University of Reading

Extending Histories: from Medieval Mottes to Prehistoric Round Mounds

Skipsea Castle, East Yorkshire

Interim Report

Elaine Jamieson and Phil Stastney

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Executive Summary

Skipsea Castle is situated in the gently undulating landscape of Holderness, 12km south of Bridlington. In 2015 and 2016, as part of the Leverhulme Trust funded project Extending Histories: from Medieval Mottes to Prehistoric Round Mounds, staff from the University of Reading undertook archaeological investigations at the site. Fieldwork included drilling two boreholes through the castle mound down to the old ground surface, as well as the detailed analytical earthwork survey of the upstanding remains. This fieldwork was followed by a programme of scientific dating and palaeoenvironmental analysis. The preliminary results of this work have demonstrated that the castle mound may have originated in the middle Iron Age, probably sometime after 401-233 cal BC (95% confidence).

1. INTRODUCTION AND RESEARCH BACKGROUND

This report describes the initial result of archaeological investigations carried out at Skipsea Castle, East Yorkshire, as part of the *Extending Histories: from Medieval Mottes to Prehistoric Round Mounds* project (The Round Mounds project for short), a University of Reading research project funded by The Leverhulme Trust. The Round Mounds project aims to unlock the story of monumental mounds in the English landscape. It contends that fossilised within the main body of some medieval mottes are large Neolithic round mounds, which are among the rarest and least well understood monuments in Britain. Skipsea Castle is one of 20 mottes from across England considered as having prehistoric potential and selected for detailed archaeological investigation as part of the Round Mounds project.

Skipsea Castle (Scheduled Monument Number: 1011212) is situated immediately north of the hamlet of Skipsea Brough, and 300m west of the main village of Skipsea, East Yorkshire. It is located in an area formed primarily from Glacial deposits of clay, sand and gravel overlying Cretaceous Chalk (British Geological Survey 2013). The principal elements of the monument consist of an earthen mound, named Castle Hill, which is enclosed by an oval ditch and outer bank. The low-lying area which surrounds the mound, and extends c.900m to the north, represents the location of a former post-Glacial lake known as Skipsea Bail Mere. Lakes and marshland were once common in the Holderness landscape, with the mere at Skipsea reportedly drained by 1720 (Sheppard 1956; Butler 1984, 45-6). The fragmentary remains of a large horseshoe-shaped enclosure extend over the area to the south of the mound, in what was once the southernmost extent of the mere. Occupying a ridge to the west is a crescent-shaped enclosure of around 3.5 hectares in area; this feature is defined on three sides by a massive bank and ditch and has been interpreted in the past as the site of the castle bailey (Atkins nd, 6-12), or the location of the planted settlement of Skipsea Brough (Ainsworth et al. 2001, 5-6; Butler 1984, 45-6).

The archaeological fieldwork at Skipsea was carried out in November 2015 and March 2016 by staff from the University of Reading. Scheduled Monument Consent was required for the works, and this was applied for and duly given prior to the commencement of fieldwork. This report represents an interim statement of the findings from 2015/16. A final report will be produced in 2017, presenting the results of all the work at Skipsea Castle following the completion of the extended programme of archaeological survey and laboratory works.

2. HISTORICAL BACKGROUND

Skipsea lies within the manor of Cleeton and was in the hands of the important Saxon magnate Harold in the pre-Conquest period, possibly indicating the Norman stronghold was sited at or near a key Saxon centre (Creighton 2002, 104-5). The medieval motte-and-bailey castle is thought to have been constructed by Drogo de la Beauvrière, the first of the lords of Holderness, sometime between 1071 and 1086 (Cathcart King 1983, 539).

Skipsea castle functioned as the central caput of the Holderness lordship, and a chapel is documented by 1102 (Renn 1968, 312). The castle was replaced by the manor house at Burstwick as the central caput of the lordship, and was possibly abandoned in 1221 after King Henry III ordered it to be slighted (English 1979, 174; Cathcart King 1983, 539). In 1350 Sir John de Sutton and his ancestors had received herbage of a plot inside the castle, indicating that at least part of the site was leased as pasture by the 14th century (Cathcart King 1983, 539).

A borough at Skipsea is documented by 1175, and is assumed to be a foundation of Count William le Gros who succeeded to the lordship of Holderness in 1135 (English 1979, 210-11). The planted settlement was referred to on several occasions as the 'borough of the castle of Skipsea', suggesting the two were physically close, but is not documented after the end of the 13th century.

3. METHODOLOGY

The works at Skipsea Castle closely followed the methods used at the Marlborough Mound (Leary *et al*. 2013), and that set out in the Skipsea Castle Project Outline (Jamieson & Stastney 2015). It comprised a multi-disciplinary approach, involving a programme of coring, analytical earthwork survey, scientific dating and detailed palaeoenvironmental assessment.

The initial phase of fieldwork at Skipsea involved drilling two boreholes through the motte: one from the summit of the motte to the top of the underlying natural deposits, and the second approximately 30m to the north east. The boreholes were formed using an Eijkelkamp core sampler driven by an Atlas Copco Cobra TT drill. Mound material was recovered in sealed 1m long plastic tubes and removed to the University of Reading for further examination.

In the laboratory the plastic tubes were cut open, photographed and described according to standard geological criteria (Jones et al. 1999; Munsell Color 2000; Tucker 2011). The samples were then assessed to determine the presence and preservation of material suitable for Accelerator Mass Spectrometry (AMS) ^{14}C dating and any palaeoenvironmental indicators. Material suitable for dating was submitted to the Scottish Universities Environmental Research Centre (SUERC), East Kilbride, for AMS ^{14}C determination.

A second phase of fieldwork involved the detailed analytical earthwork survey of the site. This was carried out using differential GNSS (Global Navigation Satellite System) and completed in the field using graphical survey methods. It was initially envisaged that only the motte would be the focus of survey work, and this has been completed; however, it was decided that the entire castle was worth of detailed examination. This extended programme of analytical survey work will now be concluded in the winter of 2016/17, the extended timescale reflecting a commitment to undertaking the survey work in the best conditions and to the highest possible standards.

4. RESULTS

4.1 Description of the earthwork remains

An analytical survey at 1:500 scale of the earthwork remains at Skipsea Castle was undertaken in November 2015 and February 2016. The site was under pasture and the total survey area extended to approximately 2.4ha. As the survey of the entirety of the site has yet to be completed, this interim report will only focus on the earthworks of the motte and its surrounding ditch and bank (Fig. 1).

4.1.2 Motte

The site is dominated by the large mound or motte, positioned at the western end of a natural gravel spur. The grass-covered mound has a basal diameter of between 88m and 90m and is surrounded by a substantial ditch and outer bank. The top of the mound stands between 12.8m and 13m above the bottom of the surrounding ditch, with its sub-circular summit a maximum of 30m in diameter and defining an area of approximately 720m². A distinct break-of-slope was recorded between 1.3m and 1.6m below the mound's summit, and could be traced around much of its circuit. This would appear to reflect a change in the material makeup of the mound, the topmost layer being composed of sand (*see* below), and most likely representing a levelling deposit. Traces of a slight break-of-slope were recorded within this levelling layer, 0.6m below the mound's summit, and may represent evidence for an encircling curtain wall or tower.

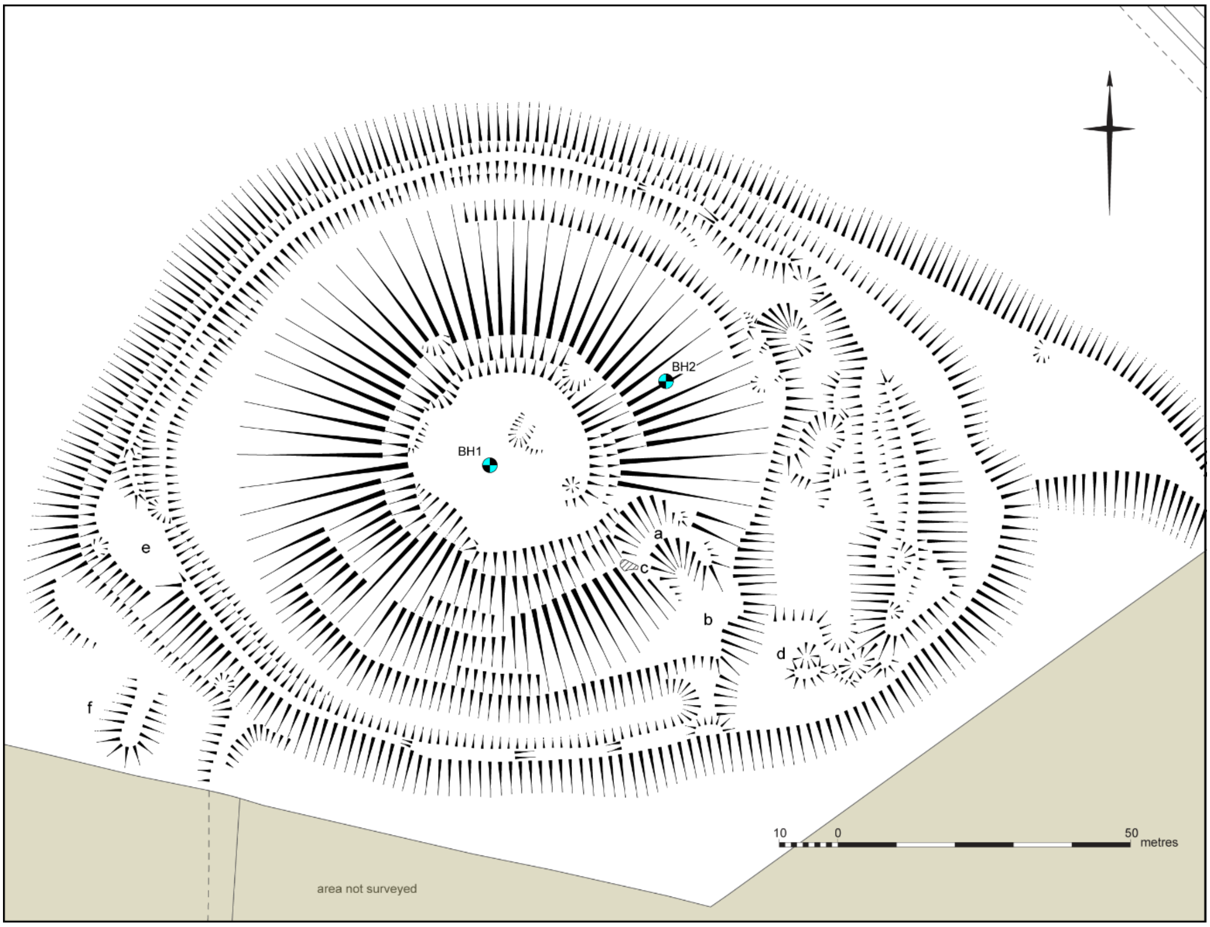

Figure 1: Skipsea Castle: earthwork survey plan of castle motte at 1:500 scale (reduced) showing borehole locations.

A number of breaks-of-slope and ledges were also identified around the circumference of the mound. Several were recorded along the south-western side and almost certainly represent the former location of scrubby vegetation, the ledges created through damage from cattle poaching. The exception to this may be a break-of-slope located 1.5m above the bottom of the mound on its southern side which is likely to represent the ditch cut; further evidence for a ditch cut was also recorded around the north-east side of the mound at the same level. The very slight concentric ridges evident on the side of the motte (particularly noticeable to the north and west) are the result of cattle poaching or soil creep, and do not reflect construction episodes as suggested previously (Atkins nd, 14).

On its south-eastern side two substantial scoops, separated by a level terrace (a), have been cut into the fabric of the mound; these scoops measure between 8.2m and 11.3m across and are up to 4m in height. The scoops almost certainly represent the remains of a medieval tower or stairway arrangement which would have given access to the top of the mound. The base of the mound would also appear to have been cut back at this point to create a sub-rectangular platform (b); this platform is defined by a sinuous scarp to the east and south which stands a maximum of 1.6m high, delineating an area approximately 98m². The platform may have accommodated a structure designed to facilitate access to the top of the mound.

Adjacent to the remains of the stair or tower a 3m long and 1.8m wide section of cobble walling was recorded approximately half way up the mound (c) (Fig. 2). This section of walling, which represents the only upstanding building fabric on the site, was in existence during the early 19th century when Robert Knox noted 'people now living say (this old wall) was larger within their recollection' (1855, 129). The masonry is aligned following the slope of the mound and it is possible that it represents the remains of a medieval structure. However, no other medieval masonry is apparent on the site (with the possible exception of a few large slabs of stone at the base of the mound) and a medieval date for this wall was questioned by Atkins (nd, 15).

Figure 2: Skipsea Castle: section of cobble walling.

4.1.2 Ditch and bank

The foot of the motte is encircled by an elliptical ditch and outer bank. The bank largely follows the edge of the natural spur occupied by the motte, and is a maximum of 8.6m wide and up to 2m high. The bank is well-preserved on all but the eastern side where later disturbance has interrupted its course; fragmentary earthwork remains of the bank do, however, suggest it originally continue around the entire circumference of the mound. The ditch has also been damaged significantly on its eastern side; the Ordnance Survey 1st Edition Map of 1888 labels this area 'Sand Pit', suggesting material continued to be extracted from the area at that time. This quarrying process has resulted in the area now being defined by a series of pits and quarry scarps, some of which impinge on the base of the mound, and which have eradicated the earlier form of this side of the monument.

A level terraced area was identified on the south-eastern side of the motte (d), and is now cut by two small quarry pits which retain their associated spoil heaps. It is possible this area accommodated some kind of gatehouse structure which facilitated access to the motte from the bailey area to the south. It appears to cut the line of the ditch and therefore post-dates it. A small platform was also recorded on the western side of the mound (e). It is sub-rectangular in form, measuring approximately 12.8m long and 9.8m wide, and may have accommodated a further structure. There is also evidence along this side that the ditch has been re-cut, appearing as a narrow ledge and break-of-slope on the inner face of the bank. The ditch floods on this side however, and the cut may represent seasonal water damage.

A short section of ploughed-down bank was also identified adjacent to the south-western side of the ditch's outer bank (f), the feature a maximum of 11m wide and 14.7m long. This would appear to represent the remnants of a curving bank which can be traced running south-westwards in the adjoining field. This curving linear bank was interpreted by Atkins as defining the northern side of a water channel (nd, 12), and by Ainsworth et al. as the rampart of a possible enclosure or bailey lying to the south of the mound, now largely destroyed (2001, 4). On the eastern side of the mound a broad, spread bank was also recorded which may represent the eastern side of the bailey enclosure mentioned by Ainsworth, although it may equally represent the eastern extent of the natural spur on which the mound sits.

4.2 Borehole stratigraphy

Two boreholes, BH1 and BH2, were drilled from the present ground surface of the motte to the top of the underlying geological deposits in November 2015 in order to recover cores for laboratory assessment and radiocarbon dating. BH1 was positioned in the centre of the summit of the motte, and was drilled to a maximum depth of 8.00m below ground level (bgl); BH2 was positioned part way down the north eastern slope of the motte and was drilled to a maximum depth of 6.00m bgl.

In-situ glaciofluvial deposits, consisting of compact brown matrix-supported gravels (Units 1-3), and faintly bedded gravelly sands (Units 17-23), were encountered at depths of 7.67m and 2.78m bgl in BH1 and BH2, respectively; the glaciofluvial deposits therefore subcrop at an elevation of between 10.97mOD and 10.24mOD which is significantly higher than the surface of the surrounding alluvium, indicating the glaciofluvial deposits would likely have formed an 'island' surrounded by former wetlands at some point during the Holocene (BGS 2016). In BH1, the glaciofluvial strata appear to be directly, and unconformably, overlain by mound makeup deposits, although in BH2 a well-developed dark brown silty fine sand palaeosol (Unit 23) was formed on the glaciofluvial deposits, that was in turn sealed by mound makeup.

Mound makeup deposits (Units 4-16 and Units 24-31) were found to be a maximum of 7.67m thick in BH1, and were variable in lithology ranging from firm brown silt/clay to silty sand and matrix-supported gravels/diamict. It is not possible to determine conclusively whether these lithological changes relate to phasing or some other form of deliberate layering of these artificial deposits, however, there is no evidence for any stabilisation surfaces or obvious correspondence between layers in either borehole to suggest any interpretational significance of this variability, save that the top metre of mound makeup in both boreholes consisted of relatively clean sandy material (Units 14 and 30), which may represent a superficial final levelling deposit. With the possible exception of the two sandy layers within the mound makeup, immediately beneath the present topsoil, Units 14 and 30, it does not appear that the mound makeup strata are derived from the underlying glaciofluvial deposits. Given the generally unsorted nature of most of the mound makeup strata, and the presence of inclusions of a wide range of lithologies (flint, chalk, mudstone, sandstone, coal, quartz), a more likely parent material would appear to be the Till, which is mapped immediately either side of the former Bail Mere (BGS 2016).

4.3 Palaeoenvironmental indicators

18 small bulk samples, ranging between 50ml and 400ml in volume, were wet-sieved over a nest of meshes (apertures of 4mm, 1mm and 300µm), and the residues assessed for the presence of palaeoenvironmental indicators and material suitable for AMS ^{14}C dating. None of the subsamples taken from the mound makeup deposits in either boreholes contained any botanical remains except for rare small (<2mm) fragments of charcoal (generally unidentifiable, although one fragment was identified as *Quercus*). Samples taken from the palaeosol in BH2 (Units 22 and 23) contained rare partially-decayed rootlet fragments and occasional fragments of charcoal, with some fragments identifiable as *Acer campestre* (field maple), *Alnus glutinosa* (alder) and *Quercus* (oak).

A total of seven subsamples, taken from a possible organic lens at the top of the glaciofluvial deposits in BH1 (Unit 3), and from the palaeosol in BH2 (Units 22 and 23) were assessed for pollen content. The results of the pollen counts are presented in Appendix 2. Pollen preservation and concentration was extremely poor in all samples, no tree or shrub pollen was found in any of the samples, and many counts were dominated by spores and notably robust pollen types (e.g. Lactuceae) indicating that assemblages are likely to have been severely distorted by differential preservation of pollen grains. None of the strata in either borehole are assessed as being suitable for pollen analysis.

4.4. Radiocarbon dating

Twelve samples of charcoal recovered from the boreholes were submitted for AMS radiocarbon dating; the results are presented in the table below.

BH	Depth (m)	Lab code	Material	$\delta^{13}C$	Radiocarbon age BP	95% confidence calibrated range[1]
BH1	7.00-7.45	SUERC-68671	Charcoal fragments (indet.)	-24.9	2283±25	401-233 cal BC
BH2	1.07-1.83	SUERC-70558	Charcoal (*Quercus*)	-25.0*	920±33	cal AD 1027-1187
BH2	1.07-1.83	SUERC-70559	Charcoal fragments (indet.)	-25.0*	7008±33	5986-5810 cal BC
BH2	2.78-3.00	-	Charcoal (*Alnus glutinosa*)	Insufficient carbon		
BH2	2.78-3.00	SUERC-70560	Charcoal fragments (indet.)	-25.0*	2628±33	889-771 cal BC
BH2	3.07-3.60	SUERC-68673	Charcoal fragments (indet.)	-24.8	2684±29	898-803 cal BC
BH2	3.07-3.60	SUERC-70561	Charcoal (*Acer campestre*)	-24.8	2709±33	916-806 cal BC

[1] Using IntCal13 calibration curve (Reimer *et al.* 2013). * $\delta^{13}C$ values assumed due to small sample size.

BH2	3.07-3.60	-	Charcoal (*Quercus*)	Insufficient carbon		
BH2	3.07-3.60	SUERC-70565	Charcoal fragments (indet.)	-25.1	2583±33	818-568 cal BC
BH2	3.51-3.52	SUERC-68674	Charcoal fragments (indet.)	-23.2	2531±27	796-547 cal BC
BH2	3.51-3.52	SUERC-68678	Charcoal fragments (indet.)	-23.2	2480±27	772-490 cal BC
BH2	3.60-4.00	SUERC-70566	Charcoal fragments (indet.)	-24.3	4106±33	2866-2505 cal BC

A total of six dates were obtained from the palaeosol in BH2 (Unit 22 at 3.07-3.60m and Unit 3 at 2.78-3.00m). These dates were found to be significantly different (χ^2 (5) = 11.1, p <0.05) indicating that these determinations are not likely to be estimating a single date (Stuiver and Reimer 1993; Ward and Wilson 1978), and that therefore it appears that these dates are likely to have come from multiple entities (as opposed to multiple dates on fragments taken from a single original piece of charcoal). The dates obtained on these samples all intersect with a significant plateau in the radiocarbon calibration curve, known as the "Halstatt Plateau", which means that any late Bronze Age to early Iron Age radiocarbon determination will return a calibrated date range spanning the entire period between *c.*800-500 cal BC. These dates, nevertheless, seem to indicate a genuine concentration of charcoal dating to the early Iron Age, with no evidence for any later material and would seem to suggest some form of occupation or activity at the site during the Iron Age.

Very little datable material was recovered from the mound makeup deposits, and therefore it is not possible to conclusively determine the date of the construction of the mound on the present evidence. The three dates from the mound makeup are all on either oak or bulk unidentified charcoal, and the date ranges obtained on these samples display a considerable spread of ages indicating either the incorporation of much older residual charcoal within the mound, the downward movement of younger, intrusive, comminuted charcoal fragments into the mound, or both. Two of the three samples (SUERC-70558 and SUERC-70559) consist of very small fragments (<2mm), both of which were recovered from the upper 2m of mound makeup strata, which therefore could plausibly have been introduced by down-washing or bioturbation, further reducing the interpretability of these dates. It is also unclear is the sandy deposits in the upper metre of BH2 may reflect a second pahse of construction, or a levelling layer. The other date from the mound makeup, SUERC-68671 (2283±25, 401-233 cal BC at 95% confidence), is based on a larger sample and is more deeply buried, and is therefore less likely to be intrusive but could nevertheless very plausibly be residual.

As such, it is difficult to determine whether: a) the concentration of charcoal in the buried soil horizon dating to the Iron Age reflects the date of the burial of the soil (and therefore the construction of the mound), possibly sometime after ~500 cal BC, and that some medieval charcoal was later introduced into the upper part of BH2 (either by bioturbation, weathering, or subsequent modification of the mound), or b) there was a significant time lag between the likely Iron Age activity on the old ground surface and the construction of the mound, during which no later charcoal or other datable remains (plant macrofossils etc) accumulated on this surface, and that the mound was then built at some later date, probably in the medieval period, incorporating some rare fragments of residual charcoal.

5. CONCLUSIONS

The new archaeological works undertaken by the University of Reading on the castle motte at Skipsea have shown that the mound was probably constructed in the middle Iron Age. A total of six AMS ^{14}C dates were obtained on fragments of charcoal (*Acer campestre* and unidentified heartwood) extracted from the buried soil beneath the mound which returned calibrated dates ranging from 898-803 cal BC to 772-490 cal BC (95% confidence). A charcoal fragment recovered from within the makeup of then mound, at a depth of 7m below the present surface, returned a radiocarbon measurement of 401-233 cal BC (95% confidence). The radiocarbon results from the sealed palaeosoil suggest either the mound was constructed in the middle Iron Age, or alternatively, some other form of middle Iron Age activity at the site was subsequently incorporated into the mound during its construction. Both interpretations imply previously unrecognised middle Iron Age activity at Skipsea.

If the mound does originate from the middle Iron Age this would place it within the context of the distinctive square barrow funerary rite which dominates accounts of the Iron Age in East Yorkshire. However, the mounds within these square-ditched enclosures are relatively small in their scale, with the largest mounds no more than 12m in diameter and standing 1.2m high; this is in stark contrast to the mound at Skipsea which measures 85m in diameter and stands 13m high. Skipsea mound would therefore represent the largest Iron Age mound in Britain and one of the very largest in Europe, although its function and purpose remain unclear.

The borehole stratigraphy has revealed that a natural glaciofluvial ridge or spur was utilized in the construction of the mound at Skipsea. The mound makeup deposits (Units 4-16 and Units 24-31) were a maximum of 7.67m thick at the centre of the feature and were identified as overlying *in-situ* glaciofluvial deposits. This natural galciofluvial spur is likely to have formed an 'island' surrounded by former wetlands at some point during the Holocene. The spur was sculpted, with a ditch dug around it and material piled up to form a mound and outer bank, giving the mound the appearance of being monumental in scale. The oval form of the surrounding ditch may also be a consequence of the shape of the natural spur, but equally may represent a conscious desire by its creators to surround the mound with an elliptical ditch enclosed by a bank. The western end of this ditch floods seasonally, but, prior to the draining of the mere and the subsequent lowering of the water table in the 18th century, it may have held water on a more permanent basis.

Although it is not possible to determine conclusively whether the stratigraphy within the cores relate to phasing in the construction of the main body of the mound, the top metre of mound material would appear to represent a superficial final levelling deposit. This deposit consists of a relatively clean sandy material (BH1 Unit 14), with the change in material makeup also reflected in the earthwork remains and visible as a break-in-slope which can be traced around almost the entire circuit of the mound. The sandy deposit could be related to the creation of a substantial levelled area on the mound's summit (which measures around 30m in diameter) to be built on, and as such, may support an argument for an episode of remodelling in the later medieval period. There is also the possibility that the main body of the mound was truncated at this time, to enable the creation of a greater surface area on which to build.

That there were substantial structures on the site in the medieval period is evidenced by the documentary reference to a chapel in 1102, and implied by an order from King Henry III for the castle to be slighted in 1221 (Renn 1968, 312; Cathcart King 1983, 539). The earthwork evidence also suggests the former location of a substantial, probably stone-built tower or stairway arrangement on the south-eastern side of the mound, which may have been associated with an adjoining gatehouse structure. Whether the surviving upstanding section of walling recorded on this side of the mound is medieval in date must remain open to question. The platform which supported the possible gatehouse building appears to cut the line of the ditch surrounding the mound, indicating it represents a secondary construction phase. It is interesting to note that the summit of the mound was accessed from the southeast, which has implications for how the wider site functioned in the medieval period and for the movement of goods and people around the castle complex.

The possible new discovery of an Iron Age monumental mound in East Yorkshire necessitates a reappraisal of Iron Age activity in the region, along with a comprehensive rethinking of the archaeological remains at Skipsea. It is unlikely that the mound stood in isolation in the Iron Age, and the surface discovery of a rim sherd of pottery dated to the late Bronze Age or Iron Age (found in the south-eastern part of Skipsea Brough), along with a late Bronze Age looped bronze spearhead recovered as a surface find in the same area hints at later prehistoric activity in the immediate vicinity (Atkins nd, 17; Radley 1967, 18). Along with this, the unusual configuration of the earthworks surrounding the mound does not sit comfortably with conventional motte-and-bailey forms, and once again points to the potential for earlier origins. Further investigations at Skipsea are required if a better understanding of its wider chronology is to be achieved.

6. BIBLIOGRAPHY

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7. APPENDIX 1 – BOREHOLE LOGS

BH	Top	Base	Lithology	Comments	Unit
BH1	0.00	0.38	Topsoil	Turf over 10 YR 3/2 Very dark greyish brown very fine sandy silt/clay topsoil with frequent fine rootlets throughout and rare charcoal granules. Grading into:	16
BH1	0.38	0.66	Sandy silt/clay	10 YR 3/4 Dark greyish brown sandy silt/clay with occasional fine rootlets, rare granules of reddish mudstone/?CBM and occasional granules (rare pebbles) of sandstone. Grading into:	15
BH1	0.66	0.91	Fine sand	10 YR 4/4 Dark yellowish brown firm very silt fine sand with rare granules of weak pale yellow sandstone and rare subangular flint granules. Diffuse to:	14
BH1	0.91	1.00	Diamict	10 YR 4/4 Dark yellowish brown friable/loose diamict of subangular flint and sandstone pebbles with some firm sandy silt/clay matrix.	13
BH1	1.00	1.24	No recover	VOID - core compressed.	-
BH1	1.24	2.00	Matrix-supported gravel	10 YR 3/4 Dark yellowish brown diamict consisting of poorly sorted gravel of subrounded to subangular granules and pebbles of various lithologies (flint, quartzite, sandstone, granite), with occasional charcoal granules in a little matrix of brown sandy silt/clay.	12
BH1	2.00	2.37	No recover	VOID - core compressed.	-
BH1	2.37	2.63	Slump	?SLUMP - material possibly fallen in to hole. Loose gravel of subrounded pebbles of various lithologies.	-
BH1	2.63	3.00	Matrix-supported gravel	10 YR 3/4 Dark yellowish brown diamict consisting of poorly sorted gravel of subrounded to subangular granules and pebbles of various lithologies (flint, quartzite, sandstone, granite), with occasional charcoal granules in a little matrix of brown sandy silt/clay.	11
BH1	3.00	3.15	No recover	VOID - core compressed.	-
BH1	3.15	3.93	Matrix-supported gravel	10 YR 3/4 Dark yellowish brown diamict consisting of poorly sorted gravel of subrounded to subangular granules and pebbles of various lithologies (flint, quartzite, sandstone, granite), with occasional charcoal granules in a little matrix of brown sandy silt/clay.	10
BH1	3.93	4.00	Silt/clay	10 YR 4/3 Brown firm slightly sandy silt/clay with occasional fine gravel inclusions.	9
BH1	4.00	4.54	Matrix-supported gravel	Very loose, may be somewhat disturbed: 10 YR 3/4 Dark yellowish brown diamict consisting of poorly sorted gravel of subrounded to subangular granules and pebbles of various lithologies (flint, quartzite, sandstone, granite), with occasional charcoal granules in a little matrix of brown sandy silt/clay.	8

BH	Top	Base	Lithology	Comments	Unit
BH1	4.54	7.00	Matrix-supported gravel	10 YR 4/3 Brown firm diamict consisting of subrounded gravel of various lithologies (chalk, sandstone, pinkish ?granite etc.) in much sandy silt/clay matrix with occasional charcoal granules.	7
BH1	7.00	7.26	Fine sand	10 YR 3/3 Dark brown slightly friable very silty fine sand with rare subrounded granules of stone (unknown lithology). Diffuse to:	6
BH1	7.26	7.45	Clayey sand	10 YR 4/4 Dark yellowish brown very silt/clayey sand. Grading into:	5
BH1	7.45	7.67	Matrix-supported gravel	10 YR 4/4 Dark yellowish brown diamict consisting of frequent subangular pebbles of various lithologies in a firm very silty fine sand matrix. Sharp and compressed boundary to:	4
BH1	7.67	7.68	Organic mud	10 YR 2/2 Very dark brown ?organic silt/clay [very decayed and heavily compressed organic material?]. Diffuse to:	3
BH1	7.68	7.76	Matrix-supported gravel	7.5 YR 4/3 Brown diamict consisting of subangular flint and sandstone pebbles in a firm very sandy silt/clay matrix. Grading into:	2
BH1	7.76	8.00	Sandy clay with gravel	7.5 YR 4/4 Brown firm sandy silt/clay with frequent subrounded to subangular granules of various lithologies and rare rounded granule-sized pockets of dark greyish brown silt/clay. END BH.	1
BH2	0.00	0.35	Topsoil	10 YR 2/2 Very dark brown sandy silt topsoil with roots throughout, occasional subrounded sandstone and chalk granules and pebbles (becoming frequent towards base), rare subangular platy reddish brown ?mudstone pebbles at base. Grading into:	31
BH2	0.35	1.00	Fine sand	10 YR 4/4 Dark yellowish brown friable silty sand with occasional rounded to subrounded granules and pebbles of chalk , flint etc. Rare charcoal flecks.	30
BH2	1.00	1.06	No recover	VOID - core compressed.	-
BH2	1.06	1.84	Sandy clay with gravel	10 YR 3/4 Dark yellowish brown friable sandy silt/clay with occasional charcoal flecks and granules, and rounded to subrounded granules of chalk, flint and clasts of other lithologies. Diffuse to:	29
BH2	1.84	2.00	Matrix-supported gravel	10 YR 3/4 Dark yellowish brown loose diamict of subrounded pebbles and granules of flint, chalk, dark reddish mudstone in some sandy clay matrix. Roots locally present.	28
BH2	2.00	2.05	No recover	VOID - core compressed.	-
BH2	2.05	2.37	Matrix-supported gravel	10 YR 3/4 Dark yellowish brown loose diamict of subrounded pebbles and granules of flint, chalk, dark reddish mudstone in some sandy clay matrix.	27
BH2	2.37	2.54	Sandy silt/clay	10 YR 4/2 Dark greyish brown firm sandy silt/clay. Diffuse boundary to:	26

BH	Top	Base	Lithology	Comments	Unit
BH2	2.54	2.58	Sandstone	Broken cobble (recovered as shattered angular pebbles) of 10 YR 8/4 Very pale brown weak/friable sandstone.	25
BH2	2.58	2.78	Sandy clay with gravel	10 YR 3/3 Dark brown firm sandy silt/clay with sandstone granules. Sharp to:	24
BH2	2.78	3.00	Palaeosol	Reddish ?mudstone pebble at boundary, over: 10 YR 2/2 Very dark brown firm very silty fine sand [possible palaeosol?]. Rare flecks of charcoal and weak granules of pale yellow sandstone. Occasional reddish brown mottles (?Mn).	23
BH2	3.00	3.07	Slump	SLUMP - material fallen into hole.	-
BH2	3.07	3.60	Palaeosol	As above (2.78-3.00m) - very dark brown very silty fine sand, possible palaeosol? Grading into:	22
BH2	3.60	4.00	Silty fine sand	10 YR 6/4 Light yellowish brown friable slightly silty fine sand. Faintly bedded. 3.76-3.79m: band of dark brown Mn mottles. 3.94-3.99m: some silty bands.	21
BH2	4.00	4.11	Slump	SLUMP - material fallen into hole.	-
BH2	4.11	4.27	Laminated silt and fine sand	7.5 YR 4/4 Brown laminated/interbedded silty sand and silt/clay. Occasional fine dark brown or black mottles in diffuse horizontal bands. Diffuse to:	20
BH2	4.27	4.44	Laminated silt and fine sand	10 YR 4/4 Dark yellowish brown soft sand interbedded with silty sand. Bands ~0.005 - 0.02m thick. Diffuse to:	19
BH2	4.44	5.00	Laminated silt and fine sand	7.5 YR 4/4 Brown bedded firm silty sand, occasional bands of silt/clay.	18
BH2	5.00	5.32	Slump	SLUMP - material fallen into hole.	-
BH2	5.32	6.00	Laminated silt and fine sand	10 YR 5/6 Yellowish brown soft/friable bedded very slightly silty fine sand. Occasional fine blackish bands ~0.005m thick (?Mn mottles). Tending towards coarse sand with depth. Rare pebble-sized pockets of silty sand towards base. END BH.	17

8. APPENDINX 2 – POLLEN ASSESSMENT RESULTS

		BH1	**BH2**					
		7.67-7.68m	**2.86-2.87m**	**3.20-3.21m**	**3.30-3.31m**	**3.40-3.41m**	**3.50-3.51m**	**3.60-3.61m**
Trees/Shrubs		0	0	0	0	0	0	0
Herbs								
Asteraceae	daisy family	0	**1**	**1**	0	**2**	0	0
Caryophyllaceae	carnation family	0	0	**1**	0	0	0	0
Lactuceae	e.g. chicory, dandelion	0	**2**	**6**	**2**	0	0	0
Poaceae	grass family	**1**	0	0	0	0	0	0
c.f. *Typha latifolia*	bulrush	**1**	0	0	0	0	0	0
Ferns, Spores etc								
Trilete spore (indet.)		**7**	**1**	**1**	0	0	0	0
Monolete spore (indet).		0	0	**1**	**3**	0	0	0
Fungal spore	fungal spores	0	**1**	**2**	0	0	0	0
Other								
Unidentifiable pollen		**6**	0	**3**	**2**	0	**1**	0
Total pollen (ex. Spores and indet.)		**2**	**3**	**8**	**2**	**2**	0	0
Microcharcoal	**(0=absent, 5=abundant)**	**1**	**3**	**4**	**4**	**4**	**2**	**2**
Preservation	**(1=very poor, 5=excellent)**	**1**	**1**	**1**	**1**	**1**	**n/a**	**n/a**
Concentration		**1**	**1**	**1**	**1**	**1**	0	0
Suitable for analysis?		**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**