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ARO68: Iron Age and early medieval settlement at Cruden Bay, Aberdeenshire

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ARO68: Iron Age and early medieval settlement at Cruden Bay, Aberdeenshire

Published by GUARD Archaeology Ltd, www.archaeologyreportsonline.com

Editor Beverley Ballin Smith

Design and desktop publishing Gillian Sneddon

Produced by GUARD Archaeology Ltd 2026.

ISBN: 978-1-9195636-1-9

ISSN: 2052-4064

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Contents

List of Figures

List of Figures *(continued)*

List of Figures *(continued)*

List of Tables

Summary

An archaeological evaluation and excavation were conducted at land west of Cruden Bay in advance of residential development. The investigations uncovered a substantial middle Iron Age settlement, encompassing numerous structures, alongside traces of early medieval activity. Radiocarbon dating revealed occupation from c. 300 cal BC to 235 cal AD. Analysis of pottery, lithics, vitrified materials, and plant remains provided insights into the settlement's domestic activities, craft production (including possible metalworking), and the environment. The site exhibited evidence of prolonged use, with lithic artifacts suggesting activity from the Late Upper Palaeolithic onwards.

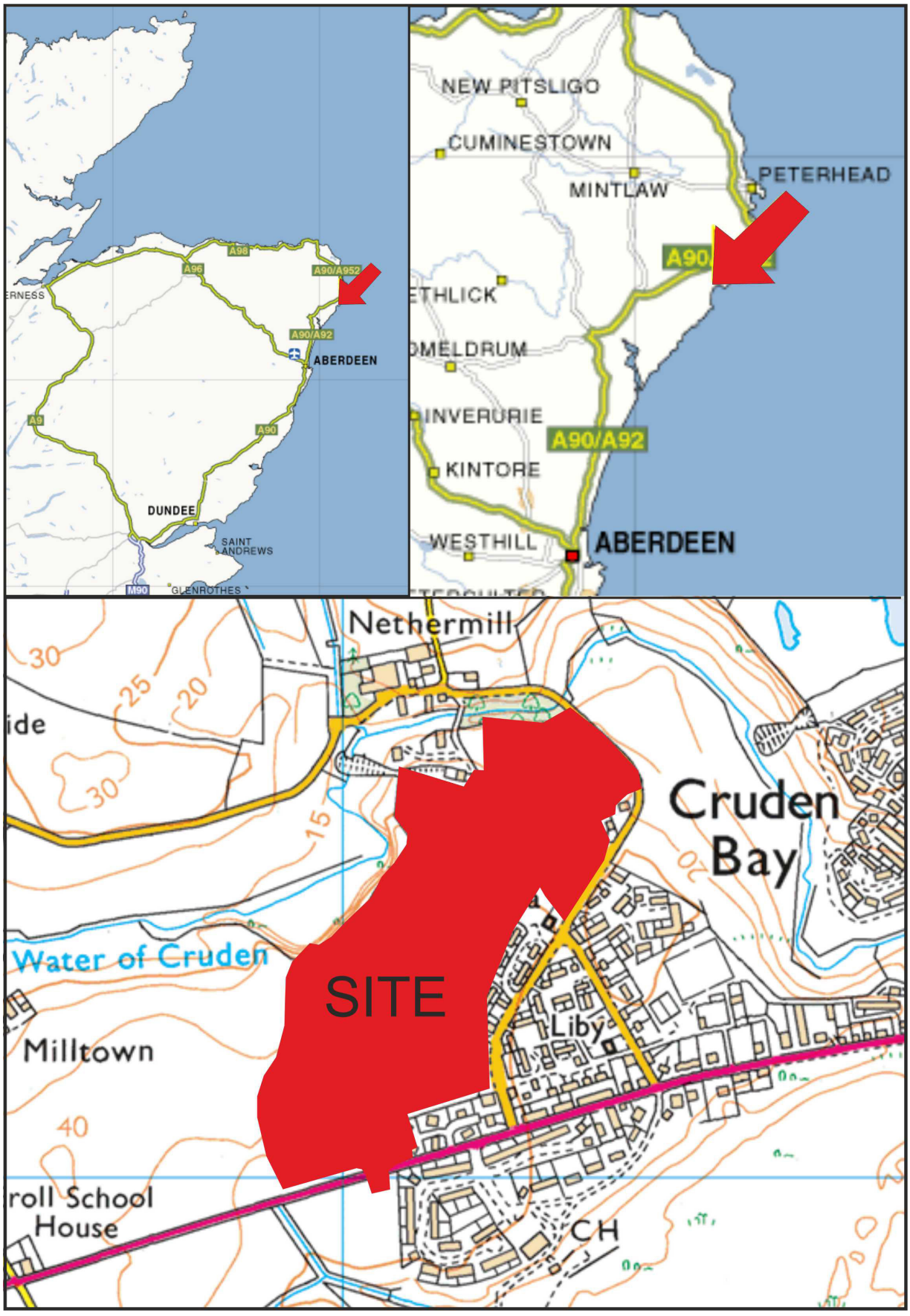

Figure 1: Site location map. Contains Ordnance Survey data © Crown copyright and database right 2024.

Introduction

Between September and October 2017, a 17 hectare greenfield site on the western fringe of Cruden Bay, Aberdeenshire (Figure 1) south of Water of Cruden, was evaluated in advance of a proposed residential development (Lenfert 2018). Its location was at NGR: NK 08111 36387 and it lay between 25 m and 35 m OD. Prior to the investigation no archaeological features or artefacts were recorded from the area. The evaluation revealed traces of prehistoric settlement on the western side of the site. Further archaeological intervention, a monitored topsoil strip, took place from 7-20 May 2019 followed by an excavation between 20 May and 20 June 2019 by Cameron Archaeology Ltd (Cameron and Simon 2019). The excavation revealed an unenclosed settlement with at least 23 structures, together with numerous isolated features.

The Excavation Results

The archaeological interventions exposed remains of a previously unknown, unenclosed middle Iron Age settlement comprising several possible roundhouses, rectilinear structures and miscellaneous pits. In addition, two possible areas of early medieval activity were also identified. The Iron Age settlement was concentrated on an east/south-east facing slope in an area c. 100 m by 160 m, whilst the possible early medieval structures were located on the eastern and southern fringes of the site (Figure 2). All features were investigated by hand and 50% of deposits were excavated, except for those in a narrow strip of land on the west side of the site which was not to be disturbed during development. This portion of the settlement was therefore preserved in situ. Drone photos (Figure 3) were used to check the relationship of features and that all archaeological elements had been investigated, as some features were difficult to identify from ground level. Over 20 individual structures were identified during the excavations, along with a number of associated feature groups.

All radiocarbon dates are presented at 95.4% probability (see Table 1).

Structure 1

This undated structure comprised fragmentary evidence of a possible roundhouse ditch (178) estimated to have been c. 13 m in diameter with interior evidence of a possible ring of posts and other features. It was located downslope and slightly distant from the main concentration of structures (Figures 2, 4 and 5).

A long portion of a semi-circular, U-shaped curvilinear ditch (178) survived. It was a maximum of 0.45 m in width, but only 40 mm in depth due to truncation. It was aligned east/west with a 2.5 m long out-turn suggesting an entrance extending eastwards. To the immediate south was a shorter ditch fragment (1023) aligned north/south. The ditch sections were filled with compact clay and loam. However, preservation was insufficient to determine whether these features could have been erosion gullies or a deliberately dug ditch. Heather type charcoal, possibly from heather thatch, was recovered from their fills.

The internal features comprised two postholes (175) and (176) and a pit (177), all three of which were heavily truncated. Two smaller postholes (170) and (171), the former was 0.20 m in diameter and the later 0.25m to 0.35 m in diameter, were located in the south-west quadrant of the interior of the structure with posthole (170) containing two lithics (SF 26) within its sandy loam fill. The small diameter of these features suggests they were possibly associated with interior activities (Figures 4 and 5).

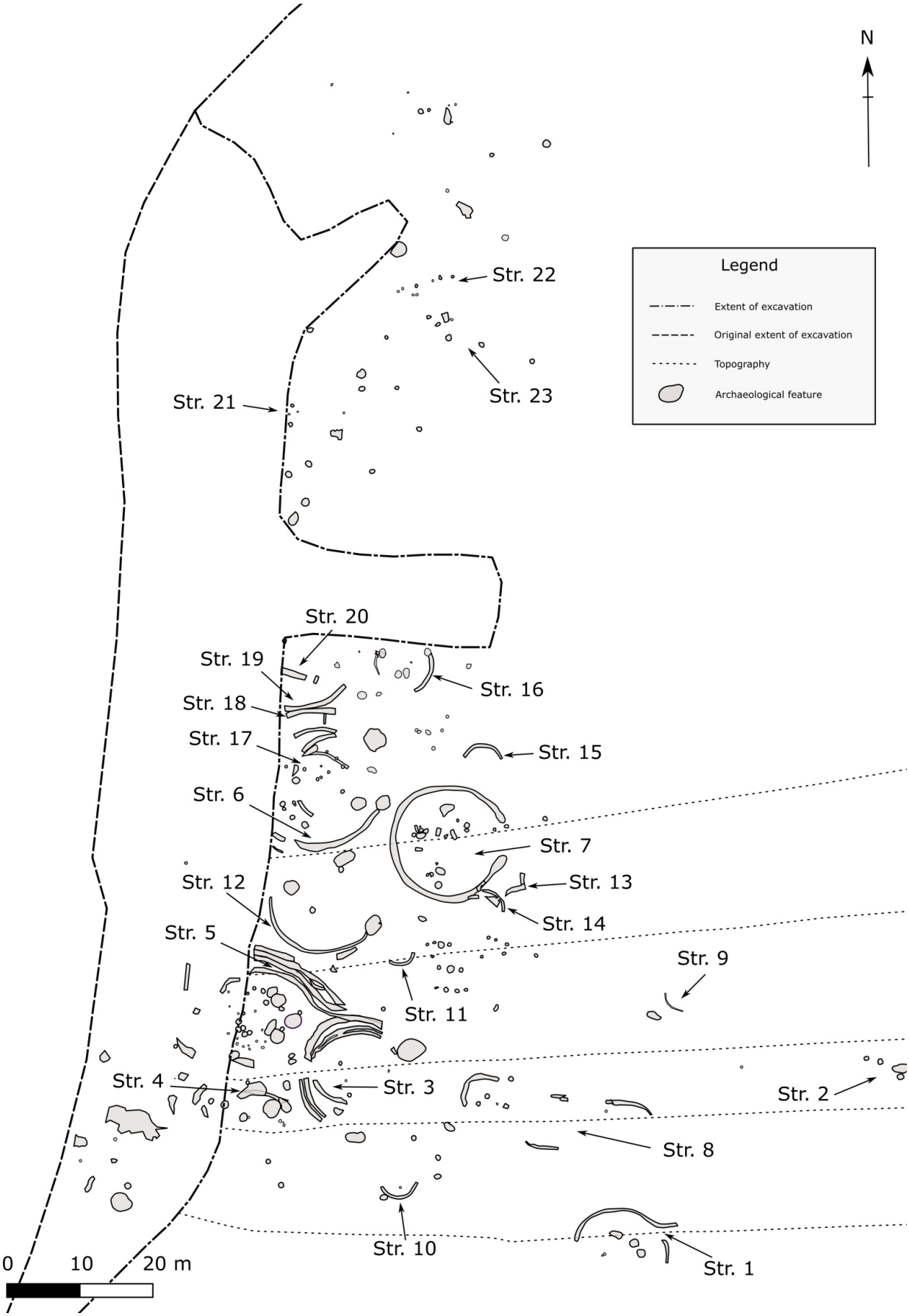

Figure 2: Site plan with numbered features.

The postholes could have been the remains of an inner post-ring which would have supported the roof of the roundhouse. Postholes (175) and (176) were 1 m to 1.3 m in diameter, shallow at only 100-200 mm in depth, and contained fragments of charcoal within their clay loam fill. Whilst (175) contained a single large packing stone displaced by plough action, several large stones in the base of (176) could have been a post pad or collapsed packing to a post. Pit (177) was oval in shape and measured c. 1.7 m by 0.65 m by 100 mm in depth. Its fill contained a flint flake (SF 27) and sherds of prehistoric pottery (vessel V02). There were no clear post-pipes in any of these features and only a small amount of birch charcoal was recovered from their fills.

Figure 3: Drone shot of site showing Structure 5 during excavation. Facing NNE.

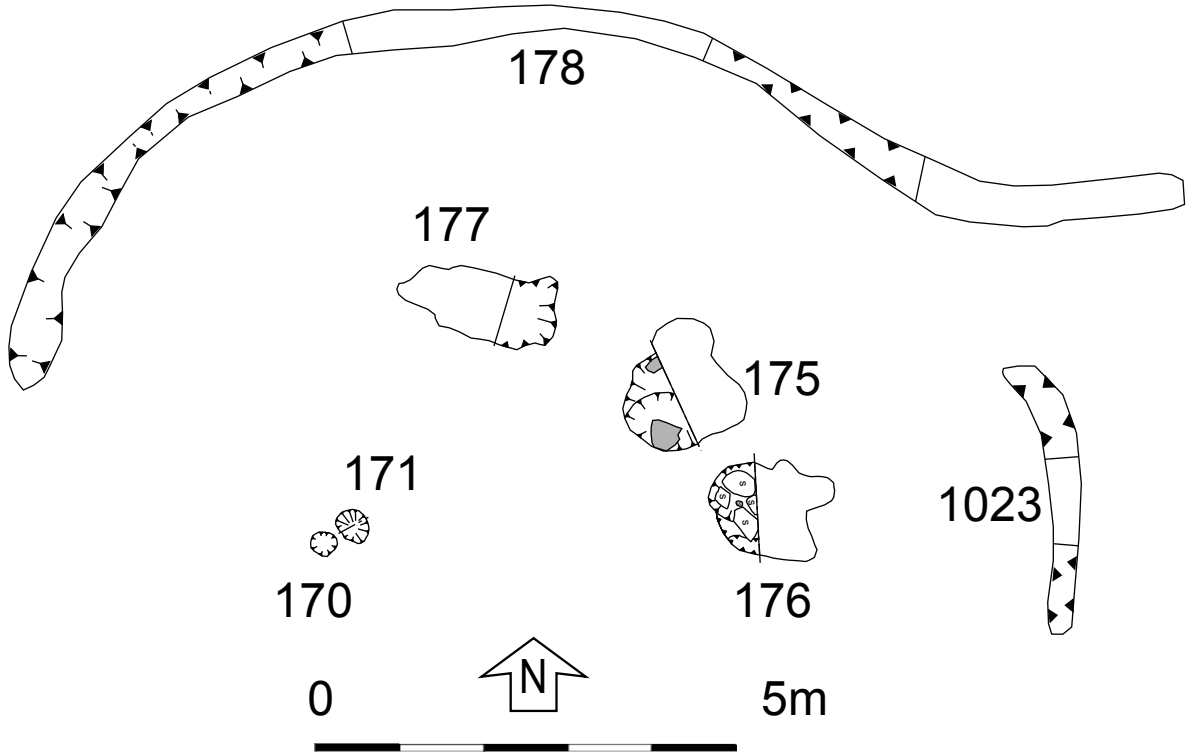

Figure 4: Structure 1 plan.

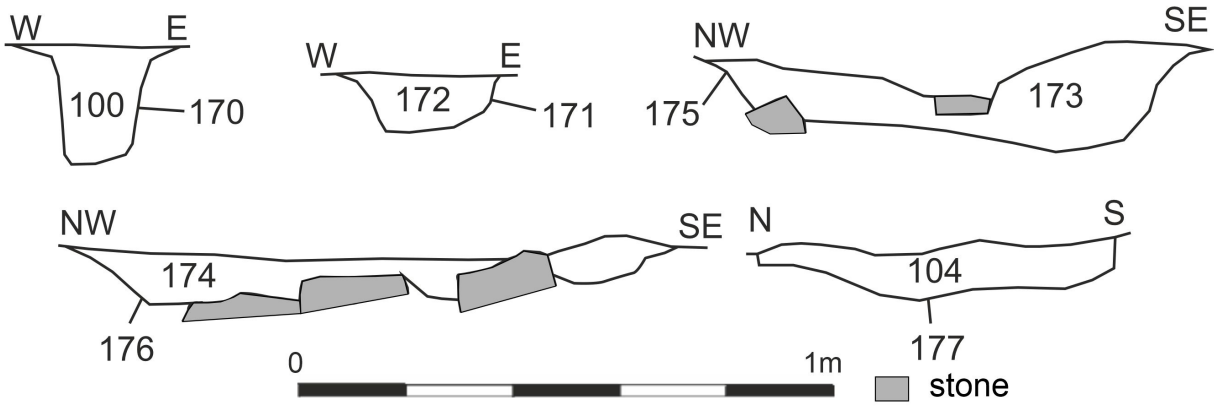

Figure 5: Structure 1 sections.

Structure 2

This group of features was located on level ground at the easternmost area of the site, remote from other structures (Figures 2, 6 and 7). It was heavily truncated and comprised shallow features with two postholes and a pit. The physical form of this possible structure could not be determined due to the lack of features and stratigraphy. However, most features contained charcoal and a cereal assemblage consistent with domestic hearth waste.

Two large shallow scoops (236) and (238), 1.5 m and 2.2 m long and 0.6 m to 1.35 m wide, were found in association with a posthole (105). It was not possible to determine their function. Feature (238) contained charcoal from birch wood which provided a radiocarbon date of 772 – 976 cal AD (SUERC-102205) from the early medieval period.

Posthole (105) lay to the south of feature (236). It was 0.7 m in diameter, 0.2 m deep and contained an undiagnostic flint chip (SF 31). Birch charcoal

from its fill was radiocarbon dated to 772 – 973 cal AD (SUERC-102199), contemporary with scoop (236). It is therefore considered that posthole (105) was perhaps part of the same event. Posthole (106) lay north-west of (105) and was of similar size (0.75 m by 0.55 m), but it only survived to a depth of 80 mm.

A shallow, oval feature (240) was located between posthole (106) and scoop (236). Although interpreted as a pit, it could equally have been the base of a posthole measuring 0.90 m by 0.50 m by 0.10 m. It only survived to a depth of 100 mm and provided little evidence as to its function.

In plan, these five features formed a linear arrangement. However, the fills of postholes (105) and (106) are distinct and may not represent the same phase of occupation. The lack of stratigraphical relationships between these features prevents further investigation. Feature (238) was the only one dated to early medieval period, but a cereal grain assemblage from Structure 8A may also be linked to early medieval activity on site (see below). At a distance of 15.5 m west of posthole (106) was another, (99). This isolated feature was unrelated to any others.

Figure 6: Structure 2 plan.

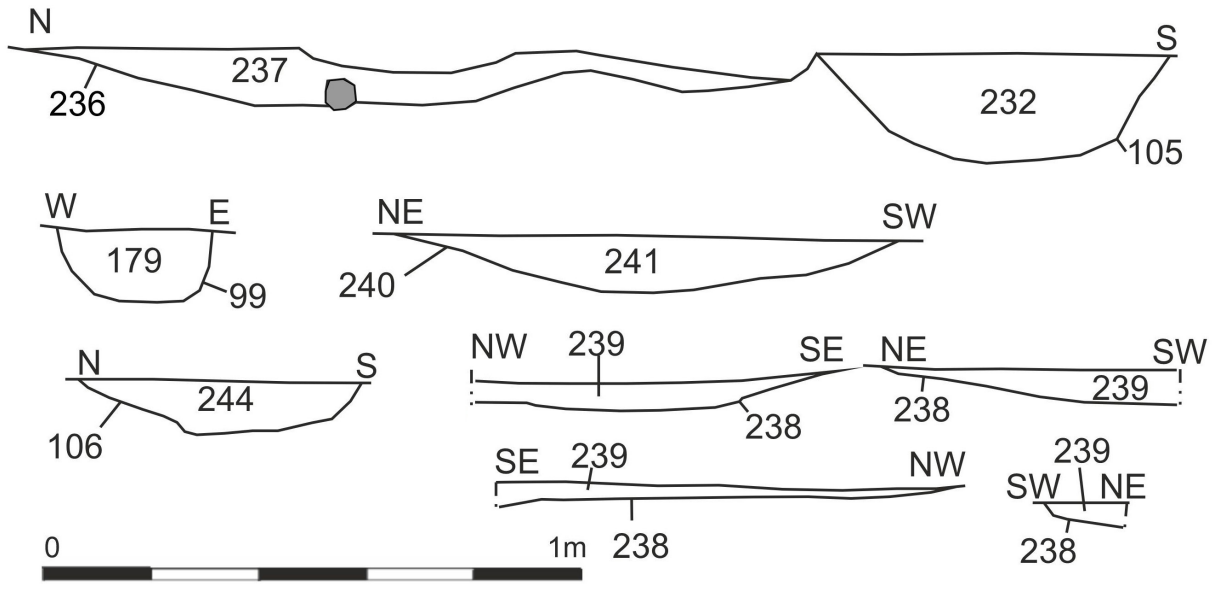

Figure 7: Structure 2 sections.

Structure 3

Structure 3 was located below the crest of the slope and was heavily truncated (Figures 2, 8 to 12). A group of closely positioned parallel curving ditches or gullies to the north and north-west and similar but wider situated features to the south-west suggested at least two circular or sub-circular structures, or one structure that was altered several times. A group of postholes and isolated pits were located within and around these ditches.

The remains of two curved ditches (45) and (56) (Figures 8 and 9) were truncated to both the east and the south-west, but further segments (195) and (197/199), were preserved in the south-west quadrant. The outermost ditch (45) in the north-west was 0.4 m to 1 m in width and up to 0.38 m in depth (Figures 10 and 11), but its outline was irregular and included (368), a possible terminus at its east end (Figure 9). The two lines of the inner gully (56) were not clear-cut although they were c. 0.85 m wide, dividing then re-merging along its length, indicative of recutting or possible repair of parts of it. Although separate from ditch (45) in the north, they seemed to have been truncated by it in the south-west.

In the south-west quadrant two parallel outer ditch segments (195 and 832) were considered a continuation of (45) but there was in addition a separate inner ditch segment (197) that measured 0.5 m in width and 0.12 m in depth. It is unclear whether ditch (197) was a separate feature from the ditches and gullies in the north. The ditches could have formed an enclosure of between c. 11.5 m and 14.5 m in diameter – ample room for a wooden roundhouse. However, there was little evidence of large structural timbers in the interior space.

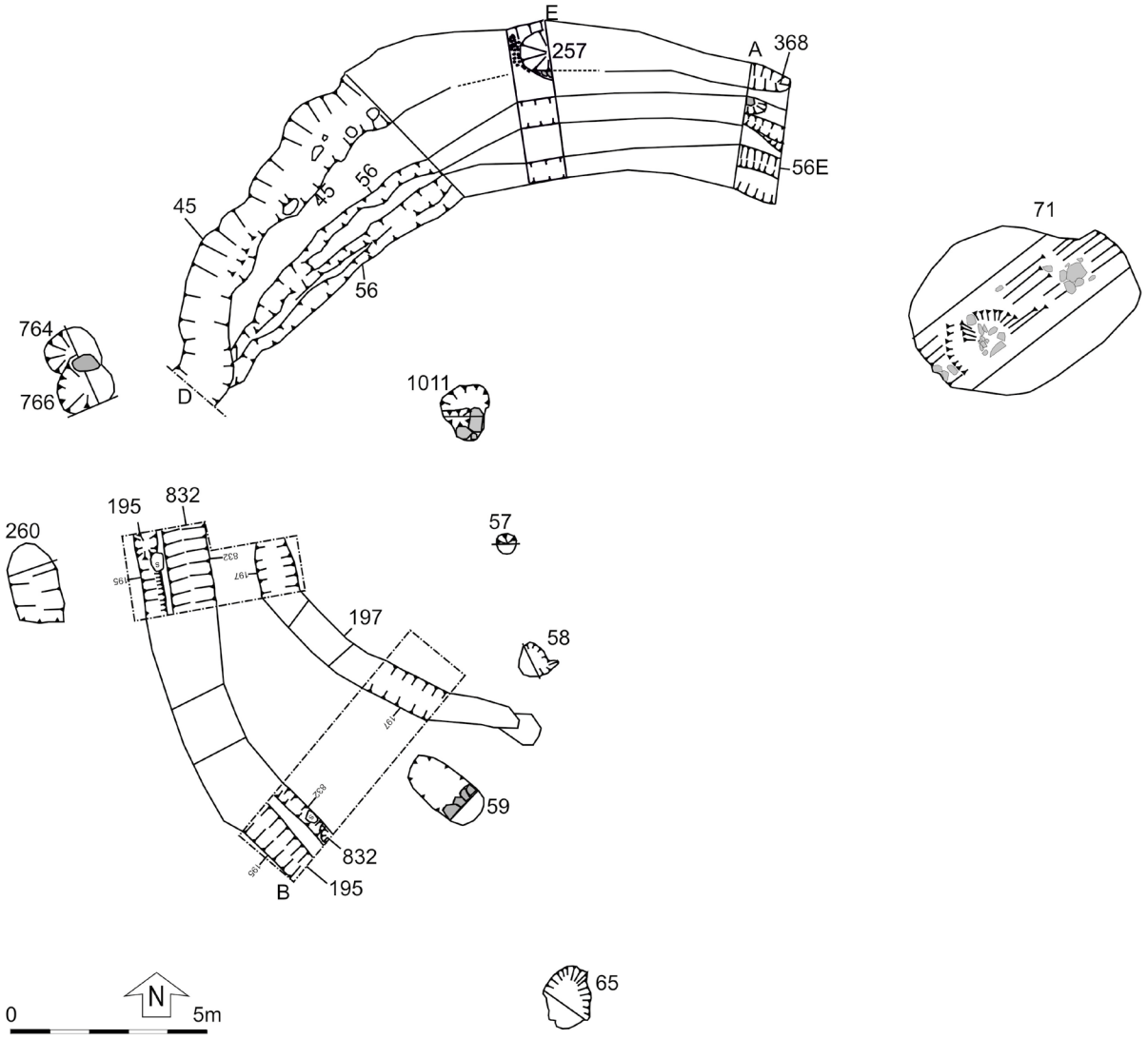

Figure 8: Structure 3 plan.

Birch charcoal samples recovered from ditches (45) and (56) were dated to 33 cal BC – 124 cal AD (SUERC-102200) and 121 – 235 cal AD (SUERC-102198) respectively. The dating supports the suggestion that these features representing sequential alterations rather than contemporary features. Birch timber was used for building but it would not have been as strong or durable as oak for roof supports. Several lithics and a pottery spindle whorl (SF 51) indicative of domestic activities were recovered from the fills of these features.

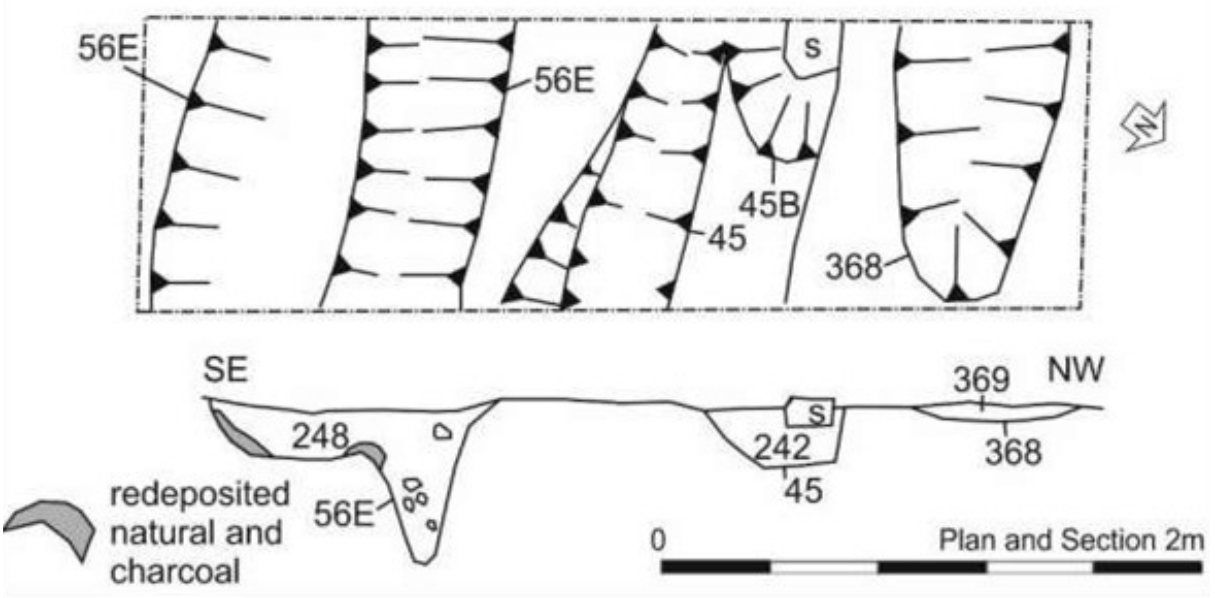

Figure 9: Structure 3 sections through ditches (56E), (45) and (368).

Figure 10: Structure 3 Ditches 45 (left) and 56 (right) during excavation: facing east.

Within Structure 3, an approximately north/south alignment of three postholes, (57), (58) and (1011), survived 0.24 m to 0.5 m in diameter and 0.1 m to 0.44 m in depth (Figure 12), and could have been a partition or a later fence line. Both (1011) and (58) had flat-bases and contained in situ packing stones (Figure 13). The more central posthole (57) was the smallest at 0.24 m in diameter and 0.1 m depth, with a slightly V-shaped base. Willow charcoal from (1011) was dated to 43 cal BC – 114 cal AD (SUERC-102244) suggesting the use of this feature was possibly contemporary with ditch (45).

Three pits were located within the vicinity of Structure 3: (71) to the north-east, (59) between diches (56) and (197) in the south-west, and (65) south of the structure (Figures 11 and 12). Pit (71) was one of the largest pits investigated measuring 4.2 m by 2 m and with a maximum depth 0.9 m. The pit was filled with layers of charcoal-rich silty sand containing fragments of burnt bone, lithics and a mixed charcoal assemblage consistent with midden waste.

Pit (59) was sub-oval in shape and measured 0.6 m in width and c. 0.7 m in length, but it was cut by a deep furrow at its south-east end (Figures 12 and 13). It survived 0.72 m in depth and was packed with an upper layer of large burnt stones (262) and had two lower fills of heavily burnt clay and charcoal, (263) and (267) (Figure 14). The clay edges of the pit had also been subjected to severe heating and initially it was thought it may have been a kiln. Subsequent analysis of fragments of fired clay from within the pit showed them to be from the rim and body of a furnace. Willow charcoal yielded a radiocarbon date of 87 – 232 cal AD (SUERC-102197). It is likely that this feature – a furnace, was broadly contemporary with ditch (56) whose curve it lay within. The furnace was significant as there was little evidence of metalworking across the site as a whole.

A large pit (65) lay south of the south-west ditches. It contained sherds of a flat-rimmed ware vessel (V05) and a ceramic spindle whorl (SF 51) (Figures 11 and 15). A truncated pit (260) and two postholes (764) and (766) were situated to the west of Structure 3 and outside the area enclosed by ditches. It is not clear whether these features were associated with Structure 3 or to Structures 4 and 5 to the west.

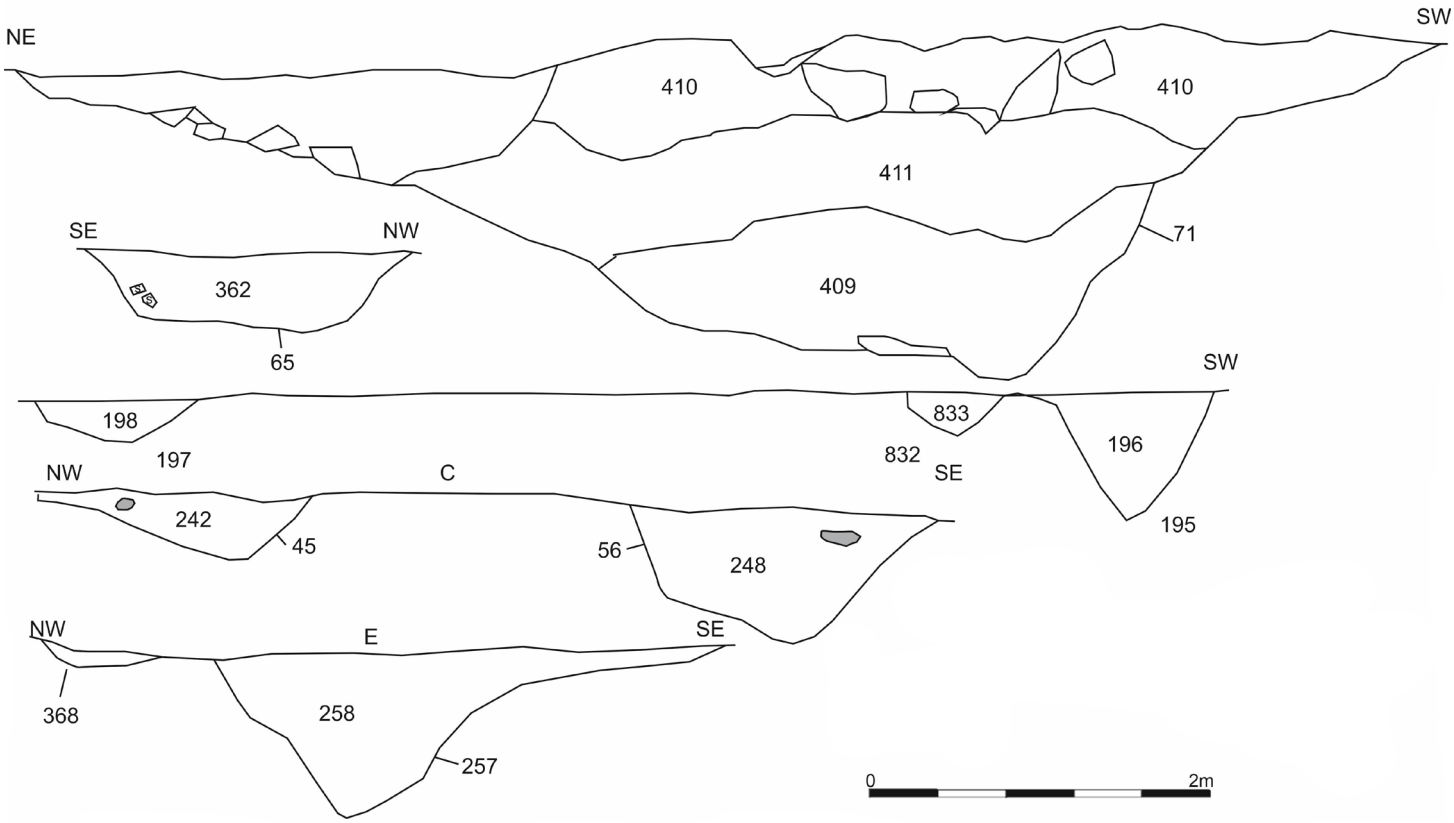

Figure 11: Structure 3 sections.

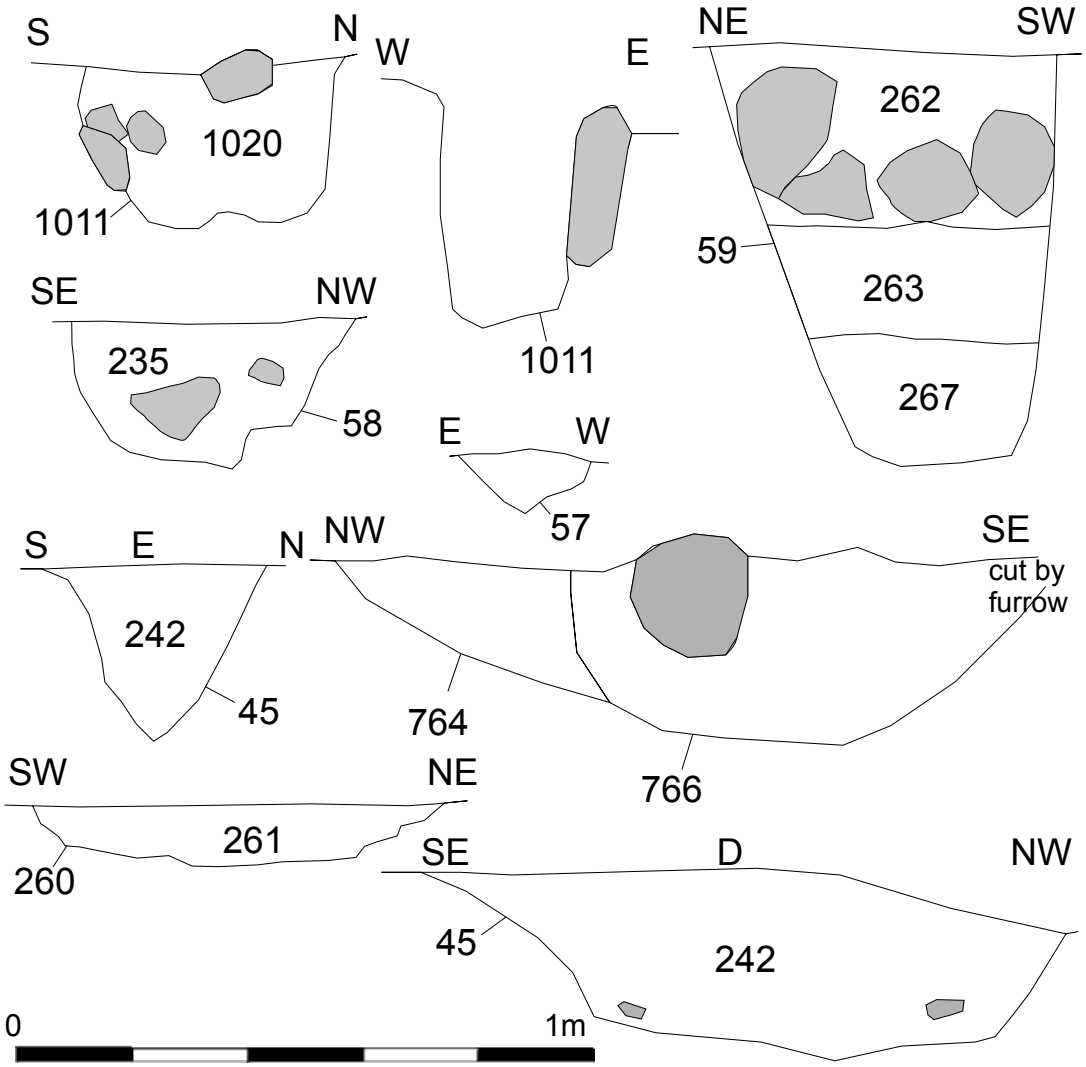

Figure 12: Structure 3 sections.

Figure 13: Structure 3 pit (59) during excavation showing stones within the upper fill: facing north-east.

Figure 14: Structure 3 Fired clay within the base of pit (59): facing south-east.

Figure 15: Structure 3 Vessel 5 within pit (65) during excavation: facing south.

Structure 4

Structure 4 was situated to the west of Structure 3 and south of Structure 5 (Figures 2, 16 and 17). It consisted of a 7 m long segment of ditch (193) with a terminal pit or posthole (46) that possibly indicated the northern quadrant of a roundhouse with an east-facing entrance. The contents of the ditch (193) were consistent with domestic use and included a number of lithics. The terminal pit (46) measured c. 1.25 m in diameter and 0.35 m in depth but there was no evidence of a wooden post, although large stones within it may have been packing stones. Located immediately north of ditch (193) was a thin layer of cobbles (34) 1.75 m in length and c. 0.5 m in width.

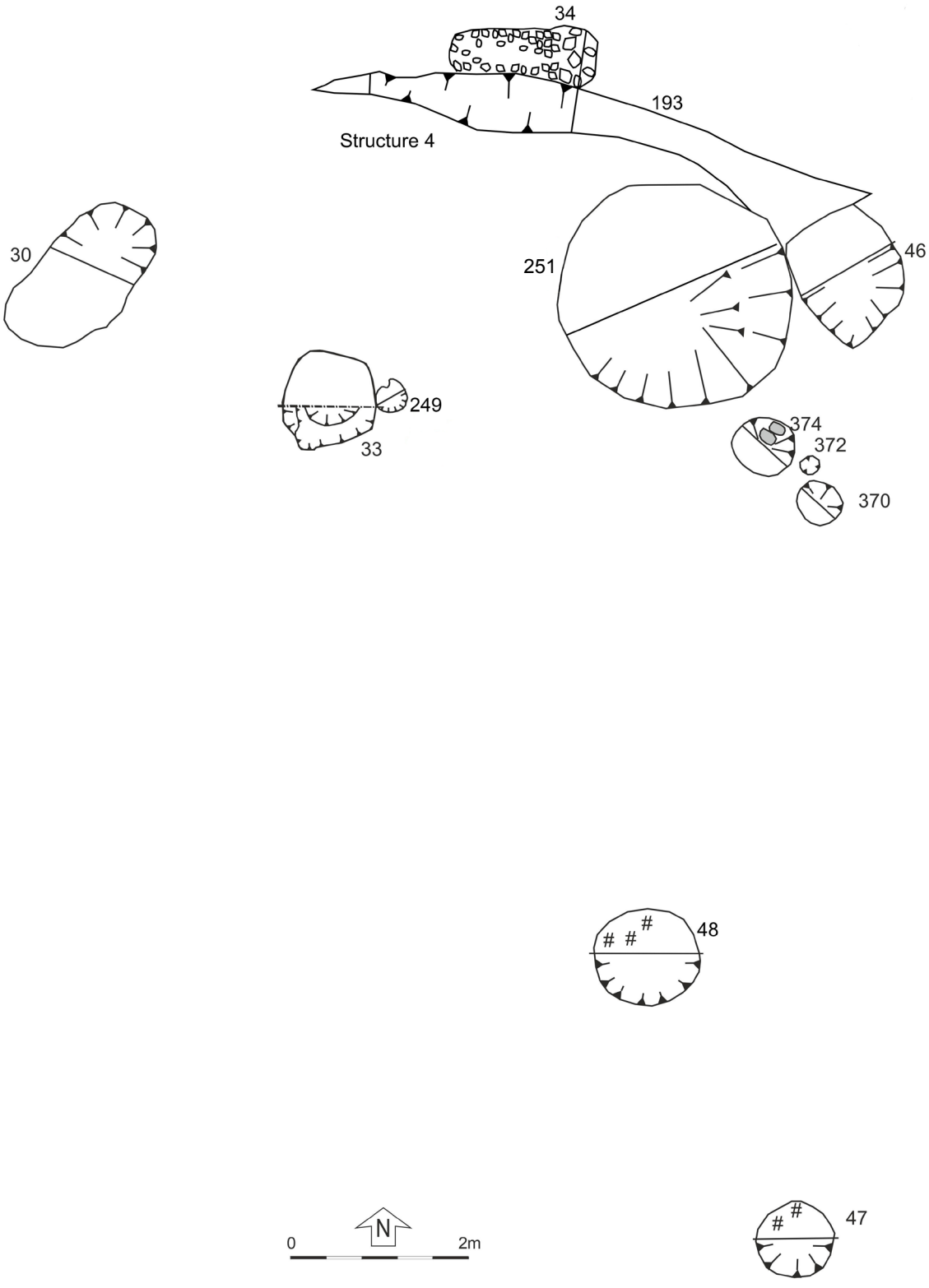

Figure 16: Structure 4 plan.

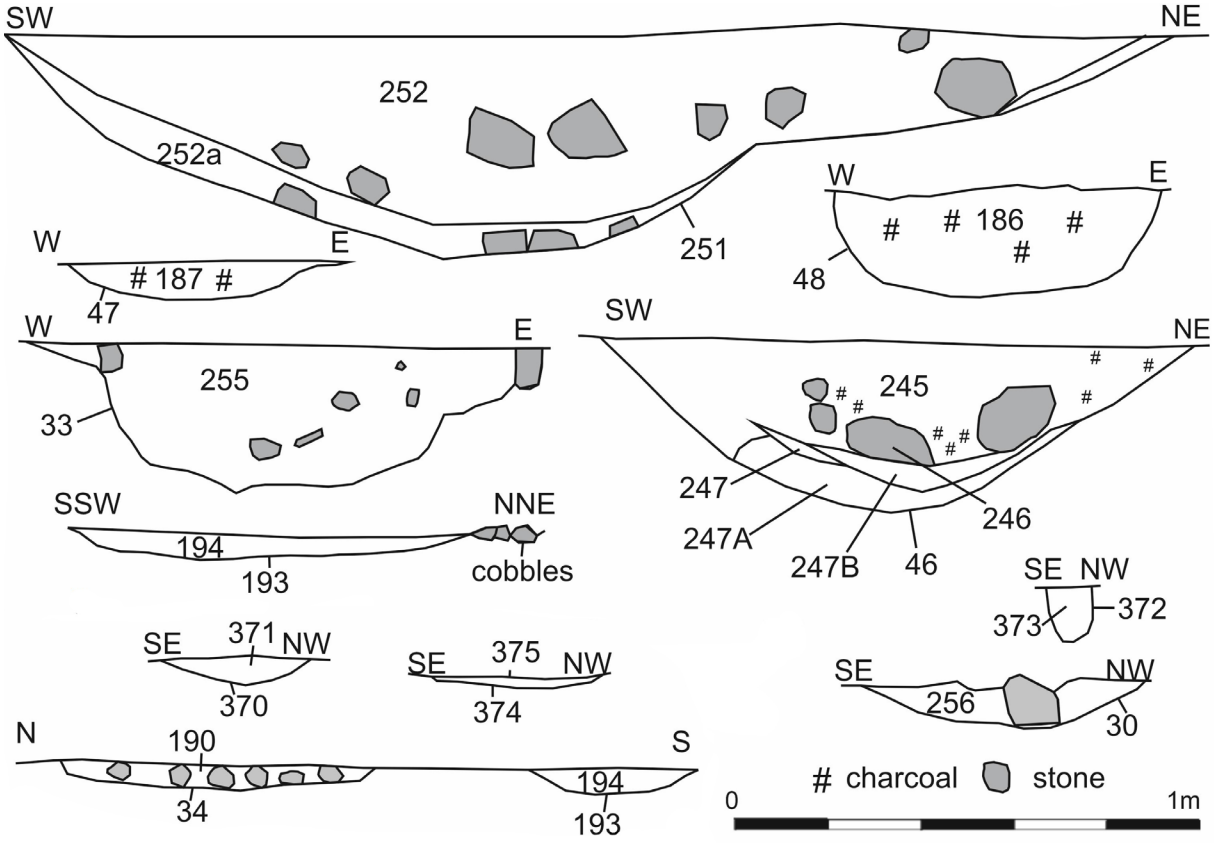

Figure 17: Structure 4 sections.

Two pits (33) and (251) (Figure 18) and three postholes (370), (372) and (374) were located to the south of the ditch. Pit (33), 1 m in diameter and 0.28 m in depth, was situated furthest west and contained some lithics in its fill. To its immediate east was a small posthole (249). Pit (251) was 2.6 m in diameter and 0.45 m in depth and included a fragment of saddle quern (SF 50). Postholes (370), (372) and (374) were grouped together to the south-east of pit (251). A pair of shallow pits or larger postholes (47) and (48), both containing charcoal, were located 6 m to 9 m to the south. However, it is uncertain how they related to the ditch and the features nearer to it. Alder charcoal from posthole (48) was dated to 167 cal BC – 4 cal AD (SUERC-102189), part of the earliest phase of settlement. Another large but shallow pit (30) lay further to the west of the main features.

Figure 18: Structure 4 South-east facing section through pit (251).

Structure 5

Structure 5 was a complex series of features found immediately west of Structure 3 and located between Structures 4 and 12 (Figures 2, 3 and 19). The northern part of this group of features was defined by a series of truncated parallel linear ditches (35/206), (328), (330) and (334) (Figure 20). Their orientation and elongation, particularly the terminations of (330) and (334) suggest there was an entrance through them to the east. Ditch (330) provided evidence for numerous stakeholes, and samples recovered from parallel ditch (328) contained large amounts of hazel and willow roundwood that may have been associated with wattle or wickerwork. The four segments may represent separate construction/reconstruction phases of a possible roundhouse. Radiocarbon dates may suggest that ditch (334) (41 cal BC – 118 cal AD; SUERC-102179) was earlier than (328) (1 – 130 cal AD; SUERC-102180) but there is considerable overlap in the dates obtained (Figure 21).

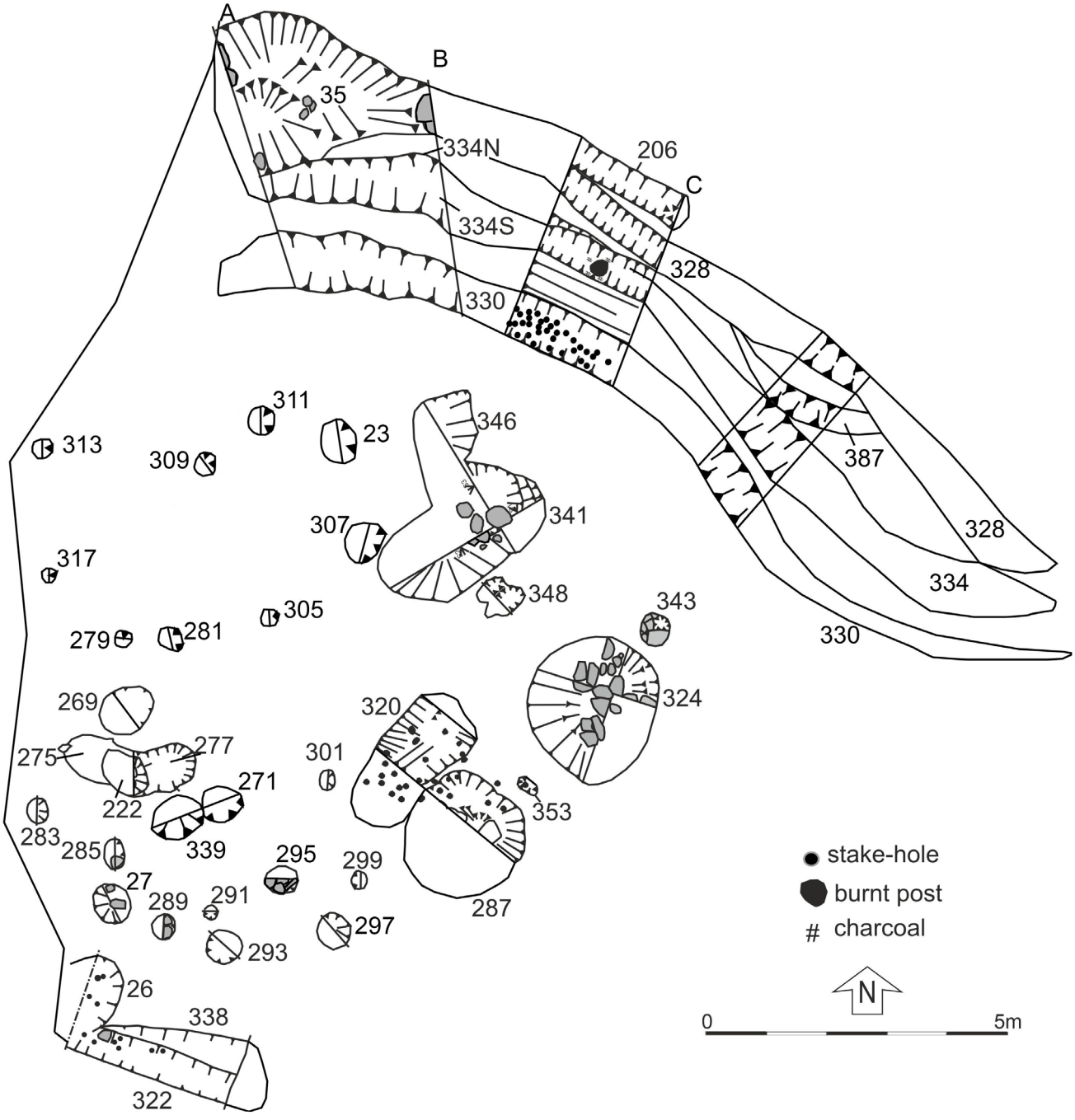

Figure 19: Structure 5 plan.

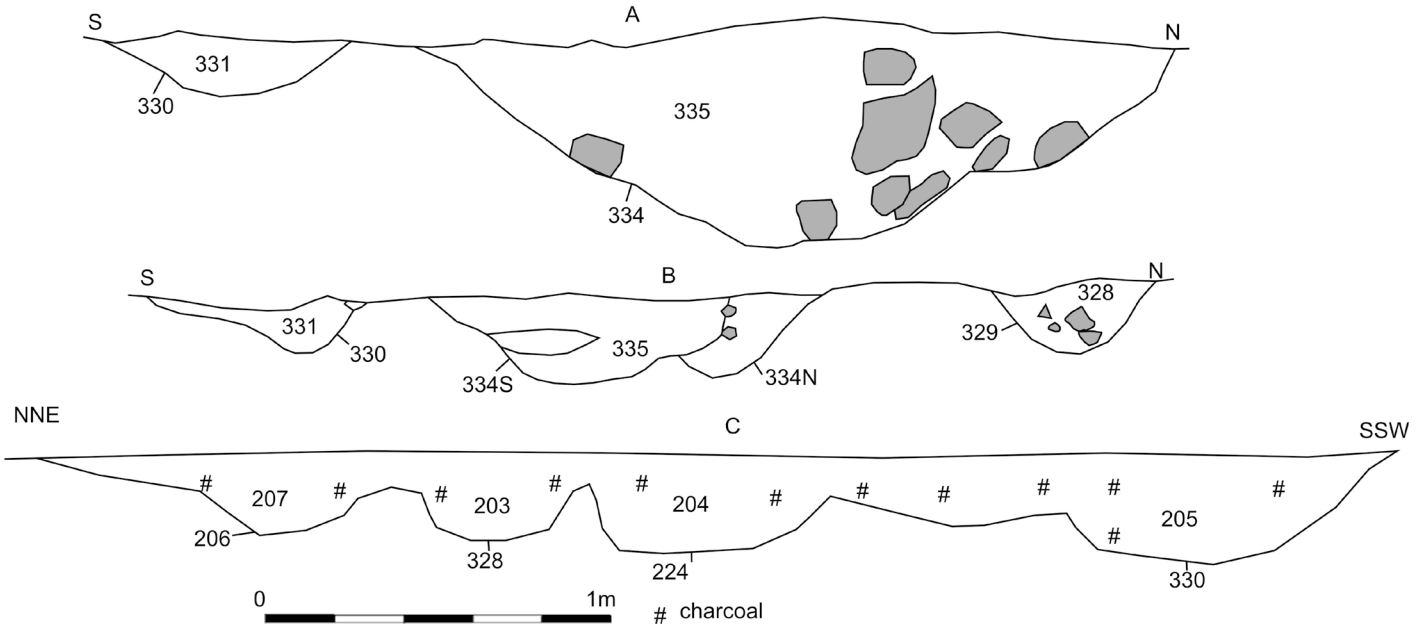

Figure 20: Structure 5 ditch sections.

Figure 21: Structure 5 Ditch segments (328) (bottom), (334) (centre) and (330) (top): facing south.

Only two possible segments of ditch or gully survived in the south-west quadrant, (338) lying within (322) (Figures 19 and 22). Ditch (322) was up to 0.7 m wide and 0.22 m deep. The ditch segment (338) was narrower at 0.3 m and shallow at only 90 mm. Pit (26), c. 0.7 m in diameter and 0.12 m in depth, lay at the west end of ditches (338) and (322) and was an earlier feature as it was cut by the latter ditch. Both pit (26) and ditch (322) had evidence of stakeholes in their bases.

Because of the fragmented stratigraphy and truncation, it is not possible to link either of these segments directly with any of the features to the north. Together, the two ditch segments (north and south-west) would have enclosed a structure of between 12 m to 14.6 m in diameter. Both (322) and (26) contained small stakeholes, possibly indicating the presence of wattle panels, as in the northern ditches/gullies.

Between the two areas of ditches/gullies were a large number of features. Based on their similar sized postholes with average diameters of c. 0.65 m, (222), (269), (271), (275), (277), (307), (339), (343) and (348) (Figure 23) they may be the remains of one or more internal ring of posts c. 5 m in diameter, which could have supported the roof of Structure 5. However, there is no clear pattern to these features. Features (339) and (271) are paired. The former was 0.8 m in diameter and 0.1 m deep and (271) was 0.5 m in diameter and 0.25 m deep. Oak charcoal was recovered from posthole (269). Posthole (277) was cut by posthole (222) suggesting either the replacement of a post, or the insertion of a prop alongside an existing post to provide additional support. Posthole (348) appeared to have been recut (Figures 22 and 24).

A group of small postholes (27), (283), (285), (289), (291), (293), (295), (297), (299) and (301), all 0.25 m to 0.45 m in diameter, were located in the south-west quadrant between the ditches and pits (320) and (287) (Figures 19 and 23), with several containing packing stones in their fills. Posts of this size would probably be associated with the securing of the exterior wall of a roundhouse on the inside the southern ditch. A line of similar sized postholes (279), (281) and (305), were set slightly off-centre towards the north-west quadrant and may have similarly been related to an internal partition. Other small postholes with no obvious associated feature or function included (309), (311), (313) and (317) in the north-west quadrant, and (301) adjacent to pit (320). Charcoal obtained from postholes (27) and (295) was dated to 9 – 201 cal AD (SUERC-102216) and 30 – 208 cal AD (SUERC-102206) respectively.

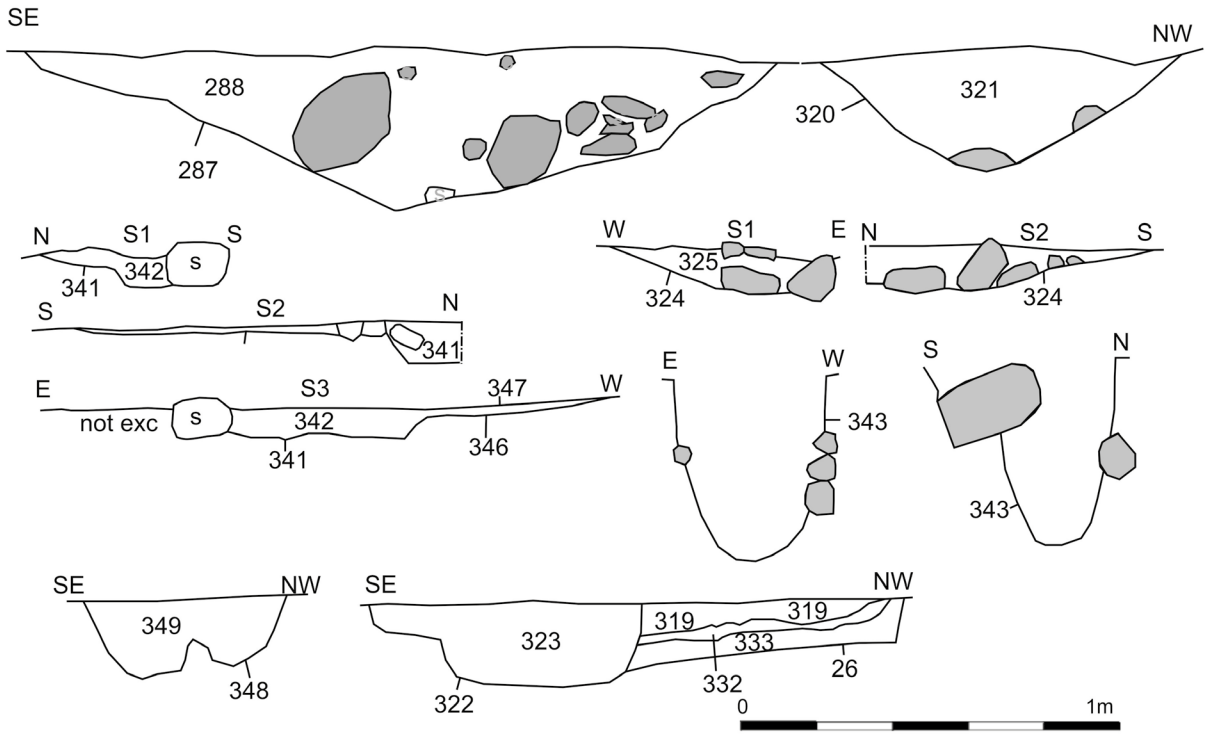

Figure 22: Structure 5 sections through features.

Large pits (287), (320), (324), (341) and (346) were located in the interior of Structure 5 (Figures 19, 22 and 25). Pit (287), 1.95 m in diameter and up to 0.42 m deep and pit (320), 2.5 m by 1.2 m by 0.41 m were adjacent to each other and both showed evidence of associated stakeholes (Figure 26). Mixed charcoal assemblages were found in both pits and (287) contained several lithics. Hazel from pit (320) was dated to 96 cal BC – 60 cal AD (SUERC-102187). Pit (324), 2.4 m by 2 m by 0.12 m, also contained a mixed charcoal assemblage together with charred grains, fragments of burnt bone and a single flint flake, all consistent with domestic refuse. It was dated to 30 – 208 cal AD (SUERC-102188). These latter two pits could have been contemporary with either ditch (328) or (334). Adjacent pits (341) and (346) were large. The former was 3.2 m by 1.5 m by 0.18 with a stony fill and evidence of being recut. Pit (346) was 1.2 m in diameter and only 60 mm deep, but two flints were noted in its fill.

Concentrations of fuel ash slag were found within Structure 5 including ditch (328). Although this slag is not associated with a particular craft activity, the quantity and size of fragments present suggest it was not simply a product of domestic fires or hearths.

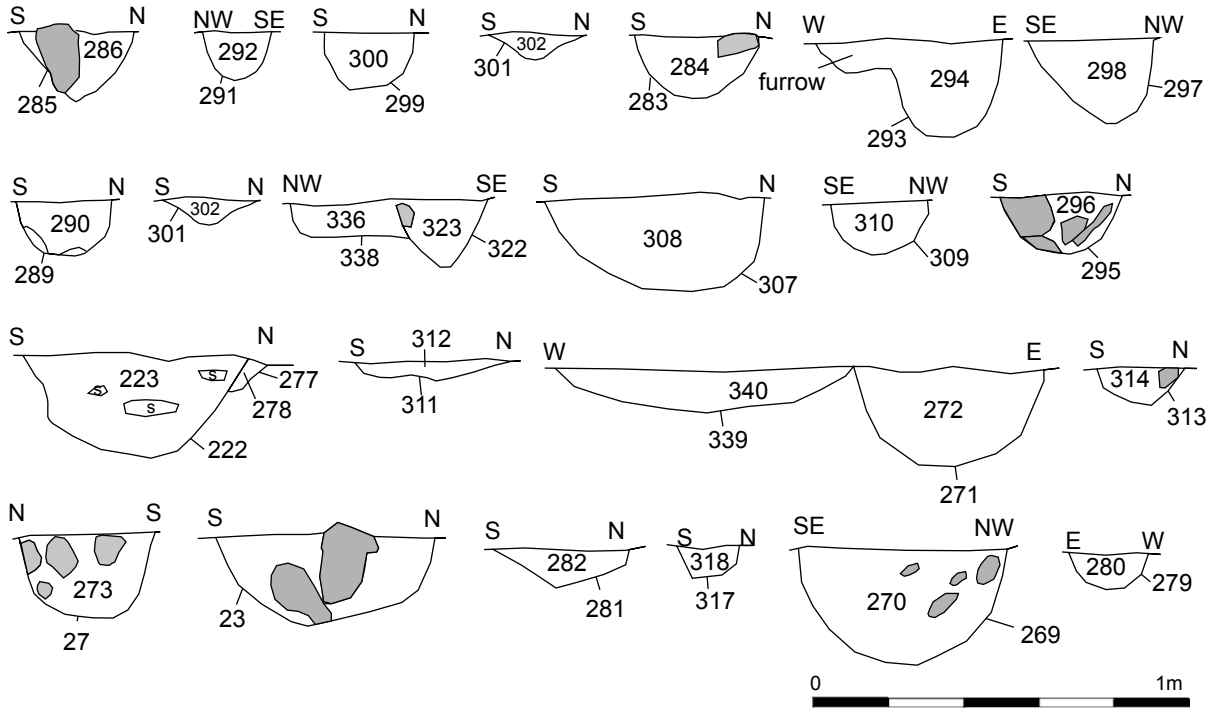

Figure 23: Structure 5 sections through features.

Figure 24: Structure 5 Double cut posthole (348): facing south-west.

Figure 25: Central area of Structure 5 during excavation: facing NNW.

Figure 26: Structure 5 Base of pit (320) punctuated with numerous stakeholes: facing south-east.

Structure 6

(*see* Structures 17 and 18, below)

Structure 7

A complete penannular ditch c. 14 m diameter with an eastern entrance was located downslope of Structure 6 (Figures 2 and 27-31). The ditch (167) averaged 0.60 m in width with a rounded southern terminus (Figure 28) but there was insufficient evidence to substantiate the presence of a similar round terminus to the north of the entrance. A mixed charcoal assemblage, predominantly containing heather and hazel, was recovered from the ditch but it was not dated. It also contained a fragment of iron slag (SF 161), possibly a fragment from the base of a smithing hearth. This and the furnace in Structure 3 were the only evidence of iron working found on the site.

The ditch (167) was truncated in the south to south-west quadrant by the northern arc of a surviving 3 m segment of ditch (588) and the presence of another ditch segment (587) (Figure 30). Ditch (587) merged with (588) and ran adjacent to ditch (167). As (588) curved away from (167) it is thought that it was a separate smaller ditch, but the phasing of the three features is unclear (Figure 29) and there may have been associations with the adjacent Structure 14 (see below).

Four short sections of ditch (491), (494A), (494B) and (496) (Figure 27) were located within the enclosure of Structure 7. From their position and orientation none appear related to it and were probably relics of other structures or features representing different phases of occupation or use. Ditch (494B) survived as a 3.1 m by 0.56 m section to a depth of 0.24 m. A 2.40 m by 0.50 m section of ditch (496) survived east of (494).

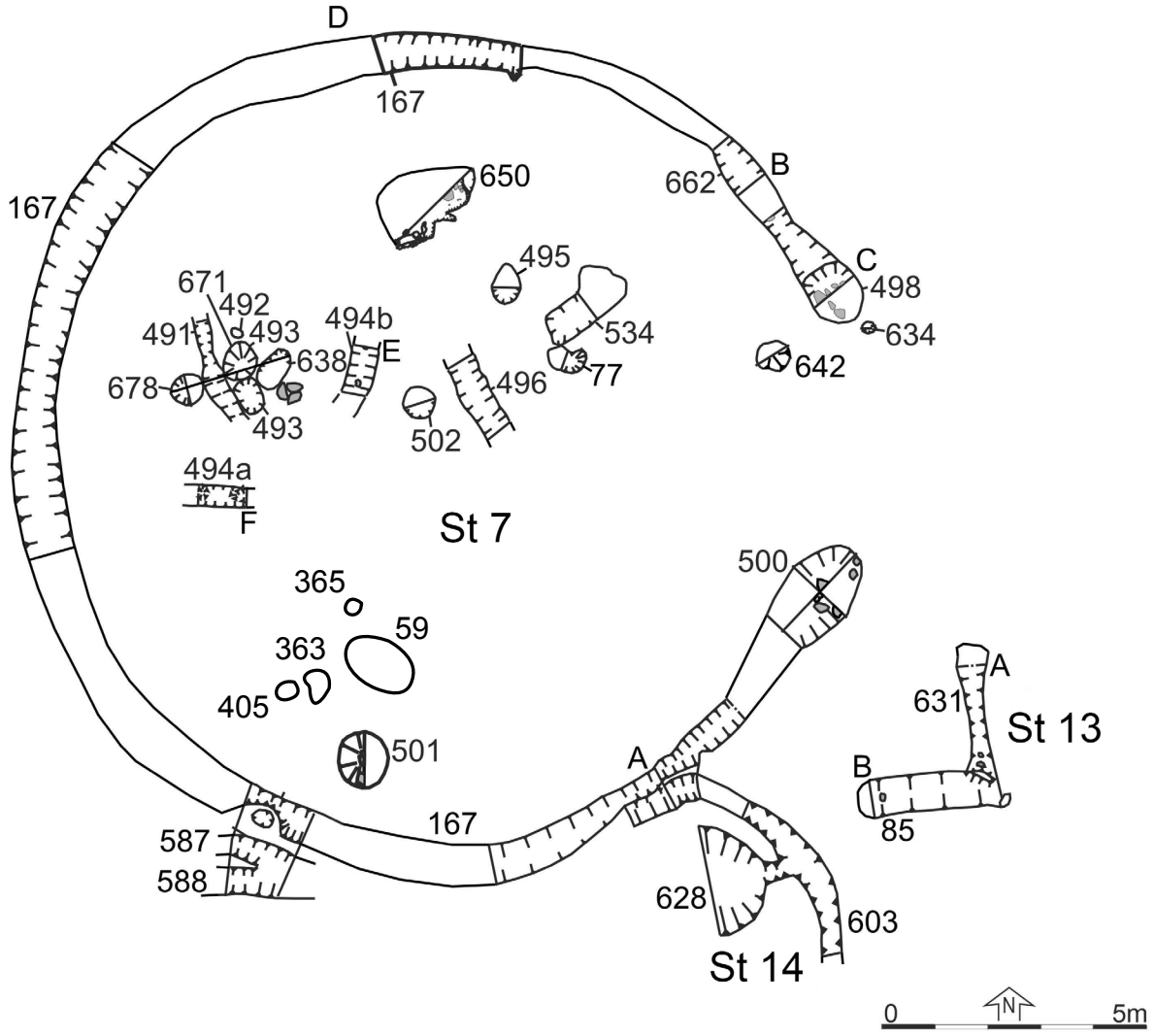

Figure 27: Structure 7 plan with plans of structures 13 and 14

Posthole (502) was located between the ditches. It measured 0.56 m by 0.52 m by 0.25 m. The third ditch segment (491) was located further to the west. It was 2.6 m long by 0.32 m in width and 90 mm in depth. It curved from the north to the east with posthole (678) (Figure 30) 0.5 m in diameter to its exterior and postholes (492), (493), (638) (Figure 31) and (671) to its interior. Posthole (492) was only 0.15 m in diameter; (493) was larger at 0.65 m in diameter and with a depth of 0.25 m; pit (671) was similar in dimensions but shallower, and posthole (638) was slightly larger and deeper than the latter and it contained a small piece of flint (SF 160). Mixed charcoal assemblages, including traces of burnt bone and burnt clay recovered from these features are consistent with domestic occupation but it was not possible to ascertain which phase of use these features related to.

Another feature group comprising of a line of three possible postholes aligned north-west/ south-east lay east of (496), within the enclosure (495), (77), (624) and pit (534). Posthole (502) lay west of ditch segment (496). No dating evidence was obtained from these features and their relationship to features to either side could not be established, suggesting they may all represent different phases of occupation. A short section of possible walling (650) was situated to the north-west of this group. There appeared to be a shallow pit around the stones of the wall, but this may have been the result of erosion or disturbance during ploughing activity. A fragment of 19th/20th century pottery was recovered during cleaning around this feature suggesting it may be a much later in date.

Figure 28: Structure 7 South terminus (500) with ditch 167 extending behind: facing south-west.

Figure 29: Structure 7 Merging ditches (167) (left), (587) (centre) and (588) (right): facing east.

Pit (501) (Figure 30), was located in the south-west quadrant of the roundhouse. Hazel charcoal recovered from within it dated to 31 – 200 cal AD (SUERC-102254), along with yellow clay and stones in its fill. Features (405), (363), (365) and pit (59) lay adjacent to the north-west.

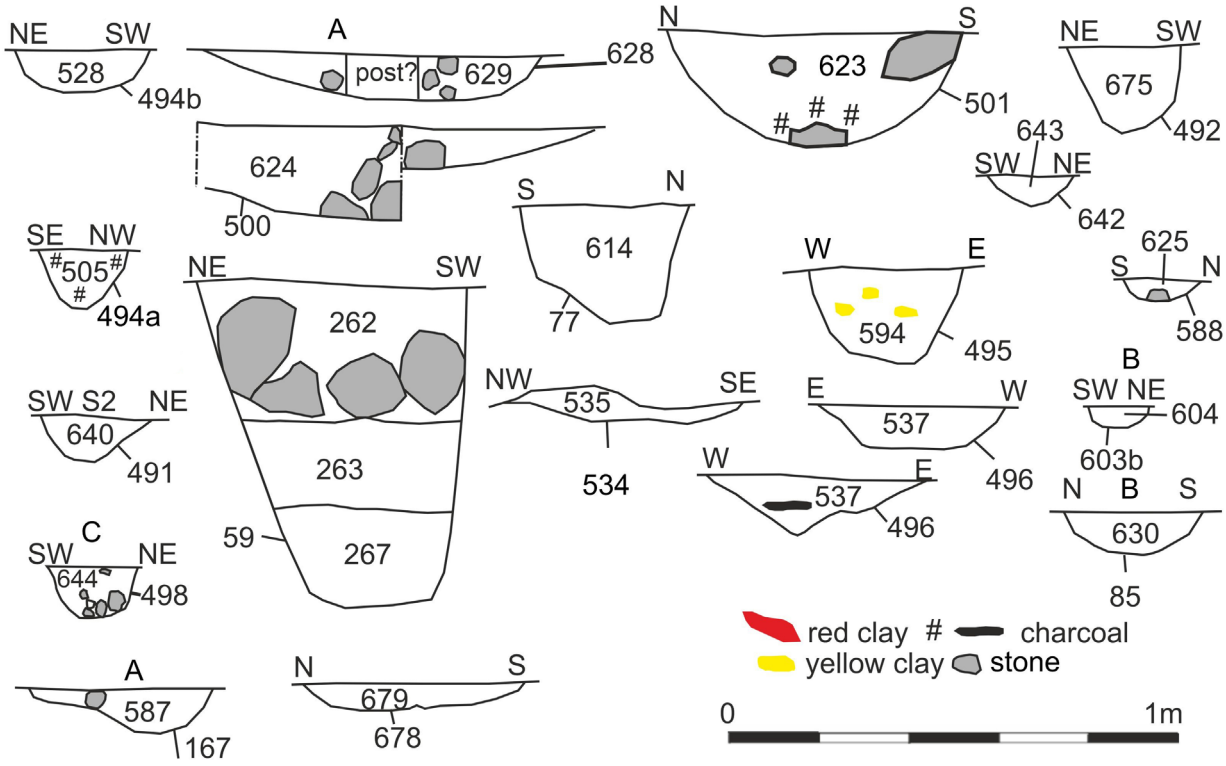

Figure 30: Structures 7, 13 and 14 sections

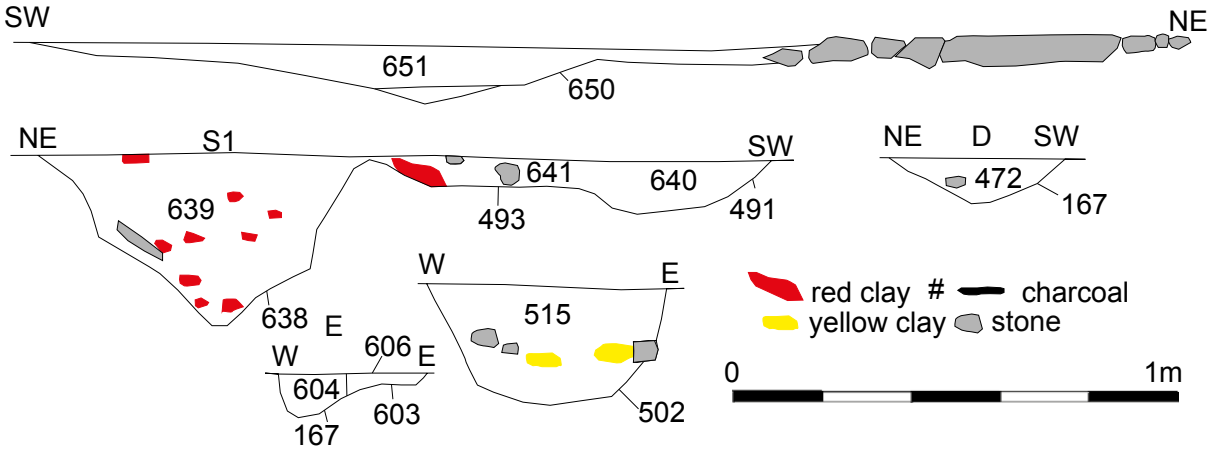

Figure 31: Structures 7, 13 and 14 sections.

Structure 8

Structure 8 comprised four separate curvilinear fragments (81), (88), (1001) and (1026) with associated pits and postholes (Figures 32 to 34). The linear features (81) and (1026) were mostly ditches or gullies with (88) and (1001) possibly the remains of furrows. Feature (81) survived 13.5 m by 0.45 m by 0.21 m. Associated with the ditches are pits (87), (180), (383) and possibly posthole (40) in the west, with posthole (90) in the east. A large pit (1004), possibly a stone hole, was located to the south-west of ditch (81).

The lack of radiocarbon dating evidence for the ditch sections restricts their interpretation, but the only indication of an early medieval or later origin is the presence of oats within the fill of slot (81). Oats were a crop that became more prominent from the later first millennium AD onwards. However, each feature, particularly that of (1001) in the south. may have originated from separate events. Indeed, hazel charcoal from posthole (383) within the arc of (81) dates to 9 – 201 cal AD (SUERC-102196) but emmer wheat grains found in nearby pit (180) suggests the various features may have been prehistoric in date.

This sparsely distributed group of features may therefore represent domestic activity extending from the Iron Age into the early medieval period or later. Given the lack of knowledge of early medieval buildings from lowland eastern Scotland, further dating evidence from the ditches would have been valuable.

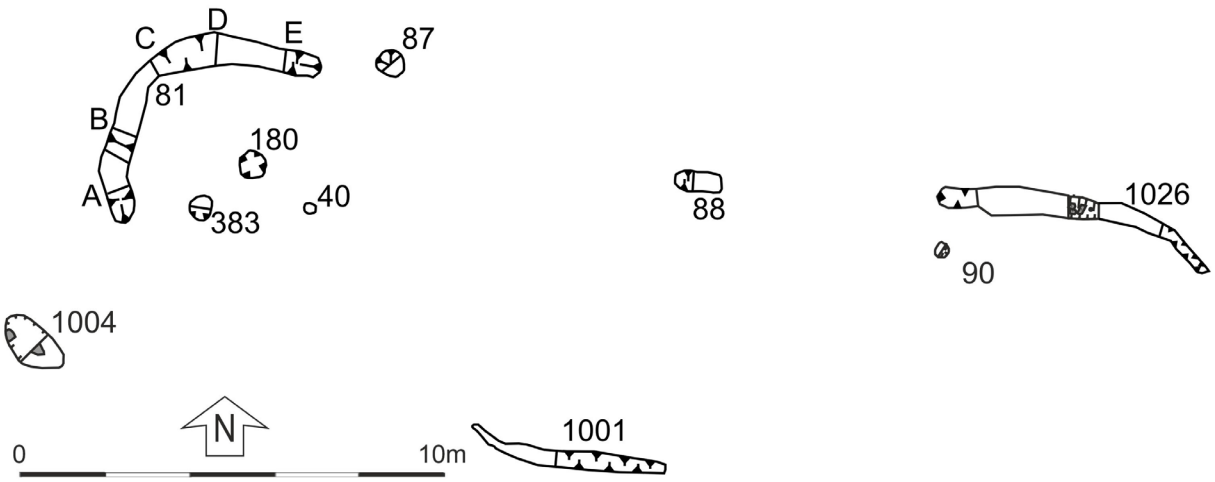

Figure 32: Structure 8 plan.

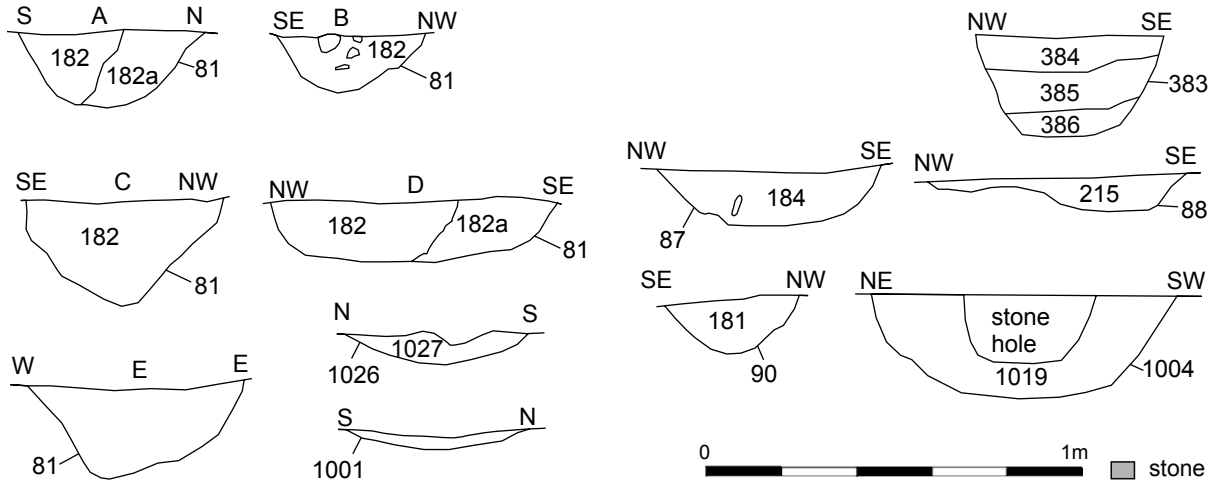

Figure 33: Structure 8 sections.

Figure 34: Structure 8 Overhead drone shot of Structure 8 under excavation.

Structure 9

Structure 9 was characterised by a poorly preserved segment of gully (102) which had been truncated by a large furrow to the north and by the machine or ploughing to the south (Figures 35 and 36). The surviving portion was less than 10 m long by 0.20 m in width and only 30 mm deep. It is considered to be the base of an erosion gully. A few fragments of burnt bone were found within it consistent with domestic refuse indicating this may have been the gully to a small dwelling. A pit, (91), was located to the south-west exterior of the gully. It contained a mixed charcoal assemblage including a few carbonised cereal grains.

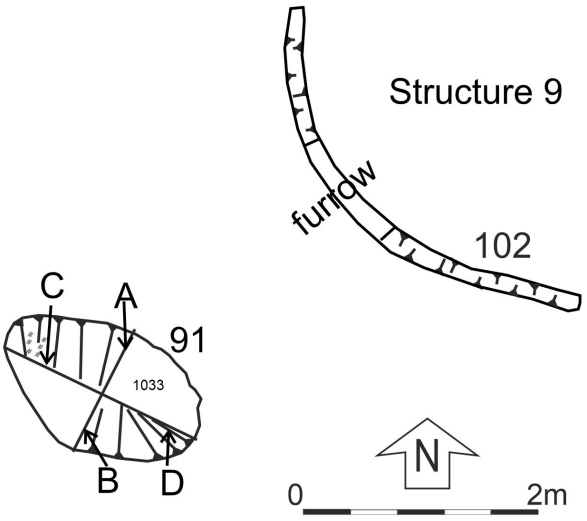

Figure 35: Structure 9 plan.

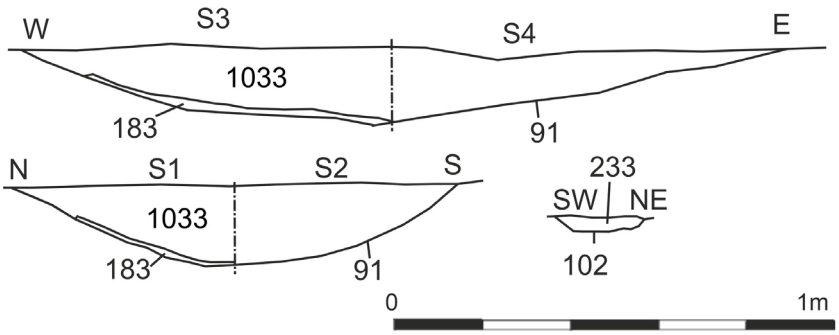

Figure 36: Structure 9 sections.

Structure 10

Fragmentary remains of another ditch or gully were located south of Structures 3 and 8. This feature consisted of a 6.5 m long, 0.35 m wide and 0,15 m deep semi-circular U-shaped ditch (74) open to the north, possibly one surviving half of a circular structure c. 5 m in diameter (Figures 37 and 38). Rounded terminals at each end of it suggest that there may have been opposing entrances to the east and west. There was no evidence of postholes within these termini and only one posthole (75), 0.26 m in diameter and 0.19 m deep, was located within arms of the ditch (Figure 39). Both features (74) and (75) contained charcoal assemblages consistent with domestic refuse. A shallow pit (76) lay outside the ditch and measured 0.91 m by 0.66 m by 0.16 m. It contained a mixed charcoal assemblage and may have been the remains of a hearth. Radiocarbon dates from the ditch (50 cal BC – 72 cal AD) (SUERC-102201) and pit (76) (32 cal BC – 124 cal AD) (SUERC-102195) overlap.

A loose group of four features were situated to the north-east between Structure 8 and ditch (74). Two of these features were postholes (216) and (92), and two were pits (376) and (1004).

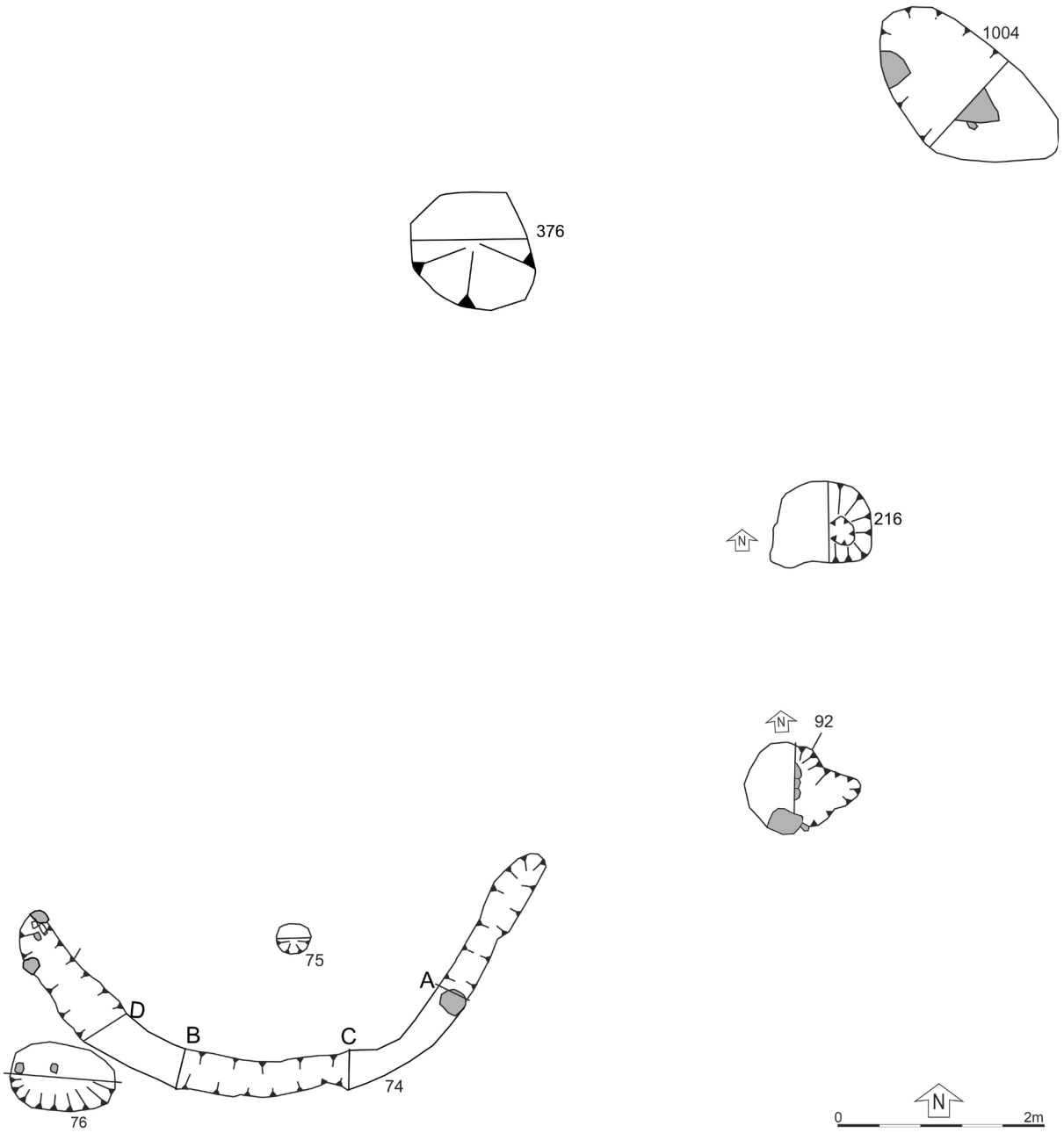

Figure 37: Structure 10 plan.

The latter lay closer to Structure 8. Posthole (92) measured 0.54 m by 0.77 m by 0.21 m and (216) was situated 2 m to the north. It was of a similar size but deeper at 0.37 m with a step down to its narrow 0.19 m base. Oval pit (1004) lay further to the north and measured 1.6 m by 0.85 m by 0.25 m. Willow charcoal located within it was dated to 79 – 219 cal AD (SUERC-102190) suggesting it was contemporary with Structure 10 and possibly activities associated with Structure 8. Traces of grain and wild plant seeds within the pit could indicate it was used for drying crops or grain processing.

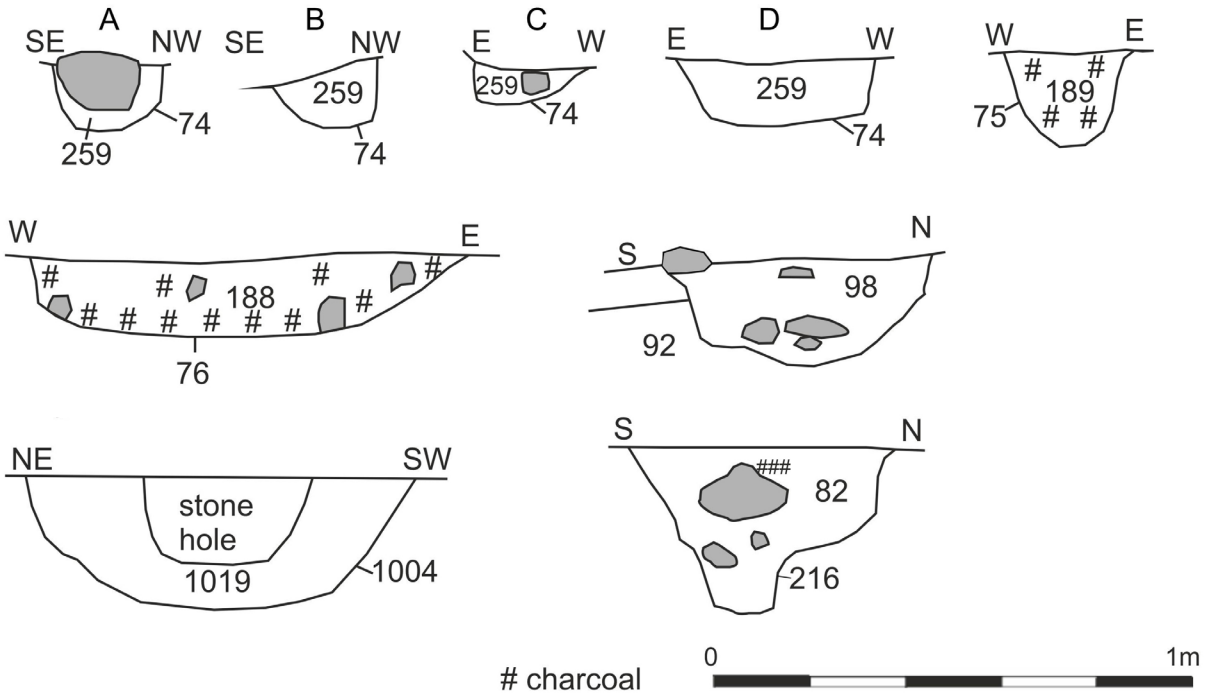

Figure 38: Structure 10 sections.

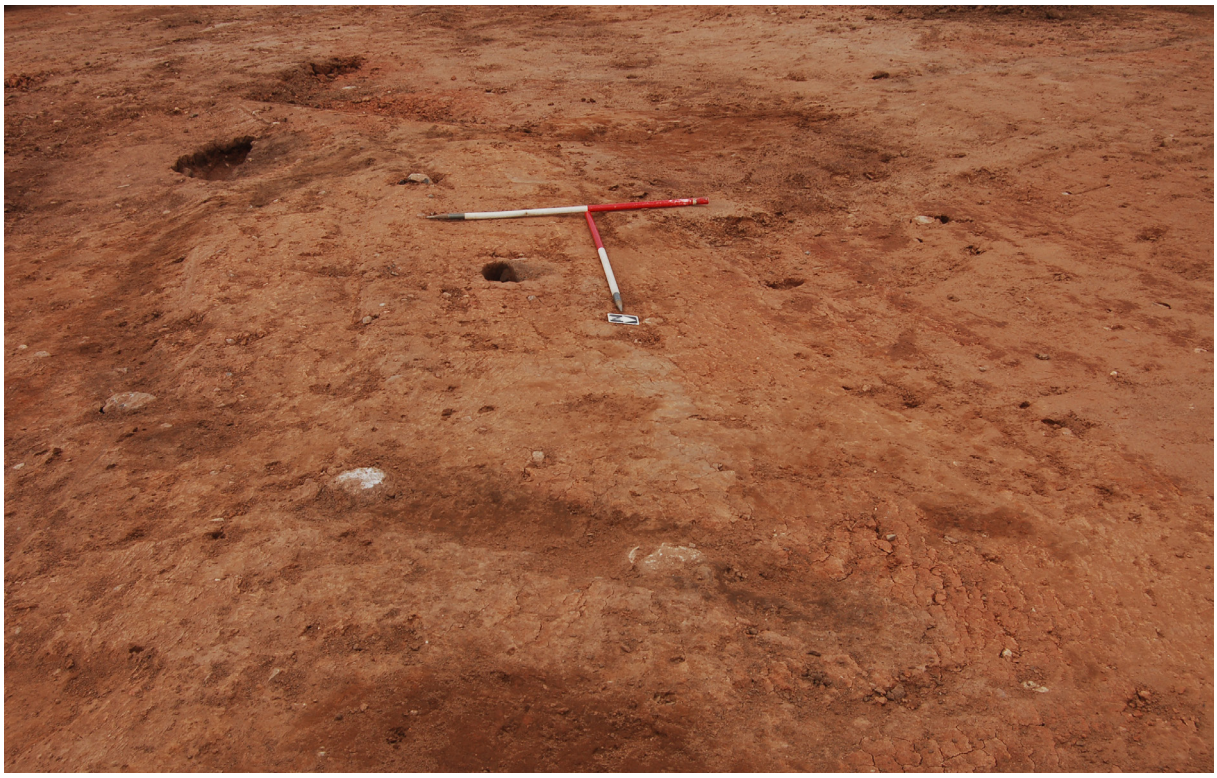

Figure 39: Structure 10 Surviving arc of ditch (74) prior to excavation with posthole (75) in the centre of the frame: facing west.

Structure 11

Structure 11 comprised several groups of features that probably relate to at least three separate constructions or events (Figures 40 and 41). None of these structures were dated, but they may well have been part of the Iron Age settlement. Structure 11A was an arc of ditch (69), forming approximately a quarter of a small circular structure. The ditch was U-shaped and survived with a maximum width of 0.35 m and a depth of 0.13 m with a rounded terminus to the west (Figure 42), indicating a possible entrance. No internal structures were associated with this ditch, but it was found in loose association with four groups of features and two outlying shallow pits, (80) to the south-east and (86) to the east.

Three lines of features, groups 1, 2 and 3 were found to the east of ditch (69). Group 1, to the south-east, comprised three possible postholes, (474) was 0.60 m in diameter and 0.35 m deep, with some packing stones, (476) and (485) were smaller and shallower. Group 2 contained two postholes, (68) measured 0.55 m by 0.40 m by 0.30 m and contained possible packing stones as well as charcoal, and (478) was similarly sized and with a similar fill. Hearth (70) was situated between then. It measured 1 m by 0.85 m and survived 0.2 m in depth with ash lenses and stone in its filling (Figure 43). The third group, slightly to the north-east of ditch (69) comprised postholes (224), (228) and (621), averaging 0.45 m in diameter by 0.2 m in depth, with a possible angled and smaller posthole (226) and a shallow pebble-lined pit or hearth (67) (Figure 44). These three groups of features appear to be parallel features, with a post positioned either side of a possible hearth or fire-pit. The recovery of a large number of cereal grains from within pit (70) indicates that it may also have been associated with the drying and storing of grain.

The last group of features, further to the east, were predominantly postholes (78), (79), (86), (480) and (481) with the addition of a small pit (275) east of Structure 11B. Postholes (78), (79), (480) and (481) varied in diameter from 0.35 m to 0.60 m and between 0.15 m and 0.2 m in depth; (86) was shallower at 50 mm. These features did not show any distinct pattern, although the excavator thought they could be interpreted as a four-poster structure. Alternatively, an east-west linear arrangement of postholes (480), (481) with (86), or (78), (79) and (86) aligned NE/SW is also a possibility. These features were not dated.

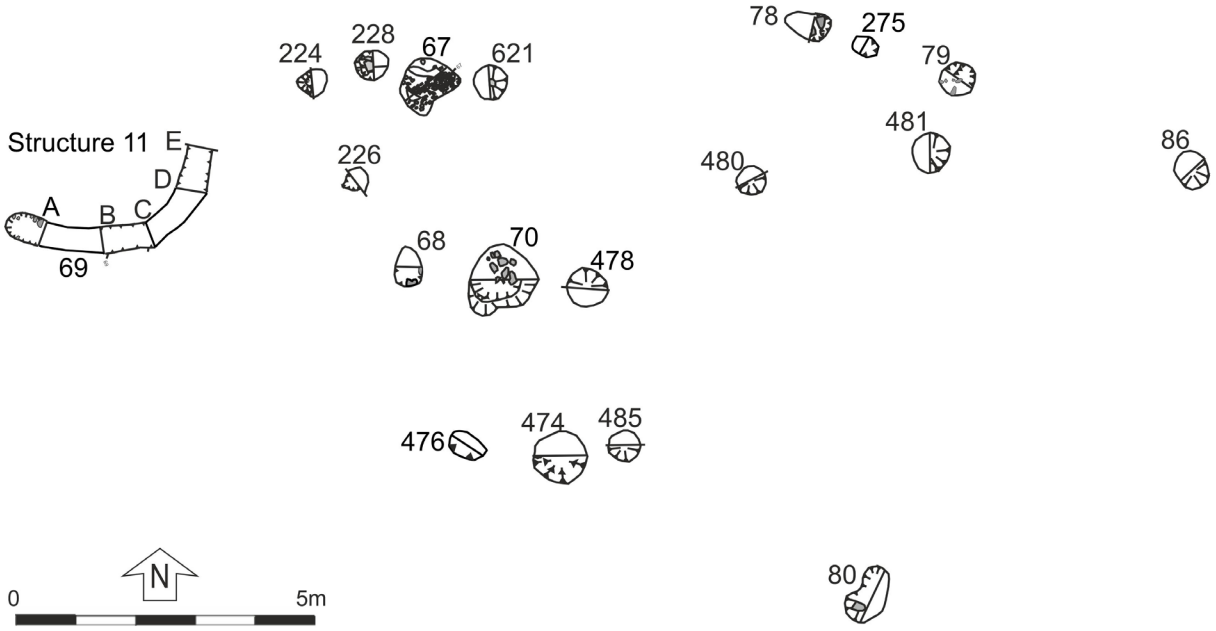

Figure 40: Structure 11 plan.

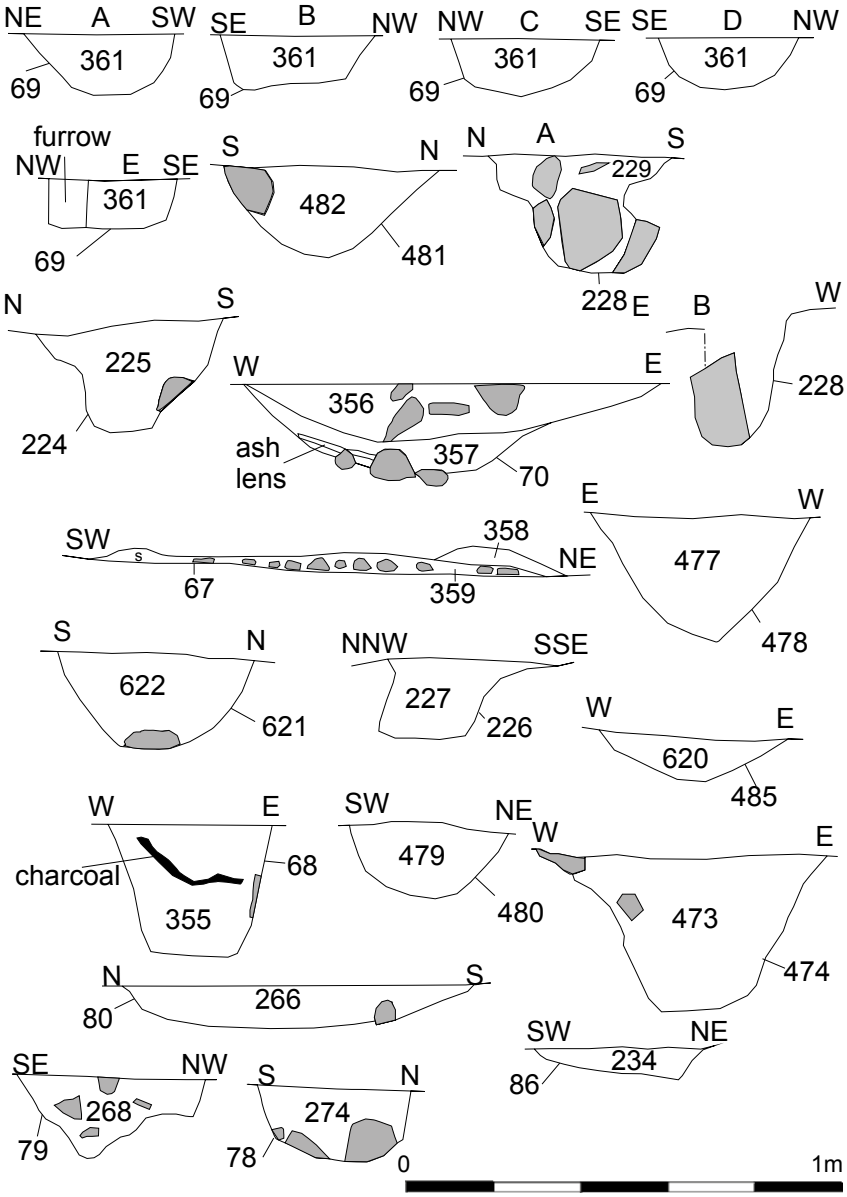

Figure 41: Structure 11 sections.

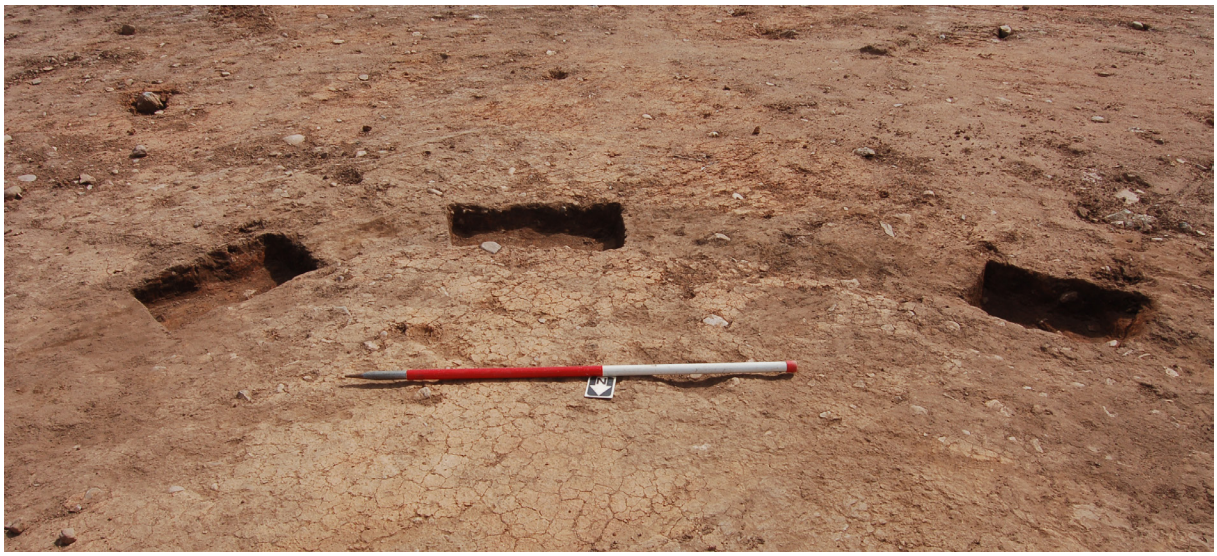

Figure 42: Structure 11 Arc of ditch (69): facing south.

Figure 43: Structure 11 South-east facing section of hearth feature 70: facing north-west.

Figure 44: Structure 11 Pebble-lined pit 67 partially excavated: facing north-west.

Structure 12

The southern half of a large-arcing ditch or gully was preserved to the north of Structure 5 (Figures 45 and 46). Ditch (53) survived as U-shaped feature 0.6 m wide and 0.1 m deep, open to the north and north-east. The eastern end of it was dug through by pit (591).

The pit (591) was filled with stones which could have been packing material for a post, but given the size (c. 2.3 m diameter 0.28 m) of the feature this seems unlikely. It was also cut by a small posthole (626). Two further truncated segments of ditch (53A) and (762) were located externally to the south-east quadrant of (53) (Figure 2). The upper part of (53A) and the adjacent ditch (53) was perforated by stakeholes with no detectable pattern to their distribution. A further four stakeholes were found in pit (591). These appeared to be paired: two stakeholes placed at the intersection with the ditch and two at the north-eastern end of the pit. Willow charcoal from ditch (53) was dated between 28 – 206 cal AD (SUERC-102186) indicating that Structure 12 and at least one phase of adjacent Structure 5, were broadly contemporary. A sherd of abraded pottery and several lithics were recovered from within (53) suggesting nearby domestic activities.

Few features interior to the curve of the ditch were preserved. Posthole (38) was off-centre to the ditch, with a pit (636) with a large central stone lay to the west. A further posthole (681) and pit (654) were located in the north-west, but these features could have been associated with Structure 6 to the north. Both (681) and (654) were cut by stakeholes.

Structure 13

Two short segments of ditch, located to the south-east of Structure 7 (Figures 27 and 30) were designated as Structure 13, but may represent two separate structures. Ditch (85) was aligned approximately east/west and it was 2 m in length, 0.56 m in width and 0.16 m in depth. It was cut by a north/south ditch (631) at its east end (Figure 47). This latter ditch was c. 2 m in length, up to 0.48 m in width and 0.10 m in depth. A sample taken from a fill of (631) contained heather type charcoal together with traces of birch and oak charcoal and a single oat grain. A mixed birch, hazel and heather type charcoal assemblage was identified from the fill of (85) with hazel charcoal providing a radiocarbon date of 386 – 205 cal BC (SUERC-102252), one of the earliest dates from the settlement.

Structure 14

Structure 14, a 5 m long segment of curved ditch (603), 0.45 m wide and 0.18 m deep, arced around a c. 1.6 m diameter pit/posthole (628) to its west, and abutted Structure 13 (Figures 27, 30 and 31). Pit/posthole (628) was located almost central to the surviving ditch, close to its curved interior edge (Figure 48). It contained the remains of a central post-pipe surrounded by packing stones. The feature contained significant amounts of heather type charcoal, and traces of carbonised barley along with two lithics. Hazel charcoal from the fill of the pit/posthole (628) yielded a radiocarbon date of 39 cal BC – 120 cal AD (SUERC-102253), significantly later than Structure 13 but contemporary with some interior features of Structure 7.

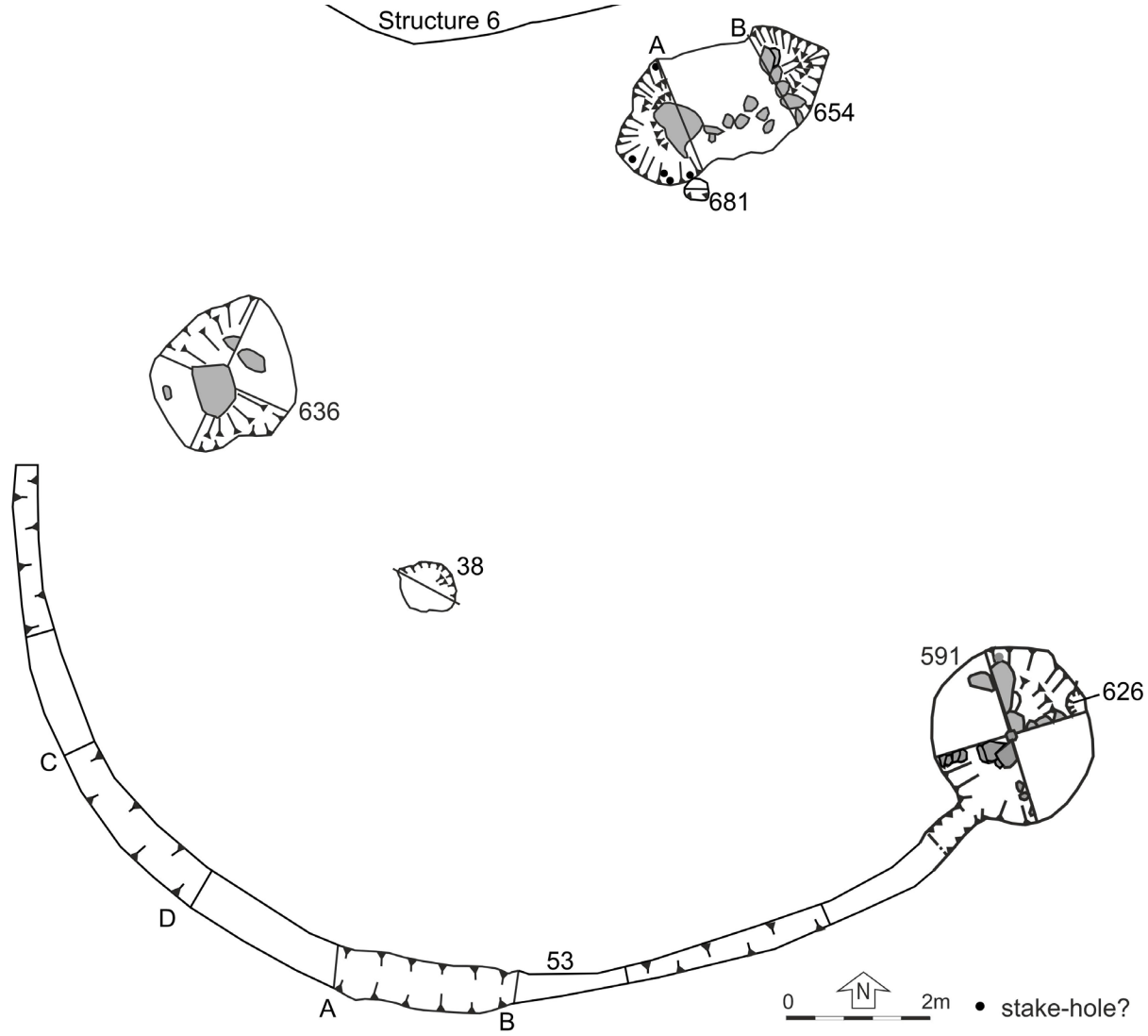

Figure 45: Structure 12 plan.

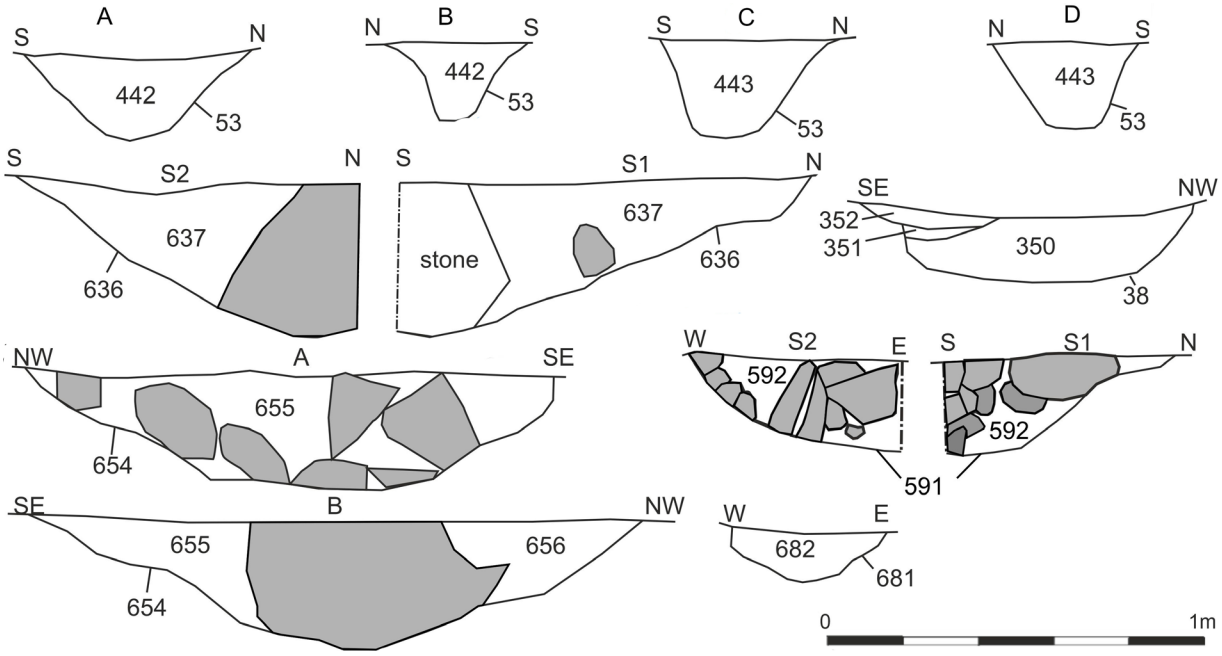

Figure 46: Structure 12 sections.

Figure 47: Structure 13 Intersection of ditches (85) (left) and (631) (right): facing west.

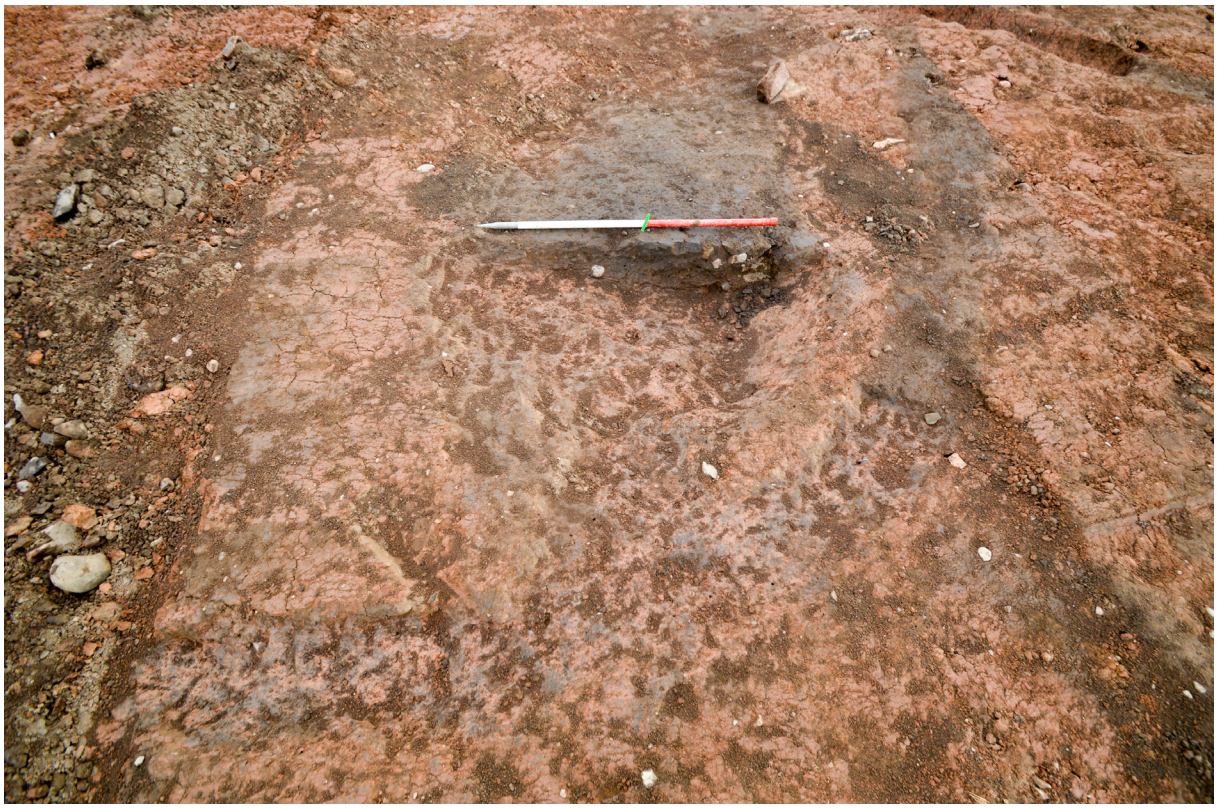

Figure 48: Structure 14 Posthole (628) flanked by cuts of furrows with curving ditch (603) in foreground: facing north.

Structure 15

A semi-circular segment of ditch (1029=75) was located between Structures 7 and 16 indicating a diameter of 5.5 m, width of 0.3 m to 0.6 m and depth of 0.12 m (Figures 49 and 50) but it was truncated at both ends. A group of postholes were located c. 6 m to 10 m north-west of the ditch (1029). Postholes (798) and (802) were the westernmost features, with a 0.75 m by 0.5 m by 0.37 m pit (429) to their east that contained packing stones. Posthole (798) was c. 0.35 m in diameter by 0.2 m in depth. It was cut by (802) which measured 0.6 m by 0.35 by 0.3 m. Further east were three shallow and similar sized postholes (595), (782) and (784) that formed a line running NE/SW.

Hazel charcoal obtained from feature (784) was dated to 65 – 205 cal AD (SUERC-102250) and charcoal from (595) was dated between 90 cal BC – 65 cal AD (SUERC-102251). No date was obtained for ditch (1029).

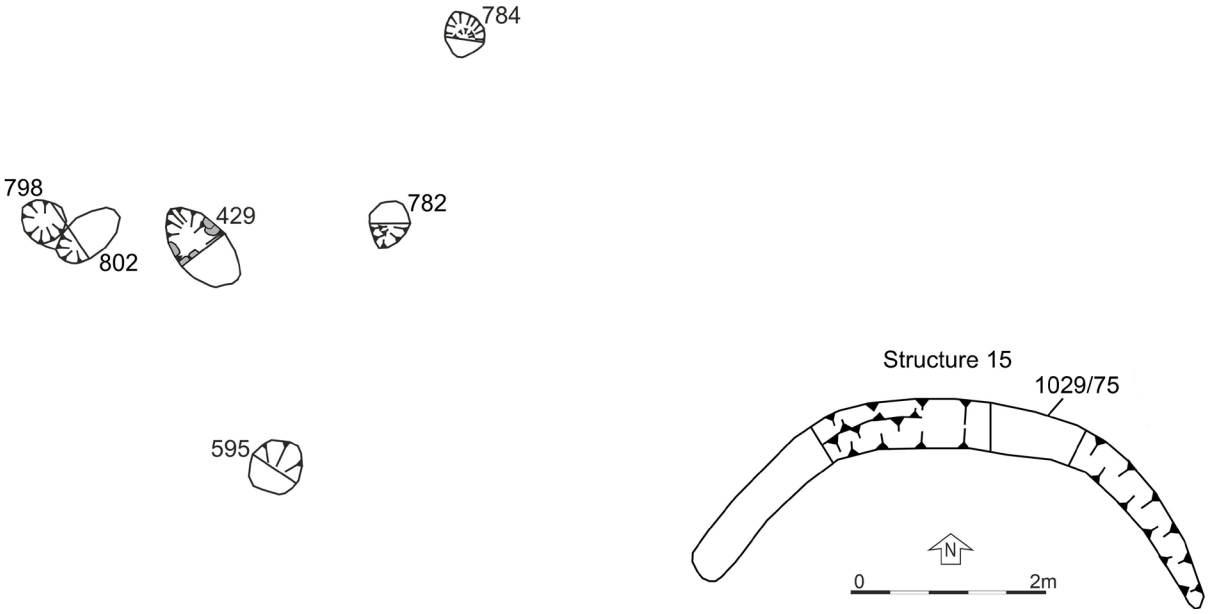

Figure 49: Structure 15 plan.

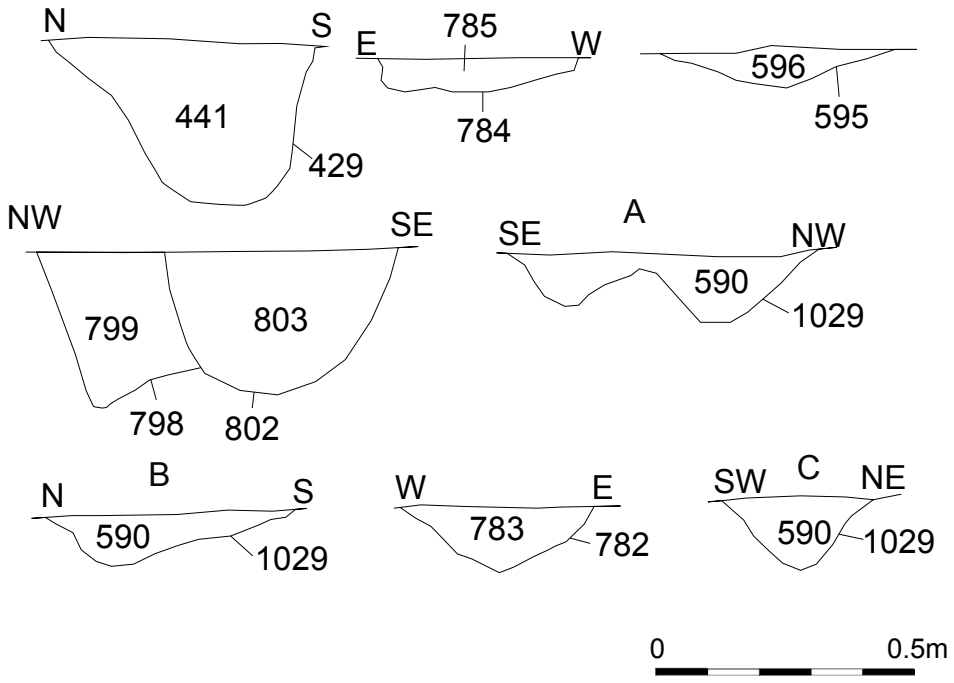

Figure 50: Structure 15 sections.

Structure 16

Two discontinuous curving ditch sections (426) and (751) were located on sloping ground north-west of Structure 15 (Figures 51 and 52). The width and shape of the ditches, (426) was 0.5 m wide and 0.17 m deep and (751) was 0.35 m wide and 80 mm deep, suggests they are two separate structures. The latter ditch had evidence of a stakehole and a pit (142) at its north end. A large pit (669) was located at the north end of (426) and measured 0.95 m in diameter by 0.45 m in depth, and willow charcoal recovered from it was dated to 32 cal BC – 125 cal AD (SUERC-102211). A posthole (520) was located to the north end of (751). Its fills were rich in willow, birch and hazel charcoal. A quantity of burnt daub was also present, both indicators of wattle structures.

Two pits (666), (776) and a shallow feature (778) were located in the area between the ditches. Birch charcoal recovered from pit (666) was dated to 344 – 53 cal BC (SUERC-102259) and pit (776) to 345– 53 cal BC (SUERC-102208) indicating these features were contemporary with each other, but perhaps earlier than the adjacent ditch. Another shallow feature (755) lay to the west of ditch (751), and to the south of the latter was another isolated pit (749) with no material cultural evidence. These two features lay between Structures 16 and 20.

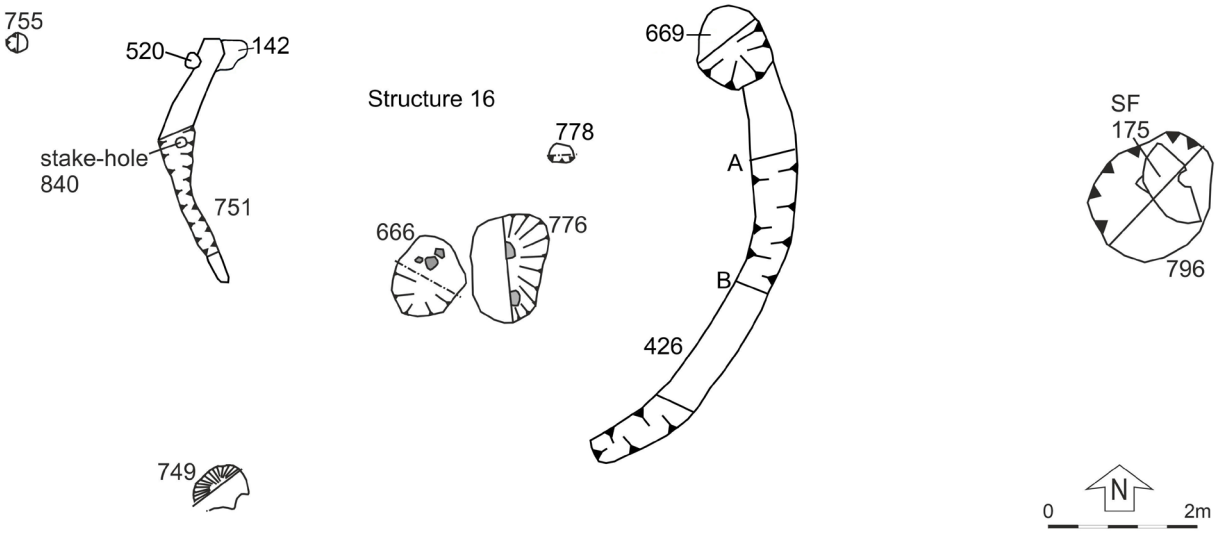

Figure 51: Structure 16 plan.

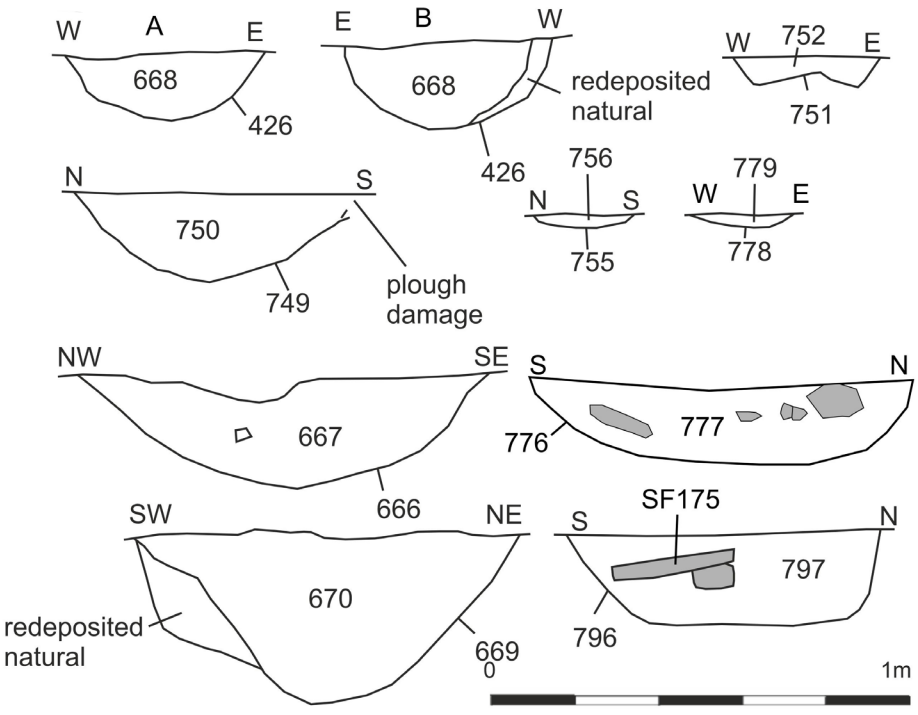

Figure 52: Structure 16 sections.

An isolated pit (796), located approximately 4 m east of ditch (426), contained the broken upper half of a rotary quern (Figure 53). It had broken at the eye and its surface was worn. Hazel charcoal recovered from the fill of the pit was dated to 68 – 212 cal AD (SUERC-102210). Deliberate burial of querns was common during the period (Strachan 2013, 105) and examples have been found at Clarkly Hill, Moray (Hunter 2012, 123).

Figure 53: Structure 16 with partially excavated rotary quern within pit (769): facing west.

Structures 6, 17 and 18

At least two overlapping structures were located between west of possible roundhouse 7 (Figures 54-57). All were partially defined by basal remains of ditch or gully segments. Ditch segments (415), (516) and (427) with eastern terminal pit (419) (Figure 55), are considered to be contemporary and form the discontinuous outline of a single round structure, Structure 6/18, c. 15 m in diameter. A short arc of ditch in the south-west (Figure 2), external to ditches (516) and (427) may indicate an alteration or a later or earlier structure overlapped the Structure 6 footprint. Ditch (444), lying immediately south of ditch (415), together with pit (417), are also interpreted as separate Structure 17 (see below).

Taken together, ditch (415) the northern arc, with (427) the southern arc, enclosed an area c. 18 m in diameter with a wide eastern entrance marked by pits (417) and (419) that were c. 5 m apart. The former (417) in the north was significantly larger than (419) to the south (Figure 56). Domestic items were recovered from both pits, including a fragment of saddle quern, a hammer stone, a grinder and several lithics. A significant amount of willow roundwood charcoal was recovered from ditch (427) suggesting the use of wicker there.

Little evidence of internal post-rings survived although an arc of four bases of postholes (511), (512), (513), (514) and one deeper posthole (130), 0.09 m to 0.56 m diameter were located in the south-west quadrant of Structure 6/18, along with (813/815). It seems unlikely that these remains, apart from (130) could have supported a roof. Willow charcoal from posthole (512) was dated to 361 – 168 cal BC (SUERC-102248), the middle Iron Age

Structure 17 lay within Structure 6/18. Three segments of ditch (444), (468) and (428) formed a rough semi-circle, probably the remains of a roundhouse c. 10.5 m in diameter, and like with Structure 6/18, its wide entrance faced east. Pit (168) with its stony fill could have been the southernmost terminal of the ditch associated with Structure 17. Radiocarbon dates obtained from hazel charcoal recovered from ditch (428) (SUERC-102185) and pit (168) (SUERC-102249) were identical at 31 – 209/210 cal AD. The radiocarbon dates also indicate that Structure 17 was erected long after Structure 6/18 fell out of use. A separate ditch (683) segment was located in the north of the features which did not align with either Structure 17 or Structure 6/18. There must have been further unrelated phases of occupation demonstrated by a linear section of ditch (1030) that intersected ditch (421) of Structure 6/18 (Figure 57).

Stakeholes were found in ditch (444) of Structure 17, and like the presence of willow roundwood charcoal in ditch (427), suggests wattle framework or fencing was used with the ditches. A cluster of small postholes was located within the arc of the ditch of Structure 17 (489), (510), (584), (597), (609) and (610) these are considered to relate to internal activities in the structure.

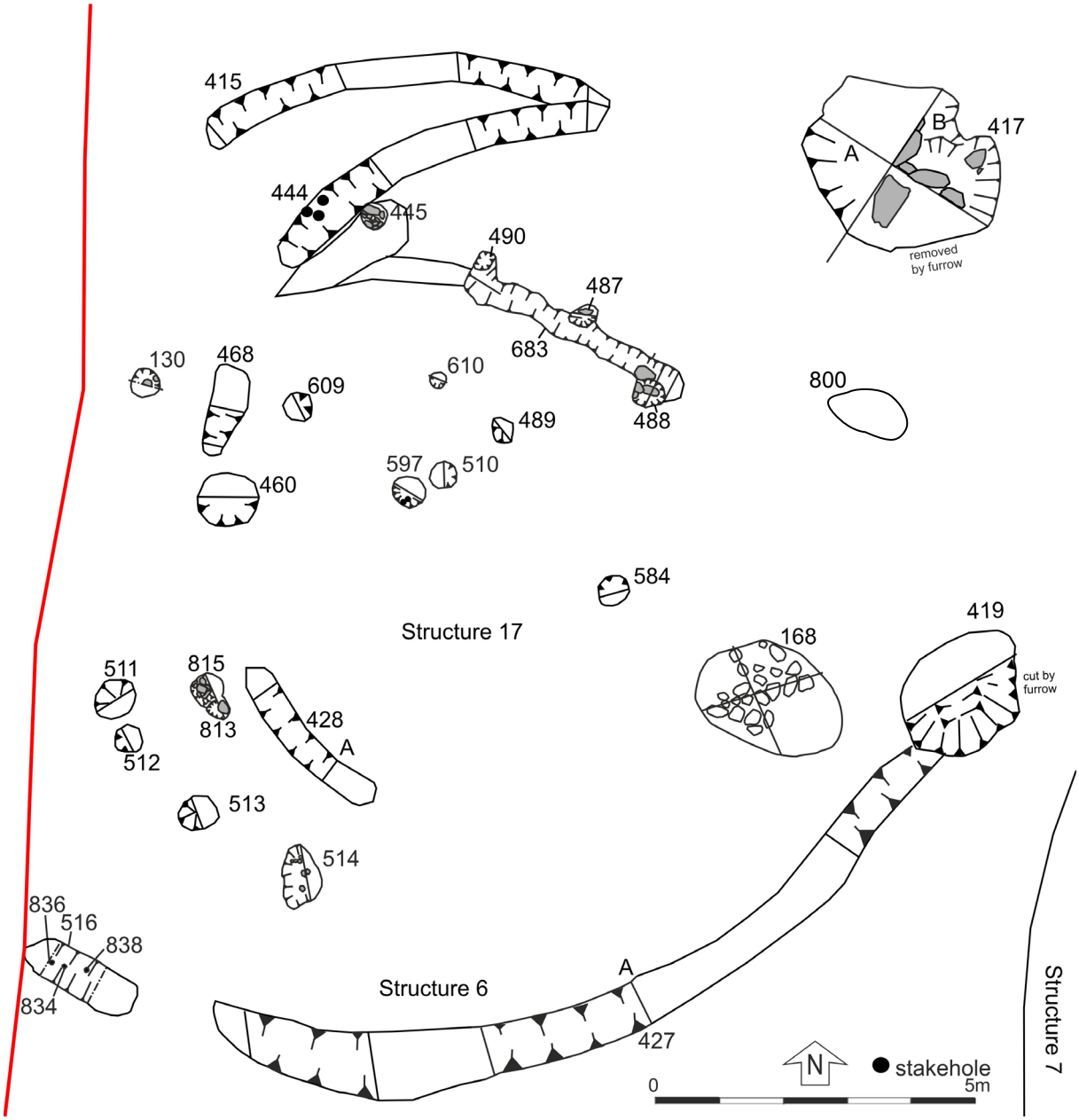

Figure 54: Structure 17 plan.

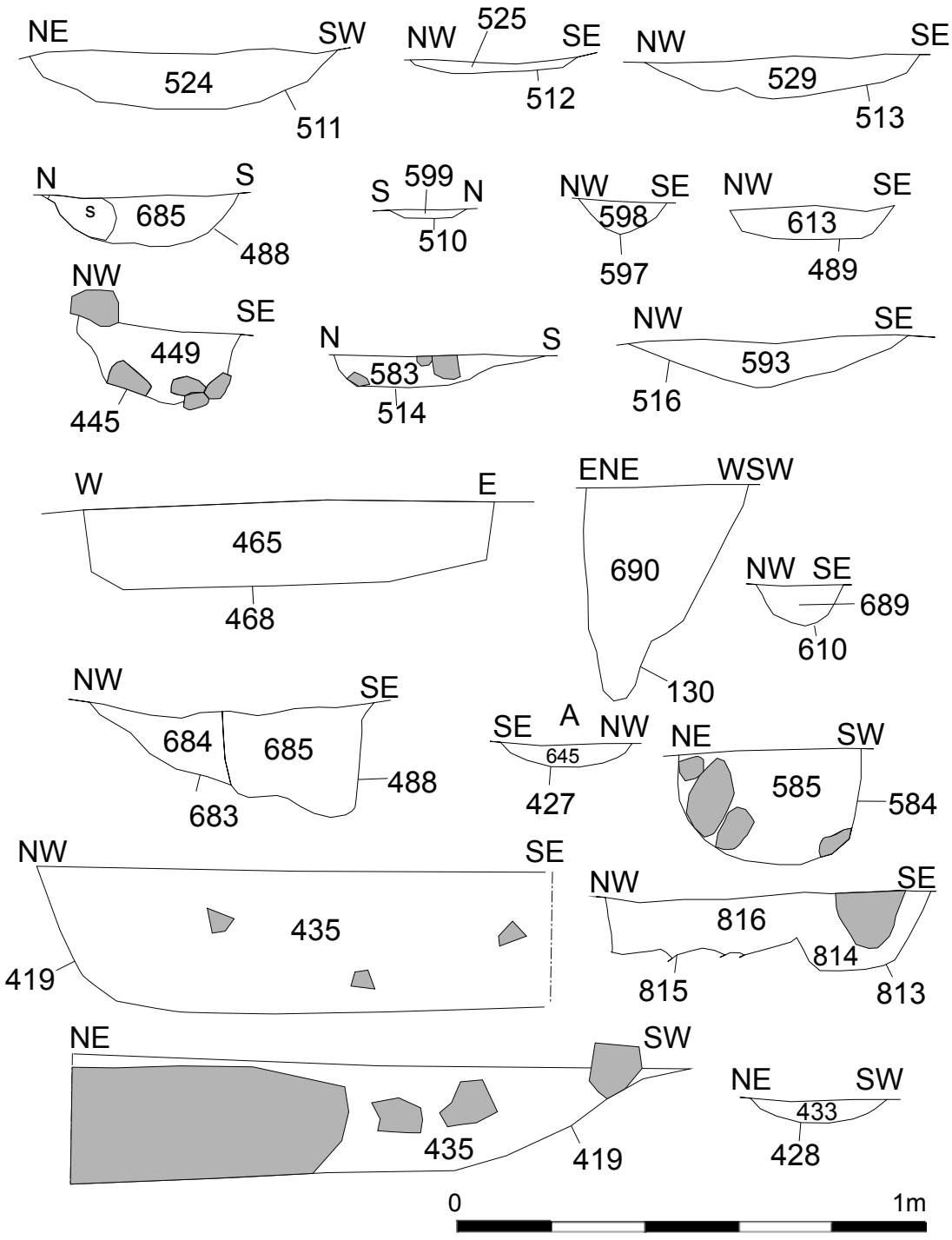

Figure 55: Structure 17 sections.

Figure 56: Structure 17 north facing section through terminal pit (419) with ditch (427)(left): facing south.

Structure 19

Structure 19 was delineated by a truncated segment of curving ditch (422), 0.36 m wide and 0.1 m deep which abutted ditch (421) of possibly Structure 6/18 to the south (Figures 57 and 58). Although two lithics were recovered from (422), they were undiagnostic. Its limited charcoal assemblage recovered represented background scatter from across the whole site.

Structure 20

Two segments of ditch aligned approximately south-east/north-west and less than 2 m apart were categorised as Structure 20: (727) to the north (not illustrated) and (705) to the south (Figure 57). A third segment of ditch (715) was perpendicular to the extended line of (705). Four pits were loosely associated with these ditch segments. Pit (141) to the east of (705), was rich in charcoal and appeared to have been deliberately backfilled and levelled with natural clay (Figures 57 to 59). Alder charcoal yielded a radiocarbon date of 166 cal BC – 2 cal AD (SUERC-102243). The backfilling of this feature suggests further structures were erected in the area of Structure 20 after this date, an event consistent with the general pattern of rebuilding on the site of previous structures seen across the majority of the settlement area at Cruden Bay.

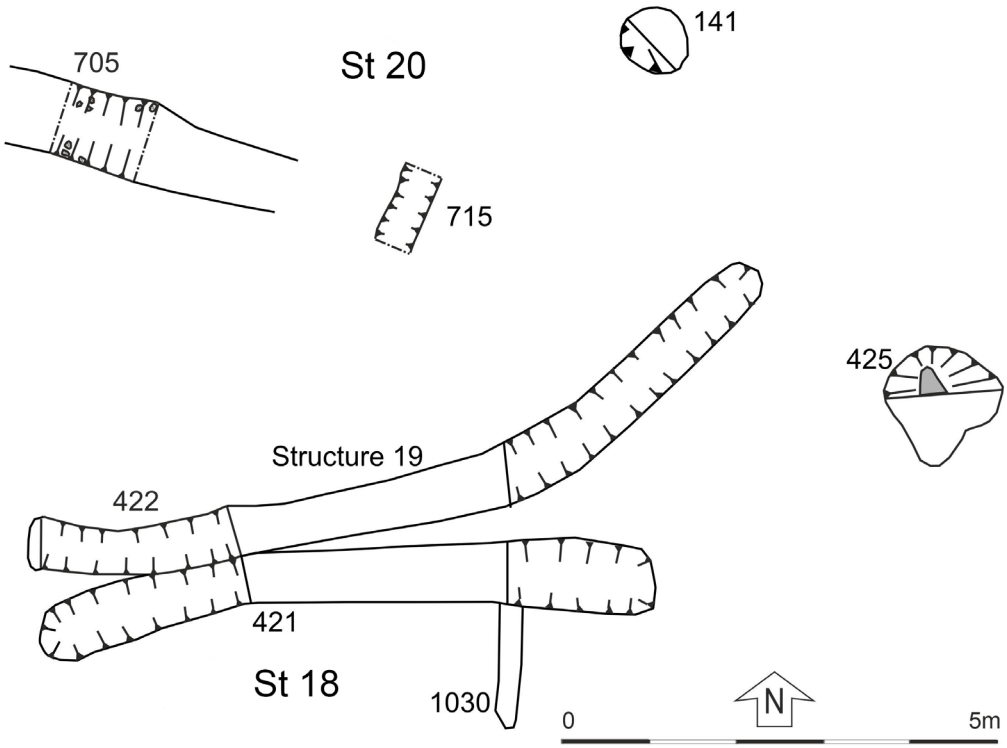

Figure 57: Structures 18, 19 and 20 plan.

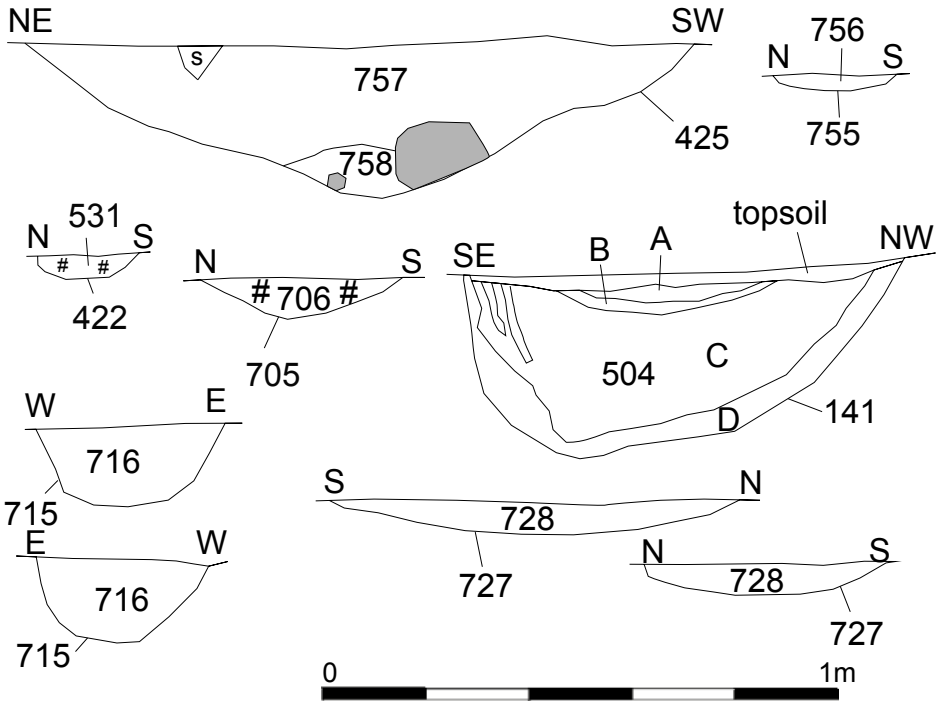

Figure 58: Structures 18, 19 and 20 sections.

Figure 59: Structure 20 north-east facing section through pit (141): facing south-west.

Structure 21

Structures 21, 22 and 23 lay to the north of the main concentration of ditches and other features and were difficult to define (Figures 2, 60 and 61). Structure 21 could be subdivided into three groups of associated features. The westernmost group comprised three slight postholes, (116), (117) and (118) with a possible shallow hearth (120). Mixed charcoal assemblages recovered from the features were consistent with domestic hearth waste.

A line of pits and possible postholes (115), (664), (701), (719), (737), (745), (768), and (780) were aligned NE/SW and located a few metres east of the latter features. A section of ditch (809) was central to the line of features and birch charcoal from it returned a radiocarbon date of 343 – 57 cal BC (SUERC-102207), whilst birch charcoal from hearth (664) was dated to 167 cal BC – 4 cal AD (SUERC-102240). The remains of a truncated pit (701) to the south contained one of the few examples of oak charcoal detected on site. Pit (115) was located at the south-west end of the group and had well preserved stratigraphy. Its upper fill contained a piece of burnt flint and an unworked flint pebble; birch charcoal recovered from it returned a date of 165 cal BC – 8 cal AD (SUERC-102258).

Further features (723), (729) and (747), were situated further east but their degree of preservation was variable. The dating evidence suggests all features grouped as Structure 21 represent activity in the first and second centuries BC, slightly earlier than many of the features to the south.

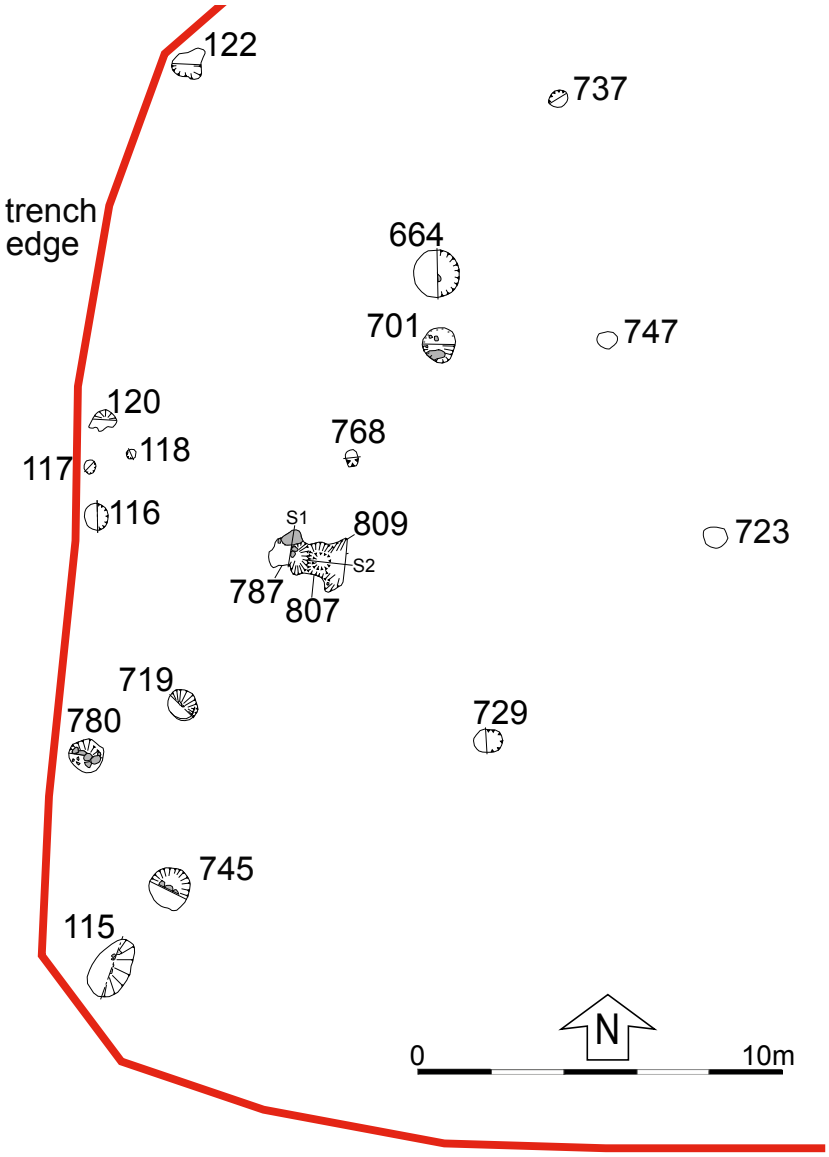

Figure 60: Structure 21 plan.

Structure 22

Structure 22 was situated north-east of Structure 21 and comprised a linear group of postholes (152), (153), (711), (721) and (725) aligned approximately east/west (Figures 62 and 63), with two, (791) and (789), adjoining to the south. The postholes contained mixed charcoal assemblages representative of general domestic activities, but there was no surviving evidence of structural timbers. Hazel charcoal from posthole (153) dated to 170 – 1 cal BC (SUERC-102209). Suggesting some of the features across Structures 21 and 22 were contemporary, and that many of these represented isolated activities.

Structure 23

Structure 23 was located between Structures 21 and 22 (Figures 64 to 66). A 3 m section of ditch (150) was surrounded by four small postholes (145), (148), (149) (Figure 64) and (151), with two loosely associated larger postholes (161) and (164), to the east. Dating evidence indicates that the smaller and larger postholes represent different phases of occupation. Alder charcoal from the fill of (149) dated from 50 cal BC – 76 cal AD (SUERC-102215) whilst birch charcoal from posthole (161) was dated to 196 – 51 cal BC (SUERC-102242). Like Structures 21 and 22, these represent earlier phases of occupation of the site.

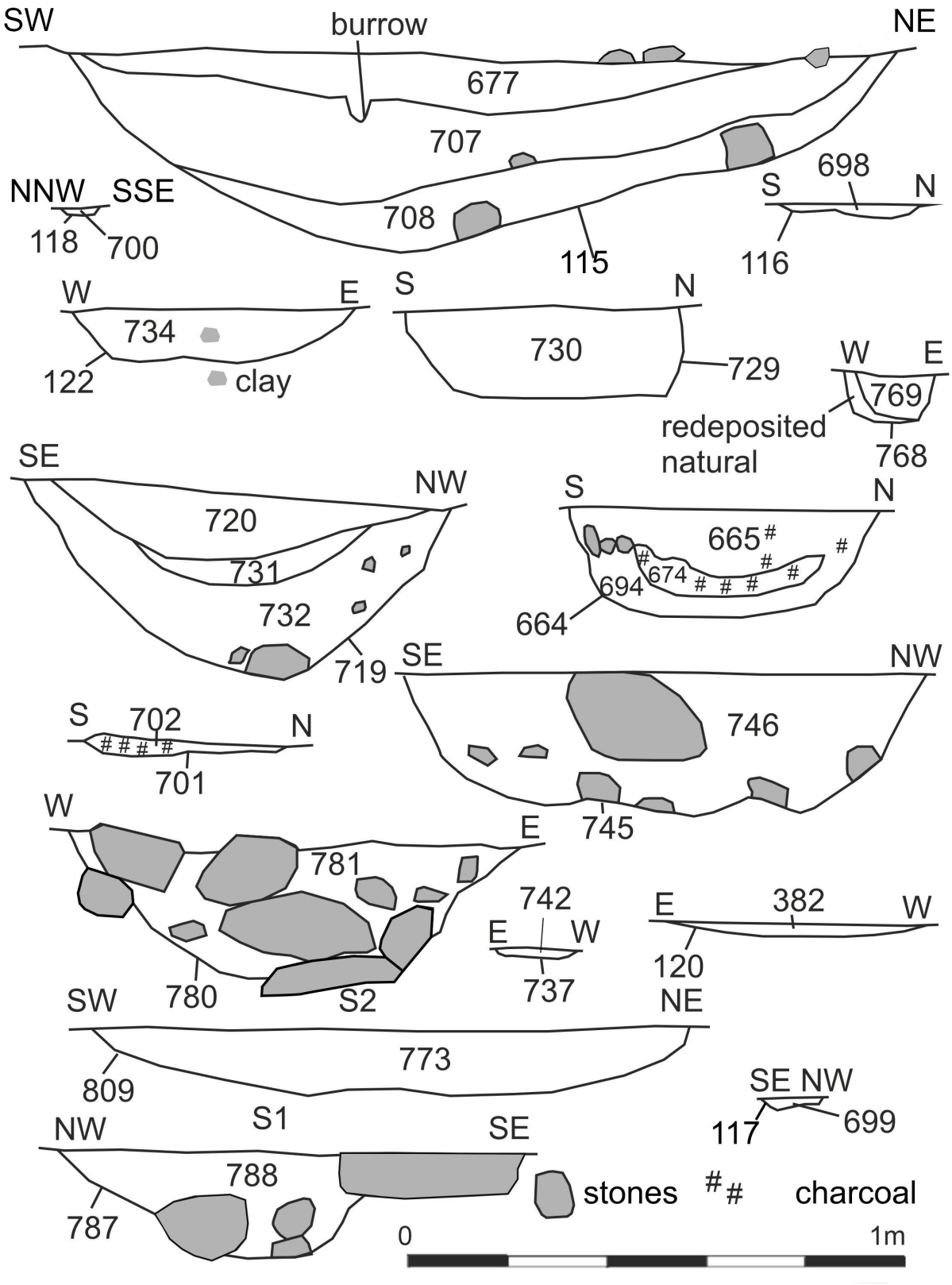

Figure 61: Structure 21 sections.

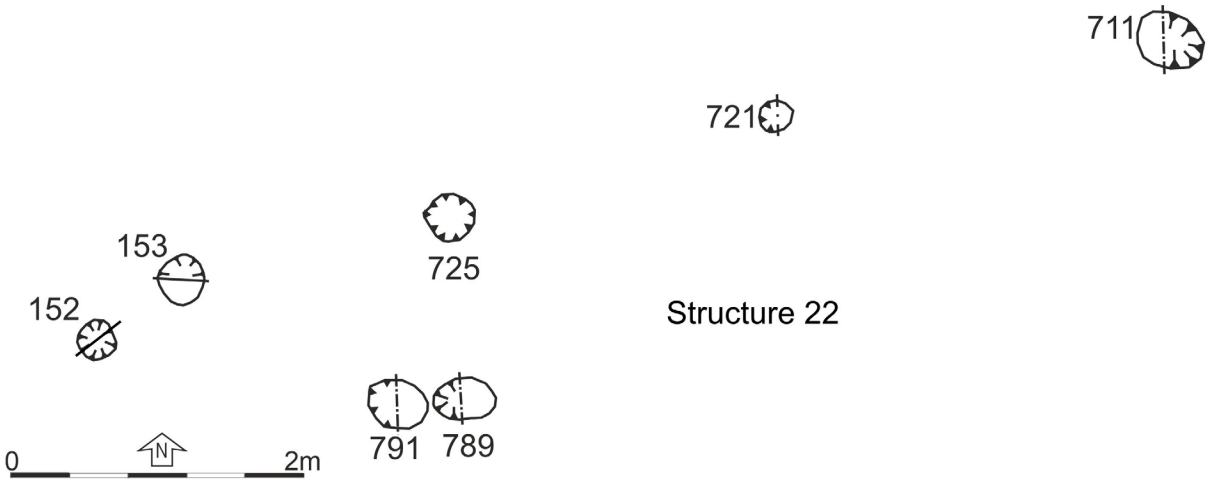

Figure 62: Structure 22 plan.

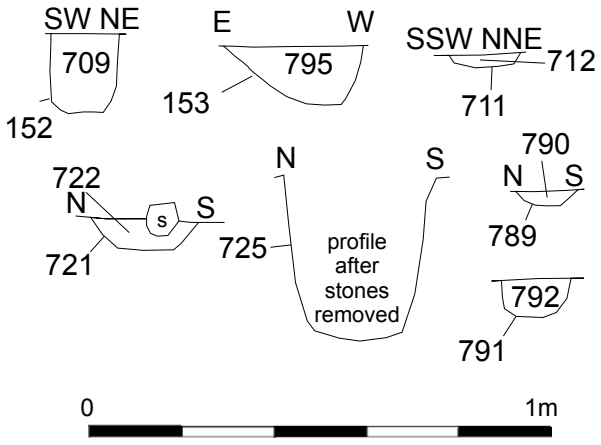

Figure 63: Structure 22 sections.

Figure 64: Structure 22 Plan view of posthole (149) after half sectioning: facing south south-east.

Northern Feature Groups

Further groups of features were located north of Structures 21 and 23 (Figure 2). However, while these features could be roughly arranged into two groups, there were no obvious structural relationships. Environmental analysis of the contents of these groups revealed mixed charcoal assemblages and burnt cereal grains. Pit (125), in the northernmost group of features contained a very mixed charcoal assemblage including oak. A sample of birch charcoal yielded a date of 357 – 113 cal BC (SUERC-102181). However, cereal grains including oats were also present. Cultivation of oats is associated with later periods of occupation so their occurrence alongside charcoal of an earlier date could suggest that some of the charcoal was residual.

A possible kiln (826), heavily truncated in the northernmost features contained mixed charcoals but also a large quantity of carbonised cereal grain. The grains were primarily barley with oats and emmer wheat also present. This mix of grains is perhaps indicative of medieval or later use of this feature.

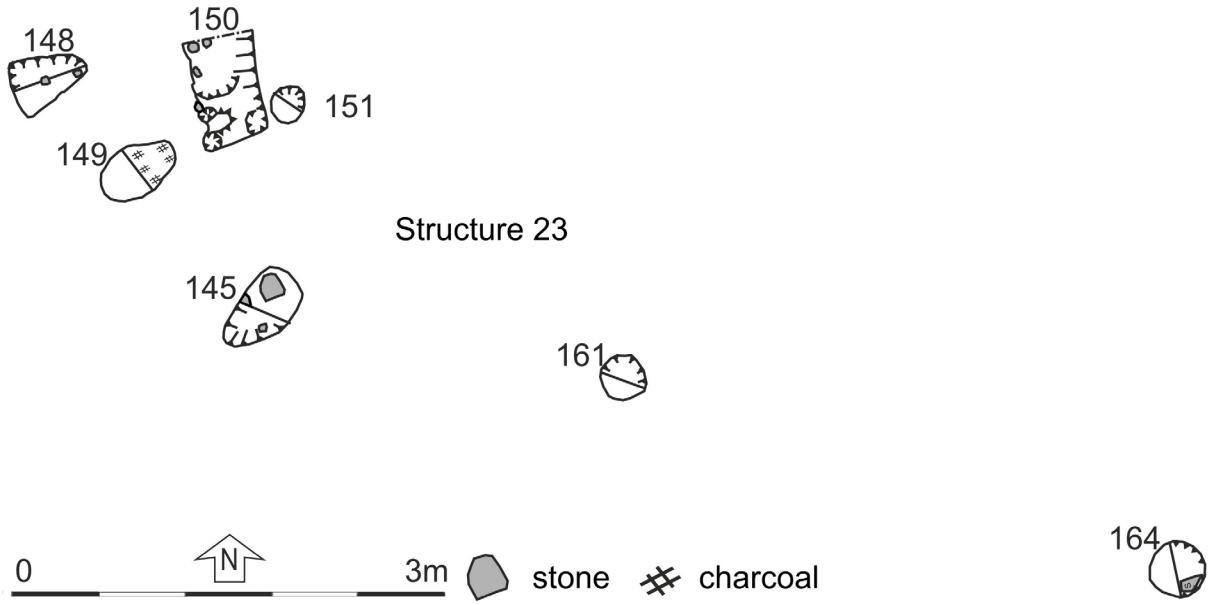

Figure 65: Structure 23 plan.

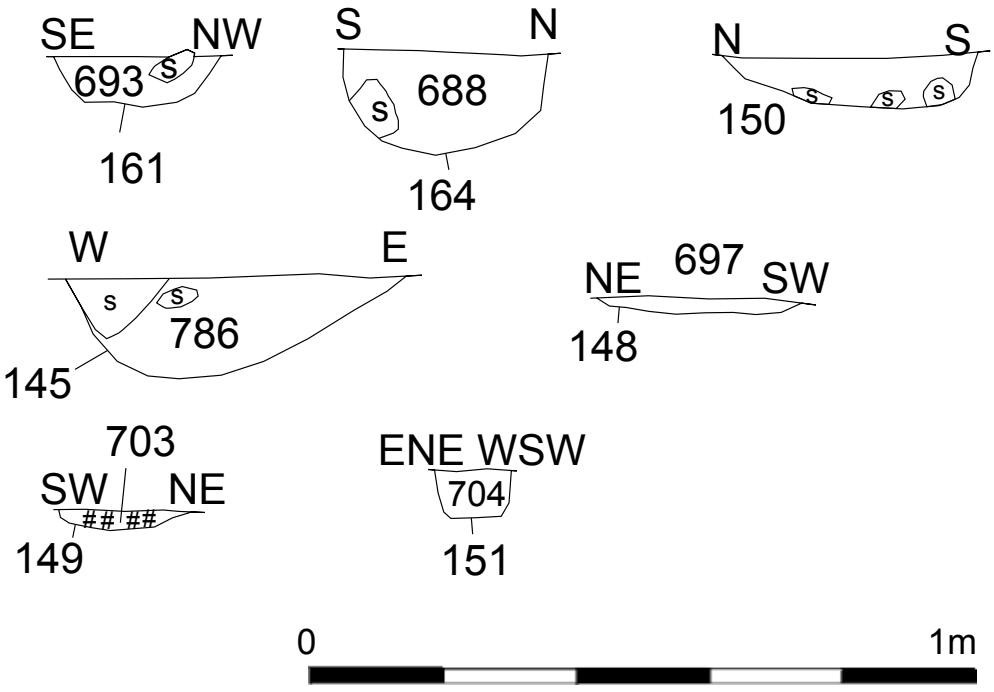

Figure 66: Structure 23 sections.

Post-excavation analysis

Radiocarbon dating

By Gordon Noble

In total 40 radiocarbon dates were obtained for the Cruden Bay site. Samples for dating were obtained from bulk samples and were all processed at the University of Glasgow's SUERC Radiocarbon Laboratory with samples pre-treated, combusted, graphitised and measured by accelerator mass spectrometry (Dunbar et al. 2016). The results are presented as conventional radiocarbon ages (Stuiver and Polach 1977) (Table 1). The date ranges have been calculated using the maximum intercept method and have been rounded to 10 years. The ranges given in the figures were calculated using the probability method (Stuiver and Reimer 1993). The calibrations used the internationally-agreed calibration curve for terrestrial samples (IntCal20) (Reimer et al. 2020), and were calculated using OxCal v4.4 (Bronk Ramsey 2009). These dates were modelled following a Bayesian approach to chronology building (Buck et al. 1996) and the modelled results are rounded outward to 5 years and given in *italics* to differentiate them from the simple calibrated dates.

The results of dating produced 38 determinations that fall within the Iron Age. These were modelled as a group to give an idea of when activity at the site in association with the majority of the structural features began and ended. The overall site model (Figure 67) showed good agreement (Amodel=104.2). The model estimates that all of the dated activity in association with Structures 3-5, 7-8, 10-17, 20-23 and associated features began in *295 – 200 cal BC* (*95% probability*), or in *255 – 210 cal BC* (*68% probability*) (Figure 67: Boundary Start). Dated activity ended in *cal AD 130 – 235* (*98% probability*), and probably in *cal AD 155 – 210* (*68% probability*) (Figure 67: Boundary End). The difference between these two dates provides an estimated span of all dated activity of *350 – 500* years (*98% probability*), and probably *375 – 450 years* (*68% probability*) (Figure 68). The two later first millennium AD dates from Structure 2 date to the 9th or 10th century AD (Table 1). There were too few early medieval determinations to model.

Lab code	Sample	Structure	Context	Material	Radiocarbon Age BP	Calibrated 1-sigma (68.3% probability)	Calibrated 2-sigma (95.4% probability)
SUERC-102179 (GU59645)	14	5	335 ditch fill	Betula sp.	1981 ± 24	31 – 318 cal BC cal AD 8 – 75	41 – 9 cal BC cal AD 1 – 85 cal AD 94 – 118
SUERC-102180 (GU59646)	15	5	329 ditch fill	Betula sp.	1949 ± 23	cal AD 30 – 42 cal AD 60 – 87 cal AD 93 – 119	31 – 16 cal BC cal AD 7 – 130
SUERC-102181 (GU59647)	21	N band G2	818 pit fill	Betula sp.	2170 ± 24	350 – 307 cal BC 208 – 169 cal BC	357 – 278 cal BC 259 – 246 cal BC 136 – 113 cal BC
SUERC-102185 (GU59648)	25	17	433 ditch fill	Corylus cf avellana	1915 ± 24	cal AD 77 – 133 cal AD 139 – 161 cal AD 190 – 201	cal AD 31 – 41 cal AD 60 – 210
SUERC-102186 (GU59649)	47	12	53 ditch fill	Salix sp.	1923 ± 24	cal AD 64 – 130 cal AD 143 – 156 cal AD 194 – 197	cal AD 28 – 44 cal AD 58 – 206
SUERC-102187 (GU59650)	51	5	321 pit fill	Corylus cf avellana	2030 ± 23	47 cal BC – cal AD 10	96 – 72 cal BC 57 cal BC – cal AD 31 cal AD 40 – 60
SUERC-102188 (GU59651)	52	5	325 pit fill	Alnus cf glutinosa	1918 ± 24	cal AD 70 – 132 cal AD 141 – 159 cal AD 191 – 200	cal AD 30 – 41 cal AD 60 – 208
SUERC-102189 (GU59652)	57	4	186 posthole fill	Alnus cf glutinosa	2075 ± 24	148 – 137 cal BC 111 – 44 cal BC	167 – 38 cal BC 13 cal BC – cal AD 4

Table 1: Radiocarbon results

Lab code	Sample	Structure	Context	Material	Radiocarbon Age BP	Calibrated 1-sigma (68.3% probability)	Calibrated 2-sigma (95.4% probability)
SUERC-102190 (GU59653)	63	10	1019 pit fill	Salix sp.	1893 ± 23	cal AD 123 – 203	cal AD 79 – 100 cal AD 107 – 219
SUERC-102191 (GU59654)	68	None	39 pit fill	Salix sp.	2212 ± 24	358 – 346 cal BC 317 – 278 cal BC 258 – 246 cal BC 233 – 204 cal BC	375 – 197 cal BC
SUERC-102195 (GU59655)	73	10	188 pit fill	Corylus cf avellana	1960 ±23	cal AD 26 – 82 cal AD 98 – 112	32 – 17 cal BC cal AD 7 – 124
SUERC-102196 (GU59656)	75	8	184 posthole fill	Corylus cf avellana	1944 ± 24	cal AD 31 – 40 cal AD 60 – 121	cal AD 9 – 132 cal AD 140 – 160 cal AD 190 – 201
SUERC-102197 (GU59657)	77	3	262 pit fill	Salix sp.	1878 ± 24	cal AD 130 – 145 cal AD 154 – 206	cal AD 87 – 93 cal AD 118 – 232
SUERC-102198 (GU59658)	81	3	248 ditch fill	Betula sp.	1868 ± 24	cal AD 130 – 144 cal AD 155 – 213	cal AD 121 – 235
SUERC-102199 (GU59659)	83	2	232 posthole fill?	Betula sp.	1167 ± 24	cal AD 776 – 787 cal AD 828 – 860 cal AD 869 – 894 cal AD 928 – 945	cal AD 772 – 793 cal AD 800 – 900 cal AD 917 – 973
SUERC-102200 (GU59660)	85	3	242 ditch fill	Betula sp.	1960 ± 24	cal AD 25 – 82 cal AD 98 – 113	33 – 16 cal BC cal AD 6 – 124
SUERC-102201 (GU59661)	94	10	259 ditch fill	Betula sp.	2008 ± 23	42 – 18 cal BC 3 cal BC – cal AD 25	50 cal BC – cal AD 72
SUERC-102205 (GU59662)	120	2	239 ring ditch fill	Betula sp.	1162 ± 24	cal AD 776 – 787 cal AD 830 – 855 cal AD 873 – 895 cal AD 925 – 950	cal AD 772 –791 cal AD 820 – 904 cal AD 913 – 976
SUERC-102206 (GU59663)	121	5	296 posthole fill	Alnus cf glutinosa	1918 ± 24	cal AD 70 – 132 cal AD 141 – 159 cal AD 191 – 200	cal AD 30 – 41 cal AD 60 – 208
SUERC-102207 (GU59664)	134	21	773 ditch fill	Betula sp.	2128 ± 24	195 – 186 cal BC 178 – 102 cal BC 66 – 61 cal BC	343 – 321 cal BC 202 – 88 cal BC 81 – 53 cal BC
SUERC-102208 (GU59665)	148	16	777 pit fill	Betula sp.	2133 ± 24	197 – 106 cal BC	345 – 318 cal BC 204 – 90 cal BC 80 – 53 cal BC
SUERC-102209 (GU59666)	149	22	795 posthole fill	Corylus cf avellana	2084 ± 24	148 – 136 cal BC 113 – 49 cal BC	170 – 41 cal BC 9 – 1 cal BC
SUERC-102210 (GU59667)	152	E of 16	797 quern pit fill	Corylus cf avellana	1906 ± 24	cal AD 83 – 96 cal AD 115 – 169 cal AD 185 – 203	cal AD 68 – 212
SUERC-102211 (GU59669)	179	16	670 ditch terminal fill	Salix sp.	1956 ± 24	cal AD 26 – 50 cal AD 55 – 84 cal AD 95 – 116	32 – 16 cal BC cal AD 7 – 125
SUERC-102215 (GU59670)	183	23	703 pit/ posthole fill	Alnus cf glutinosa	2007 ± 24	42 – 9 cal BC 2 cal BC – cal AD 26	50 cal BC – cal AD 76
SUERC-102216 (GU59671)	191	5	273 posthole fill	Corylus cf avellana	1944 ± 24	cal AD 31 – 40 cal AD 60 – 121	cal AD 9 – 132 cal AD 140 – 160 cal AD 190 – 201

Table 1 (continued): Radiocarbon results

Lab code	Sample	Structure	Context	Material	Radiocarbon Age BP	Calibrated 1-sigma (68.3% probability)	Calibrated 2-sigma (95.4% probability)
SUERC-102240 (GU59668)	175	21 other	665 pit/ posthole fill	Betula sp.	2074 ± 24	148 – 137 cal BC 111 – 43 cal BC	167 – 37 cal BC 14 cal BC – cal AD 4
SUERC-102241 (GU59672)	195	None	350 pit fill	Corylus cf avellana	1920 ± 24	cal AD 67 – 131 cal AD 141 – 158 cal AD 192 – 200	cal AD 30 – 41 cal AD 60 – 207
SUERC-102242 (GU59673)	232	23	693 posthole fill	Betula sp.	2114 ± 21	167 – 101 cal BC 67 – 60 cal BC	196 – 184 cal BC 179 – 51 cal BC
SUERC-102243 (GU59674)	238	20	504 fire-pit fill	Alnus cf glutinosa	2077 ± 24	148 – 137 cal BC 111 – 45 cal BC	166 – 39 cal BC 11 cal BC – cal AD 2
SUERC-102244 (GU59675)	251	3	1020 posthole fill	Salix sp.	1987 ± 24	33 – 16 cal BC cal AD 6 – 65	43 cal BC – cal AD 83 cal AD 97 – 114
SUERC-102248 (GU59676)	255	12	525 posthole fill	Salix sp.	2188 ± 24	353 – 286 cal BC 228 – 217 cal BC 211 – 196 cal BC 184 – 179 cal BC	361 – 241 cal BC 236 – 168 cal BC
SUERC-102249 (GU59677)	258b	17	599 posthole fill	Corylus cf avellana	1917 ± 24	cal AD 73 – 132 cal AD 140 – 160 cal AD 190 – 201	cal AD 31 – 41 cal AD 60 – 209
SUERC-102250 (GU59678)	268	15	783 posthole fill	Corylus cf avellana	1917 ± 17	cal AD 76 – 130 cal AD 143 – 156 cal AD 194 – 197	cal AD 65 – 205
SUERC-102251 (GU59679)	271	15	596 posthole fill	Corylus cf avellana	2019 ± 24	43 cal BC – cal AD 17	90 – 80 cal BC 54 cal BC – cal AD 65
SUERC-102252 (GU59680)	286	13	630 ditch fill	Corylus cf avellana	2241 ± 24	379 – 353 cal BC 286 – 228 cal BC 217 – 211 cal BC	386 – 348 cal BC 313 – 205 cal BC
SUERC-102253 (GU59681)	288	14	629 posthole fill	Coryus cf avellana	1974 ±24	cal AD 12 – 80 cal AD 100 – 108	39 – 12 cal BC cal AD 2 – 120
SUERC-102254 (GU59682)	291	7 FG2	623 posthole fill	Corylus cf avellana	1917 ± 24	cal AD 73 – 132 cal AD 140 – 160 cal AD 190 – 201	cal AD 31 – 41 cal AD 60 – 200
SUERC-102258 (GU59683)	295	21 FG2	677 pit fill	Betula sp.	2068 ± 24	106 – 41 cal BC 9 – 1 cal BC	165 – 32 cal BC 17 cal BC – cal AD 8
SUERC-102259 (GU59684)	296	16	666/667 posthole fill	Betula sp.	2131 ± 24	197 – 103 cal BC	344 – 320 cal BC 203 – 91 cal BC 79 – 53 cal BC

Table 1 (continued): Radiocarbon results

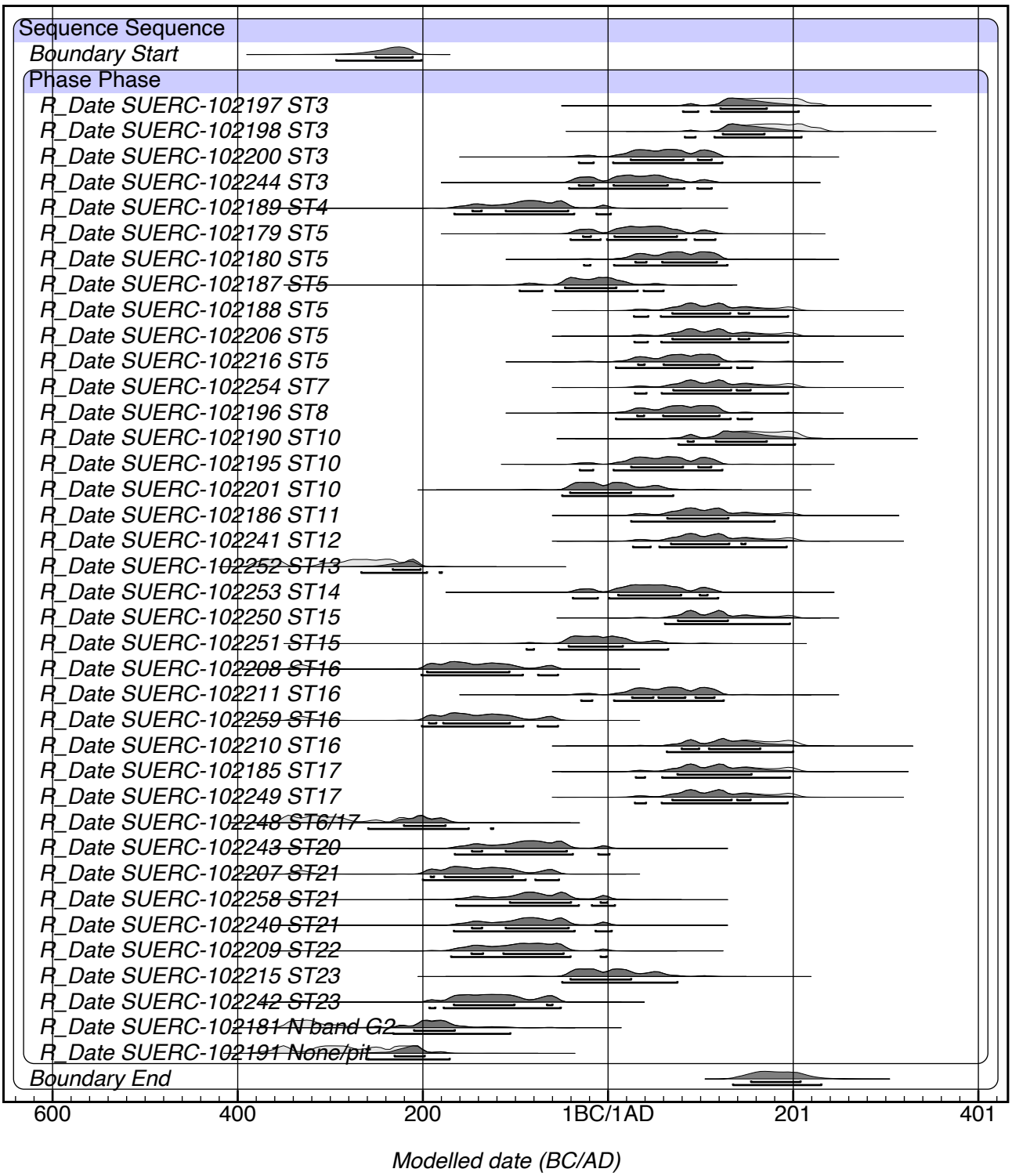

Figure 67: Overall site model of radiocarbon dates.

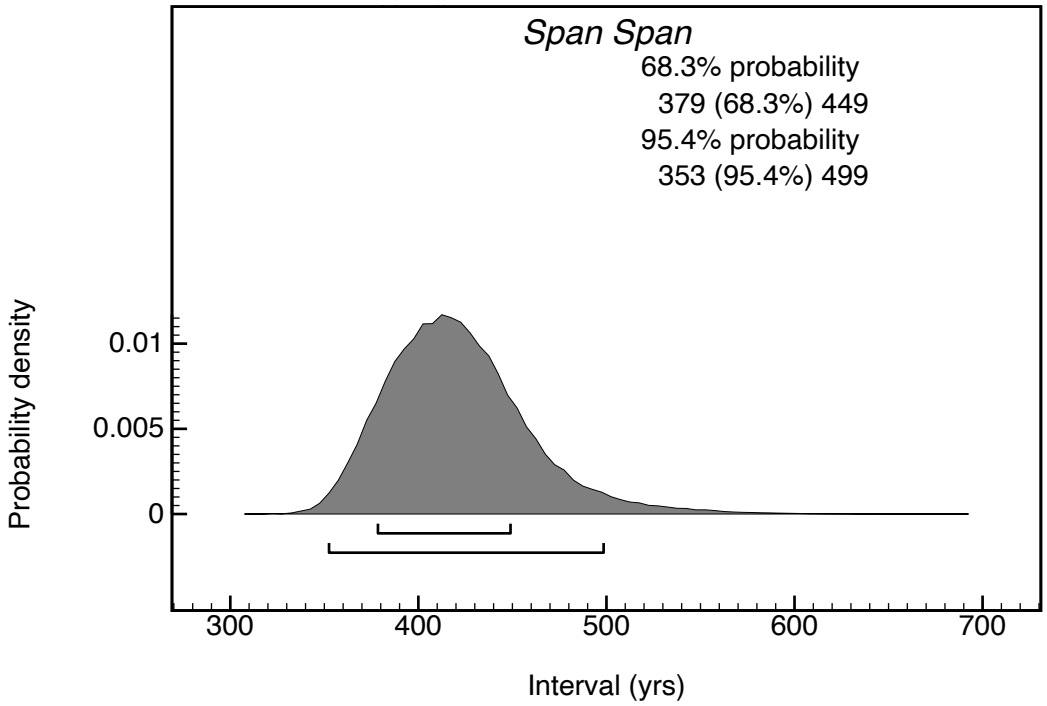

Figure 68: Estimated span of all date activity on the site.

Archaeobotanical analysis

By Susan Ramsay

Summary

The excavation revealed an unenclosed settlement with at least 23 structures, together with numerous isolated features. The archaeobotanical analyses showed a diverse range of wood types were used at Cruden Bay, suggesting that there were locally available mature woodlands from which to source fuel and construction materials. The majority of the charcoal is probably the remains of domestic hearth waste with only a few contexts providing possible evidence for structural timbers. There may also be evidence for hazel and willow having been used in the construction of kilns. Heather type charcoal was particularly common, but it is not clear whether this was used for fuel or flooring. Concentrations of carbonised cereal grains, particularly barley, were identified from Structures 2, 8, 11, 15 and 17. Large proportions of the cereal grains recovered from this site were indeterminate in nature because of poor preservation. Radiocarbon dating has shown two main periods of activity in the middle Iron Age and early medieval periods.

Introduction and Methodology

This report details the analysis and interpretation of the archaeobotanical remains recovered from samples taken during the excavation at Cruden Bay, A programme of bulk sampling was undertaken at Site M1 Area A, in order to produce material for archaeobotanical analysis and AMS dating. In total, 319 bulk samples were analysed for the presence of botanical remains. The bulk samples were processed by bucket flotation by the University of Aberdeen and 'large flots' (assumed to be >1 mm flots) were presented for archaeobotanical analysis. There appeared to be no carbonised plant remains from sorted retents.

Dried flots were examined using a binocular microscope at variable magnifications of x4 - x45. For each sample, estimation of the total volume of carbonised material >4 mm was made and all charcoal >4 mm was identified unless this proved impractical in which case a known percentage of the charcoal was identified and this percentage is noted in the results tables. All carbonised cereals, seeds and other plant macrofossil remains were also removed and identified. Occasionally a very large number of cereal grains were present in a sample and, in this case, a known percentage was identified.

The testa characteristics of small seeds and the internal anatomical features of problematic charcoal fragments were further identified at x200 magnification using the reflected light of a metallurgical microscope. Reference was made to Schweingruber (1990) and Cappers et al. (2006) to aid identifications. Vascular plant nomenclature follows Stace (1997) except for cereals, which conform to the genetic classification of Zohary and Hopf (2000).

Results

Results are mainly discussed by structure, in accordance with the data structure report. Numbers in brackets indicate individual context numbers. The results of the archaeobotanical analysis are shown in the Appendix (Tables 2-25).

Structure 1

Structure 1 was located some distance downslope from the main group of structures found on site. It was defined by a ring ditch (178), with fill (101), but this produced only a trace of heather type charcoal and a single barley grain and so may represent scatter from elsewhere in the structure. Two groups of features were located within the structure. Postholes (170) and (171) lay to the west of the centre of the structure but the fill (100) of (170) produced no carbonised remains and fill (172) of (171) contained only small amounts of indeterminate charcoal.

The second group of features contained a pit (177) and a posthole (176) but the fill (104) of pit (177) was devoid of carbonised remains and the fill (174) of posthole (176) produced only small amounts of birch charcoal.

The carbonised remains from Structure 1 are sparse and do not provide any significant information regarding the construction or occupation of this structure.

Structure 2

Structure 2 was defined by a large scoop (238), which contained fill (239) and produced a charcoal assemblage of birch, hazel, heather type and willow together with small amounts of carbonised barley. This assemblage is consistent with domestic hearth waste. Birch charcoal from fill (239) was radiocarbon dated to 772 – 976 cal AD (SUERC-102205). A second feature (236) was also a shallow scoop (238). The fill (237) produced a very similar carbonised assemblage to that of the fill of (236) but with the addition of a few grains of oats, further suggesting these two features were originally linked.

A posthole (105) lay within the ring ditch. Its fill (232) produced a mixed charcoal assemblage with barley and oats, which was very similar to those identified from the ring ditch sections and suggests that domestic hearth waste was also scattered across the interior of the structure. Willow charcoal from fill (232) was radiocarbon dated to 772 – 973 cal AD (SUERC-102199). A posthole (106) was located outside the arc of the ring ditch. The fill (244) produced charcoal of alder, hazel and willow, but no cereal grains, suggesting a different origin from the posthole and ditch fills within the structure.

A pit (240) was located between ditch (238) and posthole (106). The fill (241) produced a very similar charcoal and cereal assemblage to that recovered from the ditch fills and the interior posthole. The presence of birch and heather type makes the assemblage from fill (241) different to that recorded from posthole (106).

The radiocarbon dates from Structure 2 are both from the early medieval period and the cereal assemblages recorded are consistent with these dates.

A further posthole (99) was found between Structure 2 and Structure 9. The fill (179) contained burnt bone but the only carbonised plant remains were heather type stems, suggesting possible floor material that had been burned.

Structure 3

Ditches

Structure 3 comprised a number of fragmentary ditch sections (45), (56), (195), (197=199) and (257). The fills produced mixed charcoal assemblages with alder, birch, hazel, heather type, oak and willow all present to a greater or lesser extent. Heather type charcoal was particularly abundant in many of the fills. This could be evidence for burnt flooring/bedding material or may just have been used as additional fuel. Only ditch fill (56) produced scant evidence

for carbonised cereal grains, but this is probably the result of accidental scatter of occupation material rather than evidence for cereal remains having been dumped into the ditch. A fragment of birch charcoal from the fill (248) of ditch (56) was radiocarbon dated to 121 – 235 cal AD (SUERC-102198) while another fragment of birch from fill (242) of ditch (45) produced a slightly earlier date of 33 cal BC – 124 cal AD (SUERC-102200).

Pits / Postholes

Pits/postholes (1011), (57) and (58) were located within Structure 3. Their fills contained mixed charcoal assemblages but the fill (1020) of (1011) was particularly charcoal rich, with large quantities of birch and heather type charcoal present. A fragment of willow charcoal from (1020) produced a radiocarbon date of 43 cal BC – 114 cal AD (SUERC-102244). There were traces of carbonised barley in fill (1020) and the fill of (57). These carbonised assemblages are consistent with domestic hearth waste, although the large quantities of heather type stems are more unusual. It may be that the fuel is being used for a specific purpose or that heather stems used for flooring/bedding had been burnt in the hearth. The small quantities of cereal grains recovered does not suggest any significant amount of cereal processing was taking place in this location.

Between ditches (195) and (197) was a large pit (59) that was packed with an upper layer of burnt stones (262) and clay edges that had been subjected to intense heating. The charcoal assemblage from (262) comprised significant amounts of large roundwood that was identifiable as willow, one fragment of which was radiocarbon dated to 87 – 232 cal AD (SUERC-102197). In addition, there were small amounts of heather type stems, a few barley grains and cramp (a slag-like vitreous material often associated with burnt bone). It was initially suggested that this feature may have been a kiln but analysis of the fired clay indicates that this is more likely to have been a furnace. The willow charcoal could represent the fuel from this furnace but could also be the remnants of the furnace superstructure that was covered in clay. Although traces of barley were found in this feature, the quantities involved do not suggest that this feature was connected with cereal drying.

To the east of Structure 3 was an isolated posthole (1013) (not illustrated), but its fills (1021) and (1022) produced only traces of willow and heather type charcoal.

To the west of Structure 3 was a further posthole (766), fill (767), which contained a mixed charcoal assemblage of birch, hazel and heather type charcoal, suggesting scattered hearth waste.

Three further features were located near to Structure 3. The first was pit (65) contained fired clay fragments and fill (362) produced significant amounts of hazel charcoal, with smaller amounts of heather type and oak. Fill (362) also produced significant amounts of cramp, which suggests in situ burning. South of the Structure hearth (217) produced fills (220) and (379), with significant amounts of alder, birch and hazel charcoal, with small amounts of heather type and willow also present.

The third feature was a very large pit (71), with fills (409), (410), (411) and (412), which produced mixed charcoal assemblages suggesting hearth or midden waste had been dumped into the pit.

Structure 4

Structure 4 lay to the west of Structure 3. It comprised a very truncated ditch (193), with a large pit (46) forming the terminal at the south-east end. The fills of (46), (245) and (247) produced significant amounts of mixed charcoal, with alder, birch, hazel, heather type, oak and willow all present. No carbonised cereal grains were recorded from this feature, although there were significant amounts of burnt bone and some cramp. This mixed charcoal assemblage is consistent with domestic hearth waste. Posthole (48) is also listed as being part of Structure 4. The fill (186) produced a very similar charcoal assemblage to that from pit (46), although heather type charcoal was absent. A fragment of alder charcoal from (186) was radiocarbon dated to 167 cal BC – 4 cal AD (SUERC-102189).

Pits (33) and (251) were located within the interior of Structure 4. The fill (255) of pit (33) only produced traces of heather type charcoal, but the fill (252) of pit (251) produced birch, hazel and heather type charcoal suggesting the remains of hearth waste.

Posthole bases (249), (370), (372) and (374) were also located within the structure. Fills (373) and (375) did not contain any charcoal, whilst fills (371) and (250) produced only traces of heather type charcoal. There is no evidence for posts having been burnt in situ.

Pit/posthole (30) was also associated with this structure and its fill (256), produced a charcoal assemblage of birch, hazel, heather type and oak suggesting the presence of domestic hearth waste.

Structure 5

Ditches

Structure 5 is a complexity of features that may not all be related. Parallel ditches (328), (330) and (334) were located on the north side of the structure. Two samples from the fill (203) of ditch (328) were examined. Although this material was from the same context, the two samples produced very different carbonised assemblages. Sample <30> produced very large amounts of hazel and willow roundwood, which suggests the burnt remains of a wattle/wicker structure or object. However, sample <58> produced very large amounts of birch charcoal, together with metallic waste. This suggests fuel waste from metalworking. Samples <15> and <165> from fill (329), also from ditch (328), contained large amounts of birch charcoal, suggesting a connection with sample <58>. Birch charcoal from (329) produced a radiocarbon date of 31 cal BC – 130 cal AD (SUERC-102180). The fill (331) of ditch (330) contained only a couple of carbonised cereal grains. The fill (335) of ditch (334) produced a mixed charcoal assemblage of alder, birch, hazel, heather type, oak and willow with a trace of metallic waste. Birch charcoal from (335) produced a radiocarbon date of 41 cal BC – 118 cal AD (SUERC-102179). The very mixed charcoal assemblage suggests domestic hearth waste rather than hearth waste from metalworking and the metallic waste may just be scatter from elsewhere on the site. The fill (323) of ditch (322) produced a similar very mixed charcoal assemblage but with a few carbonised grains of barley. However, fill (338) of ditch (336) was devoid of charcoal remains.

Large pits

A number of large pits were located in the interior of Structure 5 including (287), (320), (324) and (341). Pits (287) and (320) were adjacent with the fills, (288) and (321), producing mixed charcoal assemblages although the assemblage from (288) contained large amounts of birch charcoal that was absent from (321). Hazel charcoal from pit fill (321) was radiocarbon dated to 96 cal BC – 60 cal AD (SUERC-102187). A number of stakeholes were located in the base and sides of these pit features but there is no definitive evidence in the carbonised assemblages to suggest the stakes were burnt in situ or to suggest from what wood type the stakes were made.

Pit (324) was circular and over 2 m in diameter, with some evidence for burnt bone and a single fragment of flint within the fill (325). The charcoal assemblage comprised small amounts of alder, hazel and oak charcoal, with larger quantities of carbonised heather stems and a few grains of oats and barley. The assemblage looks like small amounts of hearth waste or midden material, but it is not clear why such a large pit would have been dug within the structure. Alder charcoal from pit fill (325) was radiocarbon dated to 30 – 208 cal AD (SUERC-102188). The fill (342) within pit (341) produced only small amounts of willow and heather type charcoal.

Postholes with stone settings

A number of posthole bases within the structure had evidence for stone settings: (27), (269), (285), (289), (295), (313) and (343).

The fill (270) of posthole (269) contained a mixed charcoal assemblage but with a significant amount of oak present, together with a few barley grains. Oak is generally not common in the carbonised assemblages from this site and so this may mean that the fill contains some burnt structural material. Fill (296) of posthole (295) produced a similar mixed charcoal assemblage, but oak charcoal was not as common. Alder charcoal from (296) was radiocarbon dated to 30 – 208 cal AD (SUERC-102206). Fill (273) of posthole (27), fill (290) of posthole (289) and fill (314) of posthole (313) only produced small amounts of mixed charcoal, although (290) also contained some cramp. Hazel charcoal from fill

(273) was radiocarbon dated to 9 – 201 cal AD (SUERC-1042216). The fill (286) of posthole (285) also contained a mixed charcoal assemblage but in this case a single fragment of possible larch charcoal was also identified. Larch is not native in the UK and wasn't grown commercially until the last couple of hundred years. The presence of larch may either be evidence for driftwood collected from the coast or may indicate that this context is relatively modern.

The fill (345) of posthole (343) was very different in containing only significant amounts of heather type charcoal and a few cereal grains. The heather type may be the burnt remains of flooring or could be related to the process of drying cereal grains.

Pits and postholes with no stone settings

A large number of pit and posthole fills came from pits and postholes that did not contain any stone in the fills: (223), (272), (278), (280), (282), (292), (294), (298), (300), (302), (304), (306), (308), (310), (312), (317), (340), (349) and (354). The majority of these fills contained mixed charcoal assemblages, with heather type one of the commonest types present. Only fill (278) of posthole (277) produced an assemblage with large fragments of hazel charcoal present, which might suggest the remains of structural material (wattle) but there is no evidence for posts having been burnt in situ. It is likely that the carbonised assemblages from these posthole fills are evidence of general domestic hearth waste that has been scattered over the floor of the structure.

Structure 6

Structure 6 is defined to the south by ditch (427), with terminal pit (419). Fills (434A) and (645) of ditch (427) both produced diverse mixed charcoal assemblages with birch, hazel, heather type, oak and willow all present with a few carbonised barley grains recovered from (645). However, fill (434B) from ditch (427) contained significant amount of willow roundwood charcoal, suggesting the remains of a wicker structure or object.

The fill (435) of terminal pit (419) contained significant amounts of heather type charcoal, traces of birch and a few carbonised oats and barley. The heather may be flooring or associated with cereal drying.

Structure 6 is also overlain by the later Structure 17, which makes the individual structures difficult to differentiate. Ditch (683) may represent the northern boundary of Structure 6. The fill (684) contained only a small amount of mixed charcoal and traces of cereal grain. Pits (168) and (800) may be related to this structure. Fill (168) produced quantities of willow charcoal with smaller amounts of hazel, whilst fill (801) of pit (800) contained significant amounts of oak and willow charcoal. These types may be related to structural remains in the form of wattle walls or internal subdivisions.

Postholes that are also associated with this phase include (130), (511), (512), (513) and (514). Fills (690), (524), (525), (529) and (583) contained diverse charcoal assemblages with small amounts of cereal grain, including barley. These assemblages are consistent with domestic hearth waste. Willow charcoal from fill (525) of posthole (512) was radiocarbon dated to 361 – 168 cal BC (SUERC-102248).

Structure 7 (see also Structures 13 and 14)

Ditches

Structure 7 was defined by a penannular ditch and other ditch sections: (167), (588), (491), (494), (496), (498) and (500). Almost all the fills produced charcoal of hazel and heather type, with more diverse charcoal assemblages recorded from ditch sections (167), (498) and (491). Occasional barley grains were also identified but not in sufficient quantities to suggest cereal processing. These fills are consistent with domestic hearth waste.

There were three groups of features, mostly postholes, associated with this structure.

Feature Group 1

Feature group 1 comprised postholes (493), (638), (492), and pit (678). The fill (641) of posthole (493) contained a mixed charcoal assemblage, dominated by heather type, with traces of burnt bone. This is consistent with domestic hearth waste. Fill (639) of posthole (638) contained small amounts of birch and heather type charcoal, and the fill (679) of pit (678) produced only heather

type charcoal. The fill (675) of posthole (492) did not contain any carbonised plant remains but did contain burnt bone.

Feature Group 2

Feature group 2 comprised postholes (363), (365), (405) and (501). The fills all contained heather type charcoal, with either hazel or birch charcoal also present. A few carbonised grains of barley were identified from fills (364), (406) and (623) and traces of oats in (364). Hazel charcoal from fill (623) was radiocarbon dated to 31 – 209 cal AD (SUERC-102254).

Feature Group 3

Feature group 3 comprised postholes (77), (495), (502), (534), (634), (642) and (650). Most of the fills contained small amounts of mixed charcoal, with heather type, birch and hazel present in the majority of the fills. A few carbonised cereal grains were identified from fill (614) of posthole (77). Traces of hazel nutshell were located in fill (651) of wall fill (650), although this fill also produced a fragment of 19th century pottery.

Structure 8

Structure 8 was defined by a curved ditch (81). Its fill (182) produced a mixed charcoal assemblage of alder, birch, heather type and willow, together with cereal grains of oats and barley. This suggests domestic hearth waste had been dumped into the ditch. As oats made up roughly a third of the identifiable cereal assemblage, it suggests they were being grown as a crop rather than just being a contaminant of the barley crop. This would indicate the structure was potentially Medieval or later in date. A posthole (90) contained fill (181) did not produce any carbonised plant remains.

Pit (87), fill (184), also contained a mixed charcoal assemblage, but with a few grains of carbonised barley. Hazel charcoal from (184) was radiocarbon dated to 9 – 201 cal AD (SUERC-102196). This was similar to the carbonised assemblage recorded from the fill (231) of pit (180). However, fill (231) also contained a couple of grains of emmer wheat, which is consistent with a prehistoric date for this feature.

Posthole (383) was located within the arc of the ditch (81) but the fill (384) did not produce any carbonised remains. A further posthole (89), fill (377), produced a small amount of mixed charcoal.

Structure 9

Structure 9 comprised a poorly defined curved ditch, but no samples were available from this feature. The fill of an oval pit (91) to the south-west produced only small amounts of birch, heather type and willow charcoal with a few carbonised cereal grains.

Structure 10

The fill (259) of a curved ditch (74) contained traces of alder, birch and oak charcoal with larger quantities of heather type charcoal. Birch charcoal from (259) was radiocarbon dated to 50 cal BC – 72 cal AD (SUERC-102201). Posthole (75) with fill (189) was located within the arc of the ditch (74) and also contained a mixed charcoal assemblage consistent with domestic hearth waste.

A possible posthole or pit (92) was located slightly east of the east terminus of ditch (74). Its fill (98) was dominated by oak charcoal but with hazel, alder, birch and willow also present. The large proportion of oak might suggest a structural component within this fill but the mixed nature of the assemblage may be more consistent with hearth waste.

Pit (76) was adjacent to ring ditch (74) to the south-west and its fill (188) showed a concentration of charcoal in the base and it was initially suggested that it was the remains of a hearth or large post burnt in situ. The carbonised assemblage from (188) was a mixed assemblage of alder, birch, hazel, and willow, with alder by far the most common type present. This lends weight to this feature being a hearth. Hazel charcoal from (188) was radiocarbon dated to 32 cal BC – 124 cal AD (SUERC-102195).

A possible pit or posthole (216), fill (82), produced a large quantity of alder, birch, hazel and oak charcoal suggesting hearth waste. The fill of pit (376) produced only small amounts of mixed charcoal.

Pit (1004) may be associated with Structure 10 or nearby Structure 8. Its fill (1019) looked to

have been disturbed through bioturbation but produced heather type charcoal with traces of willow, oats and barley and a few weed seeds of rush and stitchwort or mouse-ear. It is possible that the abundance of heather stems indicates cereal drying had been taking place. Willow charcoal from (1019) was radiocarbon dated to 79 – 219 cal AD (SUERC-102190).

Structure 11

Ditch

Structure 11 was defined by an arc of ditch (69), which was associated with a further four groups of features. The fill (361) of ring ditch (69) produced only small amounts of heather type and willow charcoal. A pit (80) was located to the south-east of ditch (69) but only produced small amounts of alder and heather type charcoal.

Three parallel lines of features were located to the east of ring ditch (69), running east to west.

Feature Group 1

Only the fill (620) of posthole (485) was examined from Feature group 1 but it contained only a trace of birch charcoal and nothing else.

Feature Group 2

Feature group 2 comprised two postholes (68) and (478) that were separated by a possible hearth pit (70). The fill (355) of posthole (68) produced large amounts of heather charcoal, traces of birch and a significant number of carbonised oat and barley grains.

The hearth pit (70) contained two fills (356) and (357) that contained very similar carbonised assemblages. Charcoal was mixed, with oak relatively common and heather type absent. Most notably, there were significant numbers of carbonised cereal grains in both fills, with a combined total of over 2000 grains, although approximately half the grains were too poorly preserved to be identifiable to type. Barley was the commonest type present but oats made up just over 10% of the cereal grains that were identifiable to type. There were also a significant number of small grass seeds in the assemblage suggesting that these had probably been weeds within the cereal crop and had not been removed during processing.

The fill (477) of the second posthole (478) produced only traces of birch and heather type charcoal, as seen in posthole (68) but there were no carbonised cereal grains present.

Feature Group 3

Feature group 3 was located to the north of Feature group 2 and included postholes (224), (226) and a feature (67). The fill (225) of posthole (224) but it contained only traces of heather charcoal and a couple of carbonised barley grains. The fill (227) of (226) also contained small amounts of heather type charcoal with traces of birch and hazel, with a few more barley grains.

Feature (67) was an accumulation of pebbles with a charcoal flecked matrix. Fill (358) was located above the pebbles and produced only traces of heather type charcoal. Fill (359) was located around and beneath the pebbles but only produced traces of heather type and hazel charcoal. It is not clear from the scarce carbonised remains what the original purpose of feature (67) might have been.

Feature Group 4

Feature group 4 was a group of postholes that lay to the east of Feature group 3. These included postholes (78), (79), (86), (275), (480) and (481). Their fills (274), (268), (234), (479) and (482) produced only small amounts of mixed charcoal, although heather type was present in all the fills. Traces of cereal grain were identified from (268) and (482).

Structure 12

Structure 12 was defined by curved ditch (53), with terminal pit (591). The fill (442) of ditch (53) was dominated by willow charcoal, with smaller amounts of alder, birch, hazel and heather type, suggesting domestic hearth waste had been dumped into the ditch. Willow charcoal dated the ditch (53) to 28 – 206 cal AD (SUERC-102186). The fill (592) of terminal pit (591) also contained significant amounts of charcoal, with hazel, birch, oak and willow all present. In addition, traces of barley grain were also recorded and significant amounts of cramp (probably representing burnt bone). Again, this is consistent with domestic hearth waste.

Posthole (38), fill (350), located in the centre of the structure and pit/posthole (636), fill (637), to the west, both contained birch, hazel, heather type and willow charcoal. In addition, fill (350) also produced oak charcoal and several carbonised barley grains. These assemblages are similar to those from the ditch and terminal pit and again suggest dumped hearth waste. Hazel charcoal from pit fill (350) was radiocarbon dated to 30 – 207 cal AD (SUERC-102241).

A further posthole (681) and pit (654) were located in the north-west, but these features may be associated with Structure 6, which is located to the north. The fill (655) of pit (654) produced only traces of birch and heather type charcoal. However, the fill (682) of pit 681) produced significant quantities of charcoal, with birch, hazel, heather type, oak and willow all recorded together with traces of carbonised barley. This material is similar to that from the features from Structure 12 itself.

Structure 13

Structure 13 may actually be the remains of two separate structures. The earliest feature is ditch (85) but its fill (630) produced only small amounts of birch, hazel and heather type charcoal. Hazel charcoal from fill (630) was radiocarbon dated to 386 – 205 cal BC (SUERC-102252). The fill (632) of the second ditch (631) produced slightly more heather type charcoal together with traces of birch and oak charcoal and a single grain of oats.

Structure 14

Structure 14 comprised a curved ditch fragment (603) (which was not examined for this study) and a pit (628), which was located within the arc of the ditch. Although described as a pit, a central stone packed post-pipe (629) was identified during excavation. The fill (629) produced a mixed charcoal assemblage, with significant amounts of heather type charcoal, and traces of carbonised barley. Hazel charcoal from (629) was radiocarbon dated to 39 cal BC – 120 cal AD (SUERC-102253).

Structure 15

Structure 15 was defined by a semi-circular fragment of ditch (1029/75) but its fill (590) produced only traces of heather type charcoal and a carbonised grass seed.

Postholes (595), (782) and (784) formed a line to the west of the ring ditch. The fill (596) of posthole (595) produced a mixed assemblage of hazel, oak and willow, perhaps suggesting the remains of structural material. Hazel charcoal from (596) was radiocarbon dated to 90 cal BC – 65 cal AD (SUERC-102251). However, the fill (783) of posthole (782) and fill (785) of posthole (784) both produced significant numbers of carbonised cereal grains, with barley dominating but with oats also present in small amounts. Hazel charcoal was present in both fills, with heather type also present in (783). This suggests carbonised remains from cereal processing. Hazel charcoal from fill (783) was radiocarbon dated to 65 – 205 cal AD (SUERC-102250).

Pit (798) and posthole (429) formed part of an alignment running east-west, which intersected the previous line of postholes. The fill (441) of posthole (429) produced only traces of birch and heather type charcoal with traces of barley but the fill (799) of pit (798) did not contain any carbonised remains.

Structure 16

Structure 16 was partially defined by curved ditches (426) and (751). The fill (752) of (751) had a stakehole (840) in its base but only small amounts of hazel and heather type charcoal were identified, along with a few grains of barley. There is no evidence for the stake having been burnt in situ.

A possible fire-pit (142) was located at the north end of ditch (751). Its fill (506) contained numerous fragments of fired clay or pottery and produced large amounts of birch charcoal with some willow and a few cereal grains. However, within fill (506) was a charcoal rich deposit that was initially identified as being the remains of a post (507). The charcoal assemblage from (507) comprised very large quantities of willow charcoal and significant amounts of hazel charcoal as well. This charcoal is not the remains of a burnt post but may be the burnt remnants of a wattle or woven structure.

Pit (776) was located within Structure 16, adjacent to posthole (666). The fill (777) of pit (776) produced only small amounts of birch and heather type charcoal. Birch charcoal from (777) was radiocarbon dated to 345 – 53 cal

BC (SUERC-102208). However, the fill (667) of posthole (666) produced significant amounts of mixed charcoal, with birch and heather type dominating. This assemblage suggests hearth waste, perhaps used for post-packing but does not indicate a post burnt in situ. Birch charcoal from fill (667) was radiocarbon dated to 344 – 53 cal BC (SUERC-102259). A second posthole (778) within Structure 16 contained a single fill (779) that produced only traces of heather type charcoal.

Pit (669) cut through the north end of ditch (426). The fill (670) comprised small amounts of mixed charcoal with traces of oats and barley, similar to hearth waste seen elsewhere. Willow charcoal from this fill was radiocarbon dated to 32 cal BC – 125 cal AD (SUERC-102211).

To the east of Structure 16 was a large pit (796) that contained a rotary quern (SF 175). The mixed carbonised assemblage from fill (797) comprised charcoal of alder, hazel, heather type and oak, with small amounts of cereal grain also present. Hazel charcoal from this fill was radiocarbon dated to 68 – 212 cal AD (SUERC-102210).

Structure 17

Ditches

Structure 17 overlies Structure 6 and is defined by ditch fragments (428/423/414) and 468, and possibly and (421) (see Structure 18). The fill (433) of ditch (428) produced very mixed charcoal assemblages, dominated by heather type and willow. Significant amounts of carbonised barley were also identified but only traces of oats. Small amounts of birch also present in (423). Hazel charcoal from (433) was radiocarbon dated to 31 – 210 cal AD (SUERC-102185). Postholes (444) and (445) in ditch (428) had fills (448) and (449) that also produced mixed charcoal assemblages dominated by heather type together with carbonised barley grains. There is no evidence for posts having been burnt in situ and the assemblages from the general fill of ditch (428) and the postholes look very similar and are likely to have had the same origin. A large pit (417) was possibly located at the terminal end of the ditch. Its fill (450) contained a diverse range of charcoal but no cereal grains. The fill (471) of the second ditch (415) contained only traces of willow and heather type charcoal.

Postholes

Posthole bases (487), (488), (489), (490), (510), (584), (597), (609), (610) were all located within Structure 17 but were severely truncated. They generally contained small amounts of mixed charcoal, although heather type was present in most. Only the fill (585) of posthole (584) produced significant amounts of oak charcoal, with birch, hazel, heather type, ash and willow also present, along with traces of cereal grain. This may mean there is a structural component within this carbonised assemblage, perhaps related to the ring ditch. Hazel charcoal from fill (599) of posthole (510) was radiocarbon dated to 31 – 209 cal AD (SUERC-102249).

Structure 18

Structure 18 may be the same structure as Structure 17 but seems to be defined by ditch (421). Fill (438) contained hazel, oak and willow charcoal, together with traces of heather type and a single grain of barley, perhaps indicating the remains of structural material mixed with hearth waste.

Structure 19

Structure 19 was defined by ditch (422), which may be contemporary with ditch (421) from Structure 18. The fills (439) and (531) contained only traces of mixed charcoal, probably from background scatter across the site.

Structure 20

Structure 20 is defined by a short fragment of ditch (705) and possibly a short section of ditch (715). Fill (706) of ditch (705) contained only traces of hazel and heather type charcoal, whereas the fill (716) of ditch (715) contained small amounts of mixed charcoal with a few grains of barley.

Pits (141) and (425) may be related to Structure 20 but pit (749) and posthole (755) lies between Structures 16 and 20. The fill (504) of possible fire-pit (141) contained a mixed charcoal assemblage dominated by oak and alder charcoal, which is a different balance of types to that seen elsewhere on this site. Alder charcoal from (504) was radiocarbon dated to 166 cal BC – 2 cal AD (SUERC-102243). Fills (757) and (758) of pit (425) contained only small amounts of mixed charcoal.

The fill (750) of pit/posthole (749) contained only traces of heather type charcoal and so does not represent the remains of a post burnt in situ. The fill (756) of posthole (755) did not produce any carbonised remains.

Structure 21

There were four groups of features in the area of Structure 21.

Pit cluster and hearth

A cluster of small pits (116) (117), (118) and a possible hearth (120) were identified during the evaluation phase of the project. The pits, or possibly postholes, appeared to mark the corners of a structure with a hearth on the north exterior. The fills (264), (676), (680) and (673) produced small amounts of mixed charcoal, although there were slightly larger quantities of willow charcoal in (264). However, there is no evidence for these pits having contained posts or other wooden structures that had been burnt in situ. The carbonised assemblage is more likely to represent hearth waste. The fill (382) of the potential hearth (120) contained moderate amounts of hazel charcoal but nothing else.

Exterior Feature Group 1

Exterior feature group 1 lay 5 m east of (116) and (118) and appeared to form a line. A large posthole (780) contained stone packing, but the fill (781) produced only traces of heather type charcoal. Pit (719) lay to the north-east of posthole (780). The lower fill (732) produced small amounts of mixed charcoal, but the upper fill (720) contained only traces of heather type charcoal.

A section of ditch (809), fill (773), also contained small amounts of mixed charcoal, as did the fill (808) of posthole (807), which was located within ditch (809) and adjacent to pit/posthole (787). Birch charcoal from fill (773) produced a radiocarbon date of 343 – 53 cal BC (SUERC-102207). The fill (788) of pit/posthole (787) contained a similar charcoal assemblage but with the addition of a few barley grains.

A shallow scoop (701) may be the truncated remains of a pit. The fill (702) produced significant amounts of oak and birch charcoal with traces of hazel. This assemblage is different to the majority of the mixed charcoal assemblages seen in the vicinity of this structure and so may suggest that it is either from a different period or that the pit was used for a specific purpose.

A possible large stakehole (768), fill (769), contained only small amounts of heather type charcoal and so does not provide any evidence for the original stake.

Exterior Feature Group 2

Exterior feature group 2 does not have any obvious connection to the structure but lies to the east of Exterior feature group 1. An oblong feature (115), with fills (677) and (708), was located to the south of posthole (780). The lower fill (708) contained only small amounts of birch and heather type charcoal. This was overlain by a thick layer of redeposited clay (707) and then by upper fill (677), which contained very large amounts of heather type charcoal, with smaller amounts of birch, hazel and willow also present, together with traces of cereals. As the heather is the bulk of the assemblage it may represent the remains of either burnt flooring or bedding material or could be associated with cereal drying. Birch charcoal from (677) was radiocarbon dated to 165 cal BC – 8 cal AD (SUERC-102258). A second larger pit (745) was adjacent to feature (115) but the fill (746) produced only traces of birch and heather type charcoal.

A single posthole (729), approximately 10 m north-east of pit (745) had a fill (730) that produced only small amounts of hazel, heather type and willow charcoal.

Other Features

Pit (122) was an isolated feature that was located to the north of Structure 21. The fill (734) produced only traces of heather type charcoal, as did the fill (811) of a posthole (810). The fill (665) of pit (664) produced only a small amount of mixed charcoal, including birch that was radiocarbon dated to 167 cal BC – 4 cal AD (SUERC-102240).

Structure 22

Structure 22 was defined by a line of postholes running west to east: (152), (153), (711), (721), (725), (789) and (791). The fills (709), (795), (712), (722), (726), (790) and (792) generally

contained small amounts of mixed charcoal representing background occupation debris rather than any evidence for the original posts that formed the structure. Hazel charcoal from fill (795) was radiocarbon dated to 170 – 1 cal BC (SUERC-102209).

Structure 23

A section of ditch (150) together with pits/postholes (145), (148), (149) and postholes (151), (161) and (164) may form Structure 23. The fills of the ditch and the majority of the postholes produced small amounts of mixed charcoal. Alder charcoal from the fill (703) of posthole (149) was radiocarbon dated to 50 cal BC – 76 cal AD (SUERC-102215). However, the fill (693) of posthole (161) produced large amounts of birch, hazel and alder charcoal together with large quantities of indeterminate bark. This birch charcoal was radiocarbon dated to 196 – 51 cal BC (SUERC-102242). Again, this is not evidence for the original structural timber having been burnt in situ but the large quantities of bark may rule out general domestic hearth waste as well.

Features to the north of Structure 22

These features are located in the area to the north of Structure 22 and can be roughly grouped into two different bands. These features are listed in the data structure report under two headings: North band group 1 and North band group 2.

North band group 1

Pits (137) and (821) were located closest to Structure 22. The fills (770), (774) and (775) of pit (137), produced very mixed charcoal assemblages with traces of carbonised barley. In contrast, the fill (822) of pit (821) produced only small amounts of birch and heather type charcoal but with slightly larger numbers of cereal grains (mainly barley but with a single oat grain).

Feature (158) was a shallow pit almost completely filled with charcoal. The fill (805) contained large quantities of willow charcoal and bark but nothing else. Although it is possible a domestic hearth may have only had willow as fuel, this seems unlikely. Willow may be used for wicker structures or objects and it may be the remains of such a wicker object that has been burned in this pit.

Postholes (828) and (830) lay between pits (137) and (158). Fill (829) of pit (828) and fill (831) of pit (830) both produced small amounts of mixed charcoal, with a couple of cereal grains in (831).

Feature (771) was a pile of stones with a soil matrix (772) but the fill just produced a small amount of mixed charcoal, similar to that seen in many of the contexts from this site.

North band group 2

An isolated posthole (113) was the furthest north-west of all the features located. The fill (112) contained a large amount of charcoal and the DSR suggests a post burnt in situ. The carbonised assemblage was mixed with small amounts of alder, birch and heather type charcoal but with significant amounts of oak also present. This may represent the remains of an oak post burnt in situ, but there is another component in the assemblage which probably represents scattered domestic hearth waste.

The rest of the features within the North band group 2 were clustered to the north of the site and downslope from the main structures. Postholes (124), (126), (129) and (824) were aligned west to east but only the fill (819) of posthole (129) produced anything more than traces of charcoal, with small amounts of hazel, heather type, oak and willow identified.

The postholes lay to the north of a possible kiln (826). The main fill (827) produced small amounts of birch, hazel, oak and willow charcoal but also nearly 700 carbonised cereal grains. Although around 50% of the cereal grains were too poorly preserved to be identified to type, the majority of the identifiable grains were barley, but oats and emmer wheat were also recorded. This combination of cereal types tends to suggest a Medieval or later date for this feature.

Postholes (127) and (820) were isolated features. The fill (817) of posthole (127) produced only traces of hazel charcoal and traces of barley. The fill (821) of posthole (820) also produced small amounts of hazel charcoal with oak and slightly more cereal grains also present.

Pit (125) was located approximately 1 m west of posthole (126). The fill (818) contained a very diverse charcoal assemblage of alder, birch,

hazel, heather type, oak and willow but with the addition of 175 cereal grains. Almost 90% of the identifiable grains were barley, with the rest being oats. Birch charcoal from (818) was radiocarbon dated to 357 – 113 cal BC (SUERC-102181).

Evaluation

Five contexts were listed as having come from the evaluation phase of the excavation: (2901), (2705), (2801), (1202) and (4102), but no other details were available. Of these, (2801) was notable in containing very large quantities of birch and hazel charcoal, with small amounts of heather type and willow also present. Context (4102) also contained large quantities of alder, hazel and oak charcoal.

Features not associated with structures

Analysis was also undertaken on a total of 29 contexts (mainly fills) that were not associated with any structures: (31), (39), (131), (208), (350), (360), (360), (380), (402), (408), (431), (458), (467), (509), (555), (617), (647), (653), (658), (674), (692), (714), (744), (748), (765), (794), (1003), (1017), (1018). These fills generally either contained only traces of charcoal or a mixed charcoal assemblage that was commonly seen in features from this site. Contexts of note included fill (692) of posthole (691) which contained a possible apple pip, the only one from the entire site, and posthole/pit (131), which produced significant numbers of barley grains with traces of oats.

Unknown

Seven contexts were analysed but could then not be located on the site plan: (190), (618), (648), (656), (663), (696) and (718). The results have been included in case the context details are located in the future. These contexts generally contained mixed charcoal assemblages.

Modern

Two contexts that were examined were then noted as being marked as 'modern but have been included here for completeness. These were contexts (183) and (601). Fill (183) was from a drainage channel or furrow (91) but produced moderate amounts of birch and willow charcoal together with significant numbers of barley grains and a few fragments of chaff, suggesting possible cereal processing waste. This does not appear to be a very modern context. The fill (601) of ditch (600/602) produced small amounts of mixed charcoal but nothing distinctive.

Discussion

Wood

A diverse range of wood types were identified from this site (Figure 69), suggesting that there were locally available mature woodlands from which to source fuel and construction materials (Figure 45). Birch (*Betula* spp), willow (*Salix* spp) and hazel (*Corylus cf avellana*) were the three commonest wood types present within the structures, with oak (*Quercus* spp) and alder (*Alnus cf glutinosa*) present to a lesser extent. The comparative lack of oak in the assemblages suggested that the structures present at Cruden Bay dated from the later prehistoric onwards, when there was generally less oak present in Scottish woodlands as a result of prehistoric woodland clearance. The subsequent radiocarbon dating program has confirmed that the structures are middle Iron Age or later in date.

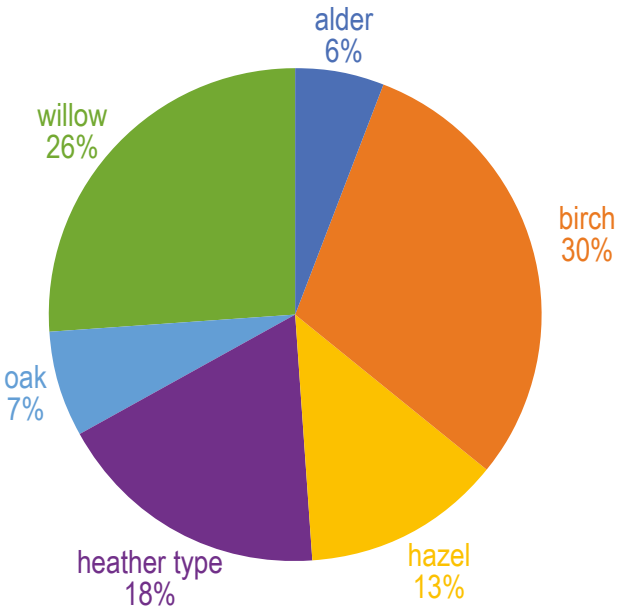

Figure 69: Wood types pie chart.

Very few carbonised assemblages were recorded in which it was clear structural materials were present but Structure 5 and Structure 12 had some evidence for the presence of burnt wattle structures made from hazel and willow. There was also possible evidence for burnt wattle/ wicker structures involved with potential kiln

features in Structure 3 and Structure 16. This willow and hazel wood might have formed some kind of superstructure that was covered with clay as part of the kiln construction.

Other wood types that were identified from Cruden Bay were ash (*Fraxinus* sp), Prunoideae (*cherry* type) and cf larch (cf *Larix* sp) but these occurred in a very limited number of samples. The presence of cf larch is unusual as it is not a native species in the UK. Larch is sometimes found in coastal locations, where it has been collected as driftwood, but this is seen most often when local woodland resources are scarce, which does not seem to be the case at Cruden Bay. It could also represent a much more modern piece of timber.

Many of the contexts examined from this site produced charcoal assemblages with a range of charcoal types present. It is thought that these assemblages represent the remains of domestic hearth waste, with these remains having been dumped in ditches, and pits and scattered across the site so that they trickled down into postholes and other features. The most interesting finding was the large proportion of heather type woody stems that were identified in many of the contexts. It is not clear whether this heather type material was being used primarily for fuel or whether it might represent the remains of flooring/bedding material that was accidentally burned or, perhaps initially used for flooring/bedding and then burned when new flooring material was required. There is also a possibility that heather type stems are all that remains of burned turves or peats but this seems less likely since there was no other evidence for botanical remains associated with heathlands or bogs.

Cereals

Concentrations of carbonised cereal grains were identified from Structures 2, 8, 11, 15 and 17 (Figure 70). The cereal assemblages were dominated by barley, with occasional grains being well enough preserved to identify them further as the hulled variety. Oats were often present but in relatively low concentrations and these grains may be from oats growing as weeds within the barley crop rather than evidence of oat crops in their own right. Occasional grains of emmer wheat were also recorded from Structures 11 and 15.

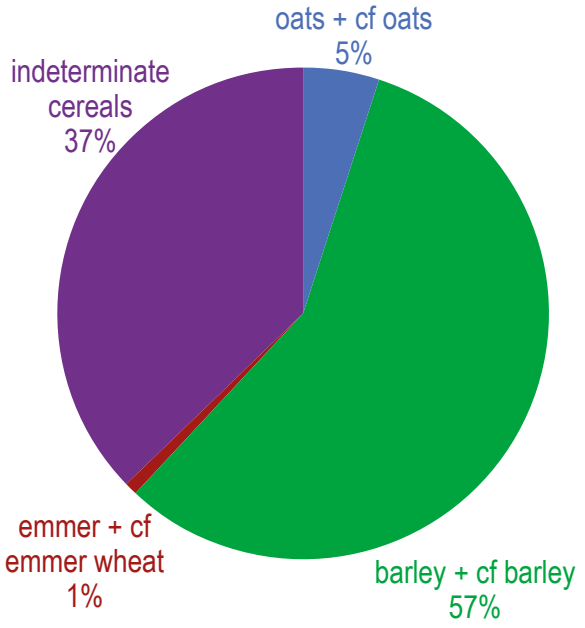

Figure 70: Cereal types pie chart.

Hulled barley was the dominant cereal type in Scotland from the Bronze Age onwards, with oats then becoming more common from the early medieval period. Wheat was generally associated with higher status sites during the prehistoric period (Bishop et al. 2009; Dickson and Dickson 2000). Large proportions of the cereal grains recovered from this site were indeterminate in nature because of poor preservation. This may be because the cereals were burned multiple times, for example in the base of a hearth.

Other food plant remains

Very few traces of other food plant remains were recorded from this site. Only a single fragment of hazel nutshell was recorded from Structure 7. This is very unusual if this site is prehistoric in date since hazel nutshell fragments are often very common finds on prehistoric sites. The only other potential food plant remain was a single pip of cf crab apple from pit (691), which was not associated with a structure.

The flaked lithics and stone tools

By Ann Clarke

Introduction

A total of 171 flaked lithics were recorded comprising 169 flint artefacts and two of quartzite (Table 26). An additional 90 recorded finds were simply natural chunks and spalls of burnt flint, as well as rolled and weathered chunks and complete flint pebbles all of which are a constituent of the natural gravels (see below). Nine objects of worked stone were also recorded including a rotary quern, a saddle quern, a grinding slab, four cobble tools and two broken cobbles.

Flaked lithics

Raw material

Cruden Bay is c. 5 km from the southern edge of mapped Buchan gravels which is a ridge composed of flint and quartzite cobbles extending inland. The Buchan flint is matt grey in colour and the cobbles have a hard, rolled cortex. Chemical alterations to the flint nodules found on the surface of the deposits mean that the colour changes from grey to brown and red and in order to get the fresher classic grey flint the cobbles must be dug from below the surface. There are prehistoric flint mines at points in the gravel ridge e.g. Den of Boddam but the brown hues of most of the worked flint at Cruden Bay suggests the cobbles were derived from surface deposits most likely around the site. Pebbles and natural rolled chunks were recorded during excavation and observed in the soils.

Structure	Blades	Flakes	Cores	Retouched and utilised tools	Chunks	Chips	Small flakes <10 mm	Total lithics	Stone tools
1		6		1	1			8	
2					2	1		3	
3	1	5	3		2		1	12	Cobble fragment
4	1		1 quartzite		4	1	2	9	Saddle quern, cobble fragment
5		15	1+2 split pebbles		5	1		24	
6			1					1	
7	1	2	1		2		1	7	
8	1	1					1	3	
9							1	1	
10		1	1				1	3	
11		1			3			4	
12	1	2			3		1	7	Fire-cracked cobble
13							1	1	
14					1			1	
17/18	1	2	1		1			5	Faceted hammer-stone, large grinder
19		1			1			2	
20	1		1					2	
21		2	1		1		2	6	
23		1						1	
Non-assigned features	1	8	1		8	2	4	24	Rotary quern, whetstone, polisher
Charcoal deposits	1	7 (plus 1 of quartzite)		1				9	Polisher
Surface collection	3	14	5	3	11		2	38	Possible hammerstone
Total	12	68	19	5	45	5	17	171	

Table 26: Types and location of flaked lithics and worked stone.

Though most of the worked flint is from the local gravels there are some pieces such as the overshot blade made from a light grey flint which may be from beach pebble flint found along the Aberdeenshire coast.

The two pieces of worked quartzite are vein quartz derived from local sources.

Cores

The cores (Table 27) have evidence for three main reduction techniques. There are five single platform cores which have been worked to detach blades (SF 184), flakes (SF 106 and SF 164) and a mix of blade and flakes (SF 182.1 and SF 183). Four of these cores have been worked from a single flat platform back towards a cortical face whilst SF 164 (Figure 71) has been flaked all around the single platform leaving cortex on the base. The blade scars vary between 10 mm and 13 mm in width on two cores and 15 mm plus on other cores and so are larger than the narrow blades (of around 8 mm in width) that tend to characterise late Mesolithic intensive blade production. Two of these cores were abandoned because of bad flaws in the nodule causing step fractures (SF 106 and SF 164) which have prevented detachments of a suitable shape or size. This group of cores may date to the late Mesolithic or Neolithic.

Core type	Total
Single platform blade core	1
Single platform blade and flake core	2
Single platform flake core	2
Multi-platform flake core	8
Levallois-like cores	2
Split pebble	2
Flaked chunk (quartzite)	1
Core fragment	1

Table 27: Core types.

Two cores (SF 5 and SF 136) (both Figure 71) are fragments of larger cores exhibiting the Levallois-like technique where faceted platforms were prepared from which to detach broad regular flakes. This technique dates to the late Neolithic and normally associated with Grooved Ware ceramics. Both cores appear to have additional flaking in a less organised manner which possibly indicates reuse in the later Bronze Age period. A broad flake with a crushed platform (SF 27) has a remnant faceted platform on the distal end which indicated it was detached from what was once a Levallois-like core.

The eight multi-platform flake cores all retain a partial cortical surface. None of them display any attempt to shape or prepare platforms, nor is there any organised flake removal. Instead, the nodule has been turned at all angles in order to detach single flakes using a hard hammer. These core types are likely to date to the later Bronze Age.

Two split pebbles are present including one (SF 196.3) which was cleaved using a hard hammer possibly in preparation for further core working.

A quartzite chunk (SF 40) was roughly flaked along one long edge of the chunk.

Blades and flakes

Blades and flakes were both detached from the cores though flakes were in the majority (Table 26). Just four of the twelve blades retained cortex whilst 40 (60%) of the flakes were cortical including three primary flakes. The high cortical component indicates pebbles were being reduced on site.

One blade is the earliest identifiable worked flint from the site (SF 108) (Figure 71) and is a broad blade detached from an opposed platform blade core. It is made from what appears to be mottled dark brown flint, but the surface colour is likely to be a product of weathering since the ventral face is darker in tone than the dorsal face. It was detached using a soft hammer leaving a remnant small flat platform on the proximal end. The distal end is formed by the flat platform of the opposite end. With dimensions of 65 mm long, 31 mm wide and 11 mm thick the blade fits well within the size range of a group of blades 43 mm – 116 mm in length from Milltimber, Aberdeenshire, which were identified as Late Upper Palaeolithic dating to 15,000 – 10,000 years ago (Ballin 2019a, Table 2.12).

Another large blade SF 162 (Figure 71) is a distal fragment with a broken length of 47 mm and a width of 22 mm which would also place it within the size category of the Late Upper Palaeolithic blades. With a thickness of 7 mm, it is less robust than SF 108, though three blades of this date from

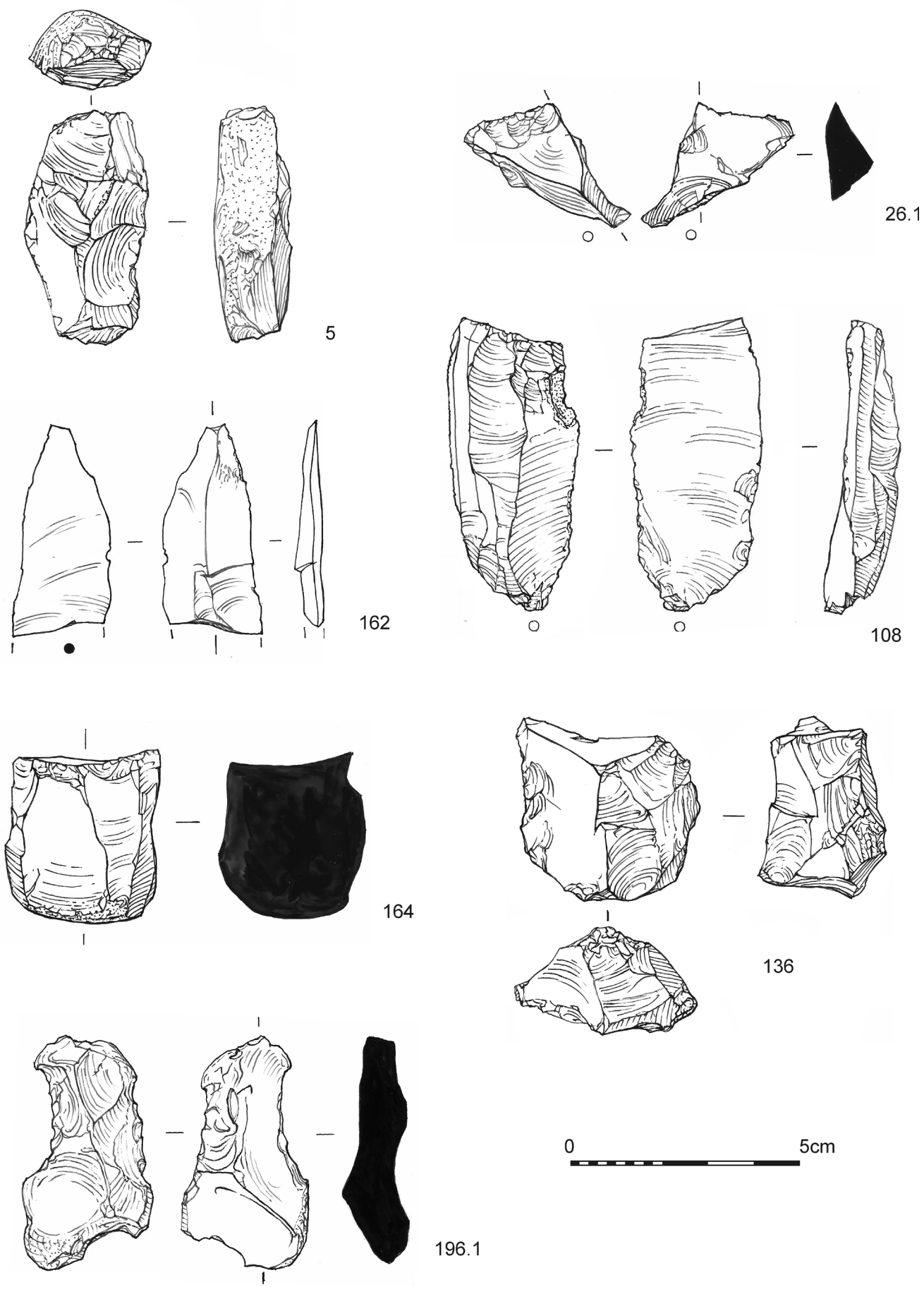

Figure 71: Lithics SFs 5, 26.1, 108, 136, 164, 196.1.

Milltimber are recorded with this this thickness (Ballin 2019a, Table 2.12). No platform survives and there is no evidence that it was detached from an opposed platform blade core. The flint is a distinctive, possibly non-local mottled brown flint which may originally have been grey.

There was no other evidence amongst the assemblage for specific core types, rejuvenation flakes or retouched tools which would indicate more widespread activity here in the Late Upper Palaeolithic.

The rest of the blades were smaller in size ranging from 5 mm to 18 mm in width and the surviving platforms were flat and narrow. These blades are likely to be the product of later working techniques dating to the late Mesolithic or Neolithic.

At least one third of the flakes showed evidence for the use of hard hammer in the form of prominent bulbs of percussion and ripples. Platforms were often cortical, occasionally flat and deep or crushed but otherwise there was no clear detachment features. Multi-directional flake scars on the dorsal of three flakes indicating they came from a late Neolithic or later core. The flake (SF 1) has narrow blade scars on the dorsal face whilst its crushed platform demonstrates it comes from the bipolar working of an earlier flake.

Chunks

Chunks were the second most common form after flakes (Table 26) and appear to be incidental shatter from the *ad hoc* working of flint. These are likely to form part of the later prehistoric assemblage along with the multi-platform flake cores and most of the flakes.

Retouched pieces

Three flakes had small amounts of retouch. A small scraper fragment (SF 147.7) is thick with a curved edge and steep invasive retouch which resembles a thumbnail scraper dating to early Bronze Age. This was from the surface of context 34. A fragment of a thick broad flake (SF 26.1) (Figure 71), which retained irregular shallow invasive retouch on one edge is from Structure 1 and dates to the late Neolithic/early Bronze Age. Another scraper (SF 229) is simply a primary flake that has been lightly modified with semi-abrupt retouch around the distal end. This is from charcoal deposit (220) and likely to date to the Bronze Age.

There are also utilised chunks which were used as strike-a-lights (SF 177.4 and SF 196.1) (Figure 71). Both have coarse bifacial edge damage along a long edge from use as a strike-a-light.

Discussion

Although most of the lithic assemblage is a product of Bronze Age flint knapping there are elements of several earlier episodes of flint working including the Late Upper Palaeolithic; late Mesolithic/Neolithic; late Neolithic/early Bronze Age; and Bronze Age.

The large Late Upper Palaeolithic blade from Cruden Bay (SF 108) came from the middle fill (411) of pit (71) Structure 3 and was found together with a multi-platform flake core and worked chunk as well as a fragment from a large grey quartzite cobble from the layer above (410). The blade is clearly intrusive and may have been incorporated incidentally in the pit with other material or, more likely found and collected by the occupants of the later prehistoric site perhaps as a useful shape and size of flint or as an oddity. Flaked lithics dating to the Late Upper Palaeolithic (LUP) have recently been identified at several locations in Aberdeenshire. All have been dated by typology, and none have associated archaeological features. At Blackdog a surface collection of late Neolithic and Bronze Age lithics included three broad flakes probably dating to the LUP (Ballin 2019b). At Milltimber a concentration of broad blades and knapping debris dating to the LUP was identified amongst a larger spread of later lithics along the back of a river terrace (Ballin 2019a). A programme of field walking along the River Dee by Mesolithic Deeside community group has also identified late Upper Palaeolithic flints from locations at Nethermills and East Park (Wickham-Jones et al. 2021). The other less certain LUP large blade (SF 162) also came from a pit in Structure 20.

The evidence for late Mesolithic occupation is slight and the single platform blade and blade/flake cores and a few blades are not exclusive to this period and could be derived from later, Neolithic flint working. Specific late Neolithic flint working technique is present in the form

of fragments of Levallois-like cores, but these were also reworked as simple flake cores most likely in the Bronze Age. A fragment of a possible thumbnail scraper may be an early Bronze Age type.

Most of the flaked lithics suggest an industry based on the *ad hoc* production of flakes from local gravel flint nodules using a hard hammer. Single flakes were detached from around the core in an improvised manner producing chunky shatter and thick flakes. The two strike-a-lights based on chunks most likely derive from this period of working. This assemblage is likely to be contemporary with the use of some of the structures.

The worked flint is scattered across the site but most of it is concentrated around Structures 3, 4, 5, 7 and 12 in the southern half of the site (Table 26). Here, the lithics include chunky shatter, hard hammer and flake dominance and are from later flint working which suggests some form activity related to the structures that involved the need for sharp flint edges.

There is no immediate comparison for an assemblage of this date in the region. At Blackdog, Aberdeenshire most of a surface collection of 170 lithics was dated to the Bronze Age based on the dominance of bipolar working and use of hard hammer (Ballin 2019b.) whilst at Greenacres, Wester Clerkhill, Peterhead, Aberdeenshire the bipolar cores were seen as part of a larger late Neolithic assemblage (Ballin 2018, 23). It is probable that the Bronze Age inhabitants of Cruden Bay simply made use of the natural flint cobbles and any large debitage from earlier flint working to produce flakes with sharp edges as needed on site.

Structure 1 had a retouched flake with irregular shallow invasive retouch (SF 26.1) and a possible Levallois-like flake from pit with pot. Both imply a late Neolithic/early Bronze Age date, and pottery vessel VO2 was of middle Bronze Age/Iron Age date.

Worked stone tools

As well as working flint the occupants of the area made use of the local stone to make several tools including querns and a range of cobble tools (Table 26).

Rotary quern (Figure 72)

The quern (SF 175) is half of an upper stone of a rotary quern set with a raised collar around the central eye. It is 450 mm in diameter and the eye is straight sided with a diameter of 65 mm. The stone used for the quern was mica schist which has angular quartz grains up to 10 mm in size throughout it matrix. The foliation of the mica schist allowed the rock to be split into thin slabs making it easy to prepare a quern blank whilst the hard grains provided a coarse rough working surface for grinding. The length of use of the quern is attested by the flattening and smoothing of these quartz grains to form a heavily worn and slightly concave face. This is particularly noted around the quern's outer perimeter. The source of this stone is not known; it could well have derived from the metamorphic suite of Dalradian rocks which form the bedrock of North-East Aberdeenshire. A study of rotary querns from around Scotland in the collections of the National Museum of Scotland suggests that most rotary querns could have been made from locally available rock (McLaren and Hunter 2009).

At some point the upper stone broke cleanly in half. The reasons for this are unclear. Perhaps it had broken during use or was dropped when moved. The worked face of the quern is heavily worn but there was no attempt to re-peck its worn surface to extend its working life, and the breakage served to effectively decommission it. The quern was placed in the east half of pit (796) (dated cal AD 68 – 212, SUERC-102210) propped on a stone with the worn face uppermost. The proportions of the pit and its flat base might suggest it was deliberately dug to contain the complete quern but only the southern half of the pit was used. Lack of damage around the perimeter of the quern indicates it was most likely placed in the pit directly, or not long after breakage. The pit was situated close to Structure 16.

Saddle quern (Figure 72)

The saddle quern (SF 50) is almost complete except for some later damage at one end. It is made on a shaped oval slab of coarse-grained metamorphic rock, possibly granite and it is 220 mm long and 160 mm broad. It has a rounded lower surface and a worn upper face. The latter is worn very smooth and is slightly concave long

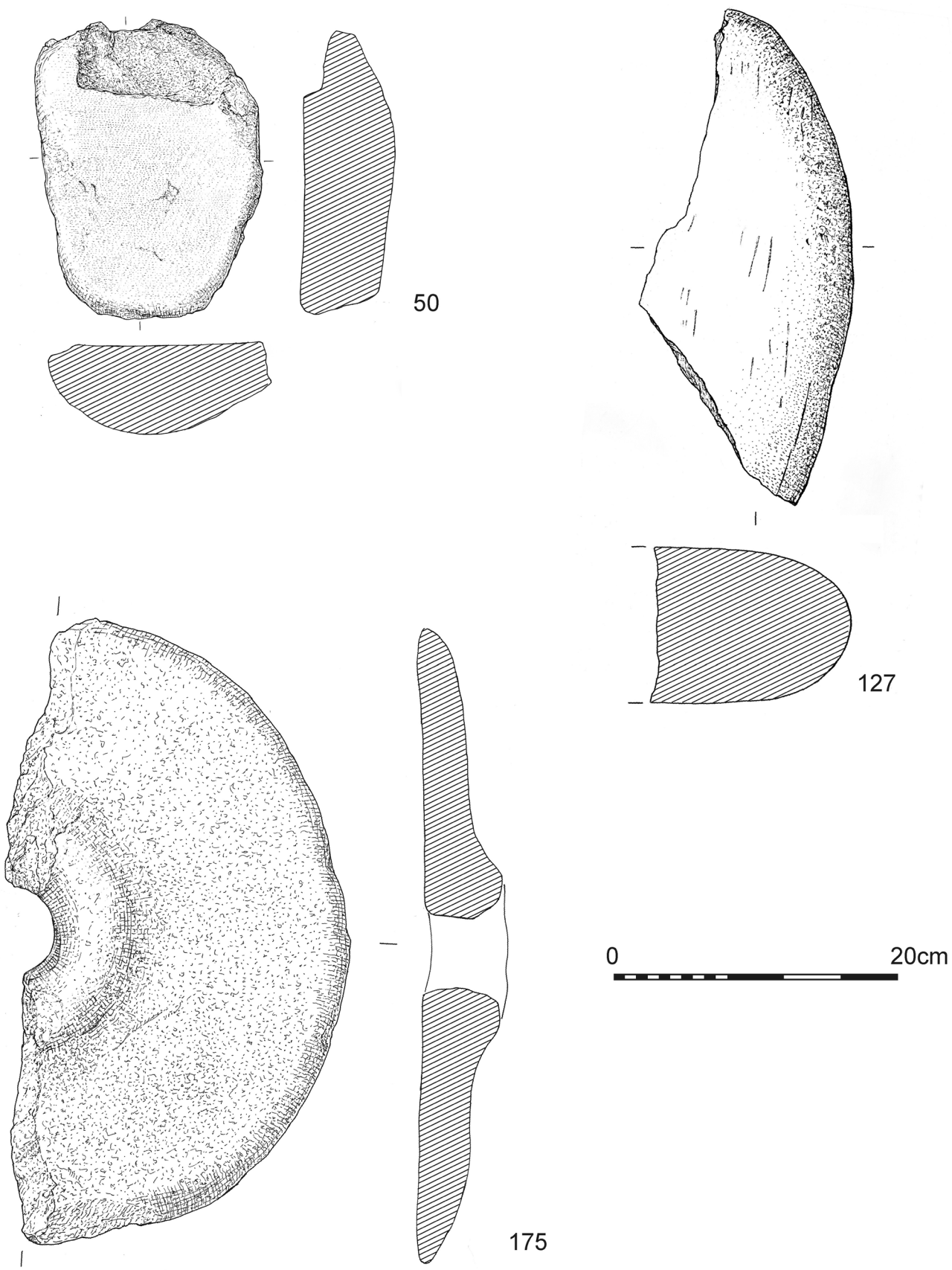

Figure 72: Stone tools SFs 50, 127 and 175.

the length of the stone and almost flat across its width. It has some deep pecking in the centre of the face that has since been worn. The pecking of the surface was to roughen it to increase its usefulness in grinding grain, for example. The broad end of the stone has been heavily damaged through coarse bifacial flaking, possibly once the quern was no longer required. The damage may have been from its use as a hammerstone or it may have occurred post-deposition. It came from pit (251) associated with Structure 4 together with a fragment of a deliberately struck waterworn cobble (SF 49).

Grinding slab (Figure 72)

A flat water-worn boulder of coarse-grained metamorphic rock was used as a grinding/ smoothing slab (SF 127). Found as a large fragment, the base is flat and part of the surviving upper face towards the centre has been worn flat and smooth. Polish and unidirectional striations run the length of the surviving face and are truncated by the breakage. These marks demonstrate the hardness of the material being worked and the direction of movement of the working. It was found in the terminal pit of Structure 17/18.

Cobble tools

A faceted hammerstone (SF 131) (Figure 73) is made from a cobble of coarse-grained metamorphic rock. It has been used as a hammerstone on both broad ends and across the faces leaving coarse pecked facets at either end.

A cobble of a finer-grained black metamorphic rock was selected for polisher (SF 103). This already had a naturally polished surface, which would have been useful for smoothing and polishing. The centre of the flatter face has a higher polish than the rest of the cobble suggesting it had been used on a soft surface.

A narrow elongated waterworn cobble (SF 89) of a coarse-grained metamorphic rock has a sub-rectangular cross-section (Figure 73). The stone was held at the broad end in order to use one side of the narrower end for a purpose that left small groups of parallel striations made at slight angles to each other. These groups demonstrate the slight adjustments to the angle of the tool as it was being used. The adjacent long edge was also worn to a narrow, polished angled facet. Traces of hard dark concretions especially on this face may be iron pan or remnants of a metallic substance being worked. This is likely to have been used as some form of burnisher or whetstone. This came from pit (66).

A weathered narrow rectangular cobble of pelitic schist (SF 93) was found during surface collection. The faces are naturally rough from the stone's texture. Both ends are damaged - one with bifacial flaking whilst the opposite end is more heavily flake-damaged by removal of part of one face. The stone would easily split along the foliations and it is uncertain whether the damage to the stone was a result of use or not.

A large fragment of grey quartzite (SF 121) was deliberately struck from a waterworn boulder. There are no signs of use or further shaping on this piece. In some respects, the deliberate fragmentation is like that of the broken cobble SF 49 found in pit (251) together with the saddle quern (SF 50) (see above).

Discussion

There are not enough stone tools to be certain about how the site was occupied but the broken grinding slab, the coarse faceted cobble, the whetstone/burnisher, and the polisher suggest some form of craft activity. The former two are from ditches of Structures 17/18, the whetstone/ burnisher from pit (66) between Structures 7 and 11, and the polisher from ditch (53), Structure 12.

The rotary quern probably dates broadly to the late Iron Age. It is a flat disc quern with a raised collar around the central eye. The surviving half of the quern has no evidence for rhind slots: the two opposed slots cut into the base of the stone used to hold it on an adjustable mechanism above a lower stone. There are also no handle holes on the surviving upper surface. At 450 mm in diameter the quern is at the smaller end of the size range for this type. At Pool, Sanday a rotary quern fragment of 450 mm in diameter with a raised collar around the central hole was found in the late Iron Age Phase 6.4 which was broadly dated 210 – 660 cal AD (Hunter, Bond and Smith 2007, 377-378).

An earlier style of rotary quern is present at Aldclune, Angus where 12 upper rotary querns were recovered from the two fortified homestead the occupations of which spanned 200 BC – AD 200. These are different in form to the one from Cruden Bay as they have oval outlines with a rounded point on one end in which there is a hole made for an upright handle (Hingley et al. 1997). At Black Spout, a monumental roundhouse at Pitlochry, Perthshire that was occupied last two centuries BC, two rotary querns were found with a protruding shaped edge with handle hole like those at Aldclune. A smaller example than that from Cruden Bay was a complete upper stone c. 340 mm in diameter, without rhind slots or handle holes that had been placed in the foundation of the entrance to an intra mural cell (Clarke 2013, 39-45).

There are frequent instances of the deliberate placement rotary querns after use in sites across Scotland (Strachan 2013). Floors in middle Iron Age roundhouses such as Aldclune and Black Spout both in Perthshire and particularly around entrances are common locations for querns (Hingley et al. 1997, Strachan 2013). Rotary quern

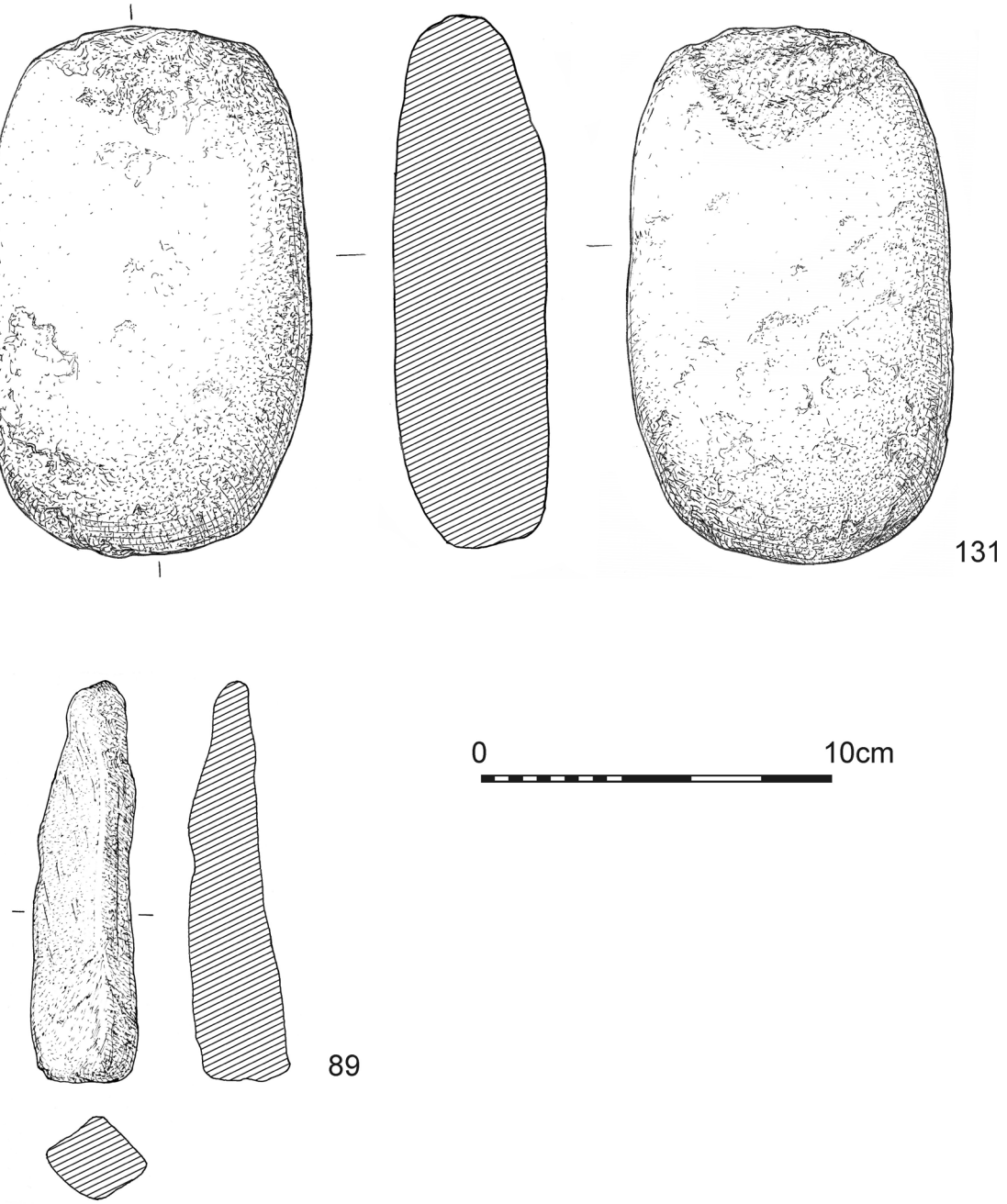

Figure 73: Stone tools SFs 89 and 131.

deposits in the later Iron Age were sometimes used to mark major structural changes: at Scalloway Shetland a decorated quern was found in a casement wall which reduced the size of the original internal broch area (Clarke 1998, 140, Fig 88), whilst at Bayanne, Shetland a decorated quern was used as a foundation deposit for the alteration of the roundhouse to a figure-of-eight form (Clarke 2014, 167, figure 3.63). At Cruden Bay there are no structural deposits to associate with the rotary quern that was placed in one half of a circular pit to the east of Structure 16 and does not immediately appear to have been part of it.

Saddle querns are also found in secondary contexts: often pits or ditches of roundhouses, and as with the rotary querns their final place of deposition does not reflect their context of use. They date from the middle Bronze Age to the early to middle Iron Age. There are several instances of saddle querns found in pits and ditches of roundhouses from excavations along the Aberdeen Bypass: The one from Milltimber was in a pit dating to the early to middle Iron Age, whilst Gairnhill, Chapel of Stoneywood and Wester Hatton are all later Bronze Age. The group of saddle querns at Wester Hatton show a wide range in size from larger stationary querns to smaller, portable 'slug' querns (Lochrie 2019, 122, 187 and 305) and the range of sizes may reflect the different types of meal being ground, or at least differences in textures of the intended product. Two fragments from a single quern rubber were found at different points in the ring ditch fill of Little Lediken, near Insch, Aberdeenshire (Clarke 2018, 49). And at Coul Brae, Mosstodloch, Moray saddle querns and quern rubbers were associated with early Iron Age contexts (Clarke 2015, 49) though the complex nature of the archaeology meant there was possible later stone clearing from earlier occupations.

Other sites in the region have correspondingly small number of stone tools to Cruden Bay. A faceted cobble from Wester Hatton is similar in shape to the one from Cruden Bay as well as a fragment of a grinding stone; two polishers and a pounder come from Gairnhill (Lochrie 2019).

Pottery and Fired Clay

by Julie Lochrie

Introduction

This assemblage includes 129 sherds of pottery, 174 pieces of fired clay and two ceramic objects. The assemblage is middle Bronze Age to Iron Age in date.

Methodology

The pottery has been fully catalogued by context, type, weight, description, fabric and assigned a vessel number. The pottery was visually examined, using x20 magnification where necessary and was recorded in accordance with guidance and standards set by the Prehistoric Ceramics Research Group (PCRG 2010)

The fired clay has been given a basic identification and quantification. The furnace has not been cleaned and should be in future processed to identify any potential trace metallurgical artefacts adhering to the surface. Natural stone, bone and slag have all been noted in the catalogue but not discussed further.

All measurements are in millimetres and all weights are in grams. Sherd size is described under the following categorisation: small 0-40 mm, medium 40-80 mm and large >80 mm.

Pottery analysis

The pottery comprises 129 sherds, weighing 4.9 kg from a minimum of 14 vessels. Most of the sherds are small, abraded body sherds but there is a higher proportion from two examples (V02 and V05). No deposit contained more than one vessel. The fragmentation and abraded condition all point towards the pottery being domestic refuse.

The pottery is a type known as Flat-Rimmed Ware which has a long period of use between the middle Bronze Age and Iron Age. Flat-Rimmed Ware is an antiquated term which fails to describe the range of rim forms present during this period of potting tradition. Unfortunately, the majority

of the Flat-Rimmed Ware in this assemblage has no remaining rims. The exceptions to this are vessel V02 and V05 which are described in detail below.

V02 Decorated vessel

This is the only decorated vessel in the assemblage (Figure 74). There are 51 sherds amounting to 1 kg of which three are rim sherds (SF 28) and the remainder are body sherds. The vessel has an oblique internally bevelled rim which has been slightly flattened into a T-shaped profile. The rim has some variation in thickness between the three sherds and this makes the diameter estimate less accurate but in the region of 230 mm. Directly below the rim is a band of incised decoration around 32 mm in width. The decorative motif comprises two horizontal lines containing diagonal slashes. The incised decoration is not particularly regular, even or straight and the diagonals occasionally meet the horizontal lines.

Thick organic residue is present on one of the rim sherds and several body sherds. No base sherds remain but the base would have been flat, and the overall form would have been bucket or barrel-shaped. The construction technique of the vessel is revealed on one body sherd which has broken along a clay join which is irregular but very oblique.

The undecorated pottery assemblage from Cruden Bay is middle Bronze Age to Iron Age and decorated forms during this period are rare but not unheard of. Vessel P163 from the middle Bronze Age settlement at Drumyocher (Johnson 2017, 19) is very similar to V02 from Structure 1. At Drumyocher incised decoration was present on 14 vessels, showing that while rarer in general it was by no means unheard of during the middle Bronze Age (Johnson 2017, 20).

V05 Flat Rimmed Ware

The sherds (SF 90) from this vessel are from context (362) and number 60 sherds, representing almost half of the entire pottery assemblage. The sherds weigh a heavy 3.6 kg which is due to the entire base being present (Figure 75). There are also two rim sherds and 45 body sherds which reveal a large bucket-shaped form with a simple rounded rim of c. 320 mm diameter and a wide flat base of 225 mm.

There are nine base sherds which reveal how this part of the vessel was constructed. The base began as a large circular disc 21 mm thick. Pieces of clay manipulated to between 10 mm and 15 mm were then attached to this disc. Vertical finger smoothing on the vessel exterior show how the walls were manipulated to a smoother and more uniform thickness and surface. This type of finger smoothing can also be seen on body sherds from (39) and (665).

The vessel has been repaired as shown on a single body sherd by two, post-firing perforations. These would have been used to bind together cracks in the pot to help prevent further cracking. The location of the two holes could indicate a double bind was used to secure one crack or the perforations were to bind two separate cracks.

Vessels like this one have been found at many middle to late Bronze Age sites (Old Meldrum, Johnson 2010, Kintore, Alexander 2000) and the bucket shaped, undecorated form is typical for middle Bronze Age to Iron Age pottery.

Ceramic Objects

A ceramic object (SF 51), a spindle whorl, in three conjoining pieces was found amongst the pottery sherds of V05 and is likely the same date. This ovoid piece of fired clay has a central perforation of 6.5 mm which is mostly straight and regular in width, only widening slightly at its terminals. The reconstructed diameter of the object is 41 mm and its thickest point, at which the perforation runs, through is 26 mm. The fabric is sandy with voids suggesting an organic temper and one large, rounded pebble 8 mm in visible length.

A second shaped piece of fired ceramic was found unstratified. This piece is partial and abraded but has the overall appearance of a ‘waisted’ disc weighing 35g. Only one end and one side are original and unbroken, and it is unclear if this bears a resemblance to its overall original form. The purpose of this object is unknown.

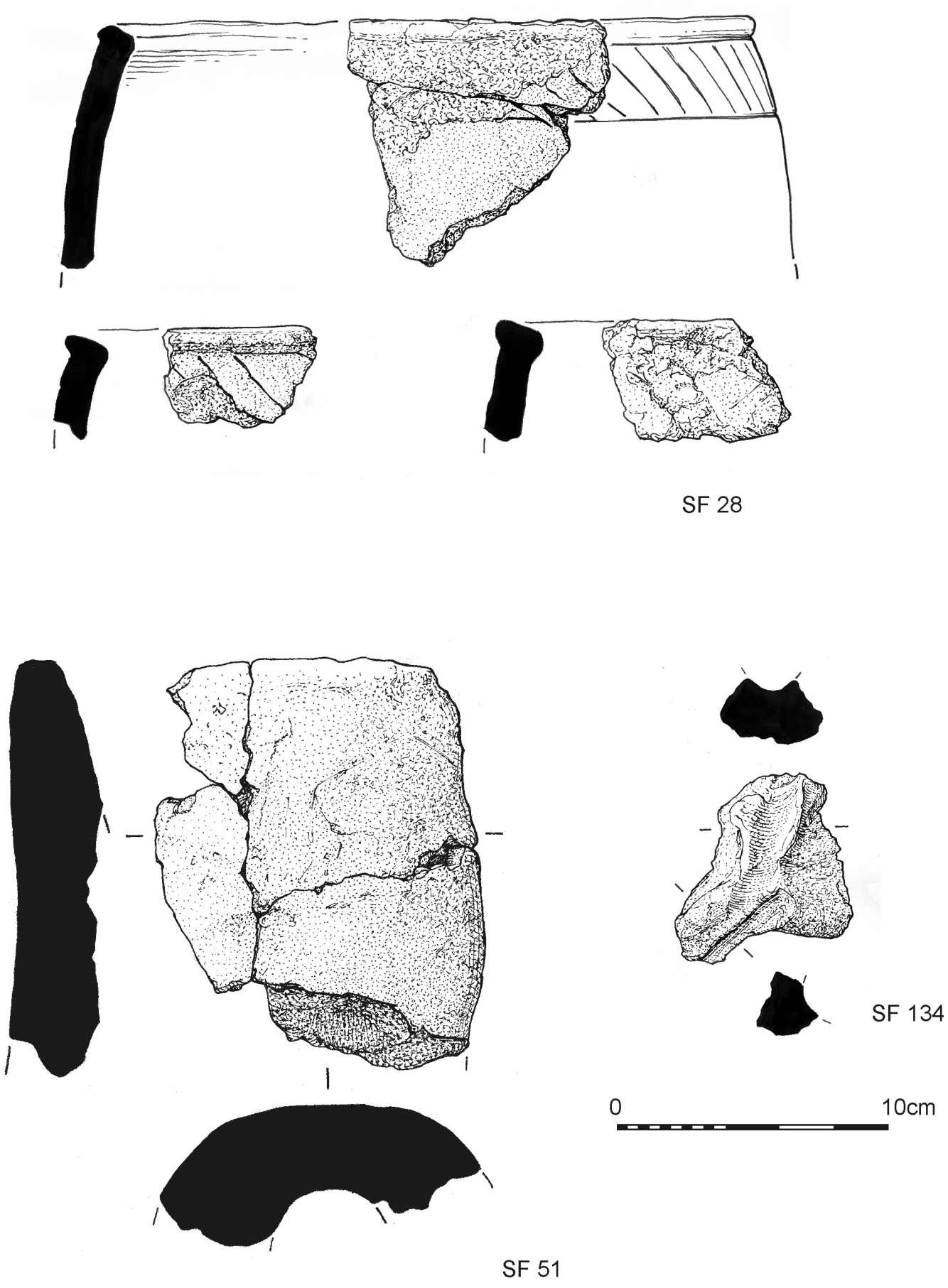

Figure 74: Pottery V02 (SF 28) and fired clay SF 51 and SF 134.

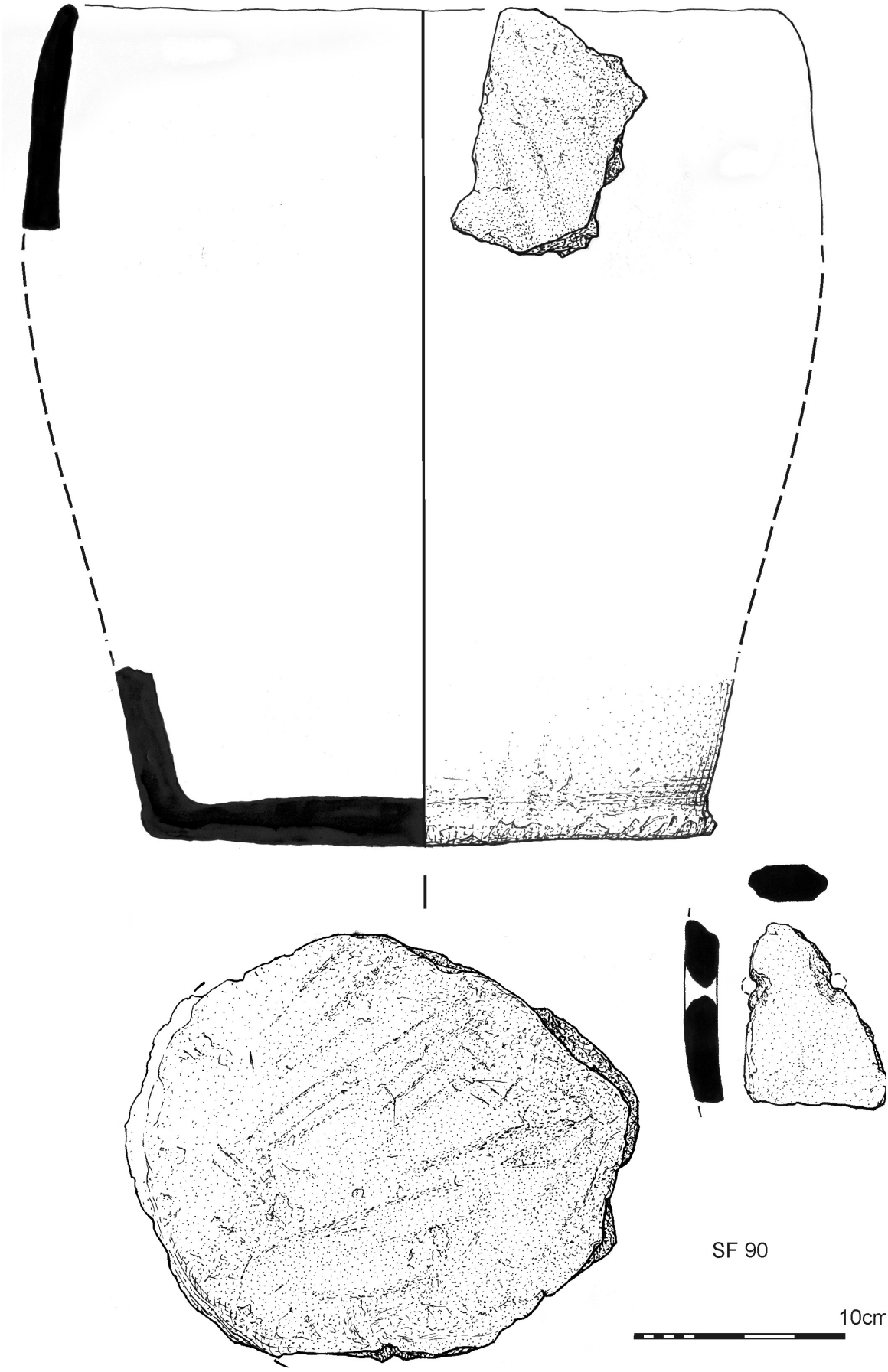

Figure 75: Pottery V05 (SF 90).

Fired Clay

The fired clay comprises 59 pieces (1532 g) of a fragmentary furnace, 99 (305 g) pieces of daub and 16 (37 g) undiagnostic pieces. The undiagnostic pieces are small and abraded and cannot be identified further.

The furnace pieces from (262) in Structure 3 are large sections from the top of the furnace, including its rim (SF 51), (Figure 74). However, sample processing has retrieved some vitrified lining and slag which are likely to be from lower in the furnace where the heat would have been higher.

The 305 g of daub is present in six deposits (412), (450), (504), (506), (665) and (770) with a concentration of 76 pieces, weighing 92 g from (506). The daub has been identified as such when wattle impressions, in the form of intersecting linear depressions, could be seen. Grass or straw impressions were also noted on one piece from (166) and are likely a deliberate addition to the clay when the mixture was created before being applied to the wattle. In general, the daub is soft and sandy, occasionally finer, and contains few inclusions other than naturally occurring sub-rounded or sub-angular quartz.

The linear wattle impressions were measured and all individual depressions measure between 10.5 mm to 20 mm in width indicating small branches, see (SF 134) (Figure 74). The daub has become ceramic through exposure to high heat which indicates the structures were fired.

Discussion

The assemblage includes craft, technology and domestic elements which mark it as belonging to a homestead or settlement. The daub indicates that there was a wattle and daub structure/s which burnt down. The burnt daub has been caused by a fire and the lack of further artefacts in more complete condition suggests that the fire was either planned and the inhabitant's belongings were removed, or it could be controlled before too much damage was done.

The pottery assemblage is not large, and its fragmentation and abrasion suggest it has been part of a refuse deposit, possible midden material which has become incorporated into features. Despite there only being more substantial parts of two pots, we still see a glimpse of domestic life. The smaller vessel from (104) has carbonised organic residue encrusted to its exterior and it is likely this is a cooking vessel. The much larger vessel from (362) has no carbonised organic residue but its size and weight point towards storage for its use as moving this on and off a fire is not practical. This large storage vessel was also clearly valued enough to have been repaired.

The furnace is most likely related to metalworking and the spindle whorl would have been for creating thread which could have many uses by itself or could be weaved into textiles. The presence of these craft and technology elements enrich our understanding of the activities which would have taken place and the items which could have been made at the site.

Vitrified Material

By Gemma Cruickshanks

Summary

A little under 2 kg of vitrified material was recovered during excavations at Cruden Bay (Table 28). Vitrified material can be produced during a range of high-temperature processes from regular domestic hearth activity to specialised crafts such as glass or metalworking. Most of the material recovered here is fuel ash slag which is not diagnostic of a particular process, but a single fragment of ironworking slag attests to some blacksmithing activity. The material was retrieved from a range of features across the settlement including a concentration of fuel ash slag in Structure 5. Fragments from radiocarbon dated contexts indicate the material was deposited in the first century BC and first century AD. The sparsity of ironworking debris is typical for the area.

The Assemblage

The material was visually examined and classified using common terminology (e.g. Crew and Rehren 2002; Lucas and Paynter 2010; McDonnell and Milns 2015) based upon characteristics such as size, morphology and density. The assemblage is summarised below and a full catalogue is in the archive.

Ironworking debris

A single fragment (SF 161) of ironworking slag (96g) was recovered from the ditch (167), fill (663) of Structure 7. Its morphology resembles a fragment from a plano-convex smithing hearth base, a type of slag which forms in a blacksmith's hearth from accumulating slag and iron particles dislodged as hot iron is moved in and out between hammering.

Fuel Ash Slag

Most of the assemblage comprises fragments of fuel ash slag which are characteristically lightweight with a porous/bubbled texture and grey-white colour. Such slag is formed during the high temperature reaction between alkaline fuel ash and silicates found in sand, clay or soil. As such, this type of slag is not diagnostic of a specific process such as metalworking. The largest concentration of fuel ash slag was retrieved from features associated with Structure 5, including the ditch (328).

Iron concretion

Several fragments (Samples 99, 119, 243 and 302) recovered from Structures 1, 17 and 19 are naturally occurring iron-rich concretions.

Discussion

Although only one fragment of ironworking slag (SF 161) was recovered, its presence in the ring ditch fill of roundhouse Structure 7 provides a glimpse of Iron Age ironworking in the vicinity. Iron slag often becomes incorporated into later feature fills and deposits, making it difficult to establish exactly where and when the activity took place without discovering in situ features such as smelting furnaces and blacksmiths' hearths. Iron Age ironworking evidence remains relatively sparse in Aberdeenshire compared to the neighbouring Moray Firth area where several roundhouse settlements, such as Culduthel (Hatherley and Murray 2021), Birnie (Hunter 2010) and Clarkly Hill (Hunter in prep), have produced several hundred kilogrammes of ironworking debris, indicating they were producing iron for beyond their own requirements (Cruickshanks 2017).

While fuel ash slag cannot normally be attributed to a specific activity, its concentration in the ring ditch of Structure 5 and the relatively large size of some of the fragments suggests it was not simply produced during domestic hearth/daily cooking activity. It is not possible to determine the exact nature of the high-temperature event which produced this material, but possibilities include a timber or turf structure burning down, or cremation events.

Vitrified material type	Structure 1	Structure 3	Structure 4	Structure 5	Structure 7	Structure 12	Structure 16	Structure 17	Structure 18	Structure 19	Total (g)
Iron working slag					96						96
Fuel ash slag		118	29	1215	3.5	53	11	350	6		1785.5
Natural iron concretion	53							3		3	59
Total	53	118	29	1215	99.5	53	11	353	6	3	1940.5

Table 28: Summary of vitrified material assemblage by structure.

General Discussion

The archaeological results from the excavation at Cruden Bay revealed a complex palimpsest of activities. The earliest visitation to the site was during the Late Upper Palaeolithic, identified by a possible lithic point of that date. Further evidence indicates that hunting parties or small groups of people during the late Mesolithic and Neolithic periods also visited and possibly camped at the site. They made new tools and refurbished others, leaving lithic fragments behind that have found their way into ditch, pit and posthole fills of the middle Iron Age settlement. Although most of the lithics and pottery are considered Bronze Age in date there were no confirmed contemporary structures present on the site. This supposes earlier use of the site during prehistory was low, for example, for camp fires or pit digging but not necessarily for settlement. Examples such as pits (71) and (65) near Structure 3, are both undated, but the former contained a fragment of saddle quern (SF 100), flint artefacts, burnt bone, and the latter had most of the pottery found on the site - Vessel V05, with fired clay, and cramp. Fire-pit (142) associated with Structure 16, also undated, but contained much fired clay and wattle with evidence of cereals, seems to be earlier than the Iron Age settlement. These three isolated pits are rare examples of surviving Bronze Age activities. However, it must also be considered that any Bronze Age settlement could have been situated outside the excavated area. The surviving evidence points to significant occupation and use of the landscape in the middle Iron Age from as early as the 4th century BC to the early 3rd century AD. Later use of the site in the early medieval period, towards the end of the first millennium AD, was also documented.

Interpretation of the site is difficult due to the widespread nature of the Iron Age occupation that may have destroyed evidence of earlier occupation. However, the major cause of the poor preservation and severe truncation of features in general, and the loss of stratigraphy, is mostly due to later farming activities including those of more recent times. In spite of these taphonomic problems, sufficient evidence has remained to confirm that it was once the site of extensive activities during the Iron Age. These included a small number of possible structures and enclosures, with field boundaries, the cultivation and processing of crops, the use of a probable furnace and other metal working activities, with sparse and more ephemeral activities during the early Medieval period.

With no recognisable and dated features earlier than the Iron Age this discussion concentrates on the interpretation of the structural evidence from that period and what it tells us of the occupation over an approximate 600 year period.

Interpretation of the structures

Analysis of the excavated features from the site suggests there were a number of structures present that can be identifiable to type or function (Table 29), but clouding the overall picture are earlier middle Iron Age radiocarbon dates from features scattered across the excavated area. The interpretation of the structures and their dates is therefore very subjective (Figure 76). The most prominent features were ditches from possible roundhouses, other built structures and those that formed enclosures. Other features, mostly pits and postholes and fragments of ditches not related to the structures are considered as possible small enclosures and field boundaries. Apart from one definite and one possible structure that can be considered early Medieval in date, there are a number of areas (labelled as structures during the excavation), whose form and purpose are not known.

Larger structures and enclosures

During the excavation Structures 3 and 5 were considered to be possible roundhouses. Each had up to three roughly parallel but fragmented shallow ditches surviving, either in the north-west or north-eastern quadrants of the structures and with a suggestion of a continuation of those ditches in the south-west quadrant. The eastern halves of both ditch complexes were missing, including any entrances, if they existed there.

Structure 3

The curvature of the ditches of Structure 3 suggests they could, if continuous, have enclosed a circular area c. 14 m to 18 m in diameter. The outer ditch is the more substantial being wider than the two inner ditches in the north but also somewhat shallower than them. The enclosed

Structure	Ditches	Postholes	Pits	Comments	Interpretation
1	2 simple, possible entrance	2 internal to ditch	3	Little evidence of it being a roundhouse. No 14C dates	Enclosure?
2	0	1	4	Linear arrangement - pit and postholes early Medieval	?
3	3 substantial, segmented, complex	3 internal to ditches	external	Phase 1: outer ditch and postholes esp (1011) BC/AD. Interior evidence sparse. Phase 2: inner ditches, furnace (59) - with fired clay and cramp. AD. Possibly a byre	Byre, later workshop
4	1	shallow	2 deep	Mix of periods from BC/AD,	Boundary/ Medieval?
5	3-4 substantial, complex	many	several	Phase 1: ditches BC/AD date plus one pit Phase 2: larger pits and some postholes, lots of stakeholes. Looks to have been a RH but pattern of features not easy to read.	RH?
6	2 sections one long, curved Related to Structure 17?			Possibly BC? But undated	Enclosure
7	penannular with other ditch fragments	several	4+	Best ditch (undated) with earlier ditch fragments (BC and BC/AD) and other features (AD). Ditch fill contained iron working slag, possibly a workshop area?	Enclosure domestic / workshop
8	2 separate fragments with furrows	3 in linear alignment		Possible AD fence alignment with fragments of boundary ditches. Some could be Medieval	Small, ditched enclosure / boundaries / Medieval
9	shallow fragment		large pit	Undated	Small, ditched enclosure
10	curved fragment	3 pits/postholes	hearth and large pit	Ditch and hearth BC/AD, large pit AD	Small, ditched enclosure
11	curved fragment	several	hearth and large pit	Hearth undated, groups of pits/postholes in linear arrangements. Undated.	Small, ditched enclosure/ boundaries
12	long, curved	1	3	Enclosure? With pits, corn-drying? all AD	Enclosure / kiln
13	2 short, linear fragments			BC date	?
	curved frag with adjoining pit/ posthole		1	BC/AD date	?
15	short, curved	line of 3	2	Sparse features BC/AD and AD date	Small, ditched enclosure/ boundaries
16	2 short, curved fragments	3	5	Pit 142, with pottery and wattle structure, two pits in between ditches BC date, pit at end of larger ditch BC/AD date, and large pit with quern frag AD date	Uncertain
17	curved sections	several	3	Possible structure of AD date, 3 deeper postholes, rest shallow. Later? large pit with grinder and hammerstone	Structure

Table 29: Structures evidence for interpretation.

Structure	Ditches	Postholes	Pits	Comments	Interpretation
18	may be part of Structure 17??			Undated	Enclosure
19	1 section adjacent to Structure18		1	Undated	Enclosure
20	2 short sections		1 fire-pit	BC/AD	Enclosure?
21	1 short section	several	several	Linear arrangements of BC and BC/AD dated pits and postholes	Boundaries
22		c. 7		one is BC in date, spaced, linear arrangement	Boundaries
23	1 short section	3	2	BC and BC/AD date	Boundaries

Table 29 (continued): Structures evidence for interpretation.

space contained only two deep postholes and one shallow one in a NNW/SSE alignment c. 7 m in length.

To confirm these features as a roundhouse more evidence would have been needed, including a number of deep postholes for posts positioned in a circular arrangement dug into the clays, sands and gravels of the subsoil. These would have supported the roof of a round structure. Although a central fire-pit or hearth is not always an essential feature of Bronze Age or Iron Age roundhouses(Ballin Smith et al. 2025), none was located in Structure 3. The sparsity of features and the arrangement of the surviving ditches suggest that their function was somewhat different.

The botanical analysis (see *Archaeobotany analysis*) identified mixed charcoal assemblages in all the ditches with heather being the most common type, but the amount of it is considered unusual. Heather was most likely used as flooring or bedding material but it was also found in large quantities in the fill of one posthole (1011). A large pit located to the east of the structure produced fills of hearth or midden waste but there was scant evidence for carbonised cereal grains in any of the features.

The radiocarbon dates of the northern ditch and the posthole (1011) (see Table 1) indicate activity in last half of the 1st century BC and into the first quarter of the 2nd century AD. No material cultural evidence was associated with these features to collaborate the date range. However, an interpretation of the available evidence from this structure suggests it may have had an agricultural use, possibly as a byre or sheltered area for the overwintering of livestock.

It would seem that the structure had a second phase of use, an industrial one, with the construction of a furnace (59) between the ditches in the south-west and the digging of large pit (65) to the south. The intensely burnt clay edges to the pit (59) and the presence of slag, cramp, and fragments of its lining or superstructure of willow roundwood and clay, identified it as a furnace. The large pit (65), was most likely a companion feature as its fill contained fragments of fired clay probably from the furnace. Radiocarbon dates from the furnace and the inner ditches (56) are roughly contemporary, from as early as the end of the 1st century AD to the second quarter of the 3rd century AD. The reuse or repurposing of a derelict building or structure for later industrial purposes is a common one (see Ballin Smith (ed.) 1994, 86-88).

Structure 5

This structure was situated to the immediate north-west of Structure 3 but the stratigraphic relationship between the two is uncertain. It comprises three parallel gently curved ditches in the north and north-east that appeared to terminate to the east. Their continuation to the west and south was not confirmed because of the limits of the excavated area. A short fragment of ditch was also recorded in the south-west and assumed to be part of the same structure. If these ditches were penannular or slightly oval in shape, with an entrance in the east, they would have enclosed an area c. 13 m to 15.5 m in diameter.

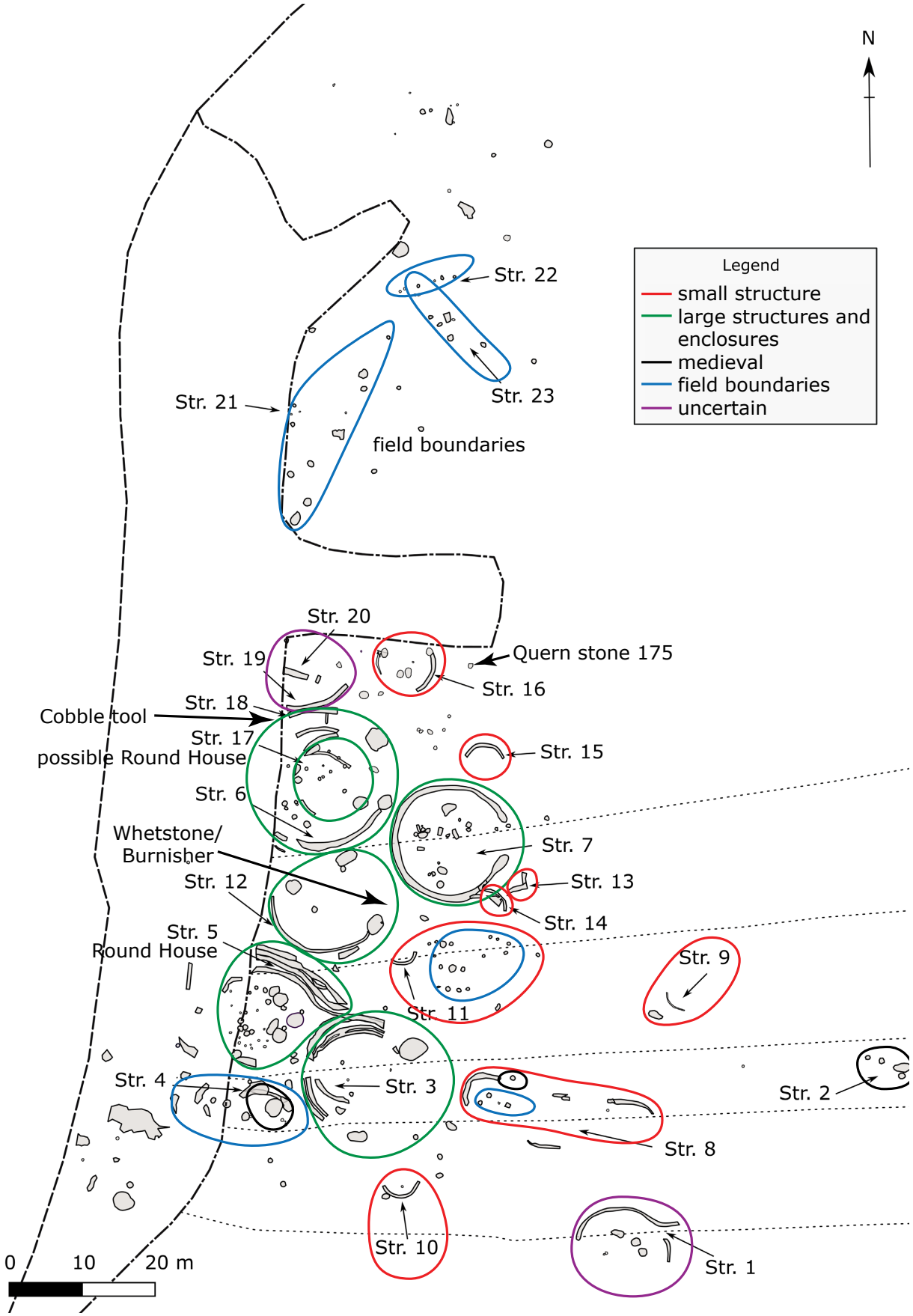

Figure 76: Interpretation plan.

Within the area between the north and south-west ditches, there were a large number of pits and postholes. Further analysis of these indicates there was an oval-shaped distribution of larger postholes, several with stone packing, positioned c. 2 m to 2.5 m from the innermost ditch edge and enclosing a space c. 9 m by 11 m. It is estimated that 15 posts positioned c. 2.25 m apart could have formed the main timbers of a roundhouse (Figure 77). Although most of these postholes survived only 0.10-0.20 m in depth, one posthole (343) was c. 0.45 m deep with stone packing and another posthole (27) is likely to have contained an oak post. Smaller postholes to the interior of those in the south-west quadrant suggest additional supports for the framework of a building exposed to prevailing south-westerly winds and weather (Ballin Smith 2025a, 282).

Of significance to the understanding of this building is the number of stakeholes in the south-west ditch and the inner ditch in the north with the occurrence of burnt wickerwork in the outer ditch (see *Archaeobotany analysis*). If this structure was a roundhouse it walls were most likely constructed of roundwood panels, daubed with raw or prepared clay (wattle and daub), and positioned near the internal edge of the ditch but beneath the building roof. The latter would have protected the walls from the weather (Ballin Smith 2025b, 177). The stakeholes in the ditches indicate that the wall panels were supported externally. Some of the postholes of this structure included cramp, some fuel ash slag and cereals in their fills, and also carbonised heather stems, suggesting flooring.

Four large pits and adjacent postholes may be later features dug into the centre of the structure. Pit (287) contained birch charcoal and had stakeholes suggesting wattle screens or that an oven was constructed there. The adjacent pit (324) contained the remains of barley and oats, with burnt bone suggesting it could have been a shallow hearth or a pit for hearth or midden debris.

This radiocarbon dates for this structure, most likely a roundhouse, although material cultural evidence was again lacking, span the beginning of the 1st century AD to the beginning of the 3rd century AD, and indicating some contemporary use with Structure 3.

Structure 7

Structure 7 had the clearest and most complete penannular ditch of the excavated area. The ditch was a single unit with an entrance to the east. It was also shallow but it enclosed an area c. 15 m in diameter. Both terminals of the ditch ended in deep stone-filled pits which were moderately angled outwards, creating a slight funnel shape to the 4.5 m wide entrance. The ditch was filled with domestic hearth waste which included occasional barley grains, but neither it nor its terminals were dated.

The interior space contained small lengths or remnants of, presumably, earlier ditches with postholes that congregated around the westernmost ditch fragment. Heather charcoal and burnt bone was found among them. One larger pit (502) was roughly centrally positioned. It contained a few stones and clay, and could have potentially been a fire-pit but only small amounts of charcoal were recorded from it. Two postholes were located north-east of it with a third near the entrance: all contained charcoal and a few carbonised cereal grains. The southern half of the enclosed area was largely devoid of features but the most informative was pit (501). It lay close to the ditch edge and contained heather type charcoal a few carbonised grains of barley and stones in its fill, suggesting it too could have been a fire-pit. This pit was in use from the second quarter of the 1st century to the beginning of the 3rd century AD.

Iron working slag and a smithing hearth base found in the ditch fill to the west may indicate either a workshop within the enclosed area or one outside it.

What is definite about this structure is its ditch formed an enclosure. As it is reasonably well-preserved it is problematical that the features within it do not form a coherent pattern of activities, and therefore it is uncertain whether a domestic or industrial-type structure existed there.

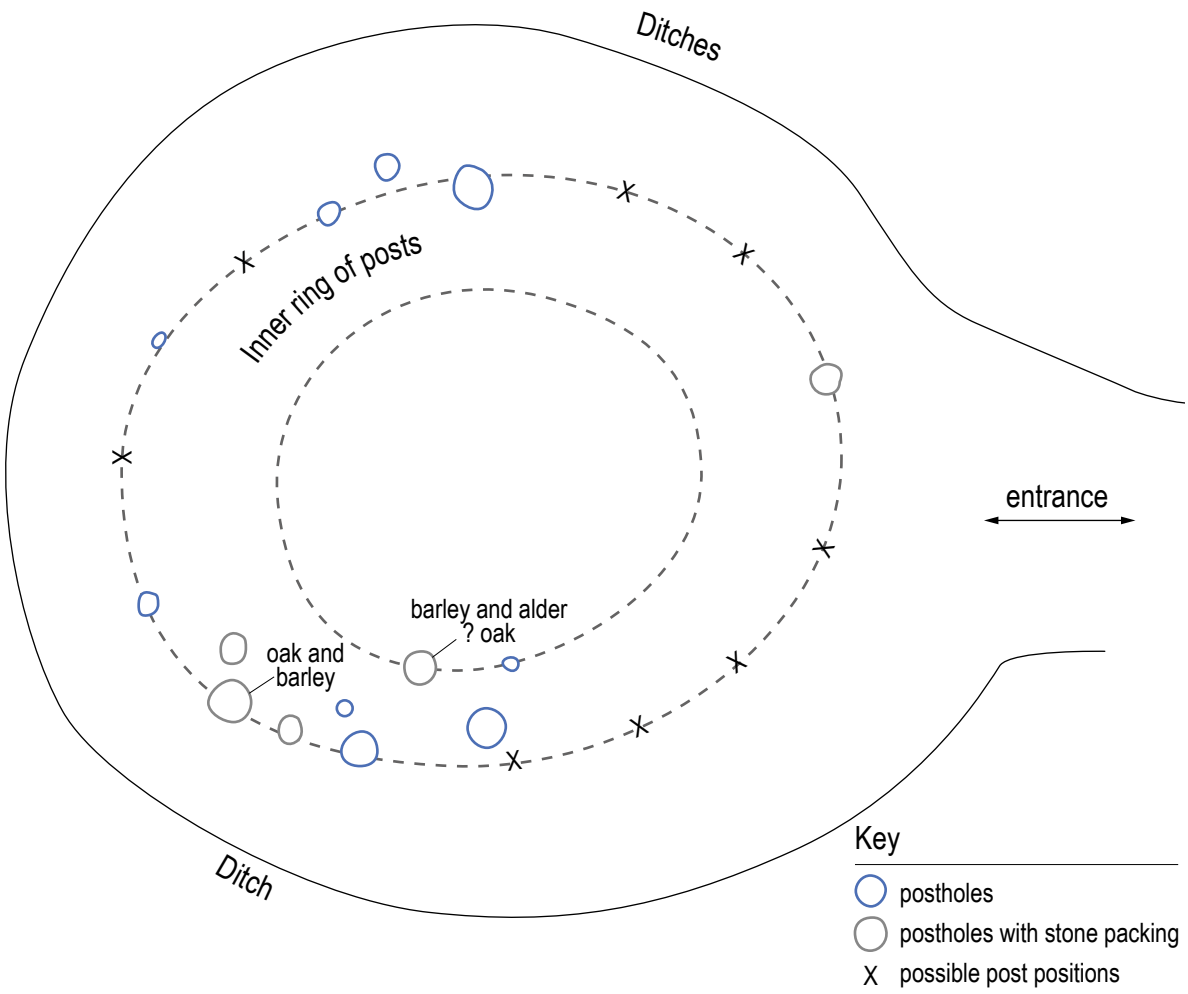

Figure 77: Reconstruction plan of Structure 5.

Structure 12

Situated between structures 5, 6 and 7, was approximately one-third of the southern and western arc of an enclosure ditch with a large terminal pit at its north-eastern end. The remains of any internal structure were possibly removed by subsequent activities on the excavated area. The terminal pit was stone-filled but it also contained evidence from domestic hearth debris including grains of barley and cramp.

Three pits occupied what would have been the internal area of the structure. The largest to the north near Structure 6 contained stone, charcoal and grains of burnt barley and it is possible that this functioned as a corn-drying kiln. The smallest of the pits was dated to the end of the first quarter of the 1st century and the beginning of the 3rd century AD, and it is closely matched by the date returned from the fill of the enclosing ditch.

Structure 17 with Structure 6, and Structure 18

The interpretation of this area is complex but also the majority of features are very shallow. The central features form Structure 17, but to its immediate north was the ditch of Structure 18 and to its south the ditch and a possible terminal pit of Structure 6.

Structure 17 comprised a ditch in three sections that formed the western arc of a possible circular structure, which could have had a diameter of c. 13 m. A few stakeholes survived in part of it. A fragment of another curved ditch abutted or joined it in the north. Within the area bound by the arc of ditches were six seemingly randomly positioned postholes, the deepest was (584). A slightly curved linear narrow gully immediately north of the postholes appeared to abut the arced ditch in the north-west. Along the gully were four equally spaced postholes that together indicated a division or partition within area bordered by

the arced ditch. Structure 17 appears to have been a structure in use between the first half of the 1st century AD and the beginning of the 3rd century AD, but there was not enough surviving evidence to determine what that structure was.

The fragmentary ditch of Structure 18 to the north with those of Structure 6 may be considered part of a large enclosure with terminal pits. The stone-filled pit (419) terminated the eastern end of the Structure 6, and the ditch itself contained evidence of carbonised wicker work. Correspondingly, the large pit (417) to the north also contained stone, including grinding stone SF 127, and may have terminated the Structure 18 ditch if it had originally extended to the east. A number of pits situated between Structures 6 and 17, had cereal grains in their fills, but their function remains unclear.

It is possible that Structures 6 and 18 together could have formed a large enclosure c. 17 m in diameter with an eastern entrance c. 8 m in width between the large pits. The relationship of Structure 17 to the enclosure is uncertain, as the latter could be earlier or later in date. The location of Structure 17 within the enclosure is also problematic as it would have blocked the enclosure's entrance if they had been contemporary structures. As no features of the enclosure were radiocarbon dated the problem of their relationship remains unresolved.

A similar scenario to the above existed at the Curragh, Girvan in South Ayrshire, where a roundhouse was located within a large enclosure but its palisade lay partly outside it (Barbour and McNicol 2025, 16, Figure 8). The roundhouse and its contemporary palisade dated from approximately the first quarter of the 2nd century AD to as late as the early 4th century AD. The enclosure was not radiocarbon dated but was considered stratigraphically earlier than the roundhouse and probably of late Bronze Age date.

Uncertain structures

Structures 1 and 19 and 20

Situated near the southern boundary of the excavated area, Structure 1 comprised a long curved ditch with a small length of another close to it, where there may have been an entrance to the enclosed area. Three pits and at least one posthole are all that remain of the interior of this undated structure.

Structure 19 is an undated longer curved fragment of ditch whose only association is with other short fragments of ditch to its north and to a possible fire-pit of Structure 20.

Structure 16

This structure was situated north of those already discussed, and in comparison it seems to have been a small enclosure with a few internal features. Its two ditch fragments, one to the east and one to the west appear to have pits located at their northern ends but it cannot be proven they are part of the same structure. The west ditch is shorter and narrower than that to the east, presumably because of truncation and neither of the ditch fragments is dated. Both pits at the end of the ditches contained carbonised cereal grain but the western pit (142) also contained sherds of residual (?) pottery, burnt clay and the remains of a wattle structure that suggests it was an oven or fire-pit.

Within the space between the two ditches were two large pits both with contemporary fills dated to the middle of the 4th century BC to as late as the middle of the 1st century AD. The pit at the terminus of the eastern ditch was a later feature, dating from the second quarter of the 1st century AD to the end of the first quarter of the 2nd century AD. Another pit situated further to the east and external to the ditches was large and contained half of a broken rotary quern (SF 175). The disposal of the quern took place probably before the first quarter of the 3rd century AD and was the latest event in this area.

Interpreting these features as a unit is not entirely satisfactory. The radiocarbon dates suggest at least two and probably three separate events took place within and around the ditches. The possible oven with the remains of cereal grain and the quern fragment indicate domestic activities possibly external to a roundhouse that may have been located beyond the excavated area.

Small structures 8, 9, 10, 11, 13, 14, 15 and 20

These structures mainly comprised relatively short lengths of curved or straight ditches that were largely un-associated with any internal features. Some (Structures 8, 9, 10, 11, 15) survived as isolated segments of predominantly smaller structures with an estimated 5 m diameter internal area. Structure 10 is dated to the latter half of the 1st century BC and the 1st century AD and it had a contemporary to slightly later fire-pit external to it. The date for this structure is slightly earlier than the larger ditched enclosures discussed above, suggesting that these smaller structures could be either earlier in date, or shorter lived ephemeral structures associated with the larger enclosures.

Structure 11 (see *Field boundaries*, below) had two short parallel linear alignments of a posthole at either end and with a pit/hearth between them. During the excavation the easternmost features were considered a six-post structure – a raised grain storage facility commonly found within Iron Age settlements such as Grantown Road, Forres (Cook 2016, 18-19, illus 7) and Thainstone, Inverurie (Murray and Murray 2006, 10). The features in Structure 11 produced a rough square shape with each arm measuring c. 3 m in length. However, the possible structure is much smaller than the examples identified at Douglasmuir (Kendrick, 1995, 56-57, illus 24), but comparable in size to the similar structures found at Dryburn Bridge (Dunwell 2007, 61-62 and illus 47) that were also c. 3 m square. If this was a four-post structure, it is the only one identified on the excavated area. Its location near to Structure 7 may suggest there was a connection between them.

Field boundaries

Structures 4, 8, 11, 21, 22 and 23

The identified features from these structures, discounting any curved ditches discussed above, mainly comprise linear arrangements of pits, postholes and the occasional furrow or straight ditch. The fills of some of these features, Structure 8 in particular, included wheat, oats and barley and suggest a possible medieval date. However, one pit from this structure returned a late 1st century to 3rd century AD date.

The features of Structure 21 were mixed: a short length of ditch produced mid-4th century to mid- 1st century BC dates and pits at either end of the alignment were later, from the mid-2nd century BC to c. 0 AD. A pit in the alignment of pits in Structure 4 was contemporary with the latter date. These dates were also matched by a pit in Structure 22, but a short length of ditch and pits/postholes in Structure 23 were both slightly earlier and later.

These features hint at the widespread activities surrounding agricultural and presumably grazing land throughout the middle Iron Age and probably just before the turn of the millennium from BC to AD, with what appears to be installation and movement of boundaries.

Medieval

Structures 2, 4 and 8

These structures were located on lower ground towards the southern edge of the excavated area. Little can be discussed about the features identified as Structure 2 except they returned early medieval dates of the late 8th century to the late 10th century AD. The features forming Structure 4 are unusual and feature a stone-lined pit, which could also be medieval, and as mentioned above part of the ditch fills in Structure 8 suggest a possible medieval origin.

The middle Iron Age settlement

The types of structures found within the middle Iron Age settlement were mixed: one possible roundhouse and a byre, possibly two workshops/working areas and large and small enclosures delineated by interrupted sections of curving ditch, with predominantly east-facing entrances. The lack of floor level deposits and deeper stratigraphy has hampered interpretation of the structures. Even discerning the nature of the ditches in general and those defining structures have proved problematic. Material cultural evidence is also sparse and from different historical periods. A wealth of evidence has been lost and to such an extent that what remains leaves a limit and inadequate picture of the settlement and activities of this area.

Ditches

Initially ditches were referred to as ring ditches, but this is a misnomer as none of them were complete rings, and those that were identified were penannular in shape. The surviving ditches or gullies were mainly shallow bases of truncated features with generally narrow, steep sides. They could have been deliberately dug as foundation trenches that demarcated the limits of domestic internal spaces where activities took place, or they could have been created naturally through erosion by rainwater runoff from the roof of a roundhouse, such as Structure 5. In some cases, the number of stakeholes present in some ditch bases suggested they helped with the external support for the walls of a building.

Structures 7 and 6 with 18 had large diameter ditches ending with a swollen terminal or significant stone-filled pits at their entrances. The fragmentary Structure 12 is similar, and they are described as enclosures that would have encircled a building or other activities with them. These ditches could have been deliberately dug and secured at the entrance by a gate. Their function as protective elements or boundaries was entirely different from the multiple shallow ditches of Structures 3 and 5. Although the evidence is lacking, they may have been dug to keep domestic animals away from a timber building or a workshop. Some of the ditches in Structure 3 may have been to keep animals in, if during one phase it had been used as a byre. There is also the possibility that the large enclosures could be earlier elements of the settlement that are not identified as such by the radiocarbon dates or stratigraphy. As mentioned previously. in the recently published example of The Curragh, South Ayrshire, a large, ditched enclosure was found to be earlier (late Bronze Age) than the two Iron Age roundhouses that were found within it (Barbour and McNicol 2025, 15, 16, Fig 5.8).

Many of the small, curved ditches cannot be discounted as identifying buildings or external work areas in spite of the lack of other evidence. Structure 16, for example, produced cereals and a wattle and daub covered oven, and it is not implausible that the broken quern buried in a pit to its east had actually been used there.

Buildings

The initial thinking during the excavation was that the ditches indicated roundhouses, but this has proven, with the rare exception, not to have been the case. Evidence for the ring of deeply dug load-bearing pits indicating the central areas of roundhouses and the substantial pits demarcating their entrance areas have not been found. There were undoubtedly roundhouses present, and initially, Structures 3, 5, 7 and 17 were good candidates for them. The sparse, predominantly shallow features and the lack of stratigraphy have not provided sufficient evidence, except in Structure 5, to confirm their presence. The pattern of reuse and rebuilding over existing structural footprints has also erased much of the evidence.

Structure 5 is discussed in detail (see *Discussion* above, and *Archaeobotanical analysis*). Oak charcoal was rarely found in the structure but its presence in one of the stone-packed postholes suggests there had been an oak post there. The general lack of oak in the remains of this building may suggest that the posts were removed and reused elsewhere. Oak would have been an essential resource needed for the structural components of a roundhouse, but in the case of Cruden Bay, oak may have been in short supply or not available and its lack would have influenced construction methods and other resources used within the settlement. The possible use of driftwood and of birch, hazel and alder and willow for structural timbers could imply that a roundhouse built of these timbers may not have had long viability and may have been replaced frequently (see Cook and Dunbar 2008, Table 37 for the longevity of roundhouses). The presence of wattle (large hazel fragments in one posthole) and the number of stakeholes noted in the inner ditch, suggests that the walls of the building may been built of wattle panels. Heather stems could have covered the floor of the building and possibly its roof as thatch.

Reuse of buildings seemed to have been common and the ditches of Structure 3 implied change to activities there. The surviving evidence implies that it may have functioned as a subsidiary building during its later use: a byre is possible from the lack of cereal grain in the

fills of its features, and the presence of much heather. It was reused again for the siting of a furnace, presumably for the smelting of iron ore, an activity that was required to be some distance from domestic structures. Fuel ash slag from Structure 3 may have been dumped around the ditches of Structure 5. It is possible that Structure 5 and Structure 3 functioned as a unit: a farmhouse and its ancillary building. The ditch fills of Structure 7 contained iron-working slag, suggesting a smithy or smithing hearth was located there and the Structure 12 enclosure may have contained a corn-drying pit.

The environment

The general impression from the *Archaeobotanical analysis* is that oak charcoal was rare across the excavated area indicating that its local availability as a building material during the middle Iron Age was severely restricted. Mature oak trees may no longer have formed part of the local natural environment or woodland cover, and their lack suggests they had disappeared through earlier clearances and certainly by later prehistory. The alternative tree species that were used at the site were birch, hazel and alder and willow that formed the woodland that was used for constructional purposes and for fuel.

The lack of evidence of settlement during the Bronze Age, for example, may indicate that dense woodland cover had already disappeared in favour of a more open landscape with fields. Heather type stems widely found in feature fills indicated that heathland was situated close to the settlement. Heather may have been an important resource for fuel, bedding, floor covering and possibly for thatching.

Cereals, mainly barley, found in the fills of features fills demonstrated that fields were located around the settlement. Lines of postholes and pits may possibly mark field boundaries, especially in the north of the excavated area, but from what period(s) is not known. The evidence of at least one oven, a possible corn-drying pit and two querns in the settlement indicate that grain was processed, possibly dried and made into flour there. Evidence for other food plant remains were scarce and hazel nutshells, a winter staple of prehistoric peoples in Scotland, was almost absent from the site, in spite of the presence and use of hazel wood.

Although some burnt bone found in the domestic ashes filling features, there is no indication as to which species of animal they belonged to. The knowledge of the local economy of the site is poorly understood because of the lack of evidence.

The end of the Iron Age settlement and Conclusions

Important questions about the origin of the site, due to the lack of earlier evidence, and its demise may not be adequately answered. Currently our understanding is of a widespread distribution of many archaeological features, but from them only one confirmed roundhouse has been established. Are the archaeological features a product of a single or an extended farming family that expanded and contracted over a short time frame, leaving behind evidence of its agricultural activities and scant indications of iron-working but little material culture? Was there more than one roundhouse or do the features suggest it was dismantled and rebuilt elsewhere, but close by? Were enclosures used for stock management or overwintering? Were some larger pits used for grain storage and were some of the ditches used for water management? There are too many unanswered questions concerning the use of the site. From other earlier and contemporary sites there can be small hints suggesting land ownership or territorial boundaries, but they are missing here. In the absence of evidence, the picture is of a small farming settlement supported primarily by the growing of grain similar to the middle Iron Age Dalladies, Kincardineshire (Watkins 1980a) and the middle Iron Age phase of occupation at Kintore (Cook and Dunbar 2008, 110-128, Figure 77).

From the number of radiocarbon dates obtained it is difficult to discern a clear sequence of events. The implications are that some of the features considered as (field) boundaries in the north of the area come early in the sequence of radiocarbon dates from the site, along with some small possible structures, Structure 16 being the main one. Structures 5 and 3 are prominent at the turn of the millennium with activities around Structures 6 and 17 coming next, but it must be stressed that the picture is very mixed. However, the evidence indicates that these activities end in the first half of the 3rd century AD.

There can be much speculation of why a settlement comes to an end: death and disease can be explanations, along with territorial disputes, movement to another part of the landscape, social and economic situations, lack of resources, depletion of soil, weather factors, and others. The answer is we simply do not know.

Acknowledgements

Thanks to Claymore Homes for initiating this project. Thanks also to Claire Herbert and Bruce Mann, Aberdeenshire Council Archaeology Service for their advice and support during this work. The excavation team: Rob Lenfert, Stuart Farrell, Jan Dunbar, Jacob Metson, Katie South, Kirsty Stanton, Rob Pass and Beatrix Duzs. Thanks also to Sesilia Niehaus for preparing Topcon site plans.

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Appendices

Appendix 1: Archaeobotanical Tables 2-25

Table 2: Archaeobotanical results from Structure 1 and Structure 2

	Structure	Structure 1					Structure 2					
	Context	100	101	104	172	174	179	232	237	239	241	244
	Sample no	11	91	20	119	99	182	83	64	120	301	128
	Description	Fill of posthole (170)	Ring ditch fragment (178)	Pit (177)	Fill of posthole (171)	Fill of posthole/ pit (176)	Fill of possible posthole (099)	Fill of possible posthole (105)	Fill of cut (236)	Fill of cut (238)	Fill of pit (240)	Fill of possible posthole (106)
	Vol charcoal >4mm	-	<2.5ml	-	<2.5ml	2.5ml	5ml	30ml	20ml	10ml	20ml	2.5ml
	% charcoal ID	-	100%	-	100%	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	100%	-	-	-	-	100%	100%	100%	100%	
Charcoal	Common name											
Alnus cf glutinosa	alder	-	-	-	-	-	-	11 (1.01g)	-	-	-	9 (0.22g)
Betula spp	birch	-	-	-	-	6 (1.07g)	-	8 (2.30g)	9 (0.62g)	9 (0.71g)	18 (2.63g)	-
Corylus cf avellana	hazel	-	-	-	-	-	-	6 (0.18g)	3 (0.14g)	7 (0.72g)	1 (0.04g)	2 (0.10g)
Ericales	heather type	-	1 (0.02g)	-	-	-	20 (1.20g)	5 (0.07g)	3 (0.11g)	1 (0.11g)	2 (0.09g)	-
Salix spp	willow	-	-	-	-	-	-	17 (1.20g)	35 (3.06g)	7 (0.26g)	15 (0.54g)	4 (0.19g)
Indet charcoal	indet charcoal	-	-	-	2 (0.32g)	-	-	-	-	-	-	-
Cereals												
Avena spp	oats	-	-	-	-	-	-	4	5	-	-	-
Hordeum vulgare sl	barley	-	1	-	-	-	-	36	42	13	9	-
cf Hordeum vulgare sl	cf barley	-	-	-	-	-	-	34	13	4	6	-
Indeterminate grain	indet grain	-	-	-	-	-	-	-	26	10	-	-

Table 3: Archaeobotanical results from Structure 1 and Structure 2

	Structure	Structure 3 - ditches							
	Context	56	196	198	200	242	248	258	424
	Sample no	53, 61	79	62	16	84, 85	17, 81	60	28, 203
	Description	Arc of charcoal rich material-possible ring ditch	Fill of ring ditch (195)	Fill of inner ring ditch (197)	Fill of inner ring ditch (199= 197)	Fill of ditch (045)	Fill of ditch (056) East	Fill of ditch (257)	Fill of possible ring ditch (424) / (045)?
	Vol charcoal >4mm	20ml	5ml	5ml	20ml	40ml	50ml	20ml	2.5ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	100%	-	-	-	-	-	-	-
Charcoal	Common name								
Alnus cf glutinosa	alder	6 (0.32g)	1 (0.22g)	-	16 (2.72g)	7 (0.97g)	5 (0.40g)	-	-
Betula spp	birch	4 (0.38g)	1 (0.07g)	-	12 (0.80g)	33 (4.23g)	17 (2.53g)	-	-
Corylus cf avellana	hazel	19 (0.39g)	6 (0.27g)	1 (0.22g)	16 (0.93g)	8 (0.84g)	14 (1.27g)	7 (0.39g)	3 (0.77g)
Ericales	heather type	41 (1.56g)	27 (0.49g)	-	29 (1.11g)	42 (1.43g)	33 (1.57g)	43 (2.65g)	3 (0.08g)
Quercus spp	oak	1 (0.05g)	1 (0.14g)	3 (0.41g)	-	7 (0.77g)	6 (0.44g)	4 (0.45g)	-
Salix spp	willow	-	-	1 (0.05g)	6 (0.26g)	-	21 (1.31g)	4 (0.44g)	-
Indet charcoal	indet charcoal	3 (0.26g)	-	-	-	-	16 (1.67g)	-	-
Cereals									
Hordeum vulgare sl	barley	3	-	-	-	-	-	-	-
Indeterminate grain	indet grain	3	-	-	-	-	-	-	-

Table 4: Archaeobotanical results from Structure 3 - ditches

	Structure	Structure 3 - pits & postholes				East of Structure 3	
	Context	57	235	262	1020	1021	1022
	Sample no	55	65	77	251	178	205
	Description	Possible posthole	Fill of possible posthole/pit (058)	Fill of possible pit/ kiln with some burnt stone (059)	Fill of posthole (1011)	Upper fill of posthole (1013)	Lower fill of posthole (1013)
	Vol charcoal >4mm	15ml	2.5ml	200ml	30ml	2.5ml	-
	% charcoal ID	100%	100%	100%	100%	100%	-
	% cereal ID	100%	-	100%	100%	-	-
Charcoal	Common name						
Alnus cf glutinosa	alder	-	-	-	-	-	-
Betula spp	birch	-	-	-	26 (3.10g)	-	-
Corylus cf avellana	hazel	22 (1.93g)	1 (0.05g)	-	8 (0.43g)	-	-
Ericales	heather type	16 (0.61g)	9 (0.30g)	43 (1.15g)	105 (4.18g)	3 (0.17g)	-
Prunoideae	cherry type	1 (0.19g)	-	-	-	-	-
Quercus spp	oak	-	-	-	2 (0.13g)	-	-
Salix spp	willow	1 (0.03g)	1 (0.05g)	105 (48.62g)	4 (0.51g)	2 (0.13g)	-
Indet charcoal	indet charcoal	-	-	-	-	-	-
Cereals							
Hordeum vulgare sl	barley	2	-	8	2	-	-
cf Hordeum vulgare sl	cf barley	-	-	-	2	-	-
Indeterminate grain	indet grain	2	-	-	2	-	-
Misc							
Cramp	cramp	-	-	+++	-	-	-

Table 4 (continued): Archaeobotanical results from Structure 3 - ditches

	Structure	West of Structure 3	Near Structure 3						
	Context	767	65	220	362	409	410	411	412
	Sample no	202	304	87	40	97	116	10	9
	Description	Fill of posthole (766)	pit containg fired clay fragments	charcoal layer in pit (065=217) containing fired clay fragments	Fill of pit (65) containing fire clayed fragments	Fill of large pit (071)	Fill of large pit (071)	Fill of large pit (071)	Fill of possible posthole (071)
	Vol charcoal >4mm	5ml	150ml	5ml	20ml	15ml	2.5ml	5ml	5ml
	% charcoal ID	100%	33%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	-	-	-	-	-	100%	-
Charcoal	Common name								
Alnus cf glutinosa	alder	-	24 (3.15g)	-	-	-	-	-	-
Betula spp	birch	4 (0.35g)	17 (3.66g)	1 (0.26g)	-	-	-	2 (0.11g)	-
Corylus cf avellana	hazel	3 (0.32g)	30 (4.09g)	2 (0.42g)	4 (1.58g)	42 (2.12g)	3 (0.23g)	6 (0.52g)	2 (0.18g)
Ericales	heather type	43 (1.24g)	-	4 (0.23g)	3 (0.19g)	-	8 (0.36g)	21 (0.54g)	7 (0.42g)
Prunoideae	cherry type	-	-	-	-	-	-	-	-
Quercus spp	oak	-	-	-	3 (0.80g)	1 (0.02g)	-	2 (0.34g)	-
Salix spp	willow	-	1 (0.04g)	-	-	-	-	-	-
Indet charcoal	indet charcoal	2 (0.26g)	-	-	15 (2.92g)	-	-	-	-
Cereals									
Hordeum vulgare sl	barley	-	-	-	-	-	-	1	-
cf Hordeum vulgare sl	cf barley	-	-	-	-	-	-	-	-
Indeterminate grain	indet grain	-	-	-	-	-	-	-	-
Misc									
Cramp	cramp	-	-	-	+++++	-	-	-	-

Table 5: Archaeobotanical results from Structure 3 - pits and postholes

	Structure	Structure 4									
	Context	186	245	247	250	252	255	256	371	373	375
	Sample no	57	86	103	90	82	76	305	254	261	244
	Description	Fill of posthole (048)	Fill of pit (46)	Fill of pit (46)	Fill of small posthole (249)	Fill of pit (251)	Fill of area of darker soil/pit (033)	Fill of possible pit/ posthole (030)	Fill of posthole (370)	Fill of posthole (372)	Fill of posthole (374)
	Vol charcoal >4mm	50ml	100ml	15ml	<2.5ml	10ml	<2.5ml	20ml	<2.5ml	-	-
	% charcoal ID	100%	50%	100%	100%	100%	100%	100%	100%	-	-
Charcoal	Common name										
Alnus cf glutinosa	alder	13 (1.98g)	6 (2.12g)	-	-	-	-	-	-	-	-
Betula spp	birch	20 (2.52g)	10 (2.71g)	5 (0.30g)	-	9 (0.34g)	-	8 (0.47g)	-	-	-
Corylus cf avellana	hazel	9 (0.92g)	25 (2.89g)	8 (0.51g)	-	1 (0.33g)	-	8 (0.46g)	-	-	-
Ericales	heather type	-	72 (2.57g)	40 (1.55g)	6 (0.15g)	28 (1.33g)	3 (0.24g)	62 (2.95g)	6 (0.24g)	-	-
Quercus spp	oak	4 (0.37g)	3 (0.32g)	-	-	-	-	9 (0.57g)	-	-	-
Salix spp	willow	6 (0.67g)	6 (0.65g)	1 (0.41g)	-	-	-	-	-	-	-
Misc											
Cramp		-	++	-	-	-	-	-	-	-	-

Table 6: Archaeobotanical results from Structure 4

	Structure	Structure 5 - ditches								
	Context	203	203	329	329	323	331	335	335	338
	Sample no	30	58	15	165	95	18	14	59	91
	Description	Fill of ring ditch (328)	Fill of ringditch (328)	Fill of ditch (328)	Fill of ditch (328)	Fill of ditch (322)	Fill of ditch (330)	Fill of ditch (334)	Fill of ditch (334)	Fill of ditch (336)
	Vol charcoal >4mm	150ml rw	250ml	15ml	180ml	10ml	-	20ml	10ml	-
	% charcoal ID	100%	100%	100%	100%	100%	-	100%	100	-
	% cereal ID	-	-	-	-	100%	100%	-	-	-
Charcoal	Common name									
Alnus cf glutinosa	alder	-	-	-	-	4 (0.31g)	-	5 (0.42g)	-	-
Betula spp	birch	-	22 (70.29g)	26 (2.38g)	127 (55.50g)	13 (1.23g)	-	14 (1.77g)	6 (2.15g)	-
Corylus cf avellana	hazel	11 (4.98g)	-	-	-	2 (0.14g)	-	11 (0.66g)	4 (0.38g)	-
Ericales	heather type	-	-	-	-	45 (0.79g)	-	7 (0.31g)	9 (0.37g)	-
Quercus spp	oak	-	-	1 (0.05g)	-	-	-	11 (0.61g)	-	-
Salix spp	willow	113 (21.92g)	-	-	-	1 (0.16g)	-	-	3 (0.29g)	-
Indet bark	indet bark	45 (1.61g)	-	-	-	-	-	-	-	-
Indet small twigs	indet small twigs	139 (2.96g)	-	-	-	-	-	-	-	-
Indet charcoal	indet charcoal	-	-	-	-	-	-	2 (0.10g)	-	-
Cereals										
Hordeum vulgare sl	barley	-	-	-	-	5	1	-	-	-
Indeterminate grain	indet grain	-	-	-	-	1	1	-	-	-
Misc										
Metallic waste / slag		-	5 (19.36g)	-	-	-	-	-	1 (0.30g)	-

Table 7: Archaeobotanical results from Structure 5 - ditches

	Structure	Structure 5 - large pits				Structure 5 - postholes with stone settings						
	Context	288	321	325	342	270	273	286	290	296	314	345
	Sample no	41	51, 109	52	42	2	191	122	142	121	151	300
	Description	Fill of pit (287)	Fill of pit (320)	Fill of pit (324)	Fill of pit (341)	Cut of posthole (269)	Fill of posthole (027)	Fill of posthole (285)	Fill of posthole (289)	Fill of posthole (295)	Fill of posthole (313)	Fill of posthole (343)
	Vol charcoal >4mm	20ml	15ml	20ml	2.5ml	30ml	5ml	2.5ml	10ml	15ml	<2.5ml	15ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	-	100%	-	100%	-	100%	-	-	-	100%
Charcoal	Common name											
Alnus cf glutinosa	alder	-	-	16 (0.87g)	-	5 (0.82g)	-	-	-	3 (0.41g)	-	-
Betula spp	birch	8 (3.97g)	-	-	-	4 (0.37g)	-	1 (0.03g)	-	-	-	-
Corylus cf avellana	hazel	2 (0.13g)	13 (1.85g)	3 (0.17g)	-	9 (1.07g)	3 (0.19g)	1 (0.02g)	5 (0.41g)	11 (0.54g)	2 (0.16g)	-
Ericales	heather type	13 (0.42g)	27 (0.75g)	72 (3.24g)	5 (0.27g)	29 (0.57g)	18 (0.59g)	10 (0.19g)	-	15 (0.76g)	-	85 (4.45g)
cf Larix spp	cf larch	-	-	-	-	-	-	1 (0.08g)	-	-	-	-
Quercus spp	oak	1 (0.14g)	2 (0.31g)	3 (0.32g)	-	14 (3.48g)	-	1 (0.02g)	2 (0.21g)	12 (0.64g)	-	-
Salix spp	willow	1 (1.31g)	-	-	5 (0.27g)	7 (0.79g)	-	-	6 (0.16g)	5 (0.34g)	-	-
Cereals												
Avena spp	oats	-	-	2	-	-	-	-	-	-	-	
Hordeum vulgare sl	barley	-	-	4	-	4	-	1	-	-	-	1
Indeterminate grain	indet grain	-	-	4	-	3	-	-	-	-	-	3
Misc												
Cramp	cramp	-	-	-	-	-	-	-	+++	-	-	-

Table 8: Archaeobotanical results from Structure 5 - large pits and postholes with stone settings

	Structure	Structure 5 - pits and postholes with no stone settings									
	Context	223	272	278	280	282	292	294	298	300	302
	Sample no	240	45	8	104	150	108	105	123	127	89
	Description	Fill of posthole (222)	Fill of pit (271)	Fill of pit (277)	Fill of posthole (279)	Fill of posthole (281)	Fill of posthole (291)	Fill of posthole (293)	Fill of posthole (297)	Fill of posthole (299)	Fill of posthole (301)
	Vol charcoal >4mm	20ml	15ml	50ml	<2.5ml	10ml	5ml	5ml	<2.5ml	10ml	<2.5ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	100%	100%	-	-	-	100%	100%	100%	-
Charcoal	Common name										
Alnus cf glutinosa	alder	-	-	-	-	-	-	1 (0.13g)	-	6 (0.58g)	-
Betula spp	birch	7 (0.37g)	-	-	-	-	-	4 (0.35g)	-	2 (0.11g)	-
Corylus cf avellana	hazel	22 (1.49g)	1 (0.08g)	17 (8.56g)	-	2 (0.16g)	1 (0.10g)	3 (0.15g)	-	5 (0.47g)	1 (0.07g)
Ericales	heather type	9 (0.16g)	147 (4.50g)	13 (0.41g)	7 (0.16g)	35 (1.12g)	6 (0.14g)	14 (0.60g)	3 (0.16g)	-	2 (0.24g)
Quercus spp	oak	9 (0.58g)	4 (0.23g)	1 (0.85g)	-	-	3 (0.24g)	-	-	-	-
Salix spp	willow	6 (0.83g)	-	1 (0.89g)	-	-	-	2 (0.14g)	1 (0.06g)	3 (0.26g)	-
Ulmus spp	elm	-	-	-	-	-	-	-	-	-	-
Cereals											
cf Avena spp	cf oats	-	1	-	-	-	-	-	-	-	-
Hordeum vulgare sl	barley	-	4	1	-	-	-	2	3	-	-
Indeterminate grain	indet grain	-	2	3	-	-	-	1	2	-	-
Misc											
Bone	bone	-	-	-	-	-	-	-	-	3	-

Table 8 (continued): Archaeobotanical results from Structure 5 - large pits and postholes with stone settings

	Structure	Structure 5 - pits and postholes with no stone settings								
	Context	304	306	308	310	312	318	340	349	354
	Sample no	115	143	88b	156	124	102	44	211	241
	Description	Fill of posthole (303)	Fill of posthole (305)	Fill of posthole (307)	Fill of posthole (309)	Fillof posthole (311)	Fill of posthole (317)	Fill of posthole (339)	Fill of posthole (348)	Fill of posthole (353)
	Vol charcoal >4mm	5ml	-	-	2.5ml	2.5ml	5ml	20ml	15ml	5ml
	% charcoal ID	100%	-	-	100%	100%	100%	100%	100%	100%
	% cereal ID	-	-	-	-	-		100%	-	-
Charcoal	Common name									
Alnus cf glutinosa	alder	-	-	-	-	-	-	-	-	-
Betula spp	birch	2 (0.15g)	-	-	-	5 (0.23g)	-	9 (1.49g)	4 (0.67g)	1 (0.12g)
Corylus cf avellana	hazel	7 (0.44g)	-	-	5 (0.35g)	-	4 (0.15g)	5 (0.41g)	4 (0.56g)	3 (0.18g)
Ericales	heather type	16 (0.77g)	-	-	2 (0.12g)	4 (0.30g)	-	54 (2.00g)	13 (0.19g)	17 (0.41g)
Quercus spp	oak	-	-	-	-	1 (0.04g)	-	14 (1.74g)	2 (0.74g)	-
Salix spp	willow	-	-	-	-	-	3 (0.17g)	-	4 (2.35g)	-
Ulmus spp	elm	-	-	-	-	-	1 (0.07g)	-	-	-
Cereals										
cf Avena spp	cf oats	-	-	-	-	-	-	-	-	-
Hordeum vulgare sl	barley	-	-	-	-	-	-	1	-	-
Indeterminate grain	indet grain	-	-	-	-	-	-	3	-	-
Misc										
Bone	bone	-	-	-	-	-	-	-	-	-

Table 9: Archaeobotanical results from Structure 5 - postholes with no stone settings

	Structure	Structure 6								
	Context	434A	434B	435	645	524	525	529	583	690
	Sample no	27	34	37	210	280	255	258a	269	167
	Description	Fill of ditch (427)A	Fill of ditch (427)B	Fill of feature (419)	Fill of ditch (427d)	Fill of posthole (511)	Fill of posthole (512)	Fill of posthole (513)	Fill of posthole (514)	Fill of pit/ posthole (130)
	Vol charcoal >4mm	15ml	50ml	10ml	25ml	5ml	10ml	15ml	10ml	2.5ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	-	100%	100%	100%	100%	100%	100%	100%
Charcoal	Common name									
Alnus cf glutinosa						-	-	8 (0.69g)	1 (0.12g)	-
Betula spp	birch	8 (0.88g)	-	2 (0.19g)	4 (0.21g)	1 (0.05g)	4 (0.27g)	6 (1.60g)	6 (0.55g)	1 (0.04g)
Corylus cf avellana	hazel	8 (1.24g)	-	-	7 (0.45g)	4 (0.19g)	1 (0.12g)	9 (0.69g)	2 (0.19g)	-
Ericales	heather type	9 (0.15g)	-	53 (3.04g)	39 (0.85g)	12 (0.53g)	9 (0.54g)	-	11 (0.60g)	13 (0.53g)
Quercus spp	oak	1 (0.07g)	-	-	8 (1.13g)	-	1 (0.07g)	3 (0.59g)	5 (0.49g)	-
Salix spp	willow	5 (0.25g)	21 (10.78g)	-	7 (2.44g)	-	4 (0.41g)	-	6 (0.41g)	-
Indet charcoal	indet charcoal	-	-	-	7 (1.01g)	-	-	-	-	-
Cereals										
Avena spp	oats	-	-	2	-	-	-	-	-	-
Hordeum vulgare var vulgare	hulled barley	-	-	2	-	-	4	-	-	-
Hordeum vulgare sl	barley	-	-	-	8	2	3	12	3	5
cf Hordeum vulgare sl	cf barley					2	-	2	-	-
Indeterminate grain	indet grain	-	-	2	-	-	-	-	3	-

Table 10: Archaeobotanical results from Structure 6

	Structure	Structure 7 - ditches							
	Context	472	472	625	640	505	528	537	624
	Sample no	69	24, 32	224	256	249	222	201	285
	Description	Ditch (167)	Fill of ditch (167)	Cut of ditch (588)	Fill of ring ditch (491)	Fill of ring ditch (494a)	Fill of ring ditch (494b)	Fill of ring ditch (496)	Fill of ditch (500)
	Vol charcoal >4mm	2.5ml	30ml	5ml	20ml	10ml	10ml	20ml	5ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	100%	-	-	-	-	100%	100%
Charcoal	Common name								
Alnus cf glutinosa	alder	-	-	-	6 (0.61g)	-	-	-	-
Betula spp	birch	-	21 (1.23g)	2 (0.25g)	6 (0.79g)	-	-	-	-
Corylus cf avellana	hazel	-	10 (0.49g)	1 (0.06g)	4 (0.31g)	1 (0.93g)	1 (0.04g)	4 (0.47g)	1 (0.10g)
Ericales	heather type	2 (0.22g)	46 (1.91g)	41 (1.60g)	3 (0.22g)	14 (0.51g)	9 (0.71g)	22 (1.28g)	18 (0.74g)
Quercus spp	oak	-	5 (0.55g)	-	6 (0.41g)	-	-	-	-
Salix spp	willow	2 (0.08g)	-	-	4 (0.34g)	-	-	-	-
Indet charcoal	indet charcoal	-	5 (0.66g)	-	10 (0.99g)	4 (2.10g)	10 (1.38g)	7 (2.74g)	-
Cereals									
Hordeum vulgare sl	barley	-	-	-	-	-	-	4	4
Indeterminate grain	indet grain	-	4	-	-	-	-	2	6
Misc									
Cramp	cramp	-	-	-	-	-	+	-	-

Table 11: Archaeobotanical results from Structure 7 - ditches

	Structure	Structure 7 - Feature Group 1					Structure 7 - Feature Group 2			
	Context	644	639	675	641	679	364	367	406	623
	Sample no	248	225	166	277	294	221	139	?	291
	Description	Fill of posthole (498)	Fill of posthole (638)	Fill of posthole (492)	Fill of posthole (493)	Fill of pit (678)	Fill of posthole (363)	Fill of posthole (365)	Fill of posthole (405)	Fill of pit/ posthole (501)
	Vol charcoal >4mm	20ml	2.5ml	-	10ml	5ml	30ml	<2.5ml	2.5ml	10ml
	% charcoal ID	100%	100%	-	100%	100%	100%	100%	100%	100%
	% cereal ID	-	-	-	-	-	100%	-	100%	100%
Charcoal	Common name									
Alnus cf glutinosa	alder	8 (0.73g)	-	-	-	-	-	-	-	-
Betula spp	birch	8 (1.11g)	1 (0.14g)	-	1 (0.33g)	-	1 (0.35g)	-	-	-
Corylus cf avellana	hazel	4 (0.29g)	-	-	1 (0.25g)	-	-	1 (0.06g)	1 (0.04g)	7 (1.06g)
Ericales	heather type	28 (1.67g)	9 (0.43g)	-	15 (1.69g)	30 (1.82g)	132 (6.94g)	1 (0.08g)	16 (0.40g)	12 (0.67g)
Quercus spp	oak	5 (0.85g)	-	-	1 (0.06g)	-	-	-	1 (0.02g)	-
Salix spp	willow	4 (0.16g)	-	-	-	-	-	-	-	-
Indet charcoal	indet charcoal	-	-	-	-	-	-	-	-	8 (0.97g)
Cereals										
Avena spp	oats	-	-	-	-	-	3	-	-	-
Hordeum vulgare sl	barley	-	-	-	-	-	6	-	5	-
cf Hordeum vulgare sl	cf barley	-	-	-	-	-	-	-	7	10
Indeterminate grain	indet grain	-	-	-	-	-	-	-	9	7
Seeds										
Corylus avellana nutshell	hazel nutshell	-	-	-	-	-	-	-	-	-
Misc										
Bone	bone	-	-	++	6 (0.87g)	-	-	-	-	-

Table 11 (continued): Archaeobotanical results from Structure 7 - ditches

	Structure	Structure 7 - Feature Group 3						
	Context	515	535	594	614	635	643	651
	Sample no	252	212	168	242	186	98, 235	107
	Description	Fill of posthole (502)	Fill of pit/ posthole (534)	Fill of posthole (495)	Fill of posthole (77)	Fill of post hole (634)	Posthole (642)	Fill of wall (650)
	Vol charcoal >4mm	5ml	10ml	5ml	20ml	2.5ml	20ml	10ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	-	-	100%	-	-	-
Charcoal	Common name							
Alnus cf glutinosa	alder	-	-	-	-	1 (0.03g)	-	-
Betula spp	birch	7 (1.08g)	1 (0.70g)	2 (0.26g)	6 (0.53g)	-	2 (0.09g)	-
Corylus cf avellana	hazel	2 (0.09g)	1 (0.11g)	1 (0.16g)	-	-	11 (0.96g)	2 (0.17g)
Ericales	heather type	9 (0.40g)	7 (0.63g)	28 (1.44g)	79 (2.45g)	-	22 (1.56g)	4 (0.40g)
Quercus spp	oak	2 (0.10g)	-	-	-	-	1 (0.04g)	1 (0.04g)
Salix spp	willow	-	-	-	-	-	-	-
Indet charcoal	indet charcoal	-	7 (1.67g)	-	-	5 (0.14g)	-	1 (0.12g)
Cereals								
Avena spp	oats	-	-	-	-	-	-	-
Hordeum vulgare sl	barley	-	-	-	3	-	-	-
cf Hordeum vulgare sl	cf barley	-	-	-	-	-	-	-
Indeterminate grain	indet grain	-	-	-	4	-	-	-
Seeds								
Corylus avellana nutshell	hazel nutshell	-	-	-	-	-	-	2 (0.05g)
Misc								
Bone	bone	-	-	-	-	-	-	-

Table 12 Archaeobotanical results from Structure 7 - pits and postholes

	Structure	Structure 8									
	Context	182	182	1027	98	181	184	230	231	377	384
	Sample no	56	74	70	72	67	75	71	78	3	101
	Description	Ring ditch (81) SOND2	Ring ditch (81) SOND1	Arc of mid brown silt encircling posthole (1026)	Arc of mid brown silt encircling posthole (090)	Fill of possible posthole (090)	Fill of pit (087)	Fill of pit (180)	Fill of pit (180)	Fill of posthole (089)	Fill of posthole (383)
	Vol charcoal >4mm	<2.5ml	10ml	-	60ml	-	10ml	<2.5ml	5ml	10ml	-
	% charcoal ID	100%	100%	-	100%	-	100%	100%	100%	100%	-
	% cereal ID	-	100%	-	-	-	100%	100%	100%	-	-
Charcoal	Common name										
Alnus cf glutinosa	alder	-	8 (0.29g)	-	13 (0.64g)	-	-	-	-	1 (0.98g)	-
Betula spp	birch	-	4 (0.13g)	-	1 (0.18g)	-	1 (0.12g)	-	1 (0.05g)	1 (0.12g)	-
Corylus cf avellana	hazel	-	-	-	42 (3.65g)	-	7 (0.48g)	-	8 (0.31g)	-	-
Ericales	heather type	-	41 (1.47g)	-	-		18 (0.54g)	6 (0.09g)	33 (0.59g)	12 (0.83g)	-
Quercus spp	oak	-	-	-	96 (10.99g)	-	1 (0.04g)	-	3 (0.14g)	-	-
Salix spp	willow	-	2 (0.07g)	-	3 (0.12g)	-	1 (0.05g)	-	-	-	-
Indet charcoal	indet charcoal	4 (0.12g)	6 (0.22g)	-	-	-	-	-	-	-	-
Cereals											
Avena spp	oats	-	7	-	-	-	-	-	-	-	-
cf Avena spp	cf oats	-	14	-	-	-	-	-	-	-	-
Hordeum vulgare sl	barley	-	30	-	-	-	5	3	19	-	-
cf Hordeum vulgare sl	cf barley	-	17	-	-	-	4	-	13	-	-
Triticum dicoccum	emmer wheat	-	-	-	-	-	-	-	2	-	-
Indeterminate grain	indet grain	-	36	-	-	-	-	9	17	-	-

Table 13: Archaeobotanical results from Structure 8

	Structure	Structure 9	Structure 10					
	Context	97	73	82	89	188	259	1019
	Sample no	54	113	66	181	73	94	63
	Description	Fill of oval pit	Fill of possible pit (376)	Fill of possible pit (216)	Fill of possible posthole (075)	In situ burning in pit (076)	Fill of ditch (074)	Fill of pit (1004)
	Vol charcoal >4mm	5ml	10ml	80ml	5ml	280ml	10ml	10ml
	% charcoal ID	100%	100%	50%	100%	25%	100%	100%
	% cereal ID	100%	-	-	-	-	-	100%
Charcoal	Common name							
Alnus cf glutinosa	alder	-	-	19 (1.90g)	-	43 (7.81g)	1 (0.04g)	-
Betula spp	birch	1 (0.02g)	2 (0.13g)	40 (3.60g)	1 (0.05g)	24 (3.19g)	4 (0.45g)	-
Corylus cf avellana	hazel	-	12 (1.05g)	21 (1.77g)	1 (0.07g)	8 (1.39g)	-	-
Ericales	heather type	7 (0.22g)	-	-	6 (0.30g)	-	27 (1.13g)	46 (1.51g)
Quercus spp	oak	-	1 (0.03g)	22 (1.85g)	13 (0.48g)	-	1 (0.03g)	-
Salix spp	willow	10 (0.40g)	-	-	-	4 (0.15g)	-	1 (0.13g)
Indet charcoal	indet charcoal	-	4 (0.33g)	-	-	-	-	1 (0.24g)
Cereals								
Avena spp	oats	-	-	-	-	-	-	1
Hordeum vulgare sl	barley	4	-	-	-	-	-	2
Indeterminate grain	indet grain	3	-	-	-	-	-	1
Seeds								
Scirpus spp	rush	-	-	-	-	-	-	1
Stellaria / Cerastium	stitchwort/ mouse-ear	-	-	-	-	-	-	2

Table 14: Archaeobotanical results from Structure 9 and Structure 10

	Structure	Structure 11 ditch and pit		Structure 11 Feature Group 1	Structure 11 Feature Group 2			
	Context	266	361	620	355	356	357	477
	Sample no	12	31	273	216	49	46	219
	Description	Fill of pit/ stakehole (080)	Fill of ring ditch (069)	Fill of (485)	Fill of possible posthole (068)	Upper fill of possible stone lined pit (070)	Lower fill of possible stone lined pit (070)	Fill of posthole (478)
	Vol charcoal >4mm	5ml	2.5ml	<2.5ml	15ml	15ml	30ml	5ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	-	-	100%	50%	50%	-
Charcoal	Common name							
Alnus cf glutinosa	alder	1 (0.08g)	-	-	-	1 (0.04g)	28 (2.90g)	-
Betula spp	birch	-	-	2 (0.15g)	2 (0.25g)	10 (0.80g)	21 (2.30g)	1 (0.20g)
Corylus cf avellana	hazel	-	-	-	-	2 (0.09g)	-	-
Ericales	heather type	24 (1.13g)	7 (0.36g)	-	54 (1.57g)	-	-	5 (0.24g)
Quercus spp	oak	-	-	-	-	30 (2.00g)	19 (1.83g)	-
Salix spp	willow	-	1 (0.06g)	-	-	-	-	-
Indet charcoal	indet charcoal	-	-	-	-	-	-	-
Cereals								
Avena spp	oats	-	-	-	18	41	100	-
cf Avena spp	cf oats	-	-	-	-	-	-	-
Hordeum vulgare var vulgare	hulled barley	-	-	-	-	-	6	-
Hordeum vulgare sl	barley	-	-	-	52	186	327	-
cf Hordeum vulgare sl	cf barley	-	-	-	55	251	357	-
Triticum cf dicoccum	cf emmer wheat	-	-	-	-	-	2	-
Indeterminate grain	indet grain	-	-	-	79	520	540	-
Seeds								
small Poaceae	small grass	-	-	-	-	-	98	-

Table 14 (continued): Archaeobotanical results from Structure 9 and Structure 10

	Structure	Structure 11 Feature Group 3				Structure 11 Feature Group 4					Structure 11 Other
	Context	225	227	358	359	234	268	274	479	482	229
	Sample no	131	170	189	260	206	7	13	283	284	297
	Description	Fill of posthole (224)	Fill of possible posthole (226)	Fill from (067) above pebbles	Fill from (067) around and beneath pebbles	Fill of possible posthole (086)	fill of posthole (079)	Fill of possible pit / posthole (078)	Fill of posthole (480)	Fill of posthole (481)	Fill of possible posthole (228)
	Vol charcoal >4mm	<2.5ml	5ml	5ml	2.5ml	15ml	10ml	<2.5ml	<2.5ml	<2.5ml	10ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	100%	100%	-	-	-	100%	-	-	100%	100%
Charcoal	Common name										
Alnus cf glutinosa	alder	-	-	-	-	-	-	-	-	-	8 (0.44g)
Betula spp	birch	-	1 (0.23g)	-	-	-	-	-	-	1 (0.12g)	9 (0.42g)
Corylus cf avellana	hazel	-	6 (0.26g)	-	1 (0.25g)	-	7 (0.39g)	1 (0.05g)	1 (0.19g)	-	4 (0.17g)
Ericales	heather type	1 (0.17g)	18 (0.69g)	8 (0.39g)	5 (0.25g)	61 (2.19g)	38 (1.51g)	3 (0.16g)	1 (0.01g)	3 (0.14g)	-
Quercus spp	oak	-	-	-	-	-	1 (0.04g)	-	-	-	-
Salix spp	willow	-	-	-	-	13 (1.04g)	-	-	-	-	-
Indet charcoal	indet charcoal	-	-	-	4 (0.28g)	-	-	-	-	-	-
Cereals											
Avena spp	oats	-	-	-	-	-	-	-	-	-	-
cf Avena spp	cf oats	-	-	-	-	-	2	-	-	-	-
Hordeum vulgare var vulgare	hulled barley	-	-	-	-	-	-	-	-	-	-
Hordeum vulgare sl	barley	2	12	-	-	-	-	-	-	-	4
cf Hordeum vulgare sl	cf barley	-	9	-	-	-	-	-	-	-	9
Triticum cf dicoccum	cf emmer wheat	-	-	-	-	-	-	-	-	-	-
Indeterminate grain	indet grain	-	7	-	-	-	-	-	-	2	29
Seeds											
small Poaceae	small grass	-	-	-	-	-	-	-	-	-	-

Table 15: Archaeobotanical results from Structure 11

	Structure	Structure 12									Between Structures 6 & 12
	Context	53	168	517	592	627	637	682	684	801	655
	Sample no	47	35	262	239, 281	262 / 263	264	302	192	188	289
	Description	Band of charcoal rich soil	Pit	Area of stone holes-not a feature	Fill of large pit (591)	Fill of cut (626)	Fill of pit (636)	Fill of posthole (681)	Fill of ditch (683)	Fill of pit (800)	Fill of pit (654)
	Vol charcoal >4mm	25ml	20ml	<2.5ml	40ml	<2.5ml	15ml	25ml	5ml	20ml	2.5ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	-	-	100%	-	100%	100%	100%	-	-
Charcoal	Common name										
Alnus cf glutinosa	alder	6 (1.19g)	-	-	-	1 (0.02g)	-	-	-	-	-
Betula spp	birch	1 (0.30g)	-	1 (0.06g)	11 (1.82g)	-	11 (1.15g)	4 (1.19g)	1 (0.03g)	-	1 (0.10g)
Corylus cf avellana	hazel	4 (0.26g)	3 (0.26g)	-	35 (4.61g)	-	3 (0.36g)	37 (2.91g)	-	-	-
Ericales	heather type	18 (0.56g)	-	-	-	-	13 (0.55g)	39 (2.16g)	11 (0.37g)	-	1 (0.15g)
Quercus spp	oak	-	-	-	4 (0.28g)	1 (0.02g)	-	3 (0.23g)	1 (0.06g)	38 (2.34g)	-
Salix spp	willow	9 (5.66g)	18 (3.15g)	-	3 (0.52g)	-	4 (0.31g)	2 (0.16g)	-	8 (1.37g)	-
Indet charcoal	indet charcoal	-	-	-	16 (1.16g)	-	-	-	-	-	-
Cereals											
Hordeum vulgare var vulgare	hulled barley	-	-	-	-	-	-	-	-	-	-
Hordeum vulgare sl	barley	-	-	-	1	-	3	7	2	-	-
cf Hordeum vulgare sl	cf barley	-	-	-	-	-	-	-	-	-	-
Indeterminate grain	indet grain	-	-	-	4	-	-	6	3	-	-
Misc											
Cramp	cramp	++	-	-	++++	-	-	-	-	-	-

Table 16: Archaeobotanical results from Structure 12

	Structure	Structure 13		Structure 14		Structure 15					
	Context	630	632	629	629	441	590	596	783	785	799
	Sample no	286	209b	270	288	129	169	271	268	207	196
	Description	Fill of ditch (085)	Fill of ditch (631)	Fill of pit (628)	Fill of posthole (628)	Fill of possible posthole (429)	Fill of ditch (075)	Fill of posthole (595)	Fill of posthole (782)	Fill of posthole (784)	Fill of pit (798)
	Vol charcoal >4mm	5ml	5ml	5ml	15ml	<2.5ml	2.5ml	15ml	2.5ml	<2.5ml	-
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%	100%	100%	-
	% cereal ID	-	100%	-	100%	100%	100%	-	100%	100%	-
Charcoal	Common name										
Betula spp	birch	4 (0.18g)	1 (0.03g)	-	1 (0.02g)	1 (0.10g)	-	-	-	-	-
Corylus cf avellana	hazel	5 (0.13g)	-	-	1 (0.08g)	-	-	14 (3.00g)	2 (0.05g)	20 (1.22g)	-
Ericales	heather type	12 (0.44g)	20 (1.26g)	20 (1.22g)	76 (3.88g)	4 (0.09g)	4 (0.15g)	-	17 (0.39g)	-	-
Quercus spp	oak	-	1 (0.08g)	-	-	-	-	1 (0.07g)	-	-	-
Salix spp	willow	-	-	-	2 (0.15g)	-	-	5 (0.27g)	-	-	-
Indet charcoal	indet charcoal	-	-	-	-	-	-	9 (0.71g)	-	-	-
Cereals											
Avena spp	oats	-	1	-	-	-	-	-	3	5	-
Hordeum vulgare sl	barley	-	-	-	2	4	-	-	50	48	-
cf Hordeum vulgare sl	cf barley	-	-	-	-	-	-	-	21	16	-
Triticum dicoccum	emmer wheat	-	-	-	-	-	-	-	3	-	-
Indeterminate grain	indet grain	-	-	-	2	2	-	-	5	49	-
Seeds											
small Poaceae	small grass	-	-	-	-	-	1	-	-	-	-
Stellaria / Cerastium	stitchwort/ mouse-ear	-	1	-	-	-	-	-	-	-	-

Table 17: Archaeobotanical results from Structure 13, Structure 14 and Structure 15

	Structure	Structure 16							East of Structure 16		
	Context	506	507	667	669	752	777	779	797	797	797
	Sample no	209	23	296	179	208	148	200	152	SF	162
	Description	Fill of firepit (142)	Burnt post in fill (506) of firepit (142)	Fill of posthole (666)	Fill of terminal pit (670)	Fill of ditch (751)	Fill of pit (776)	Fill of posthole (778)	Fill of pit (796)	Fill of pit (796)	Fill of pit (796)
	Vol charcoal >4mm	100ml	100ml	30ml	10ml	2.5ml	5ml	<2.5ml	20ml	25ml	10ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	100%	-	-	100%	100%	-	-	100%	-	100%
Charcoal	Common name										
Alnus cf glutinosa	alder	-	-	5 (0.35g)	12 (0.69g)	-	-	-	-	1 (7.32g)	-
Betula spp	birch	61 (21.21g)	-	30 (4.48g)	1 (0.25g)	-	1 (0.06g)	-	-	-	-
Corylus cf avellana	hazel	-	25 (4.51g)	16 (1.38g)	-	1 (0.08g)	-	-	5 (0.82g)	-	2 (0.09g)
Ericales	heather type	-	-	5 (0.34g)	11 (0.40g)	3 (0.22g)	13 (0.65g)	3 (0.04g)	6 (0.32g)	-	21 (0.71g)
Quercus spp	oak	-	-	3 (0.19g)	-	-	-	-	30 (4.24g)	-	21 (1.19g)
Salix spp	willow	2 (0.36g)	86 (14.30g)	4 (0.55g)	1 (0.41g)	-	-	-	-	-	-
Indet charcoal	indet charcoal	-	-	-	-	-	6 (0.41g)	-	-	-	-
Cereals											
Avena spp	oats	-	-	-	-	-	-	-	-	-	8
cf Avena spp	cf oats	-	-	-	2	-	-	-	-	-	-
Hordeum vulgare sl	barley	3	-	-	4	1	-	-	9	-	15
cf Hordeum vulgare sl	cf barley	-	-	-	3	-	-	-	9	-	5
Indeterminate grain	indet grain	2	-	-	-	2	-	-	-	-	15

Table 18: Archaeobotanical results from Structure 16

	Structure	Structure 17 - ditches							
	Context	424	433	433	437	448	449	450	471
	Sample no	243	22	25, 33	26	117	125, 306	19	39
	Description	Fill of ditch (423/428)	Fill of ditch, (428)	Fill of ditch (428)	Fill of ditch (414)	Post hole in ditch (444)	Post hole in ditch (428)	Fill of possible pit/ditch terminus (417)	Fill of ditch (415)
	Vol charcoal >4mm	5ml	40ml	45ml	10ml	10ml	25ml	40ml	5ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	100%	100%	-	100%	100%	-	-
Charcoal	Common name								
Alnus cf glutinosa	alder	-	-	-	-	-	2 (0.48g)	-	-
Betula spp	birch	3 (0.24g)	4 (1.09g)	7 (0.38g)	1 (0.15g)	-	6 (0.42g)	10 (0.83g)	-
Corylus cf avellana	hazel	-	7 (0.85g)	33 (3.60g)	-	-	5 (0.48g)	9 (2.61g)	-
Ericales	heather type	1 (0.04g)	123 (3.76g)	49 (2.06g)	24 (0.86g)	36 (1.18g)	37 (1.74g)	15 (0.82g)	-
Fraxinus spp	ash	-	-	-	-	-	1 (0.12g)	-	7 (0.36g)
Quercus spp	oak	-	2 (0.30g)	6 (0.33g)	-	3 (0.25g)	4 (0.27g)	-	-
Salix spp	willow	4 (0.12g)	17 (4.06g)	14 (1.40g)	-	1 (0.06g)	1 (0.23g)	29 (1.63g)	2 (0.28g)
Indet charcoal	indet charcoal	1 (0.15g)	-	-	11 (0.75g)	-	-	14 (3.86g)	-
Cereals									
Avena spp	oats	-	-	1	-	-	-	-	-
cf Avena spp	cf oats	-	1	-	-	-	-	-	-
Hordeum vulgare var vulgare	hulled barley	-	1	-	-	-	-	-	-
Hordeum vulgare sl	barley	-	8	166	-	5	31	-	-
cf Hordeum vulgare sl	cf barley	-	6	135	-	-	15	-	-
Indeterminate grain	indet grain	-	-	60	-	-	8	-	-
Seeds									-
Stellaria / Cerastium	stitchwort/mouse-ear	-	1	-	-	-	-	-	-
Misc									-
Bone	bone	-	-	-	-	1	-	-	-
Cramp	cramp	-	-	-	-	-	-	++	-

Table 18 (continued): Archaeobotanical results from Structure 16

	Structure	Structure 17 - postholes										
	Context	685	585	598	599	689	613	619	685	686	687	689
	Sample no	279	265	259	258b	245	293	171	173	226	233	227
	Description	Posthole base (488), fill (685)	Fill of posthole (584)	Fill of posthole (597)	Fill of posthole (510)	Fill of posthole (610)	Fill of posthole (489)	Fill of posthole (609)	Basal fill of posthole (488)	Fill of posthole (487)	Fill of posthole (490)	Fill of posthole (610)
	Vol charcoal >4mm	5ml	25ml	-	10ml	10ml	2.5ml	5ml	5ml	2.5ml	5ml	-
	% charcoal ID	100%	100%	-	100%	100%	100%	100%	100%	100%	100%	-
	% cereal ID	100%	100%	-	-	-	-	-	-	100%	-	-
Charcoal	Common name											
Alnus cf glutinosa	alder	-	-	-	-	-	-	-	-	-	-	-
Betula spp	birch	-	4 (0.32g)	-	-	-	-	7 (0.38g)	3 (0.33g)	-	-	-
Corylus cf avellana	hazel	-	4 (0.26g)	-	5 (0.18g)	8 (1.41g)	-	-	11 (1.06g)	1 (0.07g)	-	-
Ericales	heather type	10 (0.87g)	31 (1.33g)	-	5 (0.31g)	-	20 (0.51g)	8 (0.18g)	1 (0.05g)	29 (0.62g)	29 (0.97g)	-
Fraxinus spp	ash	-	1 (1.75g)	-	-	-	-	-	-	-	-	-
Quercus spp	oak	-	40 (6.04g)	-	-	-	-	-	-	-	-	-
Salix spp	willow	-	11 (0.69g)	-	-	1 (0.20g)	-	1 (0.06g)	-	-	-	-
Indet charcoal	indet charcoal	-	-	-	29 (0.97g)	11 (0.85g)	-	-	-	-	-	-
Cereals												
Avena spp	oats	-	-	-	-	-	-	-	-	-	-	-
cf Avena spp	cf oats	-	-	-	-	-	-	-	-	-	-	-
Hordeum vulgare var vulgare	hulled barley	-	-	-	-	-	-	-	-	-	-	-
Hordeum vulgare sl	barley	-	1	-	-	-	-	-	-	5	-	-
cf Hordeum vulgare sl	cf barley	-	1	-	-	-	-	-	-	-	-	-
Indeterminate grain	indet grain	6	2	-	-	-	-	-	-	1	-	-
Seeds												
Stellaria / Cerastium	stitchwort/mouse-ear	-	-	-	-	-	-	-	-	-	-	-
Misc												
Bone	bone	-	-	-	-	-	-	-	-	-	-	-
Cramp	cramp	-	-	-	-	-	-	-	-	-	-	-

Table 19: Archaeobotanical results from Structure 17

	Structure	Structure 18		Structure 19		Structure 20							
	Context	421	438	439	531	504	706	716	728	750	756	757	758
	Sample no	92	36	246	274	238	174	223	136	266	215	197	204
	Description	Ditch (438)	Fill of ditch (421)	Fill of ditch (422)	Fill of ditch (422)	Fill of possible firepit (141)	Fill of ditch (705)	Fill of ditch (715)	Fill of deposit (727)	Fill of posthole (749)	Fill of posthole (755)	Fill of feature (425)	Fill of pit (425)
	Vol charcoal >4mm	20ml	2.5ml	<2.5ml	<2.5ml	30ml	5ml	5ml	5ml	<2.5ml	2.5ml	5ml	2.5ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	100%	-	-	-	-	100%	-	-	-	-	-
Charcoal	Common name												
Alnus cf glutinosa	alder	-	-	1 (0.22g)	-	12 (1.30g)	-	-	-	-	-	-	-
Betula spp	birch	-	-	-	1 (0.05g)	14 (0.55g)	1 (0.03g)	-	1 (0.12g)	-	-	4 (0.43g)	1 (0.17g)
Corylus cf avellana	hazel	14 (1.87g)	-	1 (0.24g)	1 (0.03g)	4 (0.22g)	5 (0.41g)	3 (0.29g)	-	-	-	-	-
Ericales	heather type	-	4 (0.48g)	-	1 (0.05g)	-	-	8 (0.58g)	13 (0.54g)	2 (0.17g)	-	4 (0.26g)	-
Quercus spp	oak	2 (0.10g)	-	-	-	24 (3.17g)	-	1 (0.07g)	-	-	-	3 (0.33g)	-
Salix spp	willow	13 (2.32g)	-	-	-	3 (0.38g)	-	1 (0.10g)	-	-	-	1 (0.11g)	2 (0.29g)
Indet charcoal	indet charcoal	-	-	-	-	-	3 (0.13g)	6 (0.58g)	-	-	-	-	-
Cereals													
Hordeum vulgare sl	barley	-	1	-	-	-	-	3	-	-	-	-	-

Table 20: Archaeobotanical results from Structure 18, Structure 19 and Structure 20

	Structure	Structure 21 pits & hearth					Structure 21 Exterior Feature Group 1							
	Context	264	676	680	673	382	702	720	732	769	773	781	788	808
	Sample no	217	276	218	110	4	177	147	303	164	134	145	214	95
	Description	Fill of small pit (117)	Fill of small pit (117)	Fill of pit (116)	Fill of small pit (118)	Fill of possible hearth (120)	Fill of scoop (701)	Top fill of pit/ posthole (719)	Lower fill of pit/ posthole (719)	Fill of possible large stake (768)	Fill of ditch (809)	Fill of posthole (780)	Fill of posthole/ pit (787)	Fill of posthole (807)
	Vol charcoal >4mm	25ml	10ml	10ml	<2.5ml	5ml	50ml	<2.5ml	5ml	2.5ml	10ml	<2.5ml	20ml	5ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	-	100%	-	-	-	-	-	-	-	-	100%	-
Charcoal	Common name													
Alnus cf glutinosa	alder	-	2 (0.05g)	-	-	-	-	-	-	-	-	-	-	1 (0.26g)
Betula spp	birch	-	2 (0.26g)	7 (0.42g)	-	-	45 (3.03g)	-	4 (0.44g)	-	11 (1.40g)	-	10 (2.11g)	4 (0.36g)
Corylus cf avellana	hazel	5 (0.24g)	7 (0.45g)	6 (0.61g)	-	17 (1.12g)	1 (0.13g)	-	-	-	1 (0.16g)	-	7 (0.64g)	-
Ericales	heather type	19 (0.82g)	-	10 (0.21g)	10 (0.20g)	-	-	2 (0.31g)	5 (0.15g)	10 (0.24g)	11 (0.71g)	2 (0.11g)	20 (0.65g)	2 (0.12g)
Quercus spp	oak	-	-	1 (0.08g)	-	-	121 (5.52g)	-	1 (0.34g)	-	2 (0.09g)	-	1 (0.09g)	1 (0.04g)
Salix spp	willow	28 (2.48g)	-	4 (0.32g)	-	-	-	-	2 (0.21g)	-	1 (0.36g)	-	12 (0.98g)	-
Indet charcoal	indet charcoal	-	-	-	-	-	-	-	6 (0.39g)	-	-	-	-	-
Cereals														
Hordeum vulgare sl	barley	-	-	1	-	-	-	-	-	-	-	-	3	-
Indeterminate grain	indet grain	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc														
Bone	bone	-	-	-	1 (0.03g)	-	-	-	-	-	-	-	-	-

Table 20 (continued): Archaeobotanical results from Structure 18, Structure 19 and Structure 20

	Structure	Structure 21 Exterior Feature Group 2				Structure 21 Other		
	Context	677	708	730	746	665	734	811
	Sample no	295	161	159	160	175	141	267
	Description	Upper fill of pit/ posthole (115)	Layer within pit posthole (115)	Fill of posthole (729)	Fill of (745)	Fill of (664)	Fill of possible pit/posthole (122)	Fill of posthole (810)
	Vol charcoal >4mm	35ml	5ml	5ml	2.5ml	25ml%	2.5ml	<2.5ml
	% charcoal ID	100%	100%	100%	100%	100%%	100%	100%
	% cereal ID	100%	-	-	-	100%	-	-
Charcoal	Common name							
Alnus cf glutinosa	alder	-	-	-	-	4 (0.25g)	-	-
Betula spp	birch	2 (0.34g)	1 (0.13g)	-	1 (0.13g)	8 (0.76g)	-	-
Corylus cf avellana	hazel	4 (0.11g)	-	3 (0.29g)	-	11 (0.48g)	-	-
Ericales	heather type	359 (9.68g)	9 (0.46g)	14 (0.39g)	10 (0.56g)	3 (0.09g)	5 (0.35g)	5 (0.21g)
Quercus spp	oak	-	-	-	-	-	-	-
Salix spp	willow	6 (0.48g)	-	1 (0.04g)	-	4 (2.14g)	-	-
Indet charcoal	indet charcoal	-	-	-	-	-	-	-
Cereals								
Hordeum vulgare sl	barley	4	-	-	-	-	-	-
Indeterminate grain	indet grain	2	-	-	-	3	-	-
Misc								
Bone	bone	-	-	-	-	-	-	-

Table 21: Archaeobotanical results from Structure 21

	Structure	Structure 22						
	Context	709	712	722	726	790	792	795
	Sample no	230	229	176	153	184	153	149
	Description	Fill of posthole (152)	Fill of posthole (711)	Fill of posthole (721)	Fill of posthole (725)	Fill of posthole (789)	Fill of posthole (791)	Fill of posthole (153)
	Vol charcoal >4mm	2.5ml	2.5ml	<2.5ml	-	<2.5ml	5ml	2.5ml
	% charcoal ID	100%	100%	100%	-	100%	100%	100%
	% cereal ID	-	-	-	-	-	-	-
Charcoal	Common name							
Alnus cf glutinosa	alder	-	4 (0.13g)	-	-	-	-	-
Betula spp	birch	-	-	-	-	-	4 (0.20g)	1 (0.02g)
Corylus cf avellana	hazel	2 (0.18g)	-	-	-	-	5 (0.18g)	4 (0.14g)
Ericales	heather type	3 (0.12g)	2 (0.08g)	4 (0.04g)	-	5 (0.17g)	6 (0.27g)	2 (0.05g)
Quercus spp	oak	-	-	-	-	-	1 (0.07g)	-
Salix spp	willow	-	1 (0.04g)	-	-	-	1 (0.07g)	-
Indet bark	indet bark	-	-	-	-	-	-	-
Cereals								
Hordeum vulgare sl	barley	-	-	-	-	-	-	-

Table 21 (continued): Archaeobotanical results from Structure 21

	Structure	Structure 23							
	Context	381	688	693	697	703	704	710	786
	Sample no	1	287	232	190	183	193	135	155
	Description	Fill of pit / posthole (160)	Fill of possible pit/posthole (164)	Fill of posthole (161)	Fill of possible pit/posthole (148)	Fill of pit/ posthole (149)	Fill of possible posthole (151)	Fill of possible ring ditch (150)	Arc of darker soil leading to possible pit / posthole (145)
	Vol charcoal >4mm	<2.5ml	2.5ml	400ml	5ml	10ml	5ml	5ml	<2.5ml
	% charcoal ID	100%	100%	25%	100%	100%	100%	100%	100%
	% cereal ID	-	-	-	-	-	-	-	100%
Charcoal	Common name								
Alnus cf glutinosa	alder	-	-	19 (1.85g)	-	8 (1.07g)	-	-	-
Betula spp	birch	1 (0.04g)	-	29 (5.37g)	5 (0.19g)	8 (0.35g)	-	-	-
Corylus cf avellana	hazel	-	1 (0.06g)	54 (5.66g)	1 (0.03g)	5 (0.34g)	-	2 (0.40g)	-
Ericales	heather type	-	12 (0.24g)	-	-	-	12 (0.51g)	8 (0.43g)	2 (0.13g)
Quercus spp	oak	-	-	-	1 (0.04g)	-	1 (0.03g)	8 (0.19g)	-
Salix spp	willow	-	1 (0.02g)	-	-	-	-	3 (0.12g)	-
Indet bark	indet bark	-	-	157 (4.27g)	-	-	-	-	-
Cereals									
Hordeum vulgare sl	barley	-	-	-	-	-	-	-	2

Table 22: Archaeobotanical results from Structure 22 and Structure 23

	Structure	N band group 1							
	Context	133	772	774	775	805	822	829	831
	Sample no	154	187	199	140	153	130	96	118
	Description	Top fill of large pit (137)	Fill of pit (771)	Fill of substantial arc of dark brown soil (137)	Charcoal in arc of dark brown soil (137)	Fill of pit (158)	Fill of pit (821)	Fill of posthole (828)	Fill of posthole (830)
	Vol charcoal >4mm	30ml	5ml	5ml	5ml	500ml	2.5ml	10ml	5ml
	% charcoal ID	100%	100%	100%	100%	20%	100%	100%	100%
	% cereal ID	100%	100%	-	-	-	100%	-	100%
Charcoal	Common name								
Alnus cf glutinosa	alder	-	1 (0.17g)	6 (0.22g)	-	-	-	-	-
Betula spp	birch	6 (0.28g)	-	-	12 (0.69g)	-	1 (0.11g)	13 (0.95g)	1 (0.01g)
Corylus cf avellana	hazel	12 (0.56g)	5 (0.29g)	2 (0.07g)	-	-	-	2 (0.07g)	5 (0.15g)
Ericales	heather type	9 (0.28g)	10 (0.32g)	13 (0.28g)	-	-	6 (0.08g)	-	2 (0.05g)
Quercus spp	oak	16 (2.73g)	-	-	-	-	-	-	1 (0.02g)
Salix spp	willow	5 (0.56g)	1 (0.03g)	-	-	142 (11.56g)	-	2 (0.14g)	7 (0.30g)
Indet bark	indet bark	-	-	-	-	180 (5.14g)	-	-	-
Cereals									
Avena spp	oats	-	-	-	-	-	1	-	-
cf Avena spp	cf oats	-	-	-	-	-	-	-	-
Hordeum vulgare var vulgare	hulled barley	-	-	-	-	-	-	-	-
Hordeum vulgare sl	barley	1	3	-	-	-	2	-	1
cf Hordeum vulgare sl	cf barley	-	-	-	-	-	17	-	-
Triticum dicoccum	emmer wheat	-	-	-	-	-	-	-	-
Triticum cf dicoccum	cf emmer wheat	-	-	-	-	-	-	-	-
Indeterminate grain	indet grain	-	-	-	-	-	5	-	1
Culm node	culm node	-	-	-	-	-	-	-	-

Table 22 (continued): Archaeobotanical results from Structure 22 and Structure 23

	Structure	N band group 2								
	Context	806	812	818	817	819	821	825	826	827
	Sample no	137	144	21	114	100	157	126	138	133
	Description	Fill of pit/ posthole (126)	Fill of possible posthole (113)	Fill of pit (125)	Fill of possible stakehole (127)	Fill of posthole (129)	Fill of posthole (820)	Fill of posthole (824)	Cut of kiln (826)	Fill of kiln (826)
	Vol charcoal >4mm	<2.5ml	30ml	40ml	2.5ml	15ml	5ml	-	<2.5ml	20ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	-	100%	100%
	% cereal ID	-	-	100%	100%	-	100%	-	100%	100%
Charcoal	Common name									
Alnus cf glutinosa	alder	-	3 (0.10g)	6 (0.51g)	-	-	-	-	-	-
Betula spp	birch	-	10 (0.54g)	45 (3.20g)	-	-	-	-	1 (0.04g)	9 (0.54g)
Corylus cf avellana	hazel	-	-	7 (0.30g)	1 (0.20g)	27 (0.72g)	3 (0.04g)	-	-	14 (0.54g)
Ericales	heather type	4 (0.21g)	1 (0.03g)	23 (0.95g)	-	6 (0.35g)	-	-	8 (0.28g)	-
Quercus spp	oak	-	92 (4.68g)	3 (0.15g)	-	10 (0.44g)	13 (0.60g)	-	-	3 (0.12g)
Salix spp	willow	-	-	7 (0.39g)	-	17 (0.35g)	-	-	-	7 (0.81g)
Indet bark	indet bark	-	-	-	-	-	-	-	-	-
Cereals										
Avena spp	oats	-	-	12	-	-	-	-	-	45
cf Avena spp	cf oats	-	-	8	-	-	1	-	-	-
Hordeum vulgare var vulgare	hulled barley	-	-	3	-	-	-	-	-	-
Hordeum vulgare sl	barley	-	-	74	4	-	6	-	1	170
cf Hordeum vulgare sl	cf barley	-	-	78	-	-	5	-	-	122
Triticum dicoccum	emmer wheat	-	-	-	-	-	-	-	-	10
Triticum cf dicoccum	cf emmer wheat	-	-	-	-	-	-	-	-	12
Indeterminate grain	indet grain	-	-	-	-	-	10	-	2	329
Culm node	culm node	-	-	-	-	-	-	-	-	1

Table 23: Archaeobotanical results from N band group 1 and N band group 2

	Site Identifier	EV1	EV2	EV3	Evaluation	Evaluation
	Context	2901	2705	2801	1202	4102
	Sample no	?	?	?	106	93
	Description	Post	?	?	?	?
	Vol charcoal >4mm	20ml	>2.5ml	400ml	10ml	150ml
	% charcoal ID	100%	100%	100%	100%	50%
	% cereal ID	-	100%	-	-	-
Charcoal	Common name					
Alnus cf glutinosa	alder	18 (3.06g)	-	-	1 (0.02g)	25 (4.11g)
Betula spp	birch	3 (0.28g)	-	48 (95.56g)	6 (0.31g)	-
Corylus cf avellana	hazel	-	-	28 (14.29g)	17 (1.04g)	31 (11.72g)
Ericales	heather type	13 (0.32g)	6 (0.20g)	67 (0.78g)	-	-
Prunoideae	cherry type	1 (0.24g)	-	-	-	-
Quercus spp	oak	-	-	-	-	10 (3.41g)
Salix spp	willow	10 (0.54g)	-	10 (1.97g)	4 (0.33g)	-
Cereals						
Hordeum vulgare sl	barley	-	3	-	-	-
Indeterminate grain	indet grain	-	2	-	-	-

Table 24: Archaeobotanical results from Evaluation

	Structure	Not in Structure							
	Context	31	39	503	208	350	360	360	380
	Sample no	80	68	272	43	195	48	50	6
	Description	Possible posthole / pit (221)	Large spread of charcoal rich material	Possible pit/ posthole (131)	Fill of pit (052)	Fill of charcoal rich area (038)	Fill of possible pit with charcoal (066)	Fill of possible pit with charcoal (066)	Fill of posthole (144)
	Vol charcoal >4mm	15ml	10ml	15ml	2.5ml	15ml	15ml	2.5ml	10ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	-	100%	-	100%	-	-	-
Charcoal	Common name								
Alnus cf glutinosa	alder	-	-	-	-	-	-	-	-
Betula spp	birch	-	1 (0.02g)	9 (0.79g)	-	1 (0.12g)	18 (4.07g)	-	39 (1.88g)
Corylus cf avellana	hazel	-	1 (0.04g)	-	-	8 (1.80g)	1 (0.07g)	5 (0.44g)	4 (0.05g)
Ericales	heather type	108 (2.96g)	43 (1.69g)	3 (0.25g)	19 (0.70g)	33 (1.12g)	16 (0.98g)	7 (0.18g)	-
Quercus spp	oak	-	1 (0.05g)	2 (0.13g)	-	7 (0.61g)	-	-	-
Salix spp	willow	-	3 (0.63g)	17 (0.79g)	-	6 (0.63g)	-	-	-
Indet charcoal	indet charcoal	-	-	-	-	-	10 (1.43g)	-	-
Cereals									
Avena spp	oats	-	-	4	-	-	-	-	-
Hordeum vulgare var vulgare	hulled barley	-	-	15	-	-	-	-	-
Hordeum vulgare sl	barley	-	-	100	-	14	-	-	-
cf Hordeum vulgare sl	cf barley	-	-	91	-	-	-	-	-
Indeterminate grain	indet grain	-	-	74	-	7	-	-	-
Rachis internode	rachis internode	-	-	-	-	-	-	-	-
Seeds									
Bromus spp	brome grass	-	-	-	-	1	-	-	-
Misc									
Bone	bone	-	-	-	-	-	-	-	-

Table 24 (continued): Archaeobotanical results from Evaluation

	Structure							
	Context	402	408	431	458	467	509	555
	Sample no	111	112	38	275	237	180	213
	Description	Fill of posthole (401)	Fill of posthole (407)	Fill of pit (416)	Fill of pit (453)	Fill of posthole (466)	Fill of posthole (508)	?
	Vol charcoal >4mm	2.5ml	2.5ml	15ml	<2.5ml	2.5ml	5ml	10ml
	% charcoal ID	100%	100%	100%	100%	100%	100%	100%
	% cereal ID	-	-	100%	100%	100%	-	-
Charcoal	Common name							
Alnus cf glutinosa	alder	-	-	9 (0.64g)	-	-	-	-
Betula spp	birch	-	2 (0.20g)	-	-	-	-	7 (0.47g)
Corylus cf avellana	hazel	2 (0.21g)	-	9 (0.83g)	-	1 (0.09g)	10 (1.04g)	-
Ericales	heather type	-	6 (0.25g)	45 (1.41g)	(0.02g)	13 (0.47g)	-	-
Quercus spp	oak	-	-	1 (0.08g)	-	-	-	4 (0.23g)
Salix spp	willow	-	-	-	-	-	-	-
Indet charcoal	indet charcoal	-	-	-	-	-	-	-
Cereals								
Avena spp	oats	-	-	-	-	-	-	-
Hordeum vulgare var vulgare	hulled barley	-	-	-	-	-	-	-
Hordeum vulgare sl	barley	-	-	4	2	-	-	-
cf Hordeum vulgare sl	cf barley	-	-	-	-	-	-	-
Indeterminate grain	indet grain	-	-	6	-	2	-	-
Rachis internode	rachis internode	-	-	-	-	-	-	-
Seeds								
Bromus spp	brome grass	-	-	-	-	-	-	-
Misc								
Bone	bone	3 (0.30g)	-	-	-	-	-	-

Table 25: Archaeobotanical results from features not in a structure

	Structure	Not in Structure (continued)						
	Context	617	647	653	658	674	692	714
	Sample no	253	247	185	257	194	278	236
	Description	Fill of posthole (526)	Fill of shallow pit (646)	Fill of posthole (652)	Fill of cut (657)	Fill of (664)	Fill of posthole (691)	Fill of cut (713)
	Vol charcoal >4mm	<2.5ml	10ml	5ml	5ml	250ml	5ml	<2.5ml
	% charcoal ID	100%	100%	100%	100%	20%	100%	100%
	% cereal ID	-	100%	-	100%	-	100%	-
Charcoal	Common name							
Alnus cf glutinosa	alder	-	-	-	-	6 (0.22g)	-	-
Betula spp	birch	-	6 (0.46g)	-	1 (0.10g)	46 (5.83g)	-	1 (0.03g)
Corylus cf avellana	hazel	-	2 (0.27g)	-	1 (0.08g)	24 (1.46g)	-	-
Ericales	heather type	8 (0.21g)	23 (1.30g)	17 (0.93g)	22 (1.26g)	-	20 (0.43g)	-
Quercus spp	oak	-	-	2 (0.12g)	-	-	-	-
Salix spp	willow	-	1 (0.05g)	-	2 (0.23g)	2 (0.58g)	1 (0.06g)	-
Indet charcoal	indet charcoal	-	12 (1.28g)	-	-	42 (2.62g)	-	-
Cereals								
Hordeum vulgare sl	barley	-	2	-	-	-	4	-
Indeterminate grain	indet grain	-	-	-	4	-	1	-
Seeds								
cf Malus sylvestris	cf crab apple	-	-	-	-	-	1	-
Plantago major	greater plantain	-	1	-	-	-	-	-

Table 25 (continued): Archaeobotanical results from features not in a structure

	Structure								
	Context	714	744	748	765	794	1003	1017	1018
	Sample no	236	163	132	146	158	4	5	220
	Description	Fill of cut (713)	Fill of (739)	?	Fill of posthole (764)	Fill of cut (793)	DK20 cut of posthole (1003)	fill of posthole (1003)	Fill of pit (1005)
	Vol charcoal >4mm	<2.5ml	2.5ml	-	5ml	<2.5ml	<2.5ml	-	<2.5ml
	% charcoal ID	100%	100%	-	100%	100%	100%	-	100%
	% cereal ID	-	-	-	-	-	-	-	-
Charcoal	Common name								
Alnus cf glutinosa	alder	-	-	-	3 (0.31g)	-	-	-	-
Betula spp	birch	1 (0.03g)	1 (0.08g)	-	3 (0.27g)	1 (0.14g)	-	-	-
Corylus cf avellana	hazel	-	1 (0.12g)	-	2 (0.12g)	-	-	-	2 (0.22g)
Ericales	heather type	-	-	-	26 (0.49g)	1 (0.03g)	-	-	-
Quercus spp	oak	-	-	-	-	-	3 (0.22g)	-	-
Salix spp	willow	-	-	-	1 (0.09g)	-	-	-	-
Indet charcoal	indet charcoal	-	-	-	-	-	-	-	-
Cereals									
Hordeum vulgare sl	barley	-	-	-	-	-	-	-	-
Indeterminate grain	indet grain	-	-	-	-	-	-	-	-
Seeds									
cf Malus sylvestris	cf crab apple	-	-	-	-	-	-	-	-
Plantago major	greater plantain	-	-	-	-	-	-	-	-

Appendix 2: Pottery Catalogue

Structure	Feature	Fill	SF #	Sample #	Vessel #	Category	Type	Qty	Weight (g)	Th	Fabric	Period	Description
?	Unstratified	-	78	-	-	Fired Clay	-	1	35	See description	Sandy, oxidised, frequent fine to coarse sub-angular quartz and fine mica	-	Object. Unusual shaped piece of fired clay appears broken and much abraded. Like a disc with a pinched waist. max diameter of 41, min dimeter 35. 22mm thick
3	56		-	61	-	Fired Clay	-	3	13	13	Sandy, oxidised, rare angular quartz	-	Amorphous lumps
?	39	393	-	68	1	Pottery	FRW	1	32	13	Coarse sandy, reduced, rare coarse sub angular quartz, common fine rounded quartz and common fine rounded quartz, micaceous	MBA-IA	Medium body sherd with finger smoothing ridges to both faces

Structure	Feature	Fill	SF #	Sample #	Vessel #	Category	Type	Qty	Weight (g)	Th	Fabric	Period	Description
?		104	28	-	2	Pottery	FRW	51	1099	Oct-20	Sandy, reduced, few visible inclusions	MBA	Small to large sherds of a decorated vessel. Three rim sherds, some variation to thickness but likely all same vessel, rim diameter estimated c230mm. Expanded and flattened internal bevel. Organic residue on the exterior blocks the surface of one but a similar decorative pattern can be seen. Incised decoration to exterior, vertical linear directly below the bevel and diagonal slashes below, one body sherd seems to show a second horizontal line at the bottom of the diagonals (slightly obscured by residue). This would be a band of decoration c 32mm in thickness. At least two of the body sherds conjoin and one body sherds conjoin to one of the rim sherds. Body is barrel or bucket shaped. One body sherd has broken along a clay join which is oblique but fairly irregular in cross section No base sherds present
?		117	15	-	3	Pottery	FRW	2	25	12.5	Sandy, oxidised ext reduced int, rare coarse angular quartz	MBA-IA	Two small conjoining body sherds. Very gentle curvature.
?		196	-	79	-	Fired Clay	-	2	2	9	Fine sandy, irregular firing	-	Small amorphous pieces
7		262	51	-	-	Fired Clay	Furnace	14	1134	40	Sandy, irregular	-	Furnace pieces, medium to large, including a rim
4		252	51	-	-	Stone	Natural	3	554	-	-	-	-
				77	-	Stone	Natural	2	3	-	-	-	Heat affected
		262	-	77	-	Bone	-	3	3	-	-	-	
7		262	-	77	-	Slag	Lining	1	1	-	-	-	Appears to be a piece of slag from the furnace lining
7		262	-	77	-	Fired Clay	Furnace	45	398	-	Sandy, irregular	-	Furnace pieces, small to medium including vitrified lining on the interior

Structure	Feature	Fill	SF #	Sample #	Vessel #	Category	Type	Qty	Weight (g)	Th	Fabric	Period	Description
5	299	300	-	127	4	Pottery/ Fired Clay	-	3	5	10.5	Sandy, oxidised	-	Small amorphous pieces, much abraded
?	38	350	-	195	-	fired clay	-	9	12	9.5	Sandy, oxidised	-	Small amorphous pieces
?		362	90	-	5	Pottery	FRW	60	3660	Walls 10 – 15, base 21	Sandy, oxidised, frequent fine to coarse sub rounded quartz	MBA-IA	Nine conjoining base sherds from entire base, 45 body sherds from fairly straight sided vessel, two rounded rim sherd which appears pointed due to the tapering vessel thickness and two fragments. The base kicks out and the vessel would have been bucket shaped although the rim diameter is not possible to estimate confidently from the single rim sherd it appears to be around 320mm in diameter. Vertical finger smoothing on ext.one body sherd has two post-firing (hourglass sectioned) perforations, 30mm apart located at the breaks on opposing sides of the sherd, no conjoining perforations could be found. 225mm base diameter.
?		362	90	-	-	Ceramic	Object	3	33	See description	Fine sandy, oxidised, voids along with moderate fine to course sub-rounded quartz and one small pebble measuring 8mm	MBA-IA	Spindle Whorl. Three conjoining pieces forming an ovoid with a straight, central perforation, slightly hourglass shaped at either end. Diameter c 41mm, thickness 26mm. Perforation diameter 6.5mm
?		364	130	-	6	Pottery	FRW	2	5	11.5	Sandy, oxidised	MBA-IA	Small much abraded pieces
?	89	377	-	3	7	Pottery/ Fired Clay	-	2	2	7	Sandy, oxidised, moderate, fine sub-rounded quartz	-	Small thin piece, much abraded

Structure	Feature	Fill	SF #	Sample #	Vessel #	Category	Type	Qty	Weight (g)	Th	Fabric	Period	Description
?	71	412	-	9	-	Fired Clay	daub	5	60	23	Sandy, oxidised	-	Four amorphous pieces, three of which are very small. One large piece, with a flat surface and two linear impressions on the opposing face, c16mm width x c4mm depth and c20mm width x c5mm depth
12		434	126	-	8	Pottery	FRW	1	12	15	Sandy, oxidised, fine common sub rounded quartz and rare coarse, rounded soft cream inclusions	MBA-IA	Small much abraded body sherd
17	417	450	119	-		Fired Clay	daub	6	19	10	Sandy, oxidised, moderate, coarse sub-angular quartz		The fabric of this is more like the pottery fabric. However the small amorphous pieces are more like daub, and one has an impressed linear (11.5 x 4) which appears to have been made by wattle.
?		465	128	-	-	Fired clay	-	1	2	7	Fine sandy, oxidised	-	One smooth concave side
7		472	154	-	-	Fired Clay	-	1	8	7.5	Fine sandy, oxidised, rare coarse angular quartz,	-	Linear impressions of c8mm in width and 3mm in depth
20		504	135	-	-	Fired Clay	daub	8	88	32.5	Fine sandy, oxidised	-	Mostly small to medium amorphous pieces although one of the medium pieces is thicker and larger with one concave face
16	143	506	134	209	-	Fired Clay	daub	7	52	29	Fine sandy, oxidised	-	Small amorphous pieces and medium piece with linear impression c17mm x c5mm
16	143	506	134	-	-	Fired Clay	daub	69	40	640	Fine sandy, oxidised	-	Small to large amorphous and linear impressed pieces. The best of which shows two crossing linears measuring c20mm x c6mm and c10.5mm x c3mm
7		507	-	23	9	Pottery	FRW	2	6	12	Sandy, oxidised ext and reduced int., rare, fine angular quartz, micaceous	MBA-IA	Small much abraded body sherds

Structure	Feature	Fill	SF #	Sample #	Vessel #	Category	Type	Qty	Weight (g)	Th	Fabric	Period	Description
?		555	-	213	-	Fired Clay	daub	1	28	19	Sandy, oxidised, rare coarse sub-angular quartz	-	Fairly amorphous, two possible concave linear surfaces, on opposing faces
?		665	166	-	-	Fired Clay	daub	2	15	17	Fine sandy, irregular firing,	-	One small amorphous piece and one piece with linear impression (11x3) and other organic impressions (straw/ grass)
?		665	166	-	10	Pottery	FRW	1	20	13	Sandy, reduced core, sparse sub-angular quartz	MBA-IA	Medium body sherd with interior finger smoothing, abraded
21	719	732	204		11	Pottery	FRW	1	9	10	Sandy, oxidised	MBA-IA	Small body sherd, much abraded
20		757	-	197	12	Pottery	FRW	1	19	11.5	Coarse sandy, oxidised ext and reduced int, abundant fine sub-rounded quartz	MBA-IA	Medium body sherd broken along possible clay join. Much abraded
?		770	190	-	-	Fired Clay	daub	1	3	6	Fine sandy, oxidised	-	Y-shaped cross section. Likely to have formed against three linears.
16		777	-	148	13	Pottery	FRW	1	5	10	Coarse sandy, reduced with an oxidised exterior, abundant fine sub-rounded quartz	MBA-IA	Small body sherd, much abraded
?		794	178	-	14	Pottery	FRW	1	12	12	Sandy, oxidised ext, reduced int	MBA-IA	Small gently curving body sherd
?	793	794	178	-	-	Ceramic	-	1	6	10	-	-	piece of pantile or post-medieval oxidised pottery

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