1SD weight
+2σ = +2SD weight

Struck flint

n	1553
Ex	1168g
Ex2	39978g
μ	6.083g
σ	16.980g
+1σ	23.063g
+2σ	40.043g

Burnt flint

n	1553
Ex	3378g
Ex2	154688g
μ	18.259g
σ	22.886g
+1σ	41.146g
+2σ	64.032g

Prehistoric pottery

n	1553
Ex	10g
Ex2	50g
μ	5.00g
σ	0.00g
+1σ	5.00g
+2σ	5.00g

Roman pottery

n	1553
Ex	675g
Ex2	23497g
μ	16.071g
σ	17.397g
+1σ	33.469g
+2σ	50.866g

Roman brick

n	1553
Ex	7245g
Ex2	2175299g
μ	95.329g
σ	145.954g
+1σ	241.283g
+2σ	387.236g

Roman tile

n	1553
Ex	43950g
Ex2	8431634g
μ	56.609g
σ	96.844g
+1σ	153.452g
+2σ	250.296g

Medieval pottery
n 1553
Ex 207g
Ex2 3075g
μ 9.857g
σ 7.019g
+1σ 16.876g
+2σ 23.895g

Post-medieval pottery
n 1553
Ex 5594g
Ex2 162664g
μ 12.515g
σ 14.431g
+1σ 26.946g
+2σ 41.377g

Modern pottery
n 1553
Ex 4041g
Ex2 182624g
μ 6.571g
σ 18.200g
+1σ 24.771g
+2σ 42.971g

Peg-tile (medieval and post-medieval)
n 1553
Ex 157183g
Ex2 408827787g
μ 20.582g
σ 128.957g
+1σ 149.539g
+2σ 278.496g

15 Appendix

Tabulation of field surface conditions during fieldwalking survey.

Field code	Description
Area F	Ploughed and rolled, some parts freshly ploughed
Area R west	Ploughed but becoming dusty
Area R east	Ploughed and recently rolled, weathered between ploughing and rolling
Areas P, Q	Planted, with 5-10% of surface obscured by plant growth
Area M	Ploughed and planted
Area G	Ploughed and rolled, recent rain
Area DRI	Ploughed and rolled, dusty
Area S1	Ploughed and rolled
Area S2	(not walkable)

Howard Brooks, May 2002: revised August 2002

Distribution list:
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RMPA Services
RPS
John Lochore
Martin Winter, Archaeology Officer for Colchester Borough Council
Essex Heritage Conservation Record, Essex County Council

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Checked by: *Philip Crummy*
Date: *24.09.02*

Adams c:/reports02/garrisonfieldwalking/rep184final.doc

Essex Heritage Conservation Record/ *Essex Archaeology and History*

Summary sheet

Site address: Colchester Garrison PFI site, Colchester, Essex	
Parish: Colchester	***District:*** Colchester
NGR: north edge TL 990 233 south edge TL 988 229	***Site code:*** Museum accession code 2002.8
Type of work: Fieldwalking and geophysical survey	***Site director/group:*** Colchester Archaeological Trust
Date of work: January-March 2002	***Size of area investigated:*** 62 hectares
Location of finds/curating museum: Colchester Museums	***Funding source:*** Developer
Further seasons anticipated? Geophysical survey and trial-trenching this season	***Related EHCR nos:*** 11839, 11898, 11921, 11927, 11974, 11633
Final report: CAT Report 184 and summary in *EAH*	
Periods represented: prehistoric, Roman, medieval, post-medieval, modern	

Summary of fieldwork results:

A fieldwalking evaluation was conducted over a 62 hectare area of land which coincides with the arable areas of the Colchester Garrison PFI site, Colchester, Essex.

Only three classes of archaeological material were found in any quantity: burnt flint (prehistoric), Roman tile, and post-medieval pottery. General spreads of burnt flints and Roman tile indicate general areas of activity in the prehistoric and Roman periods. Within those general spreads were significant clusters of Roman tile (three clusters), as defined by the Essex fieldwalking methodology. It is not clear whether the concentrations of Roman tile indicate the position(s) of Roman buildings or whether they are simply manure scatter finds, but they probably represent the latter.

The post-medieval pottery is probably on the site as a result of manuring operations which used material from local farms.

The geophysical survey was undertaken concurrently with the fieldwalking. There were some instances where 'anomalies' detected by the geophysical survey were quite clearly archaeological features already known as cropmarks. This was particularly so of a number of double-ditched trackways. Where there was a direct correlation, the cropmark plots were corrected to the anomaly positions. In other cases, geophysical anomalies probably represent previously unknown archaeological features, perhaps field-boundaries, which add further detail to the picture of the late prehistoric and Roman landscape now being built up by these various archaeological survey techniques.

Previous summaries/reports: None	
Author of summary: Howard Brooks	***Date of summary:*** 17th May 2002

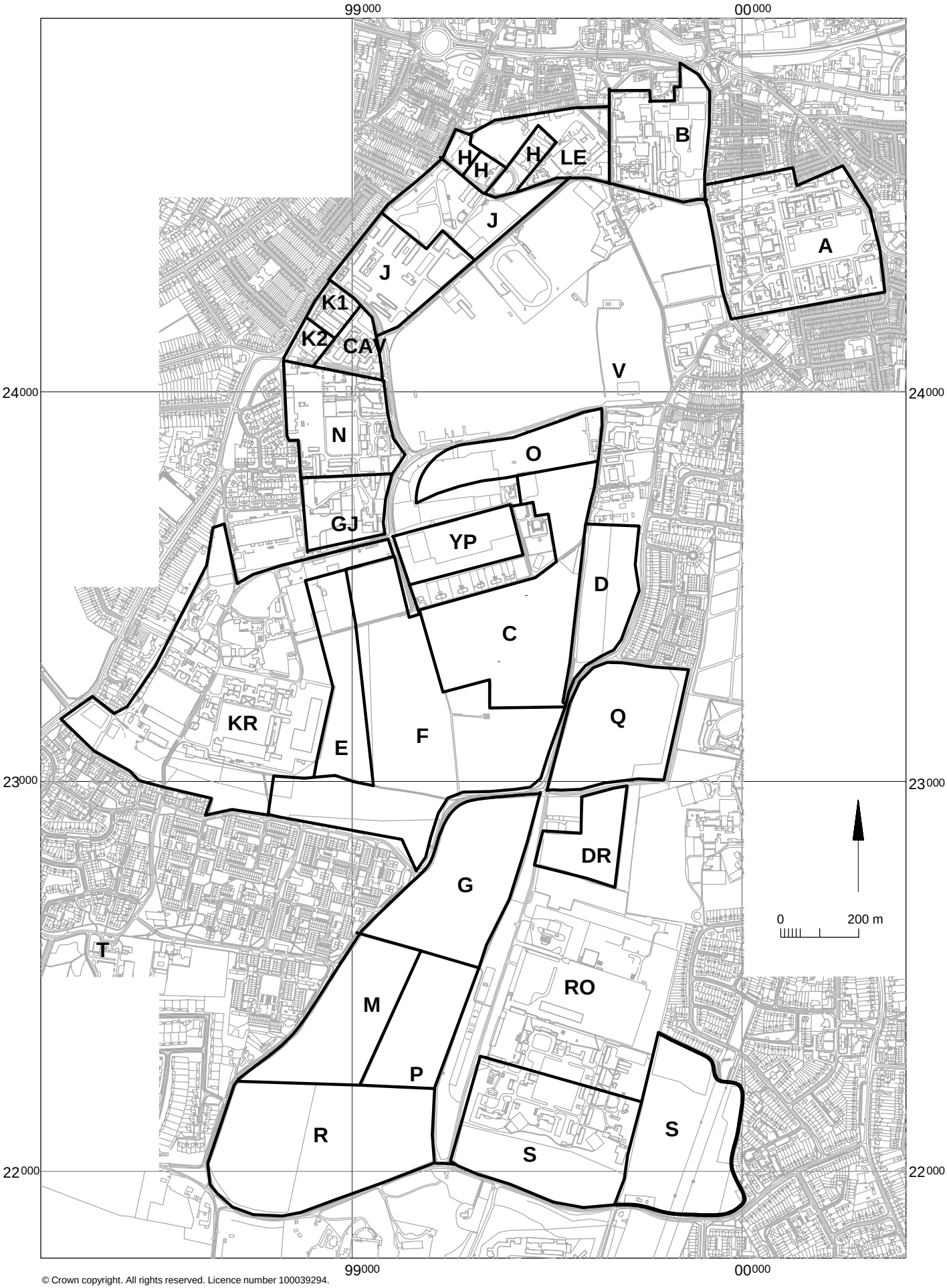

Fig 1 Area locations.

Fig 2 Kilometre, area and hectare names over fieldwalked area.

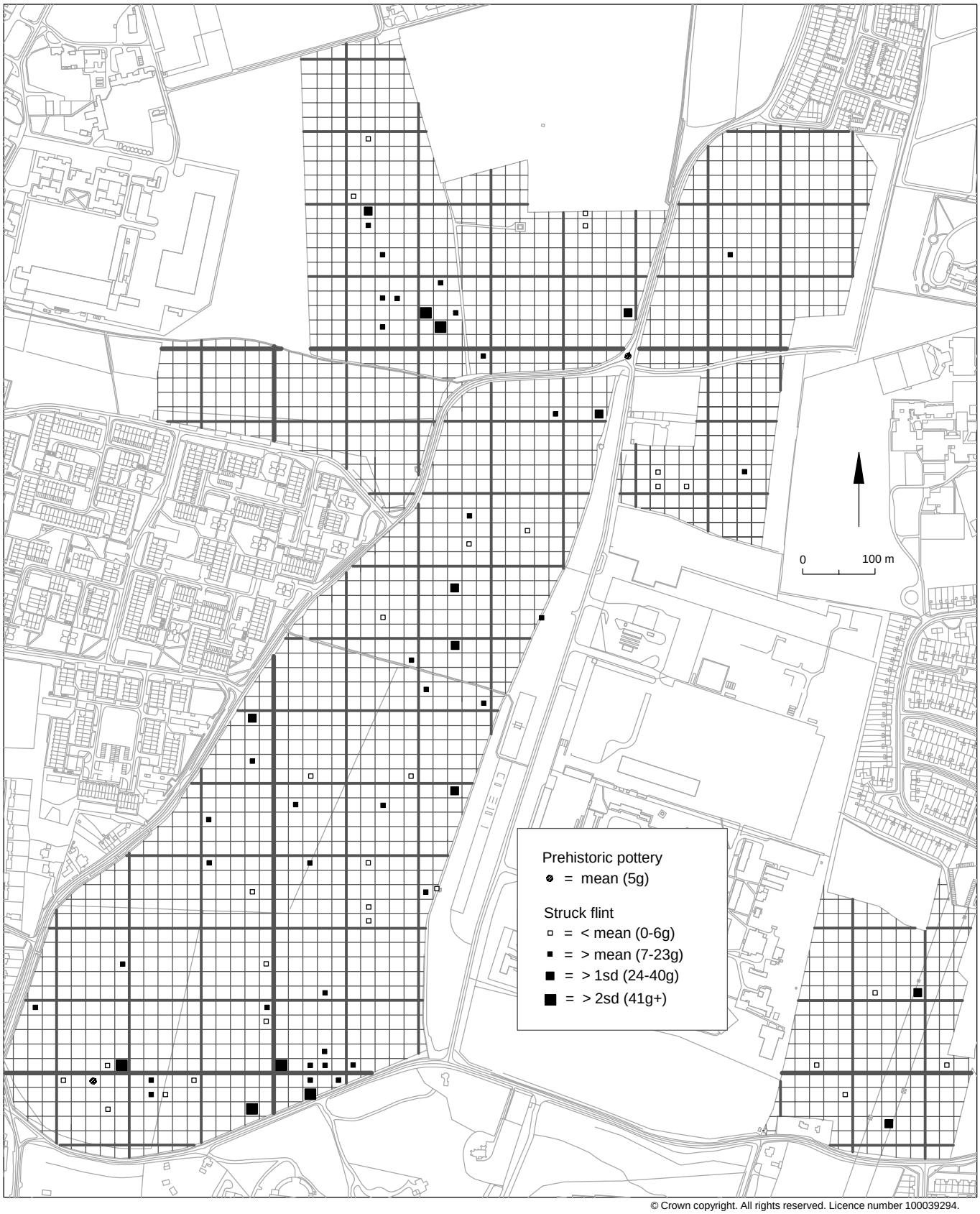

Fig 3 Distribution of prehistoric pottery and struck flint.

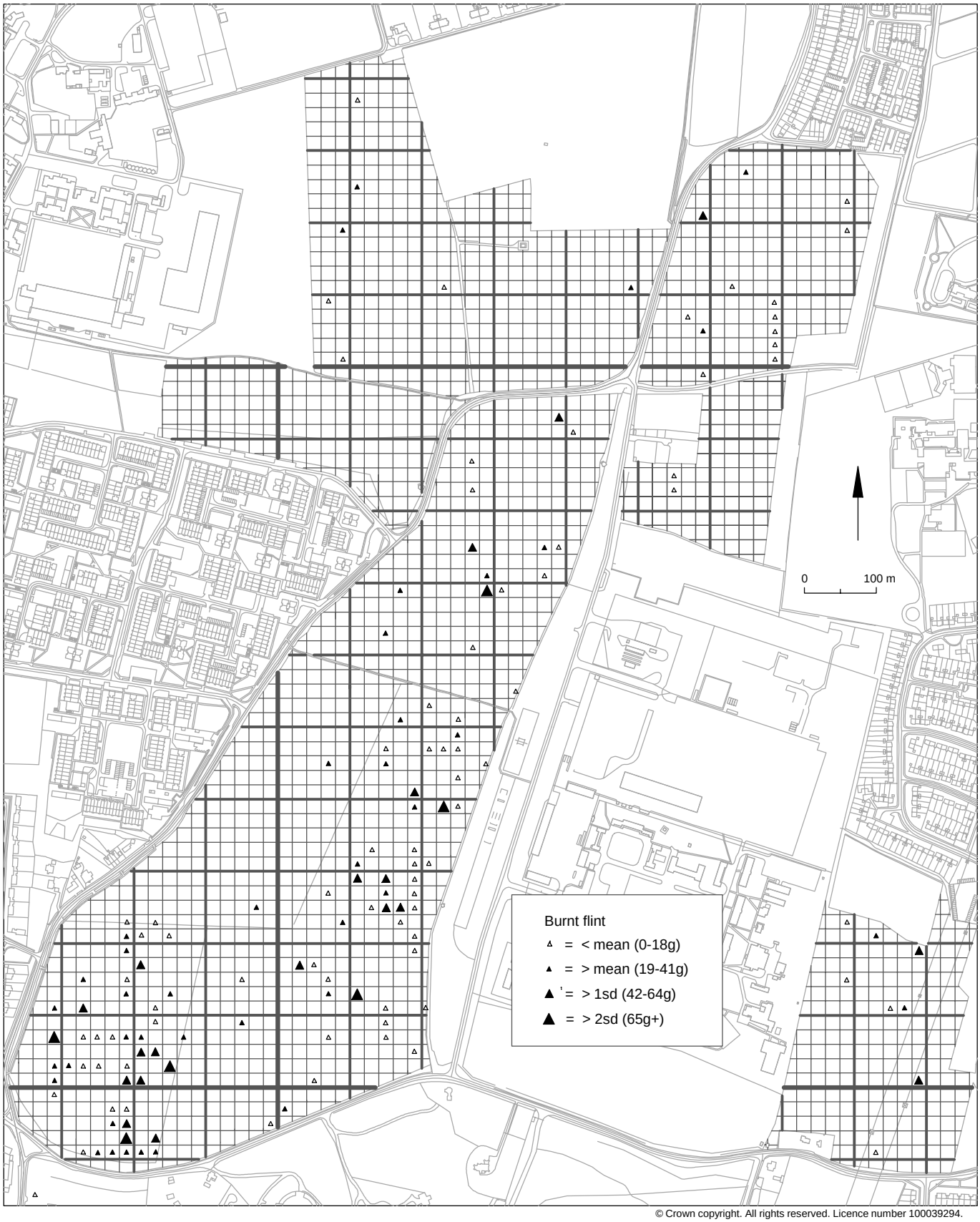

Fig 4 Distribution of burnt flint.

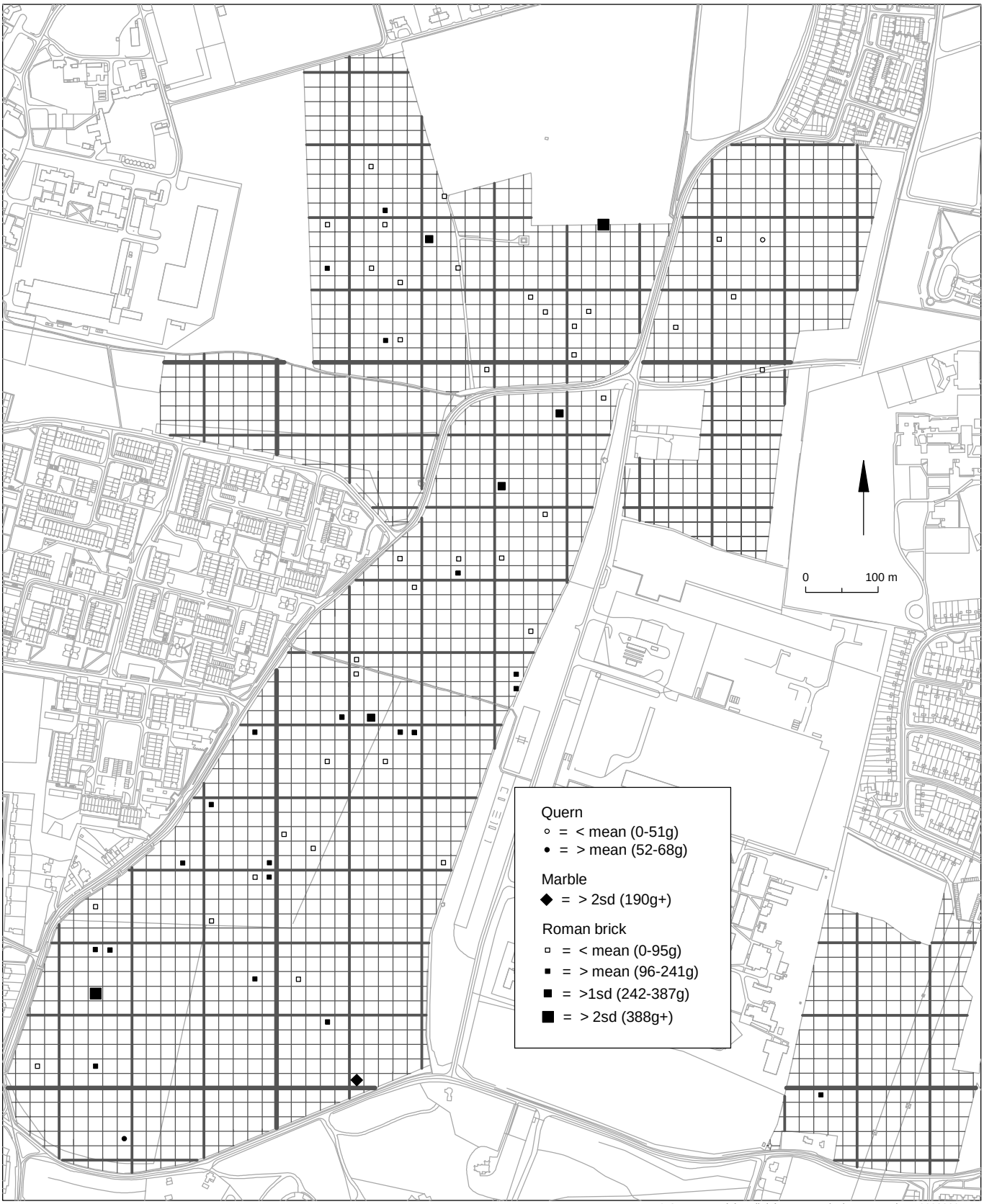

Fig 5 Distribution of quern, marble and Roman brick.

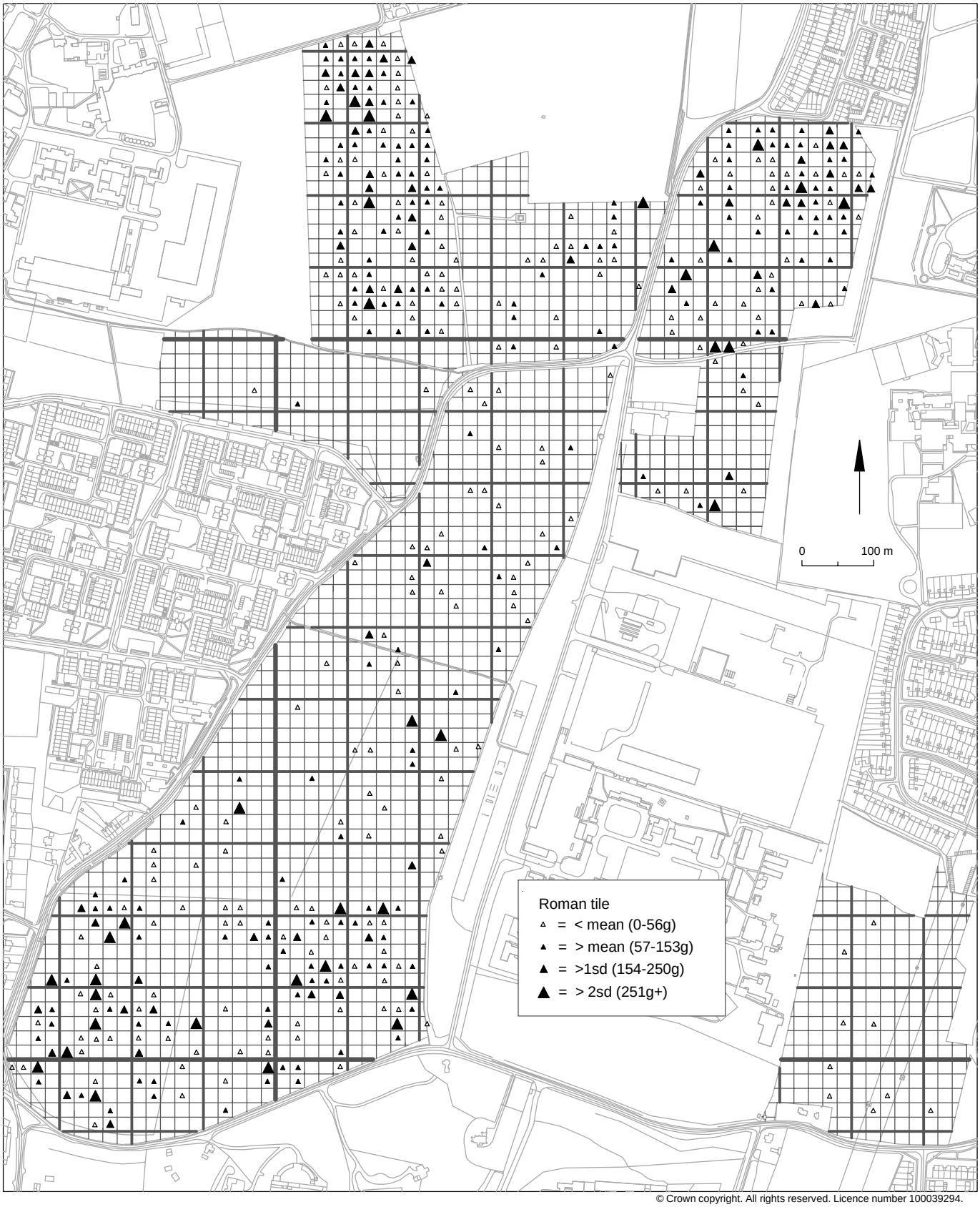

Fig 6 Distribution of Roman tile.

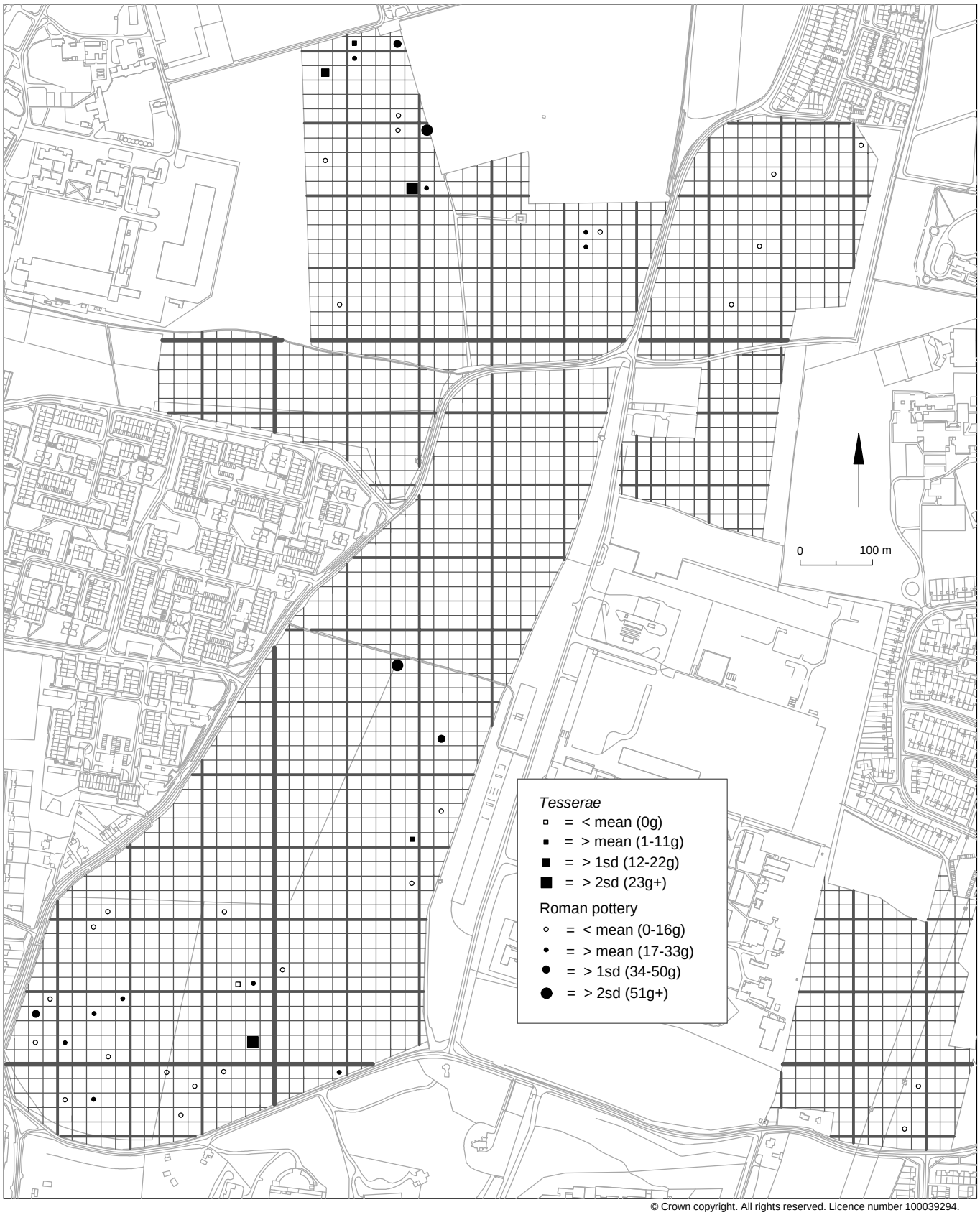

Fig 7 Distribution of Roman pottery and *tesserae.*

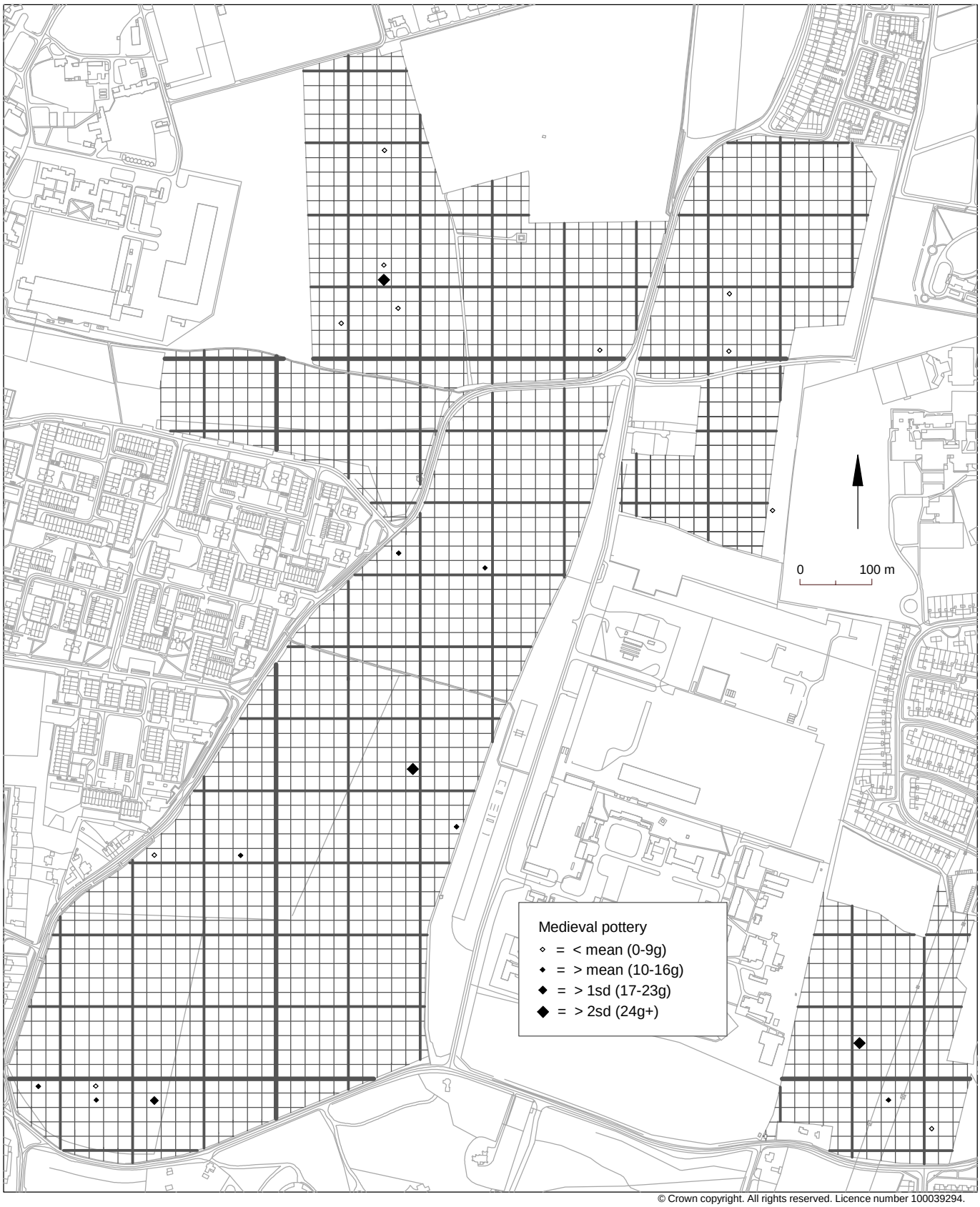

Fig 8 Distribution of medieval pottery.

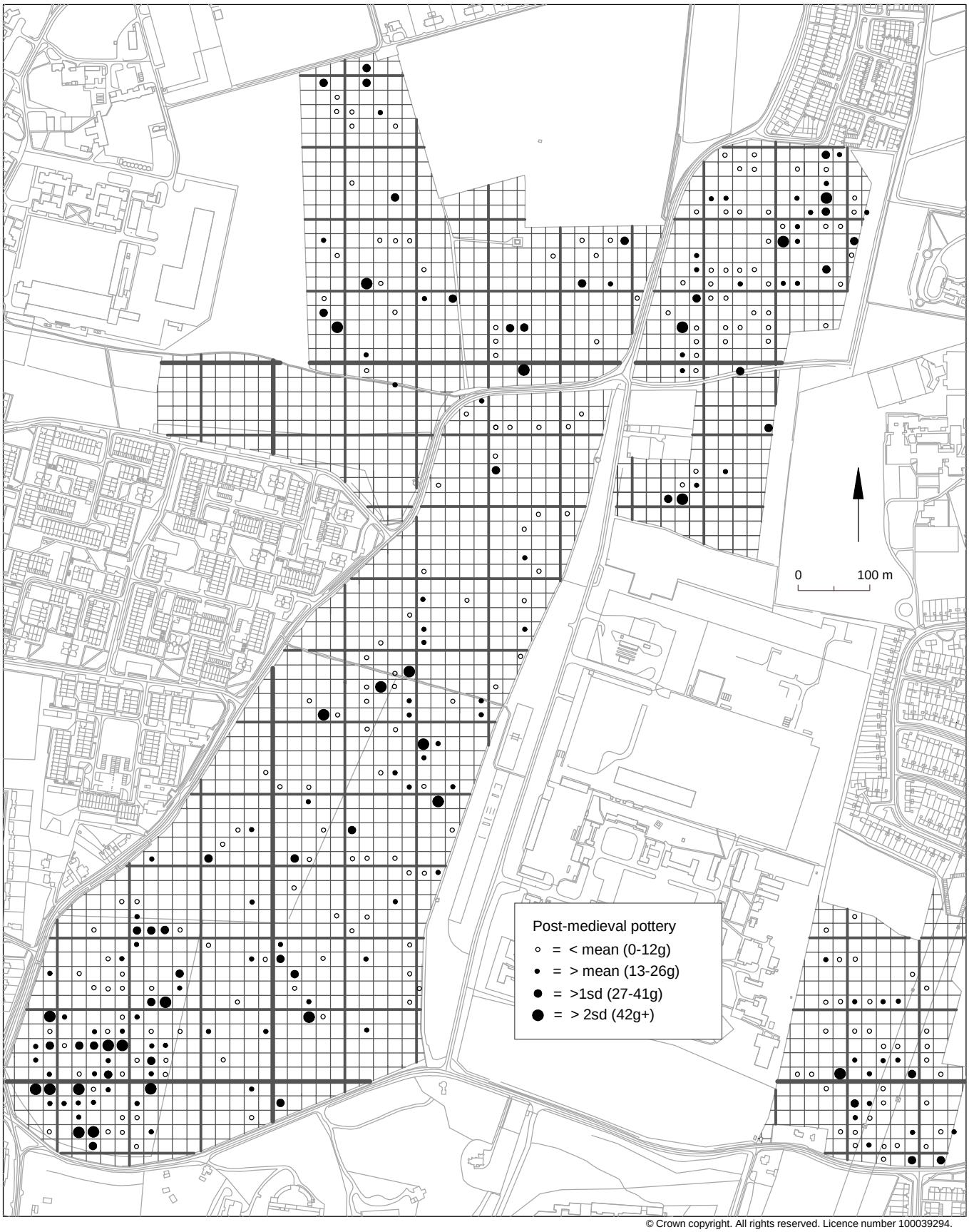

Fig 9 Distribution of post-medieval pottery.

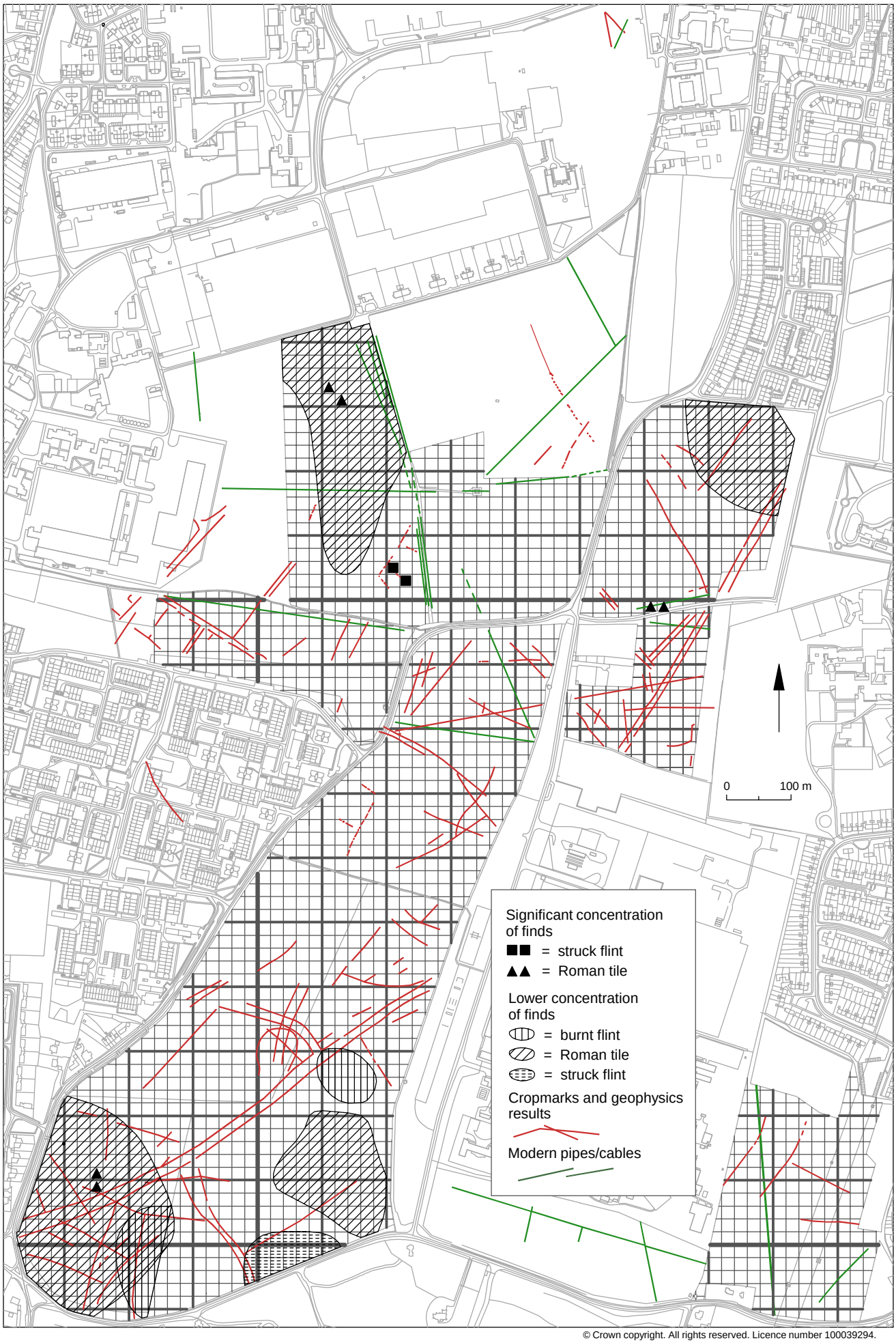

Fig 10 Fieldwalking summary with cropmarks and geophysics results, showing modern pipe/cable locations.

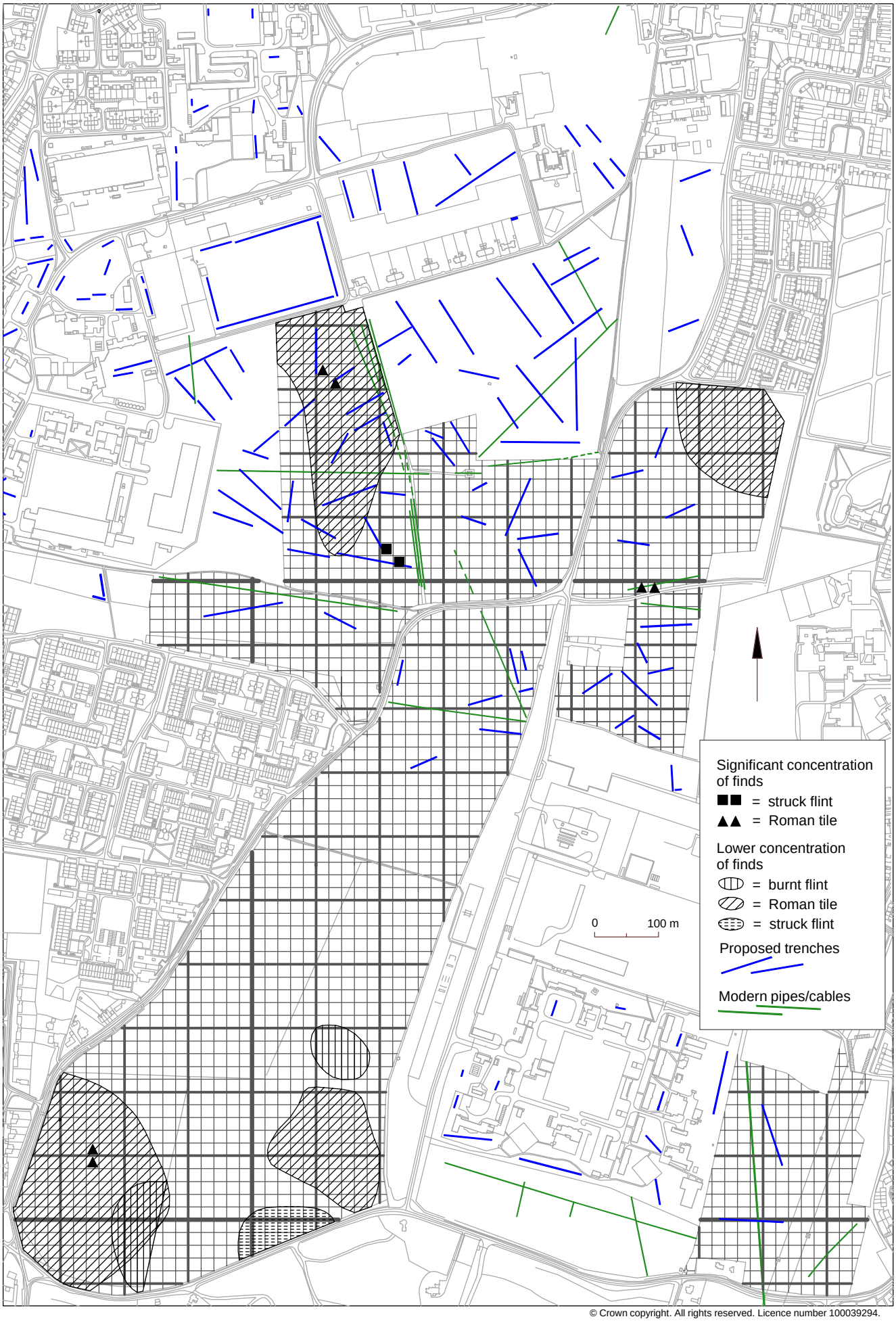

Fig 11 Fieldwalking summary with proposed trench plan, showing modern pipe/cable locations.

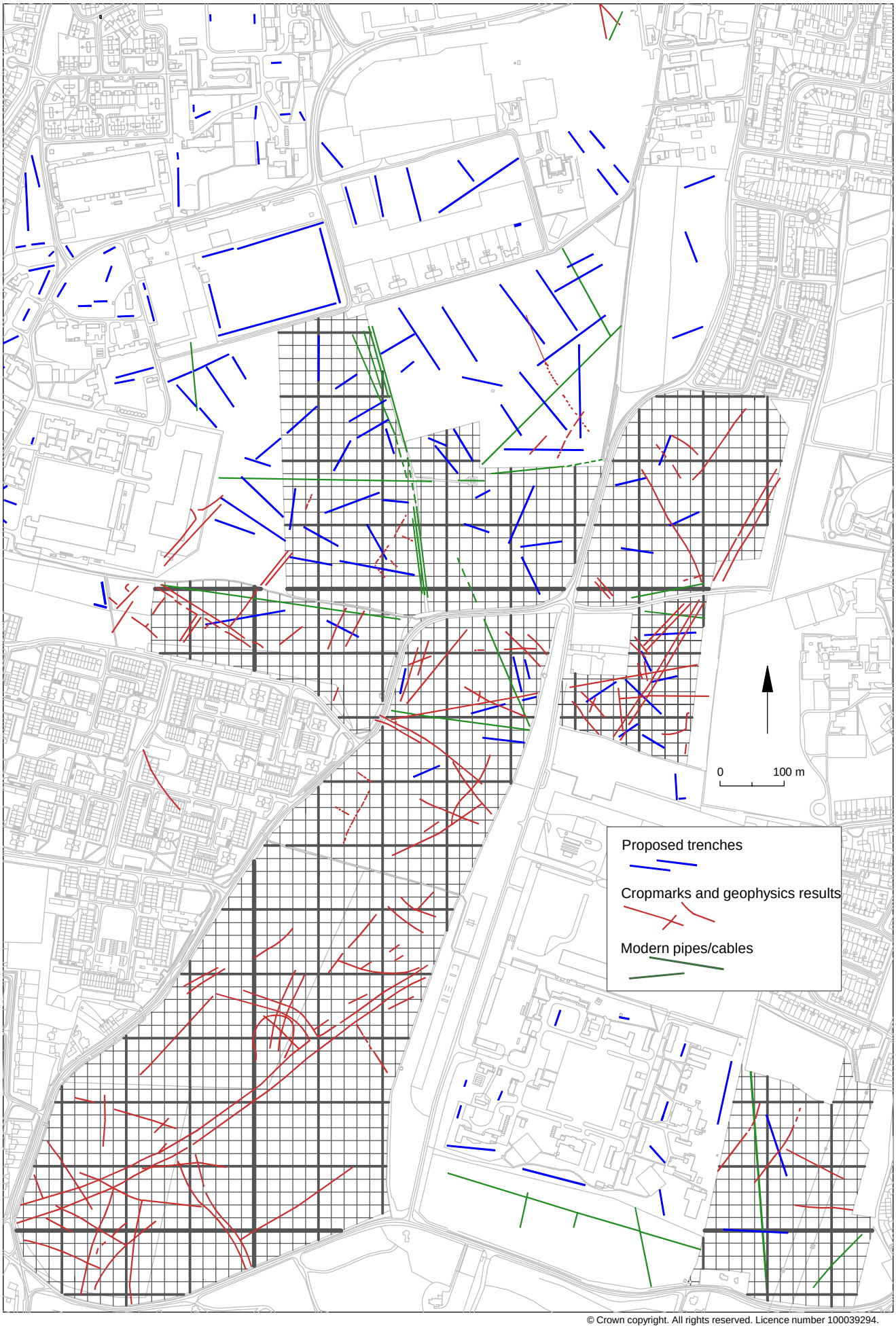

Fig 12 Proposed trench plan with cropmarks and geophysics results, showing modern pipe/cable locations.

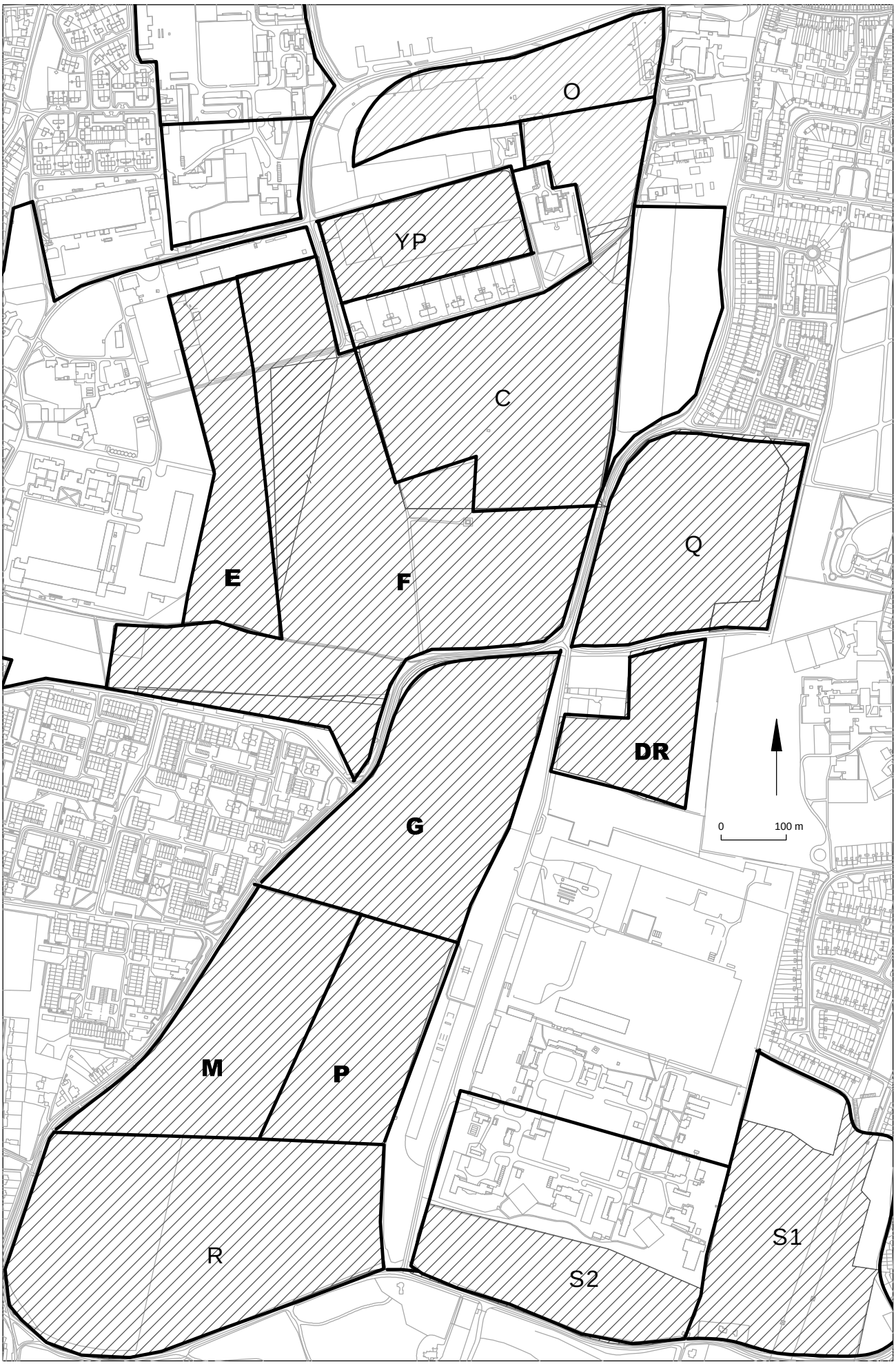

Fig 13 Geophysical survey areas.

Fig 14 Geophysical survey anomalies (without modern pipes/cables).

Fig 15 Cropmarks plot.

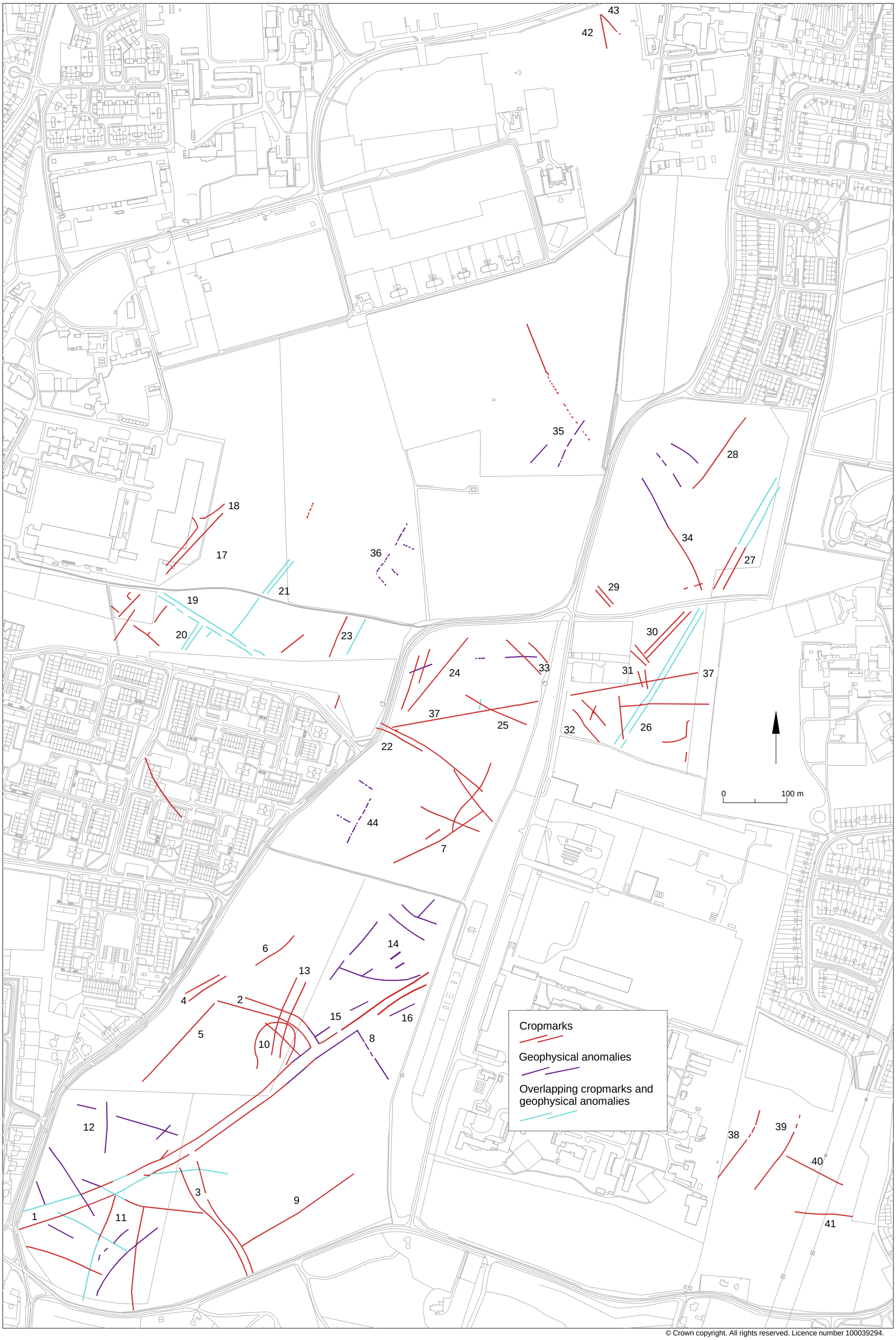

Fig 16 Cropmarks and geophysics results combined plot.

Fig 17 Geophysical survey processed data: Areas C, E, F, Q, P, DRI, G, YPR, O, E/F playing fiel

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Project: Colchester Garrison				
Title:				
Scale: NTS	Drawn By: CA	Date: 20.05.02	Checked By:	Date:
Project No.: JR4536B			Drawing No.: V:\cadwork 4536\015.dwg	Revision:

Fig 18 Geophysical survey processed data: Areas P, M, R, S1, S2.

RPS Planning, Transport and Environment

Project: Colchester Garrison				
Title:				
Scale: NTS	Drawn By: CA	Date: 20.05.02	Checked By:	Date:
Project No.: JR4536B			Drawing No.: V:\cadwork\4536\015.dwg	Revision: