Archaeological evaluation at Colchester Northern Gateway Sports Hub Plots 2-3, east of Colchester Park and Ride, Mile End, Colchester, Essex, CO4 5JA

November-December 2017

by Laura Pooley

with contributions by Steve Benfield, Lisa Gray and Adam Wightman
figures by Laura Pooley, Mark Baister, Ben Holloway, Chris Lister, Emma Holloway and Adam Wightman

fieldwork by Adam Wightman with Sarah Carter, Elliott Hicks, Ben Holloway, Robin Mathieson, Nigel Rayner, Adam Tuffey and Alec Wade

commissioned by Colchester Borough Council

NGR: TL 99878 29486 (centre)
Planning ref.: n/a
CAT project ref.: 17/11e
CHER code: ECC4112
Colchester Museum accession code COLEM: 2017.152
OASIS ref.: colchest3-301355

Colchester Archaeological Trust
Roman Circus House,
Roman Circus Walk,
Colchester,
Essex, CO2 7GZ

tel.: 01206 501785
email: lp@catuk.org

CAT Report 1219
May 2018

Archaeological evaluation at:

Colchester Northern Gateway Sports Hub Plots 2-3,
east of Colchester Park and Ride, Mile End, Colchester,
Essex, CO4 5JA
CAT Report 1219

Author:

Laura Pooley, Project Officer

Version:

V1, 22nd January 2018

V2, 3rd May 2018

Checked by / Approved by:

Philip Crummy, Director of Archaeology

Colchester Archaeological Trust

Contents

List of photographs, tables and figures

Cover: working shot

1 Summary

An archaeological evaluation (120 trial-trenches) was carried out at Colchester Northern Gateway Sports Hub Plots 2-3, Colchester, Essex, in advance of development works. The development site has been divided into 11 plots with Plots 2 and 3 representing potential areas for the development of sports and leisure facilities.

The most significant archaeological remains consisted of 24 charcoal-rich pits probably relating to charcoal production. These were sub-round or sub-oval charcoal-rich features with occasional evidence of in situ burning. Dating evidence was mostly lacking but two of the pits contained finds dated to the Roman and post-Roman periods. With radiocarbon dates from charcoal in another two of the pits dating to the Middle Iron Age and late Anglo-Saxon/early Medieval period. Together with another 77 charcoal-rich pits known from previous archaeological investigations, they suggest that charcoal production was occurring in this part of northern Colchester from the Early Iron Age through to the medieval period.

Other archaeological remains included residual prehistoric work flints, a single tree-throw containing a prehistoric worked flint which may or may not be residual, a small number of undated pits and tree throws, and a number of modern field boundary ditches, many of which are visible on old OS maps dating from the late 19th-century to the late 1990s, with associated agricultural features.

2 Introduction (Fig 1)

This is the report for an archaeological evaluation by trial-trenching at Colchester Northern Gateway Sports Hub Plots 2-3, Colchester, Essex which was carried out from 20th November to the 20th December 2017. The evaluation was commissioned by Colchester Borough Council in advance of the Colchester Northern Gateway Sports Hub development. The development has been divided into 11 plots identified by Colchester Borough Council, Plots 1-5 being situated to the north of the A12 and the remainder to the south. Plots 2 and 3 represent the first in a series of phases, which have been assigned as potential areas for the development of sports and leisure facilities. All work was carried out by Colchester Archaeological Trust (CAT).

As the site lies within an area highlighted by the EHER/CHER as having a high potential for archaeological deposits, an archaeological condition was recommended by the Colchester Borough Council Archaeological Advisor (CBCAA). This recommendation was for an archaeological evaluation by trial-trenching and was based on the guidance given in the *National Planning Policy Framework* (DCLG 2012).

All archaeological work was carried out in accordance with a *Brief for an archaeological trial-trenched evaluation at Plots 2, 3, 10 and 11, Colchester Northern Gateway, Colchester*, detailing the required archaeological work, written by Jess Tipper (CBCAA 2017), and a written scheme of investigation (WSI) prepared by AECOM Infrastructure & Environment UK Limited in response to the brief and agreed with CBCAA (AECOM 2017).

In addition to the brief and WSI, all fieldwork and reporting was done in accordance with English Heritage's *Management of Research Projects in the Historic Environment* (*MoRPHE*) (English Heritage 2006), and with *Standards for field archaeology in the East of England* (EAA **14** and **24**). This report mirrors standards and practices contained in the Institute for Archaeologists' *Standard and guidance for archaeological field evaluation* (CIfA 2014a), the CIfA Code of Conduct (CIfA 2014c) and *Standard and guidance for the collection, documentation, conservation and research of archaeological materials* (CIfA 2014b).

3 Archaeological and historical background (taken from AECOM 2017, 5-6)

Plot 2 covers an area of 8.4 ha centred on NGR TL 9969 2965, with Plot 3 covering 22.7 ha centred on NGR TL 9982 2937. Both plots are currently under cultivation with Plot 2 located to the north of Salary Brook and Plot 3 to the south. The A12 runs along the southern edge of the development site. North of the A12 is mainly farmland with recent development to the south including the Colchester Community Stadium and Northern Approach Road.

The British Geological Survey 1:50,000 scale geological mapping indicates that the superficial geology of the site comprises deposits of cover sands (previously mapped as Kesgrave and Lowestoft Formations). The underlying bedrock geology of London Clay outcrops at the surface at some locations, for example along the route of the Salary Brook where a shallow valley has incised through the superficial deposits. The cover sand deposits are described as "sand and silt, commonly wind-blown (aeolian)", of the Quaternary Period.

A desk-based assessment for the scheme, carried out by Archaeology South East in 2015, concluded that there was a generally low potential for archaeological remains to be present. It identified little evidence of prehistoric activity with a slightly increased potential for evidence relating to the Romano-British period. Numerous 'fire pits' of Iron Age, Romano-British and later date have been identified by previous archaeological investigations in the area.

There is little evidence of medieval activity, with post-medieval remains represented by the existing field systems. Many of the linear cropmarks evident in the area are also likely to be of this date, probably representing evidence for agricultural land-use during this period.

The desk-based assessment concluded that there is the potential for as yet unknown archaeological remains to be present, given the general low density of archaeological investigation carried out in the area. This could include further evidence for pre-Roman features including the 'Rampers', a possible northern boundary of late Iron Age Camulodunum.

Following the desk-based assessment, a geophysical survey was carried out by Stratascan (2016) of Plots 2, 3, 4 and 11 of the scheme in order to further investigate the potential for below-ground archaeological remains in these areas. The results of the survey for Plots 2 and 3 showed little evidence for archaeological activity. A possible ditch or field boundary was identified at the eastern edge of Plot 3, the origin of which remains uncertain and difficult to interpret. Other linear anomalies within Plot 3 align with known historic field boundaries. The report concluded that any remaining anomalies in Plots 2 and 3 were of more recent agricultural origin. General magnetic variations across the site were attributed to a periglacial origin.

The results of this evaluation in relation to the results of the geophysical survey (Stratascan 2016, Fig 11) are plotted on Fig 3.

4 Objectives

The objectives of the archaeological trial trench evaluation were:

- To identify the date, approximate form and purpose of any archaeological deposit, together with its likely extent, localised depth and quality of preservation.
- To evaluate the likely impact of past land uses, and the possible presence of masking colluvial/alluvial deposits.
- To establish the potential for the survival of environmental evidence.

- To provide sufficient information to construct an archaeological conservation strategy, dealing with preservation, the recording of archaeological deposits, working practices, timetables and orders of cost.

5 Methodology

All archaeological works were carried out in accordance with the Written Scheme of Investigation (WSI) (AECOM 2017) and instructions from AECOM Infrastructure and Environment UK Limited.

For a full detailed methodology see the WSI.

6 Results (Figs 2-17)

One hundred and twenty trenches (T1-T120) were machine excavated under the supervision of a CAT archaeologist. Each trench measured 50m long by 2m wide. Approximately 0.28-0.48m of modern plough soil (L1, medium grey/brown clayey-silt with 5% stone) was machined onto natural sandy-clay and gravel (L2). All features were cut into L2 and sealed by L1.

Modern disturbance into natural L2 and across the upper fill of many of the features had been caused by the excavation of modern land drains and by ploughing (visible as plough scars). None of these areas of disturbance were planned, but their occurrence in each trench has been noted.

Where significant archaeological remains were identified, these are listed by trench below.

T1 (Figs 4 & 17): Modern field boundary ditch F1 was aligned NNE/SSW. It continues to the SSW as F2 in T4, although it appears to have been completely ploughed-out in T2. Together with F2 it formed part of an old field boundary that is now located 20m further to the west (Fig 23, Ditch A).

T4 (Fig 4): Modern field boundary ditch F2 was aligned NNE/SSW. It continues to the NNE as F1 in T1, although it appears to have been completely ploughed-out in T2. Together with F1 it formed part of an old field boundary that is now located 20m further to the west (Fig 23, Ditch A).

T8 (Figs 4 & 12): Charcoal-rich pit F3 was a sub-round feature with a flat but irregular base. It measured *c* 1m in diameter and 0.14m deep. It had two fills, a clayey-silt with occasional charcoal sealed a thin but continuous layer of charcoal in the base of the pit. The base and sides of the pit were partially scorched red and baked firm. Radiocarbon dating on a sample of charcoal from this feature produced a 2-sigma calibrated date (at 95.4% confidence) of 1095 to 1157 AD.

T11 (Figs 4 & 13): Undated posthole F4 and pit/tree-throw F5 were excavated.

T12 (Figs 4 & 12): Charcoal-rich pit F6 was a sub-oval feature. It measured *c* 1m by 0.8m by 0.22m deep, and had a dense charcoal fill. There was no evidence of scorching of the sides or base of the pit.

T14 (Figs 4, 12 & 13): Charcoal-rich pit F16 was a sub-round feature with a flat base that had been disturbed by ploughing and a land drain. It measured *c* 0.82m in diameter by 0.12m deep. It had two fills, a clayey-silt with occasional charcoal sealing a dense lens of charcoal in the base of the pit. There was no evidence of scorching on the sides or base of the pit.

Charcoal-rich pit F18 was a sub-round feature. It measured *c* 0.48m in diameter by 0.1m deep. It had two fills, a clayey-silt with occasional charcoal sealing a thin lens of charcoal in the base of the pit. There was no evidence of scorching on the sides or base of the pit.

Pit/tree-throw F17 and posthole F19 were also excavated.

Photograph 1 Charcoal-rich pit F3, T8, looking WNW.

T15 (Figs 4 & 13): Modern field boundary ditch F10 was aligned NNE/SSW. The boundary is visible on old OS maps until the 1960s (Fig 23, Ditch B), although the boundary ditch survives further to the NNE of the development site. Modern disturbance F9 was probably connected with the removal of field boundary F10 and its associated area of trees/hedgerow.

T16 (Figs 5, 12 & 13): Charcoal-rich pit F7 was a sub-oval feature with a flat base. It measured *c* 1m by 0.7m by 0.04m deep. It had a dark charcoal fill (although there were few recoverable fragments from the soil samples). The base and sides of the pit were partially scorched to a burnt orange and baked firm. Sherds from a mid-late 1st century Roman pottery vessel were recovered from the fill of the pit.

Posthole F8 was also excavated, a land drain was present and plough scarring was visible.

T17 (Fig 5): Modern drainage ditch F20 was aligned NW/SE. It continues to the SE as F114 in T22 but was not identified in T25 (Fig 23, Ditch C). The drainage ditch appears to be aligned on the existing NW/SE field boundary ditch on the northern edge of the development site.

T18 (Figs 5 & 13): Three undated pits (F21, F22 and F24) and a pit/tree-throw (F23) were excavated.

T19 (Figs 5, 12 & 13): Charcoal-rich pit F12 was a sub-oval feature. It measured *c* 1m by 0.77m by 0.21m deep. It had two fills, a charcoal rich clayey-silt sealing a denser lens of charcoal in the base of the pit. There was no evidence of scorching on the sides or base of the pit. Excavated from the lower fill was a single piece of peg-tile, which could range in date from the medieval to the post-medieval/modern period.

A small post-medieval/modern pit (F11) was also excavated and two natural features were visible.

T22 (Figs 5 & 13): Modern drainage ditch F114 (not excavated) was aligned NW/SE. It continues to the NW as T20 in T17 but was not identified in T25 to the SE (Fig 23, Ditch C). The drainage ditch appears to be aligned on the existing NW/SE field boundary ditch on the northern edge of the development site.

Undated pit F29 was also excavated.

Photograph 2 T23, looking ESE

T23 (Figs 5, 12 & 13): Charcoal-rich pit F13 was a sub-round feature with a flat, irregular base. It measured *c* 1m in diameter by 0.13m deep. It had two fills, a charcoal rich clayey-silt sealing a denser lens of charcoal in the base of the pit. The base of the pit was slightly scorched red, and natural flint nodules present in the base were also scorched and fire-cracked.

Pit F14 and tree-throw F15 were also excavated.

T25 (Figs 5 & 12): Charcoal-rich pit F28 was a sub-round feature with a flat base. It measured *c* 0.77m in diameter by 0.08m deep. It had with two fills, a charcoal rich clayey-silt sealing a thin lens of charcoal in the base of the pit. There was no evidence of scorching on the sides or base of the pit.

T26 (Figs 6 & 13): Pit/tree-throw F33, post-medieval/modern pit F34 and probable natural feature F25 were excavated.

T28 (Fig 6): Modern drainage ditch F30 was aligned NNW/SSE.

T30 (Fig 6): Modern drainage ditch F31 was aligned N/S.

T37 (Figs 6 & 14): Undated pits F46, F53 and F54 were excavated.

T39 (Figs 6 & 12): Charcoal-rich pit F32 was a sub-oval feature. It measured *c* 0.7m by 0.48m by 0.04m deep. It had two fills, a clayey-silt with occasional charcoal sealing patchy charcoal in the base of the pit. There was very slight, possible, scorching on the base of the pit but this could equally have been slightly darker patches of natural. Radiocarbon dating on a sample of charcoal from this feature produced a 2-sigma calibrated date (at 95.4% confidence) of 362 to 183 BC.

Plough scarring was visible.

T41 (Figs 6 & 14): Modern field boundary ditch F39 was aligned WNW/ESE. The boundary is visible on old OS maps until the late 1950s (Fig 23, Ditch E). The ditch continues to the ESE as ditch F56 in T48. North/south gully F40 is probably contemporary with F39, possibly for additional drainage.

Pit/tree-throw F41 and natural feature F42 were also excavated.

Photograph 3 T41, looking SSW

T44 (Figs 6 & 12): Charcoal-rich pit F38 was a sub-oval feature. It measured *c* 1.1m by 0.16m deep. It had two fills, a charcoal rich clayey-silt sealing a dense lens of charcoal in the base of the pit. There was no evidence of scorching of the sides or base of the pit.

Plough scarring visible.

T45 (Figs 7 & 12): Charcoal-rich pit F36 was a sub-oval feature with a flat, irregular base. It measured *c* 0.82m by 0.63m by 0.04m deep, and had a dense charcoal fill. The base and sides of the pit were partially scorched to a burnt orange and baked firm.

Two land drains were also present and plough scarring was visible.

T46 (Figs 7 & 14): Modern field boundary ditch F49 was aligned WNW/ESE. The boundary is visible on the earliest OS maps but appears to have been filled in by the late 1890s (Fig 23, Ditch D). The ditch continues to the ESE as ditch F61 in T54.

Natural linear/gully F37 was also excavated and plough scarring was visible.

T47 (Figs 7 & 14): Pit/tree-throw F52 was excavated. Three land drains were also present.

T48 (Fig 7): Modern field boundary ditch F56 was aligned WNW/ESE. The boundary is visible on old OS maps until the late 1950s (Fig 23, Ditch E). The ditch continues to the WNW as ditch F39 in T41.

Plough scarring was visible.

T51 (Figs 7 & 15): Undated ditch F58 was aligned N/S, measured 0.7m wide by 0.18m deep. Pit/tree-throw F57 was also excavated.

T52 (Figs 7 & 17): Within the far NNE extent of this trench, three extra layers were identified as deposits associated with Salary Brook. Sealed by L1, was post-medieval/modern levelling (L4, *c* 0.2-0.34m thick), undated silting (L5, *c* 0.14-0.2m thick) and possible river sediment (L6, *c* 0.25-0.32m thick). However, none of these layers were present in any other trench adjacent to Salary Brook.

T54 (Figs 7 & 15): Modern field boundary ditch F61 was aligned WNW/ESE. The boundary is visible on the earliest OS maps but appears to have been filled in by the late 1890s (Fig 23, Ditch D). The ditch continues to the WNW as ditch F49 in T46.

A small cluster of undated features were excavated to the north of the ditch (pits F62, F64, F65 and posthole F63).

A modern land drain was also present.

T57 (Figs 8, 12, 14 & 15): Charcoal-rich pit F50 was a sub-oval feature which showed minor disturbance by land drains. It measured *c* 0.8m by 0.7m by 0.1m deep, and had patches of charcoal in a backfilled-natural fill. The base and sides of the pit were slightly scorched to a dark reddish-orange and baked firm.

Charcoal-rich pit F51 was a sub-round feature which had been disturbed by land drains and ploughing. It measured *c* 0.93m in diameter by 0.1m deep, and had only small patches of charcoal in the backfilled-natural fill. The base and sides of the pit were scorched a dark reddish-brown and baked firm.

Three tree-throws (F47, F48 and F55) were excavated and three land drains were also present.

T59 (Figs 8, 12 & 15): Charcoal-rich pit F59 was a sub-round feature with had been slightly disturbed on one edge. It measured *c* 0.9m in diameter by 0.13m deep. It had two fills, a charcoal rich clayey-silt sealing a dense lens of charcoal in the base of the pit. The base and sides of the pit were partially scorched a reddish-orange and baked firm.

Pit F60 was also excavated and plough scarring was visible.

T60 (Figs 8 & 15): Modern field boundary ditch F72 was aligned NNE/SSW. The boundary is visible on old OS maps until the late 1990s (Fig 23, Ditch F). The ditch continues to the SSW as F84 in T64, F115 in T69, F116 in T65 and as F117 in T66.

Probable natural linear F71 was excavated. Two land drains were also present and plough scarring was visible.

Photograph 4 T60 with boundary ditch F72 in foreground, looking WNW

T63 (Figs 8 & 15): Pit F74 and natural gully F75 were excavated and a land drain was also present.

T64 (Fig 8): Modern field boundary ditch F84 was aligned NNE/SSW. The boundary is visible on old OS maps until the late 1990s (Fig 21, Ditch F). The ditch continues to the NNE as F115 in T69 and F72 in T60, and to the SSW as F116 in T65 and F117 in T66.

Also present in the trench was a natural linear, three land drains and plough scarring.

T65 (Figs 8 & 12): Charcoal-rich pit F76 was a sub-oval feature which had been slightly disturbed by ploughing. It measured *c* 1.5m by 1.18m by 0.2m deep, and had small patches of charcoal in the backfilled-natural fill and a slightly more defined lens of charcoal in the base of the feature. The base and sides of the pit were scorched red/reddish-orange and baked firm.

Modern field boundary ditch F116 (not excavated) was aligned NNE/SSW. The boundary is visible on old OS maps until the late 1990s (Fig 23, Ditch F). The ditch continues to the NNE as F84 in T64, F115 in T69 and F72 in T60, and to the SSW as F117 in T66.

Photograph 5 Charcoal-rich pit F76, T65 (with plough scarring), looking S

T66 (Fig 8): Modern field boundary ditch F117 (not excavated) was aligned NNE/SSW. The boundary is visible on old OS maps until the late 1990s (Fig 23, Ditch F). The ditch continues to the NNE as F116 in T65, F115 in T69, F84 in T64 and F72 in T60.

Modern field boundary ditch F78 was aligned WNW/ESE. The boundary is visible on old OS maps until the 1960s (Fig 23, Ditch G). The ditch continues to the ESE as F91 in T74.

Cut by F78 was modern ditch F79 which was aligned NNE/SSW. This ditch was possibly related to ditch F80 in T67.

T67 (Figs 9, 15, 16 & 17): Undated ditch F80 and modern ditch F77 are both aligned NNE/SSW and either could be related to modern ditch F78 in T66.

T69 (Figs 9 & 14): Modern field boundary ditch F115 (unexcavated) was aligned NNE/SSW. The boundary is visible on old OS maps until the late 1990s (Fig 23, Ditch F). The ditch continues to the NNE F72 in T60 and to the SSW as F84 in T64, F116 in T65 and as F117 in T66.

Undated ditch F43, aligned NNE/SSW, was also excavated. It was a U-shaped ditch measuring 0.7m wide by 0.22m deep.

T70 (Figs 9 & 15): Two possibly modern postholes were excavated (F66 and F67) and a modern agricultural linear and natural linear were also present.

T72 (Fig 9): Pit F92 and probable natural linear F83 were excavated.

T74 (Fig 9): Modern field boundary ditch F91 was aligned WNW/ESE. The boundary is visible on old OS maps until the 1960s (Fig 23, Ditch G). The ditch continues to the WNW as F78 in T66.

T79 (Fig 9): Modern field boundary ditch F118 (unexcavated) was aligned WNW/ESE. The ditch continues to the ESE as F89 in T96. The boundary is not present on the earliest OS maps so pre-dates 1875 (Fig 21, Ditch H).

Natural silt patch F86 was also excavated.

T80 (Figs 9 & 12): Charcoal-rich pit F95 was a sub-oval feature. It measured *c* 0.82m by 0.75m by 0.08m deep, and had a dense charcoal fill. There was no evidence of scorching on the sides or base of the pit.

Photograph 6 Charcoal-rich pit F95, T80, looking SE

T81 (Figs 10 & 12): Charcoal-rich pit F87 was a sub-round feature with a flat base. It measured *c* 0.97m in diameter by 0.1m deep, and had only small patches of charcoal

in the backfilled-natural fill. The base and sides of the pit were partially scorched red and baked firm.

Modern field boundary ditch F96 was aligned WNW/ESE. The boundary is visible on old OS maps until the late 1990s (Fig 23, Ditch I). The ditch continues to the ESE as F100 in T110.

T82 (Figs 10 & 12): Charcoal-rich pit F93 was a sub-round feature. It measured *c* 1.2m in diameter by 0.26m deep. It had two fills, a charcoal rich clayey-silt sealing a dense lens of charcoal in the base of the pit. The base and sides of the pit were scorched a red and baked firm.

A land drain and natural linear were also present.

T83 (Figs 10, 12 & 16): Charcoal-rich pit F70 was a sub-oval feature which had been slightly disturbed by ploughing. It measured *c* 0.8m by 0.64m by 0.06m deep, and had only small patches of charcoal in the backfilled-natural fill. The base and sides of the pit were partially scorched a dark reddish-brown and baked firm.

Tree-throws F81 and F82 were also excavated and plough scarring was visible.

T91 (Figs 10 & 16): Probable elongated pit F88 was excavated.

T94 (Figs 10 & 16): Pit/tree-throw F97 was excavated.

T96 (Figs 10 & 16): Modern field boundary ditch F89 was aligned WNW/ESE. The ditch continues to the WNW as F118 in T79. The boundary is not present on the earliest OS maps so pre-dates 1875 (Fig 23, Ditch H).

Tree-throw F94 was also excavated.

Photograph 7 T96, looking NNE

T98 (Figs 10 & 16): Ditch F90 was aligned E/W but was not identified in any other trenches. It measured 1m wide by 0.22m deep.

Natural linear features F98 and F101 were also excavated and a natural silt patch was present.

T104 (Figs 11-12): Charcoal-rich pit F111 was a sub-oval feature. It measured *c* 1.1m by 1m by 0.15m deep. It had two fills, a charcoal rich clayey-silt sealing a dense lens of charcoal in the base of the pit. The base and sides of the pit were scorched red and baked firm. A charred grain from this pit was sent for radiocarbon dating, however the results were problematic and are discussed below (see p28).

Modern field boundary ditch F112 was aligned WNW/ESE. The boundary is visible on old OS maps until the 1930s (Fig 23, Ditch J). The OS maps show that this field boundary ditch turned to a NNE/SSW alignment. However, no trace of this ditch was located in T95, T101 or T103.

Modern agricultural linear F106 was also excavated.

Photograph 8 T108 with charcoal-rich pits, looking SSW

T108 (Figs 11-12): Charcoal-rich pit F99 was a sub-oval feature with had been disturbed by ploughing. It measured *c* 0.86m by 0.7m by 0.1m deep, but compared to

the other pits had a less-rich charcoal fill. There was a low level of scorching on the sides and base of the pit, which were slightly reddened.

Charcoal-rich pit F102 was a sub-round feature. It measured *c* 0.55m diameter by 0.06m deep. It had small patches of charcoal in the backfilled-natural fill and a slightly more defined charcoal lens in the base of the feature. The base and sides of the pit were scorched red and baked firm.

Charcoal-rich pit F103 was a sub-oval feature. It measured *c* 0.83m by 0.64m by 0.05m deep, but compared to the other pits had a less-rich charcoal fill. There was no evidence of scorching of the sides or base of the pit.

T110 (Figs 11 & 16): Modern field boundary ditch F100 was aligned WNW/ESE. The boundary is visible on old OS maps until the late 1990s (Fig 23, Ditch I). The ditch continues to the WNW as F96 in T81.

Modern field boundary ditch F105 was aligned NE/SW. The boundary is visible on old OS maps into the 1980s (Fig 23, Ditch K).

Elongated pit or irregular linear feature F110 (damaged by ploughing) included two possible postholes (F108 and F109) cut into its base. It includes a charcoal horizon which was probably originally a surface spread, which has since settled into F108 and F109. It is not certain what this activity represents. There were no dated finds but a small quantity of heat altered stone and iron pan/a sandy concretion was recovered.

Modern pit F104 was also excavated.

Photograph 9 F108-F110, T110, looking NNE

T111 (Fig 11): Pit or modern agricultural scar F107 was excavated. A land drain was also present.

T113 (Figs 11-12): Charcoal-rich pit F113 was a sub-round feature. It measured *c* 0.66m in diameter by 0.05m deep. It had two fills, a clayey-silt with occasional charcoal sealing a thin lens of charcoal in one side of the pit. The base and sides of the pit were scorched a reddish-orange and baked firm.

Plough scarring was also visible.

No significant archaeological remains were identified in 65 of the trenches: **T2**, **T3** (plough scarring), **T5**, **T6**, **T7**, **T9** (land drain), **T10** (Fig 16), **T13** (plough scarring and land drain), **T20** (plough scarring), **T21** (land drain), **T24** (natural feature F26 and plough scarring F27), **T27** (two natural silt patches), **T29** (Fig 17), **T31** (Fig 17) (plough scarring), **T32** (plough scarring and two land drains), **T33** (plough scarring), **T34** (plough scarring and four land drains), **T35** (plough scarring and a land drain), **T36** (land drain), **T38** (plough scarring and two land drains), **T40** (plough scarring and three land drains), **T42** (natural linear F35 (Fig 14), a second natural linear plus plough scarring), **T43** (plough scarring), **T49**, **T50** (plough scarring), **T53** (plough scarring and three land drains), **T55** (land drain, agricultural linear, burnt out tree-bowl), **T56** (plough scarring), **T58**, **T61** (tree-throws F44 and F45), **T62** (natural gully F73), **T68**, **T71** (natural feature or tree-throw F69), **T73** (plough scarring), **T75** (plough scarring), **T76** (natural feature F68), **T77** (plough scarring), **T78** (tree-throw F85), **T84** (plough scarring), **T85** (plough scarring), **T86**, **T87**, **T88** (land drain), **T89** (natural linear), **T90**, **T92** (Fig 17) (natural linear and silt patch, plough scarring), **T93**, **T97**, **T99** (land drain), **T100** (natural silt patch), **T101** (land drain and plough scarring), **T102** (land drain and deep plough scarring), **T103** (Fig 17) (land drain and plough scarring), **T105** (natural linear), **T106** (natural linear and silt patches), **T107** (two land drains), **T109** (Fig 17), **T112** (plough scarring), **T114** (plough scarring), **T115** (land drain and plough scarring), **T116** (plough scarring), **T117** (land drain and plough scarring), **T118** (land drain, plough scarring and natural silt patch), **T119** (Fig 17) (two land drains, plough scarring and natural silt patch) and **T120** (plough scarring and natural silt patch).

Brief summary of the charcoal-rich pits (Figs 4-12, Fig 19)
(also see Table 1)

In total, 24 features identified as charcoal-rich pits were 100% excavated (10 trenches were widened as necessary). As defined here, a charcoal-rich pit was a sub-round or sub-oval feature with a charcoal-rich fill. Some also included evidence of scorched edges and bases, from either *in situ* burning or the deposition of hot, charred material. The vast majority of the charcoal has been identified as oak and beech with only small fragments of charcoal from cherry/plum/sloe and alder identified (see Environmental Analysis below).

The sub-round features ranged in diameter from 0.48m to 1.2m (averaging 0.86m) and the sub-oval features ranged from 0.7m by 0.48m to 1.5m by 1.18m. Depths varied from between 0.04m and 0.26m, averaging 0.12m, suggesting that only the very base of the pit had survived.

The charcoal-rich pits appear to fall into three broad types:

- Type 1 = one fill of dense charcoal, less frequently one fill of rare charcoal flecks. The pit edges/base may or may not be scorched.
- Type 2 = two fills, fill a) grey clayey-silt with occasional to rich charcoal inclusions sealing fill b), either a thin or dense lens of charcoal in the base of the feature. The pit edges/base may or may not be scorched.
- Type 3 = backfill of natural clay with usually sparse charcoal inclusions sealing the scorched edges and base of the pit, sometimes this includes a charcoal lens on the edge/base of the pit.

However, such a classification should be treated with caution as it is possible that some of the shallow Type 1 pits could be truncated Type 2 and 3 pits.

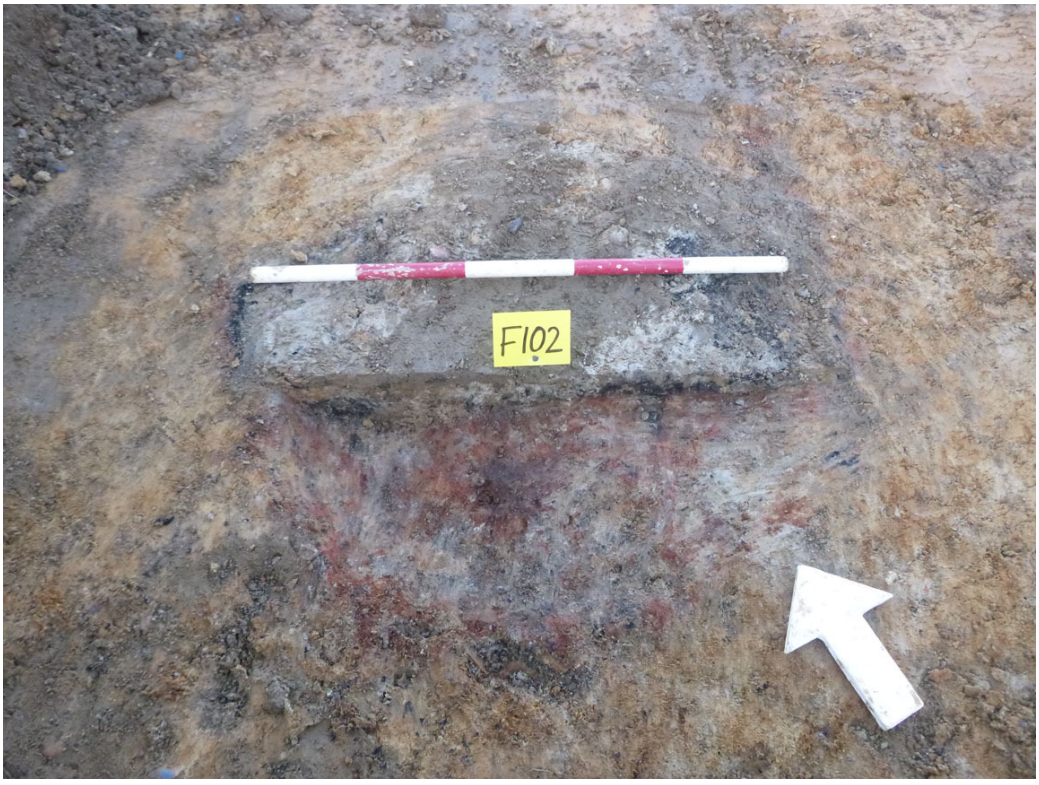
Only two of the charcoal-rich pits contained datable finds. Pit F7 contained Roman pottery of mid-late 1st century date, and F12 contained a single piece of peg-tile (recorded as being from the lower fill) which could range in date from the medieval to the post-medieval/modern period. Undated finds from two other pits included a piece of heat altered flint (F13) and fragments of fired clay (F38).

Charcoal from two of the pits was sent for radiocarbon dating. This produced 2-sigma calibrated dates (at 95.4% confidence) of 362 to 183 BC (F32) and 1095 to 1157 AD (F3). Placing these pits within the Middle Iron Age (F32) and the late Anglo-Saxon to early medieval period (F3).

Charred grains and seeds from another three charcoal-rich pits (F87, F95 and F111) were also sent for radiocarbon dating. However, one failed, one is a modern intrusive grain and the another grain produced a very late calibrated date (at 95.4% confidence) of 1689 to 1926 AD, and might also be intrusive (for full discussion see p27-28).

Photograph 10 Type 1 charcoal-rich pit F6, T12, looking W

Photograph 11 Type 2 charcoal-rich pit F93, looking W



Photograph 12 Type 3 charcoal-rich pit F102, looking NNE

Table 1 Description of the charcoal-rich pits

Context	Size and shape	Pit-types (see p14 for definitions)	Scorching?	Other notes
F3 (T8)	Sub-round, flat irregular base *c* 1m diameter 0.14m deep	Type 2 fill a) light grey clayey-silt with occasional charcoal fill b) thin but continuous lens of charcoal in the base	Partial scorched base and sides which was reddened and baked firm	**Radiocarbon date:** 2-sigma calibrated date (at 95.4% confidence) of 1095 to 1157 AD (late Anglo-Saxon/early medieval)
F6 (T12)	Sub-oval *c* 1m by 0.8m 0.22m deep	Type 1	No scorching	Disturbed by ploughing on upper edge
F7 (T16)	Sub-oval, flat base *c* 1m by 0.7m 0.04m deep	Type 1, charcoal rich but very few recoverable fragments	Scorched base which was burnt dark orange and baked firm	**Finds date:** Roman pottery (mid-late 1st century) was recovered from the southern half of the feature.
F12 (T19)	Sub-oval *c* 1m by 0.77m 0.21m deep	Type 2 fill a) charcoal rich clayey-silt but less than fill b fill b) dense lens of charcoal in the base	No scorching	**Finds date:** A single fragment of peg-tile from the lower fill dates this feature from the medieval to the post-medieval/ modern period
F13 (T23)	Sub-round, flat irregular base *c* 1.2m diameter 0.13m deep	Type 2 fill a) charcoal rich clayey-silt but less than fill b fill b) dense lens of charcoal in the base	Scorched base slightly reddened and baked firm	**Finds:** A piece of undated heat altered flint was recovered from the pit.
F16 (T14)	Sub-round, flat base *c* 0.82m diameter 0.12m deep	Type 2 fill a) light grey clayey-silt with occasional charcoal fill b) thick patch of charcoal in the base	No scorching	Significant disturbance by ploughing and a land drain.
F18 (T14)	Sub-round *c* 0.48m diameter 0.1m deep	Type 2 fill a) light grey clayey-silt with occasional charcoal fill b) thin lens of charcoal in the base	No scorching	
F28 (T25)	Sub-round, flat base *c* 0.77m diameter 0.08m deep	Type 2 fill a) charcoal rich clayey-silt but less than fill b fill b) thins lens of charcoal in the base	No scorching	
F32 (T39)	Sub-oval *c* 0.70m by 0.48m 0.04m deep	Type 1/2, mixed fill a and b fill a) light grey clayey-silt with occasional charcoal fill b) patchy charcoal in the base	Very slight, possible, scorching on base (but could be dark patches of natural)	**Radiocarbon date:** 2-sigma calibrated date (at 95.4% confidence) of 362 to 183 BC (Middle Iron Age).
F36 (T45)	Sub-oval, flat irregular base *c* 0.82m by 0.63m 0.04m deep	Type 1	Little evidence of *insitu* scorching apart from one reddened flint pressed into the natural	
F38 (T44)	Sub-oval *c* 1.1 by 0.82m 0.16m deep	Type 2 fill a) charcoal rich clayey-silt but less than fill b fill b) dense lens of charcoal in the base	No scorching	**Finds:** Nine small pieces (18g) of undated burnt clay were recovered from the pit.
F50 (T57)	Sub-oval *c* 0.8m by 0.7m	Type 3, *in situ* burning but only small patches of charcoal in backfilled natural, especially around	Slightly scorched base and edges which were a dark reddish-orange and baked	Minor disturbance by land drains

	0.1m deep	edges	firm	
F51 (T57)	Sub-round *c* 0.93m diameter 0.15m deep	Type 3, i*n situ* burning but only small patches of charcoal in backfilled natural	Scorched base which was a dark reddish-brown and baked firm	Disturbed by land drains and ploughing
F59 (T59)	Sub-round *c* 0.9m diameter 0.13m deep	Type 2 fill a) charcoal rich clayey-silt but less than fill b fill b) dense lens of charcoal in the base	Scorched partial edges and patches of base which were reddish-orange and baked firm	Edge disturbed by land drain/plough
F70 (T83)	Sub-oval *c* 0.8m by 0.64m 0.06m deep	Type 3, *in situ* burning but only small patches of charcoal in backfilled natural	Partial scorched base which was a dark reddish-brown and baked firm	Disturbed by ploughing on edges
F76 (T65)	Sub-oval *c* 1.5m by 1.18m 0.2m deep	Type 3, i*n situ* burning and slightly thicker lens of charcoal in base, but only small patches of charcoal in backfilled natural which formed rest of the fill	Scorched base and sides which was reddened/reddish-orange and baked firm	Disturbed by ploughing on very top of pit
F87 (T81)	Sub-round, flat base *c* 0.97m diameter 0.1m deep	Type 3, i*n situ* burning but only small patches of charcoal in backfilled natural	Scorched base and partial sides which were reddened and baked firm	
F93 (T82)	Sub-round *c* 1.2m diameter 0.26m deep	Type 2 fill a) charcoal rich clayey-silt but less than fill b fill b) dense lens of charcoal in the base	Scorched base and sides which was reddened and baked firm	
F95 (T80)	Sub-oval *c* 0.82m by 0.75m 0.08m deep	Type 1	No scorching	
F99 (T108)	Sub-oval *c* 0.86m by 0.7m 0.1m deep	Type 1, but charcoal is not as dense	Low level of scorching on base and sides, which were slightly reddened and firm	Disturbed by plough
F102 (T108)	Sub-round *c* 0.55m diameter 0.06m deep	Type 3, i*n situ* burning and slightly thicker lens of charcoal in base, but only small patches of charcoal in backfilled natural forming rest of fill	Scorched base and sides which was reddened and baked firm	
F103 (T108)	Sub-oval *c* 0.83m by 0.64m 0.05m deep	Type 1, but charcoal is not as dense (few recoverable fragments)	No scorching	
F111 (T104)	Sub-oval *c* 1.1m by 1m 0.15m deep	Type 2 fill a) charcoal rich clayey-silt but less than fill b fill b) dense lens of charcoal in the base	Scorched base and sides which was reddened and baked firm	
F113 (T113)	Sub-round *c* 0.66m diameter 0.05m deep	Type 2 fill a) light grey clayey-silt with occasional charcoal fill b) thin layer of charcoal on one side	Scorched base and sides which was a reddish-orange and baked firm	

7 Finds

7.1 Bulk finds (Fig 18)

by Stephen Benfield

Introduction

Overall the number of bulk finds recovered in relation to the size of the evaluation area is low, with only small numbers of finds recovered from individual features and soil layers. These finds consist of pottery, glass and ceramic building material (CBM) with small quantities of burnt stones, fired clay, slag and animal bone. These finds are listed and described in Appendix 3 with a finds spot date.

Extremely small quantities of finds were excavated from four of the charcoal-rich pits, of which material from only two could be dated. The majority of the bulk finds can be dated to the post-medieval or modern period and are primarily associated with field boundary ditches (recorded as extant features on old maps) and drainage ditches.

The pottery fabrics quoted refer to the Colchester Roman (*CAR* **10**) and post-Roman (*CAR* **7**) pottery type series and the Roman pottery forms to the Colchester form type series (Hawkes & Hull 1947, Hull 1958).

Finds from the charcoal-rich pits

The most significant find is part of an early Roman pottery vessel (Fig 18) recovered from one half of charcoal-rich pit F7 (T16). Excavation of the other half of the pit did not produce any finds. The remains of the pot itself were quite broken-up. A total of 83 sherds were recovered with an average sherd weight of just 4.2g. These represent parts of the rim, neck and body. No base sherds were present.

The pot is a butt beaker of form Cam 119 in a slightly soft Romanising fabric (RCW) with smooth, dark grey/black coloured surfaces. This generalised and long-lived form is current from the Late Iron Age and probably throughout the Roman period at Colchester (*CAR* **10**, 473). While only a small part of the pot was able to be reconstructed from the joining sherds, it can be seen to be relatively plain, apart from three low cordons around the body, with a sloping neck and slightly everted squared-off rim. That there is no indication of any decoration which is slightly unusual for this particular form, although it can be noted that one late dated greyware example from the Colchester 'Mithraeum' group also appears to be plain (Hull 1958, fig 63, no. 52). The fabric, which is typical of the early Roman period, and probably also the strong demarcation formed by the three cordons which is similar to examples published in Camulodnum (Hawkes & Hull 1947, plate LVIII), indicate a mid to late 1st-century date for the beaker.

Fig 18 F7 (4) T16. Cam 119 Butt Beaker, quite broken-up (83 sherds, weight 348g), much of one side present with areas of joining body sherds and sherds from the neck and rim also joining, base entirely absent. Low cordons around body of which at least two are clear, with a third at the base of the neck. Fabric is Romanising coarseware (Fabric RCW) with dark grey/black smooth surfaces and red-brown core with some small orange coloured grog and dark ?organic inclusions (mid-late 1st century).

A piece of peg-tile came from the lower fill of charcoal-rich pit F12 (T19). This cannot be closely dated, but is unlikely to date prior to the 14th century.

Other finds from charcoal-rich pits consist of a heat altered (burnt) flint from F13 (T23) and a small quantity of abraded fired clay fragments from F38 (T44). Although these finds cannot be dated, they are indicative of deliberate heating.

Although not a charcoal-rich pit, pit F110 (T110) also contained a small quantity of heat altered stones (both flint and quartz) and some possible iron pan or sandy concretion material that may also have been heat altered.

Finds from post-medieval/modern contexts
Residual finds from later dated contexts included 2-3 fragments of CBM that might be Roman, a sandy greyware pottery sherd (Fabric 20) that is probably medieval (13th to 14th century), and a few pieces of peg-tile that could date to the medieval period. Peg-tile becomes much more common as a roofing material in Essex from the 14th century onwards (Ryan & Andrews1993, 97) but, without associated dating, can only be broadly dated as medieval to post-medieval/modern.

The majority of the finds are of post-medieval or modern date from field boundary ditches and drainage ditches. These include pieces from bricks, modern stoneware pottery (Fabric 45M & Fabric 47) and other factory made earthenwares (Fabric 48D), glass bottle fragments and a piece of modern window glass. An absence of post-medieval red eathenwares (Fabric 40), which are common in the 17th to 18th centuries, suggests only limited or intermittent activity prior to the 19th century.

All of the bulk finds will be discarded except for those recovered from the charcoal-rich pits.

7.2 Worked flints (Figs 19-20)

by Adam Wightman

Twenty-five worked flints were recovered during the evaluation work. Four of these were recovered from three archaeological features (F7, F47 and F78) (Table 2) and the remaining twenty-one were from the ploughsoil (L1) (Table 3).

A blade from an early Roman charcoal-rich pit (F7) and a flake/blade and a retouched flake from the modern infill of boundary ditch (F78) are both considered to be residual in these contexts. Tree-throw F47 contained a blade which has been detached from its parent core using a soft hammer and could be Mesolithic or Early Neolithic in date.

Context	finds no.	artefact type	cortex %	soft/hard hammer	modification
F7 (T16)	8	blade	50	soft	
F47 (T57)	14	blade	5	soft	
F78 (T66)	73	flake/blade	0	soft	usewear/edge damage
		flake (retouched)	0		abrupt retouched notches

Table 2 Worked flints recovered from archaeological features

The worked flints recovered from the ploughsoil were collected by the excavation team while in transit between the trenches and during the machine excavation of the trenches themselves. The closest trench for each piece found lying on the surface of the ploughsoil was recorded so that a rough distribution plan could be generated (Fig 20). However, caution should be exercised as the flints could have moved a considerable distance from their original place of deposition during many years of ploughing and a number of biases will have affected the collection of surface finds across the site. For example, the presence of snow on the ground during the recording of trenches towards the east of the southern field will have had an affect on the number of surface finds recovered in this area.

Sixteen of the worked flints recovered from the ploughsoil are likely to date to the prehistoric period (Table 3). There are no typologically diagnostic tool types in the assemblage. However, the presence of blades and blade cores suggests activity in the area in either the Mesolithic or, more likely, the Early Neolithic period and large flake cores and hard hammer flakes with rough, invasive retouch are probably from later in the prehistoric period, most likely the Bronze Age.

Closest trench	artefact type	cortex %	soft/hard hammer	modification
T4	core (flakes)	5		
T6	flake	75	hard	usewear/edge damage
T12	flake	15	hard	
T24	flake (retouched)	0	hard	semi-abrupt retouch right lateral
T25	core (flakes)	0		
T26	flake	0	soft	
T35	flake (retouched)	0	hard	intermittent abrupt retouch on both lateral edges
T35	flake	0	hard	
T39	flaked flake (retouched)	0	?hard	neat semi-abrupt retouch on left lateral edge
T39	gunflint	0		
T41	core (?blades)	20		
T56	gunflint	0		
T62	gunflint	0		
T63	gunflint	0		
T64	gunflint	0		
T66	flake (retouched)	30	?hard	retouched notch and other abrupt retouch
T72	flake (denticulate)	40	hard	large flake with a denticulated edge and possible retouched notch
T80	core (blades)	50		
T87	flake	5	?hard	edgewear/use damage (possible retouched notch)
T92	core (flakes)	5		
T110	flake (retouched notch)	10	hard	flake with long retouched notch on distal end (abrupt retouch)

Table 3 Worked flints recovered from the ploughsoil (L1, finds no 101).

In addition to the prehistoric flints, five gunflints were collected during the fieldwork (for illustrations see Fig 19). The gunflints were all recovered from an area just to the west of the centre of the southern field (Fig 20), although for reasons outlined above this grouping could simply be coincidental.

All five are rectangular gunflints made by segmenting parallel-sided blades (Ballin 2012). Percussion scars can be seen on the lateral edges where the segments were separated from the parent blade by a blow from a hammer on the lower (ventral) face. The heel (rear end), the leading edge (the front of the gunflint which creates the spark by hitting the 'frizzen' or steel) and the lateral sides of the gunflints are all bevelled and have been modified by retouch. On three of the gunflints (those from around T39, T56 and T64), a slight bevel has been retouched on the lower face of the leading edge to strengthen it, whereas the upper faces of the leading edge have been retouched on the pieces from near T62 and T63. The leading edges of all five gunflints appear to be damaged, probably as a result of striking the steel.

The technique of creating a bevel at both the heel and the leading edge leaves two arrises and a 'plateau' on the upper face of the gunflint. These double-backed gunflints or 'blade gunflints with two dorsal arises' (Type 3 of de Lotbiniere's basic four-type gunflint typology (1984, 206)) could be turned around and the heel used as a new leading edge (Ballin 2012). However, none of the five gunflints recovered during our evaluation have retouch on the lower face of the heel or exhibit definitive evidence of damage on the heel edge caused by striking the steel. Double-backed gunflints were created in huge numbers in Brandon in Suffolk and were considered to be the highest quality gunflint (known as 'bests') that were produced by the Brandon knappers (Skertchley 1879). Their production began in around 1790, roughly ten years after the blade technique was introduced to Britain (De Lotbiniere 1977, 41).

Trench	length (mm)	width (mm)	thickness (mm)	raw material	Fig. no.
T39	34mm	27mm	10mm	dark grey/black flint	**Fig 19.1**
T56	33mm	28mm	10mm	dark grey/black flint	**Fig 19.2**
T62	33mm	27mm	12mm	mid/light grey flint	**Fig 19.3**
T63	32mm	28mm	9mm	dark grey/black flint	**Fig 19.4**
T64	33mm	28mm	10mm	dark grey/black flint	**Fig 19.5**

Table 4 The dimensions and raw materials of the five gunflints.

All five gunflints found during the evaluation are very similar in size (see Table 4). By comparison with the standardised gunflint sizes recorded by Skertchley in 1879 (pg 48-51), it is clear that all five flints were made for muskets (33mm, width 28mm, thickness 10mm). This raises the question, why were five musket gunflints found in relatively close proximity to one another in this part of northern Colchester? It is probable that the musket(s) were being fired in this location, although the spoil from all 120 trial-trenches was examined using a metal detector and not a single musket ball was found. A blade gunflint recovered from excavations a kilometre to the south-west (CAT Report 1140 *forthcoming*) is likely to have come from a single- or double-barrelled sporting gun which fired multiple lead shots referred to as 'drop-shot' or 'hail-shot'. This is taken to be evidence of hunting in this area. However, it seems unlikely that a musket, which was significantly heavier and commonly only fired one lead shot, would have been used for the same purpose. Gunflints are believed to have had a lifespan of around 20 rounds (Kenmotsu 1990), therefore our gunflints represent around 100 shots being fired. The relatively short lifespan of a gunflint would explain the concentration in one area, but whether they derive from target practice, fighting, hunting large game such as deer, or some other activity, remains unclear.

In conclusion, the majority of the worked flints belong to a period of prehistoric activity which spans from at least the Early Neolithic period (and possibly the Mesolithic) to the Bronze Age and the gunflints suggest that a least one musket was being fired on the site sometime in the late 18th or 19th centuries.

7.3 Metal finds

by Laura Pooley

Five metal objects were excavated from five modern ditches, listed by context in Table 5. The objects consist of five pieces of agricultural ironwork and the cap from a shotgun cartridge. All are of post-medieval/modern date and all have been discarded.

Feature and Finds no.	Description
F77, 50 (T67)	Iron machinery fitting, 87mm long, 58mm wide, 45mm thick, 194g.
F78, 71 (T67)	Shotgun cartridge cap, 12 bore, paper-waded, mid-20th century.
F79, 72 (T66)	Fragment of iron, 72mm long, 40mm wide, 7mm thick, 68g.
F84, 67 (T64)	Large iron hook, rectangular sheet folded into a U-shaped hook projecting from a shaft with circular cross-section (18mm diameter), 126mm long, 55mm wide, max 35mm thick, 618g.
F100, 83 (T110)	Two fragments of rectangular iron sheet, not joining but probably from the same object, 1) 105mm long, 50mm wide, 7mm thick, 2) 37mm long, 50mm wide, 7mm thick, total 171g. Fragment of clear modern glass, 41g.

Table 5 Excavated metal finds by context.

A metal-detecting survey was also carried out over the trial-trenches and spoil-heaps. All of the finds were recovered from the topsoil (L1). Thirty-one pieces of post-

medieval/modern agricultural ironwork were recorded along with a WWII USA military button. All of the finds are listed in Table 6 and have been discarded.

Trench no.	**Description**
T14	Rectangular fragment of iron, slightly curved lengthways, 116mm long, 50mm wide, 7mm thick, 192g.
T41	1) Square-headed iron bolt, 74mm long, head 33mm by 33mm, shaft 20mm diameter, 230g. 2) Flat iron object, L-shaped, broken on short length, long length ends diagonally, long length 80mm long and 33mm wide, short-length 57mm long and 19mm wide, 19mm thick, 329g.
T42	1) Fragment of rectangular iron plate, broken across rivet holes at both ends, 95mm long, 61mm wide, 12mm thick, rivet holes *c* 12mm diameter, 272g. 2) Fragment of iron strip, curved, broken at both ends, 70mm long, 24mm wide, 6mm thick, 48g.
T43	1) Square-headed iron bolt, 74mm long, head 33mm by 33mm, shaft 20mm diameter, 241g. 2) Square-headed iron bolt, 84mm long, head 33mm by 33mm, shaft 20mm diameter, 244g. 3) Iron tang probably from an agricultural fork, curved and tapering to a flat point, broken at other end, 165mm long, 15mm wide, 15mm thick, 208g.
T48	Iron nail with a flat square head and square cross-section, 36mm long, head 13mm by 13mm, 13g.
T49	1) Fragment of iron strip, broken at one end, 57mm long, 42mm wide, 12mm thick, 131g. 2) Fragment of iron bracket, rectangular with raised central spine, one central rivet on one side of spine, other side mostly missing, 64mm long, 49mm wide, 11mm thick across spine, rivet hole *c* 4mm diameter, 67g. 3) Iron nail, square cross-section, flat head, 45mm long, 10mm by 10mm at widest, 16g. 4) Iron fragment, 43mm long, 10mm wide at one end and expanding to 19mm wide at other, 9mm thick, 26g.
T51	1) Iron fitting consisting of a rectangular sheet with a large rivet hole at one end (c 17mm diameter), the sheet is vaguely S-shaped, with the end opposite the rivet hole folded into a narrow hook, sheet 170mm long (flat) or 125mm long (folded), 68mm wide, 7mm thick, 494g. 2) Triangular fragment of iron, 96mm long, 62mm wide, 6mm thick, 272g.
T53	Fragment of iron, 62mm long, 27mm wide, 4mm thick, 30g.
T56	Fragment of iron strip, broken at both ends, triangular cross-section, 50mm long, 15mm wide, 9-4mm thick, 27g.
T58	1) Triangular fragment of iron, 55mm long, 21mm long, 11mm thick, 42g. 2) Rectangular fragment of iron, 35mm long, 19mm wide, 7mm thick, 19g. 3) Iron tang probably from a small agricultural fork, curved and tapering to a flat point, broken at other end, 80mm long, 14mm wide, 11mm thick, 39g.
T79	Button, WWII USA GI button with loop attachment, reverse C PITT & CO […], 23mm diameter, 7g.
U/S	1) Iron plough blade, 270mm long, 75mm wide at one end and 259mm wide at the other, 3.83kg. 2) Iron plough tang, hooked iron tang projecting from a square shaft, 140mm long, tang: 80mm long, 40mm wide, 20mm thick, shaft: 60mm, long, 40mm wide by 40mm thick, 750g. 3) Iron bolt with triangular head and straight circular cross-sectioned shaft, 141mm long, head 45mm wide, shaft 20mm diameter, 282g. 4) Rectangular iron plate, 107mm long, 62mm wide, 17mm thick, 634g. 5) Rectangular iron plate, 105mm long, 44mm wide, 4mm thick, 95g. 6) Fragment of iron plate, 67mm long, 50mm wide, 12mm thick, 119g. 7) Iron strip, 70mm long, 18mm wide, 7mm thick, 31g. 8) Complete iron nail, square-cross section shaft, domed-round head, 147mm long, head 20mm diameter, shaft 10mm by 10mm tapering to a point, 70g.

	9) Iron fitting, triangular in cross-section, tapering length, 90mm long, 15mm wide, 11mm thick, 46g. 10) Iron rod, broken at both ends, 97mm thick, 8mm diameter, 16g. 11) Iron fragment from a larger ring-like object, 63mm long, 30mm wide, 20mm thick, 103g.

Table 6 All metal-detected finds

8 Environmental analysis

by Lisa Gray, MSc MA ACIfA Archaeobotanist

Introduction

This report describes plant macro-remains recovered from samples excavated during an excavation of one hundred and twenty evaluation trenches across a development site. The features sampled were charcoal-rich pits, ditches, postholes, pits and pit/tree-throws. The charcoal-rich pits have been separated into three types based on observations made about structure and visible charcoal (see section 4.2).

Sampling and processing methods

69 samples were taken and processed by Colchester Archaeological Trust (see table 1, Appendix). All samples were processed using a Siraf-type flotation device. Flot was collected in a 300 micron mesh sieve then dried. 1487 litres of soil were sampled and completely processed.

Once with the author the flots were scanned under a low powered stereo-microscope with a magnification range of 10 to 40x. The whole flots were examined for most samples. Samples <14b> (F59 charcoal-rich pit type 2), <14c> (F59 charcoal-rich pit type 2), <18a> (F93 charcoal-rich pit type 2) and <19> (F95 charcoal-rich pit type 1) were sub-sampled using a riffle box. The abundance, diversity and state of preservation of eco- and artefacts in each sample were recorded. A magnet was passed across each flot to record the presence or absence of magnetised material or hammerscale.

Identifications of seeds and cereals were made using uncharred reference material (author's own and the Northern European Seed Reference Collection at the Institute of Archaeology, University College London) and reference manuals (such as Beijerinck 1947; Cappers *et al.* 2006; Charles 1984; Fuller 2007; Hillman 1976; Jacomet 2006). All results were entered into the ArboDat 2016 English Version© (Kreuz and Schäfer 2002). Plant nomenclature follows this. Identified plant remains were stored in tubes and capsules with labels that use the European Arbodat 'PCODE's.

Only fragments of charred wood larger than 4mm (sieve mesh aperture size) or roundwood or twigs larger than 2mm were selected for identification. The reason for this size selection was based on observations made by charcoal specialists that fragments larger than this size are easier to break to reveal the cross-sections necessary, meaning that more diagnostic features are likely to survive (Asouti 2006, 31; Smart and Hoffman, 1988, 178-179). When fragments have been broken to reveal anatomy they have been wrapped in foil to keep those fragments intact so they can be counted. Charcoal identifications were made using modern reference slides (author's own) and anatomical guides (Gale and Cutler 2000, Hather 2000, InsideWood 2004, Schoch *et al.* 2004 and Wheeler 2011).

Results (see Appendix 4 Environmental analysis Tables 1-8)

Samples <2c>, <2d>, <7c>, <10b>, <16a> and <22a> contained nothing but moderate to abundant quantities of charcoal too small to identify and indeterminate uncharred root/rhizome fragments.

The plant remains – seeds, grains, chaff

Plant remains were preserved by charring and also present as dried waterlogged and modern seeds. The modern seeds had internal tissue surviving. Charred seeds, grains and chaff were very low in number with less than one charred item of this type per litre of sampled soil.

Charred grains were found in samples <17c> (F87 charcoal-rich pit type 3), <18b> (F 93 charcoal-rich pit type 2), <32> (F74 Pit), <19> (F95 charcoal-rich pit type 1) and <23a> (F111 charcoal-rich pit type 2). The grains consisted of single straight hulled barley (*Hordeum distichon/vulgare*) grains in samples <32> and <19> and two oat (*Avena* sp.) grains in sample <23a>. A goosegrass (*Galium aparine*) seed was found in sample <17c>, a blackberry/raspberry (*Rubus fruticosus/idaeus*) seed was found in sample <32>, a vetch/tare (*Vicia* sp.) seed was found in sample <18b> and three stinking chamomile (*Anthemis cotula*) seeds in sample <24b>. The number of charred seeds, grains and chaff per litre of sampled soil were very low, all less than one item per litre.

It is unwise to give too much significance to isolated finds of poorly preserved charred plant remains. A recent study of intrusion and residuality in the archaeobotanical record for southern and central England (Pelling *et al*. 2015) has highlighted the problem of assigning charred plant remains such as these to the dated contexts they were taken from because it is possible that these durable charred plant remains survived being moved between contexts by human action and bioturbation so cannot be properly interpreted unless radiocarbon dates are gained from the plant macro-remains themselves. That is the only way to secure a genuine date for the charred plant macro-remains like these (Pelling *et al.* 2015, 96).

A fragment of cereal/grass stem was found in sample <32>.

Dried waterlogged seeds were more frequent than charred seeds but even so the items per litre of sampled soil is no higher than 3 in sample <12a> (F50) where minor disturbance by land drains was observed during excavation (*pers. comm.* Laura Pooley 2018).

Seeds of the goosefoot (Amaranthaceae) family were the most frequent type of seed across all samples and feature types. Seeds of common/hastate orache (*Atriplex patula/hastata*) and fat hen (*Chenopodium album*) were common. The significance of these numbers needs to take account of the fact that individual orache plants can produce up to 6000 seeds and fat hen up to 20,000 (Hanf 1983, 215 and 217). Black bindweed *(Fallopia convolvulus*) were the most frequently seen seed preserved in this way across the samples with seeds of this plant found in charcoal-rich pits, pits and tree-throws. Black bindweed can also produce thousands of seeds per plant. Seeds of cabbage/wild radish (*Brassica/ Raphanus* sp.) were found in samples <15> (F70 charcoal-rich pit type 3), <17a> (F87 charcoal-rich pit type 3), <18b> (F93 charcoal-rich pit type 2) and <32> (F74 pit). Seeds of wild radish (*Raphanus raphanistrum*) were found in sample <1a> (F3 charcoal-rich pit type 2). Violet (Viola sp.) seeds were found in samples <25> (F4 Posthole) and <32>. Other ruderals, pale persicaria/redshank (*Polygonum lapathifolium/persicaria*), blackberry/raspberry, and elderberry (*Sambucus nigra*) were found in low numbers in samples <7a> (F18 charcoal-rich pit type 2), <12a> (F50 charcoal-rich pit type 3), <13b> (F51 charcoal-rich pit type 3), <17b> (F87 charcoal-rich pit type 3), <24a> (F113 charcoal-rich pit type 2) and <36> (F110 ?Pit).

The charcoal

57 samples contained identifiable charcoal. Fragments in each of these samples were identified until all fragments were identified or a maximum number of 100 fragments had been reached. Four samples contained so many charcoal fragments of identifiable size they had to be sub-sampled. These samples were <14b> (F59 charcoal-rich pit type 2 – ¼ sub-sample), <14c> (F59 charcoal-rich pit type 2 – ¼ sub-sample), <18a>

(F93 charcoal-rich pit type 2 – 1/8 sub-sample) and <19> (F95 charcoal-rich pit type 1 – 1/8 sub-sample).

Each of these samples contained fragments of oak (*Quercus* sp.) charcoal. One fragment of oak roundwood was found in sample <1b> (F3 charcoal-rich pit type 2). Fragments of beech (*Fagus sylvatica*) were only found in charcoal-rich pit samples with no preference for any type of charcoal-rich pit. Fragments of cherry/plum/sloe (*Prunus* sp.) charcoal were found in samples <1b>, <6b> (F16 charcoal-rich pit type 2), <9b> (F32 charcoal-rich pit type 1 or 2) and <12a> (F50 charcoal-rich pit type 3). A fragment of alder (*Alnus glutinosa*) charcoal was found in sample <6b>. *Prunus* sp., *Quercus* sp. cannot be differentiated based on their microscopic wood anatomy alone (Schoch *et al.* 2004).

Discussion

Comments on preservation, stratigraphic integrity and bioturbation
Plant macro-remains were preserved by charring and possibly waterlogging but the plant remains here are dry. No plant remains were preserved by mineralisation (Green 1979, 281) or silicification (Robinson and Straker 1990), which means that there is no archaeobotanical evidence for the cess disposal or slow-burning aerated fires.

Most of the plant remains in these samples were preserved by charring. Charring occurs when plant material is heated under reducing conditions where oxygen is largely excluded leaving a carbon skeleton resistant to decay (Boardman and Jones 1990, 2; English Heritage 2011, 17). These conditions can occur in a charcoal clamp, the centre of a bonfire or pit, or in an oven, or when a building burns down with the roof excluding the oxygen from the fire (Reynolds, 1979, 57).

During excavation it was observed that samples from F6 (charcoal-rich pit type 1, samples <2a> to <2d>), F16 (charcoal-rich pit type 2, samples <6a> and <6b>), F50 (charcoal-rich pit type 3, samples <12a> and <12b>), F51 (charcoal-rich pit type 3, samples <13a> and <13b>), F59 (charcoal-rich pit type 2, samples <14a> to <14c>), F70 (charcoal-rich pit type 3, sample <15>), F76 (charcoal-rich pit type 3, samples <16a> and <16b>) and F99 (charcoal-rich pit type 1, samples <20a> to <20c>) were disturbed by ploughing or land drains.

Nearly all samples contained uncharred root/rhizome fragments. Samples <5a> (F13 charcoal-rich pit type 2) and <8> (F28 charcoal-rich pit type 2) contained terrestrial mollusca. Samples <8> (F28 charcoal-rich pit type 2), <9a> (F32 charcoal-rich pit type 1 or 2), <11a> (F38 charcoal-rich pit type 2), <12a> (F50 charcoal-rich pit type 3), <13a> (F51 charcoal-rich pit type 3), <16b> (F76 charcoal-rich pit type 3) and <25> (F4 Posthole) contained low numbers of earthworm cocoons. Rootlets, snail and worm activity can move small items in the soil after burial so may have an impact on the stratigraphic integrity of the plant macro-remains in these samples. Low numbers of seeds containing embryonic plant tissue were found in samples <12a>, <14a> and <17b>. These have been interpreted as modern seeds. The dried testas of seeds in the 'dried waterlogged' assemblage (see table 3) could also be recent but may also be much older with testas surviving when embryonic tissue has decayed.

Recommendation of items for radiocarbon dating
The charred seeds and grains in samples <17c> (F87 charcoal-rich pit type 3), <18b> (F93 charcoal-rich pit type 2), <32> (F74 Pit), <19> (F95 charcoal-rich pit type 1), <24b> (F113 charcoal-rich pit type 2) and <23a> (F111 charcoal-rich pit type 2) are suitable for radiocarbon dating.

Charcoal suitable for radiocarbon dating was found in samples <1b> (F3 charcoal-rich pit type 2), <6b> (F16 charcoal-rich pit type 2), <9b> (F32 charcoal-rich pit type 1 or 2) and <12a> (F50 charcoal-rich pit type 3).

Of these samples, samples <6b> and <12a> came from features observed to be disturbed by ploughing or land drains, and sample <12a> contained evidence of earthworm activity.

Feature function and possible activities at the site

The current provisional interpretation for the use of the charcoal-rich pits on this site is that they are the remnants of localised production of charcoal (*pers. comm.* Laura Pooley 2018). Most of the charcoal in these features is oak and beech wood, both wood taxa represented in the charcoal have uses as fuel and craft woods. Well-seasoned oak burns slowly giving off a '…good lasting heat…' and well-seasoned beech also burns well but not as well as oak (Skellern 2000). Alder wood makes good charcoal (Gale and Cutler 2000, 34) so might be evidence of one of the types of charcoal made at this site. Only one fragment of alder charcoal was found during the examination of these samples, so it is possible that what has survived at Northern Gateway is the last remnants of the charcoal making pits with the actual charcoal made in them being removed long before the pits were abandoned. Cherry/plum/sloe wood could have been used as fuel, possibly kindling.

It is likely that these woods would have been the main fuel for charcoal making but these charcoal-rich pits could also have had other domestic or community uses such as cooking hearths and corn driers (Van der Veen 1989). The finds of grains and seeds in charcoal-rich pit samples <17c>, <18b>, <19>, <23a>, <24b> and pit sample <32> could be sieving waste used as fuel or remnants of an activity needing fire that was not charcoal burning.

Three types of charcoal-rich pits were defined during excavation. Type 1 had one fill of dense charcoal. Type 2 had two fills, one back fill containing charcoal and one fill with a thick lens of charcoal. Type 3 had sparse charcoal inclusions, scorched sides and base of the pit and a charcoal lens on the sides and base of the pit. The main variation in archaeobotanical remains by charcoal-rich pit type was that charcoal-rich pit type 2 contained most charred grains and seeds and more fragments of wood likely to be turned into charcoal. It is possible that type 2 charcoal-rich pits were consumers of charcoal made in the type 1 or 3 pits. No hammerscale or slag was found in the flots.

At this stage dating has not been carried out so it is not possible to give a detailed interpretation of the features based on archaeobotanical evidence alone.

9 Radiocarbon dating (see Appendix 5)

Due to the overwhelming occurrence of oak and beech charcoal within the charcoal-rich pits, Lisa Gray identified only 10 features that contained material suitable for radiocarbon dating. These were charcoal from charcoal-rich pits F3, F16, F32 and F50, and charred seeds and grains from charcoal-rich pits F87, F93, F95, F111 and F113, and from pit F74. Both F16 and F50 contained evidence of modern disturbance and were discounted, as was pit F74. Therefore the charcoal from F3 and F32 was selected for radiocarbon dating, along with charred seeds and grains from F87, F95 and F111.

Both charcoal samples produced good radiocarbon dates.

Radiocarbon dating of a fragment of cherry/plum/sloe charcoal from charcoal-rich pit F32 produced a 2-sigma calibrated date (at 95.4% confidence) of 362 to 183 BC (SUERC-79146 (GU47814)). Placing the pit within the Middle Iron Age.

Radiocarbon dating of a fragment of cherry/plum/sloe charcoal from charcoal-rich pit F3 produced a 2-sigma calibrated date (at 95.4% confidence) of 1095 to 1157 AD

(SUERC-79145 (GU47813)). Placing the pit within the latest Anglo-Saxon or early medieval period.

The radiocarbon dates produced from the charred seeds and grains were less successful.

Radiocarbon dating of a charred goosegrass seed from charcoal-rich pit F87 failed due to insufficient carbon (GU47815).

Radiocarbon dating of a charred straight hulled barley from charcoal-rich pit F95 produced a date of post-1950 AD (SUERC-79147 (GU47816)), indicating that the feature had been disturbed, probably by ploughing, and that the seed was intrusive.

Radiocarbon dating of a charred oat grain from charcoal-rich pit F111 produced a 2-sigma calibrated date (at 95.4% confidence) of 1689 to 1926 AD (SUERC-79151 (GU47817)). The latest dated charcoal-rich pit from northern Colchester is from a 2016 NGAUE excavation, where pottery dating from the 13th to the 14th/15th centuries was recovered (see Section 10 below). Similarly, an evaluation on the NGAUE site in 2011 produced two charcoal-rich pits containing pottery dating from the late 12th to 14th centuries and the 13th to 14th centuries. Placing all three pits within the medieval period, none of which need date later than the 14th century. The radiocarbon date from this pit is therefore problematic. It might indicate that activity relating to charcoal production continued into the post-medieval/modern period, especially as the piece of peg-tile from charcoal-rich F12 could range in date from the medieval to the post-medieval/modern period. However, like F95, it is perhaps more likely that the grain from this charcoal-rich pit is not contemporary with the feature and is intrusive in this context.

The mixed results of the radiocarbon dating show that some (if not all) of the isolated charred seeds and grains are intrusive within the charcoal-rich pits. Future archaeological work on the development site, particularly with regard to the radiocarbon dating of other charcoal-rich pits, should take this into consideration when selecting material to send for analysis. Future emphasis should be placed on the analysis of suitable fragments of charcoal rather than isolated seeds and grains.

10 Discussion (Figs 21-23)

Archaeological evaluation on Plots 2/3 at Colchester Northern Gateway Sports Hub revealed a small amount of prehistoric activity, 24 charcoal-rich pits, five late 18th- or 19th-century gunflints, and a number of modern field boundaries with associated agricultural activity.

Prehistoric

Twenty prehistoric worked flints show activity on the development site from the Early Neolithic (possibly the Mesolithic) through to the Bronze Age. All but one were from later dated contexts. A flint blade of Mesolithic or Early Neolithic date from a tree-throw could be contemporary with the feature but could also be residual.

Charcoal-rich pits (Figs 21-22)

Twenty-four charcoal-rich pits were excavated on the development site. These pits are all of a similar size, shape and profile, contain high concentrations of oak or beech charcoal, and which occasionally include evidence of *in situ* burning, or at least hot materials being deposited within the pit with sufficient heat to scorch the base. A very small quantity of material finds were recovered from four of the pits. Two contained finds of a Roman (pottery) and medieval to post-medieval/modern (peg-tile) date, with another two containing undated finds (heat altered flint and fragments of fired clay). Two pits were also radiocarbon dated. Charcoal from this pits produced dates of the Middle Iron Age and the late Anglo-Saxon/early medieval period. A charred grain from

another pit was radiocarbon dated to the post-medieval/modern period, but it is uncertain if the grain is contemporary or intrusive in this context.

The charcoal-rich pits on this development site have been classified into three different types (see p14). However, such a classification should be treated with caution as it is possible that some of the shallow Type 1 pits could be truncated Type 2 and 3 pits. The distribution of charcoal-rich pits is plotted on Fig 21. In general, they appear to be scattered across the development site with no real concentrations, although less were recorded in the northeastern corner. The same figure shows that more type 2 pits are found in the northern half of the development site, with type 3 pits only found in the southern third and type 1 pits scattered throughout, which perhaps might confirm that the Type 1 pits are truncated Type 2 and 3 pits. Based on the evidence, it is difficult to determine what these different pit-types represent. They could be the result of different types of usage or represent a chronological difference, but more evidence would be needed to investigate this further.

There is a notable absence of features associated with the charcoal-rich pits, such as boundaries or structural remains, or finds of a structural and/or domestic nature. This might suggest that associated activity is of a temporary nature, possibly seasonal. Although, it is also possible that any associated activity may have had little impact on the ground and has since been lost to ploughing.

Since 2001, another 77 charcoal-rich pits have been excavated during eight archaeological investigations across northern Colchester (see Table 7), all recorded from an area measuring 2km east to west by 6km north to south. All 101 charcoal-rich pits are plotted on Fig 22. Although there appears to be a concentrations of these pits in the area immediately to the north and south of the A12, especially between Boxted Road and Severalls Lane, this distribution simply reflects where archaeological investigations have taken place rather than revealing any particular clusters of activity.

As with the examples from Northern Gateway, the 77 charcoal-rich pits were relatively shallow, round or oval pits, containing charcoal rich fills and occasional evidence of *in situ* burning. Only one of the pits showed evidence of associated activity in the form of a posthole in the base of the feature (Dyson 2015). Dating evidence was similarly lacking, with only five of the pits containing datable finds. Two produced pottery sherds of a Roman date (1st century) with the other three containing sherds of a medieval date (late 12th to 14th/15th centuries). However, since 2015 material from a further six pits has also been sent for radiocarbon dating. This has produced results dating to the Early Iron Age, Middle Iron Age (x2), Late Iron Age, early Roman and early medieval periods. Four of the dated Northern Gateway charcoal-rich pits fit comfortably within this range of activity. The post-medieval/modern date produced by pit F111 however does not, either suggesting that this activity is longer-lived that previously thought, or that the isolated grain in this feature is intrusive.

Project	**Description**
CAT: Northern Approach Road, evaluation 2001 (CAT Report 159)	***Description:*** Fourteen pits with charcoal rich fill, three of which showed evidence of *in situ* burning with a further four showing discolouration which may or may not be burning. ***Dating:*** No dating evidence.
CAT: Northern Growth Area Urban Extension (NGAUE), evaluation 2011 (CAT Report 627)	***Description:*** Thirteen pits with a charcoal rich fill (no record of any *in situ* burning). ***Dating:*** Two contained pottery of a medieval date; 1) late 12th to 14th centuries; and 2) 13th to 14th centuries.
CAT: Northern Approach Road, monitoring 2013 (CAT Report 728)	***Description:*** Eight pits with charcoal rich fills. ***Dating:*** No dating evidence.

Pre-Construct Archaeology: Cuckoo Farm, the Flakt Woods project, evaluation 2014 (Mattinson 2004)	***Description:*** One pit with a charcoal rich fill. ***Dating:*** No dating evidence.
Archaeology South-East: Cuckoo Farm Park and Ride, evaluation and excavation 2015 (Dyson 2015)	***Description:*** Thirty pits all with charcoal rich fills and evidence of *in situ* burning. ***Dating:*** Two of the pits contained pottery sherds from 1st century AD jars. A third pit produced calibrated C14 dates of 50BC-AD65 and 170BC-AD5 at 95.4% probability, making it broadly contemporary with the other two pits.
Archaeology South-East: Severalls School, Via Urbis Romanae, evaluation 2015 (Wroe-Brown 2015)	***Description:*** One possible pit with a charcoal rich fill (half sectioned only). ***Dating:*** No dating evidence.
Pre-Construct Archaeology: Severalls Hospital, evaluation and excavation 2017 (House 2017)	***Description:*** Seven pits all with charcoal rich fills. ***Dating:*** Four were radiocarbon dated and produced dates for the Early Iron Age, Middle Iron Age, Late Iron Age and early medieval periods. 1) calibrated C14 date of 797-545 BC at 95.4% probability, with a 44.8% probability within this range of 650-545 BC date, placing the feature in the Early Iron Age. 2) calibrated C14 date of 394-208 BC at 95.4% probability, with a 63.2% probability within this range of 317-208 BC date, placing the feature in the Middle Iron Age. 3) calibrated C14 date of 160BC-50AD at 95.4% probability, with a 88.8% probability within this range of 116BC-30AD date, placing the feature in the Late Iron Age. 4) calibrated C14 date of 997-1155 AD at 95.4% probability, with a 53.2% probability within this range of a 1065-1155 AD date, placing the feature in the early medieval period. *Note:* a fifth pit was radiocarbon dated to the Early Bronze Age (calibrated C14 date of 1746-1611 BC at 95.4% probability, placing the feature in the latter part of the Early Bronze Age) but it was thought by the excavators to be a tree-throw as it differed in size and form to the charcoal-rich pits.
CAT: Cambian Fairview, Boxted Road, evaluation 2017 (CAT Report 1095)	***Description:*** One pit with charcoal rich fill and a burnt base. ***Dating:*** calibrated C14 date of 350-203 BC at a 95.4% probability, placing the feature in the Middle Iron Age.
CAT: Northern Growth Area Urban Extension (NGAUE), Area 1 excavation 2017 (CAT Report 1140)	***Description:*** Two pits with charcoal-rich fills. ***Dating:*** One of the pits contained pottery sherds dating from the 13th to the 14th/15th centuries, the other pit was undated.

Table 7 Previous archaeological investigations in northern Colchester where charcoal-rich pits have been excavated.

Previous theories as to the origin and function of these charcoal-rich pits concluded that they were associated with military encampments from the 19th century/First World War (for which there has been no dating evidence) (Mattinson 2004; CAT Report 728) and that they were associated with medieval tree-clearance (CAT Report 627). More recently they have been interpreted as being connected to charcoal production (Dyson 2015; House 2017).

Experimental archaeology shows the processes involved in charcoal production (for example, see You Tube clips https://www.youtube.com/watch?v=Z0HW4qk8dv4 and https://www.youtube.com/watch?v=GzLvqCTvOQY). First the area is cleared of vegetation, and dried wood collected and cut to size. A small shallow pit is dug for the central post. Larger pieces of wood are stacked around this post with smaller pieces of wood around the edges. The whole lot is covered in kindling then mud to create a domed structure. The top of the dome is left open to vent smoke, and air holes made

around the base to let combustion air in. The mound is set alight from the top with hot coals, the fire burning back down the heap against the draft. As the fire progresses, first the air vents then finally the top vent is plugged. When the fire goes out and the mound cooled, it can be opened and the charcoal inside collected. As so much of the process occurred above ground, and would have been removed soon after the event, it is unsurprising that all that is left behind is the original shallow pit.

The introduction of the hot coals from the top of the dome and the spread of heat downwards may explain why not all of the pits showed evidence of *in situ* burning. Perhaps the identification of three different types of pit at Northern Gateway is actually a result of how the charcoal was removed/collected and the pit backfilled.

Similar charcoal-rich pits, dating primarily to the Saxon period, have been identified in Suffolk at Ipwsich (Clover 2013), in Cambridgeshire at Wittering and Parnwell, in Norfolk at Mayton Wood and Mousehold Heath, and further afield at Bestwall Quarry in Dorset (Webley 2007; House 2017). These have also been interpreted as charcoal production sites, sometimes associated with iron working features. In 2012 archaeological investigations at Eversley Quarry in Berkshire produced similar pits dated to the mid-late Iron Age and medieval period (11th to 13th centuries) (Hardy 2012). Work in 2013 at the University of Kent, Canterbury also revealed fire pits and charcoal pits associated with an early to middle Iron Age settlement that 'likely formed multiple small scale industries centred on charcoal production and possible food preparation/smoking' (accessed 16.1.2018: http://www.canterburytrust.co.uk/news-2/projectdiaries/turing-college-university-of-kent/).

The charcoal production pits from these sites share a number of common features with the examples from northern Colchester, including: similar size, shape and profile (although some variations occur); the presence of burning, occasionally with *in situ* burning or at least hot materials being deposited within the pit with sufficient heat to scorch the base; preferred use of oak; lack of finds; and a sporadic distribution across the landscape (House 2017).

It is likely the sporadic nature of the distribution relates either to the targeting of dense woodland or the use of existing clearings within that woodland. This would explain why little other evidence (features or finds) has been found relating to the pits across northern Colchester although, if this were a seasonal activity, the charcoal burners probably lived in the woods in temporary accommodation, especially as each charcoal clamp would have been monitored for a number of days during its burn. However, it is interesting to note that only 10 tree-throws and 8 pit/tree-throws were excavated on the development site during the evaluation. Perhaps showing that the charcoal burners were not actually cutting down trees, but instead using branches that had either but cut down or fallen naturally.

Dividing the total area covered by the evaluation trenches (12,000 sq m) by the number of charcoal-rich pits (21.5[1]), indicates that there is likely to be 1 pit for every 558 sq m of land, which works out at 18 pits for every hectare (Philip Crummy pers comm). The development site measures 32 hectares, so in this area alone there might potentially have been 576 charcoal clamps. Although it must be remembered that this seems to have been a long-held tradition, with dating evidence spanning approximately 2000 years of charcoal production.

Records show that by the 11th century much of this area of northern Colchester was still woodland, divided into Kingswood Forest and Cestrewald (BHO, 'Lexden Hundred'). However, large-scale woodland clearance began during the 13th century. It was this clearance that eventually led to the creation of the heathland of later centuries, the development site being located on the southern edge of Boxted Heath (BHO,

1 This is the number of charcoal-rich pits within the original area of the 120 evaluation trenches, before the trenches were extended to ensure that every pit was fully excavated.

'Boxted: Introduction' and 'Great Horkesley: Economic History'). Radiocarbon dating of the charcoal-rich pits shows that these ancient woodlands were being exploited for charcoal production as far back as the Early Iron Age, presumably for localised use. The proximity of such a large woodland to the urban centre of Colchester in the Roman and medieval periods would have been significant for the supply and/or trade of charcoal to the town.

Charcoal was very important for ancient metalworkers as it is one of the best fuels available for smelting iron ore. This is because it has a high carbon content, no sulphur, a high calorific value, is readily available and is easy to produce (Clere 1981, 49). Although no direct evidence has been found, it is likely that the charcoal being produced in northern Colchester was being used for iron working.

In summary, the 24 charcoal-rich pits from Colchester Northern Gateway Sports Hub add to growing evidence of approximately 2000 years of charcoal production within a large woodland that used to exist in northern Colchester.

Post-medieval/modern (Fig 23)
Following the clearance of the woodland and the creation of Boxted Heath, there does not appear to have been much activity on the development site aside from the presence of at least five late 18th- or 19th-century gunflints.

Boxted Heath was not enclosed until 1815 and was in a high state of cultivation by 1848 (BHO, 'Boxted: Economic History'). This would explain the apparent absence of activity on the development site until the late 19th century when field boundary ditches appear. Old OS maps dating back to 1875 show that the development site was originally parcelled into at least twelve fields/part-fields (Fig 23). The OS maps show that gradually these boundaries were removed, expanding the area of each field, until the present layout which dates from the late 1990s. Numerous modern drainage ditches and land drains have been laid out across the site to aid agriculture, with many of the disused field boundary ditches having been laid with land drains before being backfilled. Intensive farming is also revealed by the presence of plough scarring across the development site.

10 Acknowledgements

CAT thanks Colchester Borough Council for commissioning and funding the work. The project was managed by C Lister, fieldwork was carried out by A Wightman with S Carter, E Hicks, B Holloway, R Mathieson, N Rayner, A Tuffey and A Wade. Figures are by L Pooley, E Holloway, C Lister and AW. The project was monitored for Colchester Borough Council by Jess Tipper and for AECOM by Emma Clifford.

11 References

Note: all CAT reports, except for DBAs, are available online in PDF format at http://cat.essex.ac.uk

AECOM Infrastructure & Environment UK Limited	2017	*Written Scheme of Investigation for trial-trench evaluation, Colchester Northern Gateway Plots 2/3*, by N Finch
Ballin, T B	2012	*'State of the art' of British gunflint research, with special focus on the early gunflint workshop at Dun Eistean, Lewis,* Post-Medieval Archaeology **46/1,** 116-142
Brown, D	2007	*Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation*
CAR **7**	2000	*Colchester Archaeological Trust* **7***: Post-Roman pottery from excavations in Colchester, 1971-85,* by J Cotter
CAR **10**	1999	*Colchester Archaeological Trust* **10***: Roman pottery from*

		excavations in Colchester, 1971-86, by R Symonds and S Wade
CAT	2014	*Health & Safety Policy*
CAT Report 159	2001	*An archaeological evaluation on the route for Colchester Northern Approach Road Phase 3 (Severalls Hospital/Cuckoo Farm), Colchester, Essex: September-October 2001*
CAT Report 627	2012	*An archaeological evaluation by fieldwalking, geophysical survey and trial-trenching at the Northern Growth Area Urban Extension (NGAUE), Colchester, Essex: September-December 2011*
CAT Report 728	2014	*Archaeological monitoring at Northern Approach Road Phase III, Colchester, Essex: September-November 2013*
CAT Report 1095	2017	*Iron Age pit and modern drains and ditches: archaeological evaluation on land south of Cambian Fairview, Boxted Road, Colchester, Essex, CO4 5HF: April 2017*
CAT Report 1140	Forth-coming	*Pottery production in Mile End (Colchester) in the 12th to 16th centuries: excavations at 'Colchester North' (formerly NGAUE) Area 1: January to March 2017*
CBCPS	2017	*Brief for an archaeological trial-trenched evaluation at Plots 2, 3, 10 and 11, Colchester Northern Gateway, Colchester,* by Jess Tipper
CIfA	2014a	*Standard and Guidance for archaeological evaluation*
CIfA	2014b	*Standard and guidance for the collection, documentation, conservation and research of archaeological materials*
CIfA	2014c	*Code of Conduct*
Cleere, H F	1981	*The Iron Industry of Roman Britain*
Clover, K	2013	*Archaeological excavation at Site 2, Restaurant Land, Nacton Road, Ipswich, Suffolk, IPS719: Excavation report.* Oxford Archaeology East, report no. 1500
De Lotbiniere, S.	1977	*The story of the English gunflint – some theories and queries,* Arms Armour Soc. **J.9**, 18-53
De Lotbiniere, S.	1984	*Gunflint regonition*, Int. J. Naut. Archaeol. Underwater Explor. **13,** 2016-9
DCLG	2012	*National Planning Policy Framework*
Dyson, A	2015	*Cuckoo Farm Park and Ride, Myland, Colchester, Essex: Post-Excavation Assessment and Updated Project Design Report*, Archaeology South East (ASE), report no. 2015045.
English Heritage	2006	*Management of Research Projects in the Historic Environment (MoRPHE)*
Gurney, D	2003	*Standards for field archaeology in the East of England.* East Anglian Archaeology Occasional Papers 14 (EAA **14**).
Hardy, A	2012	*Eversley Quarry, Finchampstead, Wokingham, Berkshire: Post-Excavation Assessment and Updated Project Design.* Cotswold Archaeology, report number 12300
Hawkes, C & Hull, M	1947	*Camulodunum, first report on the excavations at Colchester 1930-39,* RRCSAL **14**
House, J	2017	*Archaeological excavations and trial trenches at Severall Hospital, Boxted Road, Colchester, Essex, CO4 5HG. Pre-Construct Archaeology Ltd, report number R12819.*
Hull, M	1958	*Roman Colchester,* RRCSAL **20**
Kenmotsu, N.	1990	*Gunflints: a study*, *Hist. Archaeol.* **24**, 92-124
Mattinson, R	2004	*Cuckoo Farm, the Flakt Woods project, Colchester, Essex: evaluation. Pre-Construct Archaeology Ltd,*
Medlycott, M	2011	*Research and archaeology revisited: A revised framework for the East of England*. East Anglian Archaeology Occasional Papers 24 (EAA **24**)
Ryan, P & Andrews, D	1993	'A brick and tile typology for Cressing Temple' in Andrews, D., *Cressing Temple, a Templer and Hospitaller manor in Essex*, 93-99, Essex County Council
Skertchley, S.B.J	1879	*On the manufacture of gunflints, the methods of excavating for flint, the age of Palaeoloithic man, and the connection between Neolithic art and the gunflint trade*, Memoirs of the Geological Survey of England and Wales, London: HMSO
Stratascan	2016	*Stratascan Geophysical Survey Report: Colchester Northern Gateway, Colchester, Essex*
Webley, L	2007	*Prehistoric, Roman and Saxon activity on the Fen hinterland at Pernwell, Peterborough,* Proceedings of the Cambridgeshire

		Antiquarian Society, Volume XCVI
Wroe-Brown, R	2015	*An Archaeological Evaluation at Severalls School, Via Urbis Romanae, Colchester, Essex,* Archaeology South East (ASE), report no. 2015172

'Boxted: Introduction', in *A History of the County of Essex: Volume 10, Lexden Hundred (Part) Including Dedham, Earls Colne and Wivenhoe*, ed. Janet Cooper (London, 2001), pp. 54-59. *British History Online* http://www.british-history.ac.uk/vch/essex/vol10/pp54-59 [accessed 18 January 2018].
'Boxted: Economic history', in *A History of the County of Essex: Volume 10, Lexden Hundred (Part) Including Dedham, Earls Colne and Wivenhoe*, ed. Janet Cooper (London, 2001), pp. 62-64. *British History Online* http://www.british-history.ac.uk/vch/essex/vol10/pp62-64 [accessed 18 January 2018].
'Great Horkesley: Economic history', in *A History of the County of Essex: Volume 10, Lexden Hundred (Part) Including Dedham, Earls Colne and Wivenhoe*, ed. Janet Cooper (London, 2001), pp. 226-229. *British History Online* http://www.british-history.ac.uk/vch/essex/vol10/pp226-229 [accessed 18 January 2018].
'Lexden Hundred', in *A History of the County of Essex: Volume 10, Lexden Hundred (Part) Including Dedham, Earls Colne and Wivenhoe*, ed. Janet Cooper (London, 2001), pp. 1-8. *British History Online* http://www.british-history.ac.uk/vch/essex/vol10/pp1-8 [accessed 18 January 2018].
Canterbury Archaeological Trust: http://www.canterburytrust.co.uk/news-2/projectdiaries/turing-college-university-of-kent/

12 Abbreviations and glossary

Bronze Age	period from *c* 2500 – 700 BC
CAT	Colchester Archaeological Trust
CBC	Colchester Borough Council
CBCAA	Colchester Borough Council Archaeological Advisor
CBCPS	Colchester Borough Council Planning Services
CHER	Colchester Historic Environment Record
CIfA	Chartered Institute for Archaeologists
context	a single unit of excavation, which is often referred to numerically, and can be any feature, layer or find.
EHER	Essex Historic Environment Record
feature (F)	an identifiable thing like a pit, a wall, a drain: can contain 'contexts'
Iron Age	period from 700 BC to Roman invasion of AD 43
Iron Age (earliest)	period from *c* 800 – 600BC
Iron Age (Early)	Early Iron Age, period from *c* 600 – 400BC
Iron Age (Middle)	Middle Iron Age, period from *c* 400 – 100BC
Iron Age (Late)	Late Iron Age (LIA), period from *c* 100 – 50 BC to Roman invasion of AD 43
Iron Age (later)	period from *c* 350 BC to early 1st century AD
layer (L)	distinct or distinguishable deposit (layer) of material
medieval	period from AD 1066 to *c* 1500
Mesolithic	period from *c* 10,000 – 4000BC
modern	period from *c* AD 1800 to the present
natural	geological deposit undisturbed by human activity
Neolithic	period from *c* 4000 – 2500 BC
Neolithic (Early-Middle)	Early-Middle Neolithic, period from *c* 4000 – 2900 BC
Neolithic (Late)	Late Neolithic, period from *c* 2900 – 2500 BC
NGR	National Grid Reference
OASIS	**O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S**, http://oasis.ac.uk/pages/wiki/Main
post-medieval	period from *c* AD 1500 to *c* 1800
prehistoric	pre-Roman
residual	something out of its original context, eg a Roman coin in a modern pit
Roman	the period from AD 43 to *c* AD 410
section	(abbreviation sx or Sx) vertical slice through feature/s or layer/s
wsi	written scheme of investigation

13 Contents of archive

Finds: three boxes (all of the finds from charcoal-rich pits, all of the worked flint and all the environmental flots have been kept; all others discarded)

Paper and digital record

One A4 document wallet containing:
The report (CAT Report 1219)
CBC evaluation brief, AECOM written scheme of investigation
Original site record (feature and layer sheets, finds record, plans, sections)
Site digital photos and log, attendance register, risk assessment

14 Archive deposition

The paper and digital archive is currently held by the Colchester Archaeological Trust at Roman Circus House, Roman Circus Walk, Colchester, Essex CO2 7GZ, but will be permanently deposited with Colchester Museum under accession code: COLEM 2017.152.

Distribution list:
Colchester Borough Council
Jess Tipper, Colchester Borough Council Planning Services
AECOM Infrastructure & Environment UK Limited
Essex Historic Environment Record

Colchester Archaeological Trust
Roman Circus House,
Roman Circus Walk,
Colchester,
Essex, CO2 7GZ

tel.: 01206 501785
email: lp@catuk.org

Checked by: Philip Crummy
Date: 22.1.2018

Appendix 1 Context list

Trench no.	Context Number	Finds Number F=finds, S=environmental sample	Context type	Description	Date
All	L1	F: 41 (surface)	Plough soil	Soft, moist, medium grey clayey-silt with 5% stone	Modern
All	L2	-	Natural	Firm, moist, medium orange/grey/white sandy-clay with 5% gravel	Post-glacial
T15	L3	-	Natural	Friable, moist, medium to dark red/brown silty-clay, <40% gravel and <10% stone	Post-glacial
T52	L4	-	Levelling	Friable, moist, medium orange/grey/brown silty-clay	?Post-medieval / modern
T52	L5	-	Silting	Firm, moist, light grey clay	Undatable
T52	L6	-	?River sediment	Medium brown sandy-silt with occasional rounded and smooth stone	Undatable
T1	F1	F: 1	Field boundary ditch	Shallow ditch, possibly a drainage ditch seen on old OS maps. Friable, dry, medium grey/brown silty-clay with <2% stone.	Modern
T3	F2	-	Field boundary ditch	Firm, dry, medium grey/brown silty-clay with <14% stone	Modern
T8	F3	S: 2, 20, 21	Charcoal-rich pit	Charcoal-rich pit, scorched. Upper fill: Soft to friable, light grey clayey-silt, occasional charcoal, <3% stone. Lower fill: Thin layer of charcoal in base of pit.	Late Anglo-Saxon/early Medieval (1025-1157 AD)
T11	F4	S: 22	Posthole	Soft, medium to dark grey clayey-silt with <10% charcoal fleck inclusions and <1% stone	Undatable
T11	F5	-	Pit/tree-throw	Soft to friable, medium to dark grey/brown clayey-silt with <2% charcoal fleck inclusions and <5% stone	Undatable
T12	F6	S: 3, 26, 27, 28	Charcoal-rich pit	Charcoal-rich pit, no evidence of scorching. Soft to friable, moist, dark grey/black clayey-silt with >80% charcoal fleck inclusions and >15% stone.	Undatable
T16	F7	F: 4 S: 8	Charcoal-rich pit	Charcoal-rich pit, scorched. Friable, moist, dark black clayey-silt with >80% charcoal fleck inclusions and <10% stone.	Early Roman (mid-late 1st century)
T16	F8	-	Posthole	Firm, moist, medium grey/brown silty-clay	Undatable
T15	F9	-	Natural silt / gravel patch	Friable, moist to wet, medium to dark brown silt with <10% gravel and <15% stone	Post-glacial
T15	F10	F: 13 S: 56	Field boundary ditch	Friable, dry to moist, medium orange/grey silty-sand with <10% gravel and <15% stone	Modern

T19	F11	S: 32 F: 33	Small pit	Friable, medium to dark grey/brown/black clayey-silt with <4% charcoal fleck inclusions and <7% stone	Post-medieval/ modern
T19	F12	S: 5, 30, 31 F: 34	Charcoal-rich pit	Charcoal-rich pit, scorched. Upper fill: Soft to friable, light grey clayey-silt, occasional charcoal, <3% stone. Lower fill: Dense lens of charcoal in base of pit.	Medieval to post-medieval/ modern
T23	F13	S: 6, 29 F: 35	Charcoal-rich pit	Charcoal-rich pit, scorched. Upper fill: Friable, dry, medium grey/black clayey-silt, charcoal rich, <1% gravel, <5% stone. Lower fill: Dense lens of charcoal in base of pit.	Undatable
T23	F14	-	Pit	Friable, dry to moist, medium grey/brown clayey-silt with <7% stone	Undatable
T23	F15	-	Tree-throw	Friable to firm, dry, medium grey/brown clayey-silt with <10% stone	Undatable
T14	F16	S: 16, 23	Charcoal-rich pit	Charcoal-rich pit, no evidence of scorching. Upper fill: Soft to friable, light grey clayey-silt, occasional charcoal, 5% stone. Lower fill: Dense lens of charcoal in base of pit.	Undatable
T14	F17	S: 17	Pit/tree-throw	Soft, moist, medium grey/brown/black silty-clay with charcoal fleck inclusions	Undatable
T14	F18	S: 18, 24, 25	Charcoal-rich pit	Charcoal-rich pit, no evidence of scorching. Upper fill: Soft, moist, medium grey/brown clayey-silt, occasional charcoal. Lower fill: Thin lens of charcoal in base of pit.	Undatable
T14	F19	-	Posthole	Soft, moist, medium grey/brown silty-clay with rare charcoal fleck inclusions	Undatable
T17	F20	F: 19	Ditch (drainage)	Firm, moist, medium orange/grey mottled silty-clay with occasional charcoal fleck inclusions	Modern
T18	F21	-	Pit	Soft, moist, medium grey/brown silty-clay with rare charcoal and daub fleck inclusions	Undatable
T18	F22	-	Pit	Soft, moist, light grey silty-clay with rare charcoal fleck inclusions	Undatable
T18	F23	-	Pit / tree-throw	Soft, moist light grey silty-clay with rare charcoal fleck inclusions	Undatable
T18	F24	-	Pit	Soft, moist, medium grey/brown silty-clay with rare charcoal fleck inclusions	Undatable
T26	F25	-	Natural feature	Firm, moist, medium grey/brown silty-clay	Post-glacial
T24	F26	-	Natural feature	Soft to friable, dry to moist, medium grey/brown clayey-silt with <2% stone	Post-glacial
T24	F27	-	Plough scar	Firm, dry medium brown silty-clay with <7% stone	Modern

T25	F28	S: 7	Charcoal-rich pit	Charcoal-rich pit, no evidence of scorching. Upper fill: Friable, medium grey/brown clayey-silt, occasional charcoal. Lower fill: Thin lens of charcoal in base of pit.	Undatable
T22	F29	-	Pit	Friable, dry, medium grey/brown/orange silty-clay with <8% charcoal fleck inclusions and <7% stone	Undatable
T28	F30	F: 9	Ditch (drainage)	Soft, moist, medium grey/brown silty-clay with charcoal fleck inclusions	Modern
T30	F31	-	Ditch (drainage)	Friable, dry to moist, medium grey/brown silty-sand with <10% gravel and <10% stone, fragments of land drain not retained	Modern
T39	F32	S: 10, 44	Charcoal-rich pit	Charcoal-rich pit, possible scorching. Upper fill: Firm, dry, medium grey/black clayey-silt, occasional charcoal. Lower fill: Firm, dry, medium grey/black clayey-silt, with slightly more charcoal.	Middle Iron Age (362-183 BC)
T26	F33	S: 6, 11	Pit/tree-throw	Firm, moist, medium grey/brown silty-clay with frequent charcoal fleck inclusions	Undatable
T26	F34	F: 12	Pit	Firm, dry to moist, light orange/grey mottled clayey-silt with <10% stone	Post-medieval/ modern
T42	F35	-	Natural linear	Soft, moist, very light grey silty-clay	Post-glacial
T45	F36	S: 36, 43	Charcoal-rich pit	Charcoal-rich pit, possible scorching. Firm, dry, medium grey/black silty-clay with frequent charcoal	Undatable
T46	F37	-	Natural gully	Firm, dry, light to medium grey silty-clay with 3% stone	Post-glacial
T44	F38	F: 37 S: 38, 39, 40, 63, 64, 65	Charcoal-rich pit	Charcoal-rich pit, no evidence of scorching. Upper fill: Soft, moist, medium to dark grey/black silty-clay, occasional charcoal. Lower fill: Dense lens of charcoal in base of pit.	Undatable
T41	F39	-	Field boundary ditch	Soft, dry to moist, medium to dark grey/brown silt with <2% stone.	Modern
T41	F40	-	Gully (drainage)	Soft, dry to moist, grey/brown silt with <1% stone.	Modern
T41	F41	-	Pit / tree-throw	Soft, light grey silty-clay with 5% gravel	Undatable
T41	F42	-	Natural gully	Soft, dry, light grey silty-clay with <1% stone	Post-glacial
T69	F43	-	Ditch	Firm, dry, medium grey silty-clay with 2% stone	Undatable
T61	F44	-	Tree-throw	Firm, moist, light orange/grey mottled silty-clay	Undatable
T61	F45	-	Tree-throw	Friable, dry, medium grey/brown/orange mottled clayey-silt with <20% stone	Undatable
T37	F46	-	Pit	Firm, dry to moist, light orange/grey mottled silty-clay with occasional charcoal flecks.	Undatable

T57	F47	F: 14	Tree-throw	Soft, moist, light grey sandy-silt with occasional charcoal fleck inclusions and rare stone	Mesolithic or early Neolithic
T57	F48	-	Tree-throw	Soft, moist, light grey sandy-silt with occasional charcoal fleck inclusions and occasional stone	Undatable
T46	F49	F: 15	Field boundary ditch	Firm, dry, medium grey/brown silty-clay with 1% stone	Modern
T57	F50	S: 47, 52	Charcoal-rich pit	Charcoal-rich pit, scorched. Soft, moist, medium grey/brown silty-sandy clay with rare stone, occasional charcoal flecks in fill and thin patches of charcoal around edges of pit.	Undatable
T57	F51	S: 48, 51	Charcoal-rich pit	Charcoal-rich pit, scorched. Soft, moist, light grey silty-sandy clay with rare stone, occasional charcoal flecks in fill	Undatable
T47	F52	-	Pit / tree throw	Firm, dry, light to medium grey silty-clay with 2% stone	Undatable
T37	F53	-	Pit	Firm, dry to moist, medium orange/grey mottled silty-clay with occasional charcoal fleck inclusions and 1% gravel	Undatable
T37	F54	-	Pit	Firm, dry to moist, medium orange/grey mottled silty-clay with occasional charcoal fleck inclusions	Undatable
T57	F55	-	Tree-throw	Soft, moist, light yellow/grey sandy-silty-clay with rare charcoal fleck inclusions and rare stone	Undatable
T48	F56	-	Field boundary ditch	Soft, moist, medium grey/brown/beige sandy-silty-clay, modern CBM not retained	Modern
T51	F57	-	Pit/tree-throw	Firm, dry, medium grey silty-clay with rare charcoal fleck inclusions and 1% gravel	Undatable
T51	F58	S: 53, 54	Ditch	Firm, dry, medium grey/brown silty-clay with charcoal fleck inclusions and 1% stone	Undatable
T59	F59	S: 45, 46, 55	Charcoal-rich pit	Charcoal-rich pit, scorched. Upper fill: Soft, moist, medium to dark grey/black silty-clay, occasional charcoal. Lower fill: Dense lens of charcoal in base of pit.	Undatable
T59	F60	-	Pit	Firm, moist, medium orange/grey mottled silty-clay with occasional charcoal fleck inclusions	Undatable
T54	F61	F: 57	Field boundary ditch	Soft medium grey/brown sandy-silty-clay with 2% stone	Modern
T54	F62	S: 58	Elongated pit	Soft, medium to dark grey/black silty-clay with abundant charcoal fleck inclusions and >1% stone.	Undatable
T54	F63	S: 59	Posthole	Soft, moist, dark grey/black silty-clay with frequent charcoal fleck inclusions and stone	Undatable
T54	F64	-	Pit	Soft, medium to dark grey/black silty-	Undatable

				clay with frequent charcoal inclusions and <1% stone	
T54	F65	S: 60	Pit	Soft, medium to dark grey silty-clay with occasional to frequent charcoal fleck inclusions and <1% stone	Undatable
T70	F66	S: 61	?posthole	Firm, medium grey silty-clay with charcoal fleck inclusions and 1% stone	??Modern
T70	F67	S: 62	?posthole	Firm, dry, dark grey/black silty-clay with charcoal fleck inclusions and 1% stone	??Modern
T76	F68	-	Natural	Firm, moist, light orange/grey mottled silty-clay	Post-glacial
T71	F69	-	Natural or tree-throw	Firm, dry, light grey silt with 3% stone	?Post-glacial or undatable
T83	F70	S: 66	Charcoal-rich pit	Charcoal-rich pit, scorched. Soft to friable, moist, medium grey/brown silty-clay with occasional charcoal flecks in fill.	Undatable
T60	F71	-	Natural linear	Friable, moist, grey/brown silty-clay with charcoal fleck inclusions	Post-glacial
T60	F72	F: 42	Field boundary ditch	Soft, moist, medium to dark yellow/orange/grey/ brown/black sandy-silty-clay	Modern
T62	F73	-	Natural gully	Friable, dry, medium grey/brown clayey-silt with <5% stone	Post-glacial
T63	F74	-	Pit	Soft to friable, medium grey clayey-silt with >60% charcoal fleck inclusions and <10% stone	Undatable
T63	F75	-	Natural gully	Soft, grey/brown clayey-silt with <2% gravel and <5% stone	Post-glacial
T65	F76	S: 76	Charcoal-rich pit	Charcoal-rich pit, scorched. Friable to firm, dry, medium grey/yellow/ orange/brown clayey-silt with occasional charcoal flecks in fill and slightly dense patches on charcoal in base.	Undatable
T67	F77	F: 50	?Ditch	Friable, dry, medium brown clayey-silt	Modern
T66	F78	F: 71, 73, 78	Field boundary ditch	Soft, moist, medium to dark orange/grey/brown sandy-silty-clay with rare charcoal fleck inclusions and 1%	Modern
T66	F79	F: 72	Ditch	Moist, medium slightly-sandy silty-clay with rare charcoal fleck inclusions and 1% stone	Modern
T67	F80	-	Ditch	Soft, moist, medium grey/brown silty-clay with charcoal fleck inclusions and >5% gravel	Undatable
T83	F81	-	Tree-throw	Soft, moist, light yellow/grey mottled silt with rare stone	Undatable
T83	F82	-	Tree-throw	Soft, moist, light to medium grey/brown clayey-silt with rare stone	Undatable
T72	F83	-	Natural linear	Soft, moist, medium yellow/grey mottled silty-clay	Post-glacial
T64	F84	F: 67	Field boundary ditch	Soft, moist, medium yellow/grey/brown/black silty-clay	Modern
T78	F85	-	Tree-throw	Firm, moist, medium grey silty-clay with	Undatable

				frequent charcoal fleck inclusions	
T79	F86	-	Natural silt patch	Firm, moist, light grey silt	Post-glacial
T81	F87	S: 68, 69, 77, 78	Charcoal-rich pit	Charcoal-rich pit, scorched. Soft, moist, light grey/brown silty-clay with occasional charcoal in fill.	Undatable
T91	F88	-	Elongated pit	Soft, mottled medium orange/grey/brown silty-clay	Undatable
T96	F89	F: 70	Field boundary ditch	Soft, medium grey/brown silty-clay, <1% stone.	Modern
T98	F90	-	Ditch	Soft, moist, grey slightly sandy-silty clay, <1% stone	Undatable
T74	F91	-	Field boundary ditch	Friable, dry, medium grey/brown silty-clay, with <10% stone	Modern
T72	F92	-	Pit	Soft, moist, light grey silty-clay	Undatable
T82	F93	S: 74, 80	Charcoal-rich pit	Charcoal-rich pit, scorched. Upper fill: Friable, dark grey/brown silty-clay, occasional charcoal. Lower fill: Dense lens of charcoal in base of pit.	Undatable
T96	F94	-	Tree-throw	Soft, moist, light grey silty-clay with rare charcoal fleck inclusions and rare stone	Undatable
T80	F95	S: 75	Charcoal-rich pit	Charcoal-rich pit, no evidence of scorching. Loose, moist, dark brown/black silty-clay with >80% charcoal	Undatable
T81	F96	-	Field boundary ditch	Not excavated	Modern
T94	F97	S: 79	Pit/tree-throw	Friable, wet, medium to dark grey silty-clay with >20% charcoal fleck inclusions	Undatable
T98	F98	-	Natural gully	Friable, moist, medium mottled orange/grey silty-clay	Post-glacial
T108	F99	S: 81, 86, 87	Charcoal-rich pit	Charcoal-rich pit, scorched. Soft, moist, light grey/black sandy-silty clay, charcoal rich	Undatable
T110	F100	F: 83	Field boundary ditch	Loose, soft, moist, medium grey/brown/black silty-clay with charcoal and brick inclusions, <10% stone	Modern
T98	F101	-	Natural gully	Soft, medium orange/grey silty-clay, <1% stone	Post-glacial
T108	F102	S: 82	Charcoal-rich pit	Charcoal-rich pit, scorched. Soft, moist, light grey/brown/black silty-clay with occasional charcoal in fill and slightly denser patches of charcoal in the base.	Undatable
T108	F103	S: 91, 99	Charcoal-rich pit	Charcoal-rich pit, no evidence of scorching. Soft, medium to dark grey silty-clay, occasional charcoal	Undatable
T110	F104	-	Pit	Soft, moist, medium grey silty-clay.	Modern
T110	F105	F: 92, 93	Field boundary ditch	Soft, moist, grey/black silty-clay with charcoal, CBM and modern debris included in fill	Modern

T104	F106	-	Agricultural linear	Soft, moist, dark yellow silty-clay with rare flecks of charcoal and CBM	Modern
T111	F107	S: 84	Pit / agricultural scar ?	Soft, moist, medium grey/brown silty-clay with frequent charcoal and daub flecks	?Modern
T110	F108	S: 97	?Posthole	Soft, light to medium orange/grey silty-clay	Undatable
T110	F109	S: 96	?Posthole	Soft, moist, medium to dark grey silty-clay with frequent charcoal	Undatable
T110	F110	F: 94 S: 95	?Pit	Soft, medium to dark grey silty-clay with frequent charcoal, <1% stone	Undatable
T104	F111	S: 85, 100	Charcoal-rich pit	Charcoal-rich pit, scorched. Upper fill: Friable, moist, medium grey/black silty-clay, occasional charcoal. Lower fill: Dense lens of charcoal in base of pit.	Uncertain, see discussion p27-28.
T104	F112	-	Field boundary ditch	Soft, moist, medium grey/brown sitly-clay with charcoal fleck inclusions, >10% stone	Modern
T113	F113	S: 88, 98	Charcoal-rich pit	Charcoal-rich pit, scorched. Upper fill: Soft, light-medium grey/black silty-clay, occasional charcoal. Lower fill: Thin lens of charcoal in base of pit.	Undatable
T22	F114	-	Ditch (drainage)	Not excavated	Modern
T69	F115	-	Field boundary ditch	Not excavated	Modern
T65	F116	-	Field boundary ditch	Not excavated	Modern
T66	F117	-	Field boundary ditch	Not excavated	Modern
T79	F118	-	Field boundary ditch	Not excavated	Modern

Appendix 2 Depths of topsoil (L1) onto natural (L2) listed by trench

Trench	Depths		T41	L1 (0.36m thick)		T82	L1 (0.36-0.38m thick)
T1	L1 (0.38-0.43m thick)		T42	L1 (0.3-0.38m thick)		T83	L1 (0.38-0.39m thick)
T2	L1 (0.39-0.46m thick)		T43	L1 (0.33-0.34m thick)		T84	L1 (0.35-0.42m thick)
T3	L1 (0.28-0.42m thick)		T44	L1 (0.3-0.4m thick)		T85	L1 (0.3-0.36m thick)
T4	L1 (0.42-0.48m thick)		T45	L1 (0.39-0.4m thick)		T86	L1 (0.3-0.32m thick)
T5	L1 (0.37-0.4m thick)		T46	L1 (0.37-0.38m thick)		T87	L1 (0.32-0.33m thick)
T6	L1 (0.31-0.4m thick)		T47	L1 (0.28-0.39m thick)		T88	L1 (0.3-0.32m thick)
T7	L1 (0.34-0.4m thick)		T48	L1 (0.37-0.38m thick)		T89	L1 (0.35-0.36m thick)
T8	L1 (0.32-0.34m thick)		T49	L1 (0.35-0.4m thick)		T90	L1 (0.32-0.35m thick)
T9	L1 (0.37-0.45m thick)		T50	L1 (0.36-0.42m thick)		T91	L1 (0.33-0.37m thick)
T10	L1 (0.32-0.41m thick)		T51	L1 (0.35-0.38m thick)		T92	L1 (0.33-0.4m thick)
T11	L1 (0.33-0.35m thick)		T52	L1 (0.31-0.37m thick)		T93	L1 (0.3m thick)
T2	L1 (0.36-0.37m thick)		T53	L1 (0.36.0.38m thick)		T94	L1 (0.3-0.34m thick)
T13	L1 (0.35-0.36m thick)		T54	L1 (0.35-0.37m thick)		T95	L1 (0.3-0.32m thick)
T14	L1 (0.34m thick)		T55	L1 (0.38-0.42m thick)		T96	L1 (0.3m thick)
T15	L1 (0.33-0.35m thick)		T56	L1 (0.36-0.41m thick)		T97	L1 (0.31-0.32m thick)
T16	L1 (0.33-0.34m thick)		T57	L1 (0.34-0.36m thick)		T98	L1 (0.33-0.37m thick)
T17	L1 (0.3-0.32m thick)		T58	L1 (0.3-0.34m thick)		T99	L1 (0.31-0.36m thick)
T18	L1 (0.33-0.39m thick)		T59	L1 (0.34-0.4m thick)		T100	L1 (0.37-0.38m thick)
T19	L1 (0.37-0.39m thick)		T60	L1 (0.3-0.32m thick)		T101	L1 (0.45m thick)
T20	L1 (0.32-0.39m thick)		T61	L1 (0.3-0.31m thick)		T102	L1 (0.33-0.35m thick)
T21	L1 (0.36-0.37m thick)		T62	L1 (0.3m thick)		T103	L1 (0.37-0.42m thick)
T22	L1 (0.31-0.36m thick)		T63	L1 (0.33-0.34m thick)		T104	L1 (0.28-0.33m thick)
T23	L1 (0.33-0.34m thick)		T64	L1 (0.3-0.31m thick)		T105	L1 (0.3-0.31m thick)
T24	L1 (0.3-0.32m thick)		T65	L1 (0.33m thick)		T106	L1 (0.3-0.36m thick)
T25	L1 (0.36-0.37m thick)		T66	L1 (0.37m thick)		T107	L1 (0.3-0.38m thick)
T26	L1 (0.32-0.36m thick)		T67	L1 (0.31-0.37m thick)		T108	L1 (0.38m thick)
T27	L1 (0.3-0.39m thick)		T68	L1 (0.31-0.33m thick)		T109	L1 (0.33-0.36m thick)
T28	L1 (0.33-0.39m thick)		T69	L1 (0.3-0.31m thick)		T110	L1 (0.34-0.36m thick)
T29	L1 (0.29-0.3m thick)		T70	L1 (0.33-0.4m thick)		T111	L1 (0.31-0.32m thick)
T30	L1 (0.29-0.3m thick)		T71	L1 (0.34-0.36m thick)		T112	L1 (0.25m thick)
T31	L1 (0.3-0.34m thick)		T72	L1 (0.3-0.35m thick)		T113	L1 (0.3-0.33m thick)
T32	L1 (0.3-0.35m thick)		T73	L1 (0.35-0.37m thick)		T114	L1 (0.3-0.33m thick)
T33	L1 (0.32-0.36m thick)		T74	L1 (0.31-0.37m thick)		T115	L1 (0.4m thick)
T34	L1 (0.35m thick)		T75	L1 (0.33-0.34m thick)		T116	L1 (0.4m thick)
T35	L1 (0.32-0.35m thick)		T76	L1 (0.37m thick)		T117	L1 (0.32-0.4m thick)
T36	L1 (0.34-0.35m thick)		T77	L1 (0.32-0.36m thick)		T118	L1 (0.37m thick)
T37	L1 (0.35-0.36m thick)		T78	L1 (0.31-0.35m thick)		T119	L1 (0.38-0.45m thick)
T38	L1 (0.36-0.39m thick)		T79	L1 (0.32-0.36m thick)		T120	L1 (0.3-0.38m thick)
T39	L1 (0.36m thick)		T80	L1 (0.34-0.35m thick)			
T40	L1 (0.31-0.41m thick)		T81	L1 (0.3-0.33m thick)			

Appendix 3 Bulk finds list

Context	Find no.	Description	Finds spot date
F1 (sx2) (T1), field boundary ditch	1	**Heat altered (burnt) stone:** Red-brown coloured natural flint (46g), colouration appears to be the result of exposure to heat (see F110 (94)).	not dated
F7 (T16), fire pit	4	**Roman pottery:** Sherds from a single pot, Butt Beaker of form Cam 119, quite broken-up (83 sherds, weight 348g), much of one side present as joining sherds, sherds from the neck and rim also join; base absent. Low cordons around body of which at least two are clear, with third at base of neck. Fabric RCW, dark grey/black smooth surfaces and red-brown core with some small, orange coloured grog and dark ?organic inclusions. Mid-late 1st century.	Roman, *c* mid- late 1st century
F10 (T15), field boundary ditch	13	**CBM:** (3 pieces, 28g), one piece 25mm thick, orange coloured sandy fabric, heavily sanded base and thin grey upper surface, might be Roman although there is a piece of similar thickness from F61 (57) of probable post-medieval/modern date; also two small tile flakes, slightly laminating, orange, sandy fabric and sanded base, possibly peg-tile but not closely identified or closely dated (?post-Roman).	Probably post-medieval/ modern
F11 (T19), pit	33	**CBM:** Single small piece (recently broken into 2 joining pieces) (4g), abraded, rounded, sandy orange, slightly soft, red fabric, not closely-dated but probably post-medieval/ modern brick.	Probably post-medieval/ modern
F12 (T19), fire pit	34	**CBM:** Single piece of peg-tile (22g), corner piece (recently broken into two joining pieces), broadly medieval-post-medieval/modern.	Medieval to post-medieval/ modern
F13 (T23), fire pit	35	**Heat altered (burnt) stone:** Dark coloured natural flint (126g), clearly heat altered (burnt) at one end, discoloured pink & red and structure of the flint affected.	not dated
F20 (T17), drainage ditch	19	**CBM:** Very small piece/ fragment (<1g), indeterminate brick/tile fragment, not closely-dated (easily small enough to be an intrusion through natural agency and of questionable use in relation to dating the context).	Roman or later
F34 (T26), pit	12	**Glass:** Small piece of bottle glass (4g) medium-dark green in colour (*c* 18th/19th-early 20th century).	Post-medieval/ modern
F38 (T45), fire pit	37	**Fired clay:** Small pieces (9 fragments, 18g) abraded, rounded, most in sandy brown fabric, two in orange & buff coloured fabric.	not closely dated
F49 (T46), field boundary ditch	15	**CBM:** Single small piece of peg-tile (22g) (medieval-post-medieval/modern). **Slag:** Single small piece (28g), dark grey colour, vesicular, irregular shape, medium density.	Probably post-medieval
F61 (T54), field boundary ditch	57	**Pottery:** Modern factory earthenware sherd (16g), Fabric 48D (*c* late 18th/19th-early 20th century). **CBM:** Piece possibly from a tile/floor brick used in a floor/ surface (386g), 35mm thick at edge, dished toward centre & surface appears to be worn, slightly coarse sandy red fabric (*c* 18th/19th-early 20th century). **Coal:** Single piece (10g) (post-medieval or modern). **Stone:** Piece of worked, pale brownish-yellow sandstone (920g) squared, with smooth worked faces at right angles to each other, black sooty deposit on all three surviving faces and over broken edges.	Post-medieval/modern, probably 19th-early 20th century
F72 (T60), field boundary ditch	42	**Pottery:** Modern stoneware necked preserve jar, much of pot as three joining sherds (196g), Fabric 45M (19th-early 20th century). **CBM:** Brick fragment (592g), frogged, abraded, yellow coloured sandy fabric, one edge 40mm, other 35mm, could be a voussoir-type brick but the effect might be from wear, although that might be unlikely as it would be the frogged face that had been partly worn down, traces of stamped lettering in the frog (**E**) **N** although only the letter N is clearly legible (late 19th-early 20th century). **Animal bone:** Bovine scapular piece, proximal end (224g), abraded.	Modern, late 19th-early 20th century
F78 (T66), field boundary ditch	71	**Glass:** Piece of bottle glass (14g) medium-dark green green hue (*c* 18th/19th-early 20th century).	Post-medieval/ modern
	73 (sx2)	**CBM:** (3 pieces, 282g). **Roman** 1 piece, abraded, pale orange fine silt/sand fabric. **Post-Roman** peg-tile 1 small piece (later medieval-post-medieval/modern); nibbed tile 1 piece, curving, possibly a pantile (*c* 17th century-modern). **Glass:** Part of a bottle base broken into 4 small pieces (44g), very dark green glass (*c* 18th-19th century).	Post-medieval/ modern
F79 (T66),	72	**CBM:** (2 pieces, 936g), one piece is part of the end of a brick like object with a smooth rounded cut (channel) in one	Modern, *c* 19th century

Context	Find no.	Description	Finds spot date
ditch		surface, possibly part of a drain/ land-drain pipe used singly as a channel or in conjunction with another to form a closed pipe (*c* 19th century), one other, small nondescript brick piece.	
F84 (T64), field boundary ditch	67	**Pottery:** Modern (5 sherds, 8g) modern white stoneware / Staffordshire-type white stoneware, Fabric 47 (19th-early 20th century). **CBM:** Most of one brick (2536g), not frogged, length >215mm, width 115mm, thickness 60mm, pale creamy yellow fabric flecked with dark ironstone? fragments, sides of brick smooth, surfaces slightly rough with drag lines (*c* late 18th-19th century). **Glass:** (2 pieces, 22g), one piece of pale green bottle glass, one piece of clear modern window glass (late 19th-early 20th century)	Modern, late 19th-early 20th century
F89 (T96), field boundary ditch	70	**CBM:** (4 pieces, 454g). **Post-Roman** peg-tile, 2 small pieces (later medieval-post-medieval/modern); brick abraded piece, orange sandy fabric, 40mm thick, possibly later medieval but more likely a flooring brick of 18th-19th century date; small piece of very hard red brick probably late 19th-20th century	Modern, *c* late 18th-19th century
F100 (T100), field boundary ditch	83	**Pottery:** Modern, one sherd from a small dish of factory made, white, hard fired earthenware (18g), Fabric 48D (*c* late 18th/19th-early 20th century) **CBM:** Single small piece of peg-tile (28g) (medieval/post-medieval-modern)	Modern, *c* 19th-early 20th century
F105 (T104), field boundary ditch	93	**Pottery:** Single large base sherd (108g), Fabric 45M (modern stoneware) (19th-early 20th century) **Glass:** Complete (whole) small paste bottle (206g), 85mm tall, faintly green-tinted glass (late 19th-early 20th century)	Modern, late 19th-early 20th century
F110 (T110), pit	94	**Heat altered (burnt) stone:** (16 pieces, 332g) Small-medium stones, almost all flint, some white calcified pieces, most reddened but clearly heat affected, plus two small pieces of opaque, milky quartz one partly reddened and cracked by exposure to heat. **Heat affected iron pan:** (5 pieces, 40g) dark brownish-red, hard sandy irregular pieces, appears to be natural iron pan and also appears to be probably heat affected	not dated
L1 (T2), plough soil	-	**Stone:** (natural) Piece of conglomerate stone (272g), irregular with naturally smoothed surfaces, pale matrix with probably flint stone inclusion – small stones (up to 10 mm diameter) and more numerous smaller mixed stones, dark & light grey (*c* 5mm – coarse sand size). *The most common conglomerate encountered in this area is Hertfordshire 'pudding stone' which is found both as erratics and as pieces from manufactured querns dating to the Late Iron Age and Early Roman period. The piece here is different in nature to the usual Hertfordshire material and appears to be an erratic stone of natural origin on the site.*	(Natural)
L1 (T7), plough soil	-	**Pottery:** Greyware body sherd (12g), probably medieval (Fabric 20) rather than Roman (Fabric GX) (*c* 13th-14th century).	Probably medieval (*c* 13th-14th century)
L1 (T52), plough soil	41	**CBM:** Single small piece from a drain (18g), surface flake which preserves part of lettered relief (**R**)**A** almost certainly part of a stamp reading DRAIN (this was applied to drain pipes in the early 19th century, specifically between 1826-1850, as an exemption for the tax on bricks and other clayware building materials.	Modern, early 19th century (1826-1850)
L1, plough soil	-	**Stone:** large, irregular, naturally round smooth stone, granitic or granite. No obvious archaeological significance.	(Natural)

Appendix 4 Environmental analysis Tables 1-8

Table 1 Sample details

Feature Number	Feature type	Charcoal pit type	Sample no.	Finds no.	Sample Details	Litres
F3	Charcoal-rich pit	2	**1a**	2	Eastern half – 100% sampled	40
			1b	20	Upper/mid fill of western half – 100% sampled	30
			1c	21	Lower fill of western half – 100% sampled	40
F4	Posthole	NA	**25**	22	50% sampled	10
F6	Charcoal-rich pit	1	**2a**	3	Eastern half – 100% sampled	40
			2b	26	Upper fill of western half – 100% sampled	30
			2c	27	Mid fill of western half – 100% sampled – no identifiable charcoal and no other plant macros	10
			2d	28	Lower fill of western half – 100% sampled – no identifiable charcoal and no other plant macros	20
F7	Charcoal-rich pit	1	**3**	8	Whole fill – 100% sampled	34
F12	Charcoal-rich pit	2	**4a**	5	Western half – 100% sampled	40
			4b	30	Upper/ mid fill of eastern half – 100% sampled	10
			4c	31	Lower fill of eastern half – 100% sampled	10
F13	Charcoal-rich pit	2	**5a**	6	Northwestern half – 100% sampled	40
			5b	29	Southeastern half – 100% sampled	40
F16	Charcoal-rich pit	2	**6a**	16	Southeastern half – 100% sampled	20
			6b	23	Northwestern half – 100% sampled	10
F18	Charcoal-rich pit	2	**7a**	18	Northern half – 100% sampled	5
			7b	24	Upper/mid fill of southern half – 100% sampled	10
			7c	25	Lower fill of southern half – 100% sampled	3
F28	Charcoal-rich pit	2	**8**	7	Whole fill – 100% sampled	40
F32	Charcoal-rich pit	1 or 2	**9a**	10	Western half – 100% sampled	10
			9b	44	Eastern half – 100% sampled	10
F33	Pit/tree-throw		**27**	11	Lower fill	40
F36	Charcoal-rich pit	1	**10a**	36	Western half – 100% sampled	8
			10b	43	Eastern half – 100%sampled	10
F38	Charcoal-rich pit	2	**11a**	38	Upper fill southwestern half – 100% sampled	5
			11b	39	Mid fill southwestern half – 100% sampled	20
			11c	40	Lower fill southwestern half – 100% sampled	10
			11d	64	Mid fill southwestern half – 100% sampled	20
			11e	65	Lower fill northeastern half – 100% sampled	10
			11f	63	Upper fill of northeastern half – 100% sampled	10
F50	Charcoal-rich pit	3	**12a**	47	Western half – 100% sampled	20
			12b	52	Eastern half – 100% sampled	15
F51	Charcoal-rich pit	3	**13a**	48	Southern half – 100% sampled	30
			13b	51	Northern half – 100% sampled	20
F58	Ditch	NA	**28a**	53	Upper/mid fill	30
			28b	54	Lower fill	20
F59	Charcoal-rich pit	2	**14a**	45	Upper fill southeastern half – 100% sampled	10
			14b	46	Lower fill southeastern half – 100% sampled	30
			14c	55	Northwestern half – 100% sampled	35
F62	Pit	NA	**29**	58	Lower fill	20
F63	Posthole	NA	**30**	59	Lower fill	20
F65	Pit	NA	**31**	60		20
F70	Charcoal-rich pit	3	**15**	66	Whole fill	20
F74	Pit	NA	**32**	89		40
F76	Charcoal-rich pit	3	**16a**	49	Lower fill of northeastern half – 100% sampled	14
			16b	76	Lower fill of southwestern half – 100% sampled	8
F87	Charcoal-rich pit	3	**17a**	68	Upper/mid fill of northwestern half – 100% sampled	30
			17b	69	Lower fill of northwestern half – 100% sampled	10
			17c	77	Upper/mid fill of southeastern half – 100% sampled	30
			17d	78	Lower fill of southeastern half – 100% sampled	10
F93	Charcoal-rich pit	2	**18a**	74	Mid/lower western half – 100% sampled	10
			18b	80	Mid/lower eastern half – 100% sampled	40
F95	Charcoal-rich pit	1	**19**	75	Whole fill – 100% sampled	35
F97	Pit/tree-throw	NA	**33**	79	Mid-fill	15
F99	Charcoal-rich pit	1	**20a**	81	Northeastern half – 100% sampled	20
			20b	86	Upper fill southwestern half – 100% sampled	8
			20c	87	Lower fill southwestern half – 100% sampled	4
F102	Charcoal-rich pit	3	**21**	82	Whole fill – 100% sampled	10
F103	Charcoal-rich pit	1	**22a**	91	Northern half – 100% sampled	10
			22b	99	Southern half – 100% sampled	10
F108	?Posthole	NA	**34**	97	100% sampled	10

F109	?Posthole	NA	**35**	96	100% sampled	20
F110	?Pit	NA	**36**	95	(F108 and F109 are in the bottom of this feature)	30
F111	Charcoal-rich pit	2	**23a**	85	Western half – 100% sampled	60
F113	Charcoal-rich pit	2	**24b**	98	Eastern half – 100% sampled	8

Table 2 Charred plant macro-remains (not charcoal) in samples – by feature

Feature number	Feature type	Charcoal pit type	Sample no.	Finds no.	Sample details	Sample size (litres)	Latin name	Common name	Whole no.
F38	Charcoal-rich pit	2	**11a**	38	Upper fill southwestern half	5	*Festuca* sp.	Fescue	1
F74	Pit	N/A	**32**	89		40	*Hordeum distichon/vulgare* Spelzgerste (grain)	Straight hulled barley	1
							Poaceae(stem fragment)	Grasses	1
							Rubus fruticosus/idaeus	Blackberry/raspberry	1
F87	Charcoal-rich pit	3	**17c**	77	Upper/mid fill of southeastern half	30	*Galium aparine* L.	Goosegrass	1
F93	Charcoal-rich pit	2	**18b**	80	Mid/lower eastern half	40	*Vicia* sp.	Vetch/tare	1
F95	Charcoal-rich pit	1	**19**	75	Whole fill	35	*Hordeum distichon/vulgare Spelzgerste (grain)*	Straight hulled barley	1
F111	Charcoal-rich pit	2	**23a**	85	Western half	60	*Avena* sp.	Oat	2
F113	Charcoal-rich pit	2	**24b**	98	Eastern half	8	*Anthemis cotula* L.	Stinking mayweed	3

Table 3 Dried waterlogged plant macro-remains in samples – by feature

Feature no.	Feature type	Charcoal pit type	Sample no.	Finds no.	Sample details	Litres	Latin name	Common name	Whole no.	Frag-ments
F3	Charcoal-rich pit	2	**1a**	20	Upper mid fill of western half	30	*Chenopodium album* L.	Fat-hen	1	-
							Chenopodium ficifolium/ polyspermum	Oak-leaved/many-seeded goosefoot	1	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	32	-
F4	Posthole	NA	**25**	22		10	*Atriplex patula/hastata*	Common/hastate orache	1	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	3	-
							Viola sp.	Violet	-	1
F7	Charcoal-rich pit	3	**3**	8	Whole fill	34	*Atriplex patula/hastata*	Common/hastate orache	1	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	1	-
F12	Charcoal-rich pit	2	**4b**	31	Lower fill of eastern half	10	*Chenopodium album* L.	Fat-hen	4	-
F13	Charcoal-rich pit	2	**5a**	6	Northwestern half	40	*Atriplex patula/hastata*	Common/hastate orache	2	-
			5b	29	Southeastern half	40	*Atriplex patula/hastata*	Common/hastate orache	52	-

Feature no.	Feature type	Charcoal pit type	Sample no.	Finds no.	Sample details	Litres	Latin name	Common name	Whole no.	Frag-ments
F18	Charcoal-rich pit	2	**7a**	18	Northern half	5	*Rubus fruticosus/idaeus*	Blackberry/raspberry	1	-
			7c	25	Lower fill of southernhalf	3	*Fallopia convolvulus* (L.) Á. Löve	Black-bindweed	1	-
F28	Charcoal-rich pit	2	**8**	7	Whole fill	40	*Atriplex patula/hastata*	Common/hastate orache	7	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	1	-
F32	Charcoal-rich pit	1 or 2	**9b**	44	Eastern half	10	*Fallopia convolvulus* (L.) Á. Löve	Black-bindweed	1	-
F33	Pit/ tree-throw	NA	**27**	11	Lower fill	40	*Atriplex patula/hastata*	Common/hastate orache	9	-
							Chenopodium album L.	Fat-hen	2	-
F50	Charcoal-rich pit	3	**12a**	47	Western half	20	*Chenopodium album* L.	Fat-hen	4	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	65	-
			12b	52	Eastern half	15	*Atriplex patula/hastata*	Common/hastate orache	1	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	6	-
F51	Charcoal-rich pit	3	**13a**	48	Southern half	30	*Atriplex patula/hastata*	Common/hastate orache	2	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	9	-
							Triticum aestivum s.str. (rachis fragment)	Bread wheat	2	-
			13b	51	Northern half	20	*Fallopia convolvulus* (L.) Á. Löve	Black-bindweed	8	-
							Sambucus nigra L.	Elder	1	-
F58	Ditch	NA	**28b**	54	Lower fill	20	*Atriplex patula/hastata*	Common/hastate orache	4	-
							Chenopodium album L.	Fat-hen	4	-
F62	Pit	NA	**29**	58	Lower fill	20	*Atriplex patula/hastata*	Common/hastate orache	2	-
F63	Posthole	NA	**30**	59	Lower fill	20	*Atriplex/Chenopodium* sp.	Orache/Goosefoots	1	-
F65	Pit	NA	**31**	60		20	*Atriplex patula/hastata*	Common/Hastate Orache	3	-
F70	Charcoal-rich pit	3	**15**	66	Whole fill	20	*Atriplex patula/hastata*	Common/Hastate Orache	2	-
							Brassica/Raphanus sp.	Wild Cabbage/Wild Radish	1	-
							Chenopodium album L.	Fat-Hen	2	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	9	-
F74	Pit	NA	**32**	89		40	*Atriplex patula/hastata*	Common/Hastate Orache	13	-
							Brassica/Raphanus sp.	Wild Cabbage/Wild Radish	4	-
							Chenopodium album L.	Fat-Hen	6	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	24	-
							Viola sp.	Violet	3	-
F87	Charcoal-rich pit	3	**17a**	68	Upper/mid fill of northwestern half	30	*Atriplex patula/hastata*	Common/Hastate Orache	8	-
							Brassica/Raphanus sp.	Wild Cabbage/Wild Radish	1	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	3	2
F87	Charcoal-rich pit	3	**17b**	69	Lower fill of northwestern half	10	*Fallopia convolvulus* (L.) Á. Löve	Black-bindweed	1	-
							Atriplex patula/hastata	Common/Hastate Orache	1	-
							Chenopodium album L.	Fat-Hen	1	-
							Galium aparine L.	Goosegrass	1	-

Feature no.	Feature type	Charcoal pit type	Sample no.	Finds no.	Sample details	Litres	Latin name	Common name	Whole no.	Frag-ments
F93	Charcoal-rich pit	2	**18b**	80	Mid/lower eastern half	40	*Brassica/Raphanus* sp.	Wild Cabbage/Wild Radish	2	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	1	-
F97	Pit/tree-throw	NA	**33**	79	Mid-fill	15	*Fallopia convolvulus* (L.) Á. Löve	Black-bindweed	1	-
F99	Charcoal-rich pit	1	**20b**	86	Upper fill southwestern half	8	*Chenopodium album* L.	Fat-Hen	1	-
F110	?Pit	NA	**36**	95		30	*Chenopodium album* L.	Fat-Hen	12	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	1	-
							Polygonum aviculare L.	Knotweed	4	-
F111	Charcoal-rich pit	2	**23a**	85	Western half	60	*Atriplex patula/hastata*	Common/Hastate Orache	1	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	1	-
F113	Charcoal-rich pit	2	**24a**	88	Western half	8	*Atriplex patula/hastata*	Common/Hastate Orache	2	-
							Fallopia convolvulus (L.) Á. Löve	Black-bindweed	1	-
							Polygonum lapathifolium/persicaria	Pale Persicaria/Red Shank	1	-
							Atriplex patula/hastata	Common/Hastate Orache	1	-

Table 4 Charcoal in Type 1 charcoal-rich pits

Feature no.	Sample no.	Finds no.	Sample details	Litres	Latin Name	Common name	Fragments
F6	**2a**	3	Eastern half	40	*Quercus* sp.	Oak	99
	2b	26	Upper mid fill of western half	30	*Quercus* sp.	Oak	100
F7	**3**	8	Whole fill	34	*Quercus* sp.	Oak	57
F36	**10a**	36	Western half	8	*Fagus sylvatica* L.	Beech	1
					Quercus sp.	Oak	34
F95	**19**	75	Whole fill	35	*Quercus* sp.	Oak	100
F99	**20a**	81	Northeastern half	20	*Quercus* sp.	Oak	20
	20b	86	Upper fill southwestern half	8	*Quercus* sp.	Oak	14
	20c	87	Lower fill southwestern half	4	*Quercus* sp.	Oak	14
F103	**22b**	99	Southern half	10	*Quercus* sp.	Oak	6

Table 5 Charcoal in Type 2 charcoal-rich pits

Feature no.	Sample no.	Finds no.	Sample Details	Litres	Latin name	Common name	Fragments
F3	**1a**	2	Eastern half	30	*Quercus* sp.	Oak	91
	1b	20	Upper mid fill of western half	30	*Prunus* sp.	Cherry/Plum/Sloe	1
					Quercus sp.	Oak	84
					Quercus sp. (roundwood -6 rings)	Oak	1
					cf. *Quercus* sp.	Oak	4
	1c	21	Lower fill of western half	40	*Quercus* sp.	Oak	83
F12	**4a**	5	Western half	40	*Fagus sylvatica* L.	Beech	10
					Quercus sp.	Oak	95
	4b	30	Upper/ mid fill of eastern half	10	*Fagus sylvatica* L.	Beech	1
					Quercus sp.	Oak	16
	4c	31	Lower fill of eastern half	10	*Quercus* sp.	Oak	18
F13	**5a**	6	Northwestern half	40	*Quercus* sp.	Oak	103
	5b	29	Southeastern half	40	*Prunus* sp.	Cherry/Plum/Sloe	1
					Quercus sp.	Oak	49
F16	**6a**	16	Southeastern half	20	*Fagus sylvatica* L.	Beech	6
					Quercus sp.	Oak	98
	6b	23	Northwestern half	10	*Alnus glutinosa* L.	Alder	1
					Prunus sp.	Cherry/Plum/Sloe	1
					Quercus sp.	Oak	13
					Quercus sp.	Oak	1
F18	**7a**	18	Northern half	5	*Quercus* sp.	Oak	10
	7b	24	Upper/mid fill of southern half	10	*Quercus* sp.	Oak	11
F28	**8**	7	Whole fill	40	*Quercus* sp.	Oak	15
F38	**11a**	38	Upper fill southwestern half	5	*Fagus sylvatica* L.	Beech	7
					Quercus sp.	Oak	51
	11b	39	Mid fill southwestern half	20	*Fagus sylvatica* L.	Beech	3
					Quercus sp.	Oak	101
	11c	40	Lower fill southwestern half	10	*Quercus* sp.	Oak	92
	11d	64	Mid fill northeastern half	20	*Quercus* sp.	Oak	54
	11e	65	Lower fill northeastern half	10	*Quercus* sp.	Oak	100
	11f	63	Upper fill of northeastern half	10	*Quercus* sp.	Oak	19
F59	**14a**	45	Upper fill southeastern half	10	*Quercus* sp.	Oak	68
	14b	46	Lower fill southeastern half	30	*Quercus* sp.	Oak	284
	14c	55	Northwestern half	35	*Quercus* sp.	Oak	268
F93	**18a**	74	Mid/lower western half	10	*Quercus* sp.	Oak	52
	18b	80	Mid/lower eastern half	40	*Quercus* sp.	Oak	100

F111	**23a**	85	Western half	60	*Fagus sylvatica* L.	Beech	2
					Quercus sp.	Oak	66
	23b	100	Eastern half	30	*Quercus* sp.	Oak	95
					Quercus sp.	Oak	11
F113	**24a**	88	Western half	8	*Quercus* sp.	Oak	1

Table 6 Charcoal in Type 3 charcoal-rich pits

Feature no.	**Sample no.**	**Finds no.**	**Sample details**	**Litres**	**Latin name**	**Common name**	**Fragments**
F50	**12a**	47	Western half	20	*Fagus sylvatica* L.	Beech	1
					Prunus sp.	Cherry/Plum/Sloe	2
					Quercus sp.	Oak	76
F51	**13a**	48	Southern half	30	*Quercus* sp.	Oak	88
	13b	51	Northern half	20	*Quercus* sp.	Oak	9
F70	**15**	66	Whole fill	20	*Quercus* sp.	Oak	31
F76	**16b**	76	Lower fill of southwestern half	8	*Quercus* sp.	Oak	6
F87	**17a**	68	Upper/mid fill of northwestern half	30	*Fagus sylvatica* L.	Beech	1
					Quercus sp.	Oak	12
	17b	69	Lower fill of northwestern half	10	*Quercus* sp.	Oak	6
	17c	77	Upper/mid fill of southeastern half	30	*Fagus sylvatica* L.	Beech	3
					Quercus sp.	Oak	7
	17d	78	Lower fill of southeastern half	10	*Quercus* sp.	Oak	8
F102	**21**	82	Whole fill	10	*Quercus* sp.	Oak	4
F103	**22b**	99	Southern half	10	*Quercus* sp.	Oak	6
F111	**23a**	85	Western half	60	*Fagus sylvatica* L.	Beech	2
					Quercus sp.	Oak	66
	23b	100	Eastern half	30	*Quercus* sp.	Oak	95
					Quercus sp.	Oak	11
F113	**24a**	88	Western half	8	*Quercus* sp.	Oak	1

Table 7 Charcoal in Type 1 or 2 charcoal-rich pits

Feature no.	Sample no.	Finds no.	Sample details	Litres	Latin name	Common name	Fragments
F32	**9a**	10	Western half	10	Quercus sp.	Oak	13
	9b	44	Eastern half	10	Prunus sp.	Cherry/Plum/Sloe	4
					Quercus sp.	Oak	12

Table 8 Charcoal – by feature type

Charcoal type	Type 1 charcoal pit	Type 2 charcoal pit	Type 3 charcoal pit	Type 1 or 2 charcoal pit	Posthole	Pit	Pit/tree-throw	Ditch
Quercus sp.	Y	Y	Y	Y	Y	Y	Y	Y
Fagus sylvatica	Y	Y	Y	N	N	N	N	N
Prunus sp.	N	Y	Y	Y	N	N	N	N
Alnus glutinosa	N	Y	N	N	N	N	N	N

Scottish Universities Environmental Research Centre
Rankine Avenue, Scottish Enterprise Technology Park, East Kilbride, Glasgow G75 0QF, Scotland, UK
Director: Professor F M Stuart Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229898 www.glasgow.ac.uk/suerc

RADIOCARBON DATING CERTIFICATE

02 May 2018

Laboratory Code	SUERC-79145 (GU47813)
Submitter	Laura Pooley Colchester Archaeological Trust Roman Circus House Roman Circus Walk Colchester Essex CO2 7GZ
Site Reference	N Gateway COLEM: 2017.152
Context Reference	F3 (20)
Sample Reference	1b
Material	Charcoal : cherry/plum/sloe (Prunus sp.)
$\delta^{13}C$ relative to VPDB	-25.8 ‰
Radiocarbon Age BP	944 ± 30

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

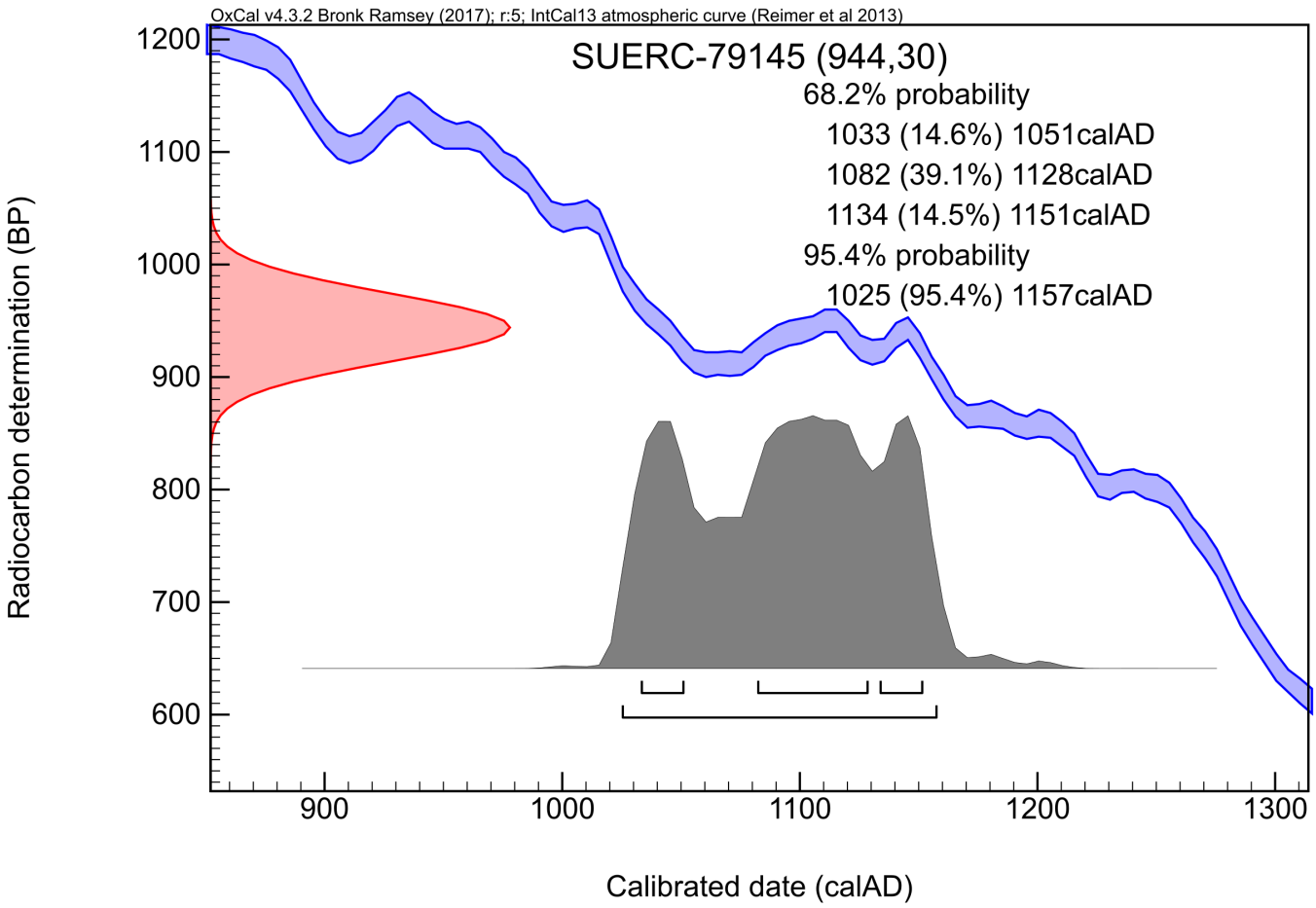
Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon 58(1) pp.9-23.*

For any queries relating to this certificate, the laboratory can be contacted at suerc-c14lab@glasgow.ac.uk.

Conventional age and calibration age ranges calculated by : E. Dunbar

Checked and signed off by : P. Nayont



The radiocarbon age given overleaf is calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.*

The above date ranges have been calibrated using the IntCal13 atmospheric calibration curve†

Please contact the laboratory if you wish to discuss this further.

* Bronk Ramsey (2009) *Radiocarbon 51(1) pp.337-60*

† Reimer et al. (2013) *Radiocarbon 55(4) pp.1869-87*

Scottish Universities Environmental Research Centre
Rankine Avenue, Scottish Enterprise Technology Park, East Kilbride, Glasgow G75 0QF, Scotland, UK
Director: Professor F M Stuart Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229898 www.glasgow.ac.uk/suerc

RADIOCARBON DATING CERTIFICATE

02 May 2018

Laboratory Code	SUERC-79146 (GU47814)
Submitter	Laura Pooley Colchester Archaeological Trust Roman Circus House Roman Circus Walk Colchester Essex CO2 7GZ
Site Reference	N Gateway COLEM: 2017.152
Context Reference	F32 (44)
Sample Reference	9b
Material	Charcoal : cherry/plum/sloe (Prunus sp.)
$\delta^{13}C$ relative to VPDB	-25.2 ‰
Radiocarbon Age BP	2193 ± 30

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

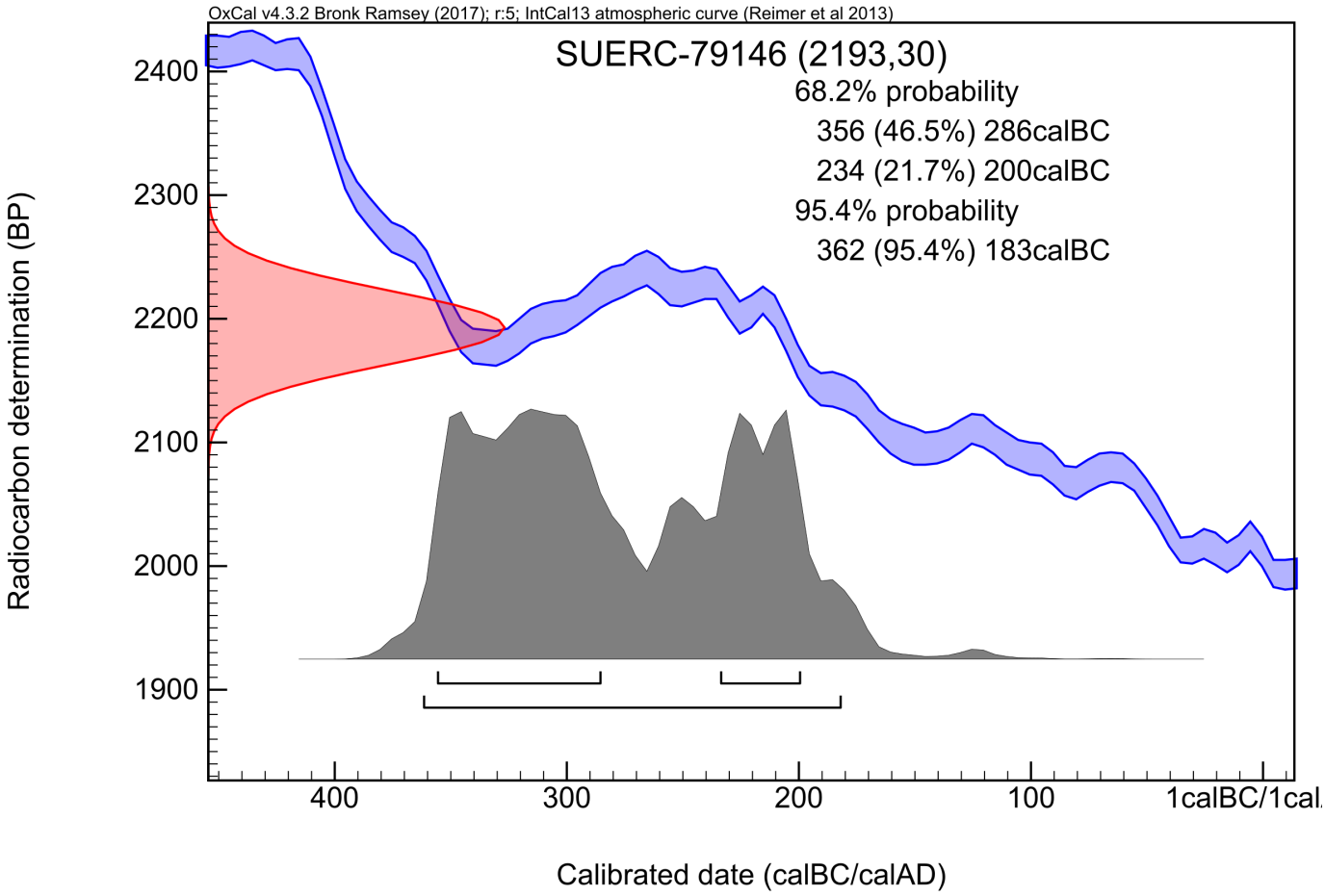
Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon 58(1) pp.9-23.*

For any queries relating to this certificate, the laboratory can be contacted at suerc-c14lab@glasgow.ac.uk.

Conventional age and calibration age ranges calculated by : E. Dunbar

Checked and signed off by : P. Nayont



The radiocarbon age given overleaf is calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.*

The above date ranges have been calibrated using the IntCal13 atmospheric calibration curve†

Please contact the laboratory if you wish to discuss this further.

* Bronk Ramsey (2009) *Radiocarbon 51(1) pp.337-60*

† Reimer et al. (2013) *Radiocarbon 55(4) pp.1869-87*

Scottish Universities Environmental Research Centre
Rankine Avenue, Scottish Enterprise Technology Park, East Kilbride, Glasgow G75 0QF, Scotland, UK
Director: Professor F M Stuart Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229898 www.glasgow.ac.uk/suerc

RADIOCARBON DATING CERTIFICATE

18 April 2018

Laboratory Code	GU47815
Submitter	Laura Pooley Colchester Archaeological Trust Roman Circus House Roman Circus Walk Colchester Essex CO2 7GZ
Site Reference	N Gateway COLEM: 2017.152
Context Reference	F87 (77)
Sample Reference	17c
Material	Charred seed : Charred goosegrass seed

Result Failed due to insufficient carbon.

N.B. Any questions directed to the laboratory should quote the GU coding given above.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon 58(1) pp.9-23.*

For any queries relating to this certificate, the laboratory can be contacted at suerc-c14lab@glasgow.ac.uk.

Checked and signed off by : P. Naysmith

Scottish Universities Environmental Research Centre
Rankine Avenue, Scottish Enterprise Technology Park, East Kilbride, Glasgow G75 0QF, Scotland, UK
Director: Professor F M Stuart Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229898 www.glasgow.ac.uk/suerc

RADIOCARBON DATING CERTIFICATE

02 May 2018

Laboratory Code	SUERC-79147 (GU47816)
Submitter	Laura Pooley Colchester Archaeological Trust Roman Circus House Roman Circus Walk Colchester Essex CO2 7GZ
Site Reference	N Gateway COLEM: 2017.152
Context Reference	F95 (75)
Sample Reference	19
Material	Charred grain : Charred straight hulled barley
$\delta^{13}C$ relative to VPDB	-25.9 ‰
Fraction Modern F	1.4668 ± 0.0054

N.B. A fraction modern value above 1 indicates this sample was formed in the nuclear era (post 1950 AD).

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon 58(1) pp.9-23.*

For any queries relating to this certificate, the laboratory can be contacted at suerc-c14lab@glasgow.ac.uk.

Conventional age calculated by : E. Dunbar

Checked and signed off by : P. Nayont

Scottish Universities Environmental Research Centre
Rankine Avenue, Scottish Enterprise Technology Park, East Kilbride, Glasgow G75 0QF, Scotland, UK
Director: Professor F M Stuart Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229898 www.glasgow.ac.uk/suerc

RADIOCARBON DATING CERTIFICATE

02 May 2018

Laboratory Code	SUERC-79151 (GU47817)
Submitter	Laura Pooley Colchester Archaeological Trust Roman Circus House Roman Circus Walk Colchester Essex CO2 7GZ
Site Reference	N Gateway COLEM: 2017.152
Context Reference	F111 (85)
Sample Reference	23a
Material	Charred grain : Charred oat grains
$\delta^{13}C$ relative to VPDB	-26.4 ‰
Radiocarbon Age BP	83 ± 30

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD) and requires calibration to the calendar timescale. The error, expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

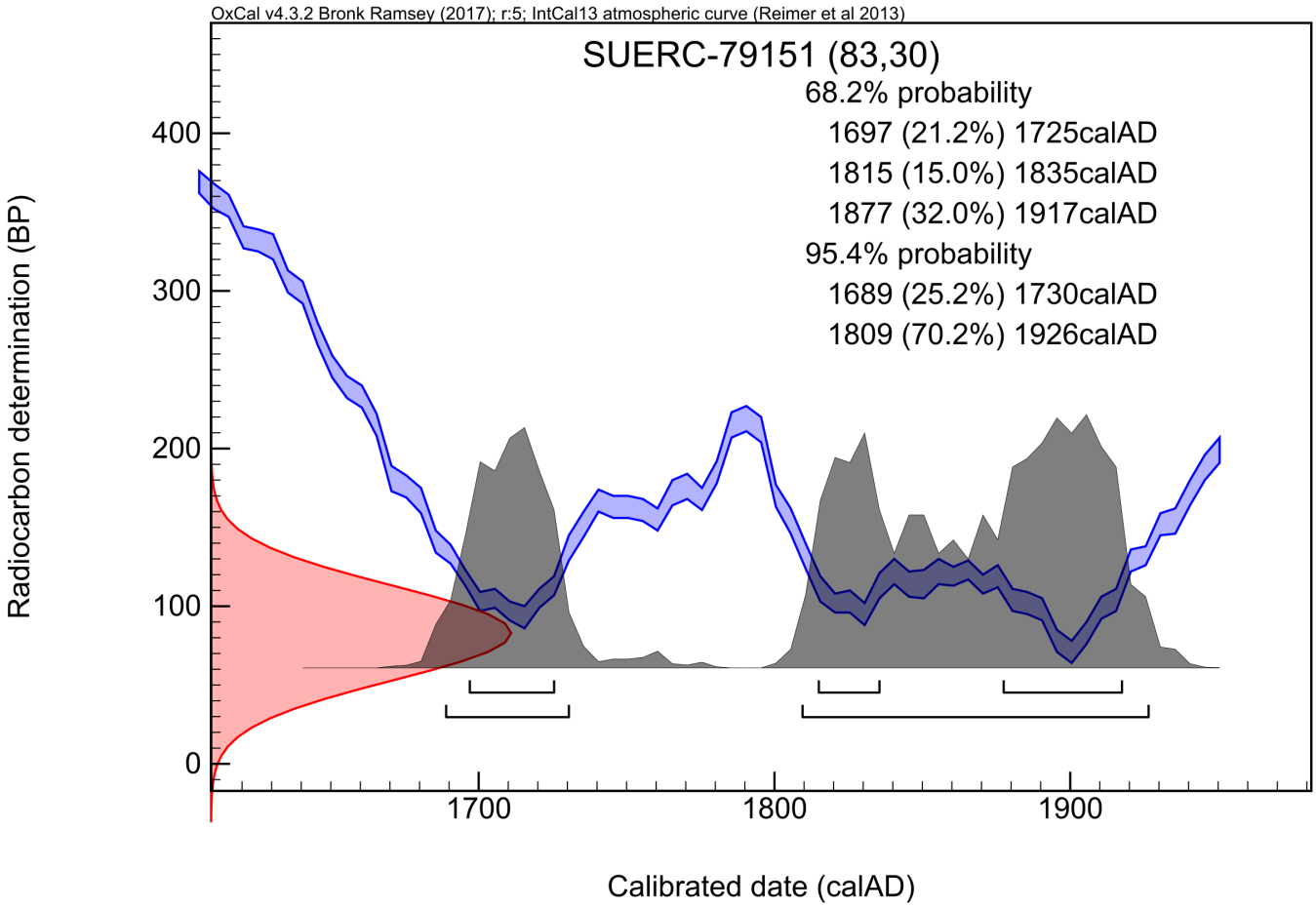
Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. The laboratory GU coding should also be given in parentheses after the SUERC code.

Detailed descriptions of the methods employed by the SUERC Radiocarbon Laboratory can be found in Dunbar et al. (2016) *Radiocarbon 58(1) pp.9-23.*

For any queries relating to this certificate, the laboratory can be contacted at suerc-c14lab@glasgow.ac.uk.

Conventional age and calibration age ranges calculated by : E. Dunbar

Checked and signed off by : P. Nayont



The radiocarbon age given overleaf is calibrated to the calendar timescale using the Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.*

The above date ranges have been calibrated using the IntCal13 atmospheric calibration curve†

Please contact the laboratory if you wish to discuss this further.

* Bronk Ramsey (2009) *Radiocarbon 51(1) pp.337-60*

† Reimer et al. (2013) *Radiocarbon 55(4) pp.1869-87*

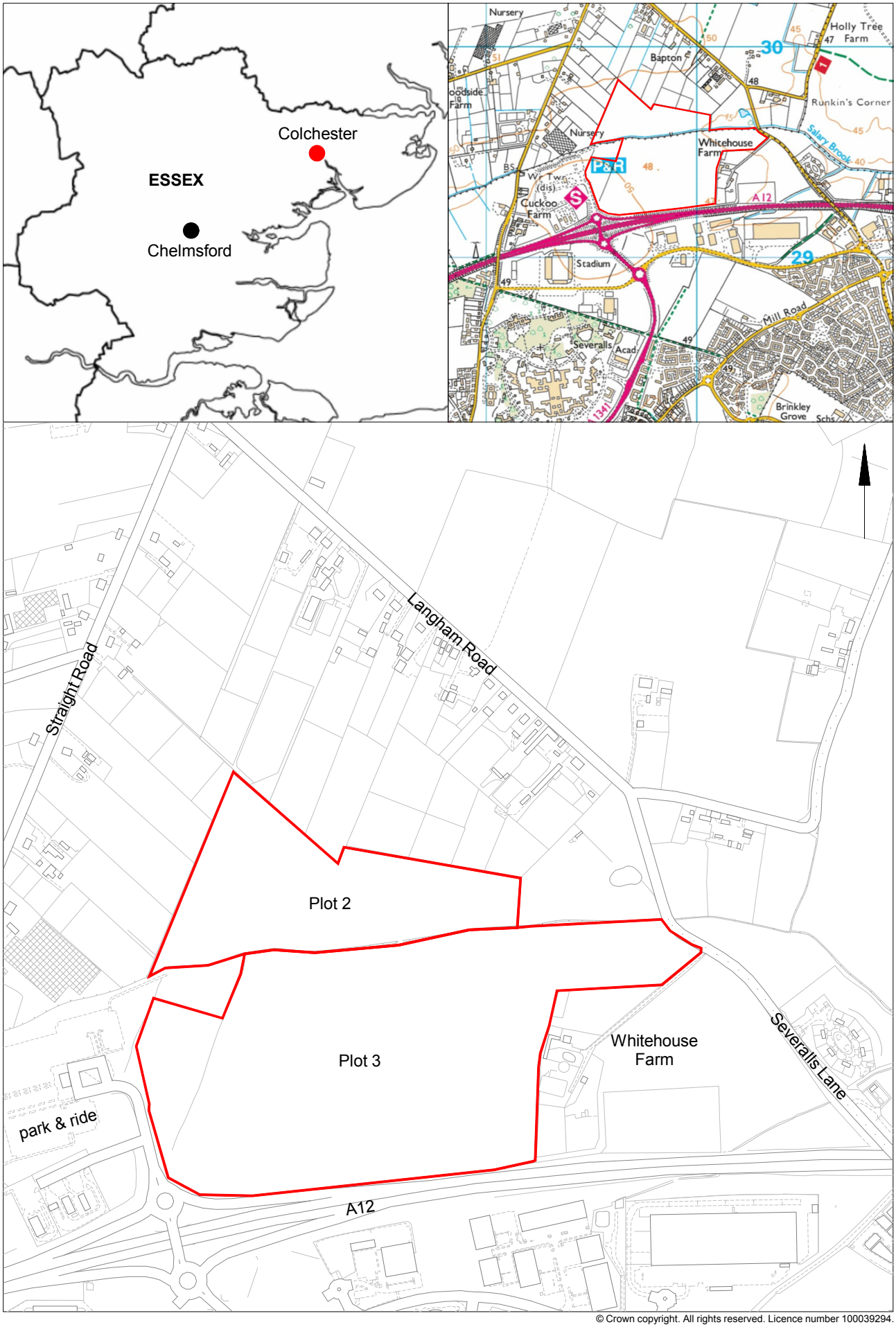


Fig 1 Site location.

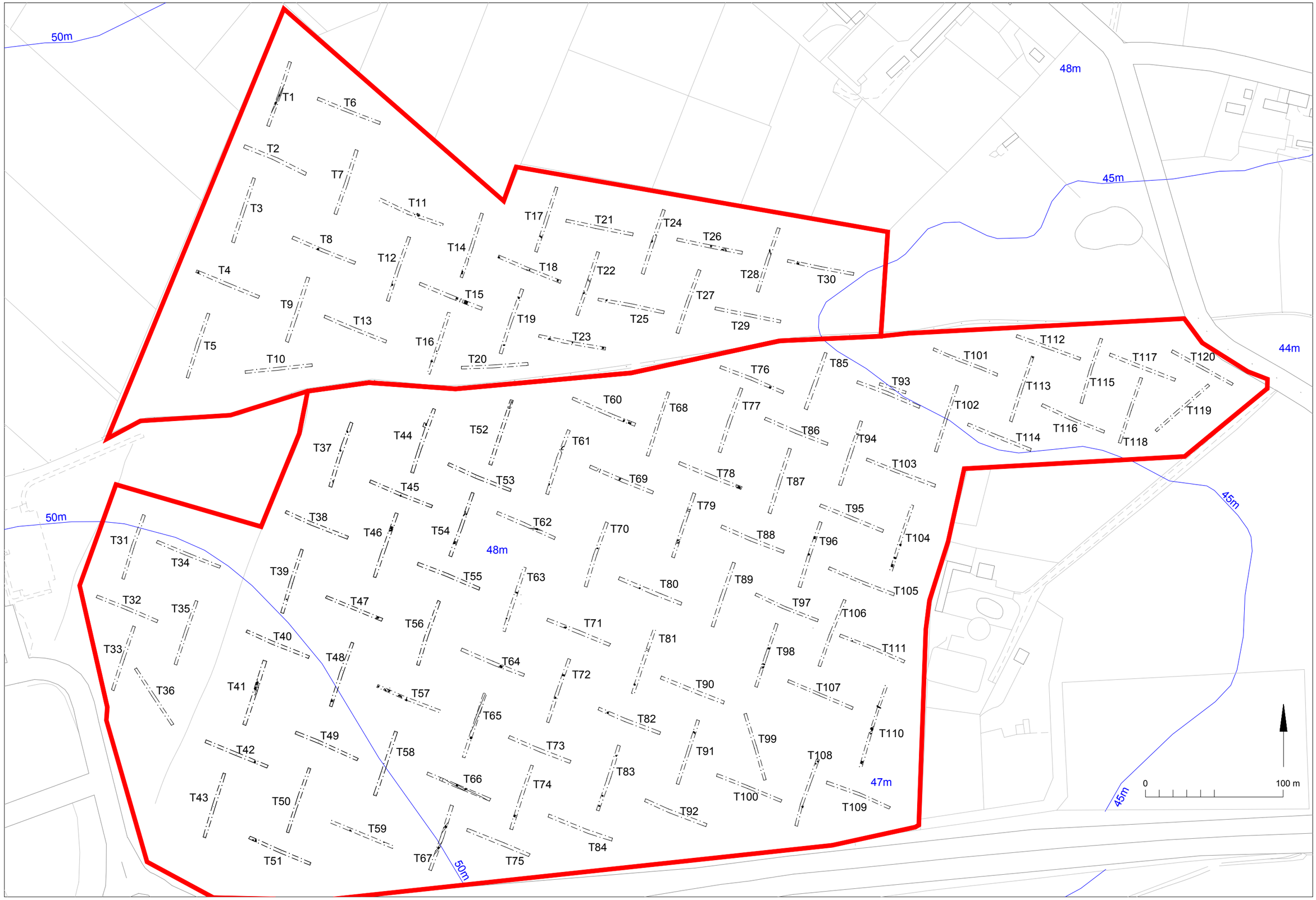


Fig 2 Results (contour information in blue)

Fig 3 Results in relation to the results of the geophysical survey (Stratascan 2016, Fig 11).
Possible and probable features identified during the survey are in colour (see Stratascan report for full details).

0 100 m

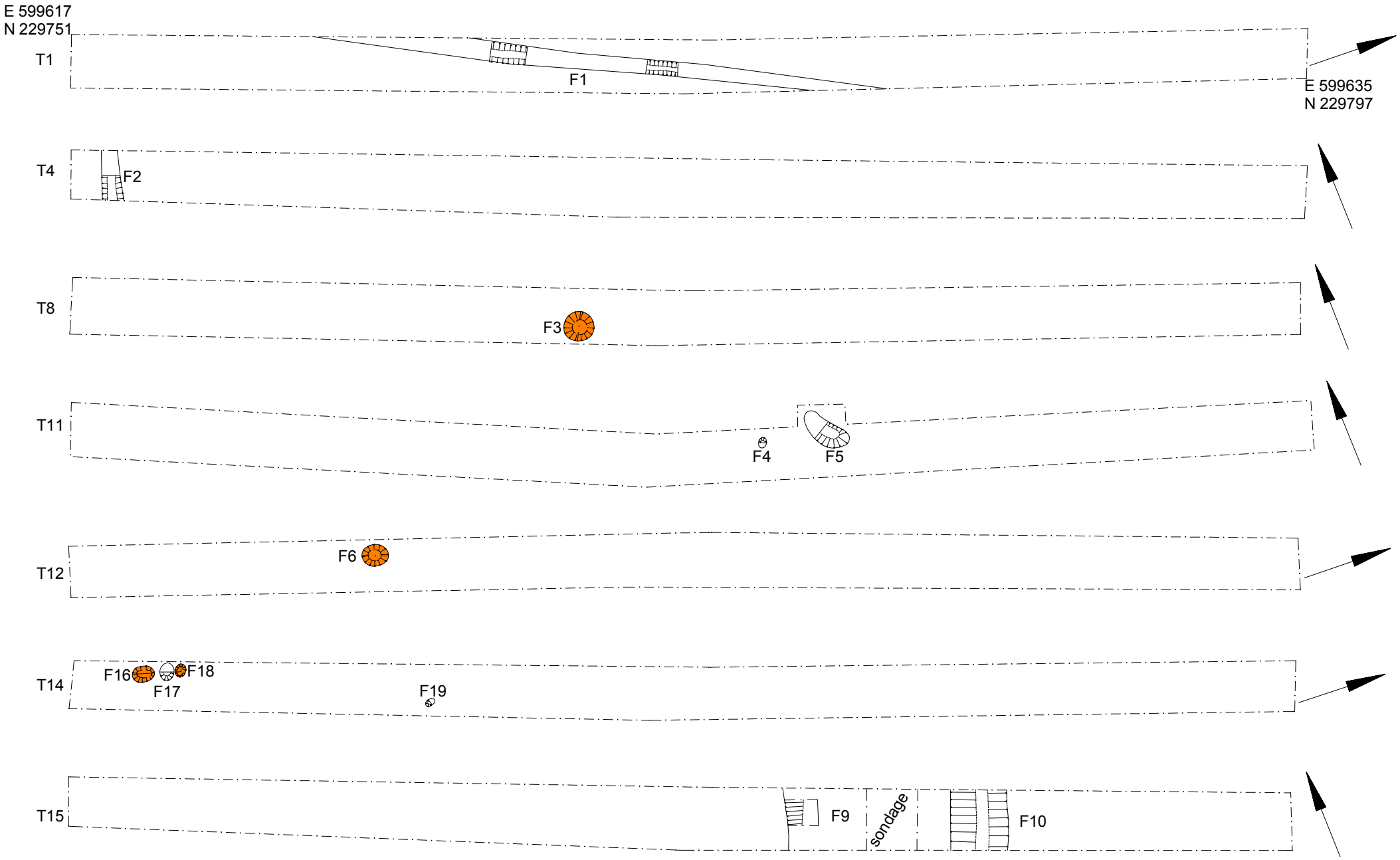


Fig 4 Detailed trench plans: T1, T4, T8, T11, T12, T14 and T15 (charcoal-rich pits highlighted orange)

Fig 5 Detailed trench plans: T16, T17, T18, T19, T22, T23 and T25 (charcoal-rich pits highlighted orange)

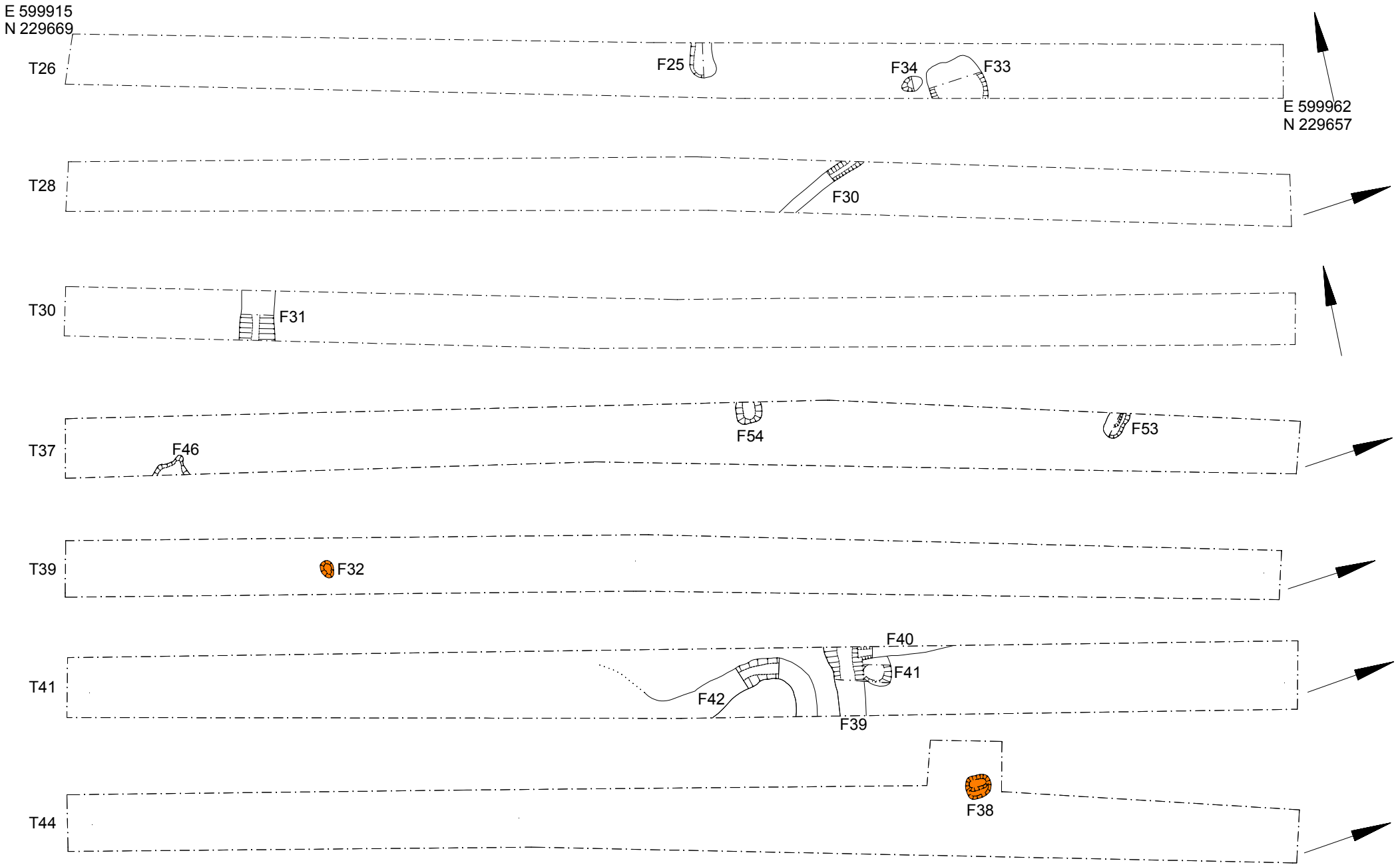


Fig 6 Detailed trench plans: T26, T28, T30, T37, T39, T41 and T44 (charcoal-rich pits highlighted orange)

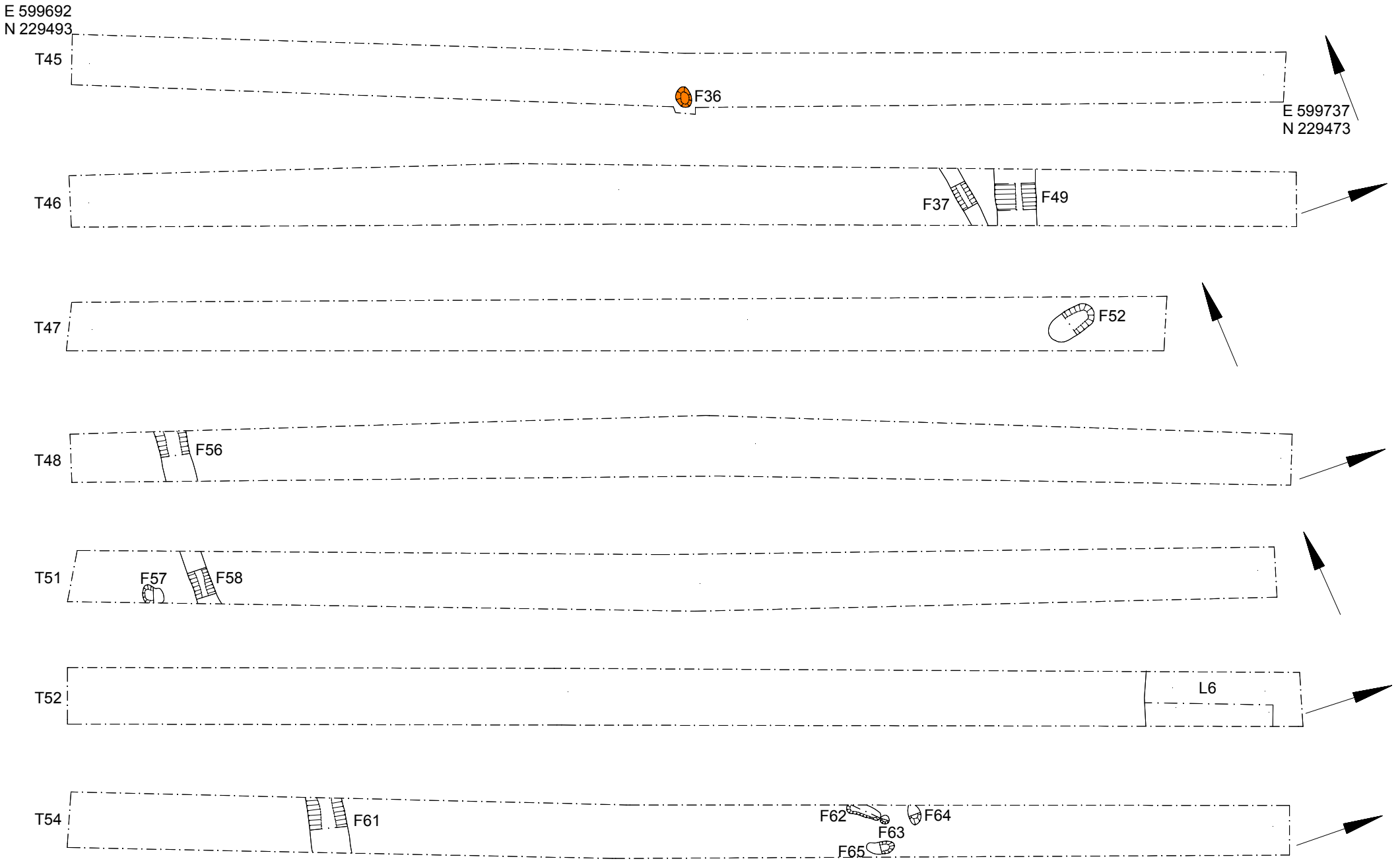


Fig 7 Detailed trench plans: T45, T46, T47, T48, T51, T52 and T54 (charcoal-rich pits highlighted orange)

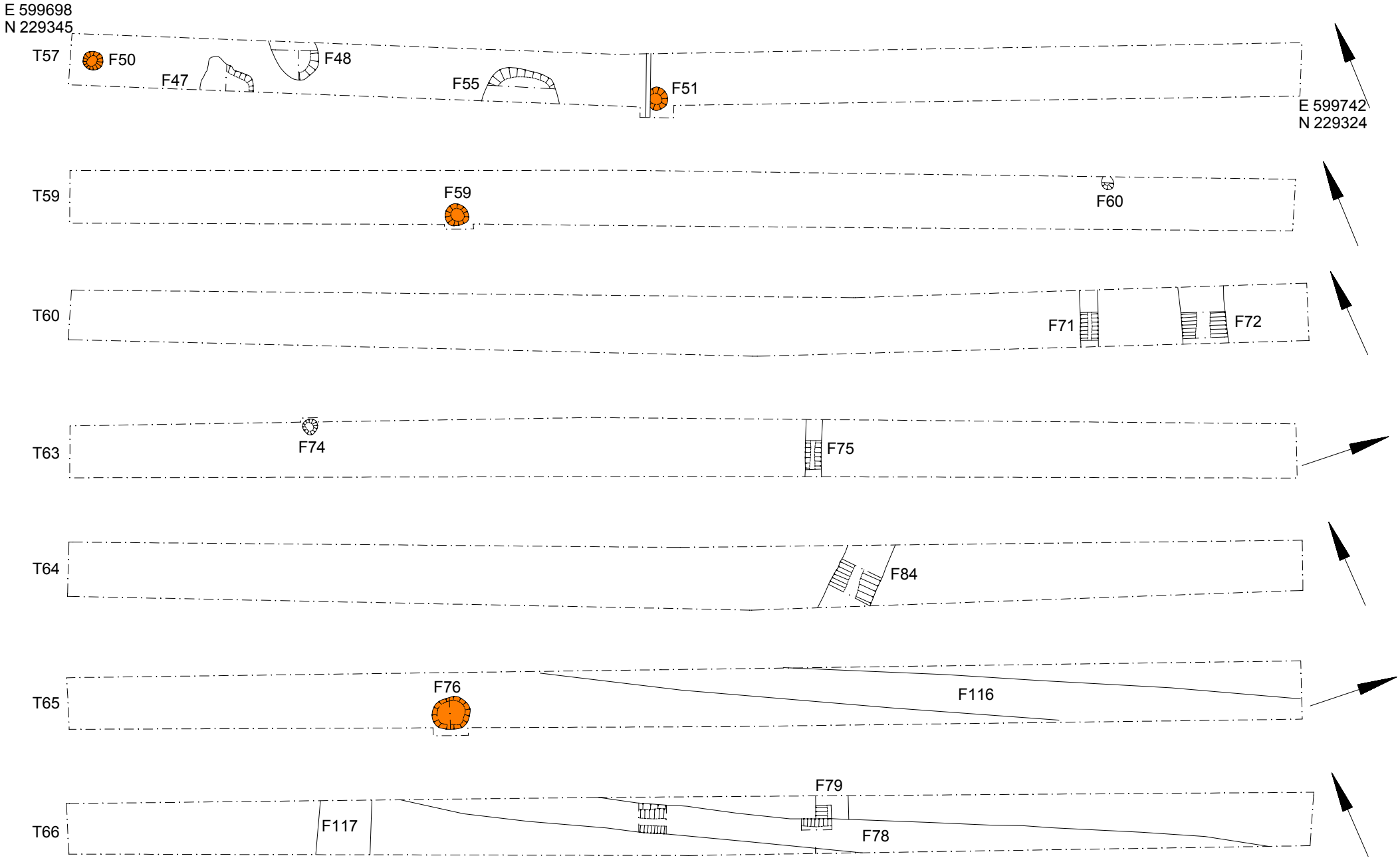


Fig 8 Detailed trench plans: T57, T59, T60, T63, T64, T65 and T66 (charcoal-rich pits highlighted orange)

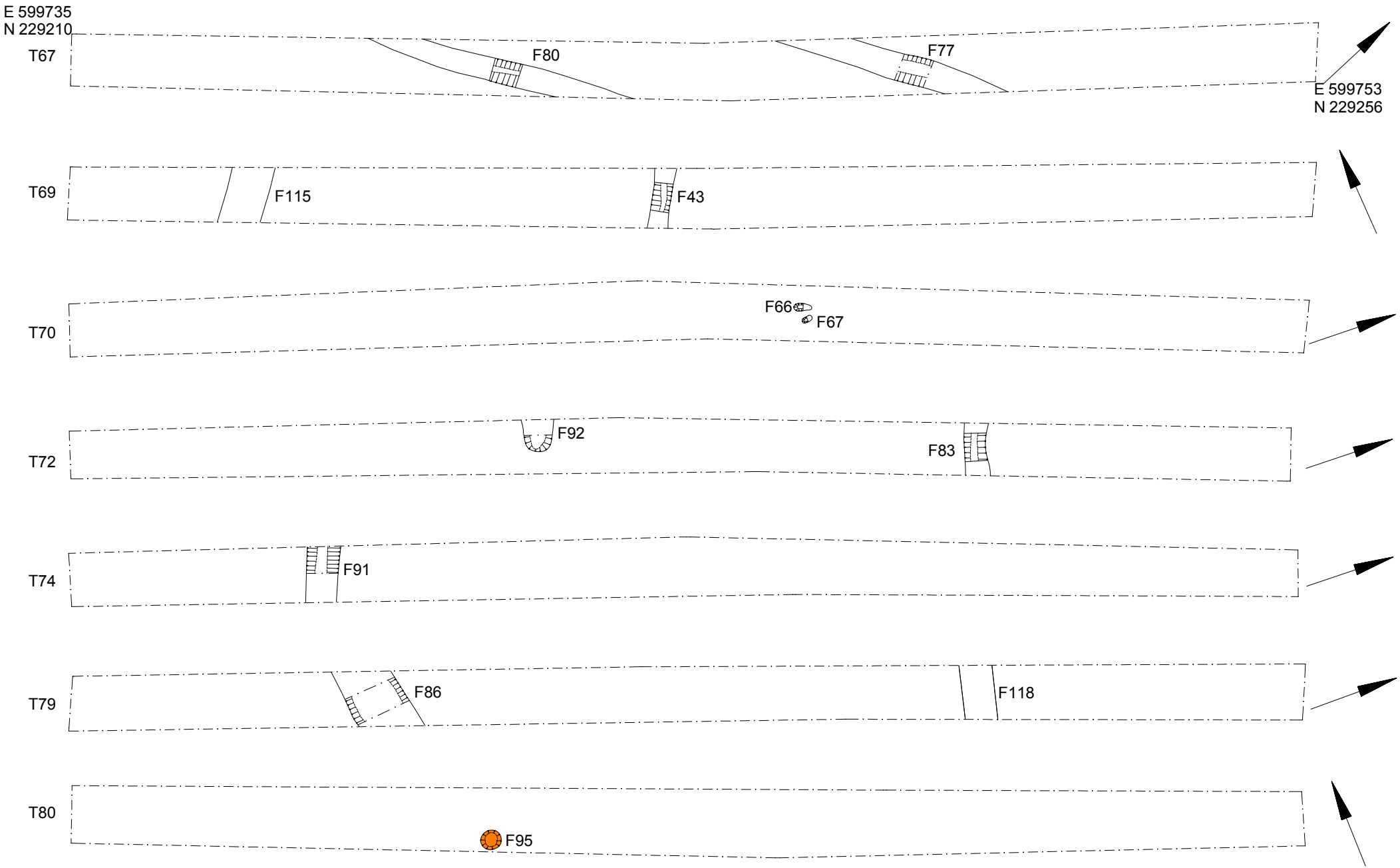


Fig 9 Detailed trench plans: T67, T69, T70, T72, T74, T79 and T80 (charcoal-rich pits highlighted orange)

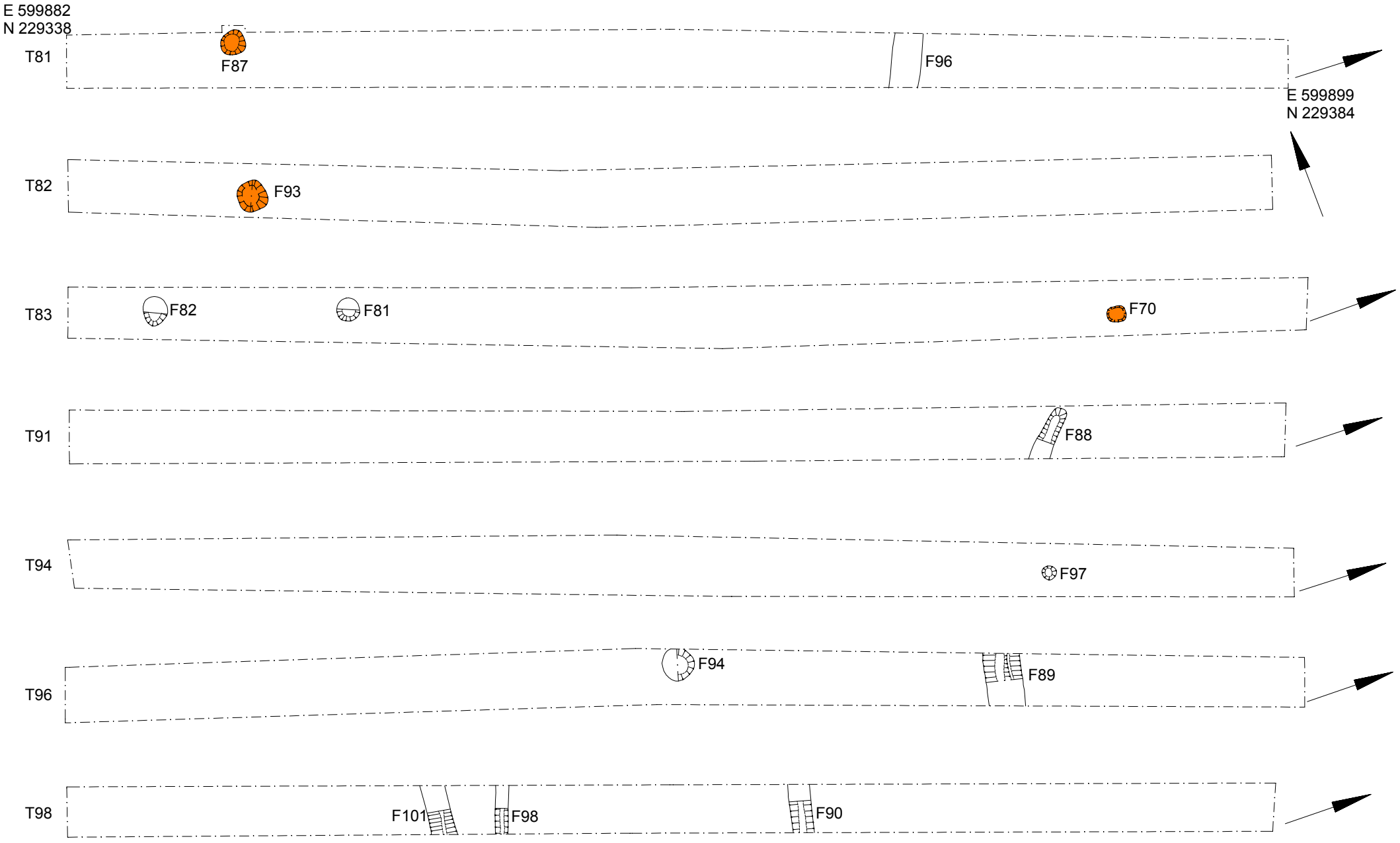


Fig 10 Detailed trench plans: T81, T82, T83, T91, T94, T96 and T98 (charcoal-rich pits highlighted orange)

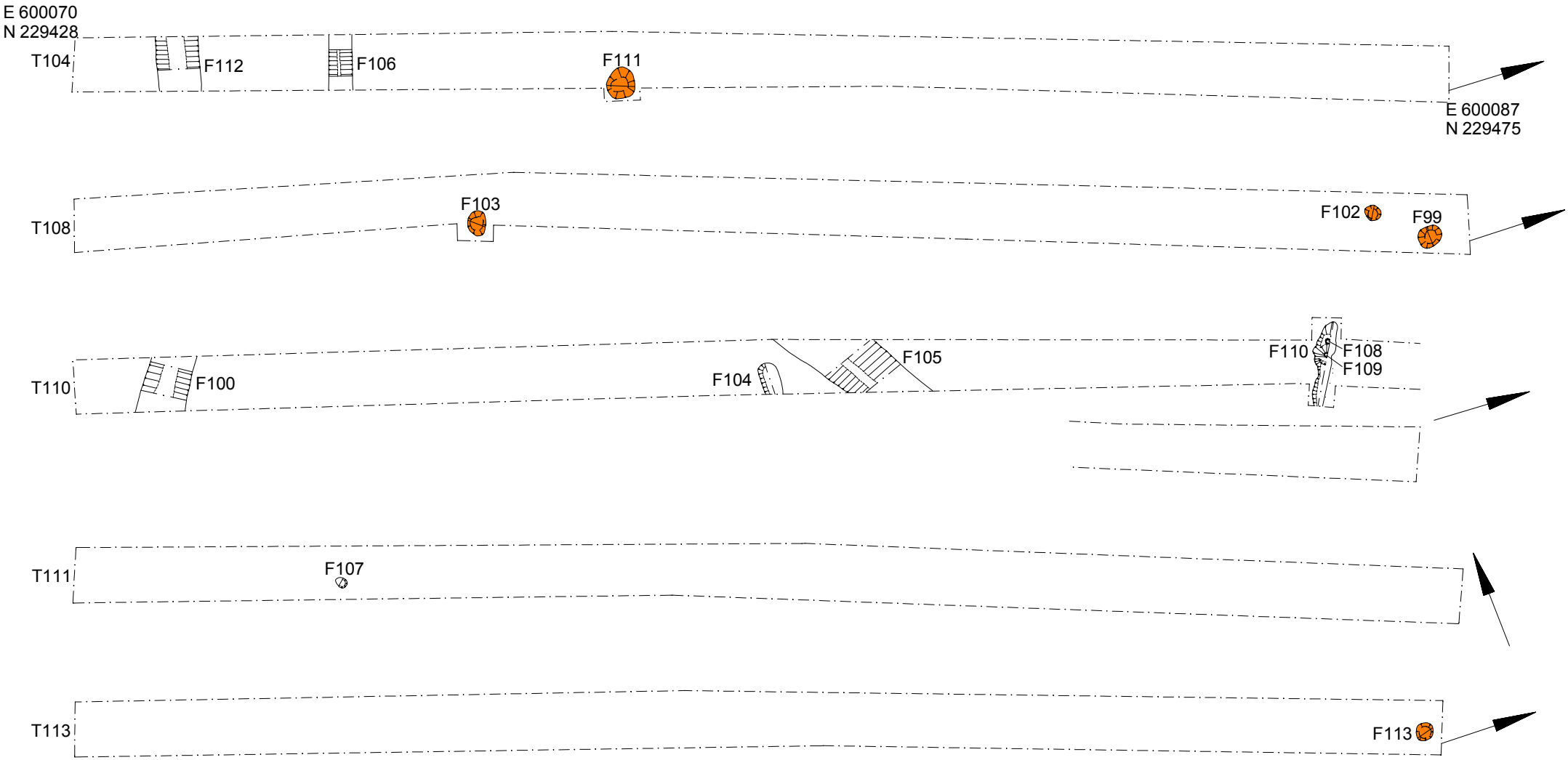


Fig 11 Detailed trench plans: T104, T108, T110, T111 and T113 (charcoal-rich pits highlighted orange)

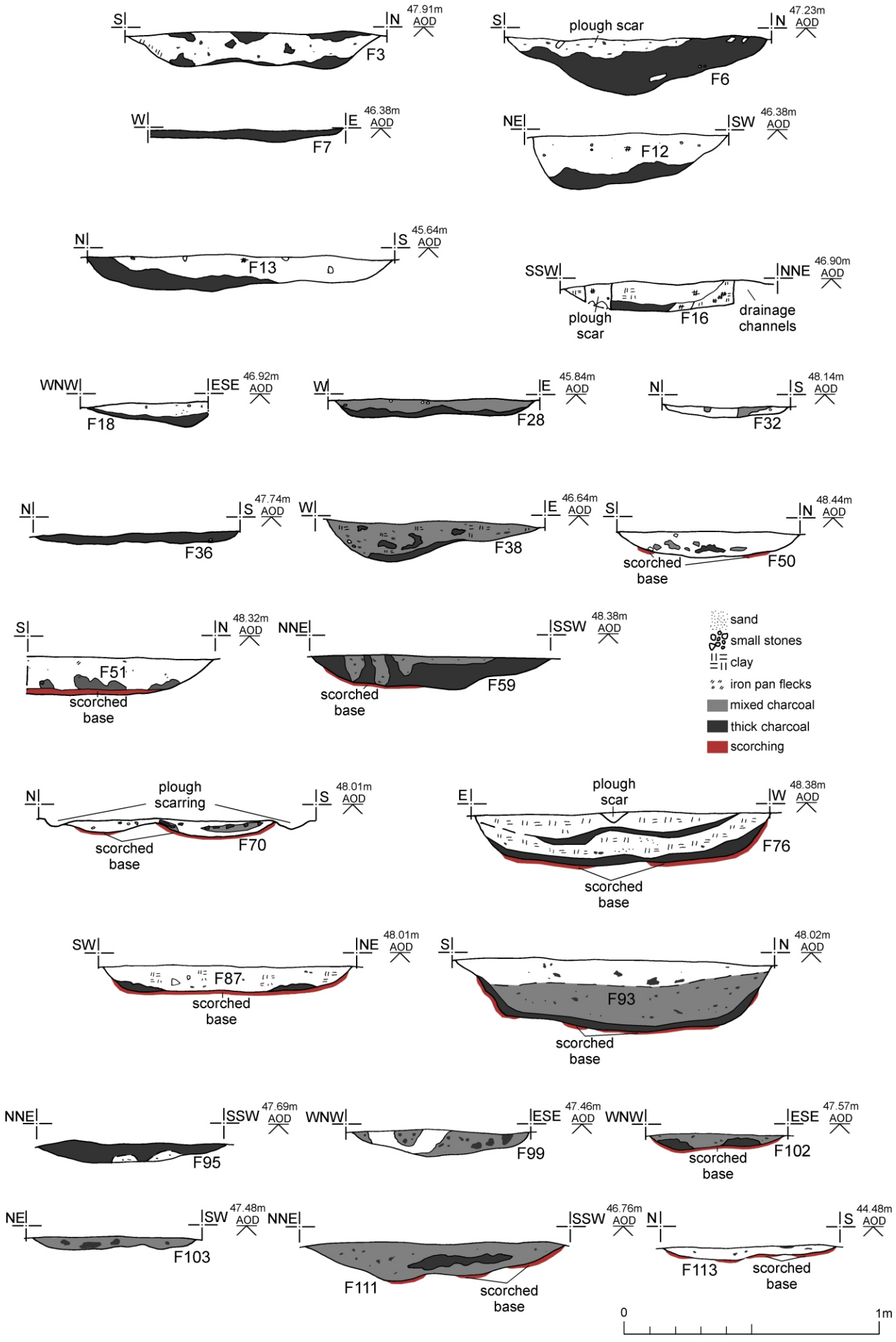


Fig 12 The charcoal-rich pits.

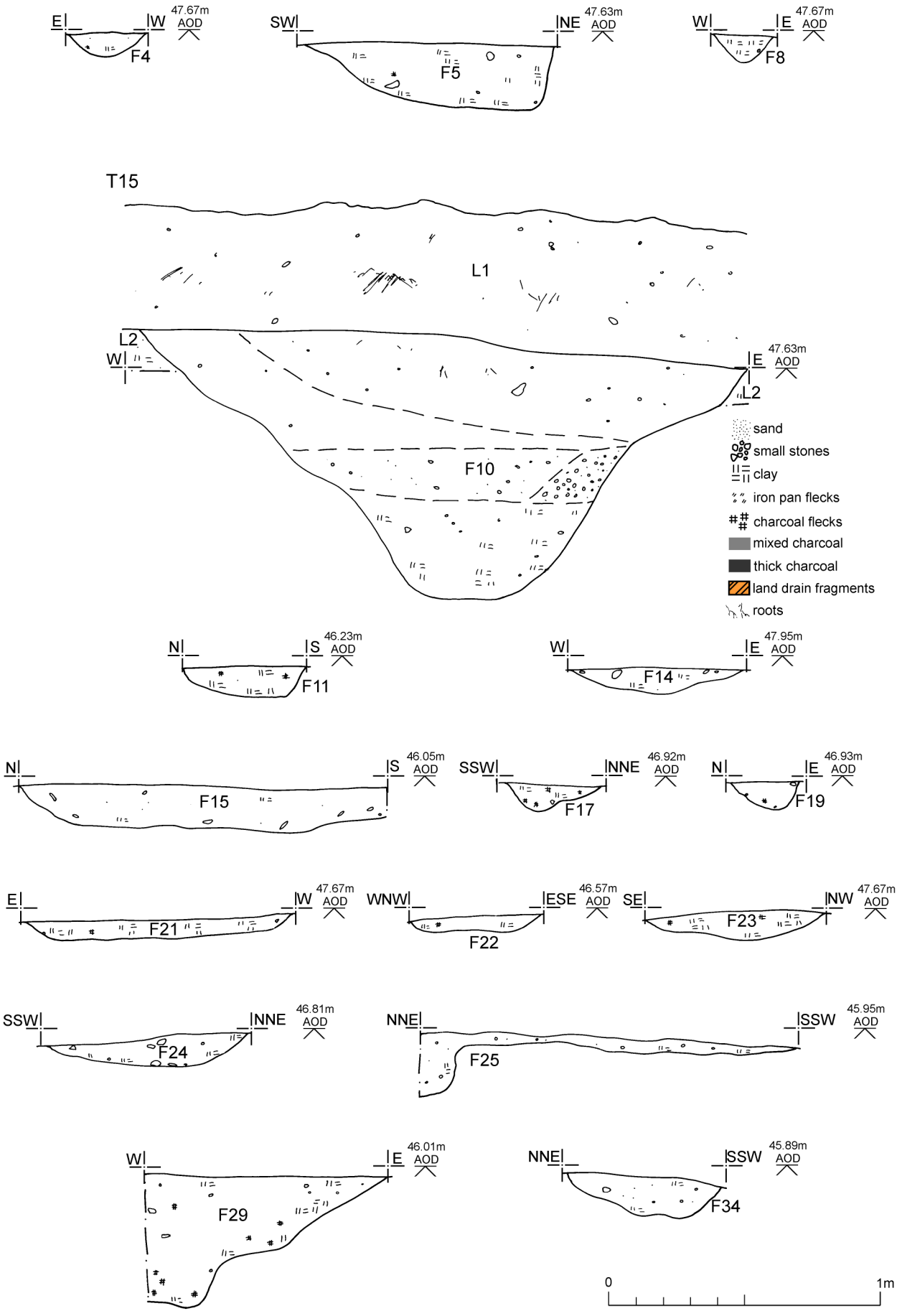


Fig 13 Other feature sections.

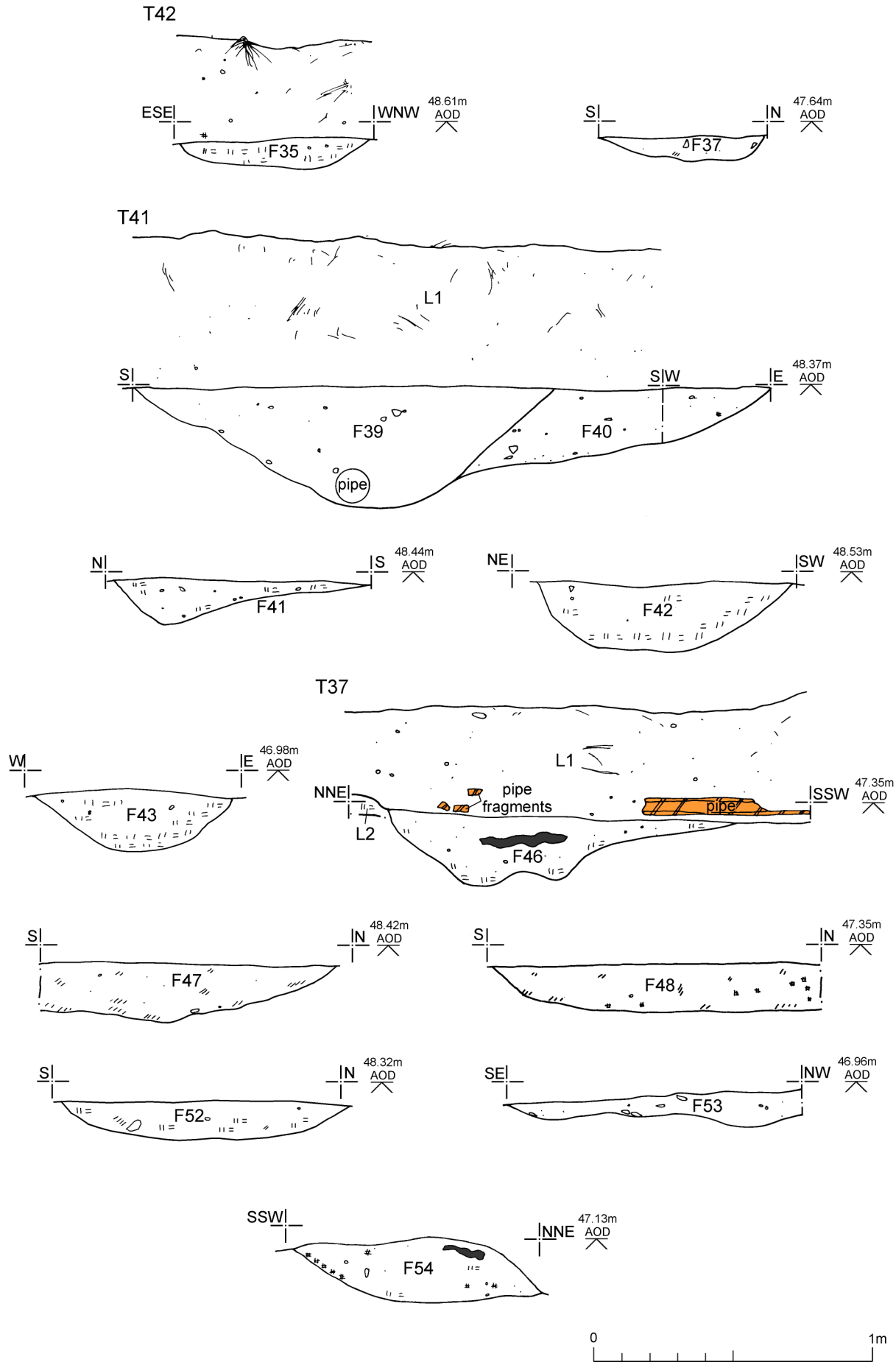


Fig 14 Other feature sections.

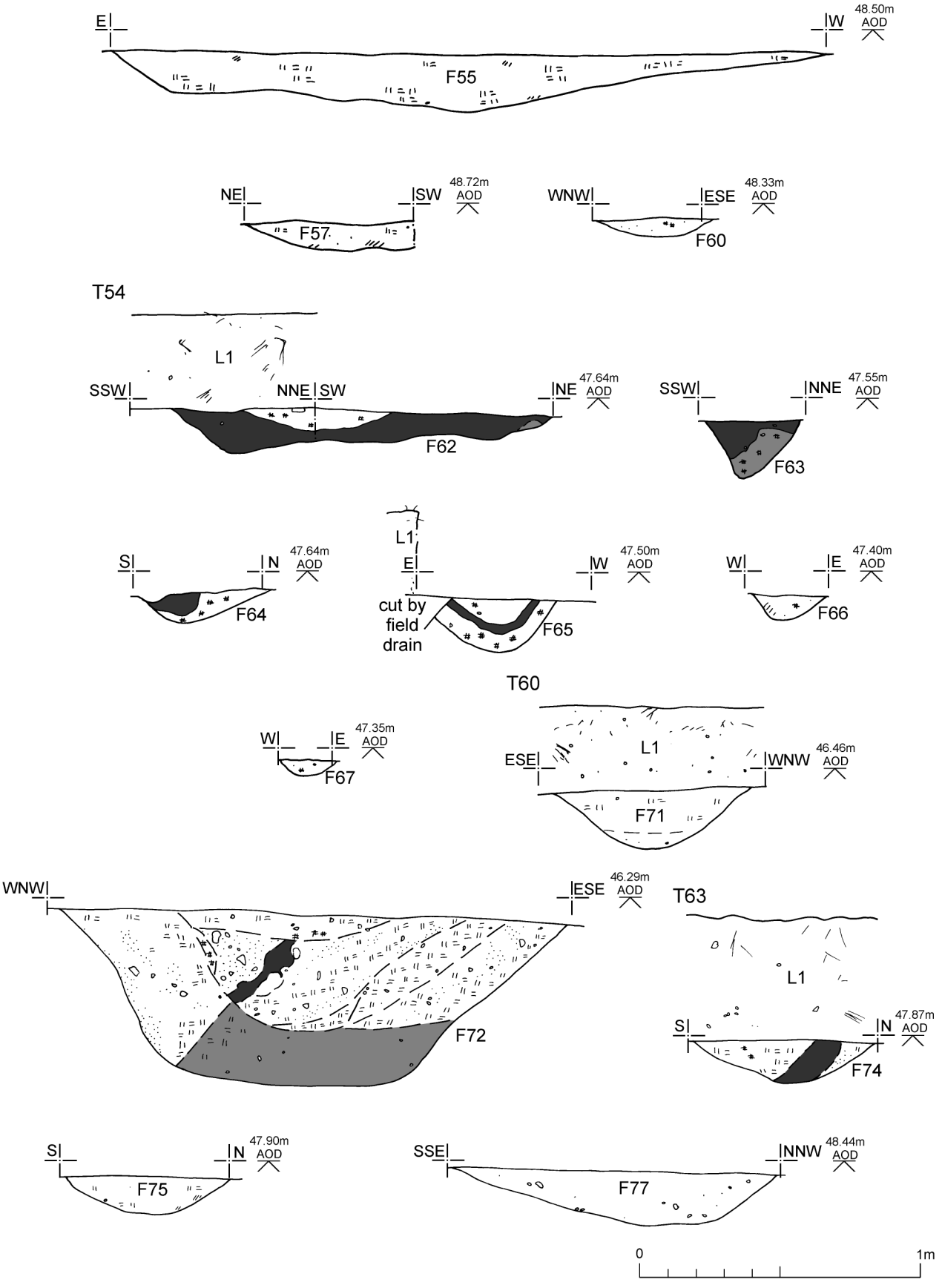


Fig 15 Other feature sections.

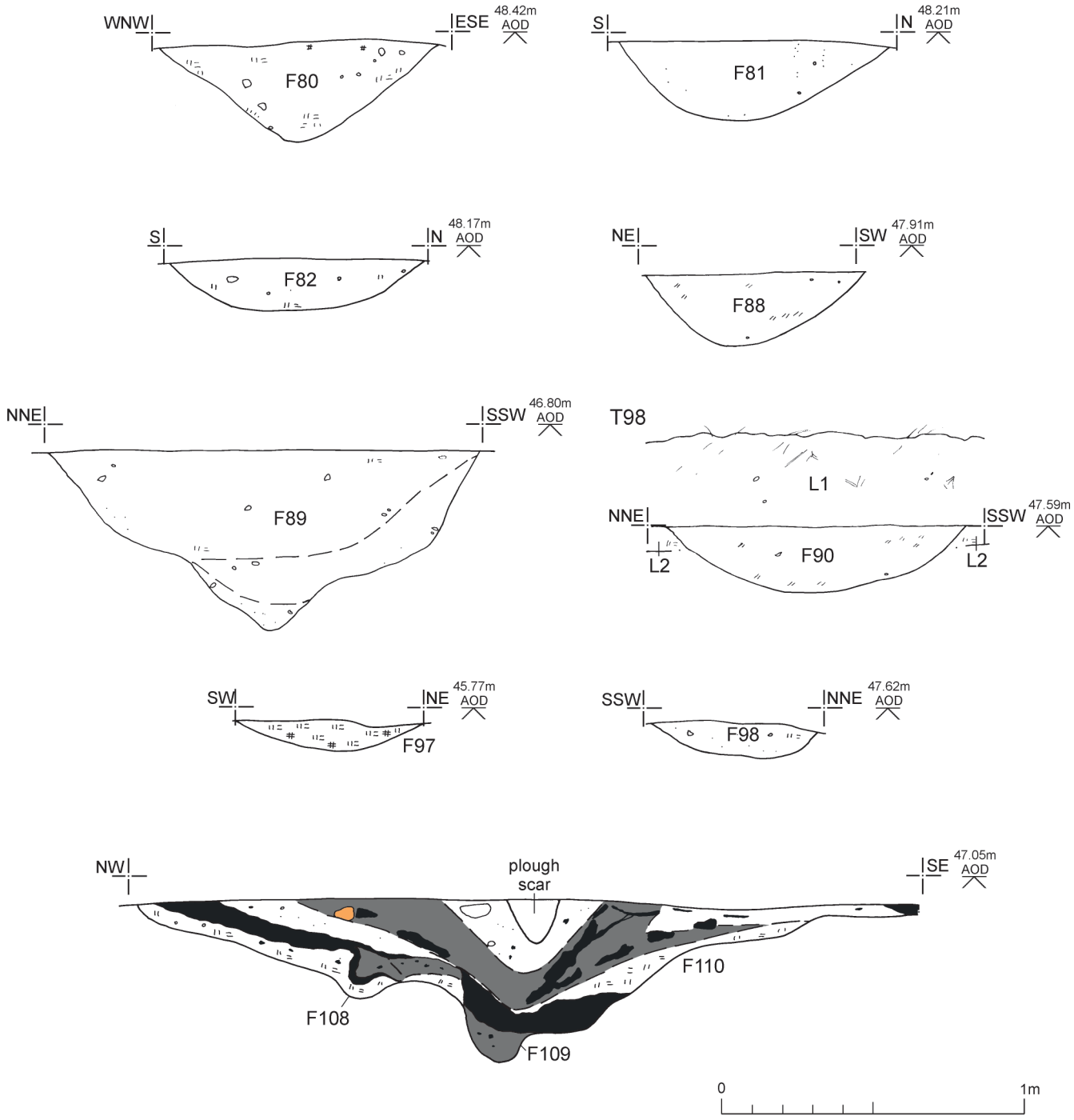


Fig 16 Other feature sections.

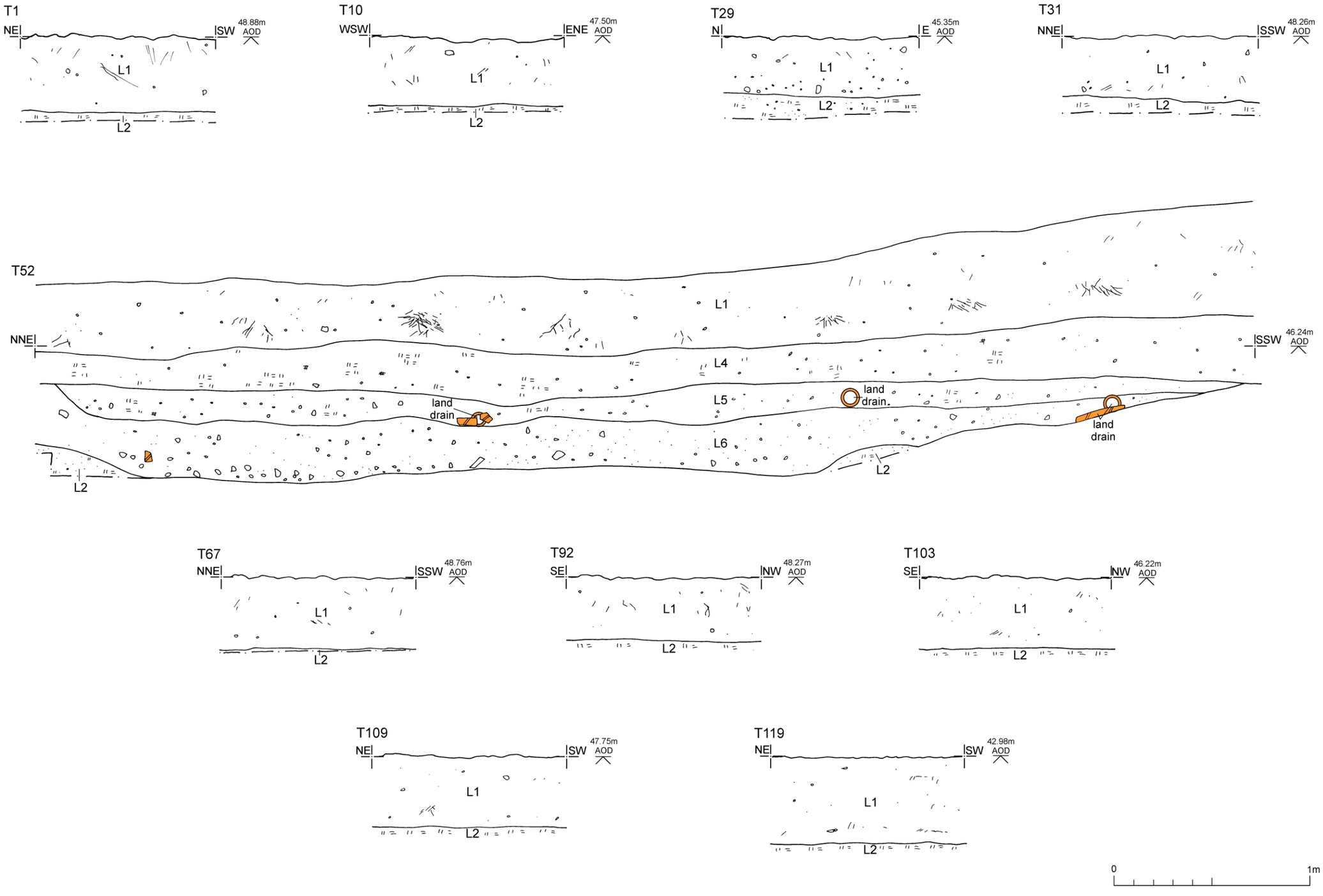


Fig 17 Representative sections.

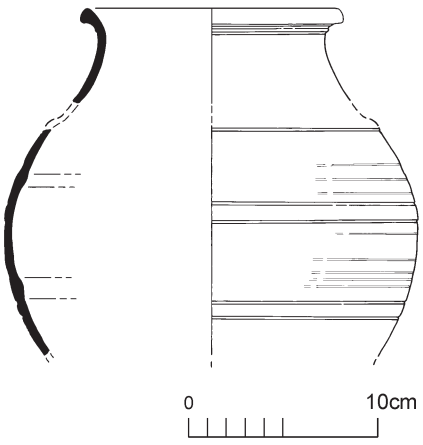


Fig 18 Roman beaker from F7.

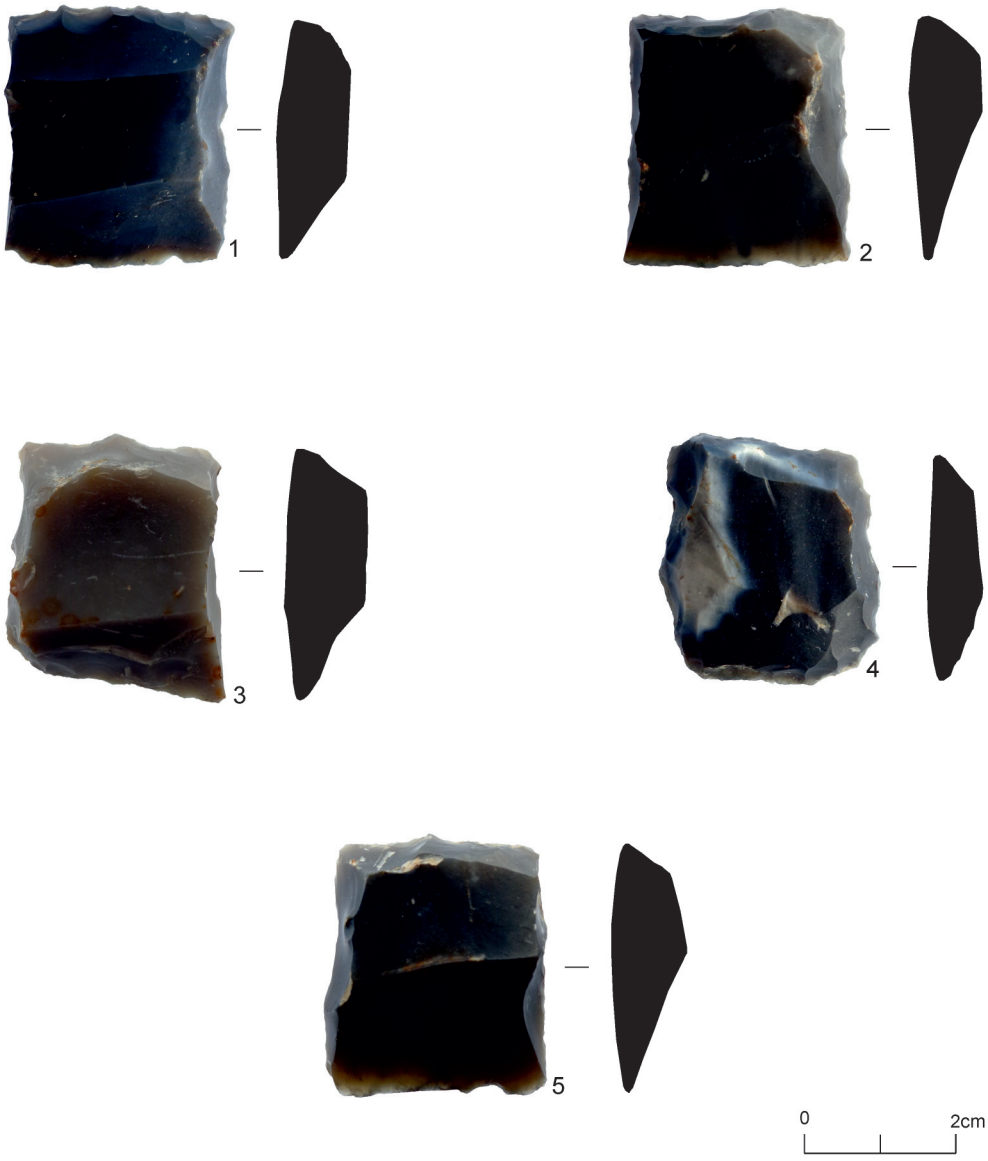


Fig 19 Gunflints.

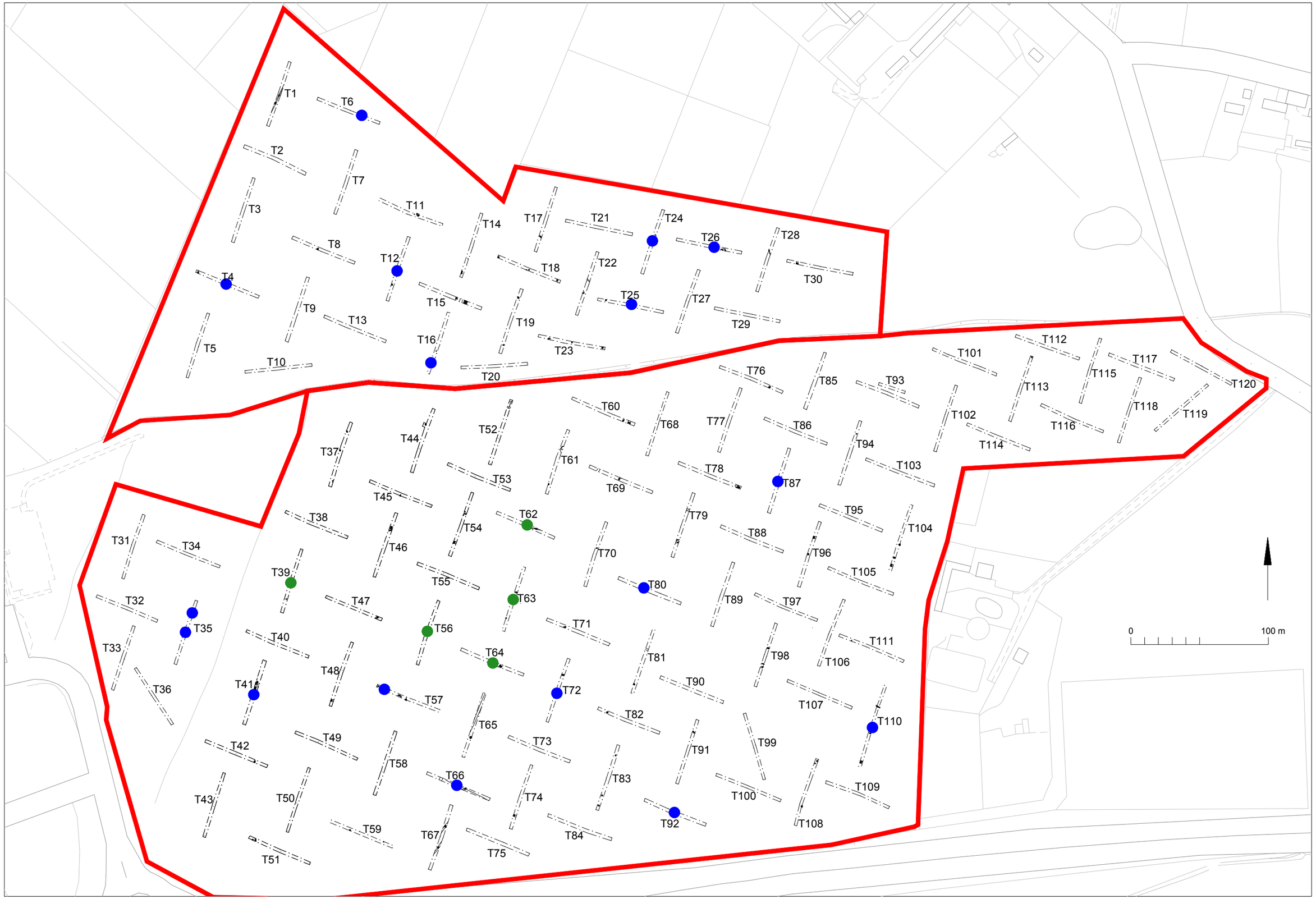


Fig 20 Distribution of prehistoric flints (blue) and gunflints (green)

undated charcoal-rich pits
Middle Iron Age charcoal-rich pit
Roman charcoal-rich pit
late Anglo-Saxon/early Medieval charcoal-rich pit
medieval to post-medieval/ modern charcoal-rich pit
1-3 types of charcoal-rich pit

0 100 m

Fig 21 Distribution of charcoal-rich pits

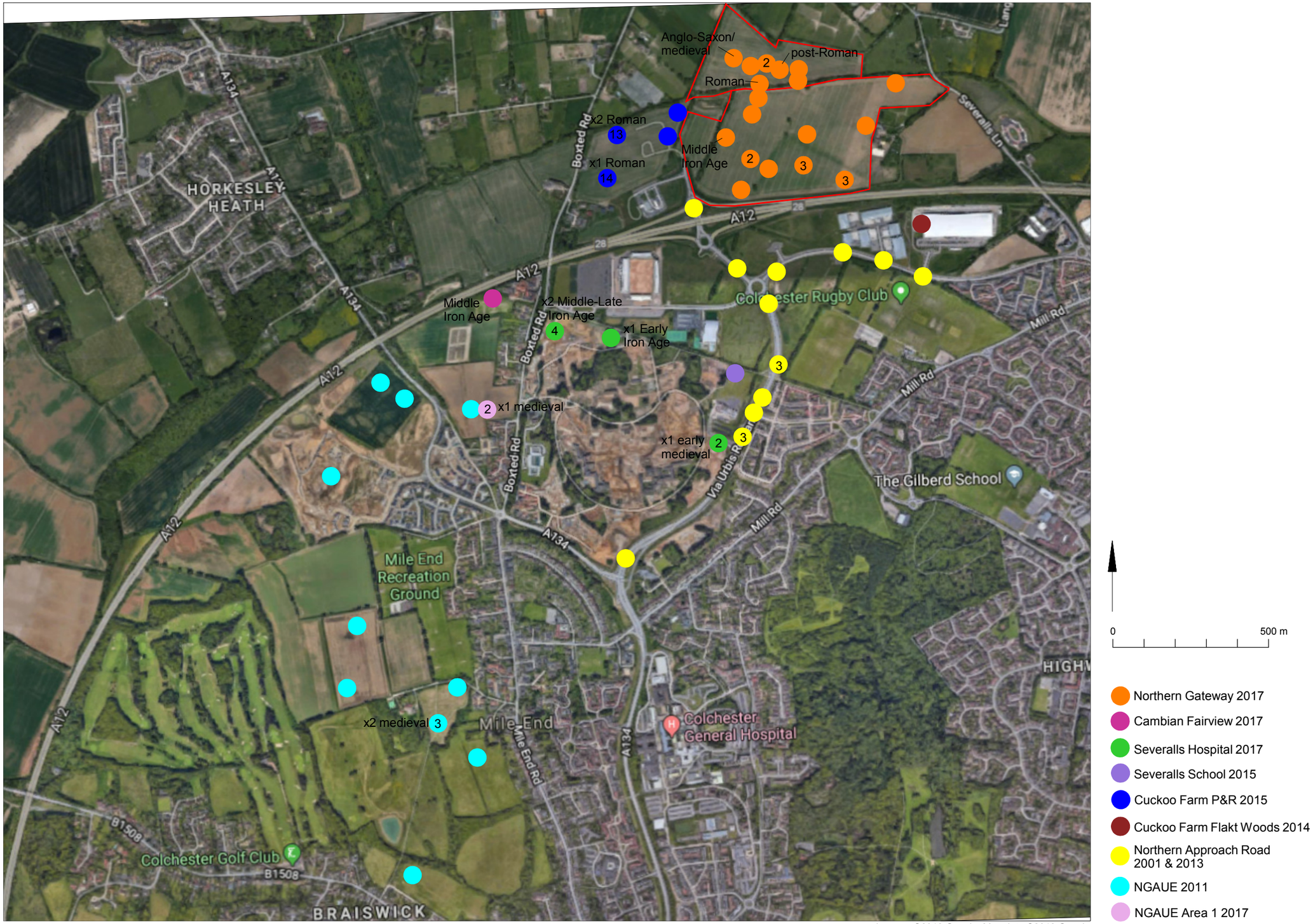


Fig 22 Distribution of fire pits across northern Colchester as recorded since 2001.
Each circle represents a single pit unless otherwise stated

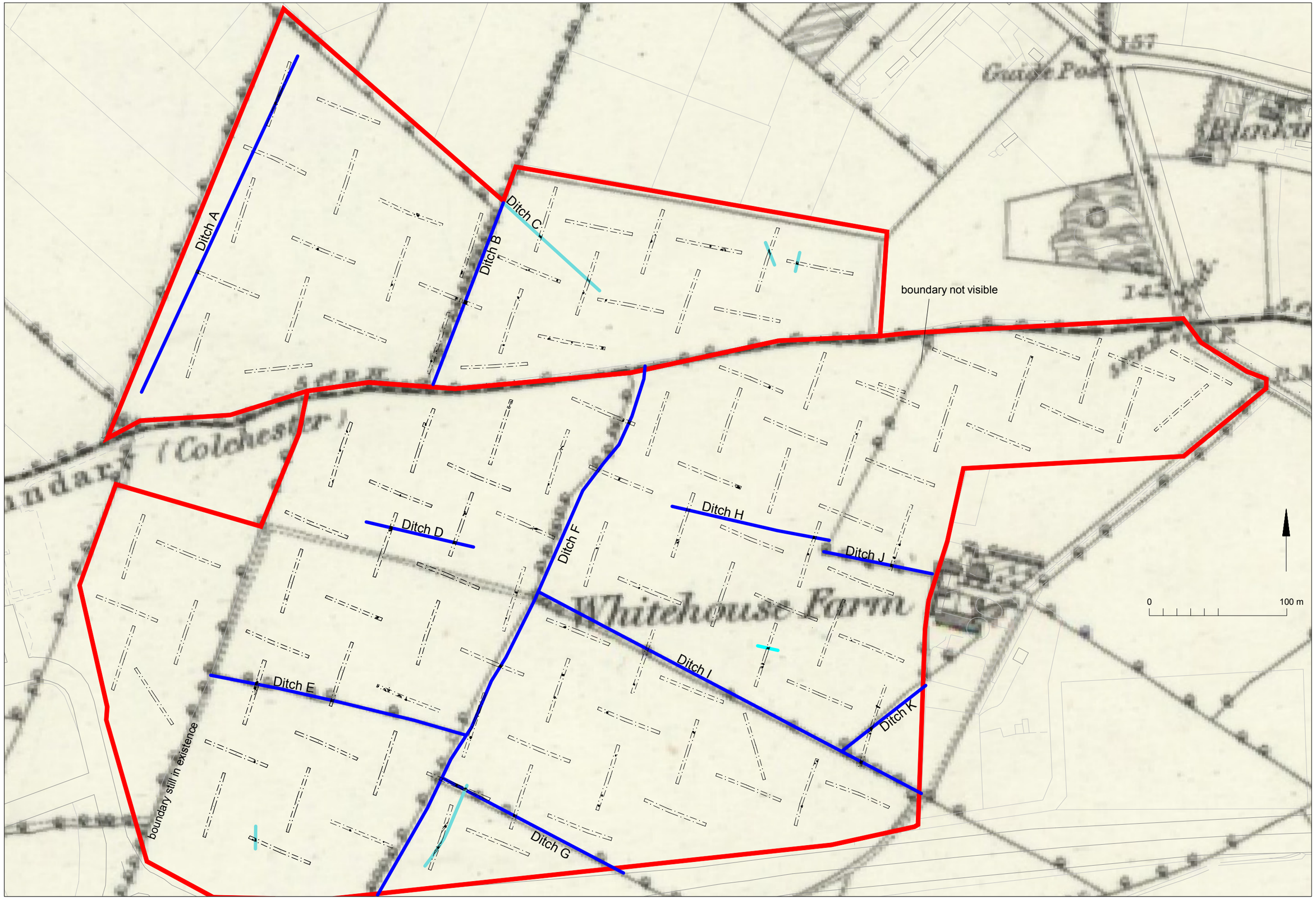


Fig 23 Modern field boundary ditches and drainage ditches, shown overlaid on the 1875 6-inch OS map

field boundary ditches

drainage ditches

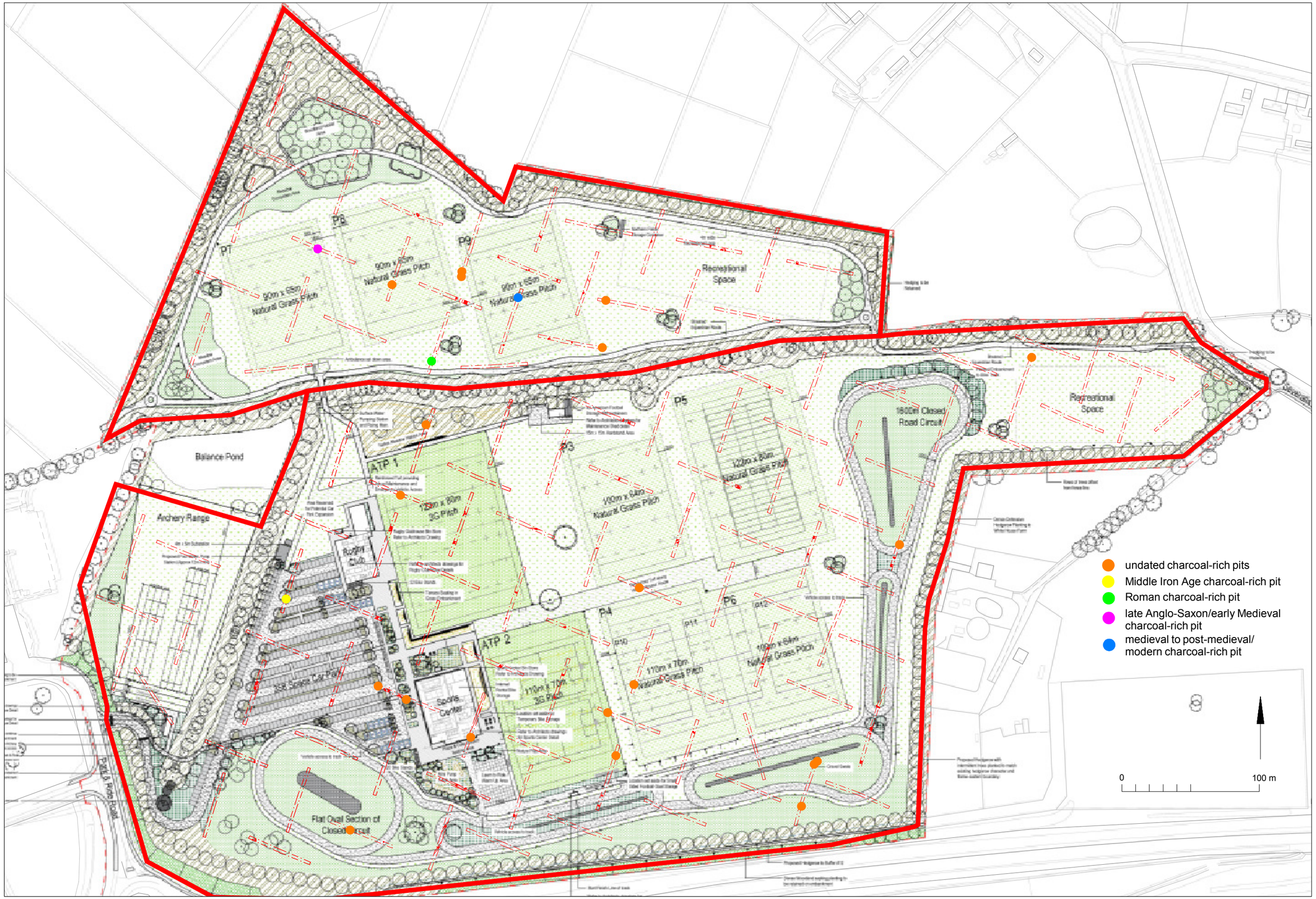


Fig 24 Evaluation results overlain on proposed development. Trenches highlighted in red for better contrast.

OASIS DATA COLLECTION FORM: England

OASIS ID: colchest3-301355

Project details

Project name	Archaeological evaluation at Colchester Northern Gateway Sports Hub Plots 2-3, Colchester, Essex
Short description of the project	An archaeological evaluation (120 trial-trenches) was carried out at Colchester Northern Gateway Sports Hub Plots 2-3, Colchester, Essex, in advance of development works. The development site has been divided into 11 plots with Plots 2 and 3 representing potential areas for the development of sports and leisure facilities. The most significant archaeological remains consisted of 24 charcoal-rich pits probably relating to charcoal production. These were sub-round or sub-oval charcoal-rich features with occasional evidence of in situ burning. Dating evidence was mostly lacking but two of the pits contained finds dated to the Roman and post-Roman periods. With radiocarbon dates from charcoal in another two of the pits dating to the Middle Iron Age and late Anglo-Saxon/early Medieval period. Together with another 77 charcoal-rich pits known from previous archaeological investigations, they suggest that charcoal production was occurring in this part of northern Colchester from the Early Iron Age through to the medieval period. Other archaeological remains included residual prehistoric work flints, a single tree-throw containing a prehistoric worked flint which may or may not be residual, a small number of undated pits and tree throws, and a number of modern field boundary ditches, many of which are visible on old OS maps dating from the late 19th-century to the late 1990s, with associated agricultural features.
Project dates	Start: 20-11-2017 End: 20-12-2017
Previous/future work	Yes / Yes
Any associated project reference codes	17/11e - Contracting Unit No.
Any associated project reference codes	ECC4112 - HER event no.
Any associated project reference codes	COLEM: 2017.152 - Museum accession ID
Type of project	Field evaluation
Site status	None
Current Land use	Cultivated Land 3 - Operations to a depth more than 0.25m
Monument type	CHARCOAL-RICH PIT Middle Iron Age
Monument type	CHARCOAL-RICH PIT Roman
Monument type	CHARCOAL-RICH PIT Early Medieval
Monument type	CHARCOAL-RICH PIT Medieval
Monument type	CHARCOAL-RICH PIT Uncertain
Monument type	DITCHES Post Medieval
Monument type	DITCHES Modern
Monument type	PITS Uncertain
Monument type	TREE-THROWS Uncertain
Significant Finds	WORKED FLINT Neolithic
Significant Finds	WORKED FLINT Bronze Age
Significant Finds	POTTERY Roman
Significant Finds	PEG-TILE Uncertain
Significant Finds	GUNFLINTS Post Medieval
Significant Finds	POTTERY Post Medieval
Significant Finds	CERAMIC BUILDING MATERIAL Post Medieval
Significant Finds	POTTERY Modern
Significant Finds	CERAMIC BUILDING MATERIAL Modern
Significant Finds	CHARCOAL Iron Age
Significant Finds	CHARCOAL Roman
Significant Finds	CHARCOAL Early Medieval
Significant Finds	CHARCOAL Medieval
Significant Finds	CHARCOAL Uncertain
Methods & techniques	""Sample Trenches""
Development type	Extensive green field commercial development (e.g. shopping centre, business park, science park, etc.)
Prompt	National Planning Policy Framework - NPPF
Position in the planning process	Pre-application

Project location

Country	England

Site location	ESSEX COLCHESTER MYLAND Colchester Northern Gateway Sports Hub Plots 2 and 3
Postcode	CO4 5JA
Study area	31.1 Hectares
Site coordinates	TL 9973 2923 51.925180746001 0.905116497661 51 55 30 N 000 54 18 E Point
Height OD / Depth	Min: 42.81m Max: 48.75m

Project creators

Name of Organisation	Colchester Archaeological Trust
Project brief originator	CBC Archaeological Officer
Project design originator	AECOM
Project director/manager	Adam Wightman
Project supervisor	Chris Lister
Type of sponsor/funding body	Borough Council
Name of sponsor/funding body	Colchester Borough Council

Project archives

Physical Archive recipient	Colchester Museum
Physical Archive ID	COLEM: 2017.152
Physical Contents	"Ceramics","Environmental","Worked stone/lithics"
Digital Archive recipient	Colchester Museum
Digital Archive ID	COLEM: 2017.152
Digital Contents	"Stratigraphic","Survey","other"
Digital Media available	"Images raster / digital photography","Images vector","Text"
Paper Archive recipient	Colchester Museum
Paper Archive ID	COLEM: 2018.152
Paper Contents	"Stratigraphic","other"
Paper Media available	"Context sheet","Miscellaneous Material","Photograph","Plan","Report","Section"

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Archaeological evaluation at Colchester Northern Gateway Sports Hub Plots 2-3, east of Colchester Park and Ride, Mile End, Colchester, Essex, CO4 5JA: November-December 2017
Author(s)/Editor(s)	Pooley, L.
Other bibliographic details	CAT Report 1219
Date	2018
Issuer or publisher	Colchester Archaeological Trust
Place of issue or publication	Colchester
Description	A4 ringbound loose leaf
URL	http://cat.essex.ac.uk/all-reports.html

Entered by	Laura Pooley (lp@catuk.org)
Entered on	3 May 2018