Excavations at Glaumbær 2005:
Preliminary Report of the Skagafjörður Archaeological Settlement Survey

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Introduction

The 2005 investigations at Glaumbær consisted of ground penetrating radar (GPR) remote sensing and two large, shallow excavations intended to expose the uppermost layers of the Viking Age longhouse identified at the site during the 2001 and 2002 research seasons. In preparation for the GPR reconnaissance and excavation a detailed surface elevation model of the site was made. Elevation measurements were taken with a total station on a 1-meter interval grid over the prospective excavation area. Multiple GPR datasets were collected over the site and surrounding area.

The GPR, in conjunction with previous test excavations and remote sensing, was used to target excavation areas at the site. Two areas were opened in 2005: area A, a large exposure over the longhouse covering 711 square meters, and area B, a long strip to the east of the house excavation measuring 24 x 3 meters where GPR identified two anomalies close to the surface (figure 1). Based on coring, area B was suspected to be the principal domestic midden associated with the occupation. In total 783 square meters were opened in 2005 season. An additional GPR dataset was collected over area A after the turf was removed.

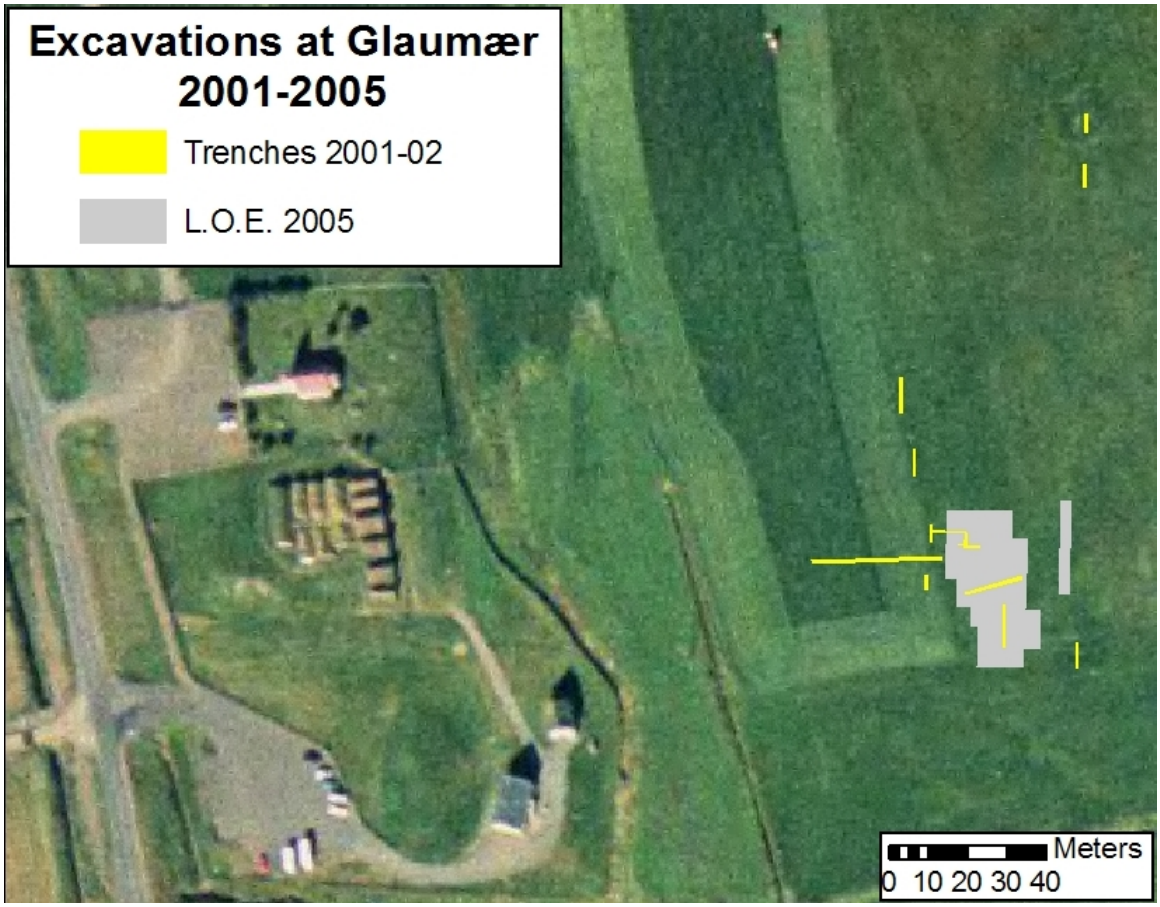

Figure 1. Test Trenches and Excavations at Glaumbær, 2001-2005.

Turf was cut by hand and removed in approximately 1 x1 meter blocks mechanically, which were then replaced at the end of the excavation to protect the site. All deposits under the turf were removed by hand. Single context recording was used and proforma sheets were used for all context records and drawings. Turf walls delimitating the

building were only exposed in sufficient detail to define context boundaries. In a small number of cases, deposits directly overlaying walls were removed to expose the walls. In most cases these were lenses of midden material, primarily peat ash. In some areas, for example the east wall of the *skáli*, it was possible to define the orientation and approximate boundaries of the turf wall without fully exposing it based on patterns in the overlying Hekla 1104 ash layer. In general inside boundaries of turf walls were not fully exposed. This was done to leave as much of the internal deposit undisturbed as possible so that there would be limited truncation of any of the intramural deposits which might compromise future excavations. Selected contexts, primarily thin midden deposits overlaying the longhouse walls, were sieved using 4 mm mesh. Very few contexts were removed during the excavation and the site remains relatively complete for future excavations.

A 5x5 meter grid of reference stakes was established with a total station after the removal of turf and topsoil. These reference stakes were used for all context drawings while elevations were measured with the total station using an arbitrary 0.00 meter height established from the surface at grid E: 569000; N: 7277550. Hand-drawn contexts also noted turf construction methods where they were identifiable. At the end of the excavation the turf walls outlining the longhouse were mapped a second time with the total station. Post-excavation all hand-drawn contexts were georeferenced and digitized in a GIS. The result is two – very similar – records of the site architecture: one based on hand drawn individual context and a second outline of the walls recorded directly with the total station. Additionally, all contexts were photographed.

Previous Research

The 2005 excavations at Glaumbær follow work at the site from 2001 and 2002.
In 2001 the site was initially identified based on anomalies in electromagnetic survey and a concentration anthropogenic material in soil cores. A test trench identified a well-preserved turf wall under the Hekla 1104 tephra. An expansion of the test trench revealed a floor deposit east of the wall. Remote sensing and coring data indicated a large domestic building aligned north to south, presumably a Viking Age longhouse (Steinberg 2002).

Additional test excavations were conducted in 2002. A test trench [15] was placed perpendicular to the predicted long axis to the building and the 2001 test trench was extended to the north and west [19]. An additional north-south oriented test trench [16] was opened with the intent of identifying the southern end of the longhouse. These excavations confirmed the presence of a Viking Age longhouse at the site. The trench bisecting the skáli revealed raised platforms on either side of a central aisle but no central hearth. The north-south trench revealed collapsed turf overlaying floor deposits but did not expose the end of the house, which the 2005 excavation showed is further south (Steinberg 2004).

Objectives of the 2005 Excavation

The principal objective of the 2005 SASS research season was to test the utility of ground penetrating radar (GPR) in producing subsurface maps of sufficient detail to target open-area excavations. Glaumbær was chosen as a test site for the GPR to complement previously obtained electromagnetic conductivity and resistivity datasets and because the basic shape of the longhouse was already established. GPR-Slice imaging software was

used, which reconstructs multiple horizontal plans at successive depths from individual GPR transects.

There has been limited previous GPR work on archaeological sites in Iceland, which has utilized low frequency antennas and relied on vertical radargrams for the identification of archaeological features. GPR is a highly experimental remote sensing technique in Icelandic archaeology and there remains a great deal of research to explore the full range of methodological concerns and potentials. The correspondence between GPR-Slice images and archaeological features revealed in the excavation is discussed briefly here but the full results of the GPR survey will be discussed in a separate report.

Contributors and Acknowledgements

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Area A: the Longhouse

The longhouse is approximately 39 meters in total length as measured from outer edge of the walls along the central axis of the each room – the skáli, middle room, and south room. This figure is an estimate as the limit of the south room was never defined in excavation but remote sensing data suggests that the building ends just south of 2005 exposure. The skáli is approximately 9 meters in breadth at its widest extent as measured from the outer edge of the walls. The interior dimensions of each room are provided below.

Site Organization and Room Function

Because excavation during the 2005 season only exposed the uppermost layer of preserved architecture at the site any discussion of room function is highly tentative. The thin deposits overlaying preserved architecture in some parts of the site consisted of collapsed turf and midden deposits, almost certainly associated with post-occupational activities and, in all likelihood, unrelated the use of the domestic spaces. Therefore the tentative identifications outlined below are based on architectural form, remote sensing of underlying deposits, and the information from the limited test excavations conducted in 2001 and 2002.

The Skáli [25]

The primary hall measured 23.5 x 5.25 meters as measured from the interior contact of the walls. Excavation was not of sufficient depth to positively identify the construction method of the turf walls. A test trench [19] excavated in the 2001 season exposed a cross-section of the western turf wall. In profile the wall appears to be composed of *strengur* (Steinberg 2002). It is not possible to extrapolate from this single location to the rest of the skáli walls but the fact that turf construction in the skáli was not identified in plan

whereas the klömbruhnaus and turf fill construction in the southern half of the longhouse was clearly apparent in the upper exposure suggests that the other skáli walls may have been composed of *strengur* as well.

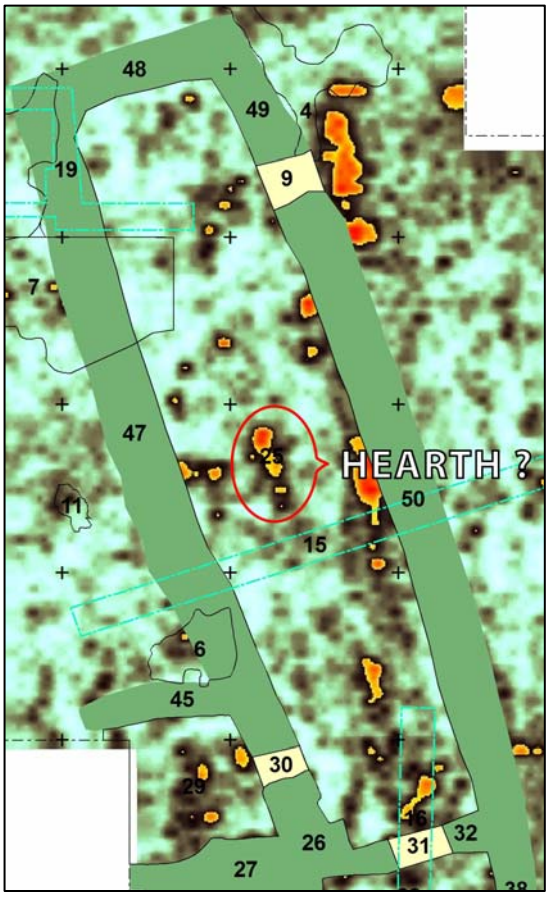


Figure 2. Skáli with GPR-Slice image at 122.8 - 136.7 cm showing a highly reflective feature in the center of the skáli.

A test trench [15] bisecting the skáli was excavated in 2002 as part of the program investigating the function of the building (Steinberg 2004). The trench revealed raised platforms on each side of a central aisle and a compacted central floor primarily composed of pinkish-white ash and charcoal. No central hearth was indentified in test excavations of the skáli. The GPR-Slice images do show a candidate for a central hearth. Located halfway along the length of the skáli, a highly reflective oblong feature can be seen at multiple depths. Shown here at a depth of 122.8 - 136.7 cm the feature is clearly visible beneath the highly reflective features associated with the central aisle of the skáli (figure 2).

North Entrance [9]

The only clear external entrance to the longhouse was found in the northeastern end of the skáli. The entrance defined in excavation corresponds to features identified in the remote sensing. GPR-Slice images show a series of highly reflective features, possibly stones or a heavily trampled floor, curving from the central aisle of the skáli toward the entrance. At the same depth, outside the entrance is a large highly reflective feature, presumably a stone paving (figure 3). However, the close association with the primary household midden [51] located approximately 15 meters east of this entrance raises the possibility that this may have been a secondary entrance. The most likely candidate is a passage [30] leading to a room [29] in attached to the southwest end of the skáli. The western extent of the room was not defined in excavation as it extends past the limit of excavation; see discussion of the west room below.

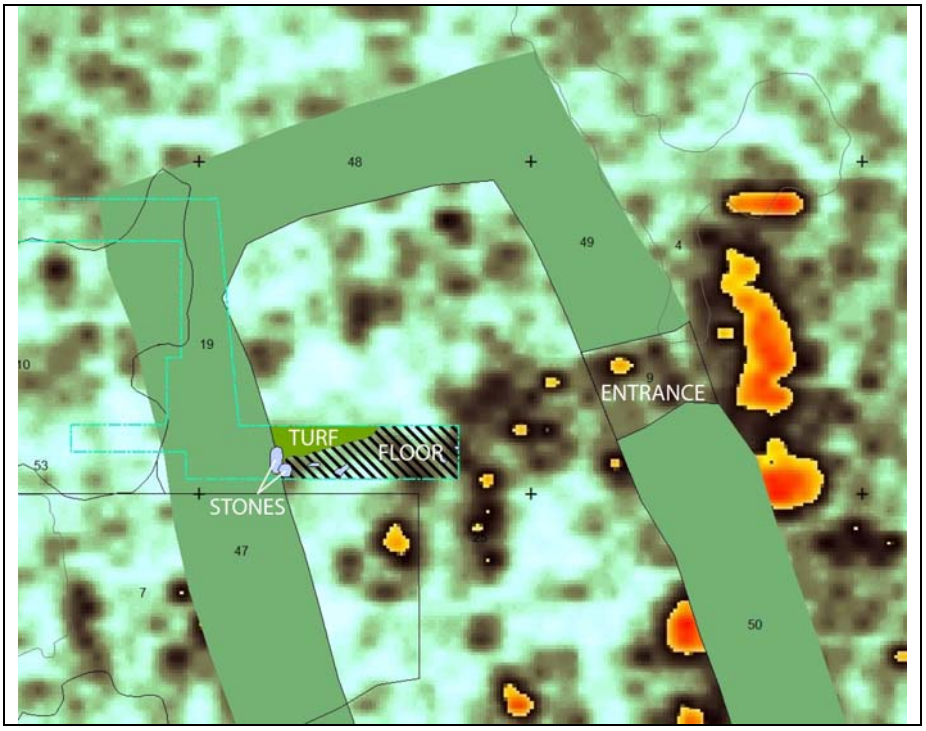


Figure 3. North end of the skáli showing entrance [9], plan of 2001 test trench [19], and GPR-Slice image at depth of 70-83.9 cm.

The area north of the entrance appears to form a separate area within the skáli. The 2001 test trench revealed a floor layer abutting a low turf construction to the north. The contact between the floor and turf aligns with the north edge of the entrance [9] in the east wall. None of the highly reflective features aligned with the central aisle continue into the space at the north end of the skáli. The turf construction and suggestive continuity between the central aisle and north entrance identified in the GPR-Slice images suggest an alternate use for the north end of the skáli and a possibly structurally separate space.

The West Room, Possible Entrance [29]

Attached to the skáli at the southwest end is a room measuring approximately 4 x 5 meters from the inside of the walls. There is a passage connecting the room to the skáli [30] which was visible in the excavation. The west wall of the room was not defined as it extends beyond the limit of excavation. The two walls identified in excavation [45] and [27] bounding the room to the north and south were poorly preserved at their western edge and no abutting wall or clear end of either wall was found (figure 2). Such a wall could easily remain to be found beyond the excavation limit but the association of the only identified external entrance to the longhouse with the domestic midden raises the question of an additional entrance. While highly speculative, it is possible that the west room was an entry chamber to the skáli like the one identified in excavations at Aðalstræti (Roberts, et al. 2003).

The Middle Room [33]

The middle room connects the skáli and the south room and measured 5 x 3.5 meters interior space. The room appears to have been accessible only from passages connecting to the skáli [31] and the south room [34]. A thin area of mixed turf [52] between klömbruhnaus constructed turf walls [23] and [27] could represent a passage opening from the room to the west but it more likely was simply turf fill between the klömbruhnaus walls. A test trench excavated in 2002 exposed a section of the middle room (figure 4) in which the compact floor of the middle room can be seen continuing through passages to the north [31] and south [34] and connects with the skáli [25] and

south room [35]. An area of turf overlaying a stone pavement in the southern half of the trench and extending into the passage way [34] to the south room [35] suggests the possibility of internal divisions in the room, perhaps different work or storage spaces.

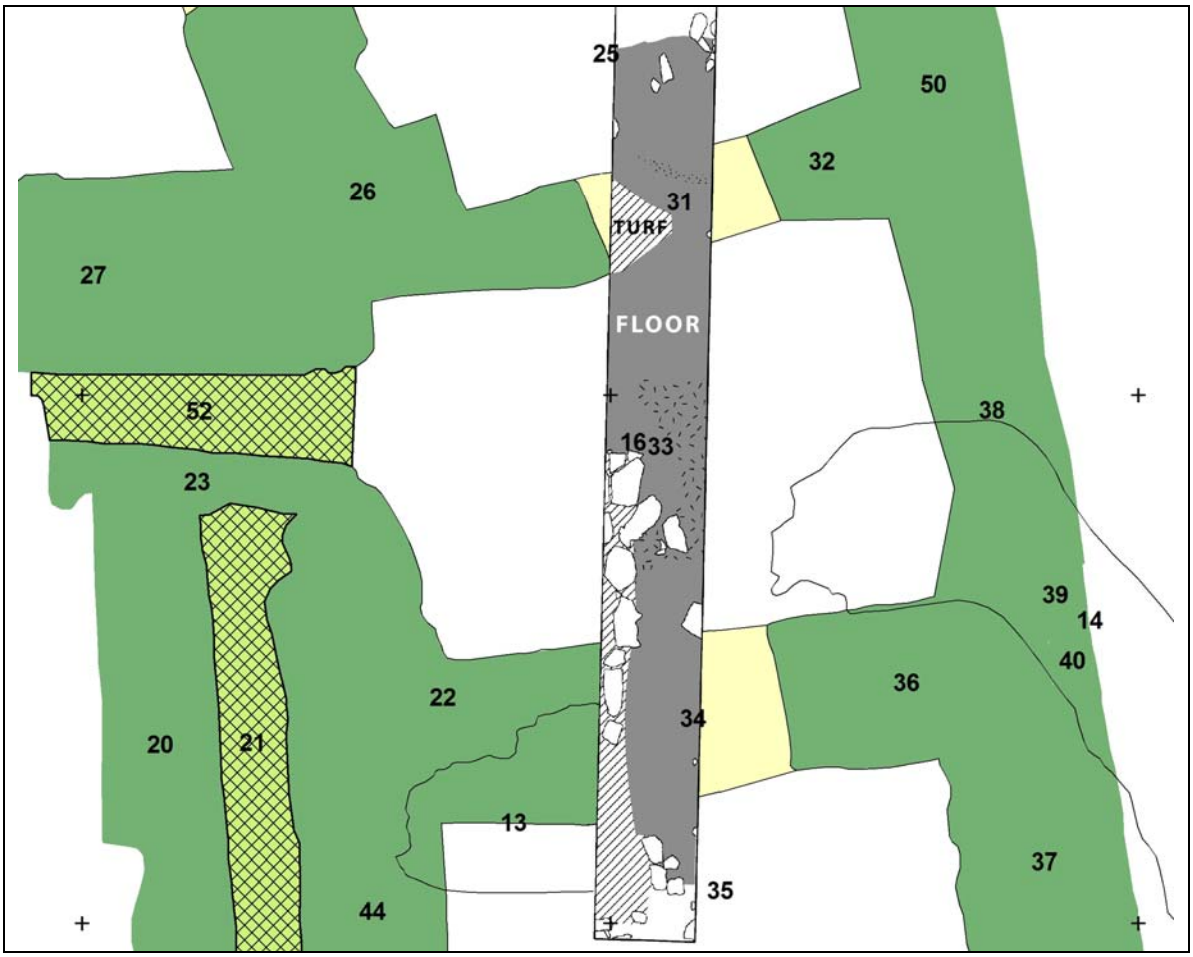


Figure 4. The middle room with plan of 2002 test trench.

The South Room, Possible Smithy [35]

The South Room [35] was not fully exposed and we have not defined the southern most extent of the room through excavation. The southern most extent of the longhouse was plowed in the spring of 2005, before the season's investigations began. The plowing, while relatively shallow (c. 30-50 cm) has damaged the upper portion of the site. A small section of the plowed area was exposed during the excavation and wall remains are preserved under the current plow horizon. The plowing is particularly worrisome in this part of the structure as the surface topography slopes down significantly at this end of the site and floor layers better protected under think deposits in the site center may be closer to the surface at the south end. The plowed area currently covers the still undefined southernmost extent of the longhouse. At present only one entrance to the room has been identified, the passage [34] connecting it to the middle room [33]. This does not rule out the possibility of an additional entrance at the southern end of the room, possibly creating an additional external entrance to the longhouse.

The southern end of the longhouse appears to have been associated with iron working or production at some point in its existence. Deposits [13] and [14] contain peat ash, charcoal and slag, including some large pieces greater than 10 cm in diameter. Slag and

peat ash were also found in the 2002 test trench [16].These features overlay or cut into the building's turf walls and collapsed turf deposits and appear to post-date the occupation of the longhouse. Among other uses for the post-occupation structure, the site may have been used for iron production or working. The actual structure associated with this post-occupational activity has not been identified and it is certainly possible that this room or the area was associated with iron working during the occupational life of the house.

The south room produced the most clearly defined features in the remote sensing of any of the rooms in the longhouse. GPR-Slice images show highly reflective surfaces forming a "U" shape inside the walls on the west, south, and east sides at a depth of 61.7-75.6 cm. under the surface. The highly reflective feature is suggestive of a stone construction and probably represents some raised platform or work area. At a depth of approximately 30 cm below the "U"-shaped feature is another highly reflective surface that appears to be a central, and again probably stone lined, floor (figure 5).

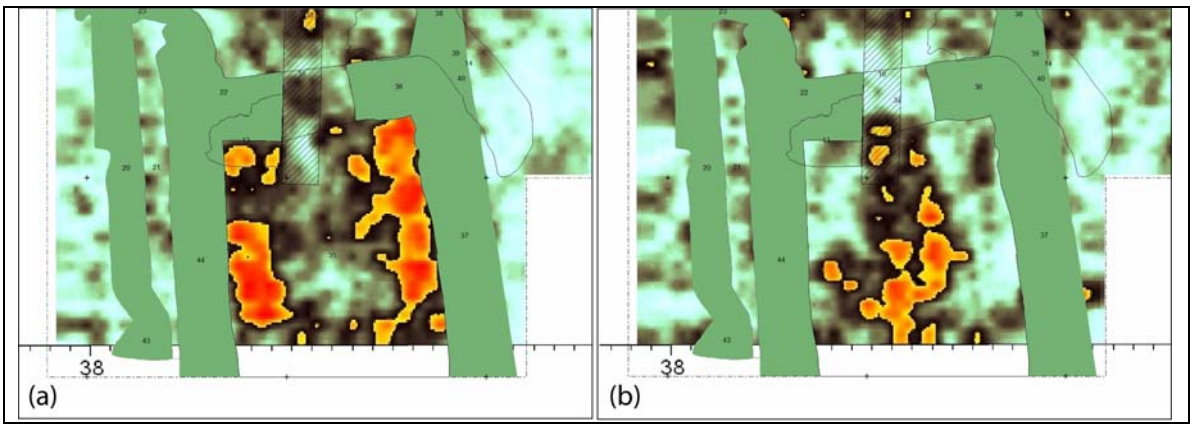


Figure 5 (a) GPR depth 61.7-75.6 cm; GPR 114-127.8 cm.

Additional Features

A series of klömbruhnaus turf block walls and turf fill [20][21] to the west of the middle and south room extending to the limit of excavation in the west, at least 3 meters to the west of the main wall [44] bounding the south room [35] (figure 2). These walls could simply be part of the defined longhouse structure, perhaps repairs or additions. They could also represent additional rooms or neighboring structures beyond the limit of excavation west of the longhouse.

Area B: the Midden

A long strip, 24 x 3 meters, was deturfed east of the longhouse based on two highly reflective features identified in the GPR reconnaissance. Based on coring data, the large anomaly at the north end of the exposure was suspected to be a midden. Bone was apparent in the area of the anomaly immediately under the turf. The area was carefully cleared of the remaining topsoil to define the upper limits of the midden. The exposed midden feature [51] filled the breadth of the exposure and extended 9 meters north to south (figure 6). Four shallow 1x1 meter by 10 cm units were excavated in the midden to collect a sample of faunal material in the midden. The exposure south of the midden was shovel scraped in the hope of exposing the source of the second anomaly but no clear feature was identified.

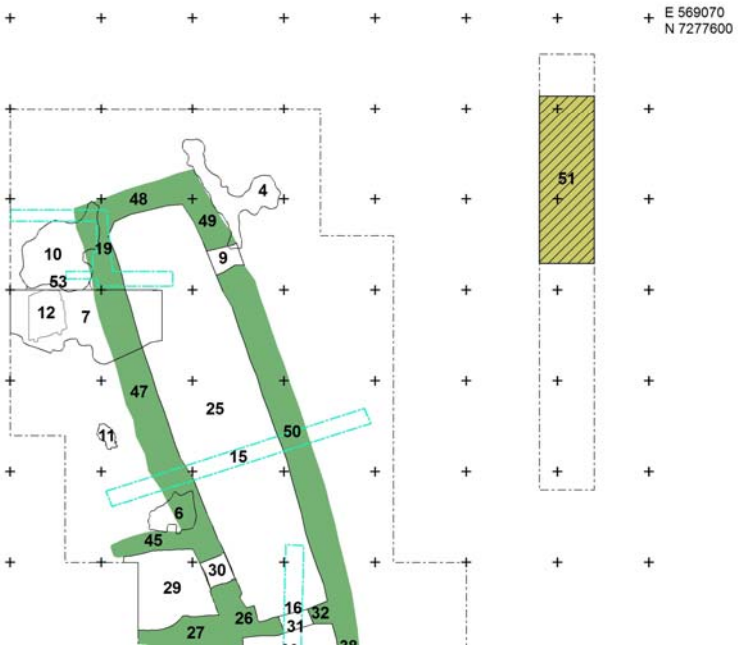


Figure 6. Areas A and B with extent of midden [51].

Occupation Dates and Site Phasing

So far, all architectural components of the longhouse as well as turf collapse and overlaying midden deposits identified in test excavations are stratigraphically under the Hekla 1104 tephra. The inclusion of tephra from the eruption of the Veidivotn-Dyngjuháls volcanic system dated to approximately 1000 AD (Ólafsson 1985; Sigurgeirsson 2001; Sveinbjarnardóttir 1992) in parts of the turf used as construction material for the longhouse sets a last phase of the occupied longhouse firmly in the 11th century. The construction of the skáli itself may date to before the V~1000 tephra. There were also cultural layers under the V~1000 tephra found outside the longhouse in one of the 2002 test trenches. It is important to note that the V~1000 tephra layer is not a historically dated tephra and that the date is only approximate.

Acknowledging the limited investigation of the early phases of the site, the occupation can be tentative dated to begun in the late 10th century and continued into the 11th century. Samples taken for radiocarbon dating during the 2002 test excavations support an 11th date for the last phase of occupation in the skáli (Steinberg 2004). Activity at the site appears to have continued after the longhouse was abandoned as a domestic structure. Infill in the collapsed structure contains both turf and layers of ashy midden. Middens also overlay and are cut into the collapsed structure. This activity appears to have continued until the close of the 11th century as the 1104 tephra fell directly on top of exposed middens in many places.

The continued use of the site as a dump and possibly for iron working or production as well as other activities attest that the abandonment of the longhouse as a domestic structure did not correspond to an abandonment of the farmstead. In all likelihood the occupations moved the short distance west to the site of the medieval turf house and contemporary museum. Test excavations in the domestic midden associated with the

medieval house conducted in 2002 showed the initial deposition of material to be around the time of the 1104 ash fall.

Building Phases

Due to the limited nature of excavation at the longhouse during the 2005 season little can be said about the construction phases in the longhouse. However, the inclusion of the V~1000 tephra in the turf throughout the southern half of the longhouse and not in the skáli suggests a later building phase for this part of the construction. This is also suggested by the difference in construction technique and alignment of the buildings. Anthropogenic inclusions – primarily charcoal and ash – are also more common in the turf used in the southern half of the longhouse.

The difference in turf building techniques between the skáli and the southern rooms was clearly visible even in the upper exposure of the walls (figure 7). Klömbruhnaus and turf fill were used in the west [29], middle [33], and south rooms [35]. The same construction technique was used in the southwest corner of the skáli, the section abutting the west and middle rooms. It is tentantively suggested that the southern half of the longhouse, including the west room, represents an extension to or remodeling of an earlier skáli. If this is the case, it is unclear what that structure looked like in its original form, if it had additional rooms, or how far it extend in length.

By the time the 1104 tephra fell on the site the longhouse had been abandoned and the structure had collapsed. The basic outline of the structure would have remained visible from the surface. The Hekla 1300 layer was identified infilling a bowl abutting the external northeast end of the longhouse [4] indicating that at that time there remained some surface topography associated with the underlying structure. The Hekla 1766 tephra was not identified in any of the deposits excavated during the 2005 season, although it is present at the farmstead, usually at a shallow depth. In all probability the 1766 tephra was removed with the turf when the site was exposed. Given the lack of any 1766 tephra in any of the material below the turf it seems likely that the longhouse was not longer visible on the surface by the 18th century and quite possibly a long time before that.

Figure 7. Glaumbær turf walls, construction type and tephra inclusions.

Site Closing

The site was closed on 14 August 2005. Textile was placed over the walls in the northern half of the building and the southern half was covered entirely. Backdirt was laid over the whole site and then the turf was replaced. Excavation markers were left in place. Survey pins set on 5 x 5 meter grid were replaced with orange flags with coordinates on attached pink flags. Red flags were used to mark prior excavation trenches, yellow flags to mark the outside contact of walls, and white (the skáli and southern rooms) and blue (middle and west room) flags to mark the inside contacts of walls.

Appendix 1: Context Descriptions

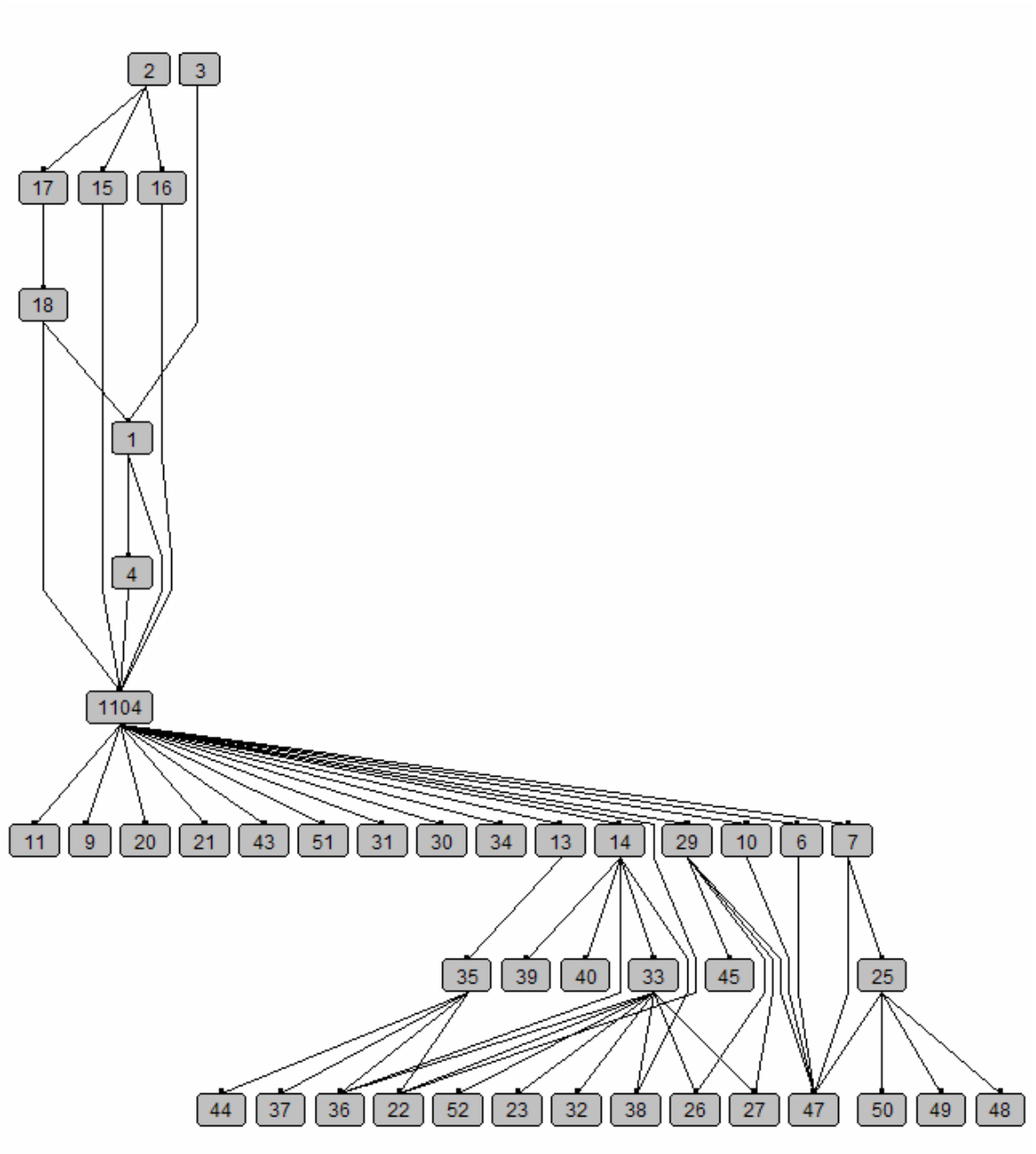
CONTEXT	AREA	TYPE		DESCRIPTION
0001	A	Deposit		Topsoil, over H. 1104 tephra
0002	A	Cut		Excavation, LOE area A
0003	B	Cut		Excavation, LOE area B
0004	A	Deposit		Loose fill, northeast corner of house
0006	A	Deposit		Peat ash lens
0007	A	Deposit		Peat ash lens
0008	A	Deposit		Collapsed turf
0009	A	Deposit		Doorway
0010	A	Deposit		Peat ash lens
0011	A	Deposit		Charcoal, ash pit
0012	A	Cut		Pit associated with [7]
0013	A	Deposit		Peat ash lens with black border
0014	A	Deposit		Peat ash lens
0015	A	Cut		Test trench 2002
0016	A	Cut		Test trench 2002
0017	A	Cut	19	Test trench 2001
0018	A	Cut	19	Test trench 2002
0019	A	Cut		Test trench 2002, [17] + [19]
0020	A	Deposit		Turf wall
0021	A	Deposit		Turf fill
0022	A	Deposit		Turf wall and fill
0023	A	Deposit		Turf wall
0024	A	Deposit		Turf collapse and fill
0025	A	Deposit		Interior, skáli
0026	A	Deposit		Turf wall
0027	A	Deposit		Turf wall
0028	A	Deposit		Turf collapse and fill
0029	A	Deposit		Side room, turf collapse
0030	A	Deposit		Doorway, turf collapse
0031	A	Deposit		Doorway, turf collapse
0032	A	Deposit		Turf wall, skáli NE
0033	A	Deposit		Middle room, turf collapse
0034	A	Deposit		Doorway, turf collapse
0035	A	Deposit		South room, turf collapse
0036	A	Deposit		Turf wall
0037	A	Deposit		Turf wall
0038	A	Deposit		East wall, exterrnal contact
0039	A	Deposit		Turf blocks
0040	A	Deposit		Peat ash and charcoal turf blocks
0041		Deposit		Backdirt from 2005
0042		Deposit		Backdirt from 2005
0043	A	Deposit		Turf wall
0044	A	Deposit		Turf wall
0045	A	Deposit		Turf wall
0046	A	Deposit		Turf wall and collapse
0047	A	Deposit		Turf wall, skáli W
0048	A	Deposit		Turf wall, skáli N
0049	A	Deposit		Turf wall, skáli NE
0050	A	Deposit		Turf wall, skali E

0051	B	Deposit	Midden
0052	A	Deposit	Turf fill or collapse, possible passageway
1104	A	Deposit	Hekla 1104 tephra layer

Appendix 2: Finds

No.	Context	East	North	Elev	Material	Comments
1	4	569047.28	7277588.82	-0.68	glass	2 pieces blue glass
2	4	569045.09	7277592.62	-0.71	glass	1 piece
3	1				ceramic	1 piece
4	7	**569035**	**7277580**			Various, screen
5	7	569036.12	7277583.77	-0.45	bone	Possible weaving tool
6	7	569039.00	7277584.44	-0.30	bone	Butchered long bone
7	7	569038.80	7277583.90	-0.35	bone	
8	7	569036.84	7277583.04	-0.50	bone	6 articulated fish vertabrae
9	7	569036.84	7277583.49	-0.50		
10	7	**569040**	**7277580**		Various, screen	
11	1	569044.36	7277560.02	-0.86	metal	Copper buckle, 2 pieces
12	n/a	569053.38	7277564.57	-1.03	metal	Slag, 1 large piece
13	n/a	**569050**	**7277565**		wood	Burnt wood, several pieces
14	1	569065.17	7277575.92	-1.76	metal	Rivet
15	n/a	569047.87	7277565.10	-0.69	bone	horse skull, left in situ
16	33	569049.27	7277563.26	-0.94	bone	Vertebrae
17	33	569051.26	7277564.96	-0.95	metal	Nail
18	1	569049.15	7277557.29	-1.26	ceramic	
19	1	569051.77	7277557.34	-1.30	ceramic	
20	1	569051.05	7277558.52	-1.20	stone	Whetstone

Appendix 3: Harris Matrix



Name

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equal to:
above:
contemporary with:
below: 15, 17, 16

3

equal to:
above:
contemporary with:
below: 1

17

equal to:
above: 2
contemporary with:
below: 18

15

equal to:
above: 2
contemporary with:
below: 1104

16

equal to:
above: 2
contemporary with:
below: 1104

18

equal to:
above: 17
contemporary with:
below: 1104, 1

1

equal to:
above: 18, 3
contemporary with:
below: 1104, 4

4

equal to:
above: 1
contemporary with:
below: 1104

1104

equal to:
above: 15, 16, 18, 1, 4
contemporary with:
below: 7, 13, 14, 10, 11, 6, 9, 29, 20, 21, 22, 43, 51, 31, 30, 34

11

equal to:
above: 1104
contemporary with:
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9

equal to:
above: 1104
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7

equal to:
above: 1104
contemporary with:
below: 25, 47

35

equal to:
above: 13
contemporary with:
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39

equal to:
above: 14
contemporary with:
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40

equal to:
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contemporary with:
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33

equal to:
above: 14
contemporary with:
below: 26, 27, 52, 22, 23, 32, 38, 36

45

equal to:
above: 29
contemporary with:
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equal to:
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contemporary with:
below: 50, 49, 48, 47

44

equal to:
above: 35
contemporary with:
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equal to:
above: 35
contemporary with:
below:

36

equal to:
above: 35, 14, 33
contemporary with:
below:

22

equal to:
above: 35, 33, 1104
contemporary with:
below:

52

equal to:
above: 33
contemporary with:
below:

23

equal to:
above: 33
contemporary with:
below:

32

equal to:
above: 33
contemporary with:
below:

38

equal to:
above: 14, 33
contemporary with:
below:

26

equal to:
above: 29, 33
contemporary with:
below:

27

equal to:
above: 29, 33
contemporary with:
below:

47

equal to:
above: 25, 10, 7, 29, 6
contemporary with:
below:

50

equal to:
above: 25
contemporary with:
below:

49

equal to:
above: 25
contemporary with:
below:

48

equal to:
above: 25
contemporary with:
below:

Appendix 4: Coordinate System

The same coordinate system was used through the investigation at Glaumbær 2001-2005. Coordinates are expressed in UTMs, zone 27, based on the Hjorsey 1955 datum. With the availability of ISNET93 on GPS units SASS moved all survey work to the ISNET93 system at the beginning of the 2005 season with the exception of the excavations at Glaumbær. We felt that is was better to preserve the grid used in previous test excavations and remote sensing in 2005 than to replace the coordinate system.

The original Hjorsey 1955 UTM grid was established using handheld differential GPS units (± 2 meters on the horizontal plane). This grid was checked at the beginning of the 2005 excavation with the total station and internally consistent to ± 0.10 meters over 50 meters. All excavation coordinates from Glaumbær are in the E 569000, N 7277000 kilometer block. On forms and notes the full UTM coordinates were usually abbreviated to the last 4 digits (e.g., E 9035; N 7550). Vertical elevation coordinates (z) based on a local datum established at E 569000; N 727750.

Two additional reference points were measured in based on the previous remote sensing grid and, after they were established, were used to set up the total station each day (figure 7).

Figure 7. Remote sensing grid and additional reference points.

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