Norsk institutt for kulturminneforskning

Hamar ruin

Archaeological investigations 1996-1998

Stan Reed

Norsk institutt for kulturminneforskning

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Cleaning of the brick floor in the south aisle.
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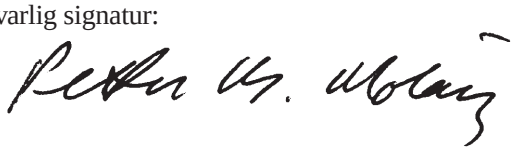

Sammendrag

Reed, S. 2004. Hamar Cathedral ruin. Archaeological investigations 1996-1998. - NIKU Rapport 6: 1-244

De arkeologiske utgravningene i og rundt ruinen på Domkirkeodden på Hamar ble utført fra november 1996 til mai 1998, forårsaket av det planlagte vernebygget. Dette måtte oppføres for å hindre videre forfall pga frostsprengning. Undersøkelsene var tenkt å supplere de utgravningene som fant sted 1991-92, men vokste etter hvert til et større utgravningsprosjekt. Nitti hele graver ble funnet i tillegg til et hundretall som var brutt gjennom og delvis ødelagt alt i kirkegårdens bruksperiode. Ny kunnskap om kirkebyggets utvikling kom frem, og det ble også funnet konstruksjoner som kan tyde på at det har ligget en eldre kirke på samme sted. Reparasjoner, ombygginger og endringer av kirkens plan kunne også påvises ved graving i tårnfoten, ved søyler og utenfor vestfront og tverrskip. Deler av kirkegårdsmuren ble funnet flere steder samt spor av bygninger utenfor murene. Inne i kirkeskipet ble det funnet ulike nivåer av opprinnelige gulv samt gravstener. I ulike grøfter utenfor selve kirkeområdet kunne spor av opprinnelig bakkenivå påvises. Rapporten er skrevet på engelsk. Den er trykket i begrenset opplag, men er tilgjengelig på NIKUs nettsider www.niku.no.

Abstract

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Excavations were carried out in and around Hamar Cathedral from November 1996 to May 1998, initiated by the erection of a protective glass structure to prevent the ruin from deterioration due to weather conditions. The assignment started as a supplement to the investigations in 1991-92, but grew into a large-scale excavation. Ninety complete graves were uncovered, in addition to some hundred disturbed and incomplete ones. New information regarding the development of the church was unearthed, as well as possible traces of an older church. Repairs and alterations of the church's layout could be pointed out and interpreted. Parts of the churchyard walls were found, and also remains of buildings outside these. Deturfing inside the ruin revealed original floor levels. Trenches outside the church area could help reconstructing the basic topography. The report is in English. The printed edition is limited, but the report is also available at NIKU's website www.niku.no.

Forord

NIKU var ansvarlig for utgravningene i forbindelse med vernebygget over domkirkeruinene på Hamar I 1996-98. Opprinnelig var utgravningene planlagt som supplement til utgravningene i 1991-92 fordi planen for plasseringene av fundamentene var endret. Varigheten var planlagt til bare fem uker. Utgravningene viste seg imidlertid å bli svært meget mer omfattende. NIKU fikk utgravningsoppdraget fra Riksantikvaren 10. september 1996, men måtte vente på klarsignal fra Miljødepartementet til slutten av oktober. Den første utgravningen varte fra november til januar 1997. I denne perioden var arkeologene stort sett alene på odden. Først i januar 1997 kom den første entreprenøren for å støpe bæresøyler. Dermed ble området ikke lengre en utgravningslokalitet, men en byggeplass.

Arkeologiske undersøkelser tett opp til anleggsvirksomhet kan ofte by på store problemer, med krav til tilpassing, koordinering og smidighet. Det primære målet for den arkeologiske virksomheten selv under slike arbeidsvilkår må være å ta hensyn til kulturminnene gjennom å prøve å gjøre inngrepene minst mulige og å sikre at det som må fjernes blir dokumentert på en faglig forsvarlig måte.

Etter en pause på ca. to måneder fikk NIKU et nytt oppdrag i mars 1997. En rekke oppdrag fulgte, først og fremst pga. endring eller detaljering av planene for vernebygget. Byggearbeidene hadde startet opp i januar, og det at utgravningene i denne andre utgravningsperioden, fra mars 1997 helt til mai1998 foregikk på en byggeplass forårsaket en hel del praktiske problemer. Det viste seg nødvendig å overvåke for skader på de fredete levningene pga byggearbeidene, og NIKU fikk fullmakt til dette fra Riksantikvaren.

Utgravningen omfattet konstruksjoner og strukturer fra ulike perioder og av ulike typer som krevde forskjellige metoder. I området for teknisk rom ble det påtruffet kokegroper, i grøften syd for Storhamarlåven ble det funnet stolpehull. Skjelettgraving er nærmest en egen disiplin, som må gjennomføres i tett samarbeid med antropolog. Undersøkelser inne i en kirke er oftest uhyre kompliserte og krevende. Kirkegulvet har opp gjennom tidene vært utsatt for store inngrep i form av begravelser og utskiftinger i middelalderen og kabelføringer og andre inngrep i moderne tid. Lagrekkefølgen er dermed vanskelig å knytte sammen i de ulike områdene. De mange begravelsene inne i kirkerommet medførte en komplisert stratigrafi som i sin tur medførte en tidkrevende dokumentasjon.

I løpet av byggeperioden fikk NIKU ca. 30 bestillinger på utvidelser, forandringer og nye grøfter. Den uoversiktlige arbeidssituasjonen medførte at mannskapet ikke kunne engasjeres for en lengre tid, kun for korte perioder om gangen, gjerne en eller to uker og på meget kort varsel. Men den ene perioden avløste den andre, slik at det var kontinuerlig bemanning av ulik størrelse fra mars 1997 til mai 1998. Utgravningene pågikk gjennom to vanskelige vintersesonger, noe som satte spesielt store krav til arbeidsstokken. Imidlertid taklet medarbeiderne alle de vanskelige situasjonene som oppstod med en beundringsverdig profesjonalitet, og det er takket være utgravningspersonalets vilje og gode humør at utgravningen og dokumentasjonen kunne utføres på en så tilfredsstillende måte.

Riksantikvaren var både oppdragsgiver og tiltakshaver for utgravningene på Hamar. Samarbeidet fungerte i hovedsak bra til tross for feltleders og prosjektleders frustrasjoner over de mange bestillingene, hvor det ikke alltid var like enkelt å holde orden på fakturaene. Lyder Marstrander (Ark. avd.), Sjur Helseth og Harald Ibenholt (Tekn. avd.) var ansvarshavende hos Riksantikvaren.

Vi takker Riksantikvaren for samarbeidet. Personalet ved Hedmarksmuseet skal ha takk for hjelp, bistand, for bruk av lokaler og for faglig støtte. Spesiell takk til Tor Sæther og Lars Pilø.

Tina Wiberg
Prosjektleder

Contents

1 Introduction

1.1 Historical background to the excavations

The episcopal see of Hamar was established in 1152 or 1153 at the same time as the Archbishopric of Nidaros was founded. Hamar was the last of the five medieval Norwegian bishoprics to be established and was the only one that was landlocked. It was created by dividing the Oslo bishopric into two parts. It is assumed that the construction of the cathedral began shortly after the see was established.

There has been some discussion as to whether there was a church in the area prior to the construction of the cathedral. The debate centres around whether there was a royal farm and associated church at Hamar in the early medieval period or not. The alternative argument is based on the possibility that the nearby church at Vang could have functioned as the local church. The church being one element in a larger area where the apparatus of power was spread over various sites, rather than being concentrated in one place (see Pedersen, R. 2000:67-70 for a presentation of the arguments and sources).

If Oslo bishopric had remained undivided it would have been so large and powerful it may have weakened Nidaros' position as the natural centre of the Norwegian church province. A historical description of Norway, the Historia Norwegiae has been interpreted as possibly being written with the aim of promoting the interior as a natural unit, to support plans to establish an inland bishopric (Ekrem 1998:57-8). The driving forces behind the creation of a fifth Norwegian bishopric at Hamar are more likely to be found in church reform and politics than the development of Hamar as a natural site for an ecclesiastical centre.

The cathedral is cruciform in plan, and is of a similar dimension, with a similar plan to St. Hallvards in Oslo (see Lidén 1981:21 and Ekroll 1997:179). That the transepts were part of the original plan has been disputed however (see Sæther 1998:59-61; Pedersen E. A. 2000:193-4; and 4.1.2 Period 2 summary and 10.2 The development of the cathedral for a discussion on this topic). It is highly likely that a stonemasons school was centred at the bishopric, and that they were responsible for the construction and subsequent re-building of both the cathedral and Bishops Residence. Both buildings declined after the Reformation in 1537 and were partially destroyed by fire in 1567. Attempts were made to rebuild the cathedral to no avail. The collapse of various parts of the structure was documented during the 1700's. Some of the profiled stones from the cathedral were re-used in local churches during the 1600's and some were burnt in a lime kiln from the end of the 1700's to the mid 1800's (Pedersen 1998:84-91 and 97-99). In the mid 1800's however antiquarian interest secured the ruin from further plunder. The systematic excavation of the ruin from the large mounds of demolition deposits that lay over and around it was set in motion. The nave and aisles were probably cleared in the 1840's and in 1847-48 the chancel was cleared. The rest of the demolition deposits were cleared away in 1884-5 (See Pedersen, R 1998:129-33 and 1999:43-44 and 65-68). The cathedral was surveyed by J. F. Didriksen in 1886 (see Nicolaysen 1893) and again by Olaf Nordhagen in 1903 (Nordhagen 1907). The original romanesque cathedral had clearly been extended and redeveloped at the eastern end. The early surveys concluded that this extension had been undertaken in one building phase.

The standing masonry was repaired many times in the late 1800's and during the 1900's. The main focus of the work on the ruin during most of the 1900's was on restoration and conservation of the masonry. Archaelogical investigations inside the ruin were not reported on in any detail. When work inside the ruin begun in 1997, the extent to which the previous excavations had removed the medieval deposits was unclear.

The deteriorating condition of the ruin led to the south arcade being packed in tarpaulin in 1985. Plans were made to build a protective structure over the ruin. Trial excavations were undertaken in the churchyard in 1988 and two full seasons of excavation were carried out in 1991 and 1992, all by Oldsaksamlingen at the University of Oslo. Two open area excavations were undertaken in 1991 outside the walls of the chancel and south transept. In 1992 a further open area was excavated outside the wall of the north transept and a ring trench that encircled the cathedral was excavated. The excavations produced one of the largest Norwegian medieval skeletal assemblages (Sellevold 2001:93-5). Analysis of this assemblage has characterised the burial population as a 'social parish' comprising the ecclesiastical community, the supporting population of the bishop's household and surrounding settlement and wealthy families from the region (Sellevold 2001:217-224)

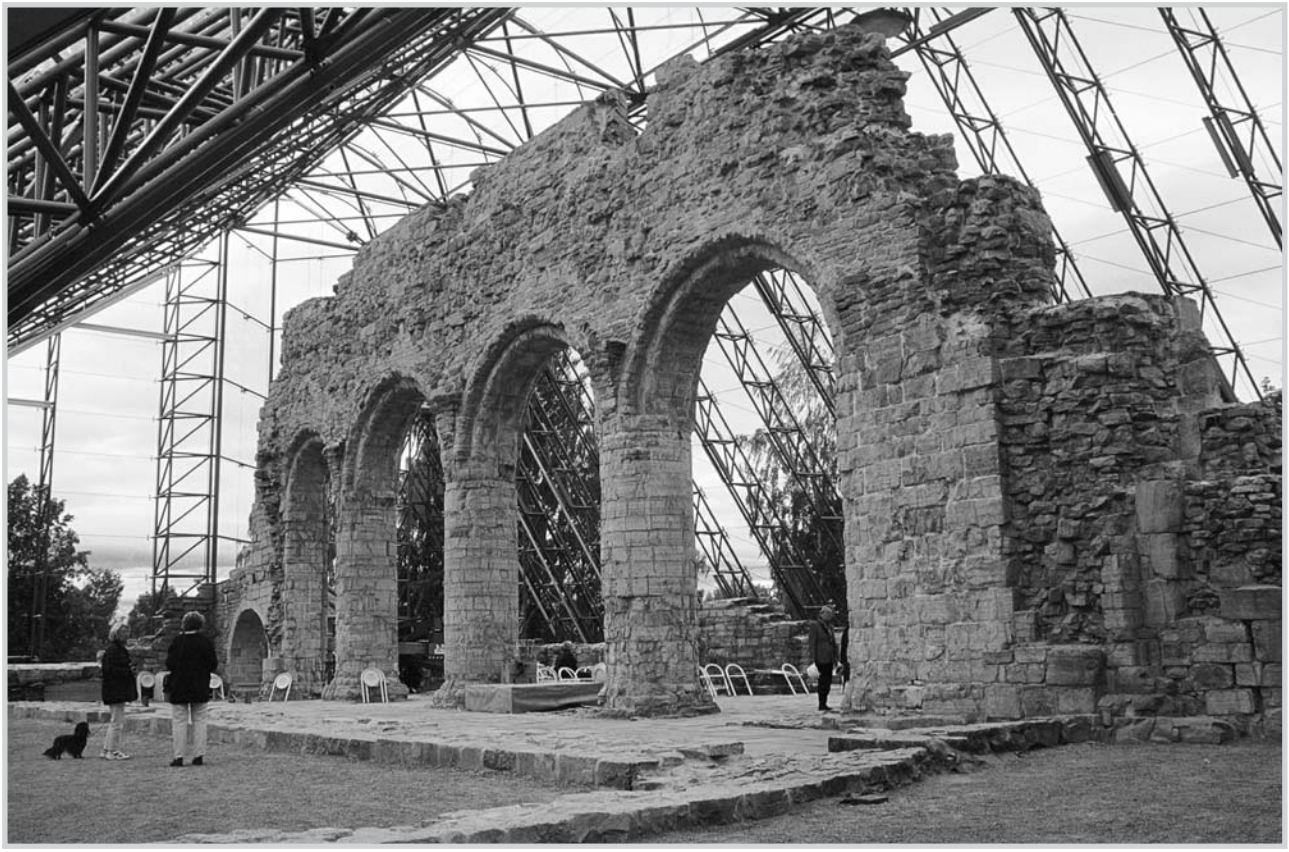


***Fig. 1**. The south arcade covered by the protective structure. Facing NW. Photo Stan Reed, NIKU.*

The plans for a protective structure provoked a passionate response from many quarters. Given the extensive restoration work that had been undertaken on the standing masonry, those who opposed the protective structure questioned whether the ruin had any real source value as an authentic medieval cathedral (see Pedersen, R. 2002). An article by Tor Sæther of Hedmarksmuseet showed that a close inspection of the masonry allows the newer stoneworking to be distinguished from the original (Sæther 1995b). A further article by Sæther demonstrated that the surveys undertaken in the late 1800's/early 1900's greatly simplified the building history of the cathedral. Sæther re-interpreted the development of the cathedral, clearly indicating the value of the ruin as a source (Sæther 1998). A series of articles by Ragnar Pedersen also of Hedmarksmuseet have traced the decline of the cathedral, its value as a monument and symbol and the initial work to preserve the ruin (Pedersen, R. 1995, 1998 and 1999). Pedersen has also explored the background to the discussion on the protective structure (Pedersen, R. 2002, see this article for other sources on this theme).

The protective structure has ensured that the ruin is removed from the annual freeze-thaw cycle that was undoubtedly the cause of most of the deterioration of the masonry. A system of probes inserted in the masonry are monitoring any changes in the structure. This work is carried out by NIKU. A project design for monitoring of the buried archaeological resource was also ordered by Riksantikvaren, but the project was never realised.

1.2 The excavation

The positioning of the trenches in 1991 and 1992 was determined by the foundation system of the protective structure. This was altered after the excavations were completed such that the open areas excavated to the north, south and east were not used as foundations. A series of 'point foundations' secured to bedrock were chosen instead. A concrete raft would sit on top of these foundations. The foundations and raft lay, for the most part, within the ring trench excavated in 1992. In several places however the adjusted foundations lay partially outside the previously excavated areas. These small areas were excavated by NIKU in 1996/7, the excavation was planned as being supplementary to the work carried out in 1992. In addition the area under the steps at the west front was to be excavated, completing the ring trench.

NIKU got the assignment for the work by September 10. 1996 and the duration of the excavations were stipulated to five weeks. But the Department of Environment only gave the signal to Riksantikvaren to start by the end of October,

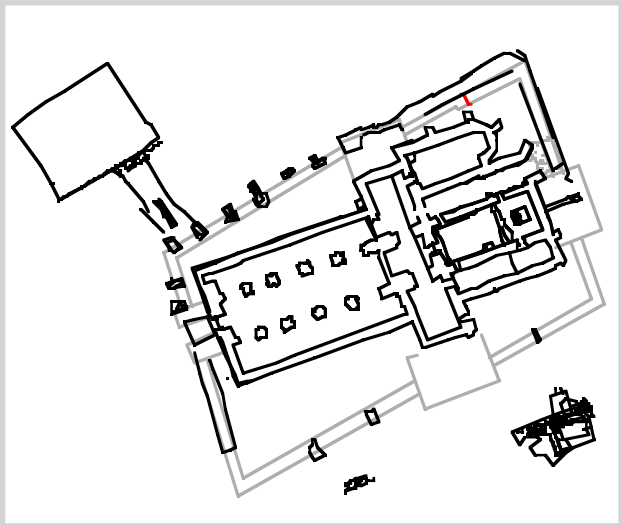


***Fig. 2**. The ruin and the trenches from 1991, 1992 and 1996 that lay within the churchyard. Q96 (top left) and X96 (bottom right) are also shown. The 1991 and 1992 excavations are marked in grey.*

causing the excavations to take place in a very unfavourable time of the year. After the practical preparations the excavation campaign started by the beginning of November, two days after the first snow and frost period. Thus the excavations most of the time had to take place inside tents with artificial light and heating. The unfavourable time of the year, several changes in the foundation plans (indicating that they were not finished by the time of NIKU's assignment) and new ditches for installations caused the work to last much longer than originally planned. The archaeological excavations were finished by January 17.

An underground room to house all the electrical and ventilation installations was to be built outside the churchyard. The excavation of the construction trench for this room and a trench from the NW corner of the cathedral down to this room were planned for May 1997. But a new assignment from Riksantikvaren was received in March. The concrete raft in NW should be placed with the bottom down in the ground thus causing archaeological investigations. This was contrary to the information in the first assignment.

When the archaeologists arrived at the site by the middle of March large areas to the west and north of the ruin had been excavated with machine. In the western part many graves had been destroyed and the contents levelled. Along the Northern wall several m^3 had been taken away and the ditch had been filled with gravel. The digging was stopped and archaeologists from NIKU were called in. After a meeting on the site, 14. March, the assignment was redefined to documentation of damage.

This digging took place on the southern side of the west wall. Here burials had clearly been disturbed. The loose material was cleared away and the area was excavated archaeologically as trench H96-14. An area along the north side of the cathedral, south of trenches J96-3 and 4 had also been excavated without supervision. It became clear that the excavation trenches had been planned around the width of the foundations and concrete raft. Riksantikvaren had not calculated for the ventilation shaft and the extra space that was necessary for the construction workers to work in and construct the shuttering to hold the concrete. The unsupervised machining intended to widen the respective trenches to provide the necessary space.

Widening of the 1992 excavation was also necessary in the NE. Trench M96-11 consisted of a widening of the original trench by c.0.5m. Two further, limited, additions M96-12 and 13 were also necessary. The trench through the Bishops Foundation was also widened. M96-11 was widened again at a later date. A number of other trenches were added to the work load as the building project progressed. B96-4 that lay outside the chancel was excavated, as were service trenches S96, T96 and U96 that lay outside the churchyard. Trench X96, that lay on the line of the southern service road and W96 a section of the churchyard wall on the southern side were uncovered and documented without excavation.

As early as in the spring 1997 NIKU informed that the planned new floor of the protective building probably would be in conflict with the medieval church floor. There were no documentation of a floor from any of the many restoration works which had taken place during the years and thus no information about damaging of floor and graves. In June 1997 NIKU got the permission from Riksantikvaren to excavate five small test pits in the nave. In all these test pits were found floor tiles in situ, some places two levels of tiles from different floors. As late as in November 1997 NIKU got the assignment to de-turf an area inside the ruin. A limited excavation was undertaken over an area of approximately $100m^2$. This was necessary to reduce the ground level sufficiently to lay a new stone floor. Excavation was undertaken in the crossing and north transept and in the SW corner of the south aisle. In all the area were found a floor of square, unglaced tiles. The tiles were partly well preserved, but large areas were damaged by frost and by roots. Also stone slabs probably marking graves were found in the floor. All this was found only 5-15cm underneath the surface. Throughout the winter 1997-98 several assignments for various parts of the floor were given to NIKU by Riksantikvaren, when measuring stated that terrain was too high to give room

for the new floor. The whole of the north aisle and in between the columns of the north arcade, an area at the SE end of the south aisle and the south transept were deturfed and documented without excavation. Over all the tile floor was preserved in situ, more or less damaged. Especially well preserved was en area in SW lying under 2cm earth only. In retrospect it is satisfying that this area was not excavated with machine, and also that the sand and gravel layer below the new floor was not compressed with vibration.

The extra work was ordered by Riksantikvaren in stages, often verbally during the regular building meetings. NIKU had at no point during the excavation an overview of all the work that was required. As a result no clear research design was produced. The excavation was organised so that it could be as flexible and responsive to the needs of the building process as possible. Once a building leader had been appointed in the latter half of 1997, the archaeological work was organised after his instructions. This led to trenches being temporally abandoned as labour was redirected elsewhere. The documentation of the archaeology naturally suffered as a result of this strategy. The need to adopt a flexible approach involved the site supervisor working on site for long periods. As a result checking of the documentation on site was minimal. This has placed a heavier burden on the post-excavation analysis than would have been the case if it had been possible to organise the excavation after a more traditional model.

After the unsupervised excavation in the spring of 1997 Riksantikvaren allocated a general supervisory role to NIKU's representatives on site. The authority to temporarily halt construction was granted. This power was used on several occasions to allow Riksantikvaren time to approve further excavation and in one case to build a protective road for the heavy plant machinery to access the site.

NIKU maintained a presence on site from the spring of 1997 up until shortly before the opening of the building.

1.2.1 List of participants

During the first period of the project, from November 1996 to January 1997, the following persons were employed on site: Bent Bang-Hansen, Wendy Booth, Chris Brayne, Kennan Fulks, Lars Erik Gjerpe, Kate Hughes, Nils Tore Nondal, Elise Roll-Lund, Tanja Røskar Reed, Ragnhild Steinshamn, Lillian B.Trinterud, Vanja Tørhaug and Marius Ødegaard.

During the second period of the project, from March 1997 to May 1998, the following persons were employed on site: Bent Bang-Hansen, Chris Brayne, Lars Erik Gjerpe, Kate Hughes, Janne Kroll, Nils Tore Nondal, Tanja Røskar Reed, Lillian B.Trinterud, Vanja Tørhaug, Bruce Sampson and Richard Woolley.

In addition to participating in the excavation the following had extra roles: Kate Hughes was on-site osteologist and took over the supervisory role in Stan Reed's absence. Chris Braine and Nils Tore Nondal were responsible for surveying and digital documentation. Wendy Booth and Tanja Røskar Reed had responsibility for on site finds processing during the first excavation period. Tanja Røskar Reed in her second period of employment also had a consultancy role with regards to the preservation of remains in-situ. Bruce Sampson was responsible for on-site photography.

Per Christensen of Anleggsdrift AS was responsible for organising the technical aspects of the excavation, in particular the tents, heating and lighting rigs that were essential during the two winter seasons. Christensen also functioned as a technical consultant and acted as an on-site contact person with the construction workers and building leader.

Tina Wiberg was project leader and Stan Reed site supervisor.

1.2.2 Problem orientation

NIKU's original project was planned as supplementary to the 1992 excavation. The problem orientation of the 1992 excavation was adapted to suit the limited nature of the 1996 excavation. Investigating the possibility that a church stood on the site prior to the construction of the cathedral and the building up of a chronology for the use of the churchyard were the elements of the 1992 research design that were most relevant. The 1996 excavation involved excavating under the steps into the western entrance and through the churchyard wall. Dating the construction of these structures was also a primary goal. The project expanded greatly during 1997. As has been noted above however, at no time was an overview of the necessary work available. It was not possible to work out a formal research design that focused on the potential of these extra trenches. They were therefore excavated with a view to thoroughly documenting all the archaeological deposits without focusing on any specific research questions during the fieldwork.

1.2.3 Context system

On the suggestion of the leader of the 1992 excavation, Ellen Anne Pedersen, the context system from the earlier

project was continued in 1996. In 1992 the excavation was divided into areas, each represented by a letter. The trenches within these areas were divided numerically, J1, J2 etc. Each area had its own series of context numbers, prefixed by the area letter. Layers, structures and graves were also prefixed by L, K and G respectively. Each of these sub groups also had a separate context series, e.g. JL3 (layer 3 in area J), JG3 (grave 3 in area J) DL3 (layer 3 in area D). The division into areas, each with its own context series was retained for the 1996 project but one context series for layers, structures and graves was used. The prefix G was retained to refer to the skeletal remains. Grave cuts, fills, coffin remains etc. were all given separate context numbers e.g. J3 (grave fill). JG4 (burial), J5 (grave cut).

The suffix 96 was added to the area letters to denote the trenches excavated in 1996, e.g. D96. The aim of this was to clearly separate the trenches excavated by NIKU from those of the earlier projects. It was not the intention to differentiate between trenches excavated in 1996 and 1997, the suffix 96 was therefore used for all the trenches excavated by NIKU, whether the work was undertaken in 1996, 97 or 98.

In area M96 the context series began at M30, following on from the last number used in 1992. This practice caused confusion and was not used in the other trenches. The context series in each of the other trenches began at 1. Given the supplementary nature of the initial excavation plan it was considered appropriate to continue the existing context system. On reflection however the use of several context series caused confusion. If the scale of the excavations had been clear at the start another system would have been used. Probably with one context series and blocks of contexts allocated to particular trenches.

The Harris stratigraphic system of recording has been used. Weight has been placed on documenting the action of forming each context in addition to documenting the physical remains. The sequence in each trench was broken down as far as possible into discreet contexts. These have been built up into groups of activity. Each group is placed into one of seven periods (see 1.2.4 below). Where two similar deposits were excavated in adjacent trenches or were exposed in plan but not physically connected, a separate context was issued for each. Breaking down the sequence in this way allows a greater degree of freedom when attempting to re-interpret the evidence. Where there was a high degree of certainty that separate contexts were part of the same layer they have been merged at the context level. Otherwise separate contexts have been retained and the deposits compared at the level of the group text. Where contexts have been merged, the original paper documentation is available for eventual re-interpretation.

The term ’beach gravel’ has been used in many context descriptions. This is a direct translation of the Norwegian ’strandgrus’ that is used locally in Hamar to refer to the gravel along the beach of Lake Mjøsa. The gravel is crushed shale (alunskifer), seams of which occur naturally in the limestone bedrock in the area.

1.2.4 Period and group divisions

The contexts have been ordered into groups of activities. These have been placed into seven periods.

- Period 1 pre dates the construction of the cathedral.
- Period 2 represents the construction of the initial cathedral building and its use up to the extension of the eastern end.
- Period 3 was reserved for deposits and structures interpreted as connected to the extension of the eastern end of the cathedral. The remodelling of the crossing and transepts is also gathered in period 3 as it was dated to the same period and has a clear contextual connection to the rebuilding of the chancel.
- Period 4 represents the use of the cathedral from the completion of the first building up to the Reformation. Period 3 is in effect a sub group of period 4.
- Period 5 was reserved for activity that is interpreted as relating to after the Reformation, but prior to the cathedral’s eventual abandonment.
- Period 6 relates to the post-medieval farm.
- Period 7 is related to the antiquarian investigations of the ruin and other modern material.

None of the excavated trenches were connected, as the 1992 trenches were. The building up of a site chronology based upon stratigraphic relationships that spanned the whole site was not possible with the material presented here. In an attempt to write a site narrative the various groups have been placed into periods that can be related to known building phases of the cathedral. The periods were defined by existing interpretations of the cathedral’s development, i.e. by material that was external to the site documentation, rather than through a rational ordering of the observed stratigraphic relationships. The various groups were placed within a period through interpretation. Only in a few cases was there stratigraphic or other empirical evidence to connect a group to the defining element of the period. For example the graves in group 2:18 in trench B96-4 were sealed by construction debris and cut by the construction cut for the chancel wall. They were clearly older then the chancel’s extension and there-

fore were part of period 2. The dumping of stone working debris that built up the ground surface in trench M96-11 however (group 3:15) was interpreted as being related to the construction of the chancel (period 3), but no stratigraphic relationship connected this activity to the construction of the chancel wall. This process is clearly more subjective than traditional stratigraphic analysis that would link groups of activity together based on the observed relationships between them. Where there was uncertainty over the placing of a group of activity this is outlined in the text.

The small trenches along the southern side of the churchyard: E-96-1, H96-9, H96-10 and W96 were not integrated into the overall site narrative. With the exception of W96, these trenches consisted of turf, grave soils with burials and natural. They were isolated from the rest of the trenches; integration of these deposits into the overall site narrative would have been based upon guesswork. The contexts are presented under the respective trench descriptions in chapter 2. Trench W96 exposed the top of the churchyard wall in a limited area on the southern side of the churchyard. The structure in all probability belongs in period 4, but given its isolated position, it too is reported on under the trench description.

1.3 Integration of the results with the 1991 and 1992 excavations

In an excavation report the basic context descriptions are built up, through association and interpretation to a narrative of the activity on the site. The interpretations are informed by the results of previous research and where appropriate through the results of nearby excavations. In this case recent excavations were immediate both in terms of the physical proximity of the trenches and the length of time that had lapsed between the projects. As noted above NIKU's initial project was planned as supplementary to the 1992 excavation. As such it was considered appropriate to integrate the results as far as possible with the previous excavation report. This was consulted prior to excavation of the trenches, context descriptions in the field referred to the contexts in the earlier report.

As this excavation progressed and increased in size it became less realistic to consider it simply as supplementary to the earlier work. This project included results from outside the churchyard and inside the ruin, areas that were not investigated by the previous projects. It became clear that the results from 1996 were in conflict with the interpretation from 1992 around the stairs into the western entrance. The 1992 ring trench provided the opportunity to stratigraphically link the development of the churchyard around the whole cathedral. The deposits around the stairs therefore affected the 1992 interpretation of the whole churchyard. By directly integrating the contexts into the 1992 sequence the interpretation of the site and its narrative are implicitly accepted. In many respects the trenches in the churchyard are still supplementary to the work undertaken in 1991 and 1992. The use of the churchyard cannot be separated from the developmental history of the cathedral however. The size of the 1996 project demanded a 'free-standing' narrative; attempts to fully integrate this report with the previous results were therefore abandoned.

References are made to the 1992 results where there is a clear agreement or disagreement between the interpretations and/or documentation. These are simply comments, they are not part of a comprehensive review of the earlier work and where opinions are expressed, these should not be accepted without also referring to the earlier work. The equating of contexts with those from 1992 was, as mentioned above, part of the initial excavation strategy. Where the site documentation gives an equivalent 1992 context this is noted in the context descriptions. These should only be considered as suggestions however.

It is tempting to view later work on a subject as more definitive, shedding new light on material etc. This report and its results should not be considered in this way with respect to the results from 1991 and 1992, even though I have access to material that the previous authors did not. As this report's narrative is built up from the material from this excavation there is much in the earlier work which could also 'shed light' upon these results.

The 1991 and 1992 excavations produced the most information on the churchyard and burial history of the site, whereas this excavation uncovered areas outside the churchyard and inside the ruin not touched by the earlier work. A full integration of the results from all three excavations is beyond the scope of this report. In any case, given the potential for conflicting interpretations and a natural tendency to trust ones own results any such 'full' integration should be undertaken by a third, impartial party.

In the absence of an integrated narrative the results from the earlier projects should perhaps be considered as giving the most complete picture of the development of the churchyard. More weight should perhaps be given to the results from this report with regards to the development of the cathedral and the areas outside the churchyard. The following results presented here, in addition to the extra

burials, could be considered relevant to the development of the churchyard: the dating of the stairs at the west front (group 7:1, in addition see discussions in 4.1.2 Period 2 summary and 7.1.2 Period 5 summary); the make-up dumping in trench P96 (groups 4:20 - 4:24); the dating and development of the churchyard walls in trenches P96 and U96 (groups 2:25, 2:26, 4:25 and 4:37) the sequence in trench J96-6 (groups 2:22 and 4:16) and the grave outside the chancel wall in trench B96-4 that provided dating evidence for the construction of the chancel wall (group 3:8 and 3:9).

An interesting topic for further research could be an investigation of the effect the excavated areas have had upon the eventual interpretation. The 1992 ring trench provided the opportunity to connect the whole churchyard together stratigraphically. My impression of the interpretative process is that the focus naturally fell upon identifying marker horizons that connected the interpretation of one area with all the others. Re-interpretation of one context could thus affect the whole site. The 1996 excavations consisted of unconnected trenches. The stratigraphic relationships that would normally structure interpretation were by and large not available. This lack of stratigraphic rigour and looser structure has led to freer interpretation of the trenches. As such they exist almost as separate interpreted units where the re-interpretation of one would not necessarily affect the interpretation of the others. Such a review is beyond the scope of an excavation report, but is interesting food for thought. The wealth of material produced by the excavations could provide the opportunity to pursue other methodological lines of inquiry, in addition to a more nuanced cultural historical narrative of the site.

1.4 Organisation of the report

The various trenches are presented in chapter 2. A list of the groups, with context numbers, from each trench is given. A brief summary of the activity recorded in the trench is also presented.

Chapters 3-9 present the various periods. The groups that have been placed within the period are described. The context descriptions are given under the appropriate group. Group plans are presented. Due to the fact that the excavated areas are of differing sizes the plans are at various scales in an attempt to reduce them to a suitable size for inclusion in the report. Harris matrices have not been included. Given that the material has largely been recovered from unconnected trenches, no overall site matrix was produced. Many of the group matrices were simple, linear strings. It was not considered useful to reproduce them in the report. The under and over stratigraphic relationships are given for every context however. These relationships are stratigraphic, not physical. Matrices can therefore be reproduced, if necessary, to re-interpret the material.

The discussion section in each chapter is a presentation of the activity in the period, with reference to each group of contexts. A summary of the period and an outline of the relevant dating evidence are presented at the beginning of each chapter. The summary is a condensed version of the discussion with the main points of the period presented.

A final summary, chapter 10 is an attempt to condense the results and present the main points of the excavation report.

2 Excavation trenches

2.1 Area B

Area B lay outside the eastern end of the cathedral, the chancel wall formed the western edge of this area. The area was excavated in 1991, but a baulk that ran E/W across the centre of the area was left unexcavated. Trenches B96-1 and B96-4 were located along this baulk. Trenches B96-3 and 4 lay within the area already excavated in 1991.

Trench B96-1 was a small trench c. 1m x 1m, 4.5m west of the chancel wall. It was excavated during the first period of the excavations in 1996. Trench B96-4 consisted of the rest of the baulk from B96-1 to the chancel wall. It was 4.5m long (E/W), x 1m wide. It was excavated during the spring and summer of 1997. This trench had a low priority; excavation was suspended on two occasions to divert resources elsewhere.

The turf and upper part of the grave soils in B96-1 were excavated by machine. Machining stopped when a burial (BG30) was uncovered. B96-4 was excavated entirely by hand. The contexts from B96-1 were incorporated into B96-4. Two burials (BG30 and BG35) were excavated in both B96-1 and B96-4. The femurs of both burials were missing; these appeared to have been removed by unsupervised excavation at an unknown date.

2.1.1 Area B groups

Group 7:7 B3 B4 B5 B6 B8 B13 B52
Group 3:7 B14 B15 BG16 B17 BG18 B20 B21 B22 BG23 B24 BG26 B28 B29 BG30 B31 B56 B60 B81
Group 3:8 B27 B33 B34 BG35 B39 BG40 B41 B42 BG43 B44 B45 BG46
Group 3:9 B7 B69 B73 B79 B80 B81
Group 2:18 B36 B37 BG38 B63 B64 BG65 B66 B67 BG70 B71 B72 BG74 B75 B76
Group 1:4 B32

2.1.2 Area B summary

The natural ground surface (group 1:4) consisted of moraine clay. Graves had cut into the clay; shale bedrock was exposed in one place, beneath the clay. Four burials were grouped into period 2 (group 2:18); these pre-dated the building of the chancel. Deposits and structures connected to the building of the chancel were uncovered (group 3:9). Two groups of burials (groups 3:7 and 3:8) that consisted of nine burials in total were grouped into period 3. No activity from periods 4, 5 or 6 was registered. The modern material (group 7:7) contained window glass, iron objects and disarticulated human bone. The activity from the later phase of the churchyard (period 4) appeared to have been removed, presumably when the demolition deposits were cleared away.

2.2 Area D

Area D lay outside the western end of the cathedral, outside the western entrance. The trench was c. 4m x 4m, the cathedral wall formed the eastern edge of the trench. The steps into the western entrance lay over this trench. The steps were marked and removed, the area beneath was excavated by hand. A tent was erected over the area; the excavation was carried out under artificial lighting. This trench was excavated during the first phase of the excavations, in 1996 and through into January 1997.

2.2.1 Area D groups

Group 7:16 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D65 D66 D76 D77 D78
Group 5:3 D15 D16 D17 D18 D19 D20 D21 D22 D23 D25 D28 D29
Group 5:4 D24 D26 D27 D30 D37
Group 5:5 D33 D34 D35 D38 D41
Group 4:26 D39 D40 DG42 DG43 D48 D49 DG50 DG51 D57 D58 DG59 DG72 D73 D74 D75
Group 4:27 DG44 D45 D46 DG47 D55 D56 DG61 DG62 DG63 DG67 DG68
Group 4:28 DG69 DG70 DG71 DG80 DG94 DG95 DG96
Group 4:29 D84, DG85 D86 DG91 DG92 D93
Group 4:30 D81 DG82 D83 DG97
Group 2:27 D99 DG100 D101 D102 DG103 D104 D105 D108
Group 2:28 D53 D60 D88 D98
Group 2:29 D106 D107 D110
Group 1:12 D109
Group 1:13 D111

2.2.2 Area D summary

The natural ground surface (group 1:13) consisted of a mineral soil over bedrock. Traces of the original turf horizon (group 1:12) lay over most of the trench. The foundation of the western wall of the cathedral and related contexts were uncovered (group 2:29). Extensive make-up deposits were dumped against the foundation (group 2:28). The earliest burials in this trench are also placed in period 2 (group 2:27). Six groups of burials, twentyfive in

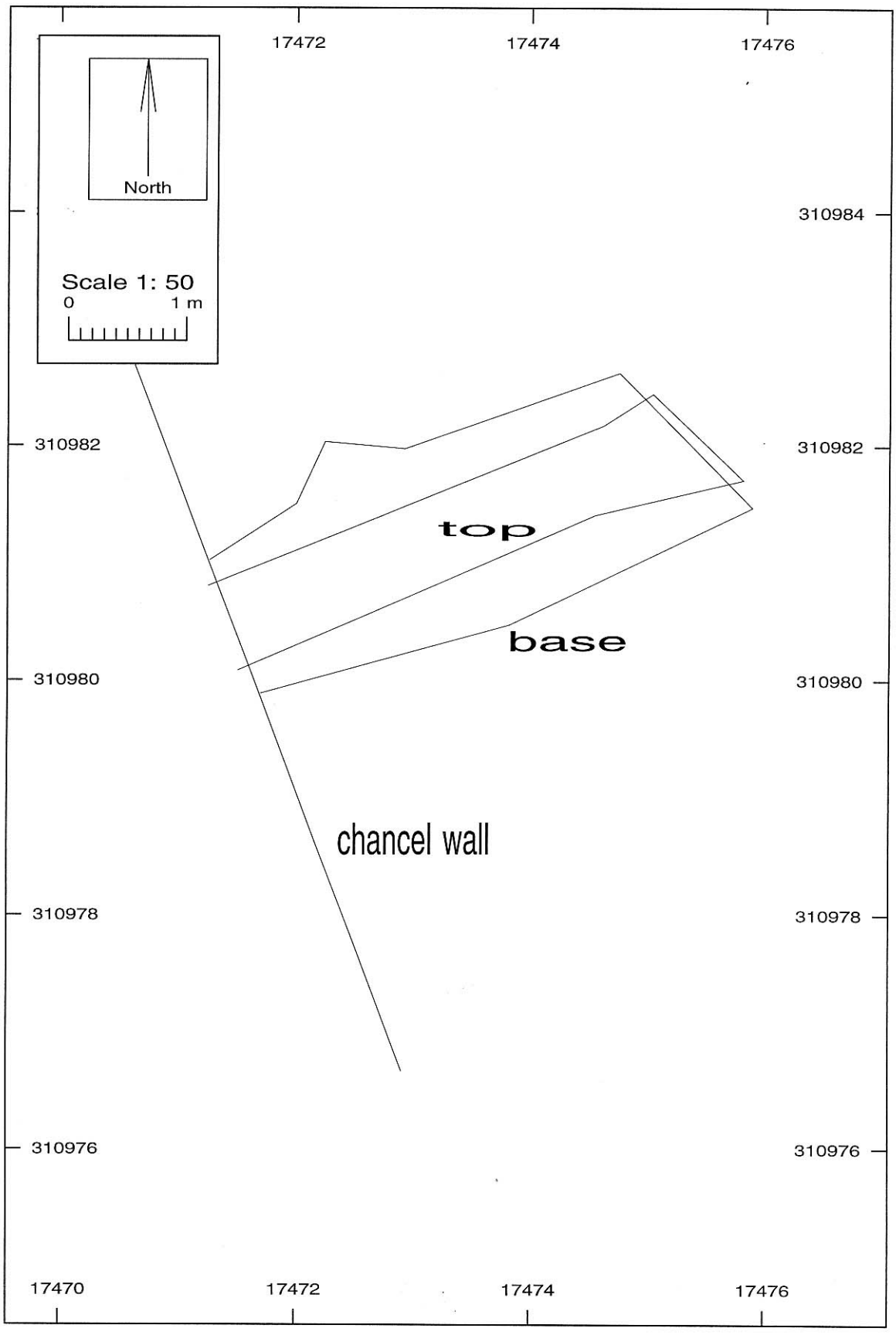


***Fig. 3**. Trench B96-4.*

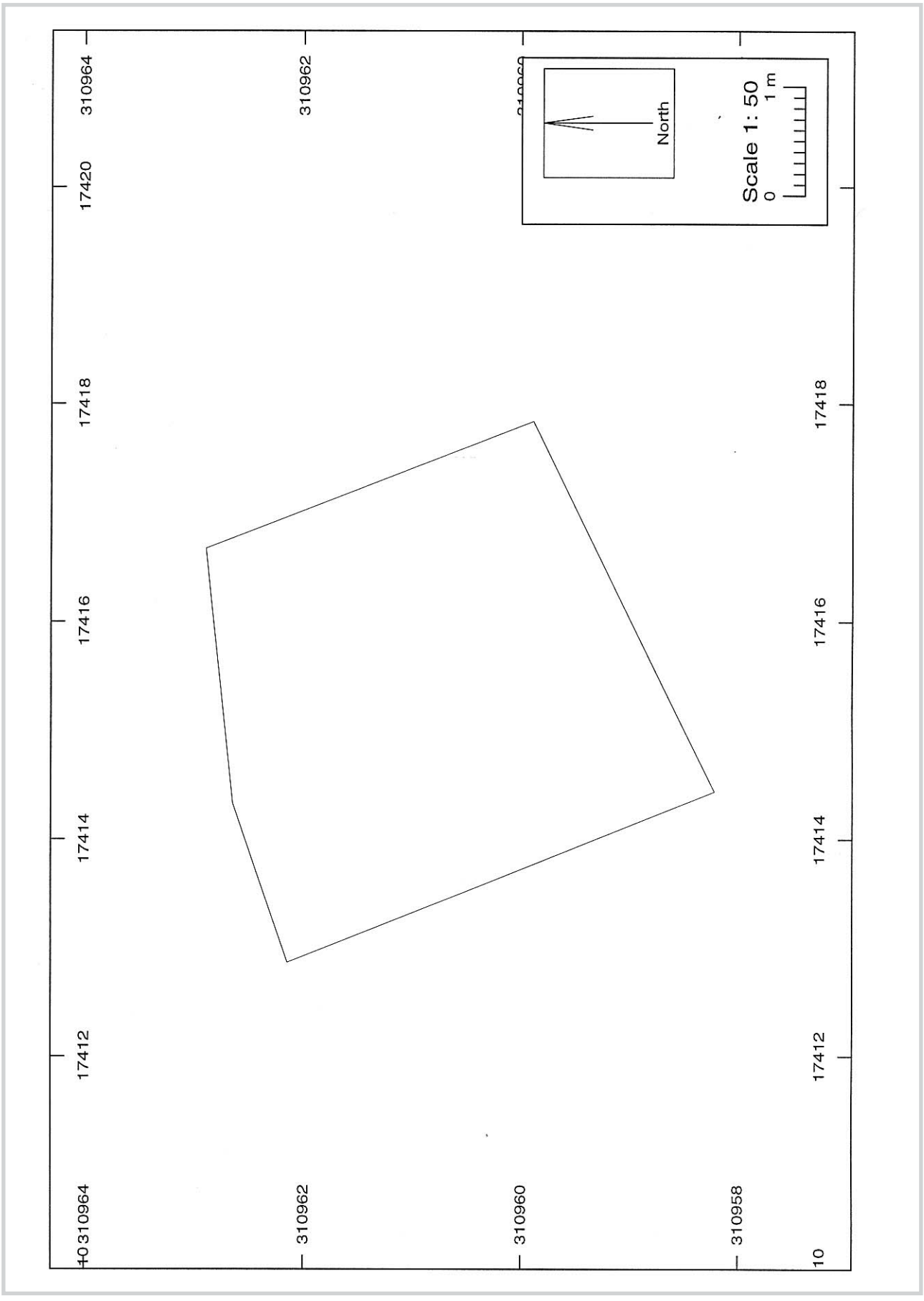


***Fig. 4**. Trench D96.*

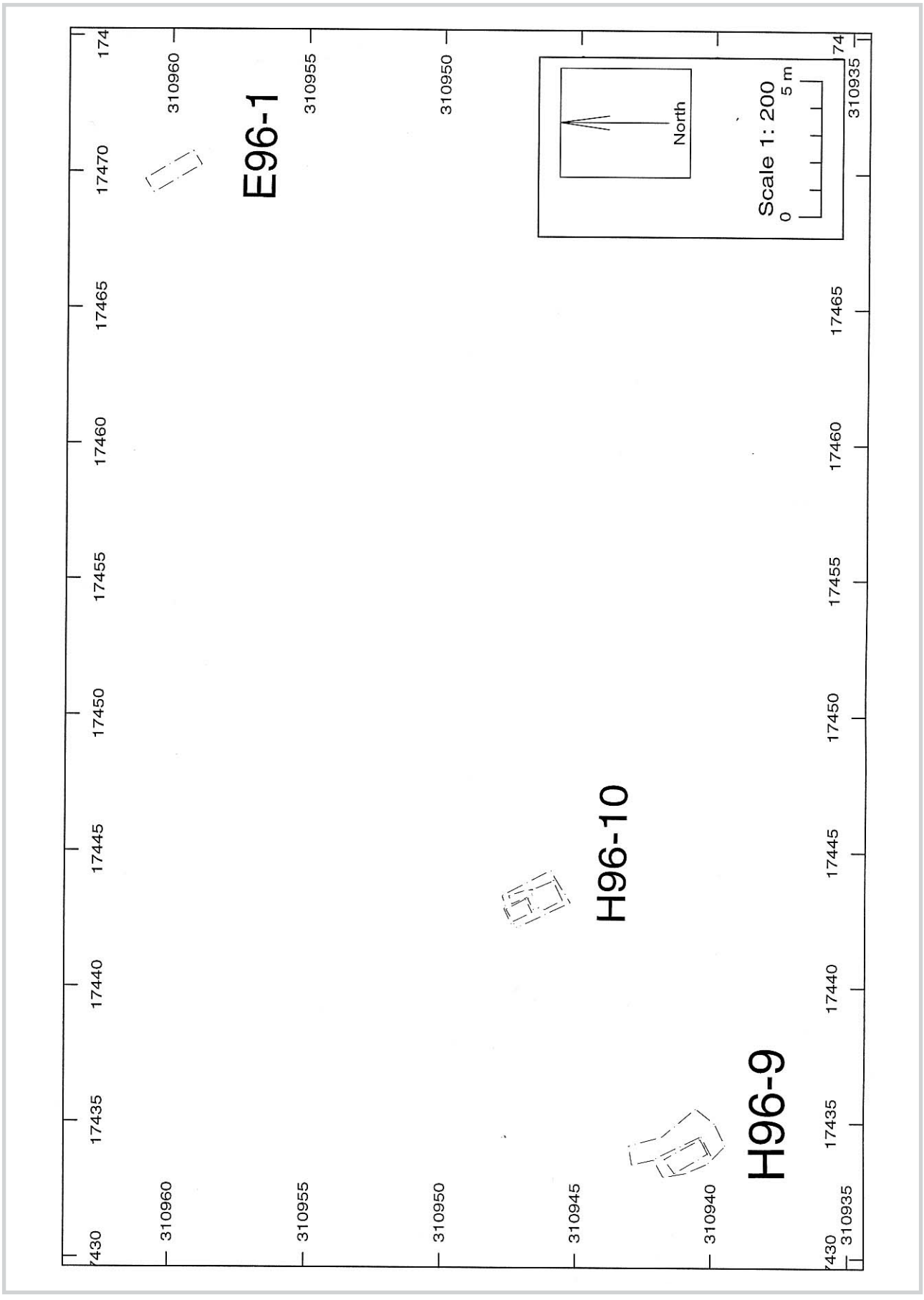


***Fig. 5**. Trenches E96-1, H96-9 and H96-10.*

all, were placed in period 4 (groups 4:26 - 4:30). Activity interpreted as having taken place after the Reformation (groups 5:3 - 5:5) was recorded. This activity is placed in period 5 by interpretation rather than empirical dating. The modern material in trench D96 (group 7:16) consisted of the steps into the west front and deposits dumped either side of them. The steps were clearly a modern reconstruction.

2.3 Area E

Two trenches were excavated in area E. E96-1 measured 0.70m (NW/SE) x 0.60m (NE/SW). The excavated area lay on the NW side of the 1992 trench. The position of the foundation had been adjusted after the 1992 excavations. The rest of the foundation lay within the area excavated in 1992. E96-2 measured c. 1.50m x 1.50m. It was excavated to make space for an inspection pit. It was not excavated down to natural. The excavation appeared to stop on post medieval deposits. E96-1 was excavated in 1996, E96-2 in 1998.

2.3.1 Area E group and contexts

The deposits in E96-2 were interpreted as a post medieval drain and grouped in period 6 (group 6:11). The contexts in E96-1 and the other trenches along the southern side H96-9 and 10, were not grouped. These trenches were isolated from the rest of the excavation. The contexts from E96-1 are described below, but are not tied in to the interpretation of the site. E96-1 was machine excavated until burials were uncovered, then hand excavated. E96-2 was machine excavated until the drain was uncovered, this was cleaned and documented. The desired depth had been reached, no further excavation was undertaken.

Group 6:11 E9 E10 E13
Trench E96-1

E1. Turf and topsoil. Over E2.

E2. Layer of gravel compacted to make a path. Under E1, over E3.

E3. Layer of light brown silty clay, contained small stones and brick fragments. Burials EG4, EG5 and EG6 lay within this layer, no grave cuts were identifiable. The layer was 0.50m thick. Under E2, over E7, contained EG4, EG5 and EG6.

EG4. Skull, no grave cut or coffin was visible, but the skull lay in the correct position for an in-situ burial and is recorded as such. The rest of the skeleton lay outside the excavated area. The skull lay within layer E3, physically over EG6. Presumably EG4 was buried in a cut that was not defineable, it is recorded as within E3.

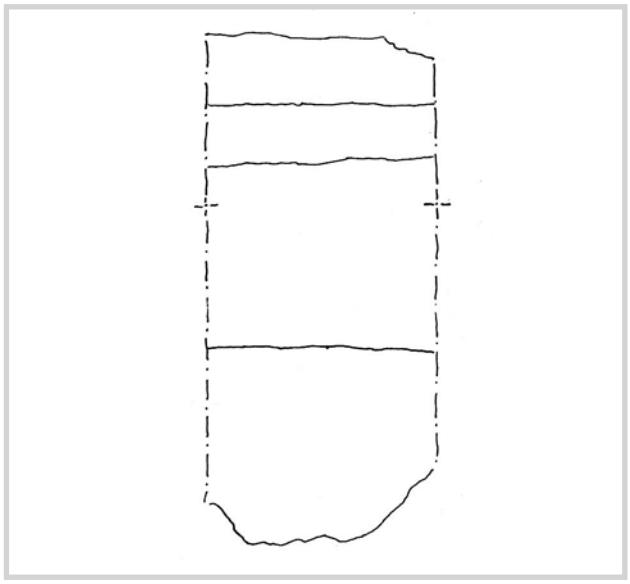


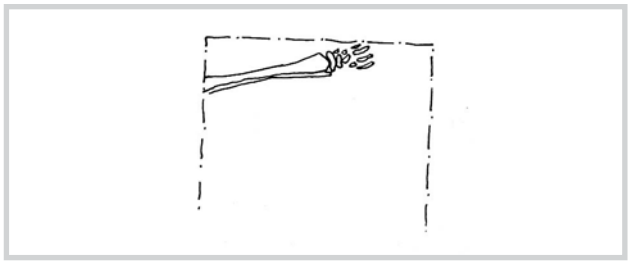
***Fig. 6**. Trench E96-1, north profile.*

EG5. Lower right leg and right foot, the rest of the skeleton lay outside the excavated area. No coffin or grave cut were defineable. The burial lay within layer E3, physically under EG4. Presumably EG5 was buried in a cut that was not defineable, it is recorded as within E3.

EG6. Adult/sub-adult burial, supine, orientated E/W, head to west. Only the lower vertebrae, pelvis and both femurs lay within the excavated area. The right side of the pelvis and the right femur appeared to have been disturbed, these lay close to the edge of the 1992 excavation, which may have resulted in the disturbance. No cut or coffin was defineable. The burial lay within layer E3. Presumably EG6 was buried in a cut that was not defineable, it is recorded as within E3.

E7. Layer of light orange brown clay, contained decayed bedrock fragments. Burial EG8 was recovered from this layer, but was presumably cut down into the layer. E7 ap-

***Fig. 7**. Burial E96-1 EG5.*



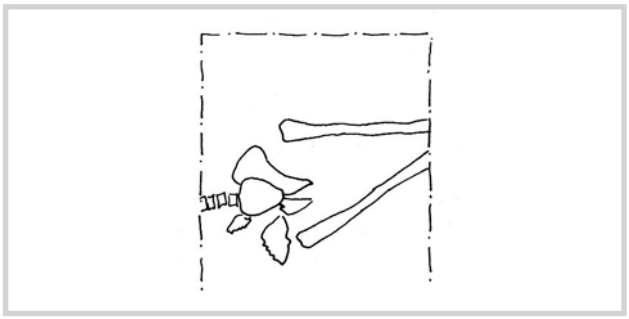


Fig. 8. Burial E96-1 EG6.

peared to be sterile moraine clay. Under E3, over bedrock, contained EG8.

EG8. Articulated feet bones recovered from within layer E7, under the base of the 1992 excavations. Layer E7 appeared to be sterile moraine clay, presumably EG8 was cut into it. No cut or coffin were definable. The heel bones were visible in the section but not recovered. EG8 is recorded as within E7.

2.3.2 Area E summary

E96-1 contained four burials. Trench E96-2 contained a stone drain that is assumed to be of post medieval date (group 6:11).

2.4 Area H

Three trenches were excavated in area H. H96-9 and 10 were small isolated trenches on the southern side of the cathedral. H96-14 was N/S aligned; it was placed outside the west front on the southern side of the steps. It was parallel with the western wall of the cathedral, c. 3m west of the wall. H96-12 and 13 lay within the area excavated in 1992, H96-11 was incorporated into H96-14.

The excavated area of H96-9 was 0.40m (NW/SE) x 0.80m (NE/SW) on the southern side of the 1992 trench. The excavated area of H96-10 was 1m (NW/SE) x 0.60m (NE/SW) on the northern side of the 1992 trench. H96-9 was machine excavated and recorded from profile. The upper part of H96-10 was excavated by machine, the rest was hand excavated. These two trenches were excavated in the first phase of the excavation in 1996. H96-14 was 14.5m long NW/SE x 0.75m wide (NE/SW). The trench was situated on the eastern side of the 1992 trench, that was cut back by 0.75m. The western profile was straightened and documented. No excavation took place on the western side of the trench. H96-14 was excavated in the spring of 1997.

2.4.1 Area H groups and contexts

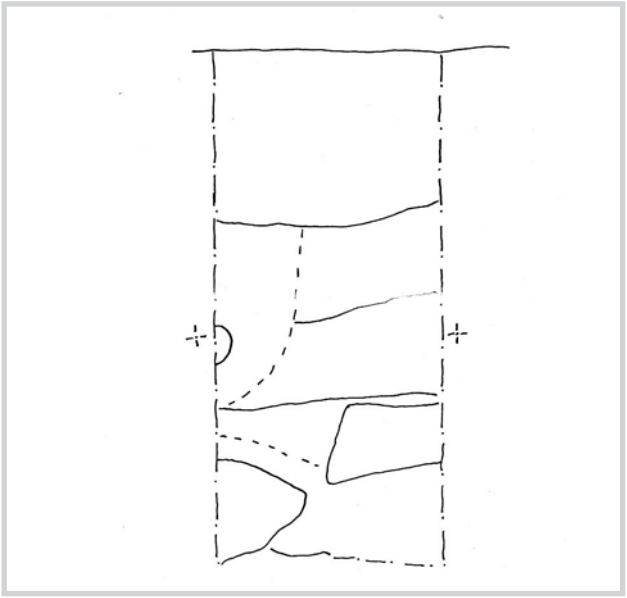
Trenches H96-9 and 10 were isolated on the southern side of the cathedral. the contexts from these trenches are listed below, they were not tied into the interpretation of the site. The contexts from H96-14 were interpreted and are integrated into the site narrative.

Trench H96-14 groups:
Group 7:17 H39 H40 H64 H65 H73 H74 H97
Group 4:31 HG31 HG32 HG33 HG34 HG35 HG36 H46 H47 H48 H49 H50 H51 H52 H53 H54 H55
Group 4:32 HG57 HG60 HG62 HG98 HG99
Group 4:33 HG28 HG29 HG58 HG78
Group 4:34 HG67 HG68 HG77 HG84 HG85 HG86 HG89 HG95
Group 4:35 HG27 HG69 H82 HG83 HG88 HG91 H94
Group 4:36 HG79 H80 H81 HG85 HG87 HG90

Trench H96-9
H10. Layer of dark brown humus rich silt, contained rounded stones, brick fragments and bone fragments. The upper parts of the layer were disturbed by the removal of a tree bole. The layer was 0.25m+ thick, it was cut by grave H26, but due to the disturbance to the stratigraphy caused by the tree bole it is not certain that this relationship is a primary one. Under H26, over H11.

H11. Layer of dark brown humus rich silt, contained small stones, mortar flecks and bone fragments. The layer was 0.25m thick and very similar to overlying H10, with the exception that H11 contained no brick fragments. Under H10, over H12.

Fig.10. Trench H96-9, south profile.



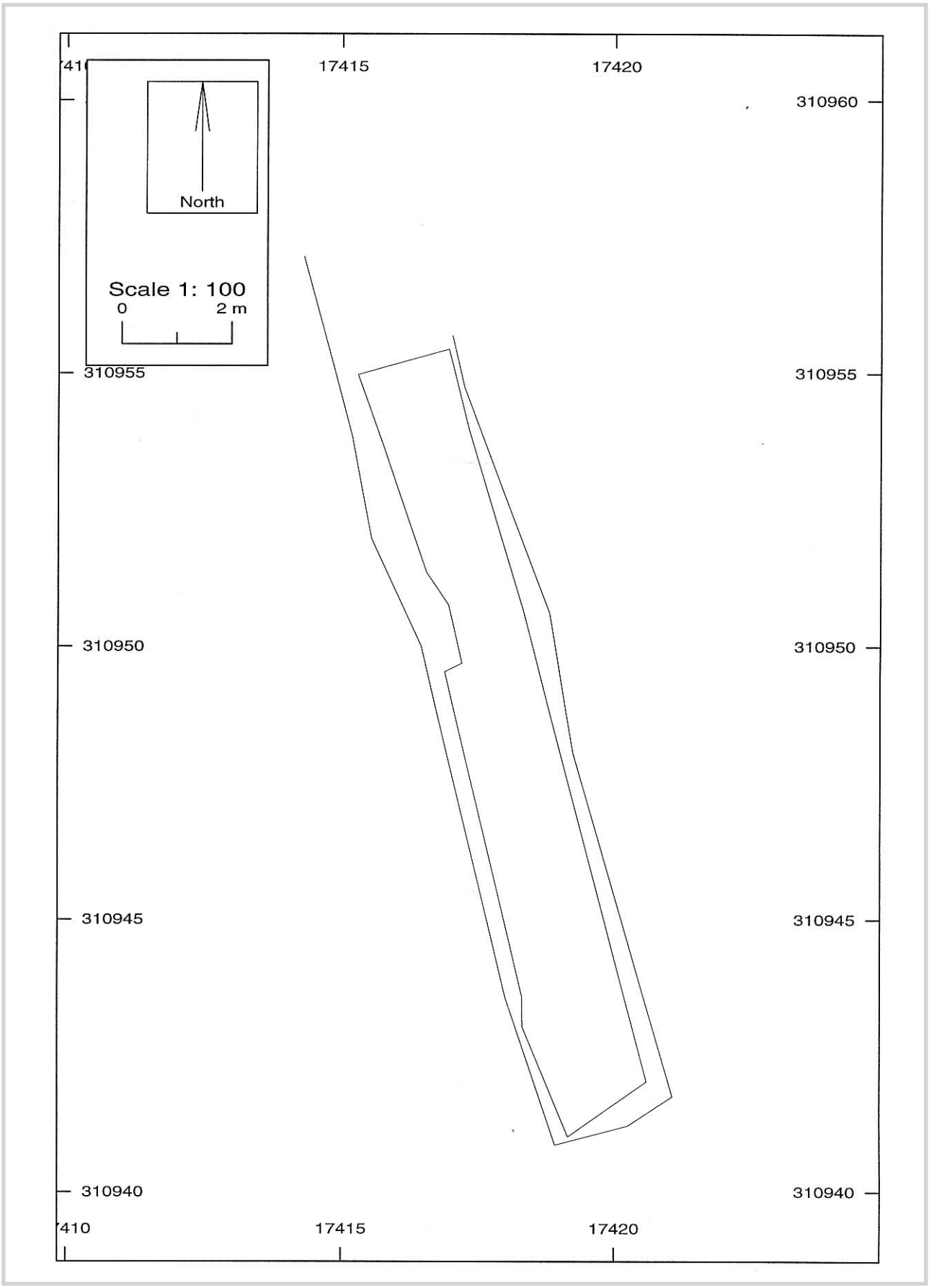


***Fig. 9**. Trench H96-14.*

H12. Layer of reddish brown clay, contained decayed bedrock fragments. Under H11, over H13.

H13. Layer of light orange brown clay, contained decayed bedrock. H23 was sterile moraine clay. The layer was excavated by machine down to the top of bedrock. Under H12, over bedrock.

H14. Fill of dark brown humic clay silt, contained small stones and mortar flecks. Filled grave cut H26 and contained skull HG15. H14 was very similar to H 10 and H11, the layers that the grave cut through. The fill was exposed by machining. Over HG15.

HG15. Skull, the top of which was recovered from the section, appeared to lie within a cut and is assumed to be part of an in-situ burial. Under H14, over H26.

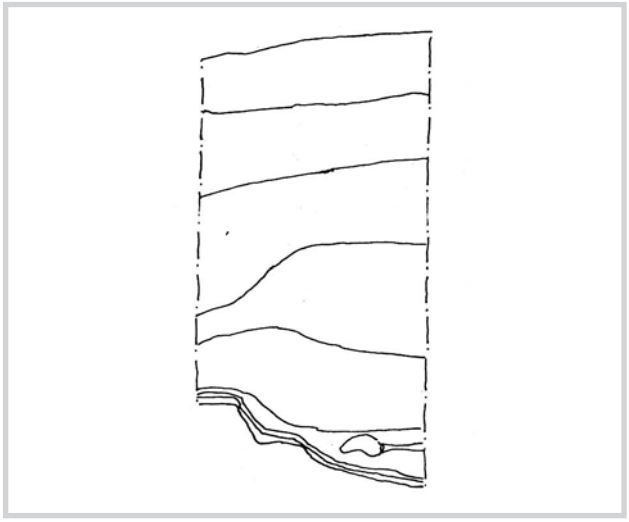
H26. Grave cut, recorded from section, only the western end lay within the excavated area, 0.50m deep, length and width unknown. The western edge was cut at a near vertical angle rounding to the base which lay outside the excavated area. Under HG15, over H10.

Trench H96-10

H1. Layer of grey brown sandy clay silt, contained small stones. The layer was 0.20m thick and appeared to seal the underlying graves, i.e. no grave cuts were registered cutting through this layer. Under H8, over H4 og HG2.

HG2. Adult/sub-adult burial, orientated E/W, supine, head to west. The burial lay partially outside the area of excavation. The right side of the body from the upper arm to the base of the leg, the lower part of the spine, the left hand, the pelvis and the left femur lay within the excavated area. The hands were folded over the abdomen, the right over the left, the right hand lay outside the excavated area. The left femur and arm bones showed signs of disturbance, directly over the burial lay a concentration of disarticulated bone. Under H1, over H3.

***Fig. 11**. Trench H96-10, north profile.*



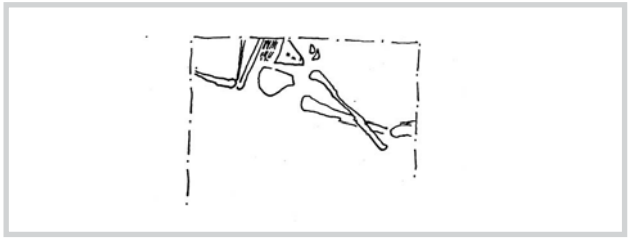


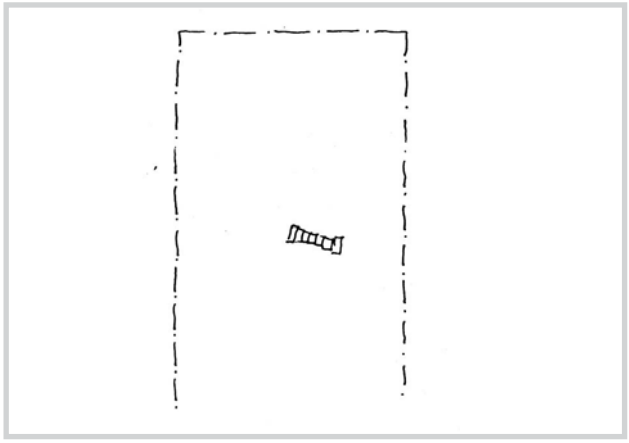
***Fig. 12**. Burial H96-10 HG2.*

H3. Layer of yellow brown sandy silt, contained small stones and slag. Burial HG2 lay within the layer, no cut was visible, burial HG5 also lay in the layer but surrounded by a separate fill, H4. The layer was 0.15m thick and sloped down to the east, following the contours of the bedrock. It is likely that the upper surface of the layer had been truncated. Under HG2 and HG5, over H6.

H4. Fill of dark brown sandy silt, contained stone fragments. HG5 lay within this fill, no cut was registered. The skeleton lay within a pocket of the bedrock, presumably the upper parts of the fill and cut were truncated. Under, H1, over HG5.

HG5. Remains of an E/W orientated supine burial, only the lower spine and a fragment of the pelvis lay in-situ, the rest of the skeleton had been removed. The remains lay in a pocket in the bedrock, the rest of the skeleton may have been removed by a general truncation event, rather than another grave as no burial was recorded over it. No cut was visible. Under H4, over H3.

***Fig. 13**.Burial H96-10 HG5.*



H6. Layer of dark grey sandy silt and small stones, contained brick fragments, 0.02-0.05m thick. Under H3, over H7.

H7. Layer of orange brown mineral silt and decayed bedrock, 0.02m thick. Under H6, over bedrock.

H8. Layer of light grey brown gravely, sandy silt, contained bone fragments and brick fragments. The layer sloped down to the west, possibly due to truncation, 0,30m thick to the east, 0.05m thick to the west. Under H9, over H1.

H9. Layer of light grey brown gravely, sandy silt, contained bone fragments. Under H16, over H8.

H16. Turf and topsoil. Under H17, over H9.

H17. Mixed deposit of clay, sand, brick fragments, mortar flecks and limestone fragments, lay upon a cloth membrane and appeared to have been spoil from the 1992 excavations. Over H16.

2.4.2 Area H summary

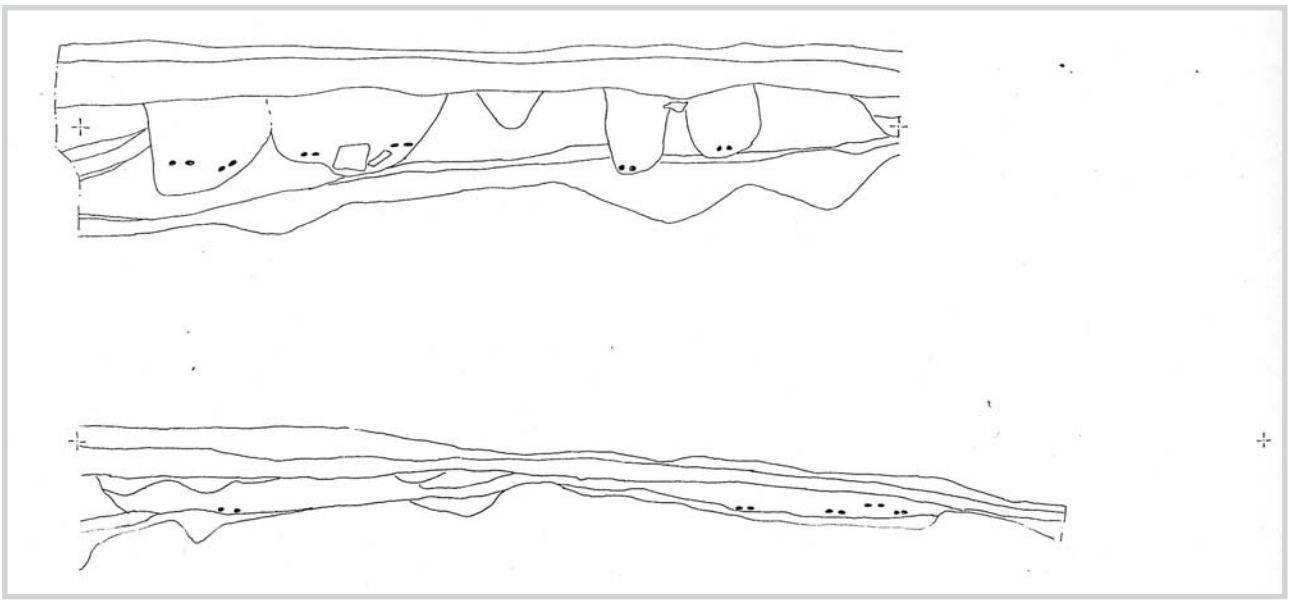
Trench H96-9 contained one burial, H96-10 two burials. The natural terrain in trench H96-14 (group 1:15) consisted of moraine clay over bedrock. Remains of the original turf horizon (group 1:14) was recorded from the eastern profile. Make-up dumps of stone working debris were present in the eastern profile, to the west these had been reworked into a grave soil. Very little stratigraphy was discernable in the western profile. The make-up dumping and grave soils were grouped into period 2 (group 2:30).

Six groups of graves were recorded in H96-14, thirty two burials in all, all of which were from period 4. Groups 4:31 and 4:32 consisted of graves recorded in the eastern profile, these burials were not excavated. Groups 4:33 – 4:36 consisted of burials and graves excavated from the western side of the trench. The modern material in trench H96-14 (group 7:17) consisted of re-deposited demolition rubble and a thin charcoal layer. These had been deposited directly upon the top of the medieval graves. It appeared as though the top of the grave soils had been truncated, presumably when the demolition deposits were cleared from the area.

2.5 Area J

Eight trenches were excavated in area J, which lay around the NW corner of the churchyard. J96-1 - 5 along the north side, J96-6 at the NW corner, J96-7 and 8 lay outside the west front, north of the steps. All were small trenches dug to house foundations. The position of the foundations had been adjusted after the 1992 excavations. The excavated areas of trenches J96-1 - 6 lay on the north side of the 1992 trench, the excavated areas of J96-7 and 8 on the west side of the existing trench. J96-1 and 2 were 1m long (NW/SE) x 0.80m (NE/SW), J96-3 and 4 c. 1.70m long (NW/SE) x 0.80m (NE/SW). J96-5 was incorporated into P96. J96-6 was 1.80m long (N/S) x 1m wide (E/W), J96-7 c. 1m x 1m, J96-8 was 1.30m long (E/W) x 1m wide (N/S). The upper deposits of trenches J96-1 - 4 were machined off and the rest of each trench excavated by hand. The trenches outside the west front were deep, the upper deposits were cleared from the whole area prior to the trenches being excavated. JG115

***Fig. 14**. Trench H96-14, east profile showing groups 4:31 and 4:32.*



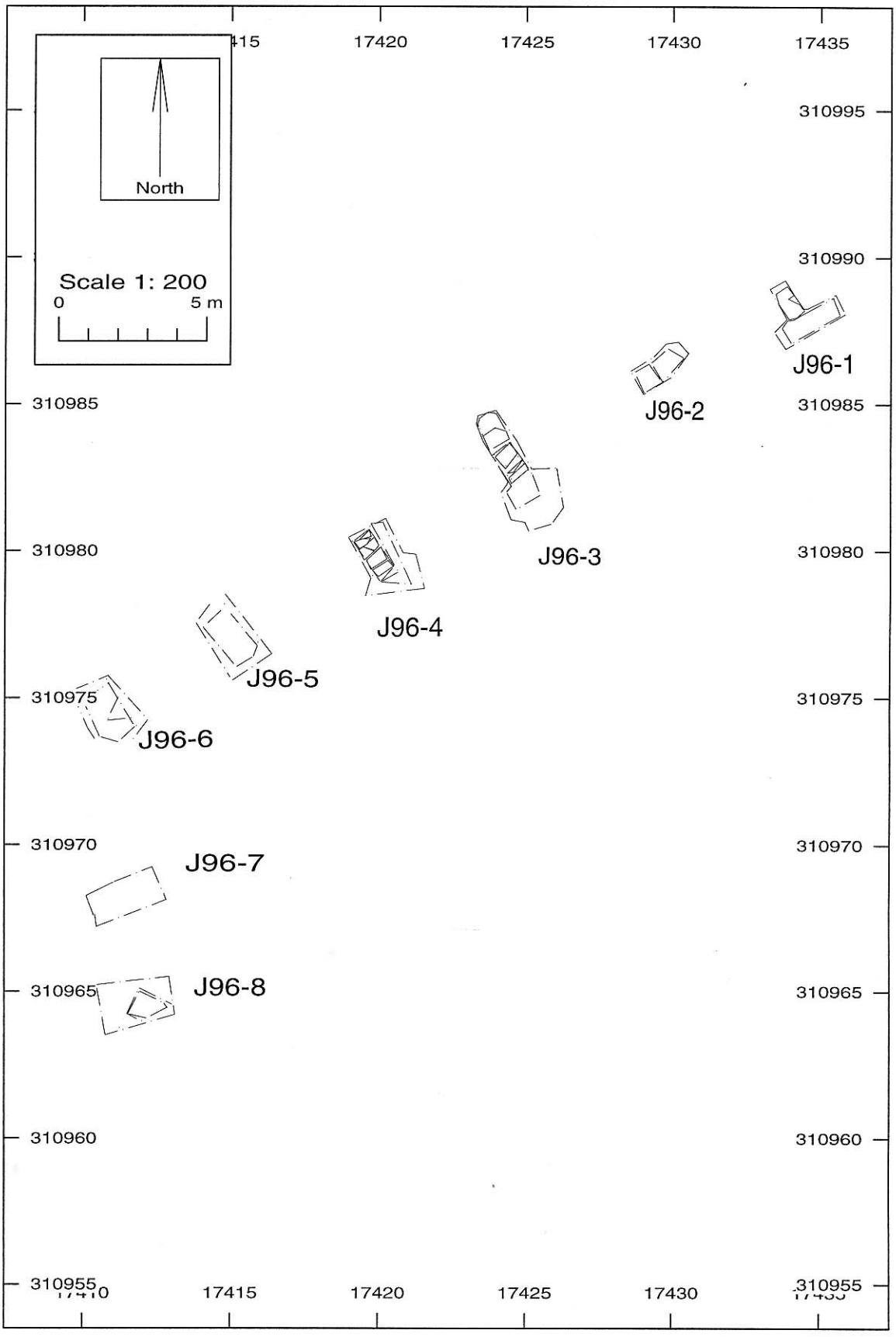


***Fig. 15**. Trenches J96-1 - 8.*

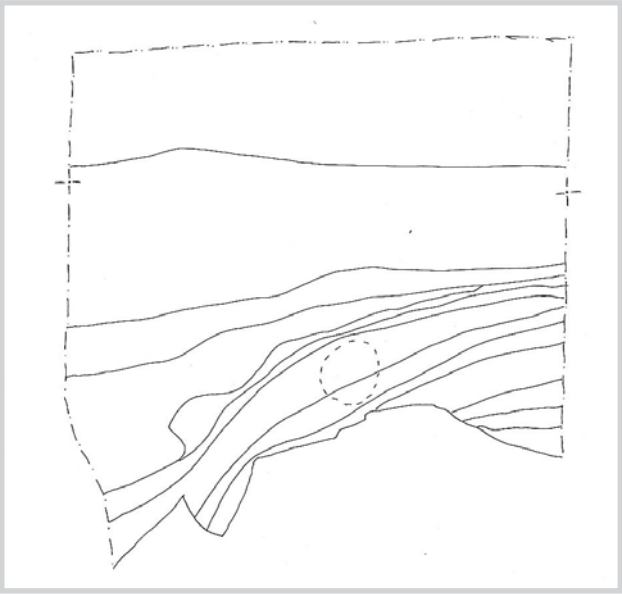


***Fig. 16**. Trench J96-6, north east profile showing groups 2:22 and 4:16.*

***Fig. 17**. Trench J96-8, north east profile showing groups 2:23, 4:18 and 4:19.*

in trench J96-8 was exposed by this machining. J96-6 was excavated using a combination of hand and machine excavation, the profile was recorded. J96-7 was so deep and narrow it was considered unsafe. The trench was machine excavated under supervision and allowed to freeze. The frost stabilised the sides of the trench, but didn't allow detailed documentation of the profile. A cursory description of the deposits is included below. These were not divided into contexts but are described in blocks. After JG115 was uncovered J96-8 was excavated by hand. A temporary tent was constructed over this trench. These trenches were excavated in the first phase of the project in 1996. J96-8 was not completed until January 1997.

2.5.1 Area J groups and contexts

Group 7:10 J74 J78
Group 7:11 J105 J114
Group 7:12 J168 J170
Group 7:13 J171 J176
Group 5:2 J172 J173 J174 J178
Group 4:14 J77 J79 J80 J81 J82 J83 J84 J86 J87 J88 J89 J90 J91 J92 J93 J97 J98 J100 J107
Group 4:15 J99 J102
Group 4:16 J147 J136 J137 J138 J162
Group 4:17 JG115
Group 4:18 JG116 J117 J118 J119 J120
Group 4:19 J121
Group 2:21 J94 J95 J96 J101 J103 J104 J109 J111
Group 2:22 J139 J140 J141 J142 J143 J144 J145 J146 JG148
Group 2:23 JG122 J123 JG124 J125 J167 J169
Group 2:24 J126 J127 J130 J131 J132 J133 J134 J135
Group 1:9 J161
Group 1:10 J128
Group 1:11 J129

Trench J96-7

J163. Yellow mortar and stone deposit. The upper part of the layer was removed by machine, 0.30m+ thick. Over J164, same as J171.

J164. Brownish grey silty clay deposits, contained stone inclusions of all sizes, mortar lumps and flecks. Both mortar and stone was present throughout, but mortar was concentrated towards the base. A concentration of medium sized stones was registered in the middle of the context. The upper surface was roughly horizontal, the lower surface sloped down to the west, 0.75m thick to the east, 1m thick to the west. Clearly more than one layer, appeared primarily to be make-up deposits. Under J163, over J165.

J165. Orange brown silty clay deposits, contained small stones throughout. A number of distinct layers were visible, the clay layers were interleaved with gravel and stones chips. 0.70-0.80m thick. Under J164, over J166.

J166. Stone chips and gravel deposits interleaved with occasional clay and sand layers. The upper surface was roughly horizontal. The deposits lay directly over bedrock in the eastern half of the trench which sloped sharply down to the west. It was not possible to expose the bedrock in the western half of the trench due to diffi-

culties resulting from the depth of the trench. Under J165, over bedrock.

2.5.2 Area J summary

The natural deposits in all of the J trenches consisted of bedrock. A mineral silt was documented over the bedrock in trenches J96-6 (group 1:9) and J96-8 (group 1:1). The original turf horizon was recorded in J96-8 (group 1:10). The natural deposits were not documented in trenches J96-1 – 4. A series of make-up dumps were deposited in J96-8 in period 2 (group 2:24), two burials were placed in this period (group 2:23). In trenches J96-1 – 4 and J96-6 the silt layers that lay over the bedrock were placed in period 2 (groups 2:21 and 2:22). In J96-3, 4 and 6 a series of silt layers were recorded. The turf in these trenches may pre-date the construction of the cathedral, but the area appeared to continue to be open into period 2 and possibly into period 4. The build up that was registered was probably small scale and took place over a period of time, not as part of a concerted attempt to build up the ground level. In period 4 large scale dumping was registered in J96-6 (group 4:16) and J96-1 – 4 (groups 4:14 and 4:15). In trench J96-8 two burials were interred in a thick grave soil (groups 4:17, 4:18 and 4:19). Some small scale dumping was registered in trench J96-8, this was placed in period 5 (group 5:2). Thick demolition rubble was re-deposited around the NW corner after the demolition deposits were cleared away from the ruin (groups 7:11 and 7:13) before the turf re-established itself (groups 7:10 and 7:12).

2.6 Area M

Trenches M96-7 - 10 were excavated by hand in a tent under artificial lighting conditions. The trench was situated outside the NE corner of the cathedral. It was 32m long (NE/SW) and varied in width from 1m - 3m. In the central part of this area the bedrock lay directly under the turf. This area was excavated as four separate trenches, these were merged during post-excavation analysis. These trenches were excavated during the first phase of the project in 1996.

Trenches M96-11 - 14 were excavated during the spring and summer of 1997, M96-15 in 1998. Trench BF96, that cut through the Bishops Foundation was merged with these trenches during post-excavation analysis. It was originally excavated in 1996, but was widened slightly during 1997 and partially exposed in trench M96-15. M96-11 was roughly NW/SE aligned, it was 10m long x c. 0.5m wide and lay on the western side of the 1992 trench. The upper deposits were excavated by machine, the rest of the trench was excavated by hand and documented in profile. The two graves that were uncovered were documented in plan. M96-12 and 13 were extensions to both M96-7 - 10 and M96-11, these were excavated roughly by hand and incorporated into the other trenches. M96-14 was an extension to M96-11 on its western side. The top of the trench was cut back at an angle by hand. This area was not excavated down to natural. M96-15 was an open area investigation between the Bishops Foundation and the cathedral, c. 5m x 5m in area. The turf was stripped off and the medieval deposits cleaned and documented, no excavation took place.

2.6.1 Area M groups

Group 7:8 M30 M34 M35 M37 M38 M39 M40 M41 M44 M47 M62 M64 M7 M82 M84 M85 M110
Group 7:9 M120 M121 M123 M153 M156 M157 M163 M167 M168 M169 M184 M185 M186 M195 M197 BF31
Group 4:12 M139 M140 MG141 M143 M151 M165 M166 M171 M172
Group 4:13 MG160 M161 M187 M189 M190 M191 M193 M194 M198 BF30 BF32 BF33 BF34 BF35 BF37 BF38
Group 3:10 M42 M43 M45 M46 M49 M70
Group 3:11 M48 M51 M52 M54 M63 M68 M69 M76
Group 3:12 M50 M66 M73 M75
Group 3:13 M86 M87 M89 M90 M91 M92 M111 M112 M113 M114 M119
Group 3:14 M142
Group 3:15 M124 M125 M126 M130 M131 M132 M136 M138 M149 M152 M154 M155 M158 M159
Group 3:16 M128 M129 M137 M145
Group 2:19 M127 MG144 M146 M162 M164
Group 2:20 M122
Group 1:5 M95
Group 1:6 M53
Group 1:7 M134
Group 1:8 M135

2.6.2 Area M summary

The bedrock in area M undulated, moraine clay lay against the sloping bedrock and 'filled' in the hollows. The natural terrain sloped down slightly to both the west and south from the highest point around the NW corner. The bedrock lay just under the turf in the middle and eastern end of trenches M96-7 - 10, moraine clay (group 1:6) lay against the bedrock at the western end of the trench and lay between two upstanding bedrock knolls at the eastern end. At the northern end of trench M96-11 bedrock lay just beneath the turf, the bedrock sloped down sharply to the south in the middle of the trench,

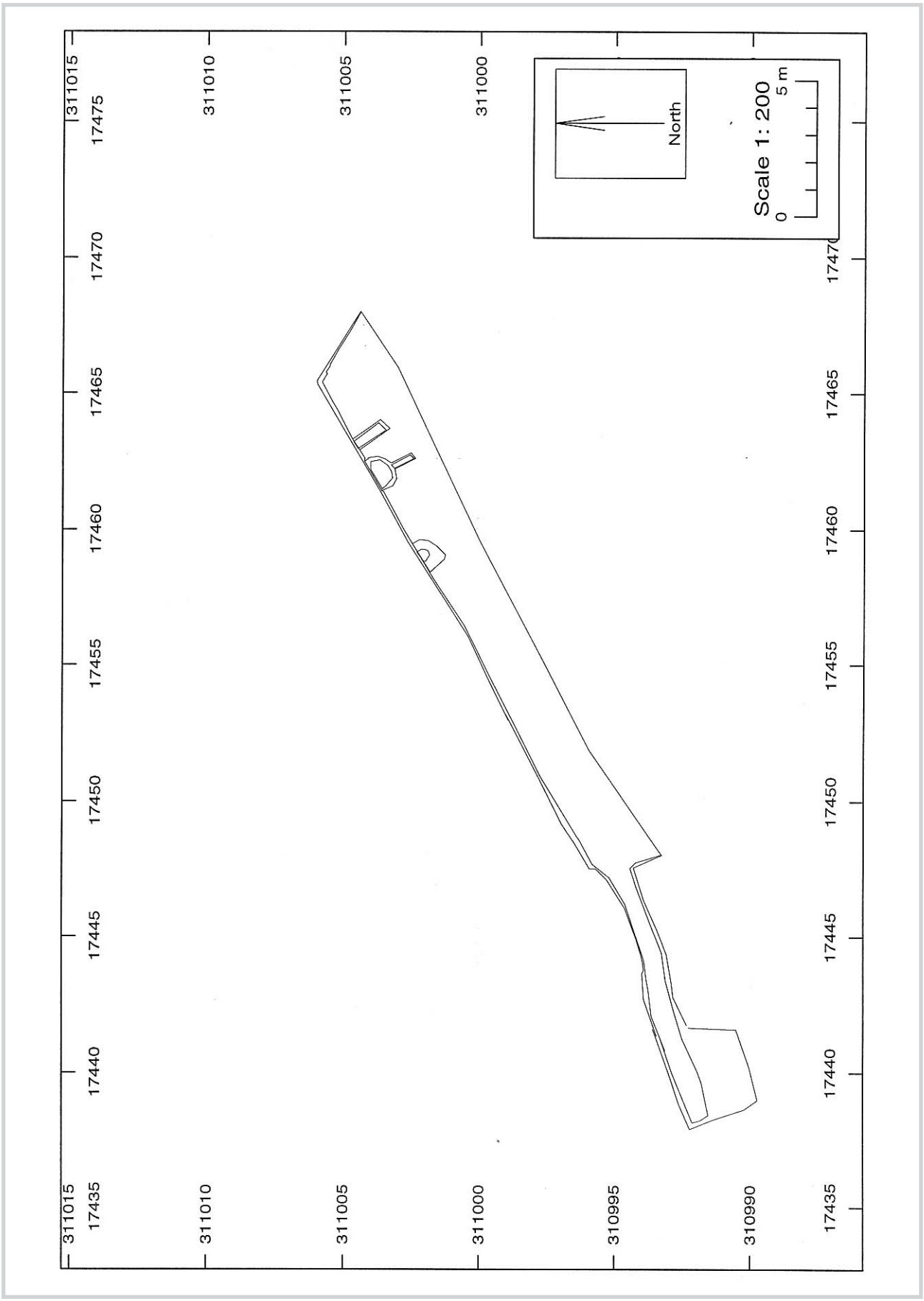


***Fig. 18**. Trenches M96-7 - 10.*

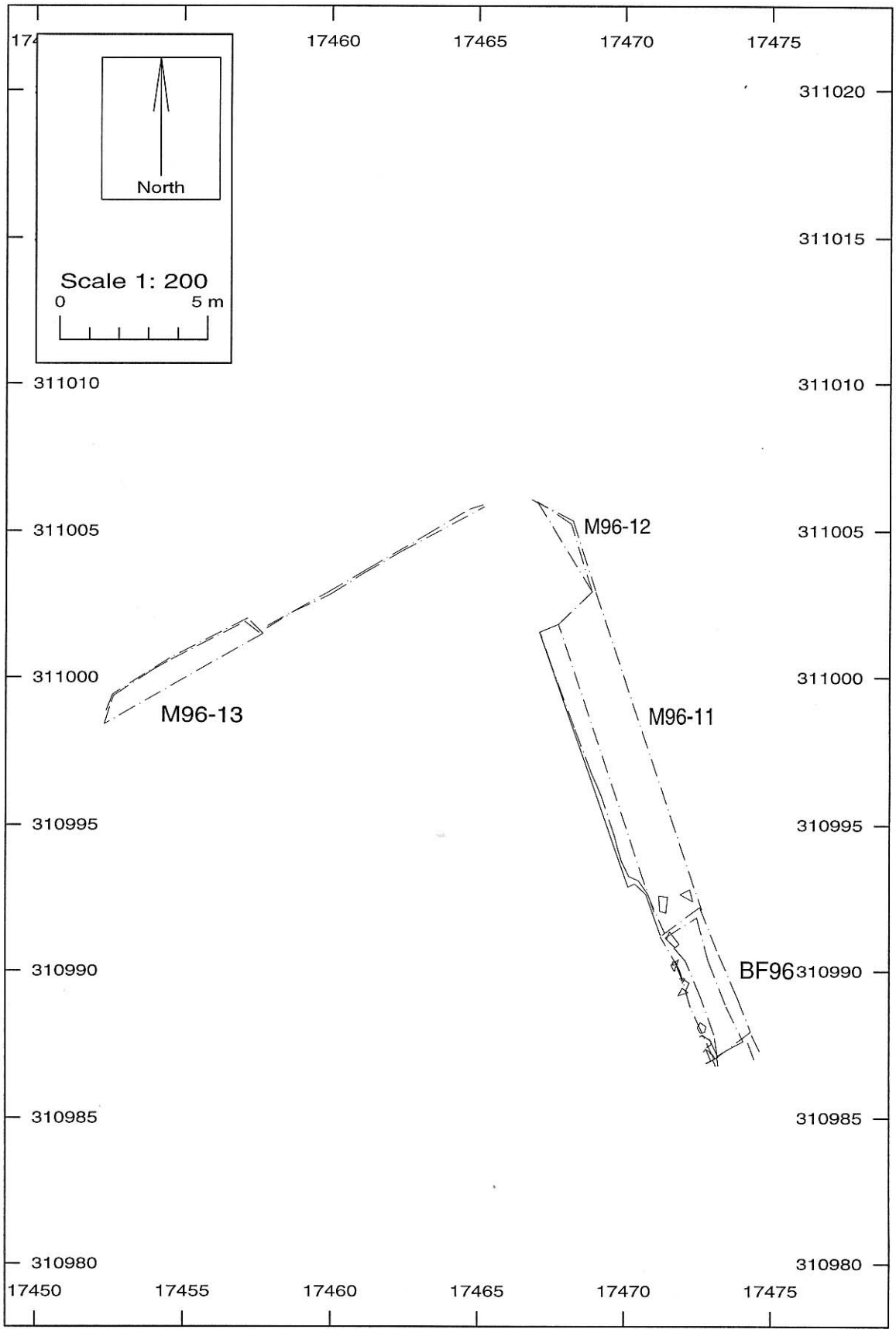


***Fig. 19**. Trenches M96-11 - 13 and BF96.*

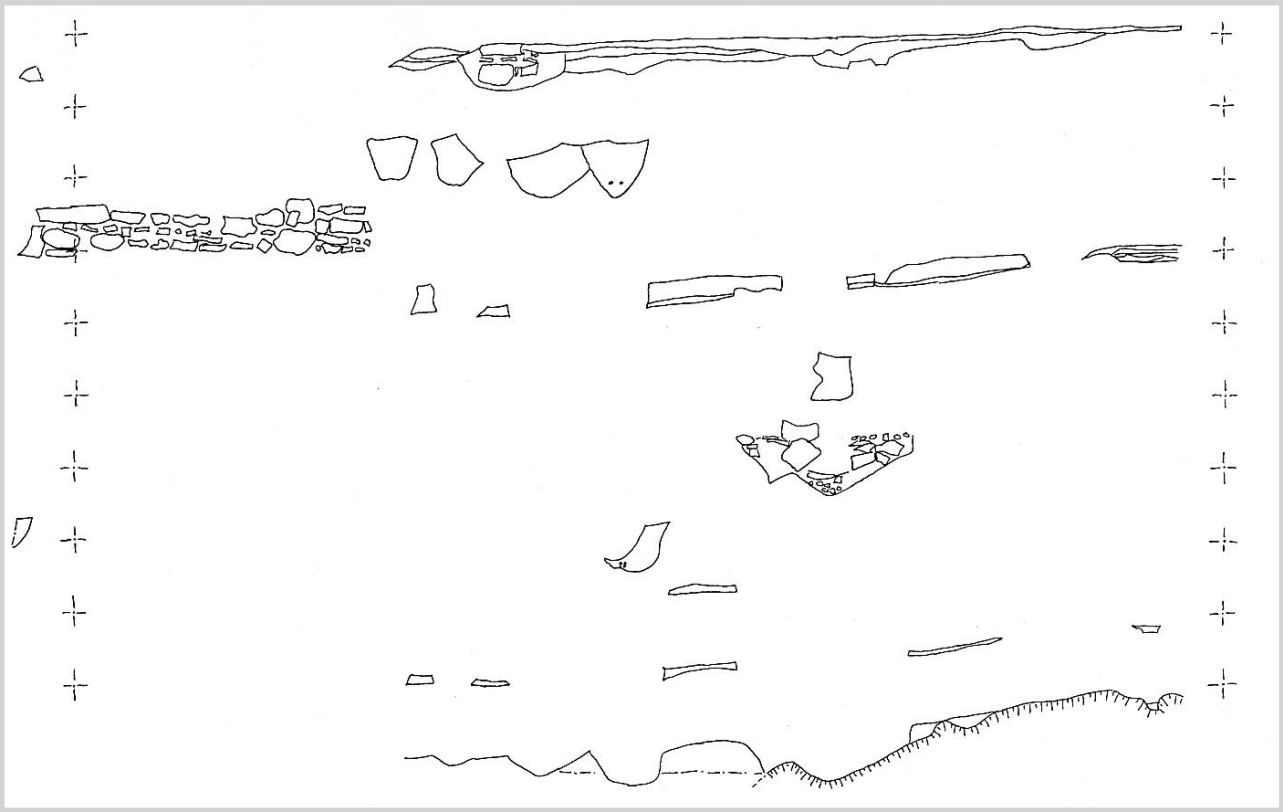


***Fig. 20**. Trench M96-11 and BF96, exploded view of the west profile showing groups 7:9, 4:12, 4:13, 3:14, 3:15, 3,16, 2:19, 2:20, 1:7 and 1:8.*

moraine clay (group 1:8) lay against the bedrock. Traces of the original turf horizon were present in two small patches at the western end of M96-7 - 10 (group 1:5). It was present over all of M96-11(group 1:7), except where it had been truncated by later cut features. In trench M96-7 - 10 all the archaeological deposits lay over the moraine clay. In trench M96-11 however the terrain had been deliberately raised by the dumping of construction debris (group 3:15).

In period 2 a thin layer of re-deposited moraine clay was spread over trench M96-11 (group 2:20) and a single grave dug (group 2:19). None of the layers in M96-7 - 10 were interpreted as belonging to period 2. Two post holes in M96-7 - 10 (group 3:11) and one in trench M96-11 (group 3:16), were dug in period 3. In each trench the ground surface was built up to the level of the post holes after they were cut (groups 3:11, 3:12 and 3:15). The post holes were also filled in (groups 3:10 and 3:14). In period 4 the Bishops Foundation and associated walls (group 4:13) were constructed. The foundation is interpreted as supporting a walkway from the Bishops Residence into the cathedral. One of these walls appears to indicate that the room north of the chancel was constructed at the same time as the Foundation. One grave and four other possible graves were dug in trench M96-11 in period 4 (group 4:12). No deposits interpreted to period 4 were recorded in trench M96-7 - 10. Modern activity was registered in both trenches (groups 7:8 and 7:9). Some of the deposits in trench M96-7 - 10 may have been refuse dumps related to the farm activity, as such they should perhaps be placed in period 6.

2.7 Area P

Trench P96 was located at the NW corner of the cathedral. It was 15m long (NW/SE) x 4m wide (NE/SW). The trench ran down the slope towards the churchyard wall. The various phases of walling were excavated. The stones of the outside, northern face were marked so that the wall could be reconstructed. On the other side of the churchyard wall, in trench Q96, an underground room was constructed to house all the electrical and ventilation equipment. Trench P96 was dug to accommodate the cables and ventilation channels that connected the technical room with the building. The area at the top of the slope was machined off during the first period of the excavation in 1996, but the trench was not excavated until the second phase in 1997. Most of the trench was excavated by machine. The extensive demolition deposits (group 4:24) were initially assumed to be from the collapse of the cathedral and were machined out. Once the profile had been cleaned it became clear that they were of medieval date. The churchyard wall was excavated by hand, with

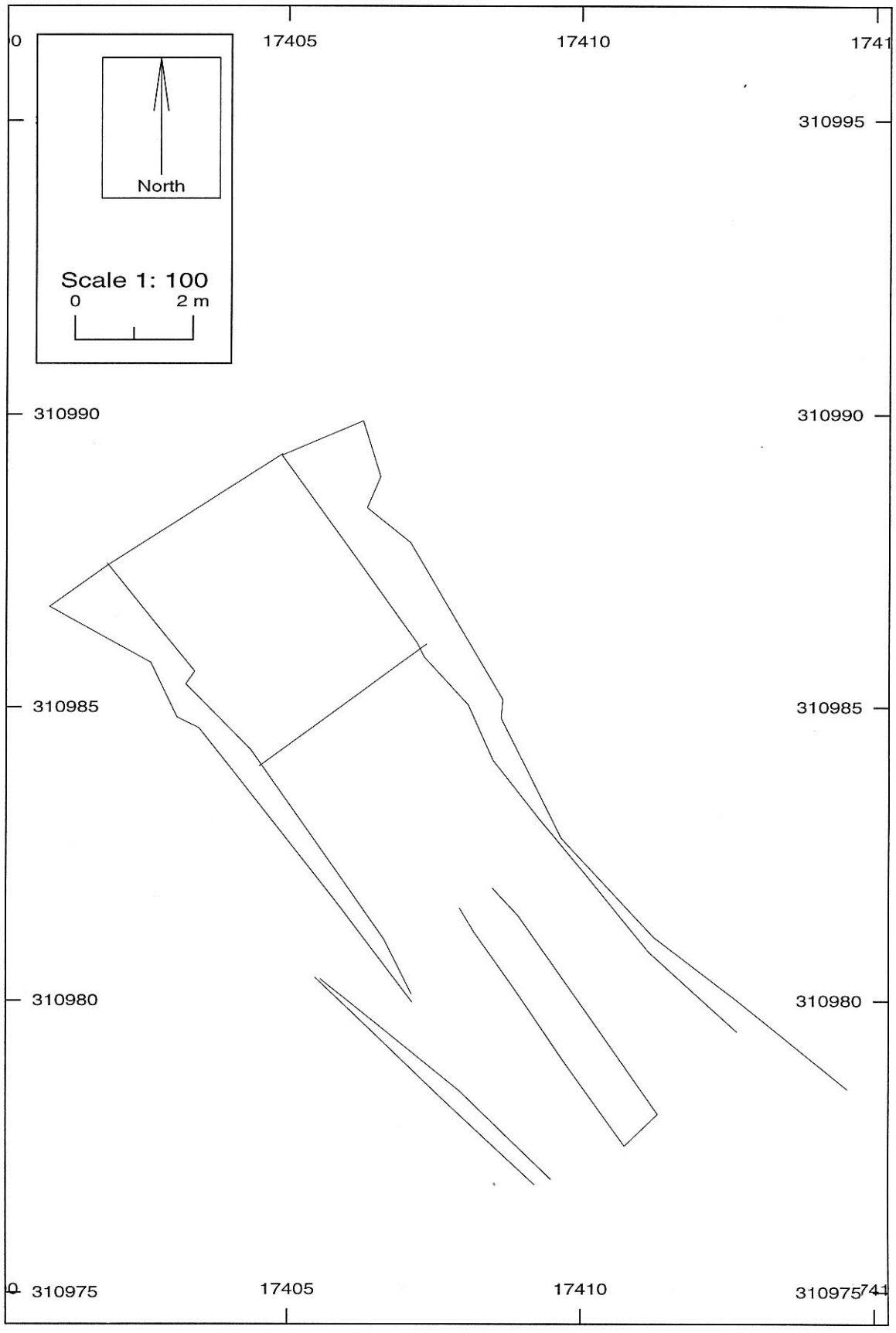


***Fig. 21**. Trench P96.*

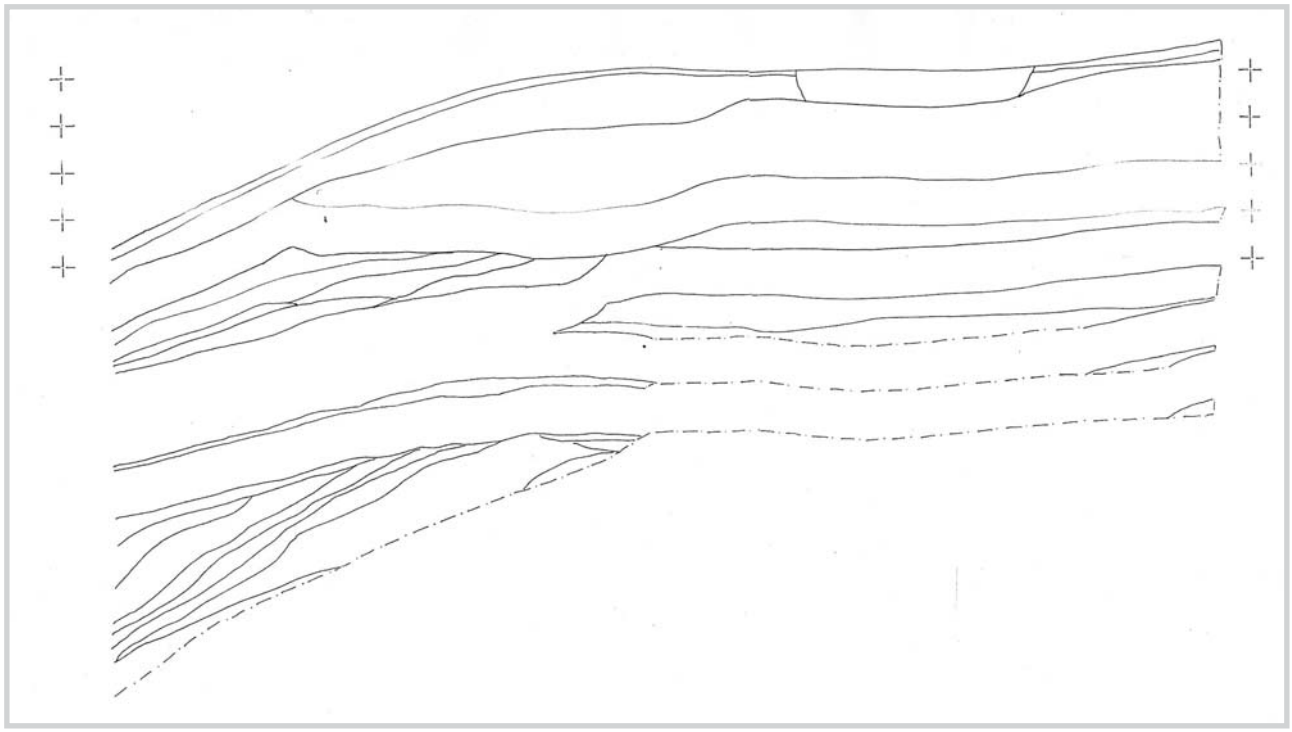
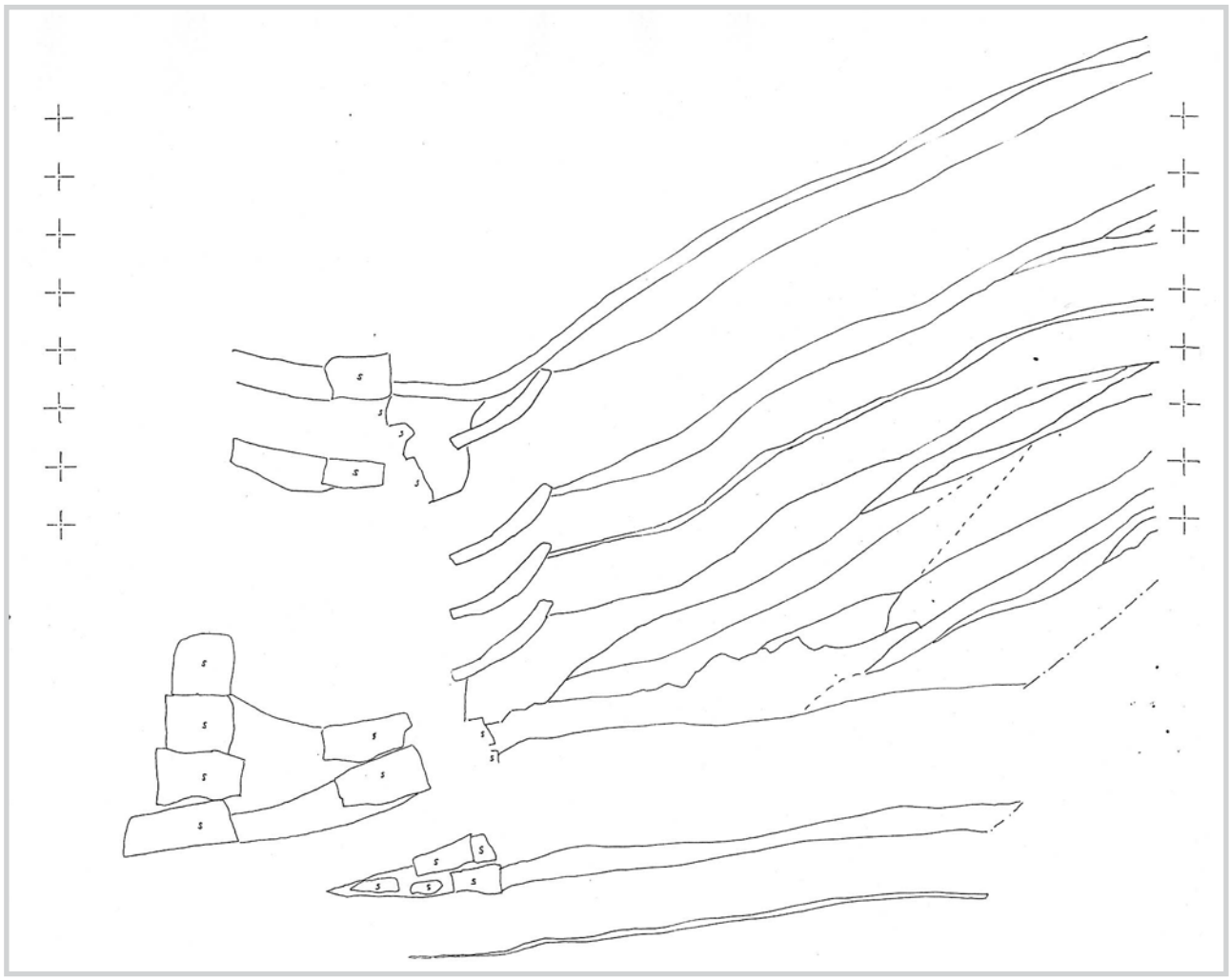


***Fig. 22**. Trench 96, exploded view of the north east profile, showing groups 7:14, 4:20, 4:21, 4:23 and 4:24. See also fig.23.*

***Fig. 23**. Trench P96, exploded view of the north east profile, showing groups 7:14, 7:15, 4:20, 4:23, 4:24, 4:25, 2:25 and 2:26. See also fig.22.*



the assistance of a mobile crane. The trench was documented in profile, the churchyard wall in plan.

A small area at the top of the slope was dug to a deeper level by hand to accommodate one of the pipes. The NE edge of the trench was later cut back by c. 0.50m by machine. This action was necessary as changes to the position of the technical room meant that the trench was not wide enough. The deposits that were encountered were the same as those documented in the profile, no further documentation was undertaken.

2.7.1 Area P groups

Group 7:14 P1 P2 P3 P27 P28 P58 P61
Group 7:15 P29 P30
Group 4:20 P4 P60 P76 P77 P78 P79
Group 4:21 P5 P6
Group 4:22 P24 P25 PG26
Group 4:23 P62
Group 4:24 P8 P18 P31 P34 P38 P40 P41 P53 P56 P63 P64 P65 P66 P67 P68 P69 P70 P71 P72 P73 P74 P80 P81 P84 P85
Group 4:25 P47 P48 P49 P50
Group 2:25 P51 P52 P57
Group 2:26 P55

2.7.2 Area P summary

Moraine clay was partially exposed in trench P96 at the base of the slope, it was not recorded. The natural terrain was not exposed over the rest of the trench. The oldest turf horizon was P55 (group 2:26). This may have been the remains of the original turf horizon, but if so it must have continued to be open into period 2. The earliest churchyard wall (group 2:25) was built upon this layer. This wall was replaced in period 4 by larger mortar bonded wall (group 4:25). A series of demolition and construction debris layers (group 4:24) were dumped down the slope against the churchyard wall. A turf horizon (group 4:23) formed over the demolition deposits before more layers were dumped at the top of the slope (group 4:20) and also down the slope (group 4:20). A grave (group 4:22) was recorded in the extra pipe trench dug at the top of the slope. In period 7 the inside face of the churchyard wall was repaired twice and redeposited demolition deposits dumped at the top of the slope (groups 7:14 and 7:15).

2.8 Area Q

Trench Q96 was 19m long (NE/SW) x 15m wide (NW/SE). It was located at the base of trench P96, outside the churchyard wall. It was dug to house an underground room that contained all the electrical and ventilation equipment for the protective structure. Service trenches S96 and T96 connected with Q96 on its SW and NE sides respectively. The trench was excavated in 1997, it was machine excavated down to natural, the surface cleaned and the exposed cut features were hand excavated. The layers that lay against the churchyard wall were partially investigated by hand.

2.8.1 Area Q groups

Group 7:20 Q1 Q2 Q40 Q45 Q46 Q47
Group 6:6 Q3 Q49
Group 4:42 Q5 Q6
Group 4:43 Q4
Group 2:31 Q13 Q14 Q16 Q17 Q18 Q19 Q20 Q21 Q30 Q31 Q34 Q35 Q38 Q39
Group 2:32 Q7 Q8 Q9 Q10 Q11 Q12 Q15 Q22 Q23 Q24 Q25 Q26 Q27 Q28 Q29 Q32 Q33 Q36 Q37 Q41 Q42 Q43 Q44
Group 1:18 Q48

2.8.2 Area Q summary

The natural terrain in Q96 consisted of gravels at the west end of the trench and moraine clay at the eastern end. Where the two met marked an old beach line of Lake Mjøsa. A series of cut features had been dug into the clay. A number of these features could be related to the use of hot stone technology (group 2:32). Two traditional cooking pits and several other features that may have been used to heat stones to boil water were recorded. Several other features whose function was unclear were also present (group 2:31).

Two silt layers, probably successive turf horizons covered the whole trench. The earliest (group 4:43) dated to the medieval period. The second churchyard wall in trench P96 (group 4:25) was constructed upon it. A later turf horizon (group 4:42) butted this wall. This layer may also have its origins in the medieval period but continued to be open into the post medieval period. A later turf layer (group 6:6) covered this. A number of layers of demolition deposits were dumped against the churchyard wall in period 7.

2.9 Area R

Area R signifies the investigations inside the ruin. The turf was removed in several areas, primarily to reduce the ground level to allow a flagstone floor to be laid. In the crossing and north transept it was necessary to excavate some of the medieval deposits to reduce the ground level to the required height. Limited excavation was under-

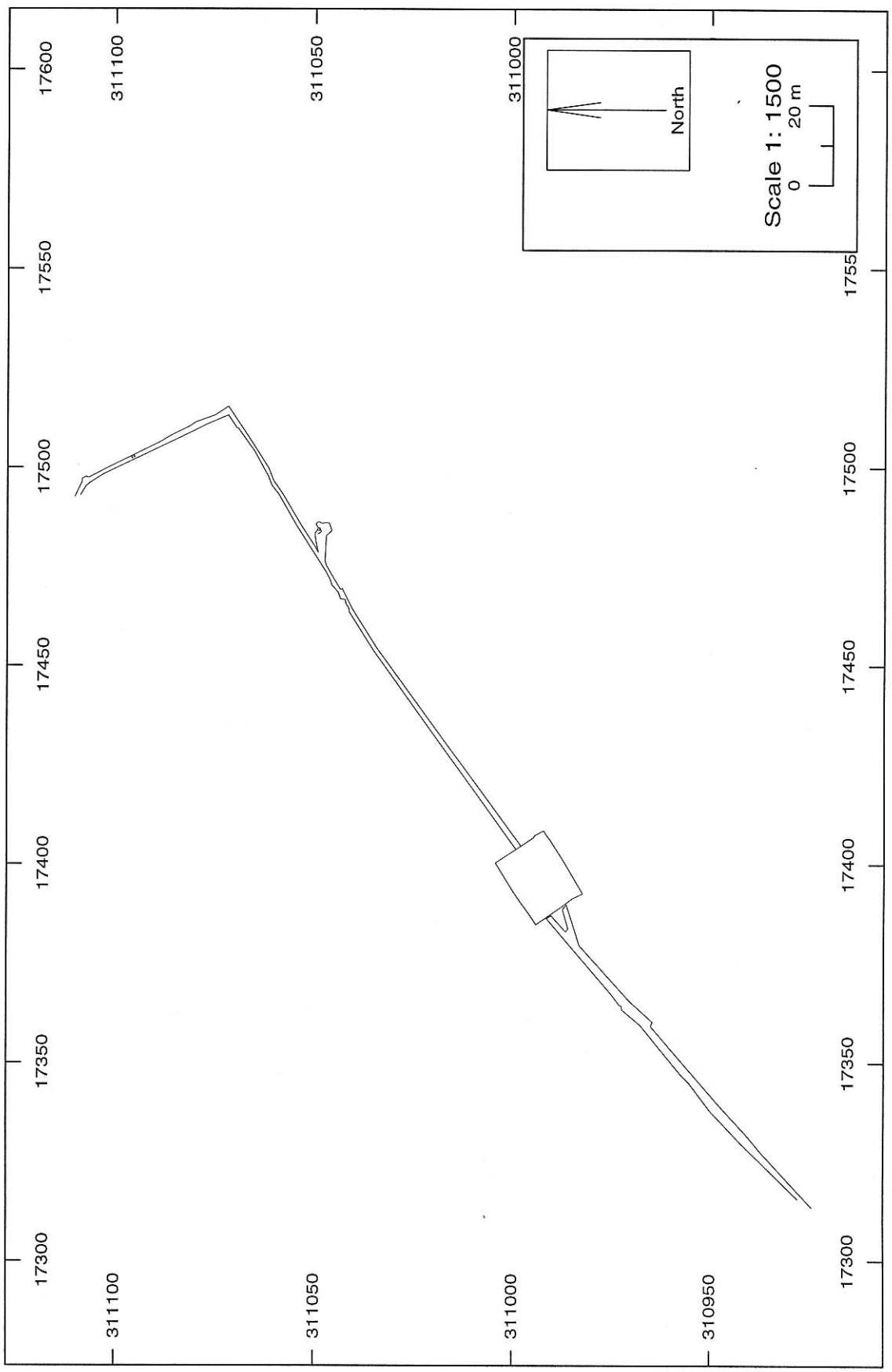


***Fig. 24**. Trenches Q96, S96 and T96.*

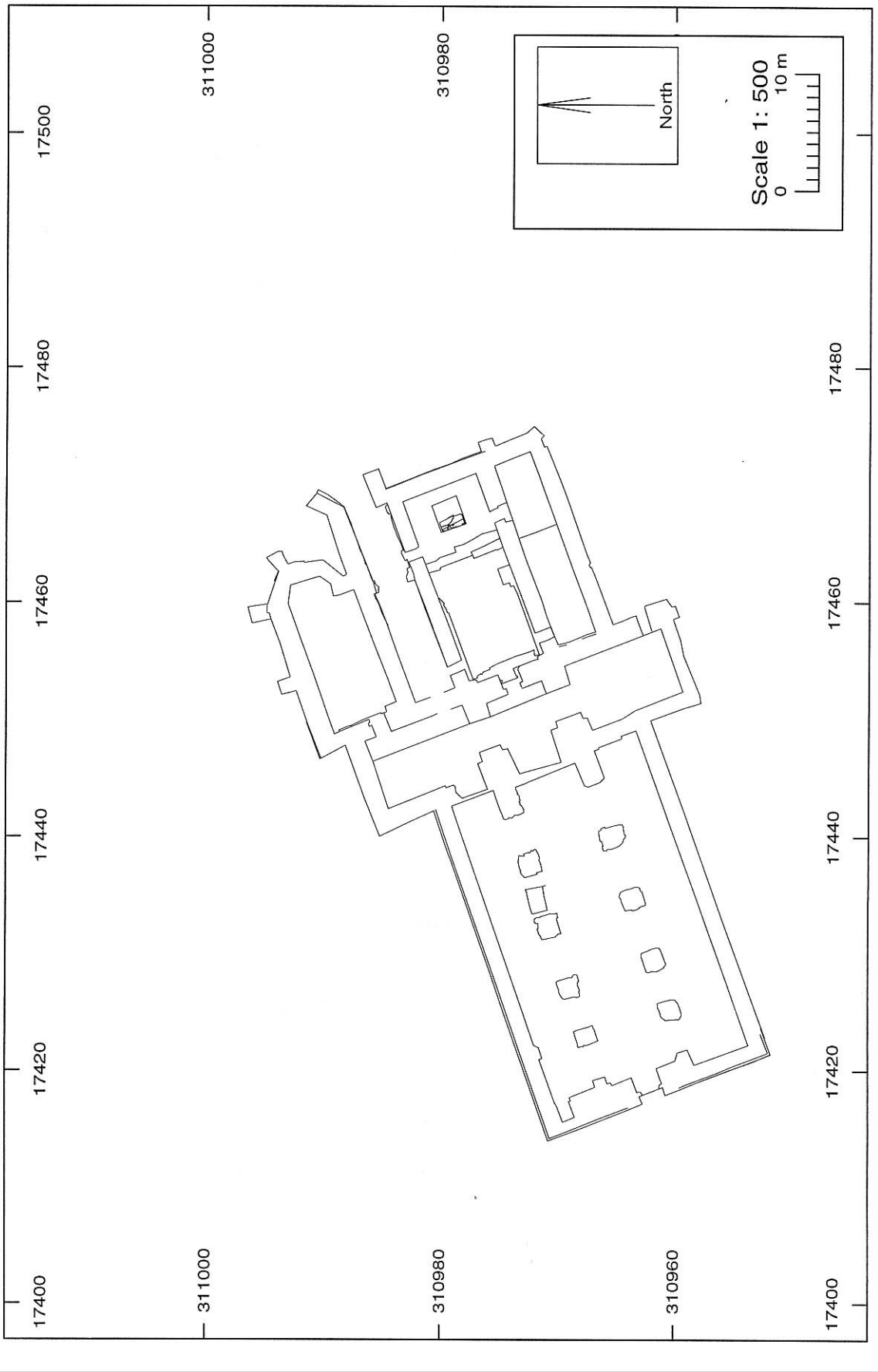


***Fig. 25**. Plan of the cathedral ruin.*

taken in the room under the SW tower. A grave chamber between the column bases of the north arcade was excavated and a triple grave in the crossing was also excavated. Seven 1m x 1m test pits were dug to determine the degree of preservation inside the ruin. All but one of these, the test pit in the Sacristy (see groups 4:10 and 4:11) lay in an area that was later de-turfed. The test pits were dug in the summer of 1997. The rest of the work in the ruin took place in the winter of 1997 and spring 1998. The work in the crossing and transepts was undertaken inside a tent, under artificial lighting conditions.

The whole of the north aisle and the spaces between the column bases in the north arcade, an area of 26.5m (E/W) x 5m (N/S), was de-turfed. The area was cleaned and documented. Apart from the grave chamber, no excavation took place. The area under the SW tower room in the south aisle, an area of 6m (E/W) x 5m (N/S), was de-turfed. Limited key hole excavation was undertaken. The possibility that a crypt lay under the tower was excluded. The area immediately east, 3m (E/W) x 5m (N/S), was also de-turfed. The brick floor was uncovered in this area, it was cleaned and documented. No excavation was undertaken. An area of 10.5m (E/W) x 4m (N/S) at the eastern end of the south aisle was also de-turfed. The area was cleaned and documented, no excavation was undertaken. The whole of the crossing and transepts was de-turfed, an area of 27m (N/S) x up to 6m (E/W). Excavation down to the desired level was carried out in the crossing and the southern half of the north transept. The rest of the area was documented without excavation. A small trench, V96, was de-turfed outside the cathedral. The trench measured 1.5m (N/S) x 1m (E/W) and was placed against the cathedral where the walls of the north aisle and north transept met. The contexts from trench V96 were merged with those of the north transept.

2.9.1 Area R groups

Group 7:1 R153 R325 R327 R329 R331 R332 R333 R361 R364 R378 R401 R405 R406
Group 7:2 R160 R180 R181 R182 R183 R184 R185 R186 R187 R189 R209 R210 R211 R213 R214 R215 R216
Group 7:3 R23 R36 R85 R90 R91 R94 R95 R97 R99 R111 R119 R227 R232
Group 7:4 R50 R51 R52 R53 R54 R55 R57 R61 R62 R63 R64 R65 R66 R67 R68 R69 R74, R78, R77 R78 R220 R221 R222 R257 V1 V2 V6 V7 V9 V10
Group 7:5 R71 R72 R132 R133 R142 R143 R163 R164 R165 R166 R247 R260 R261 R263 R424
Group 7:6 R286 R288 R289 R291 R296 R301 R302 R303 R304 R305 R313 R314 R315 R316 R317 R322 R323
Group 5:1 R29 R30 R31 R33 R34 R35 R37 R38 R39 R40 R41 R109 R110
Group 4:1 R140 R151 R152 R154 R352 R362 R387 R388 R389 R391 R392 R393 R394 R395 R397 R404 R410 R411 R412 R416 R417 R418 R422
Group 4:2 R347 R348 R360 R376 R399 R413
Group 4:3 R156 R157
Group 4:4 R26 R193
Group 4:5 R24 R25 R27
Group 4:6 R225 R226 R229 R230 R231 R233 R235 R325 RG335 R337 R338 R339 R358 R367 R368 R369
Group 4:7 R75 R76 R79 R223 R254 R256
Group 4:8 R70 R144
Group 4:9 R243 R244
Group 4:10 R4
Group 4:11 R5 R6
Group 3:1 R278
Group 3:2 R58 R59 R60 R224 R340
Group 3:3 R266 R267 R271 R272 R273 R277 R307 R318 R319 R343 R344 R428
Group 3:4 R320 R321 R324
Group 3:5 R245 R246 R269 R293 R309 R310 R311 R312
Group 3:6 R168 R248
Group 2:1 R155 R238 R330 R349 R350 R351 R363 R365 R366 R370 R371 R372 R373 R374 R377 R379 R380 R382 R383 R384 R408 R409
Group 2:2 R381 R385 R386 R396 R414 R417 R418 R419 R420 R423
Group 2:3 R178 R179
Group 2:4 R158 R190 R192
Group 2:5 R188 R217 R218
Group 2:6 R28 R98
Group 2:7 R83 R84 R89 R96 R100 R108 R113 R118 R427
Group 2:8 R250 R251 R252
Group 2:9 R120 R121 R122
Group 2:10 R134 V3 V4 V5 V8
Group 2:11 R73 R167 R270 R283 R345
Group 2:12 R169 R170 R284
Group 2:13 R262 R274 R275 R279 R280
Group 2:14 RG124 RG125 RG126 R127 R131 R147 R148 R150 R161 R162
Group 2:15 R285 R294 R295 R298 R299 R300 R342
Group 2:16 R236 R237
Group 2:17 R238 R239 R241
Group 1:1 R398
Group 1:2 R353
Group 1:3 R240

2.9.2 Area summary

Moraine clay was uncovered over a small area in the SW tower room (group 1:2). The remains of the original turf horizon (group 1:1) were also uncovered here. Bedrock was uncovered in the base of the grave chamber, but was not recorded. In the crossing mortared stones (group 1:3) were partially uncovered in the base of the triple grave. This was interpreted as being part of a structure that predated the construction of the cathedral.

Period 2 represents the construction of the original cathedral. The structural elements of the cathedral (groups 2:1, 2:5, 2:7 2:10 and 2:13) were not systematically recorded, they were documented only where they impacted with the exposed layers. A floor surface of bricks was uncovered in several places in the north and south aisles (groups 2:3, 2:4 and 2:6). The remains of a probable mortar floor were uncovered in the crossing and north transept (groups 2:8 and 2:12). This floor was covered with thin silt layers (group 2:11). In the crossing a triple grave was excavated (group 2:14). The edges of the grave revealed two groups of make-up dumping under the floor level (groups 2:16 and 2:17). Make-up dumping was also uncovered in the SW tower room (group 2:2). A stone and timber structure (group 2:15) was partially uncovered in the crossing, this may have been the foundation of a screen that partitioned the chancel from the nave.

Period 3 represents the remodelling of the eastern end of the cathedral. The threshold between the north transept and north aisle (group 3:1), the crossing and nave (group 3:3) and Crossing and north transept (group3:2) were constructed. Other structural features of the crossing were also rebuilt (group 3:3). Debris from a fire (group 3:6) and other activity connected to the rebuilding of the area were recorded (groups 3:4 and 3:5).

In period 4 the SW tower room was remodelled slightly (group 4:2), the level was raised and a possible wooden floor laid (group 4:1). A floor of square red tiles was recorded over both aisles, in the crossing and north transept (groups 4:3, 4:5, 4:7, 4:8 and 4:10). Two altar foundations of brick and mortar may have been constructed (group 4:4). An unexcavated grave in the crossing (group 4:9) and make-up dumping under the floor in the Sacristy (group 4:11) were also registered.

A series of possible graves, that may have been dug through the floor of the north aisle after the aisle was no longer in use for services were placed in period 5 (group 5:1). Modern deposits, including re-deposited demolition and fire debris were grouped in period 7. Many of the structural elements, in particular the altar foundations, appeared to have been reconstructed after the rubble was cleared away from the ruin (groups 7:1, 7:2, 7:3, 7:4, 7:5 and 7:6).

2.10 Area S

Trench S96 was c. 100m long (NE/SW), 1m - 2m wide. The trench was excavated by machine during the autumn of 1997 and the profile documented. The eastern end of the trench connected to Q96, the western end ended at the beach of Lake Mjøsa.

2.10.1 Area S groups

Group 7:21 S1 S2 S3 S9 S20 S21 S37 S38 S39
Group 6:7 S4 S5
Group 6:8 S6 S7 S8 S10 S11 S21 S22 S23 S24 S36
Group 6:9 S17
Group 4:44 S14 S15 S16 S18 S19
Group 2:33 S12 S26 S27 S28 S29 S30 S31 S32 S33 S34 S35
Group 2:34 S13 S25 S40

2.10.2 Area S summary

The natural terrain in trench S96 consisted of interleaved layers of gravel. These were not recorded. In period 2 a charcoal burning pit was dug on the contemporary beach line (groups 2:33 and 2:34). Some carbonised logs lay in-situ in the base of the feature. A cut feature interpreted as a possible boat house was recorded (group 4:44), also on the contemporary beach line of the lake. This was infilled in a later period (group 6:9). A series of silts interpreted as representing a post medieval turf horizon (group 6:8) were present along the length of the trench. A concentration of charcoal was also placed in period 6 (group 6:7). The beach line of the lake was built out through the dumping of demolition deposits in the modern period (group 7:21).

2.11 Area T

Trench T96 extended from the NE edge of Q96, in a NE/SW alignment, over 133m. The trench then turned through approximately 90 degrees. This section was aligned NW/SE and was 44m in length. The trench ended beside the Museum Cafe. The trench was c. 1m wide. 44m west of the point at which the trench dog legged an area of 4m x 4m was excavated on its southern side to enable the installation of an inspection pit. The trench was machine excavated in several sections during the autumn and winter of 1997. The profile was drawn. The stone foundation (group 6:5) was drawn in plan.

2.11.1 Area T groups

Group 7:19 T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T17 T18 T21 T24 T25 T26 T27 T28 T29 T30 T31 T32 T33 T34 T35 T36 T47 T48 T49 T57 T58 T59 T60 T61 T63
Group 6:3 T11 T15 T16 T39
Group 6:4 T12 T13 T14
Group 6:5 T19 T20
Group 4:41 T37 T38 T40 T41 T42 T43 T45 T46 T50 T51 T52 T53 T54 T55 T56 T65 T66 T68 T69 T71
Group 1:17 T23 T44 T67

2.11.2 Area T summary

The natural terrain in trench T96 consisted of moraine clay (group 1:17). This was uncovered in the NE/SW aligned section of the trench, but not in the NW/SE aligned part. The northern part of this section of the trench stopped on deposits interpreted as belonging to the post medieval farm (groups 6:3 and 6:4). To the south dumping of modern rubble continued below the level of the excavation. This dumping is probably related to the infilling of an area of marshy ground. A pond, that is known to have existed to the east, probably extended up to this point, but not much further west. Several cut features and a probable turf horizon (group 4:41) were registered in a section of the trench north of the Sacristy. This activity was not dated but is interpreted as being medieval rubbish dumping. A collection of large stones were recorded approximately where Bishops Street is supposed to have run, these didn't appear to be a deliberately laid surface. None of the documented deposits were interpreted to period 2. A sill wall, probably related to the post medieval farm (group 6:4) was partially uncovered. A post medieval turf horizon overlay the wall (group 6:3). A large stone foundation (group 6:5) was uncovered in the edge of a hole dug to accommodate an inspection pit. The feature couldn't be dated, but is tentatively interpreted as being post medieval. The inspection pit was installed without disturbing the foundation. The modern activity (group 7:19) consisted primarily of the dumping of rubble and other deposits. There were very few modern deposits in the western half of the NE/SW aligned section of the trench.

2.12 Area U

Trench U96 was 61m long, x 1m wide. It was NE/SW aligned and situated primarily outside the churchyard at its SW corner. The remains of a wall, interpreted as the churchyard wall (group 4:37) was encountered c. 7.5m from the western end of the trench. The easternmost 40m of the trench ran alongside the southern wall of the post medieval barn. This part of the trench was machine excavated, some post holes (group 5:7) and two layers (U30, group 4:48 and U35, group 4:40) were excavated by hand. In the rest of the trench to the west the uppermost turf layers were machined off, the underlying deposits were excavated by hand. The work was carried out during the winter of 1997, continuing into 1998, in a tent under artificial lighting conditions.

2.12.1 Area U groups

Group 7:18 U20 U21 U22 U23 U24 U28 U51 U61 U65 U74 U78 U79
Group 6:1 U53 U54 U55 U57 U58 U62 U63 U66 U67 U69 U70 U72 U75 U77
Group 6:2 U52 U64
Group 5:6 U73 U89
Group 5:7 U1 U2 U3 U5 U6 U7 U9 U10 U11 U12 U13 U14 U15 U16 U18 U19 U25 U26 U31 U32 U33 U37 U38 U39 U40 U41 U100 U101 U102 U103 U104 U105 U106 U109 U110
Group 4:37 U71 U88 U91 U92 U93 U116 U117
Group 4:38 U30
Group 4:39 U90
Group 4:40 U35 U36 U42 U96 U107 U108 U111 U112 U114 U115
Group 1:16 U8

2.12.2 Area U summary

The natural terrain in trench U96 consisted of moraine clay (group 1:16). With the exception of a few of the post holes in group 5:7, all the archaeological deposits lay in the western part of the trench, from a few metres east of the corner of the barn to the churchyard wall (group 4:37) in the west. This area was built up by the dumping of redeposited moraine clay and other deposits group 4:40) and covered by a turf horizon (group 4:39). The churchyard wall (4:37) was constructed towards the western end of the trench. This is interpreted as secondary, connecting the existing southern wall with a newer eastern wall. The construction cut of the wall cut through the turf (group 4:39), but it appeared to continue to form the ground surface after the wall was constructed and into the post medieval period. A layer of burnt stones (group 4:38), burnt deposits (group 5:6) and a series of post holes (group 5:7) were formed over this turf layer. The churchyard wall appears to have been standing and a feature in the terrain into the post medieval period. It was eventually covered by silt layers (group 6:2) and structures related to the post medieval farm (group 6:1). A number of modern intrusions were registered along the edge of the barn (group 7:18).

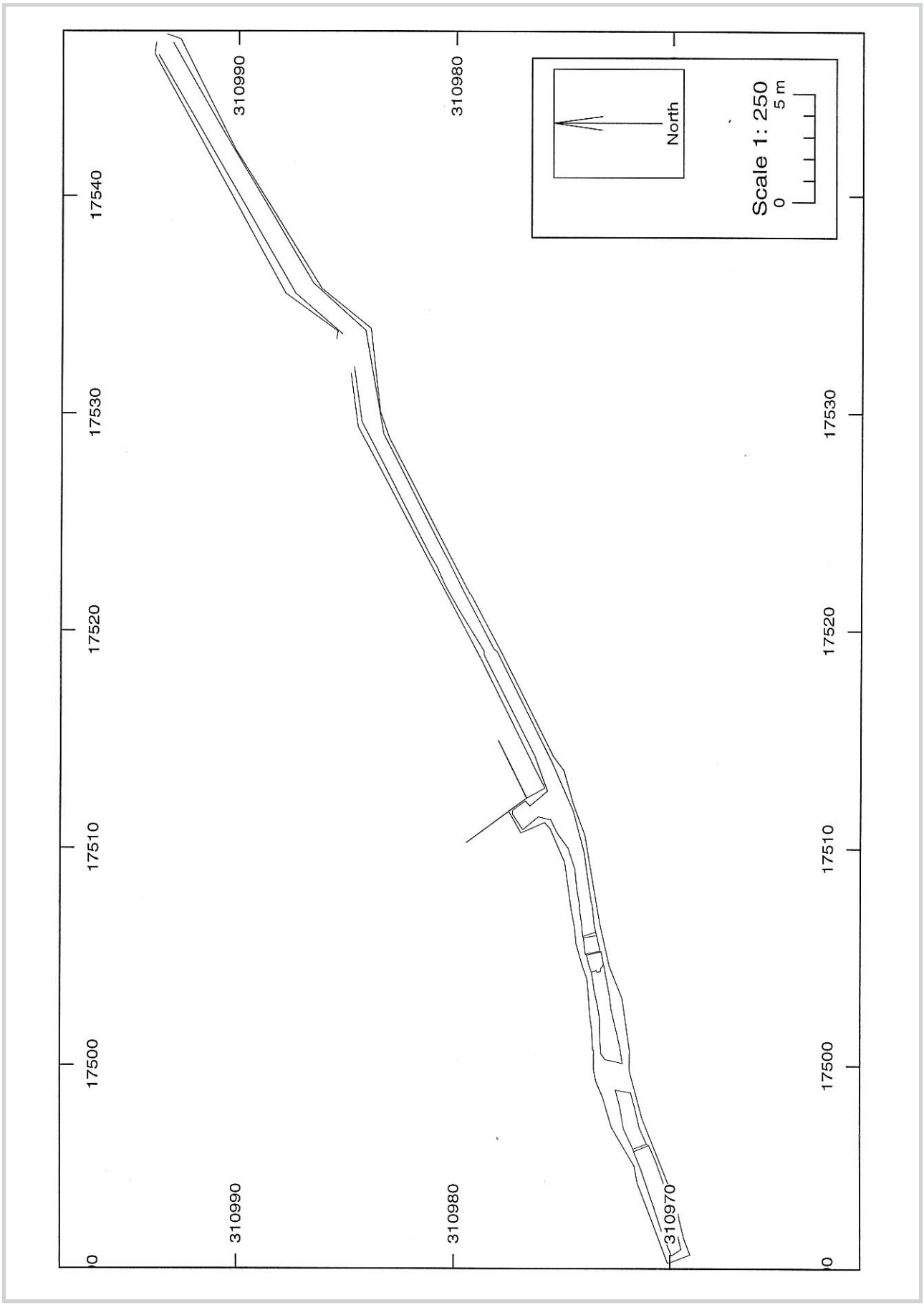


***Fig. 26**. Trench U96.*

2.13 Area W

Trench W96 was a small trench over the southern churchyard wall. It measured 5m (NE/SW) x 1.50m (NW/SE). The top of the wall was exposed by a combination of hand and machine excavation. It was cleaned and documented in plan, no further action was taken. The work was carried out in the spring of 1998. Because of the isolated position of the trench the wall was not integrated into the site narrative. The wall probably belongs to period 4.

2.13.1 Area W contexts

W1. Turf and topsoil. Covered the top of the churchyard wall. Over W2.

W2. Mixed layer of silt, gravel and stone. The stones were of small and medium size and were mixed within the silt/gravel matrix. The layer was grey brown in colour and contained small mortar and brick fragments. The layer varied in thickness from 0.25-0.60m, it covered the churchyard wall and extended beyond it. It was thickest where the wall was not complete. Under W1, over W3.

W3. Mixed layer of brown silt (c. 40%), stones (c. 40%) and crushed mortar (c. 20%). These deposits were mixed together but also present as irregular concentrations. The stones were of all sizes, concentrations of beach gravel were also present. The mortar was pale yellow in colour with a high (c. 30%) concentration of beach gravel inclusions. Occasional brick fragments were also present. W3 lay over the remains of the churchyard wall W4, it was thickest at its northern edge. Under W2, over W4 and W5.

W4. Churchyard wall, E/W aligned, 1.35m wide. It was exposed over a 5m section. It consisted of large unworked limestone blocks, c. 1m x 0.60m^2, which lay over a course of smaller stones. To the west of the investigated area the limestone blocks were smaller. It had a rubble core, W5. The stones were bonded by a cream coloured mortar with a high (c. 30%) concentration of beach gravel inclusions. The outside, southern, face of the wall was visible prior to excavation, the northern edge was exposed in plan only. Demolition deposits W3 lay over the in-situ walling. Under W3, not excavated.

W5. Wall core to wall W4. Consisted of stones of all sizes bonded with cream mortar with a high (c. 30%) concentration of beach gravel inclusions, and brown silt. No brick fragments were recorded either in the core or within the mortar. Under W3, not excavated.

2.13.2 Area W summary

See 7.2 Period 4 discussion for an comparison of the wall with the structure uncovered in U96 (group 4:37).

2.14 Area X

Trench X96 was the area over a cellar complex that lay on the line of the service road that was constructed along the outside of the southern churchyard wall. The cellars were known to exist in the area, they were not visible on the surface however and their exact position was uncertain. An entrance, via a window, was opened and the turf was stripped off the top of the vault with a mini-digger. Once it had been established that the cellars were of post medieval date, a larger area was opened by the landscape gardener firm working on the protective structure. Their work was supervised by Tor Sæther of the Hedmarksmuseum. The area that was de-turfed measured c. 13m (E/W) x 11m (N/S). The exposed structures consisted of the vaults of three cellar rooms and the remains of walls from the main house of Storhamar farm. These were documented in plan and briefly described. The cellars were considered structurally sound and were covered over by the service road, none of the structures were excavated. A large red sandstone window mullion was removed from one of the walls and added to the museum's stone collection. The work was carried out in the spring of 1998.

2.14.1 Area X group

Group 6:10 X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11 X12 X13 X14

2.14.2 Area X summary

The cellars that were uncovered were of post medieval date. They lay under the main house of Storhamar farm and were in all probability constructed at the same time as the house. They may however have been built upon earlier cellars that dated to the medieval period. No clear evidence to support this suggestion was uncovered however.

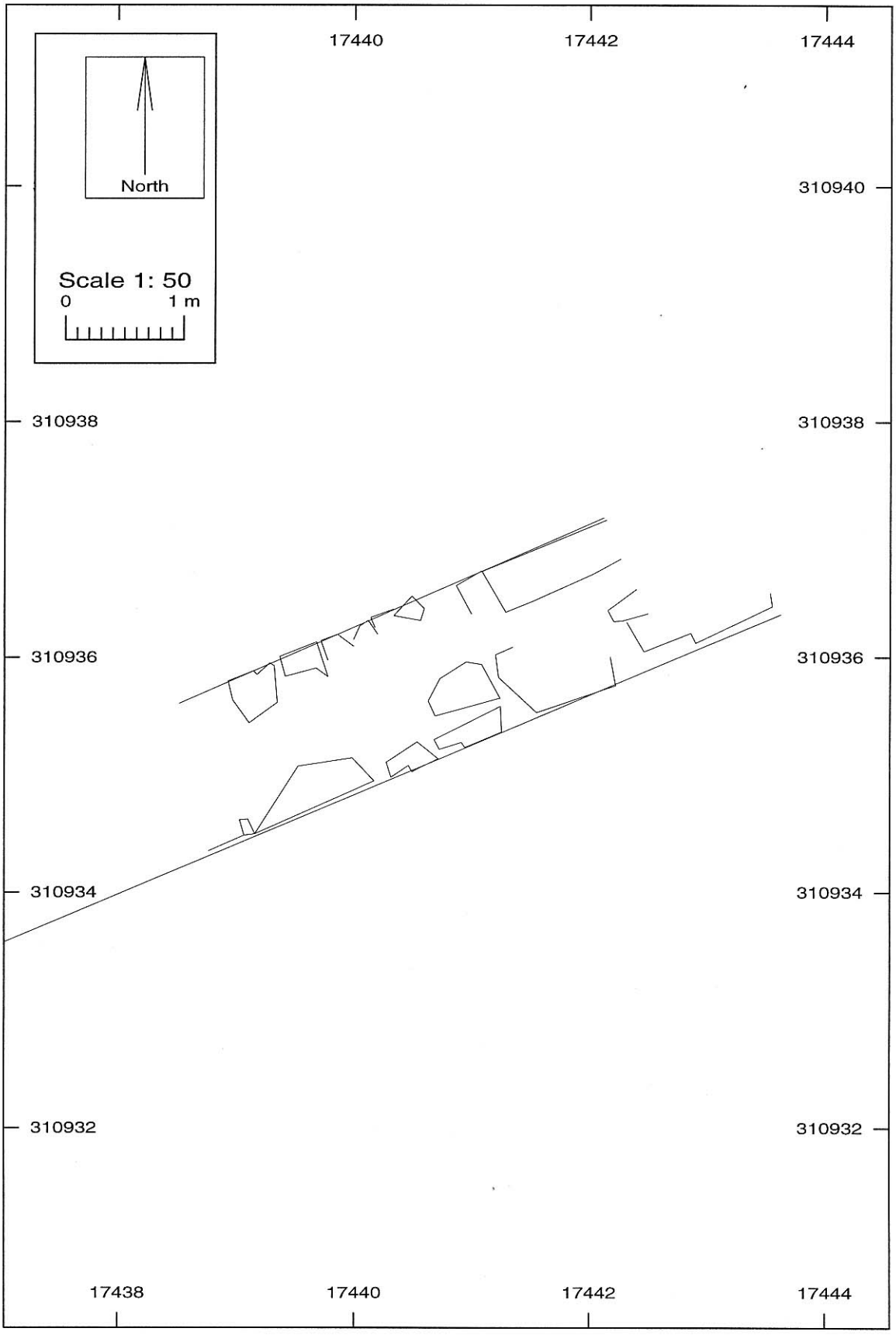


***Fig. 27**. Trench W96.*

3 Period 1: pre 1152/3

3.1 Period 1 summary

3.1.1 Period 1 dating

The contexts grouped together into period 1 consist primarily of the natural terrain and the original turf horizon that pre-dated the construction of the cathedral. The natural terrain was unfortunately not consistently recorded in all the trenches. The turf horizon was recorded in several trenches. A physical relationship between this layer and the cathedral was only uncovered in trench D96. The earliest archaeological deposit in the other trenches could confidently be identified as the same layer. A charcoal sample from the layer in trench J96-8 (J128, group 1:10) was radiocarbon dated to CAL AD 1030 - 1240 at the 95% level of confidence. A radiocarbon date was also obtained from R241 (group 2:14) that overlay stone structure R240 in the crossing. The date of CAL AD 1000 - 1205 at the 95% level of confidence indicates that the structure had been demolished and covered over before 1205. In both cases these dates span the construction of the cathedral Most of the radiocarbon dates from layers grouped in period 2 also have a date range that spans 1152/3. The layers are grouped through interpretation, not by the dating evidence.

3.1.2 Period 1 interpretation

The turf horizon was thoroughly investigated in 1992. Two radiocarbon dates and a fragment of a drinking horn all dated the layer to the period prior to the construction of the cathedral. Pollen analysis indicated that the area had been inhabited and produced evidence of agriculture and pasture in the area (Pedersen E. A. 1994:204-5, 2000:180-183).

The earliest turf horizons in trenches J96-1 - 4 (group 2:21) and P96 (group 2:26) are placed in period 2. This area doesn't appear to have been built up until after the cathedral was completed, in period 4. These turf layers may also have been open and in use through period 1 but also remained in use during period 2. A number of finds were recovered from the excavations in 1992 that dated the layer to the period prior to the construction of the cathedral, but the layers exposed in these trenches in 1996 did not have the same character as the turf horizon recorded elsewhere and they are placed in period 2.

In addition, a stone structure (R240, group 1:3) is also included in this period. It consisted of two, mortar bonded flat stones laid side by side, one of which had clearly had another stone mortared on top of it. The structure was exposed in the edge of grave cut R131 (group 2:14) in the crossing and was only partially uncovered. The structure itself was not dated, but the overlying layer R241 (group 2:17) was radiocarbon dated to CAL AD 1000 - 1205 at the 95% level of confidence. The structure lay 0.50m under the level of the earliest floor in the crossing and was covered by demolition deposits that had been used as make-up (group 2:16). Primary make-up dumping of demolition material was also recorded in trench J96-8 (J126 and J127, group 2:24). These deposits support the interpretation of R240 as a stone structure that was demolished prior to the construction of the cathedral. It is tempting to interpret R240 as the remains of an earlier church. Unfortunately the structure was not uncovered and the only thing that could be said of this church is that it existed. Its size, layout and whether it had been completed or was still under construction are unknown.

3.2 Period 1 discussion

The cathedral was constructed upon a roughly ESE/WNW aligned limestone ridge, slightly skew to the alignment of the ridge. The limestone ridge sloped away sharply on both sides. The slope in the natural ground surface was more gradual however because moraine clay butted against the limestone. The natural terrain sloped away sharply at the western end of the ridge. The foundation of the cathedral's western wall (D110, group 2:29), was exposed in trench D96. It was not laid in a cut but built directly upon the bedrock, with various deposits dumped against its external face to build up the ground surface. The height of the foundations at the western end was presumably determined by the need to maintain a level floor within the cathedral. The trenches at the NW corner of the site, D96 and J96-6 - 8 were dominated by make-up deposits. Trench J96-6, located at the very NW corner of the cathedral, was approximately 4m deep. Trench H96-14, located south of the western entrance, became shallower towards the south. At the southern end of this trench the bedrock lay almost directly under the turf. At its NW corner the cathedral was constructed beyond the western limit of the ridge out into the inclined terrain. There is no clear explanation as to why the cathedral was laid out so that it extended off the plateau in this way.

Inside the cathedral, bedrock was uncovered in the base of the grave chamber in the north arcade (see group 4:6). Moraine clay was uncovered in a small area in the SW tower room (group 1:2) and possibly in the base of the triple grave in the crossing, though this was probably re-deposited (see group 2:17).

The limestone bedrock was exposed in trenches M96-7 - 10 as upstanding knolls with moraine clay in between them. Only layers interpreted as modern lay upon the bedrock, all the medieval activity, including two post holes, was confined to the moraine clay. The northern half of adjacent trench M96-14 was dominated by upstanding bedrock, the southern half of the trench consisted of moraine clay. Some very thin layers of building debris and some make-up deposits of medieval origin lay over the bedrock. All the graves in this trench were of course confined to the moraine clay. A post hole (group 3:16) was cut against the edge of the bedrock utilising its slope as one side of the post hole cut.

In trench Q96 the natural deposits changed from moraine clay to interleaved gravel deposits. In trench T96 that lay to the east the natural terrain consisted of moraine clay, whilst in S96 to the west the natural consisted of interleaved layers of gravel. The gravels continued in S96 down to Lake Mjøsa. This interface presumably marks an old beach line of the lake. The shift lay at c. 129.00 m over sea level. The pits that cut into natural in Q96 were all dug into the clay. Some of these features were cooking pits. The clay would have had better insulating properties that the loose gravels. This bias towards the clay area probably reflects a deliberate choice on the part of those digging the pits. Other than the examples noted above and the need for large amounts of make-up deposits around the NW corner of the cathedral the natural terrain didn't appear to constrain the activity on the site.

It had been suggested that a pond, known to exist to the east of the Bishops Residence may have extended along its southern side, functioning as a defensive feature (see Sæther 1995:20). Trench T96 lay to the south of the building complex, roughly parallel with its southern wall. Natural moraine clay lay c. 0.50m under the turf, it was overlain by modern deposits. No traces of the peat layers that characterise the pond area to the east were uncovered. The natural terrain clearly indicates that the pond did not extend so far west. Infilling with modern rubble deposits (see group 7:19) was recorded in the N/S section of trench T96. This infilling is probably connected to the marshy ground at the edge of the pond and gives an approximate indication of its western limit.

The original turf horizon that pre-dates the construction of the cathedral was uncovered in several trenches: R96 (SW tower room), group 1:1; M96-7 - 10, group 1:5; M96-11 - 15, group 1:7; J96-8, group 1:10; D96, group 1:12; H96-14, group 1:14. This layer was not present in trenches X96, U96, T96, Q96 or S96, it was only recorded on the plateau, sealed beneath the cathedral and the grave soils of the churchyard. It is most likely this sealing of the layer that has resulted in its differential preservation.

The interface between the turf horizon and the cathedral was only observed in D96. D109 (group 1:12) had been partially truncated to create a horizontal surface for the construction of foundation D110. This confirms the interpretation that the layer pre-dates the construction of the cathedral. The turf horizon in the other trenches was very similar to that in D96. Although these had no physical connection to the cathedral they are assumed to be part of the same horizon and to pre-date the cathedral. The layer contained charcoal flecks and occasional animal bone fragments. A charcoal sample from J96-8 (group 1:10) was radiocarbon dated to CAL AD 1030 - 1240 at the 95% level of confidence.

Stone and mortar structure R240, group 1:3 was partially uncovered in the side of grave cut R131 in the crossing. As so little of the structure was uncovered it is difficult to interpret it with any degree of confidence. That it was related in some way to the construction of the cathedral cannot be entirely ruled out, but the most logical interpretation of R240 is that it is the remains of a stone structure that pre-dates the cathedral. This interpretation is supported by the presence of demolition layers of mortared stones used as primary make up deposits in both the crossing (group 2:17) and in trench J96-8 (group 2:24). These layers are interpreted as debris from the demolition of mortared stone structure(s) that were demolished at an early stage in the cathedral's construction process. As only a small part of R240 was uncovered, it was unfortunately not possible to determine either the dimensions or the lay out of this structure. Despite the lack of information, it is difficult to interpret a mortared stone structure, that pre-dates the cathedral as anything other than a church. There is nothing to indicate whether the building had been completed and was in use when the construction of the cathedral began, or whether it was still under construction.

3.3 Group descriptions

Group 1:1
R398
Group 1:1 consists of R398, which is interpreted as the remains of the original turf horizon in the SW tower room of the south aisle. It was only exposed in a small area and was not excavated. It appeared to overlay sterile moraine clay R353 (group 1:2). The moraine clay was exposed elsewhere in this area but R398 was not present. The turf was presumably partially removed during the construction of the cathedral.

Contexts
R398. Layer of dark grey humus rich clay silt, contained occasional mortar and charcoal flecks pressed into its surface. The layer was only exposed in a small area. It is interpreted as the remains of the original turf line, it was not excavated. Under R386, over R253

Group 1:2
R353
Group 1:2 consists of the natural moraine clay horizon in the SW tower room of the south aisle. R353 was only exposed in three small areas. The possibility that it was re-deposited moraine clay cannot be discounted, but it appeared to be sterile and was overlain by R398 (group 1:1) which was interpreted as the original turf horizon.

Contexts
R353. Layer of mid orange brown silty clay - moraine clay. R353 was only exposed in a small area, it was cut by later features and in the edge of R417 it could be seen to be at least 0.25m thick. It may have been re-deposited but there was nothing to indicate that this was the case and it is interpreted as natural moraine clay. Under R398.

Group 1:3
R240
Group 1:3 consists of the remains of a stone structure, probably a wall (R240) in the crossing. Two flat stones, laid side by side with mortar on their upper surface, were exposed in the eastern end of grave cut R131. The top of one of the stones was partially uncovered, the mortar on its surface clearly indicated that another stone had been mortared onto its surface. No other parts of the structure were exposed. The stones lay c. 0.50m under R169, the mortar surface interpreted as the earliest floor level in the crossing and c. 0.65m under R70 the later tile floor. R240 had no connection to the structure of the cathedral. It was overlain by a number of deposits, dumped as make-up, (group 2:16 and group 2:17) to build up the ground surface to the level required for the use of the cathedral. It was clearly part of a structure, as it was

***Fig. 28**. Group 1:3, area R96.*

only partially uncovered in the edge of grave cut R131 it is difficult to interpret however. It might be a temporary structure connected to the construction of the cathedral, but as it was mortared this seems unlikely. The make-up deposits that overlay it included a thick deposit of mortar and stone (R238, group 2:17) which indicates the demolition of a stone structure. Mortar and stone demolition deposits were also used as make-up outside the west front of the cathedral (group 2:24), also indicating the demolition of a stone structure. It is possible in both cases that part of the cathedral was demolished and re-built. Both of these demolition layers appeared to be primary make-up deposits however, i.e. dumped at a very early stage of the construction process. These demolition layers support the tentative interpretation of R240 as the remains of an older stone structure that was demolished and replaced by the cathedral. Not enough of the structure was uncovered however to be sure of this interpretation or to suggest its size. The structure may not even have been completed before it was demolished to make way for the cathedral.

Contexts
R240. Two flat stones exposed in the base of grave cut R131 (group 2:14), a small test area was excavated over the northernmost stone in order to document the structure. The stones were laid side by side, traces of mortar were present on the surface of both stones. The area of the northernmost stone that was exposed showed an imprint in the mortar that clearly indicated that another stone had been mortared onto the top of it. The stone appeared to be aligned roughly E/W, approximately the same alignment as the cathedral. There didn't appear to be any more stones beneath these two, but as the structure was not excavated this possibility cannot be excluded. R240 is interpreted as the remains of a wall that was demolished or dismantled. No other structural remains were visible in the opposite edge of the grave cut, neither was there any

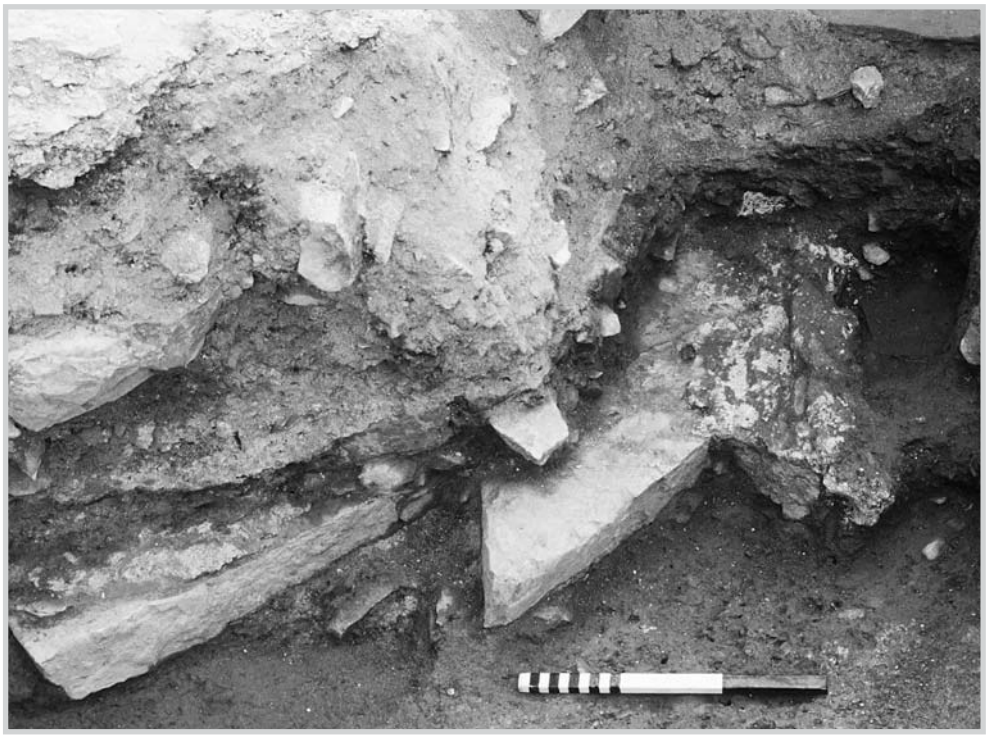


***Fig. 29**. Wall remains R240, group 1:3, exposed in the base of grave cut R131 (group 2:14). Facing W. Photo Bruce Sampson, NIKU.*

evidence of a return wall in the northern or southern edges. The grave cut bottomed out onto R239, the layer that appeared to cover these remains, but at a slightly lower level than the stones. It is therefore possible that more of the structure was extant at a lower level, below R239. It may also have been completely demolished or removed by the grave cut. Under R239.

Group 1:4

B32

Group 1:4 consists of the natural moraine clay east of the chancel wall in trench B96-4. The natural ground surface appeared to slope down to the east. The upper surface of the clay was truncated by graves. Shale bedrock was seen under the moraine clay in the base of some of these cuts.

Contexts

B32. Layer of orange brown moraine clay. The natural ground surface had been cut into by all of the graves in this area. Under B33, B36, B64, B71 and B76, same as B53, B57 and B78.

Group 1:5

M95

Group 1:5 consists of the original turf line that pre-dated the use of the area in trenches M96-7 - 10 as a churchyard. The layer was only preserved in two, unconnected areas towards the western end of the excavated area. It was < 0.05m thick and followed the undulations in the underlying moraine clay M53 (group 1:6). The layer lay between 135.80 - 136.00 m over sea level at the western end of the trench rising to 136.60 m to the east where it lay against the bedrock knoll.

Contexts

M95. Layer of black, gravely clay silt, contained a few animal bone fragments, small stones and occasional charcoal flecks. Under M91, over M53, same as M116.

Group 1:6

M53

Group 1:6 consists of the natural moraine clay in trenches M96-7 - 10. The trench was dominated by undulating bedrock, the clay was only present in between the bedrock knolls and at the western end of the trench. All of the non-modern activity, groups 3:10, 3:11, 3:12 and 3:13 was documented in the areas between the bedrock knolls, over the moraine clay. The clay lay between 135.80 - 136.70 m over sea level at the western end of the trench rising towards the east. Between the two bedrock knolls the clay lay between 136.80 - 136.90 m over sea level.

Contexts

M53. Moraine clay, reddish brown in colour, contained stones/decayed bedrock. Under M75 and M95, same as M77, M78 and M94.

Group 1:7

M134

Group 1:17 consists of the original turf line that pre-dated the use of the area in trenches M96-11 - 15 and BF96 as the churchyard.

Contexts
M134. Layer of dark brown humus rich, sandy silt, contained a few bone fragments and charcoal flecks. Under M122 and M136, over M135, same as M147, M174 and M182.

Group 1:8
M135
Group 1:8 consists of the sterile moraine clay in trenches M96-11 - 15 and BF96. The clay was not present in the northern half of these trenches, limestone bedrock was present in the northern area. The bedrock sloped sharply down towards the south, the clay had an approximately level upper surface and butted the bedrock that lay at a higher level. The natural terrain appears to have constrained the activities in this area. Only a series of thin layers were present overlying the bedrock. The burials in these trenches were cut through the moraine clay, the upstanding bedrock formed a natural limit to the churchyard in this area. The posthole in group 3:16 was dug against the edge of the sloping bedrock, the northernmost point that a post hole could be dug in this trench.

Contexts
M135. Orange brown moraine clay contained stones/decayed bedrock. In some places the upper surface of the clay was stained black by the overlying layer M134. Under M134, M143, M154 and M159, same as M148 and M183.

Group 1:9
J161
Group 1:9 consisted of J161, decayed bedrock and minerogenic silt in trench J96-6. It was only present in a pocket in the underlying bedrock.

Contexts
J161. Reddish brown mineral silt, contained bedrock shards. Decayed bedrock. Under J146, over bedrock.

Group 1:10
J128
Group 1:10 consists of the original turf line that pre-dates the construction of the cathedral in trench J96-8. Some stones and mortar fragments had been pressed down into the surface of the layer. A charcoal sample from J128 was radiocarbon dated to CAL AD 1030 - 1240 at the 95% level of confidence. The charcoal may have been deposited here prior to the building of the cathedral but may also have been deposited during the early stages of the construction process, prior to the building up of the ground surface in this area.

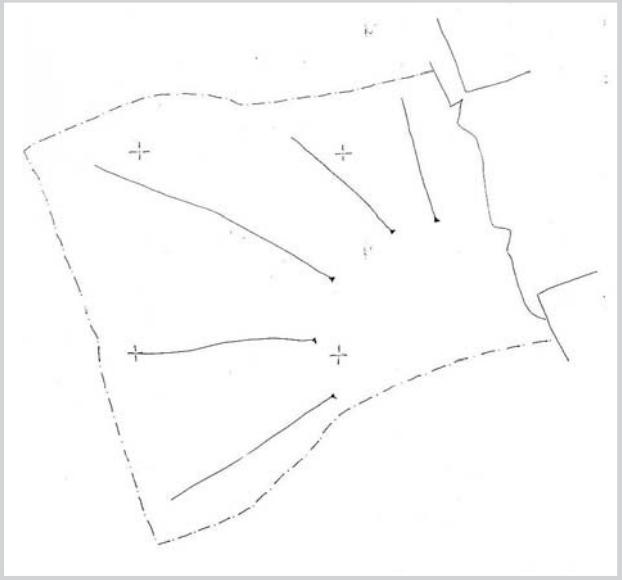
Contexts
J128. Layer of slightly reddish brown fine silt, contained gravel, mortar flecks and a few fragments of animal bone. The stones and mortar flecks were probably pressed down in the surface from the overlying layer. The layer was compact but crumbled easily under pressure. The upper surface was roughly horizontal for the easternmost 0.30m then sloped down to the NW at a shallow angle, 0.02m - 0.05m thick. A charcoal sample from the layer was radiocarbon dated to CAL AD 1030 - 1240 at the 95% level of confidence (Beta-173762, sample HKH11482). Under J127, over J129.

Group 1:11
J129
Group 1:11 consists of the natural mineral soil and bedrock in trench J96-8. The natural terrain sloped down to the NW. The area was built up considerably after the cathedral was constructed.

Contexts
J129. Layer of sterile orange brown mineral silt, contained fragments of decayed bedrock. Under J128, over bedrock.

Group 1:12
D109.
Group 1:12 consists of the original turf horizon D109 that pre-dates the construction of the cathedral in trench D96. The layer was excavated by hand, no finds were recovered.

***Fig. 30**. Group 1:12, area D96.*



Contexts
D109. Layer of dark grey/black humus rich sandy clay. D109 was the remains of the original turf layer that lay here before the cathedral was constructed. It overlay mineral soil D111 and bedrock. Under D107 and D110, over D111, same as DL26(92).

Group 1:13
D111
Group 1:13 consists of a mineral soil and fragments of decayed bedrock (D111), in trench D96. The layer lay in pockets where the bedrock undulated and sloped down to the west. The cathedral foundation was built directly upon bedrock, it appears as though the cathedral was built as far west as was possible. Extension westwards would have involved building the foundation on sloping bedrock.

Contexts
D111. Orange brown mineral soil and fragments of decayed bedrock only present in pockets where the bedrock undulates. Under D109.

Group 1:14
H38
Group 1:14 consists of H38 the remains of the original turf horizon that pre-dates the construction of the cathedral in trench H96-14. Extensive make-up deposits (group 2:30) overlay it. H38 had been truncated by grave cuts and didn't survive as a continuous layer.

Contexts
H38. layer of dark brown humus rich clay silt, contained occasional small stones and occasional charcoal flecks. H38 overlay bedrock and decayed bedrock H37 (group 1:15), it didn't survive as a continuous layer. H38 is interpreted as the remains of the original turf horizon. Under H45 and H71, over H37, same as H70 and HL15(92).

Group 1:15
H37
Group 1:15 consists of the natural terrain of decayed bedrock (H37) and bedrock in trench H96-14. The surface of the natural terrain undulated but generally sloped down to the north. The graves in this area were concentrated to the northern part of the trench. In some places in the southern half of the trench bedrock lay just below the turf.

Contexts
H37. Dark reddish brown mineral soil, contained fragments of decayed bedrock. Under H38, H74, H81 and H93.

Group 1:16
U8.
Group 1:16 consists of the natural moraine clay (U8) in trench U96. It was not uncovered over the whole trench, but it appeared to undulate, especially in the western half of the trench, where bedrock began to become visible. In the eastern half of the trench the clay had a more level upper surface. The natural terrain sloped down to the east.

Contexts
U8. Orange brown silty clay -moraine clay, contained fragments of decayed bedrock of all sizes, many large fragments protruded through the clay and were upstanding. Under U2, U5, U9, U12, U14, U18, U25, U43 and U87, same as U17, U86 and U113.

Group 1:17
T23 T44 T67
Group 1:17 consists of the natural moraine clay in trench T96. The trench was excavated in three sections, the clay was issued three separate numbers (T23, T44 and T67). The natural ground surface was not uncovered in the N/S aligned part of the trench at its western end, but was exposed over most of the rest of the trench. The present day terrain more or less reflects the slope of the natural terrain in this area.

Contexts
T23. Layer of brownish grey clay, probably sterile moraine clay. Under T21, T22, and T26, not excavated.

T44. Yellowish orange moraine clay, contained stones spread irregularly throughout the layer. Under T37, T40, T42 and T45, same as T67.

T67. Yellowish orange moraine clay, contained stones spread irregularly throughout the layer. Under T66, the same as T44.

Group 1:18
Q48
Group 1:18 consists of the natural deposits (Q48) in trench Q96. In the westernmost third of the trench the natural consisted of interleaved layers of beach gravel, these deposits also dominated the natural terrain in trench S96 to the west. The natural deposits were unfortunately not recorded thoroughly in S96, but the gravels appeared to be at least 1.50m thick. In the rest of trench Q96 and trench T96 to the east, the natural terrain consisted of moraine clay. The interface between the clay and gravels indicates and old beach line of Lake Mjøsa. The beach cannot be dated, it lay at c. 129.00 m over sea level.

Contexts

Q48. Context issued to natural. Over the easternmost two thirds of the trench the natural terrain consisted of light orange brown silty clay that contained large fragments of limestone. The westernmost third consisted of interleaved gravel deposits. The interface between clay and gravel was not investigated thoroughly due to time constraints, but there appeared to be a distinct change in the natural deposits. This interface may represent an old beach line of Lake Mjøsa. These gravel deposits dominated S96, whereas the natural in trench T was clay. Under Q10, Q14, Q18, Q20, Q22, Q24, Q28, Q31, Q34, Q37, Q44.

4 Period 2: 1152/3-1260

4.1 Period 2 summary

4.1.1 Period 2 dating

Period 2 consists of contexts associated with the construction and use of the original cathedral prior to its extension towards the east (period 3). This period is dated to 1152/3 - 1260.

The construction period is assumed to have begun in 1152/53, when the bishopric was established, though in reality the building work may not have begun until a few years later. The end of the construction period can be traced archaeologically by the laying of the floor surfaces inside the cathedral, the building of the churchyard wall in trench P96, and the final landscaping of the churchyard, i.e. the formation of grave soils over the make-up dumps. It has not been possible to accurately date the completion of the cathedral. It is likely that it was built in stages, from east to west, as has been demonstrated to have been the case elsewhere (see Ekroll 1993:19-21). Given the limited nature of the investigations inside the cathedral no stratigraphic relationships between the various areas were available to test this interpretation. The eastern end could have been 'complete' and in use whilst 'construction' continued at the western end. No attempt has therefore been made to differentiate between the construction and use of the first cathedral.

A coin recovered from mortar layer R169/R170 (group 2:12) that is interpreted as the original floor surface in the crossing is dated to AD 1206 - 1260. This layer partially sealed a triple grave and clearly indicates that the eastern end of the cathedral was in use before 1260. Radiocarbon dates of CAL AD 1170 - 1250, from timber R298 (group 2:15) and CAL AD 1000 - 1205, from R238 (group 2:17), one of the primary make-up layers, were also obtained from the crossing. Both dates are at the 95% level of confidence. The radiocarbon dates both come from deposits related to the construction period. They support the indication given by the coin that this part of the cathedral was in use by AD 1260 and may have been functioning as a church already during the first half of the 1200's.

A radiocarbon date was obtained from the coffin of burial DG100 (group 2:17) in area D96 of CAL AD 1010 - 1190 at the 95% level of confidence. DG100 was buried within the make-up deposits, it was interred after the foundation of the western wall of the cathedral had been built. There is also evidence from trenches D96 (group 2:17) and J96-8 (group 2:23) that burials were taking place prior to the building up of the ground surface and the landscaping of the churchyard.

A radiocarbon date from the turf layer P55 (group 2:26) that the first churchyard wall P51/P52 (group 2:25) was built upon was recovered from trench P96. The sample was dated to CAL AD 1240 - 1300 at the 95% level of confidence. A date was also obtained from P57 (group 2:25), a silt/stone layer that butted the wall, of CAL AD 1280 - 1400 at the 95% level of confidence. The construction of the first churchyard wall in trench P96 can therefore be dated to some point between AD 1240 and AD 1400. Given the absence of brick fragments in these deposits it is likely that the wall was constructed during the earlier part of this date range.

Outside of the churchyard there was evidence for the use of hot stone technology in trench Q96. Traditional cooking pits and pits that may have been used to heat stones for the boiling of water were present in the same area. Two radiocarbon dates were obtained from the cooking pits: CAL AD 965 - 1255 (Q25, group 2:32) and CAL AD 1000 - 1170 (Q42, group 2:32), both dates are at the 95% level of confidence. In trench S96 a charcoal burning pit was documented in profile. It was located near or on the contemporary beach of Lake Mjøsa. A radiocarbon date of CAL AD 1055 - 1085 and 1150 - 1285 at the 95% level of confidence was obtained from one of the carbonised logs (S25, group 2:34). The dates from the features outside the churchyard, like some of the other dates from period 2, span the period of the establishment of the bishopric and therefore the construction of the cathedral. Unlike the activity from within the cathedral/churchyard these features cannot be stratigraphically connected to the construction of the cathedral. Whilst the possibility that this activity pre-dates the establishment of the bishopric cannot be ruled out, it is tentatively interpreted as being connected to construction of the cathedral.

4.1.2 Period 2 interpretation

The earliest surveys of the cathedral indicated that it had been extended towards the east and that the tower bases of the crossing had been rebuilt. The excavation confirmed that the tower bases had been rebuilt (see group 3:3) and also revealed other evidence that suggested that the origi-

nal cathedral had been altered. Between the original tower bases the gap in an E/W direction was 4.20m - 4.50m. The later rebuilding reduced this gap to c. 2.50m. The remains of a N/S aligned timber and stone structure (R285/R298, group 2:15) was partially uncovered approximately in the centre of the crossing. It was only exposed in a limited test pit, but there were clear indications that it was over 5m in length. The structure consisted of flag stones laid upon a timber beam. One post (R294) was uncovered in the test pit, against the flag stones. It is possible that more posts were present in the unexcavated area. The original mortar floor (R169/R284, group 2:12) appeared to have been laid over the flag stones, but the post was upstanding in the floor. The feature is tentatively interpreted as the foundation for a screen separating the nave from the chancel, the post being part of the upstanding structure. Such screens were a common feature, separating the holiest part of the church from the lay area (Parker 1994:248-50). It may have had a dual function however as it would also have shielded the chancel from the uncompleted nave. Traditionally such screens are located directly at the opening into the chancel. If this feature is the base for a screen it would have been c.2m out from the tower bases/chancel opening, but less than 1m from the step into the chancel R262 (group 2:13). The feature continued beyond the chancel opening to both the north and south. As such it would have screened from the nave any movement of the clergy between the chancel and the transepts.

The original opening into the chancel was c. 5m wide. The narrower opening that can be seen today may have been constructed at the same time as the remodelling of the crossing, but has been interpreted by Tor Sæther as being a doorway constructed after the fire in 1567 by the remaining canons who continued to use the chancel, but not the rest of the cathedral. The priest Jens Bugge wrote in 1601 that he recalled a tapestry that hung from roof to floor separating the chancel from another area, in all probability the nave (see Sæther 1998:71-5 for a discussion of the doorway into the chancel). The possible screen (R285/R298) was clearly not in use in the later period, if Sæther's interpretation of the doorway into the chancel is correct the aforementioned tapestry may have replaced the screen in the later period.

A stone platform (R280, group 2:13) lay along the north face of the SW tower base. This was upstanding c. 0.20m over the level of the original mortar floor. This may have served as the base for a wooden bench or other piece of furniture connected to the performance of religious services. The building up of foundations to serve as benches is a practice known from elsewhere (Lidén 1974:76).

The original floor in the crossing and north transept appears to have been of mortar (see R169/R284, group 2:12 and R250, group 2:8 respectively). In the crossing this surface partially sealed a grave that contained three individuals that were probably wrapped in shrouds (see group 2:14). The mortar layers could have been waste from the construction process, but appeared to be deliberately laid surfaces. Layer R169 was only investigated in one small area, it had clearly been relaid many times. This surface lay c. 0.20m under the level of the thresholds between both the crossing and nave (R273, group 3:3) and the north transept and the north aisle (R278 group 3:1). These thresholds are secondary, they lay flush with the surface of the latest tile floor (R70, group 4:8) and appear to have been laid in connection with a raising of the floor level. It is unclear whether there was originally a height difference between the crossing/transepts and the nave/aisles and whether these areas were as clearly differentiated as they were in the later floor plan.

The earliest floor surface recorded in the north and south aisles was of pairs of bricks set in a bed of mortar. This floor surface was uncovered in the SW and SE corners of the south aisle (groups 2:3 and 2:4 respectively) and in the north aisle (group 2:6). It was only uncovered where the overlying tile floor had not survived. In some places it appeared as though the bricks may have been removed prior to the laying of the tile floor, possibly to maintain the same level. The only documented remains older than this floor were interpreted as part of a foundation raft under the columns of the north arcade (group 2:7). No traces of this brick floor were uncovered in the crossing or the transepts. The mortar floor has been dated by a coin find as being in use by 1260, possibly earlier. Brick is known to have been in use in Norway around 1250 (Ekroll 1997:69). A grave excavated outside the west front in 1992 contained a coin and brick fragments. This find indicates that brick was in use at Hamar by 1263 (see Pedersen, E. A. 2000:196). It is possible that the crossing/transepts were completed prior to the use of brick in Hamar, but that the first floor in the nave and aisles was laid later, after brick was in use. No traces of a an older surface were uncovered in the nave and aisles but the possibility that traces of an earlier mortar or stone floor lay beneath the brick floor cannot be discounted.

The area under the SW tower was partially excavated. It was clear that the structural elements in this area had undergone some rebuilding. The area was not totally excavated however and it was difficult to determine which elements were contemporary. Traces of a stone foundation raft (R408, group 2:1) under the columns, similar to that

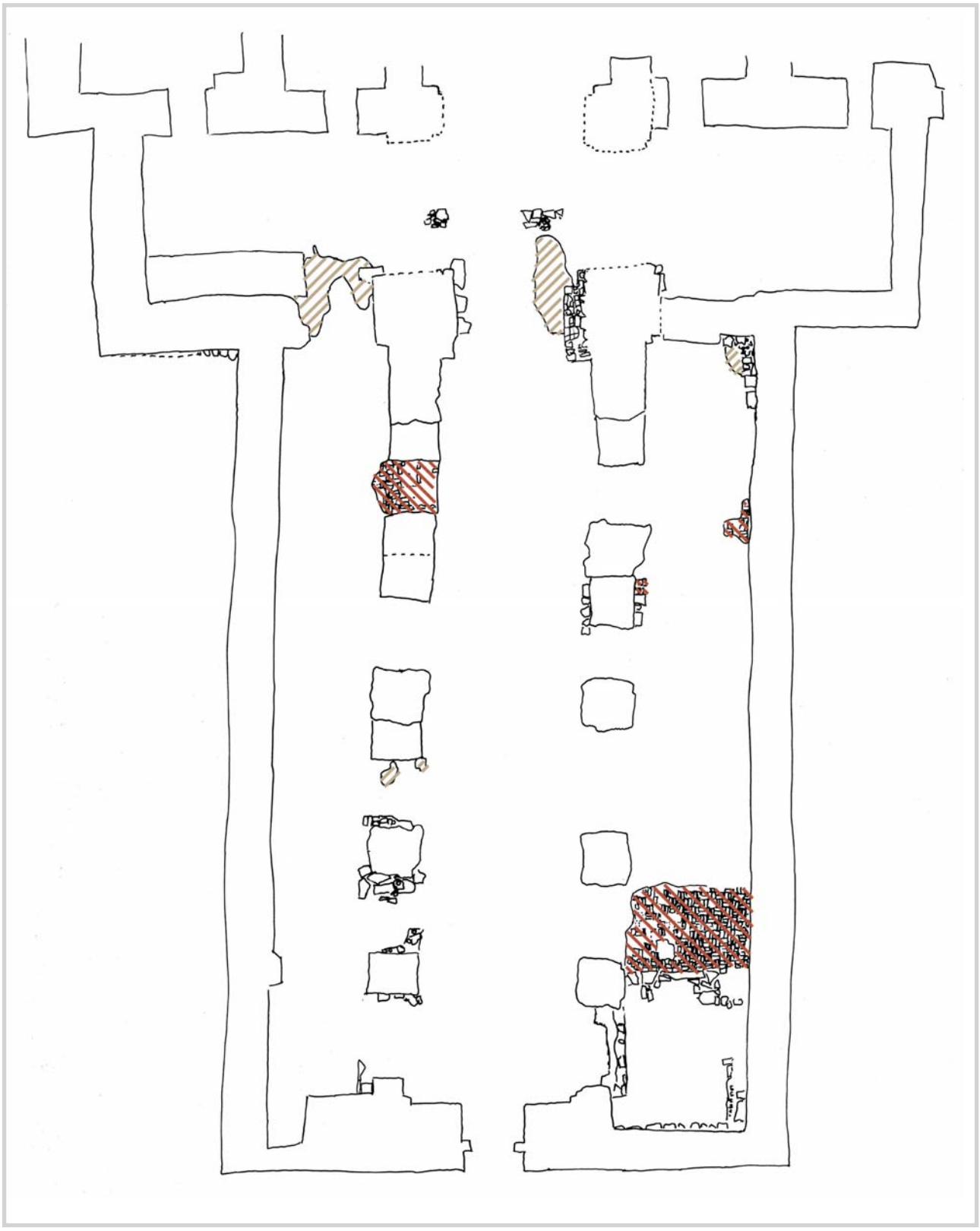


***Plate 1**. Lower brick floor, period 2. The floor was of pairs of bricks set in a bed of mortar. The brick floor is assumed to have covered the whole of the nave and the southern and northern aisles but was not recorded in the crossing or the transepts. The brick floor was only recorded where the later tile floor/beach gravel bedding had not survived. South aisle group 2:3, 2:4, north aisle group 2:6. Areas with bricks are marked with red hatching, areas with mortar acting as bedding for the tiles are hatched light greyish brown.*

documented in the north aisle, was partially uncovered in this area. A stone threshold (R330, group 2:1) lay between the tower room and the south aisle, clearly marking the area of the tower off as a separate room. The brick floor was not present in this area. The SW tower room and south aisle may have been separated by a narrow arch, or possibly, but less likely, a door. The function of this 'room' is unclear. No evidence of a similar threshold was apparent in the north aisle, but this area was not fully investigated. A written source from the 1790 mentions a square area with steps down to a crypt in the NW corner of the cathedral (see Nicolaysen 1886:144). The threshold formed a square area and the stone slabs R155 to the west of the threshold appeared to form a step down. The possibility that this crypt could have existed in the SW corner was investigated. This is not the case.

Several original altar foundations were partially uncovered against the columns in both arcades (groups 2:5 and 2:7). All were overlain by reconstructions that seemed to have added a layer of cement bonded stones to the surface of these foundations, possibly to raise them so that they were visible through the turf.

The external face of the corner between the north aisle and north transept and the internal face of the corner between the south aisle and south transept were partially exposed. In each case the walls weren't interleaved. The original foundation of the west wall of the north transept appeared to butt the foundation of the north wall of the north aisle in trench V96 (group 2:10). Two pieces of original walling were exposed in the SE corner of the south aisle. The southern wall of the aisle had been reconstructed and a N/S aligned reconstructed wall lay between the corner and the respond in the south arcade. The walls in group 2:5 were only partially exposed. It is possible these remains represented a thickening of the walls in the corner, as such they may not be representative of the relationship between the transept and aisle walls. They were not interleaved but butted one another, it was not clear which wall was earliest. The mortar foundation of the north wall of the north transept was uncovered in both 1988 and 1992. The mortar contained brick fragments. This and other indicators have led to the transepts being interpreted as secondary elements, i.e. not part of the original cathedral plan (Sæther 1998:59-61). That the walls uncovered in the corners butted one another appears to support this interpretation. The foundation of the north wall of the north transept was uncovered on the inner face however. This didn't appear to contain brick fragments however (see R134, group 2:10). The mortar seen on the outside face, that also extended north of the wall, may have been a raft or foundation connected to a repair of the wall, rather than the original foundation. A further factor to consider is that the trench dug along the inside face of the western wall of the north transept in the 1970's was excavated to below the level of the tile floor. If the cathedral had originally been constructed without transepts then the foundation of the original wall should have been encountered in this trench. Whilst the observed relationship between the walls at the corners between the aisles and transepts can be taken as supporting Sæther's theory, the evidence is inconclusive.

A grave (group 2:4) was excavated in the crossing. The grave had been partially opened in the modern period (see group 7:5). It contained three individuals, two had belt buckles resting on the top of the femurs. The bones were stained red and traces of an organic residue was present on the bones. These individuals were probably wrapped in shrouds. A copper bowl that contained ash and charcoal, presumably from the burning of incense, was found inverted in the base of the cut. The edges of the grave cut allowed the deposits that the grave cut through to be registered. The layers under the floors were dominated by make-up deposits, two of which consisted of mortar and stone rubble, some of the stones had traces of mortar on their surface (group 2:16). The remains of a stone structure (group 1:3) that appeared to be older than the cathedral was exposed in the base of the cut. The demolition deposits may originate from this structure. A layer of compacted crushed mortar (group 2:17) may have been a working surface related to the construction of the foundations of the central tower.

The original churchyard wall was excavated in trench P96 (group 2:25). The wall was a dry stone construction with a silt and rubble core. It was probably constructed at the end of period 2, i.e. after the cathedral was completed, or nearing completion. It was replaced by a mortar bonded wall in the 1400's (group 4:25).

Evidence of the use of hot stone technology was recovered in trench Q96 (group 2:32). Both traditional cooking pits and pits used for heating stones to boil water were present in this trench. A charcoal burning pit was recorded in trench S96.

4.2 Period 2 discussion

The purpose of the excavation inside the cathedral was to lower the terrain, where necessary, to enable a new floor to be laid. The upstanding, structural elements of the cathedral, walls, columns etc. were only given context

numbers and documented if they impacted with the exposed archaeological deposits. The sequence of walls and other structural elements was documented in the SW corner of the south aisle. The area was only partially excavated, some of the structures were only partially uncovered and the stratigraphic relationships between them were not exposed. There appeared to have been a re-modelling of the area, but it was difficult to judge which elements were contemporary. Two groups were tentatively identified: 2:1included the original structural elements and 4:2 those that appeared to be secondary.

Group 2:1 included the cathedral walls and their foundations, a column base and a stone structure that ran between column base R372 and R377, the respond in the western wall. This was only partially uncovered but appeared to have been built up of several discreet contexts (R373, R374, R408 and R409). This foundation (R408) had a linear, E/W aligned southern edge, a mortar wall core (R409) and two mortar deposits (R373 and R374) laid across its upper surface. It may have been part of an older structure but was probably a foundation raft laid between the columns. Remains of a possible raft were also uncovered in the north arcade (see group 2:7).

South of column base R372 lay a N/S aligned stone structure (R330) that formed a threshold with the south aisle, effectively transforming the space under the SW tower into a separate room. On the western side of R330, stone slabs (R155) were partially uncovered. These lay 0.30m lower than R330. On the eastern side of R330, brick floor R178 (group 2:3) lay flush with the top of R330. Two short walls (R328 and R371) were identified running at right angles from R330 to the edge of slabs R155. R330/R155/R328/R371 created a step up from the SW tower room into the south aisle. Slabs R155 were not part of a stone floor to this room, they appeared to be only c. 1m wide. A small area to the west was excavated to a level below R155, no traces of a floor surface were uncovered. To the north and south of short walls R328 and R371 were two roughly square areas of stones covered with a surface of mortar. The area to the south (R349 and R369) was c. 1m^2, it lay opposite column base R372 and was possibly the remains of the foundation of a respond in the southern wall that supported an arch over to R372. The area to the north (R350 and R351) lay against column base R372, it was less regular and difficult to interpret. Immediately south of this area one stone of R330 was upstanding 0.15m above the rest of the structure. This stone had been broken and clearly originally stood higher. How the threshold between the south aisle and the SW tower room was originally formed is unclear. The upstanding stone implies that the area against column R372 may have been walled up. If there was an open arch here it would have been very narrow. It is possible that the area at the southern end of R330 was not a respond foundation but that both ends of R330 were walled, and the threshold sealed by a door, the upstanding stone forming one side of a door frame.

The southern wall of the cathedral had a foundation in the SW corner that was 0.80m thicker than the actual wall. The foundation was stepped and was given two context numbers (R379 and R380). Only 1.50m of the southern wall (R384) survived. Along the rest of the southern wall of the south aisle a one course high, cement bonded wall (R364, group 7:1) had been reconstructed in its place. The function of the wide foundation is unclear, it appeared to be confined to this room. The foundation of the western wall (R382) extended up to 0.20m out from under the upstanding wall (R383). The surface of the western wall appeared to have been partially reconstructed.

A possible foundation R381 (group 2:2) was uncovered in a small test trench dug through stone working debris R385. This context filled a cut feature (R386), but also extended beyond the cut. The remains of a mortar bonded wall core (R381) were uncovered in a small area. This may an older structure, but was most likely part of a wide foundation for the southern wall. Cut R386 didn't run parallel with the southern wall, but it may have been a later feature that bottomed out upon the top of R381, rather than being a construction cut for R381. The alignment of cut R386 therefore doesn't necessarily reflect the alignment of structure R381. The rest of group 2:2 consisted of construction debris spread around the SW tower room. These layers were only partially exposed, they appeared to overlay the original turf horizon and the natural moraine clay (groups 1:1 and 1:2). This construction debris is interpreted as make-up dumping. It could be grouped together with a series of slaked lime deposits in period 4 (group 4:1), rather than being placed in period 2. No traces of the original floor in the SW tower room were uncovered.

The documented structural elements in the SE corner of the south aisle, group 2:5, consisted of two walls (R217 and R218) and a stone altar foundation (R188). R217 was aligned E/W, R218 N/S. The two sections of walling were only uncovered in the actual SE corner of the south aisle. They appeared on the surface to butt one another, i.e. they were not interleaved and are therefore assumed to not be contemporary. R217 had been replaced to the east by the reconstructed southern wall of the cathedral (R364 group

7:1), R218 was covered to the north by cement bonded stone threshold/wall (R215, group 7:2) that ran across the threshold between the south aisle and the south transept Whilst they didn't appear to have been constructed simultaneously there was nothing to indicate which was the earliest. As these structures were only exposed on the surface the relationship between them cannot be confirmed. The earliest recorded floor in the south aisle, brick floor R192 and its mortar bedding R158 (group 2:4), was exposed in the corner and butted both R217 and R218. If these walls were not constructed simultaneously both were completed prior to the laying of the brick floor.

The columns of the south arcade were only recorded in the SW corner. The excavations in the north aisle were more extensive however: the whole of the aisle and the areas between the columns was de-turfed and documented. The column bases of the north arcade were therefore more thoroughly documented. Unlike the south arcade, which is complete, only the column bases of the north arcade survive. Many of these appeared to have been partially or totally reconstructed. The remains of three altar foundations were recorded butting the column bases in the north aisle, all of which were covered by modern stone and cement reconstructions. One of the altar foundations was probably of brick and mortar and is interpreted as being of a later date (R26 group 4:4). The reconstructions are referred to here but are discussed separately in period 7 (group 7:3). The original structural elements in the north aisle were grouped together as group 2:7.

A profiled stone (R91, group 7:3) lay against the western wall of the north aisle in line with the arcade. The stone was not built into the fabric of the wall but butted against it. It is assumed to be a reconstruction of the original respond. Stone slabs R83 were visible beneath R91, these are interpreted as the remains of the foundation of the original respond. The westernmost freestanding column base, R90, was a reconstruction. Presumably the original foundation lay beneath R90, but it was not visible. The column base to the east of R90, R111 appeared to have been partially reconstructed but probably not completely. The original foundation R113 was partially visible beneath R111. The next column to the east, R427, appeared to be the original column base. The column base to the east of R427 consisted of a modern reconstruction, R95, built upon the remains of the original, R96. A layer of silt lay between the two, clearly indicating that R95 was not part of the original column. R96 was visible on the northern and eastern sides of R95. It lay approximately flush with the top of brick floor R28 (group 2:6), R96 may have been the original foundation rather than part of the upstanding column. To the east lay the respond that was built into the NW tower base of the central tower, not a freestanding column. This was not recorded.

The remains of two stone altar foundations were recorded in the north aisle. R118 butted original column base R427 on its western side. It was overlain by a stone and cement reconstruction R119. R118 was barely visible beneath R119, it appeared to have been slightly smaller than the reconstruction. R100 lay beneath reconstruction R99, butting column base R96 on its western side. R100 was also barely visible beneath the overlying reconstruction. Not enough of R118 or R100 was visible to determine their construction technique, but they were clearly separate from the overlying reconstruction's that were constructed of cement bonded stones. A further altar foundation was recorded in the SE corner of the south aisle, butting the easternmost free-standing column, opposite R100. R188 (group 2:5) protruded out from under a similar, cement bonded reconstruction (R187 group 7:2) by 0.30m on its northern side and 0.50m on its southern side. The overlying reconstruction butted the column, but a gap of 0.50m on the northern side and 0.20m on the southern side was visible between R188 and the column. The brick floor R192 (group 2:4) appeared to have been laid between the altar foundation and the column. The bricks lay approximately flush with the top of the stones but were presumably laid after the altar foundation had been constructed. R188 also appeared to extend further west than the reconstruction by 0.40m on the northern side. R188 was constructed of mortar bonded stones and was clearly a different structure than the overlying reconstruction. The interfaces between R118 and R100 and the adjacent columns were not clearly visible but there was nothing to indicate that they did not butt the adjacent columns. The original altar foundations appear to have been constructed approximately level with the brick and tile floor surfaces but the overlying reconstruction's stood proud above the floor levels. These were visible in the grass prior to the de-turfing but the original structures were not visible until the turf was removed.

Under R83 at the western end of the north arcade the northern edge of two stones (R84) were partially visible. These had a linear, approximately E/W aligned, northern edge. Their alignment was not parallel to the line of the arcade, however, they appeared to converge into the arcade in a similar way to R408 (group 2:1) in the SW corner. As only a small part of this structure was exposed however it is difficult to interpret. Mortar bonded stones, R89 were visible on both the eastern and western sides of

reconstructed column base R90. R89 was overlain by the beach gravel bedding for the tile floor (R27, group 4:5), it was only visible where R27 didn't survive and appeared to continue under R27 to both east and west. It consisted of mortar bonded small and medium sized stones. The stones were irregularly laid and didn't appear to form a flat surface. R89 continued 1m+ beyond R90 on its eastern side. On the western side of the adjacent column base R111/R113 larger mortar bonded stones, R108, were visible. R108 extended 1m+ beyond R111/R113 on its western side and 0.40m beyond the column at its NW and SW corners. R108 also lay partially under the beach gravel bedding layer R27. Directly against the column base however the stones of R108 lay flush with the adjacent tile floor remains R25 (group 4:5), indicating that part of R108 would have been visible in the floor plan of the cathedral. Part of R108 may have formed a foundation for a small altar or a platform for a bench or some other internal fitting. With the exception of part of R108, these stone layers (R84, R89 and R108) appear to have been part of a foundation, probably a stone raft that extended under the columns of the north arcade, similar to R408 (group 2:1) that was documented in the SW corner.

The foundation of the western wall of the nave (D110, group, 2:29) was exposed at its external face in trench D96. The wall was constructed of six courses of mortar bonded flat stones to a height of 1.60m. It was constructed directly upon bedrock and make-up deposits were dumped against it to build up the ground level, forming the churchyard and supporting the foundation. An unbonded stone structure (D107) lay against the foundation. It is possible this was the remains of the foundation for a temporary structure connected to the construction process, but it was more likely a dump of stones with no structural function.

The original structural elements exposed in the north transept were documented in group 2:10. The remains of the foundation of the north and west walls of the transept R134, were exposed in a band along the inside faces of parts of the walls. R134 consisted of mortar bonded small and medium sized stones. No traces of brick or tile were documented in R134, unlike in the foundation raft documented on the outside of the north wall in 1998 and 1992 (Sæther 1998:60-1). A small trench, V96, was dug on the outside of the north transept against the wall in the corner where the west wall of the transept and the north wall of the north aisle met. The facing stones of both walls appeared to have been reconstructed with cement. It was unclear whether the core of the transept wall was original or not. The reconstructed elements are discussed in period 7 (group 7:4). The original wall of the north aisle, V5, appeared to be older than the original west wall of the north transept V4. V5 was constructed of mortar bonded large stones, V4 was constructed of mortar bonded flat stones. The fabric of the two walls was not interleaved; V4 appeared to butt V5. A similar situation, i.e. butting walls, was observed on the inside face of the corner between the south transept and south aisle in the SE corner, see above group 2:5. V4 had a different alignment than the overlying reconstruction V9. V4 extended 0.50m further west in the corner than the reconstruction such that the original wall core (V8) was visible. The acute angle formed by the walls of the north transept and north aisle appears to be due to an inaccurate reconstruction of the face of the west wall of the north transept. The original walls formed an approximate right angle.

The original structural elements that were documented in the crossing (group 2:13) consisted of the NW and SW tower foundations and a structure interpreted as the original step into the chancel. The central tower that stood over the crossing was supported by four tower bases that formed the area referred to in this report as the crossing. Nordhagen's plan clearly shows that all four tower bases were rebuilt. Excavation in this area only uncovered original elements of the NW and SW tower bases, the structures to the east lay outside the area of excavation. The upper surface of the foundation of the NW tower base (R274) was partially exposed on its eastern and southern sides, it consisted of large mortar bonded stones that extended > 0.40m out from under the original tower base (R275). The foundation of the secondary NW tower base (R266, group 3:3) was partially constructed upon R274), the secondary tower R277 butted the original tower R275. The secondary towers were narrower and may have functioned as buttresses, strengthening the original tower bases. The gap between the original tower bases was 4.20m - 4.50m, the construction of the secondary tower bases reduced this gap to 2.50m.

The foundation of the original SW tower base was exposed on its northern side. A 2.80m long (E/W) x 0.65m - 0.80m wide (N/S) platform of large mortar bonded stones (R280) lay on the northern side of the tower base. The tower itself was constructed upon R280, but it was clearly more than a foundation. R280 was upstanding 0.20m - 0.30m above the possible original floor R169, (group 2:12) and lay roughly flush with the top of the later tile floor R70 (group 4:8). It appears to have formed a platform against the wall of the tower base possibly for a bench. Its N/S alignment suggests it was not an altar foundation. With the exception of R108 (group 2:7) that

lay to the west of column R113 in the north arcade, no other structures were built into the column/tower bases, the altar foundations that were recorded in the aisles appeared to butt the adjacent column bases.

The western edge of the remains of a step into the chancel (R262) was partially visible at the eastern edge of the excavated area. It was covered by an overlying cement bonded reconstruction (R247, group 7:5). The western face of four stones were visible protruding out from under the reconstruction. As only a small part of the feature was visible it is difficult to interpret, but it appeared as though it may have been the base of an original step into the chancel, the upper surface having been removed. It was butted by silt layer R270 (group 2:11), the step was therefore contemporary with the earliest floor layer R169 (group 2:12). It is not known whether the same step was in use after the tile floor (R70, group 4:8) was laid. The large threshold stone that separates the crossing from the nave (R273, group 3:3), appears to be secondary and relates to the tile floor. This was laid in a cut, no traces of any original threshold between the nave and crossing were recorded.

A 0.50m deep grave (group 2:14) was excavated in the crossing. The edges of the cut allowed for the deposits under the floor levels to be documented in profile. Two make-up deposits (R236 and R237, group 2:16) of mortar and stones lay under the earliest floor layer R169. R237 contained large stones some of which clearly had traces of mortar on their surfaces. These layers are interpreted as consisting of demolition deposits. Under these lay a compact thin layer (R238, group 2:17) of crushed mortar. As this layer was only recorded in profile it was difficult to interpret, but it was so compact it appeared to form a kind of surface. It crumbled under pressure however and was not a layer of set mortar. It is interpreted as compacted crushed mortar, representing a working surface related to the construction of the tower foundations, prior to the dumping of the make-up deposits which were subsequently used to build up the ground surface to the required level. In the base of the grave, the remains of a mortared stone structure (R210, group 1:3) was uncovered, this is interpreted as a structure that pre-dates the cathedral. The aforementioned mortar and stone demolition deposits may have originated from this structure. If this is the case they were not in-situ demolition deposits, but were removed and deliberately re-deposited as make-up. Over R210 lay a layer of re-deposited natural clay and a layer of silty sand that contained burnt stones and charcoal (R239 and R238 respectively, group 2:17). A charcoal sample from R238 was radiocarbon dated to CAL AD 1000 - 1205 at the 95% level of confidence.

A stone and timber structure (group 2:15) was partially uncovered in a 1.40m (N/S) by 0.80m (E/W) test excavation within the crossing. The structure consisted of a linear, N/S aligned, layer of flat flag stones (R285). The stones were laid upon a timber beam (R298), that was also N/S aligned. The top of the stones were also partially uncovered under the threshold between the crossing and the north transept (R60, group 3:2) the timber was also visible beneath the stones, but was not uncovered. A linear depression ran between these two points and beyond to both the north and south indicating that this was a N/S aligned linear feature > 5m in length. The depression is assumed to have been caused by the partial rotting of the beam or because of settling of the deposits around the timber. A layer of mortar and stones R340 (group 3:2) was laid in the hollow to level it off prior to the construction of threshold R60 (group 3:2). The trial excavation revealed the remains of a wooden post (R294) set in stone post packing (R299), adjacent to the slabs on their western side. The top of the post packing was approximately flush with the top of the slabs. A single, large stone slab (R300) was placed against the beam/slabs to the south but it is unclear whether this had any structural function. No part of the structure was placed in a cut, the beam appeared to have been placed upon mortar surface R238 that is interpreted as a possible working surface connected to the construction of the cathedral (see above). Make-up deposits (group 2:16) were then dumped around it, holding it in place. The stone slabs were wider than the beam, a silt layer (R295) was dumped over and around the beam and stone slabs. Traces of the original mortar floor (R284, group 2:12) were present over the slabs. A wood sample from the beam was radiocarbon dated to CAL AD 1170 - 1250 at the 95% level of confidence, dating the structure to the construction period of the cathedral. The top of the post hole appeared to be ‘filled’ by R293, (group 3:5). R293 was presumably deposited after the post was removed indicating that the post was in use during the first period of the cathedral. Presumably there were more post holes along the length of the structure but these were not uncovered. The slabs and beam lay approximately in the centre of the crossing roughly equidistant from the western and eastern tower bases, but offset slightly to the west. This construction technique, of stones atop a timber beam, is unusual. One possible explanation is that the beam was laid to mark the position of the structure and was not intended to be load bearing.

The structure's function is unclear. It appears to have lain below the floor level, whereas the post was probably upstanding in the floor. The stone slabs presumably acted as a foundation for an upstanding structure. It is possible the structure was the remains of a scaffolding support but it was positioned c. 2m from the tower bases and the post appeared to have remained upstanding after the floor surface was laid. The structure is tentatively interpreted as the foundation for a screen that separated the chancel from the nave in the first cathedral, post R294 being part of the screen. The crossing appears to have been remodelled: the tower bases rebuilt, the floor level raised and a new threshold between the nave and the crossing laid, see groups 3:3 and 4:8. The screen that this structure may be the remains of presumably became obsolete as a result of this re-organisation as threshold R60 (group 3:2) was constructed over it, and no traces of it were present in the later tile floor (R70, group 4:8).

The original opening into the chancel was c. 5m wide. The narrower opening that can be seen today may have been constructed at the same time as the remodelling of the crossing, but has been interpreted by Tor Sæther as being a doorway constructed after the fire in 1567 by the remaining canons who continued to use the chancel, but not the rest of the cathedral. The priest Jens Bugge wrote in 1601 that he recalled a tapestry that hung from roof to floor separating the chancel from another area, in all probability the nave (see Sæther 1998:71-5 for a discussion of the doorway into the chancel). The structure R285/R298 was clearly not in use in the later period, if Sæther's interpretation of the doorway into the chancel is correct the aforementioned tapestry may have replaced the screen.

Remains of two phases of flooring were uncovered both in the north and south aisles and in the crossing and north transept. In all areas the latest floor consisted of square ceramic tiles laid in a bed of beach gravel (groups 4:3, 4:5, 4:7 and 4:8). In the north and south aisles the earlier floor consisted of red bricks laid in pairs (groups 2:3, 2:4 and 2:6). The bricks were set in a bed of relatively coarse mortar, each pair was laid at a right angle to the adjacent pair, the mortar bedding was visible between the bricks. In some places the bricks did not survive, but the patterning could be seen in the underlying mortar bed. It is possible that they were deliberately removed to allow the new tile floor to be laid at the same height. The brick floor was only recorded where the later tile floor/beach gravel bedding had not survived. It was uncovered over a relatively large area in the SW corner of the south aisle (group 2:3), and in a few patches in the SE corner (group 2:4). It was also exposed in a few places between the column bases in the north arcade (group 2:6). At the eastern end of the south aisle a large stone, possibly a grave marker, was partially uncovered (group 2:4). it was overlain by the beach gravel bedding for the tile floor and therefore was probably contemporary with the brick floor. Only in two places at the western end of the north arcade were deposits that appeared to be earlier than the brick floor uncovered, (see R89 and R108, group 2:7). These consisted of stone and mortar deposits that are interpreted as part of a foundation raft that supported the arcade. No traces of a floor surface earlier than the brick floor were recorded in the aisles.

No evidence that the brick floor was ever laid in the crossing and north transept was recovered. In the crossing a mortar layer, (R169/R284, group 2:12) that is interpreted as a mortar floor surface, was partially uncovered. R169 was excavated in a small test area. It was unlike the mortar bedding for the brick floor that was uncovered in the aisles. It consisted of several thin layers of mortar with silt in between them. The possibility that these layers were waste from the building of the cathedral cannot be discounted, but they appeared to be deliberately lain horizontal surfaces. R169 was overlain by a series of thin silt layers (group 2:11) that were reminiscent of the silts seen sandwiched between the mortar surfaces. These silts are interpreted as deposits that accumulated upon the floor surface. They were only excavated in a limited area, i.e. the area in which R169 was uncovered. They covered the southern half of the crossing, and were truncated or not uncovered in the northern half. It is likely that the mortar surface was preserved beneath them and that the surface originally covered the whole crossing. A similar mortar layer and silt layer (R250 and R251, group 2:8), were uncovered in the north transept. These layers were not excavated but appeared to mirror the situation recorded in the crossing, i.e. thin interleaved layers of mortar and silt. They were only uncovered in small area north of the NW tower base. The excavation in the rest of the north transept stopped on deposits that were stratigraphically later than these. In both the crossing and north transept the mortar layers lay at a lower level than the later thresholds into the nave and north aisle. A coin dated to AD 1206 - 1260 was recovered from R169. This layer also partially overlay a grave in the crossing.

It is unclear why no traces of a brick floor were uncovered in the crossing and north transept. Broken brick fragments were present in two contexts (R143 and R247, group 7:5) but these are interpreted as broken up brick structures, not part of a floor surface. It is possible that a

brick floor was laid in the crossing and transepts, but removed prior to the laying of the tile floor. The floor level in the crossing was raised after the thresholds between the crossing and the nave and aisles were constructed. If the brick floor was laid in this area and later removed it would presumably have been laid after the thresholds were constructed and was removed to maintain the same floor level. There were no traces however of the mortar bedding that survived in the aisles where the bricks had been removed. Some evidence for a truncation event in the crossing was recorded. Burnt deposits (group 3:6) that lay over the mortar floor appeared to have been truncated. It is debatable to what extent however. Whereas the possibility that the brick floor was laid in the crossing and transepts cannot be totally ruled out, it is considered unlikely. It appears as though there never was a brick floor in the crossing and transepts.

It is likely that the cathedral was completed in sections. Dating of roof timbers from two churches have shown that the chancels were completed 50 and 70 years prior to the completion of the respective naves (Ekroll 1993:19-21). There is no reason to assume that the cathedral was constructed any differently. It is therefore likely that the crossing and transepts were completed before the nave and aisles. It is possible that the floor in the eastern half of the cathedral, including the crossing and transepts, was completed prior to the introduction of brick as a construction material at around 1250 (see Ekroll 1997:69). Whereas the possibility that there was an earlier floor in the nave and aisles cannot be discounted, it is also possible that the floor was not completed in this area until after brick became available and that the new material was used to lay the floor in this area, but not in the eastern end of the cathedral that was completed prior to the introduction of brick.

A grave that contained three individuals was excavated in the crossing (group 2:14). The grave had been disturbed, probably as part of an antiquarian investigation, see group 7:5. The robber cut appeared to have more or less the same dimensions as the original cut on the surface, but narrowed with depth and only uncovered parts of the northernmost and central individuals. The grave was not excavated in the correct stratigraphic sequence, it was therefore difficult to accurately distinguish between the robber cut and fill (R71 and R72) and the original grave cut and fill (R131 and R127) until the lower levels of the feature. At the southern edge it was clear that mortar layer R169 lay over the original fill R127. R169 lay 0.20m - 0.30m under the level of the tile floor, the grave therefore clearly belonged to an earlier period and would not have been visible in the tile floor. The robbing activity (R71) cut through the tile floor. A coin recovered from R169/R170 was dated to AD 1206 – 1260, giving a terminus post quem for the filling of the grave. The robber cut R71 continued outside the limits of the original grave to the west, between the grave and the threshold with the nave. This area was 1.20m wide (N/S) on the surface, 1m wide at the base and 0.70m long (E/W). It was 0.50m deep and bottomed out above the level of the burials in R131. It is possible that R71 investigated a second grave that lay directly against the threshold stone, which was visible in the tile floor. A grave in this position was recorded in the original surveys of the cathedral. Once this burial was removed the investigation may have continued below the base of this grave into earlier grave R131, partially disturbing tow of the burials. A seal stamp, that has been identified as belonging to Thorodd Thorsteinsson, a canon who wrote two still existing letters in AD 1346 (DN II, number 274 and DN III, number 233) was recovered from the fill of the robber cut R72. It is unlikely that this was interred with one of the three individuals in the earlier grave as the coin from R169 gives a terminus post quem for the filling of R131 of AD 1260. The most likely interpretation is that the seal stamp comes from the second grave which was dug in a later period and totally removed by cut R71.

Three individuals were interred within the grave, the northernmost RG126 had been truncated above the pelvis, the skull lay in approximately the correct position but had probably been replaced, i.e. did not lay in-situ. The torso and left arm of the central burial RG125, had also been disturbed by cut R71, but the southernmost burial RG124 was undisturbed. Some of the ribs of RG125 appeared to have been subject to chemical deterioration, some of the bones of RG124 appeared to have moved slightly post-mortem. Iron belt buckles were found on the top of both femurs of RG125 and the left femur of RG126. An inverted copper bowl that contained ash and charcoal was placed in the base of the grave in between the skulls of RG125 and RG124. It appeared to be associated with RG125, a separate lump of charcoal was placed below the right shoulder of RG125. The bowl showed signs of having been repaired or re-used and was presumably used to burn incense or some other fragrant resin. A small number of ceramic funerary pots and one metal incense burner containing charcoal have been found in medieval graves in Denmark. The practice was not widespread however. It appears to have been the preserve of the elite and may have been connected to a French practice (Madsen 1988).

A red staining was apparent on all three individuals, especially on the leg bones. An organic residue (R148) lay over the feet of both RG125 and RG126 and over the pelvis and sacrum of RG125. This staining and the belt buckles suggest that the bodies were wrapped in shrouds. Another organic residue R148 was present in the base of the grave cut. A thin layer of silt (R161) lay between R148 and the bodies. R148 may be the remains of a wooden platform in the base of the cut. R161 silting from the loose layers in the sides of the cut, prior to the interring of the bodies. A similar 0.10m thick silt and crushed mortar layer (R150) lay over the bodies. This had a concave upper surface and could also be interpreted as silting. This would suggest that the grave was 'open' for a period, i.e. not immediately backfilled. An alternative explanation is that R150 was laid as a substitute for lime for hygiene purposes.

A number of make-up deposits were recorded in the churchyard, primarily outside the west front. The west front of the cathedral was built upon sloping bedrock. The natural terrain sloped away sharply to the west. There was a need to build up the ground level in this area to support the foundations, to create the churchyard to facilitate burial and to provide access to the entrance at the west front. The make-up deposits were thickest to the north thinning out to the south. With the exception of trench D96, the trenches in this area were located away from the cathedral wall. Presumably the ground surface directly against the cathedral would have been built up to stabilise the foundations, but this activity was not recorded in trenches on the north side (J96 1-4) or at the NW corner (J96-6). The area along the north side of the cathedral appears to have been built up at a later date, see period 4.

The western profile of trench H96-14 consisted primarily of a sandy silt grave soil (H66, group 2:30). Towards the southern end of the trench two grave cuts (H82, group 4:35 and H81, group 4:36) were recorded. Over the rest of this profile the make-up deposits had been reworked into grave soil H66. Twentythree burials were present (groups 4:32, 4:33, 4:34, 4:35 and 4:36), but no other grave cuts could be defined. The eastern profile lay closer to the cathedral, in this profile discreet make-up dumps and grave cuts could be defined (see group 4:31). The make-up deposits consisted primarily of stone working debris with a few thin silt layers at the northern end of the trench (group 2:30). These silt layers (H41, H42, H43 and H44) sloped down to the north, they were dumped over the stone working debris (H45). The make-up deposits in trench D96 contained stone chips, but did not consist, as H45 did, purely of stone working debris. A thin grave soil (H63) that consisted of stone chips and silt was present in the southern half of the trench. The stone working debris appeared to have been concentrated in this trench. It overlay the original turf horizon (H38, group 1:14), building up the ground surface by < 0.90m. Debris from various stages of stone working were present, these were dumped in concentrations but were also mixed together. These deposits were also recorded in the 1992 excavations. They were interpreted as in-situ debris indicating that the stone working had taken place in the near vicinity (Pedersen 2000:186). Whilst this cannot be ruled out, material from all stages of stone working was mixed together and the deposits were not compacted. Given that the construction process would have continued over many years with seasonal activity each year, one would expect in-situ debris to consist of several consolidated layers, rather than the loose mixed deposits recorded here. H45 is interpreted therefore as debris brought in form elsewhere and deliberately dumped here as make-up.

A general grave soil context (D53, group 2:28) was also issued in area D96. Some grave cuts were identifiable, but most of these were only defined after the burial had been identified. Sixteen burials were recovered from within D53. The latest (group 4:26) and the earliest (group 2:27) burial groups were not recorded as within D53. As in trench H96-14 the grave soil is grouped together with the make-up deposits. Even though the grave soils were reworked and contained material from later periods they are interpreted as being originally deposited during period 2. The make-up deposits consisted of a 0.10m thick layer of stone chips (D98), that was localised to over stone structure D107 (group 2:29), a 0.40m - 0-60m thick layer of re-deposited moraine clay mixed with stone chips (D88) and a 0.40m thick silt layer (D60) that was only present in the eastern half of the trench, against the cathedral foundations. Both D88 and D60 had been truncated by graves. D88 sloped down to the west, D60 lay upon D88 and had a horizontal upper surface. Although D60 had been truncated by graves it did not appear to have originally covered the whole trench. The steps outside the western entrance to the cathedral (group 7:16) were reconstructed. The latest group of graves (group 4:26) appeared to have been truncated, the original steps may have been removed by the same truncation event. If this interpretation is correct the original steps would have been constructed upon D60 or a layer than lay upon D60. The upper surface of the layer lay c. 1.25m under the threshold, at 136.00 m over sea level. The latest burials, (group 4:26) lay between 135.52 -135.97 m over sea level.

The make-up deposits in trench J96-8 (group 2:24) consisted of eight discreet layers of demolition rubble and clay/silt. All the layers sloped down to the NW, following the slope of the natural terrain. They were overlain by a thick grave soil (J121, group 4:19) that had a horizontal upper surface. The rubble layers (J126 and J127) consisted of demolition material from a mortar bonded wall core. These layers were the earliest in this group and lay directly upon the original turf horizon. The presence of demolition deposits at this level supports the interpretation of group 1:3 and group 2:16 as indicating that a stone structure stood in the area prior to the construction of the cathedral. The layers in this group are interpreted as refuse from the construction process in the area dumped over a period of time rather than being deposited in one episode. This is in stark contrast to the make-up deposits described above from trench D96 that consisted of two thick layers. The area of D96 may have been deliberately built up in one episode because of the need to construct the steps into the western entrance.

A layer of re-deposited moraine clay (M122, group 2:20) was recorded in trench M96-14. It lay over the original turf horizon, but was only 0.10m thick. It was more likely thrown up from a dug feature spread out in this area, rather than a deliberate make-up dump. The trench was c. 18m away from the earliest cathedral. The area was built up during period 3 (group 3:15), after the cathedral was extended towards the east.

Two graves (DG100 and DG103, group 2:27) appeared to have been dug through make-up layer D88 in trench D96. They were not excavated until D88 had been removed, but were almost certainly cut through it. The depth of these graves strongly suggests they were dug prior to the final building up of the area and the establishment of the churchyard, i.e. these individuals were interred during the construction period. Both were coffin burials, two quartz crystals were placed in the base of grave cut D102, around DG100. The fill of this grave contained disarticulated human bone indicating there was at least one more contemporary burial further west. A fragment of wood from the coffin of DG100 was radiocarbon dated to CAL AD 1010 - 1190 at the 95% level of confidence. The grave cut through a layer that butted the cathedral foundations and was therefore interred after the foundation of the west wall had been constructed. This grave is therefore dated to between 1152 - 1190. The final landscaping of the churchyard may not have taken place until after 1190 i.e. the construction process may still have been ongoing at that time.

Two graves were also recorded in trench J96-8 as cutting through the make-up deposits and possibly pre-dating the final landscaping of the churchyard. JG122 and JG124 (group 2:23) both lay in definable grave cuts, but both were only 0.20-0.25m deep. It is possible that they were both cut from within the overlying grave soil (J121, group 4:19). It is also possible that these were dug as shallow graves in the knowledge that the area would later be built up. This might particularly have been the case had the graves been dug during the winter when the ground was frozen.

One coffin burial (MG144) and a possible grave (M164) in trench M96-14 were grouped in period 2 (group 2:19). They were not empirically dated, but contained no brick fragments and pre-dated the building up of the ground surface (group 3:15) that is interpreted as being connected to the extension of the cathedral towards the east. MG144 lay c. 18m NE of the original cathedral. It cut down into the natural moraine clay. Due to the presence of bedrock to the north, MG144 lay at the northernmost point at the eastern end of the cathedral where burial was possible.

Four burials dated to period 2 (group 2:18) were also recorded in trench B96-4. Three of these, BG38, BG70 and BG74, had been cut by the construction cut for the chancel wall (B79, group 3:9). The fourth burial BG65, pre-dated other activity related to the construction of the chancel. All four graves cut into the natural moraine clay. No trace of the original turf horizon was preserved in trench B96-4. Traces of the grave cuts for all four burials were recorded, but B64, the grave cut for BG65 was by far the most complete. Only the western half of the grave was extant, the eastern half had been truncated by a later grave. The grave was 0.90m deep, the deepest grave cut recorded during the excavations. Fragments of wood recovered from the base of the fill indicated that this was a coffin burial. The arms and hands were folded tightly against the body however, suggesting that the corpse might have been wrapped in a shroud. Three lumps of charcoal were placed around the body. These burials lay over 4m east of the contemporary apsidal east end of the original cathedral.

The area along the northern side of the nave, trenches J96-1 - 4 was not built up until period 4 (see groups 4:14 and 4:15). In all four trenches a layer of humus rich silt (group 2:21) lay over the natural terrain. Two silt layers were present in J96-3. These were separated by two layers that were indicative of building activity (J101 and J109). The turf appears to have re-established itself in this

trench after some small scale dumping. The 1992 excavations interpreted this area as being open from the period pre-dating the construction of the cathedral until AD 1250 (Pedersen E. A: 2000:181). The evidence from this excavation supports this interpretation. These silt layers were later covered by large scale dumping (groups 4:14 and 4:15) that raised the ground surface by 0.20m - 0.90m, creating sufficient depth for the area to be used for burials. This dumping is interpreted as taking place in the middle of period 4. The silts of this group may therefore have contained material form the first half of period 4. These trenches lay between 5m - 9m north of the outside wall of the north aisle.

A series of silt and clay layers (group 2:22) overlay the natural terrain in J96-6. The trench lay 4m from the NW corner of the cathedral, the natural terrain sloped sharply down to the NW. Eight discreet layers were documented, they contained charcoal, bone and other debris. The layers varied in thickness from 0.02m – 0.20m, two (J145 and J146) were confined to a pocket in the bedrock. These layers were all clearly definable, they probably accumulated over a relatively long period of time. A collection of human bones (JG148) were recovered from within layers J141 and J142. These were originally thought to be an in-situ burial, but appeared to be a collection of re-deposited bones, possibly from a single grave. A sample from one of the bones was radiocarbon dated to CAL AD 1220 - 1310 and 1365 - 1375 at the 95% level of confidence. This group was overlain by extensive make-up dumping (group 4:16), that built up the ground level by over 1.70m. This activity is interpreted as taking place in the middle of period 4. The later layers in this group may therefore have been deposited in the first half of period 4.

A section through the earliest churchyard wall P52/P51 (group 2:25) was excavated at the base of trench P96. The wall was E/W aligned at this point. Only a single course of the southern edge was extant. The wall (P52) was constructed of unworked limestone blocks, the remains of the wall core (P51) of silt and stone rubble was partially preserved. The northern edge of the wall had been removed prior to the construction of later mortar bonded wall P48/P50 (group 4:25). The height and width of the original wall is unknown. To the south a layer of silt and small and medium sized stones (P57) butted against the wall. The extensive demolition layers that made up most of the profile of trench P96 belong to period 4 (group 4:24). These deposits were dumped against the inside of the later churchyard wall. Layer P57 was the only deposit that was contemporary with the earliest churchyard wall that was exposed in the trench. The trench was not completely excavated, the earliest deposits were only exposed at the base of the trench. It is unlikely that the ground surface was built up during period 2. The earliest churchyard wall would have been free-standing, the height of the ground level on either side of the wall more or less the same. The later wall however, functioned as a retaining wall, the ground level within the churchyard being higher than the level outside.

The remains of a turf horizon (P55, group 2:26) was partially preserved under the earliest wall. A charcoal sample from this layer was radiocarbon dated to CAL AD 1240 - 1300 at the 95% level of confidence. This gives a terminus post quem for the construction of wall P52 (group 2:25). The wall was probably constructed late in period 2, but not before AD 1240. A charcoal sample from P57, the layer that butted the wall was radiocarbon dated to CAL AD 1280 - 1400 at the 95% level of confidence. This gives a terminus ante quem for the wall as AD 1400, i.e. the wall must have been constructed between AD 1240 and AD 1400. A charcoal sample from the core (P47, group 4:25) of the overlying mortar bonded wall was radiocarbon dated to CAL AD 1420 - 1640 at the 95% level of confidence. This wall is interpreted as dating to the earlier part of this date range. The original wall was therefore in use up until the first half of the 1400's.

The only deposits outside the churchyard that have been dated to period 2 were in trenches Q96 and S96. No traces of any activity dated to this period were recorded in trenches T96 or U96. Fifteen cut features were recorded in trench Q96. These have been divided into two groups (2:31 and 2:32), eight in group 2:31, seven in group 2:32. Traces of the use of hot stone technology were recovered from the features in group 2:32. Three of these features inter-cut (Q28, Q29 and Q44). The base of the fills of Q28 and Q44 (Q27 and Q43 respectively) consisted of an in-situ layer of fire-cracked stones and charcoal. Areas of orange red burnt clay were also present in the base of these features (Q27 and Q43 respectively). These were not 'fills', but the natural moraine clay that the feature was cut through that had been baked by the heating process. The combination of an in-situ layer of fire cracked stones and burnt clay is indicative of a cooking pit. A charcoal sample from Q27 was radiocarbon dated to CAL AD 965 - 1255 at the 95% level of confidence, whilst a sample from Q43 was dated to CAL AD 1000 - 1170 at the 95% level of confidence. The third feature (Q29) was the latest of the three and cut into the other two features that lay on either side of it. The fill (Q26) also contained fire cracked stones, but these may have

been re-deposited from either of the other two features. It is uncertain whether Q29 was a cooking pit or not.

Of the other features in this group, two of the fills (Q7 and Q25) contained in-situ deposits of fire-cracked stones but no burnt orange clay. Q25 may have been the remains of a hearth rather than a cooking pit. Three other features (Q10, Q22 and Q37) all contained traces of burnt orange clay but no in-situ burnt stone deposits. In one case burnt clay Q11, the primary fill of cut Q10 had partially been dug up and subsequently re-deposited in the base of the feature. The absence of in-situ layers of burnt stones and the disturbance of burnt clay Q11 indicate that these features were completely emptied, presumably after the heating process was complete.

In a traditional cooking pit, as represented by Q28 and Q44, the food is cooked upon the hot stones. When the food is cooked the pit is opened and the food removed. An alternative use of hot stone technology involves heating stones in a pit, removing them whilst hot and placing them in water to boil the water. The water is then used to cook food or for other purposes. There is no need to remove the stones from a traditional cooking pit, whereas the heating of water requires the stones to be removed. The three features that contained no traces of burnt stones, features (Q10, Q22 and Q37), may have been used to heat stones for use in this way. If this interpretation is correct then evidence for the use of both techniques is present in trench Q96. Whether one method succeeded the other or whether both were in use simultaneously is unknown. The dating of the two traditional cooking pits spans the period prior to the construction of the cathedral and the construction period. The most likely interpretation of these features is that they were used to prepare food for those working on the construction of the cathedral, or the earlier stone structure that there is tentative evidence for.

Seven cut features (Q14, Q16, Q18, Q20, Q31, Q34 and Q39, group 2:31) in trench Q96 contained no in-situ evidence of the use of hot stone technology. These features were irregular in form and had no obvious function. They were recorded as cutting the natural clay, but it is possible that they were cut through the overlying silt layer Q4. There was no evidence to suggest this, but if it were the case, two of the features (Q16 and Q18) could be interpreted as post holes. None of these features were empirically dated, none contained brick fragments.

A charcoal burning pit was uncovered in the profile of trench S96. The remains of five whole and three split carbonised logs (S25) were present in the base of the feature at the eastern end. The digging of the pit and burning of the wood was identified as group 2:34, the emptying of the pit and subsequent in-filling was documented as group 2:33. The feature was 5m long at the top, 4m long at the base, 0.80m - 1m deep. The slope of the natural terrain that the feature cut into suggests that the feature was dug on or near the contemporary beach line of Lake Mjøsa. Part of the bank created by the upcast from the digging of the pit (S13) was preserved. It raised the ground level to the west, towards Mjøsa, by 0.40m. The bank actually formed part of the western edge of the feature. The positioning of the feature so close to Mjøsa may have been deliberate to facilitate the removal of the charcoal by boat. It is not clear why some of the carbonised timber was left in the base of the feature. A sample from one of these logs was radiocarbon dated to CAL AD 1055 - 1085 and 1150 - 1285 at the 95% level of confidence. This dating allows for the possibility that the charcoal burning pre-dates the construction period of the cathedral. The placing of the feature on the beach of Mjøsa would have allowed the charcoal to easily have be transported elsewhere. The construction of the cathedral would certainly have required charcoal for the industrial processes, including the smithy uncovered in 1992, that were an integral part of the construction process. This feature is therefore tentatively interpreted as belonging to period 2.

Once the pit had been ‘opened’ and the charcoal removed it began to silt up. A number of discreet gravel and charcoal layers were documented. In the middle of the fill a possible turf horizon (S29), may have started to form indicating that the silting had stopped. The top of the pit was later deliberately back-filled (S27). It is not clear when this back-filling took place, it may have occurred in period 4.

4.3 Group descriptions

Group 2:1
R155 R238 R330 R349 R350 R351 R363 R365 R366 R370 R371 R372 R373 R374 R377 R379 R380 R382 R383 R384 R408 R409 R421
Group 2:1 consists of structural elements of the cathedral documented in the SW corner of the south aisle, in the room under the SW tower. Some of these remains consisted of upstanding masonry, whereas others were only partially exposed in the edges of cut features or through limited keyhole excavation. It appeared as though there had been some reworking of the standing structures in

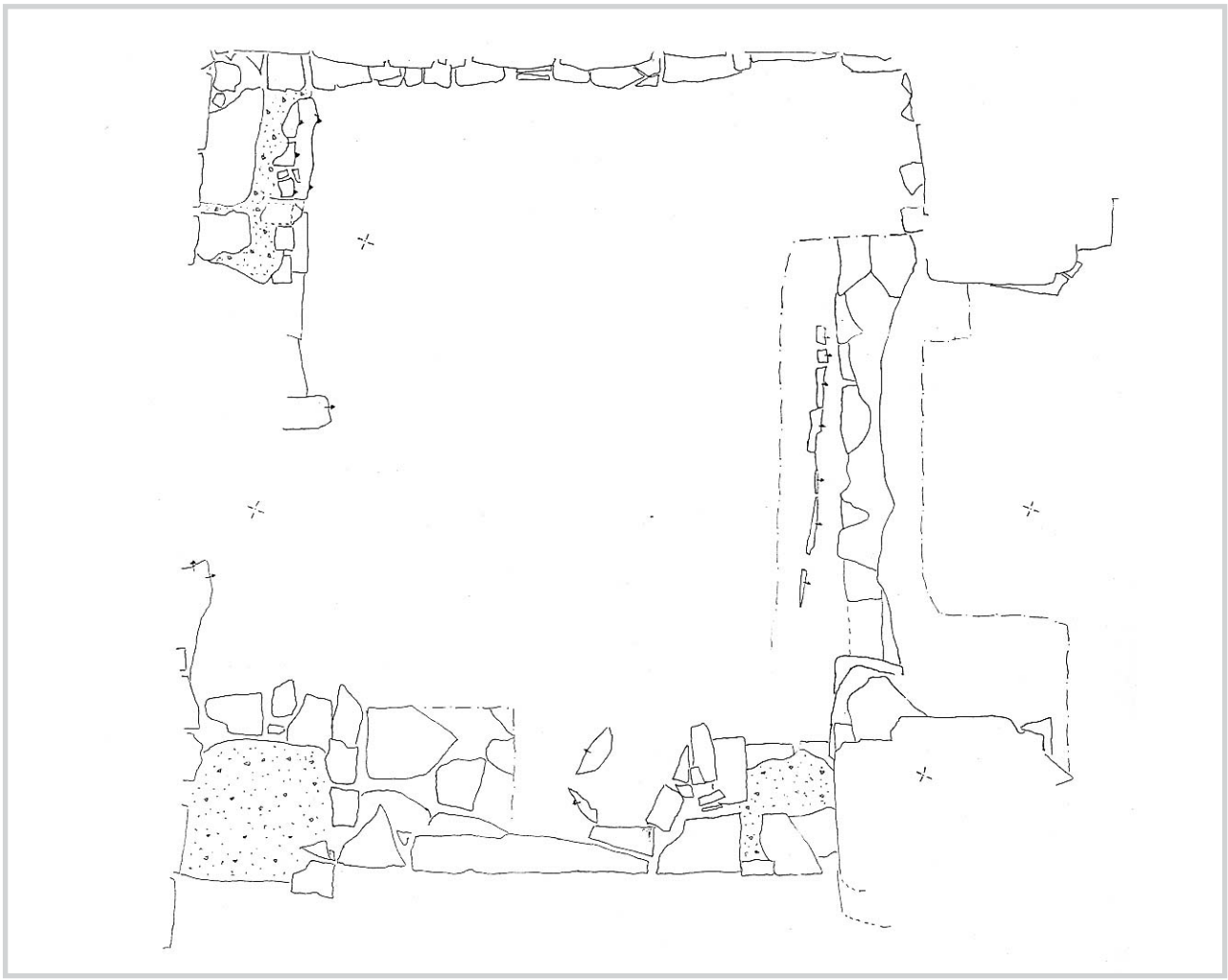


***Fig. 31**. Group 2:1, area R96, south aisle.*

this room, especially at its southern and eastern edges. As most of the features were only partially exposed it was impossible to record the complete sequence of stratigraphic relationships. The structural elements have been gathered into two groups (2:1 and 4:2). This group is interpreted as representing the original structural elements of the cathedral. Some of the features placed in this group should perhaps be placed in group 4:2 that documents the reworking activity however.

The western wall of the cathedral, R383 was extant over the entire length of the SW tower room. It stood 1m high in the SW corner, the same height as the southern wall R384, but rose in steps to the north where it met the respond of the westernmost arch, R377. R383 appeared to butt both R384 to the south and R377 to the north. The inside face appeared to be reconstructed these relationships therefore do not reflect the original situation. The top of the wall was covered with cement but a wall core bonded with white mortar could be seen through a crack in the cement. R383's foundation, R382, protruded out from under the wall for up to 0.20m. R382 appeared to have a slightly different alignment, but this may be a result of the re-facing of R383 rather than a reflection of the original situation. R382 appears to be constructed at a right angle to wall/foundation R408 that ran between the two westernmost columns, R377 and R372. R408 was not uncovered where it would have met R382. R382 did not form a right angle with the western wall R384 or its stepped foundation(s) R379/R380. The southern cathedral wall R384 was built upon foundation R379, which was 0.60m wider at its northern face than the upstanding wall. R380 was the number issued to a line of stones that protruded 0.10m out from under the northern face of R379. R380 may be a part of foundation R379, but it appeared to butt the foundation of the western wall R382, whereas R379 and R382 appeared to be interleaved. R384 and R379 were only present in the SW corner, over the westernmost 1.50m. The wall appeared to have been demolished to the east, down at least to ground level. A cement bonded reconstructed wall R364, one course high, had been laid in its place. R364 (group 7:1) was built upon a demolition deposit R368 and a silt layer R362 (also group 7:1) that covered R379. R380 was 2.20m long, but was recorded at

a lower level. None of the walls were recorded to the east of demolition layer R368. Foundation R379 consisted of two large stones that protruded out from under wall R384, the wall was bonded with mortar to these stones. They protruded out from under the wall by 0.36m. The northernmost 0.24m of R379 consisted of smaller stones and bricks set in mortar. These didn't appear to function as a support for the wall and were probably part of a kerb along the inside of the wall possibly corresponding to parallel brick kerb R376 (group 4:2) that was laid along the face of foundation R408 that formed the northern limit of the room. As such this kerb may have been secondary. R380 appeared to butt foundation R382, if this relationship is an accurate reflection of the building sequence in this area then R380 and this brick/mortar kerb should perhaps be defined as secondary elements separate from R379 and be placed in group 4:2. R360, (group 4:2) may be a continuation of this kerb, but was a completely different type of construction. The eastern exposed limit of R380 was irregular. An earlier wall core R381 (group 2:2) was partially exposed in a test slot immediately north of R380. It was unclear whether R381 was a foundation for R380 or part of an earlier structure demolished prior to the construction of R380.

The bases of both the westernmost column in the south arcade (R372) and the respond attached to the western wall (R377) were partially exposed. An E/W aligned, mortar bonded, stone wall, R408 was partially exposed along its southern face, between the column base and the respond. The core of the wall, R409 was exposed in a small area, it consisted of small stones bonded with a coarse yellowish brown mortar. The wall appeared to have been covered with a layer of white mortar with a high percentage of beach gravel inclusions (R374), possibly to level off the top of the wall. A raft of stones set in a white mortar (R373) was laid over R374. The mortar used in R373 and R374 was very similar, but a different mortar was used in the wall core (R409). R408 was more likely a foundation for the column bases rather than an upstanding wall, it appeared however to have a slightly different alignment than that of the south arcade and may have been an older structure. Brick kerb R376 (group 4:2) was laid along its southern face effectively changing the feature's alignment to that of the arcade. These bricks are considered to be secondary. Mortar and stone raft R373 appeared to be an extra foundation laid on top of R408. As these features were only partially exposed they are difficult to interpret. It is unclear whether R373 and R374 were part of the original arcade foundation or were a secondary addition.

The eastern end of the SW tower room was primarily bounded by N/S aligned stone structure R330. It ran from column base R372 in the north to within c. 1m of the southern wall of the cathedral and was butted to the east by brick floor R178 (group 2:3). To the south lay a layer of large unbonded limestone blocks (R365) that were covered by a layer of mortar (R349). A small group of stones (R370) were bonded to the surface of mortar R349 where R330 ended, these stones protruded slightly further east than R330. R365 was only partially exposed but probably extended under R349. These layers (R365, R349 and R370) lay against the southern wall of the cathedral directly south of column base R372 and are possibly the remains of a respond built into the southern wall to bear an arch between the southern wall and column R372.

R330 appears to form a threshold into the SW tower room. The tops of R330 and brick floor R178 (group 2:3) were flush. One stone in R330 stood 0.10-0.15m higher than the others however. This stone appeared to have been broken and would originally have been higher than this. To the west of R330 lay stone slabs R155. These were only partially exposed, they lay c. 0.30m lower than R330. The slabs were separated from possible respond foundation R365/R349 to the south by a short E/W aligned wall/stone setting R371. R371 was 1 - 2 courses high and was approximately level with the top of R330. A similar, though less regular, stone setting (R328) was also present towards the northern end of R330, 0.60-1m south of column base R372. R330 appeared to continue beyond R328 whereas it stopped at R371. R328 and R371 were probably not load bearing structures. Together with R330 they appear to create a threshold into the SW tower room. To the north of R328, between it and column base R372, more slabs (R350) were exposed, these were covered with a layer of mortar and small stones (R351). R350 may have been the same as slabs R155, the mortar being the same as later mortar R347 (group 4:2) that partially lay over the stones of R155. R155 appeared to extend further west than R350 however and they may have been two separate features.

R330 appears to form a threshold into the SW tower room from the south aisle with a step down onto flagstones R155, bounded to the north and south by R328 and R371 respectively. It seems most likely that R155 formed a step rather than a floor surface that covered the whole room, no traces of flagstones were uncovered to the west. R155 was partially covered with mortar bonded stones R399/R347 (group 4:2), indicating that they were no longer in use. R140 (group 4:1) may have been the re-

mains of a later timber floor, this layer covered slabs R155 and lay flush with the top of R330. Why one of the stones of R330 stood higher than the rest of the structure is unclear.

Contexts

R155. Layer of stone slabs, laid as paving along the eastern side of the SW corner of the nave, south of column base R372. The slabs were partially covered with a layer of mortar R347 that bonds stone packing R399 to its surface. The slabs were bedded onto small stones by a white mortar. 2.10m long N/S x c. 1m wide. Bounded to the east by N/S wall R330. Under R330, R350 and R347, over R400.

R238. Short E/W aligned stone wall, 1-3 courses high, 0.50m long, 0.35m wide, 0.35m deep, bonded with a yellowish mortar. It formed a boundary between stone slabs R155 to the south and stone slabs R350 to the north. R238 was parallel to N/S aligned stone structure R330, forming a short return wall. R238 was parallel to similar structure R371 to the south. Under R151 and R351, over R330.

R330. N/S aligned wall, one course high/wide, consisted of one 1.60m long stone, 0.30m wide, broken up to the north, with two 0.50m wide stones placed one at each end. The stone to the south appears to be the limit of the structure, whereas it appears to continue to the north under/up to column base R372. Brick floor R178 butts R330 to the east, stone slabs R155 lay against it to the west. R330 forms a threshold into a separate room under the SW tower. Under R155 and R178.

R349. Layer of pale cream mortar with fine gravel/sand and small stone inclusions, 0.05m thick. Covered the surface of stone structure R365. R365 was unbonded, R349 was laid over it and appeared to bond R370 to R365. Under R370, over R365.

R350. Stone slabs, lay between column base R372 and short E/W aligned wall R328. Mortar layer R351 covered the slabs. Under R404.

R351. Layer of mortar and small stones bonded to the surface of flagstones R350. At the southern side of column base R372, R351 extended under column base R372 slightly. Butted against the stones of R330, lime layer R404 butted against R351. Under R141 and R404 over R328.

R363. Stone and mortar construction seen between R360 and R364. Consisted of stones set in a grey mortar. The mortar had a high, possibly as high as 90%, sand content. It was only exposed in a small area but it appeared to be the remains of a wall core. Presumably R363 had been truncated to construct R360. The mortar was different from the grey mortar used to bond R366 immediately to the east. Under R362.

R365. Stone structure/foundation, consisted of large limestone blocks laid in a rough square/rectangle, bounded to the north by R371, to the south by R366 and to the west by R360. A layer of mortar, R349 that bonded R370 onto R365, covered the stones. R365 lay opposite column base R372 and may have been a foundation for an arch over to R372. Under R349, over R366.

R366. Three - four stones bonded with a grey mortar, only partially exposed between R360 and R365. Possibly an E/W aligned wall, part of the southern wall of the cathedral. Reconstruction R364 was built upon it. Under R365.

R370. Stone packing south of short wall R371, only a single course deep. Bonded to R365 by mortar R349, only a few stones survive on the eastern side of R365. Depressions in the mortar suggest that the stones covered R365. Under R371, over R349.

R371. Short E/W aligned stone wall 1-2 courses high, 0.90m long, 0.20-0.30m wide. It forms a boundary between slabs R155 and N/S aligned stone structure R330 to the north, and stone structure R365 to the south. Under R140, over R370.

R372. Column base in the SW corner of the nave, the westernmost free-standing column base. Supported a low arch to the west and a high arch to the east. The base was badly damaged, the assumed original dimension is 1.80m x 1.80m. The western edge was reconstructed with stones and cement. A profiled stone was present on the western face, 0.20m in from the assumed edge and 0.50m higher than the stone raft, R373, that the column was built upon. The profiled stones on the western and southern faces of R372 were 0.20m higher than on the eastern face of column base R337 to the west. Under R141, over R373 and R421, same as R375.

R373. Mortar and stone raft laid between column bases R372 and R377. Consisted of coarse white mortar, c. 60% beach gravel inclusions, many of which were very coarse, that bonded stones of all sizes and formed a very

hard, solid surface between the columns, acting as a foundation for them. R373 overlies a mortar layer R374 and earlier wall R408. Under R372 and R377, over R374 and R375.

R374. Layer of coarse white mortar with up to 70% beach gravel. Covered wall R408, levelling it off prior to the laying of mortar and stone raft R373. Under R373, over R408.

R377. Base of the western arch in the south aisle. To the west R377 was built into the western wall of the cathedral. Profiled stones formed the base of the pillar on the northern and eastern faces, the stone on the eastern face was only partially preserved, no profiling was preserved on the southern face. Under R383, over R373.

R379. E/W aligned stone wall, only 1.40m of which was exposed in the SW corner of the south aisle. The wall was demolished to the east, rubble deposit R378 lay over the demolished wall. R379 is parallel to the southern cathedral wall R384 that is built upon it. R379 was 0.60m wider. R379 appears to have been built upon another parallel wall R380 that is 0.10m wider that R379. It is probable that R379 and R380 are foundations for R384. R379 consisted of large limestone blocks and bricks set in a creamy mortar that contained beach gravel inclusions. Only the surface of the wall and part of the north face were exposed. The bricks formed an inner edge to the wall, 0.30m north of the edge of the large stones. The large stones were aligned with stone wall R366 to the east. It is possible that this was the southern wall of the cathedral with a decorative kerb of bricks, corresponding to brick kerb R376 to the north. Under R384, over R380.

R380. E/W aligned stone wall c. 2.30m long, 0.20m+ wide, and 0.40m+ deep. The wall lay in the SW corner of the nave, and protruded out from under R379 by 0.10m, it appeared to have been demolished to the east. It is likely that R380 is a foundation for R379 rather than a separate wall. The wall became irregular to the east and no longer had a clear E/W alignment. A small test pit was dug against R380 here, this bottomed out on a mortar wall core R381, it was unclear whether R381 was a foundation for R380 or part of an older structure demolished prior to the construction of R380. Under R379 and R385.

R382. N/S aligned stone wall, underlies R383 the western wall of the cathedral. R382 protrudes out from under the inside face of R383 by <0.20m, and is its foundation rather than a wall in itself. In the SW corner wall R380 appeared to butt against R382, implying that R382 is earlier. R382 has a slightly different alignment than overlying R383, but the inside face of R383 has probably been reconstructed. R383 forms a right angle with R408, the wall between the pillars, but not with any of the southern walls. Under R380 and R383.

R383. N/S aligned stone wall, the western wall of the cathedral, built upon foundation R382 that protrudes out from under the wall by 0.10-0.20m. Where R383 met the southern wall R384 in the SW corner there is no interleaving of the two walls, the corner consists of small stones irregularly lain. Where R383 met R377 to the north the masonry of R377 was clearly earlier for the lowest 1.60m, after this there is interleaving. The inside face of R383 appears to have been reconstructed, the external face appeared to be original and the core of the wall is assumed to be original. The top of the wall is bonded with cement, but a white mortar was seen in the core through a crack in the masonry. The wall is 1m high in the SW corner, rising in irregular steps towards the north. The base of R383 was bonded to foundation R382 by a white mortar. Under R141, over R377.

R384. E/W aligned stone wall, the southern wall of the south aisle. 1.50m long, the wall had been demolished or had collapsed to the east and been replaced by reconstruction R364. The wall was 1.30m wide and four courses, 1.05m, high. The outside face was profiled for the lowest 0.75m. Where R384 met N/S aligned west wall the fabric consisted of small stones and appeared to have been reconstructed. R384 was built over wall/foundation R379, that was 0.60m wider to the north with a brick kerb. A yellowish brown mortar with c. 50% beach gravel inclusions bonded R384 to R379. The upper surface and face were bonded with cement. Under R378, over R379.

R408. Stone wall E/W aligned, partially exposed in a 3m long area between column bases R372 and R377. Only the southern edge of the wall was exposed. Appeared to form a foundation for the column bases, mortar layer R374 was laid over the stones as a levelling prior to mortar and stone raft R373 being laid as a foundation. A line of bricks R376 was later added to the southern edge of the wall. Under R374 and R409, same as R407.

R409. Wall core for wall R408, only exposed in a small area, consisted of coarse yellowish brown mortar and small stones. Under R375, over R408.

R421. Stone structure bonded with a creamy white mortar, exposed in post hole cut R405, possibly the remains

of an earlier structure but most likely part of the foundation of column R372. Under R372 and R421.

Group 2:2

R381 R385 R386 R396 R414 R419 R420 R423

Group 2:2 consists of five layers of stone working debris (R385, R414, R419, R420, and R423), a layer of crushed mortar/sand and stone chips (R396), a cut feature (R386) and possible wall remains (R381) in the SW tower room in the south aisle. These layers were only partially exposed in the base of later cut R331.

Stone working debris R385 filled cut R386, but also extended beyond the edge of the cut. Possible wall remains R381 were exposed in the base of this cut by a test slot. R381 appeared to be a wall core, wall R380 (group 4:1) lay upon R381. It is uncertain whether R386 was a construction cut for wall R380, R381 being the foundation for the wall, or whether R381 was part of a an older wall, that was replaced by R380, cut R386 being a truncation event demolishing R381. As only a small part of R386 and R381 were exposed it is difficult to interpret these features but they are tentatively interpreted as the construction and foundation for wall R380.

The stone working debris layers represent dumping of debris from the building of the cathedral. They were probably deposited as a result of stone working in this area. They were relatively thin and are not interpreted as waste deposits brought in from elsewhere as make-up.

***Fig. 32**. Group 2:2, area R96, south aisle.*

Contexts

R381. Mortar bonded stones seen in the base of cut R386. R381 was only partially exposed in a test slot cut through R385, the fill of cut R386. The test slot was immediately back-filled. R381 was not drawn. The slot was exposed against the northern edge of wall R380. The stones that were exposed were not facing stones, but appeared to be part of a wall core. It is uncertain whether R381 was part of a foundation for R380, a foundation that was wider than the wall itself, or part of an earlier structure that was demolished and re-built as R380. Under R385.

R385. Deposit of stone chips and crushed stone. The deposit consisted primarily of coarse stone fragments < 0.15m x 0.10m x 0.05m, with irregular concentrations of smaller stone chips and crushed stone. A small test slot was excavated through R385 and immediately back-filled. R385 appeared to fill cut R386, but also extended beyond the limits of the cut. It was 0.05m - 0.10m thick outside of cut R386, but 0.40m thick within the cut. The upper surface of the layer was level. Under R363, R395 and R396, over R380 and R386.

R386. Cut feature, appeared to be linear, roughly E/W aligned. The northern edge was exposed over 1m, the southern edge may have cut against wall remains R380, the feature was c. 0.40m wide. The cut was defined on the surface and was overlain to the east and west by later deposits. It was filled by R385 that also extended beyond the edge of the cut. A test slot was excavated through fill R385, the remains of a wall core (R381) were seen in the base of the cut at a depth of 0.40m. Under R385, over R398.

R396. Layer of light orange brown crushed mortar/sand. The layer also contained small stone fragments - debris from stone working. R396 was only partially exposed by later cut R331. It appeared to underlie R360. Under R412, over R385.

R414. Layer of light grey crushed stone - stone working debris. Under R419, over R420.

R419. Layer of stone chips and crushed stone - debris from stone working. Under R417, over R414.

R420. Layer of stone chips, 0.15m thick, recorded in the section of posthole cut R405, where it overlay stone structure R421. Over R421.

R423. Layer of crushed stone – stone working debris. Under R415.

Group 2:3
R178 R179
Group 2:3 consists of a brick floor R178 laid in a mortar bed R179. The bricks were exposed over an area of 4.5m (N/S) x 3m (E/W) towards the western end of the south aisle. The bricks were set in the mortar, a thin line of mortar was also laid between the bricks bonding them together. The bricks were laid roughly in pairs, i.e. two were laid parallel to one another then two were laid perpendicular to the first pair, and so on. The bricks butted stone construction R330 to the west and the southern wall of the cathedral R366 to the south. This is presumably the same floor that was partially exposed in the north aisle (group 2:6) and the SE corner of the south aisle (group 2:4). Traces of beach gravel were cleaned off the bricks in the NW corner of this area suggesting that the later tile floor was also present here. No other traces of the later floor layer were recorded in this area. It was probably removed when the demolition deposits were cleared from the cathedral ruin.

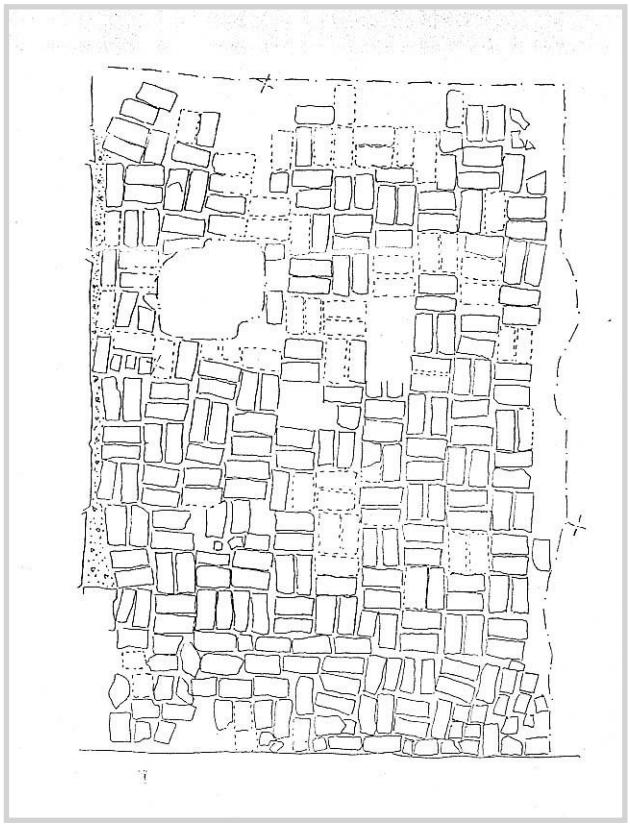


***Fig. 33**. Group 2:3, area R96, south aisle.*

Contexts
R178. Brick floor, exposed over an area of 4.5m (N/S) x 3m (E/W) in the SW corner of the south aisle. The bricks were laid in pairs, adjacent pairs being laid perpendicular to one another. They were set in a bed of mortar, R179, which was also present in a thin band between the bricks bonding them together. The pattern became more irregular in the area nearest the southern cathedral wall and the underlying mortar was exposed in some places. The bricks butted stone wall/threshold R330 to the west. No brick floor was present in the SW corner. Under R1, over R179 and R330, same as R28 and R192.

R179. Layer of mortar, serving as a bedding for brick floor R178. The mortar was also present between the bricks as bonding. The brick floor was well preserved in the exposed area such that R179 was mainly visible only between the bricks, but it is assumed to have lain under the bricks over the whole area. Under R178. Same as R98, R158 and R191.

***Fig. 34**. Brick floor R178, group 2:3 and threshold R330, group 2:1, area R96 (south aisle) looking W. Photo Bruce Sampson, NIKU.*

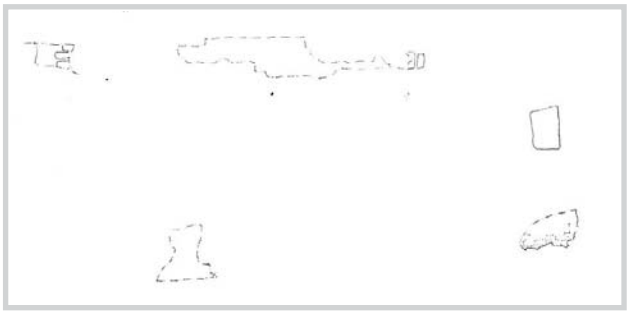


***Fig. 35**. Group 2:4, area R96, south aisle.*

Group 2:4

R158 R190 R192

Group 2:4 consists of brick floor R192, its mortar bedding R158 and R190, and a partially uncovered large stone slab, probably a grave marker in the SE corner of the south aisle. R192 and R158 are the remains of a floor surface consisting of red bricks set in a bed of mortar. This floor was only uncovered in a few places in where the overlying beach gravel layer had been truncated, and between altar foundation R188 and the adjacent column base. The bricks appear to have been laid in pairs, with the pairs laid perpendicularly to one another. This pattern was exposed in one place in the SE corner, and the brick's impression was visible in the underlying mortar R158 in a another place. This pattern was observed over larger areas in the SW corner of the south aisle (R178, group 2:3) and in the north aisle (R28, group 2:6). The brick floor is assumed to have covered the whole of the nave and the southern and north aisles but was not recorded in the crossing or the transepts. The brick floor was replaced by a tile floor R157 (group 4:3). In some places it appeared as though the bricks had been removed prior to the construction of the tile floor, presumably to maintain the desired floor level.

A large stone slab R190, was partially uncovered 0.40m west of the threshold into the south transept. Beach gravel R156 lay over the stone. It was probably a grave marker, as it lay under the beach gravel it must have been laid in the brick floor R192.

Contexts

R158. Layer of off-white mortar, the mortar contained inclusions of beach gravel. R158 was the bedding layer for brick floor R192, it lay under and between the bricks, i.e. lines of mortar were visible between the bricks. Where the bricks didn't survive, an imprint in the mortar was visible indicating where the bricks had been placed. The imprints mirrored the patterning in the floor. A similar situation was observed in the north arcade (see R98, group 2:6). Under R192, over R217, R218, R219, same as R98, R179, R191.

R190. A large stone slab, partially uncovered 0.40m west of threshold R215 in the SE corner of the nave. The stone was 0.60m+ N/S x 0.40m+ E/W. Beach gravel bedding R156 lay over the stone. It had no obvious structural function, it may have been a grave marker. Under R156.

R192. Layer of red bricks set in a bed of mortar, R158, forming a floor surface. The floor was visible in isolated patches where the overlying layers had not survived. The bricks were laid in pairs, i.e. two bricks parallel with one another, then two perpendicular to the first and so on. Mortar bedding R158 was visible on the surface of the floor between the bricks. Under R187, R193, over R158, same as R28 and R178.

Group 2:5

R188 R217 R218

Group 2:5 consists of structural remains of the cathedral at the SE end of the south aisle. Two short sections of walling (R217 and R218) were partially uncovered, both were butted by R158, the bedding for brick floor R192, and were therefore earlier than the brick floor. The two sections of walling didn't appear to have been constructed simultaneously however as there no interleaving of the masonry. The function of these masonry remains is unclear. R218 may have been a thickening of the wall as an extra foundation in the corner where south aisle and the south transept met. The southern wall of the cathedral R216 (group 7:2) consisted of cement bonded stones, one course high, and appeared to be a reconstruction. An E/W aligned cut, R213, probably associated with the restoration of the wall ran along the inside of R216. The northern edge of this cut is the same as the northern edge of R217. It is possible that R217 was the remains of the southern wall of the cathedral, R217 was irregular however and was more likely part of the wall's foundation.

***Fig. 36**. Group 2:5, area R96, south aisle.*

A stone and mortar bonded altar foundation (R188) protruded out from under reconstructed altar foundation R187. The altar foundation lay on the western side of the easternmost free-standing column in the south arcade. A gap of 0.20m on the northern side and 0.50m on the southern side was visible between R188 and the column base. Brick floor R192 and mortar bedding R157 (group 2:4) appeared to have been laid between R188 and the column base. A similar situation, where cement bonded stone altar foundations were constructed over the remains of the originals was also documented in the north arcade (group 2:7).

Contexts

R188. Mortar bonded stone foundation, presumably an altar foundation, 2.20m wide N/S x 1.90m+ long E/W. The structure was only exposed on its northern and southern edges where it protruded out from under reconstructed altar foundation R187. R188 lay on the west side of the easternmost free-standing column in the south arcade. It consisted of medium and large sized stones bonded by a white mortar. It appeared as though there was a gap of 0.20m - 0.50m between R188 and the column, reconstruction R187 butted the column, this gap could therefore only be documented at the northern and southern edges. Brick floor and mortar bedding R182 and R158 were laid in the gap. Under R158 and R187.

R217. Stone wall, E/W aligned, only visible in a 2m long area in the SE corner of the south aisle, 0.50m+ wide, the remains were overlain by cement bonded reconstructed wall R216. The wall consisted of large limestone blocks with smaller stones filling the gaps. A coarse pale grey/off-white mortar with a high percentage (40-70%) of beach gravel inclusions bonded it. R217 butted N/S wall R218 to the east. Reconstructed wall R216 lay within a construction cut that begins where R217 ends to the west, it is unlikely that the original wall would have been removed to facilitate its reconstruction, the uncovered section of R217 therefore probably reflects its original extent. A thickening of the southern wall was also documented in the SW corner of the south aisle, it is possible that R217 was part of the southern wall of the cathedral, thickened at the corner with the transept as an extra foundation. R217 was upstanding over the level of the floors R157 and R192, and was therefore a visible part of the cathedral. No corresponding thickening was visible in the NE corner. Under R158.

R218. N/S aligned stone wall, only exposed in the SE corner of the south aisle, 1m long (N/S) x 0.60m+ wide. The wall consisted of large limestone slabs and smaller stones used as filler bonded by a compact cream/white mortar with fine sand and slaked lime inclusions. It was overlain by reconstructed walls R215 and R216, its relationship with E/W aligned wall remains R217 is unclear, the two appeared to but one another and were constructed with different mortars but it is unclear which is earlier. R218 continued to the north under R215, forming the threshold between the south aisle of the nave and the south transept. Mortar bedding for brick floor R158 butted the wall, i.e. the wall was earlier than the brick floor. Under R158, same as R219.

Group 2:6

R28 R98

Group 2:6 consists of the remains of a brick floor (R28) set in a mortar bedding (R98) in the north aisle. The bricks had been laid in pairs, with each pair laid perpendicular to the adjacent one. This pattern was exposed in between column base R96 and reconstructed altar foundation R97. Remains of later tile floor and beach gravel bedding (R24 and R27, group 4:5) were extant over large areas of the north aisle and north arcade. It is not known if R28 was preserved beneath the tile floor or not. Mortar bedding R98 was exposed in two small areas in the north arcade, beneath beach gravel R27. The pattern of the floor where the bricks had been laid in the mortar was visible in one place but the bricks had been removed prior to the laying of the tile floor, possibly to maintain the new floor at the same level as the old one. The brick floor was also uncovered in a large area at the western end of the south aisle (R178, group 2:3) and in patches at the SE corner of the south aisle (R192, group 2:4). Similar imprints to those noted above were also visible in the mortar layer R158 (group 2:4) in the SE corner of the south aisle. The brick floor is assumed to have covered the whole of the nave and the southern and north aisles but was not recorded in the crossing or the transepts.

Contexts

R28. Floor surface of red bricks, bedded in mortar R98. The floor was exposed in a 2.40m (N/S) x 1.80m (E/W) area between column base R96 and reconstructed altar foundation R97, and in a thin strip on the eastern side of column base R113 in the north arcade. The bricks were laid in pairs, adjacent pairs were laid perpendicular to one another. The mortar bedding was visible between the bricks. This pattern was visible over half of the larger area. The bricks were broken up over the rest of this area, only fragments with no discernible pattern were present. These fragments appeared to be floor remains broken up in-situ. This pattern was only partially reproduced where the floor butted column base R113, presumably because

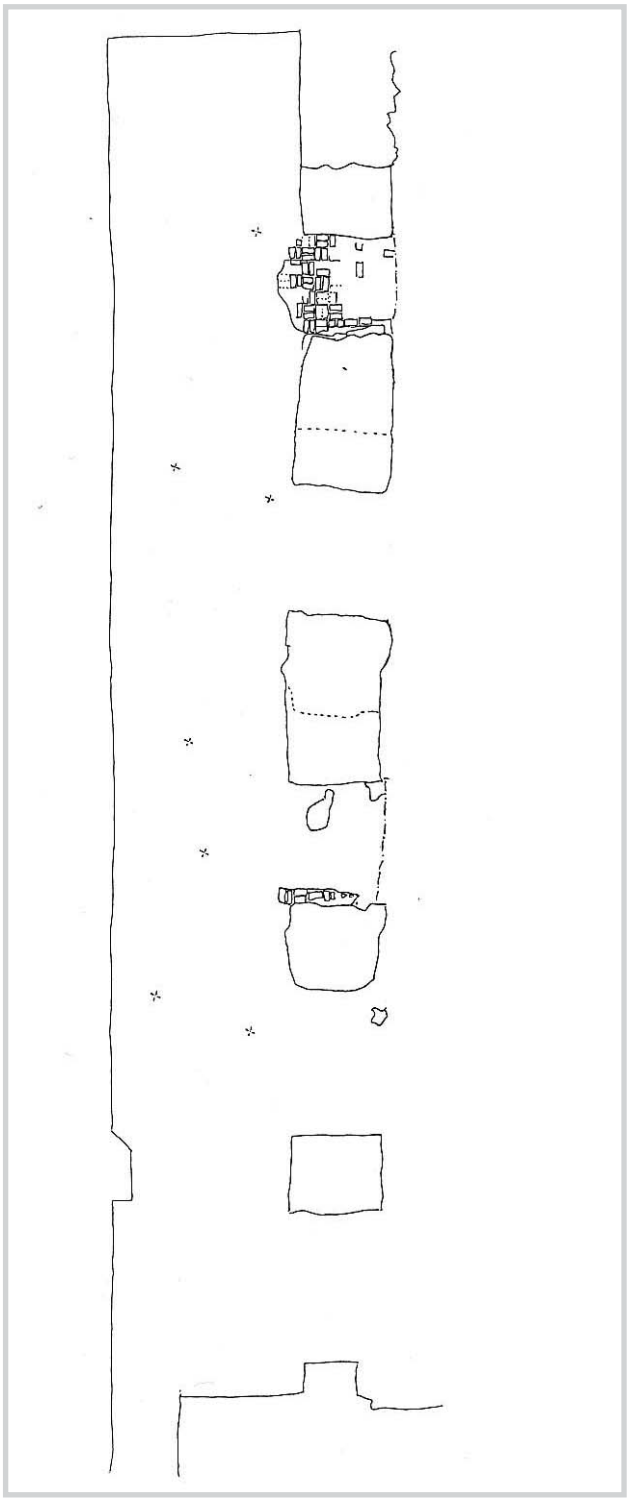


***Fig. 37**. Group 2:6, area R96, brick floor in north aisle. Top E.*

there was not space for a complete row of brick pairs. A single line of bricks butted column base R96. Tile floor R24 was laid over this floor, no traces of R28 were recorded in the north aisle where R24 was extant. Under R26 and R27, over R98, same as R115, R178 and R192.

R98. Layer of mortar serving as a bedding for brick floor R28. The mortar was visible as a thin strip between the bricks and was exposed in two small areas where the overlying beach gravel layer R27 was not preserved: to the west of stone foundation R108 and to the west of altar foundation R118. In the latter area an imprint of the bricks that had lain in the mortar was present in the surface of the mortar. This corresponded with the pattern seen in R28. A similar situation was observed in the SW corner of the south aisle, see R158. R98 was overlain by beach gravel R27, the bedding for the later tile floor. Under R28, over R108 and R118, same as R112, R116, R117, R158, R179 and R191.

Group 2:7

R83 R84 R89 R96 R100 R108 R113 R118 R247

Group 2:7 consists of structural remains of the cathedral in the north aisle and along the north arcade. The standing masonry of the cathedral was not consistently documented. Contexts were issued only to those elements that had a direct connection to the exposed layers.

At the western end of the arcade broken limestone slabs R83 were partially uncovered under reconstructed profiled stone R91 (group 7:3). R91 was placed against the wall, not integrated into it, presumably to mark the position of a respond in the western cathedral wall. R83 was only partially exposed, but is interpreted as the foundation for the original respond. Part of an apparently linear, E/W aligned stone structure (R84) was exposed north of R83 at a slightly lower level. Only two stones were exposed, as such it is difficult to interpret the structure but it may have been part of a raft or foundation under the north arcade, similar to R408 in the SW tower room (group 2:1). A layer of stones R89 were recorded protruding out from under both the eastern and western sides of reconstructed column base R90 (group 7:3). A layer of larger stones (R108) was visible extending out from under partially reconstructed column base R111 (group 7:3). These two groups of stones also appear to have served as foundations for the column bases. They extended out from under the actual columns and may be part of a raft constructed along the whole length of the arcade. Parts of R108 stood flush with the top of tile floor R24, indicating that they may have been visible in the floor plan. Beach gravel R27 overlay part of R108 however, indicating that not all of the structure would have been visible. R108 may have been part of a foundation raft built slightly higher to the west of column R113/R111 to function as an altar foundation or some other structure. Traces of a foundation (R113) were visible on the western side of column R111 (group 7:3), this column appeared to have been only partially reconstructed. Traces of an original stone altar foundation R118 were visible beneath cement bonded reconstruction R119 (group 7:3). R118 was

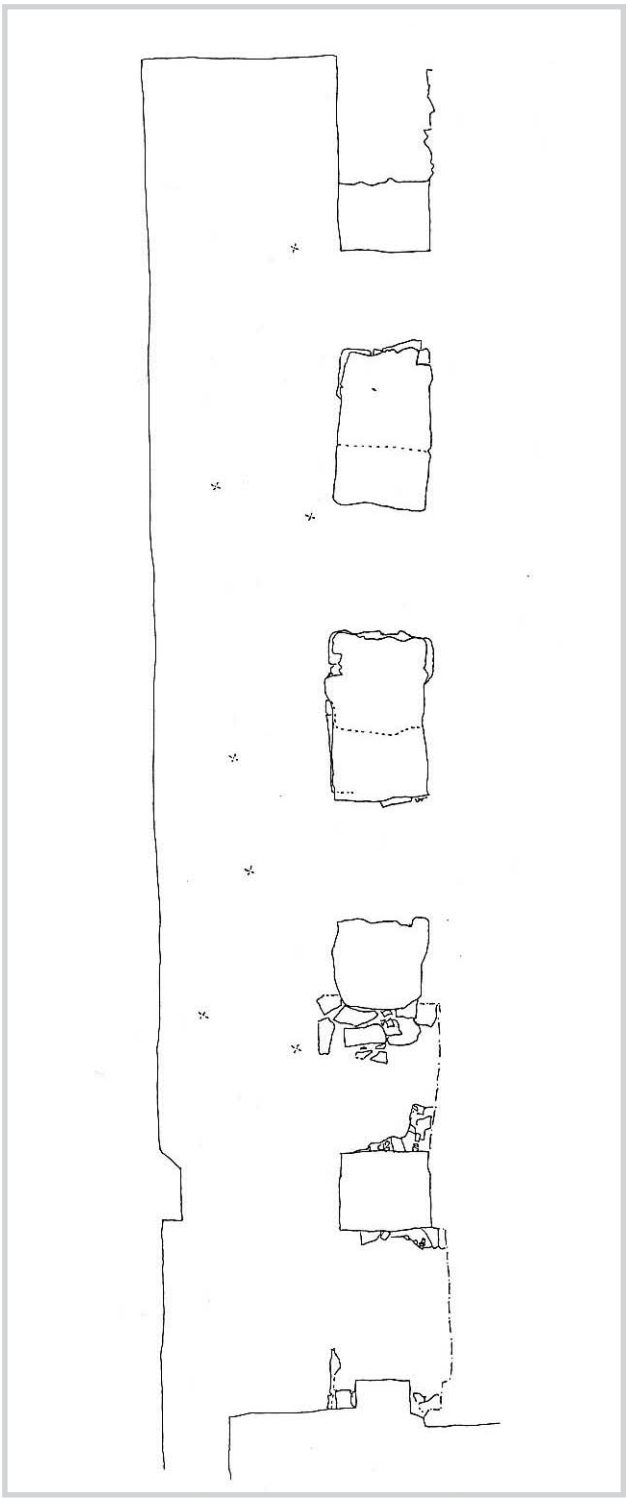


***Fig. 38**. Group 2:7, area R96, north aisle. Top E.*

placed on the western side of column R427, it appeared to have been smaller than the overlying reconstruction and was barely visible beneath it. Column base R427 was also probably partially reconstructed, but the base of the column appeared to be original. An original stone altar foundation R100 was barely visible beneath overlying cement bonded reconstruction R99 (group 7:3). R100 was placed on the western side of column base R96. R96 was only visible on the northern and eastern sides of overlying cement bonded reconstructed column base R95 (group 7:3). A layer of silt separated R96 from the cement bonded reconstruction. The top of the stones of R96 was roughly flush with the top of the adjacent brick floor R28 (group 2:6). R96 may have been part of the foundation for the original column base rather than an upstanding part of the column.

Contexts

R83. Stone structure, only a small part of which was exposed at the west end of the north aisle. It consisted of two, E/W aligned large stones and appeared to be built into the western wall of the cathedral. Not enough of the structure was exposed to interpret it. Under R84.

R84. Limestone slab, broken up in-situ, underlay profiled stone R91. R84 was only visible on the north side of R91. R91 appeared to be a reconstruction, R84 was probably the foundation for the original stone. Under R91, over R83, same as R92?

R89. Layer of limestone slabs recorded on the eastern and western sides of reconstructed column base R90. R89 was probably part of the foundation for the original column, possibly part of a raft along the whole north arcade. Under R27, same as R105.

R96. Structure of limestone blocks, only uncovered in a small area protruding out from under reconstructed column base R95 on its northern and eastern sides. The top of the stones was flush with the surface of brick floor R28. A layer of silt separated the original column base form the reconstruction. Under R28 and R95.

R100. Original altar foundation, barely visible beneath reconstructed altar foundation R99. Under R99.

R108. Layer of large stone slabs recorded on the western side of column base R111. The stones were bonded with a greyish white mortar that had c. 50% beach gravel inclusions. The stones protruded 1m+ out from under the column, they were overlain by later beach gravel layer R27, i.e. they were not fully exposed. R108 was possibly a foundation for the column but stood flush with the surface of tile floor R24, it may also have been an altar foundation. Under R27 and R111.

R113. Remains of column foundation, barely visible beneath the eastern edge of column R111. Under R111.

***Fig. 39**. Foundation R108, group 2:7 beneath and west of column base R111. Photo Bruce Sampson, NIKU.*

R118. Altar foundation, visible beneath the northern and western edges of reconstructed altar foundation R 119. Appeared to be smaller than the reconstruction. Under R118.

R427. Column base. R427 didn't appear to have been extensively reconstructed. It was 2.10m E/W x 2m N/S. Many of the stones had lost their original surface and the profile of the column was not intact. Under R24 and R369.

Group 2:8

R250 R251 R252

Group 2:8 consists of three layers that lay east of threshold R278 in the north transept. R250 may have been the remains of a mortar floor surface, but may also have been a mortar spread dumped during construction work. R251 and R252 and R253 were localised layers of silt and mortar fragments, R251 may have functioned as a bedding for R250, R252 appeared to be too coarse to be a floor layer and was probably related to the foundation of the NW tower base. Group 2:8 is similar to groups 2:11 and 2:12 in the crossing.

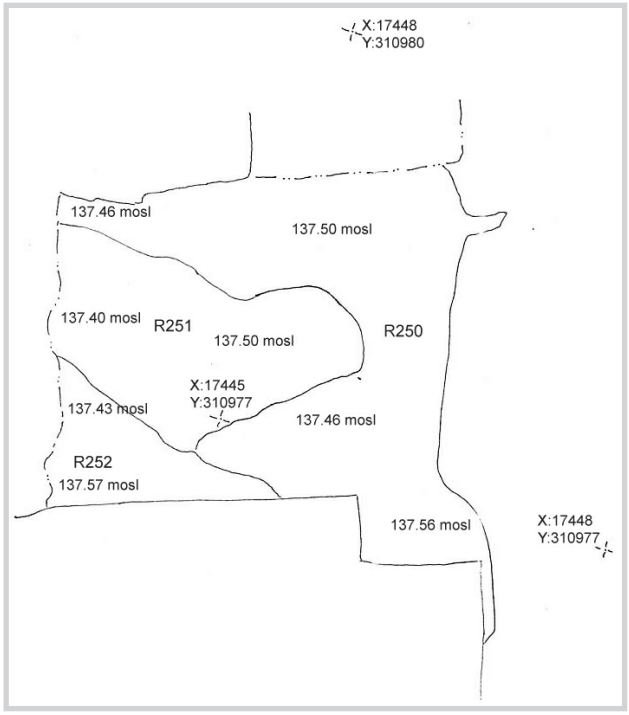
Contexts

R250. Layer of white fine-grained mortar/plaster, 0.03-0.05m thick, the surface was compact. In some places R250 appeared to be several layers of mortar. R250 may have been the remains of a mortar surface or floor in the north transept. The layer peeled away in layers, very similar to R169, in the crossing. Under R53 and R242, over R251, same as R249.

R251. Compact layer of silt and mortar in the north transept. Lay beneath possible mortar floor R250. Under R250.

R252. Layer of mortar, possibly part of the foundation for the NW tower base. Under R242.

***Fig. 40**. Group 2:8, area R96, north transept.*

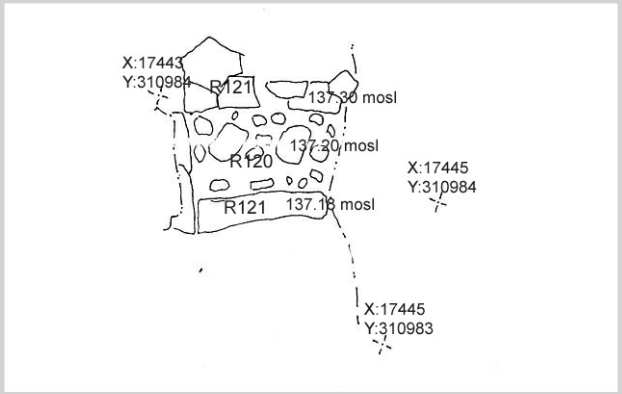


Group 2:9
R120 R121 R122
Group 2:9 consisted of a stone coffin R121, and its fill R120. The coffin was exposed in the base of the 1970's excavation trench in the north transept, in the transept's NW corner. The surface of the feature was cleaned but not excavated, it must also have also been exposed in the 1970's. The western end of the coffin butted the masonry of the western wall of the north transept. The eastern end lay beneath the remains of the tile floor R76, it appeared as though the grave had been truncated as remains of a wooden coffin R122 were visible in the profile of the 1970's trench, truncating R121. Both of these graves are earlier than the tile floor (group 4:5). The date of these burials and whether they were interred during a construction phase or were dug into an earlier floor than the tile floor is unknown.

Contexts
R120. Fill of light brown sandy silt and stones. Filled stone lined grave R121, not excavated. The grave was exposed in the base of the 1970's N/S excavation trench, after cleaning. Presumably the top of the grave was uncovered but not excavated in the 1970's. Under R76, over R121.

R121. Stone lined grave, only partially exposed in the base of the 1970's excavation trench. Consisted of large stones stood on their sides, bonded with mortar. The grave lay in the NW corner of the north transept. The west end of the grave appears to have been built right up against the foundation of the transept's west wall, the eastern end of the grave lay under tile floor R157. Traces of a wooden coffin and human bone were visible in the section created by the excavation trench, it seemed as though another grave had cut through R121. This grave was not exposed on the surface. Under R120, over R134.

***Fig. 41**. Group 2:9, area R96, north transept.*



R122. Remains of a wooden coffin visible in the profile of the 1970's excavation trench in the north transept. R122 was the head end of a coffin, it appeared to truncate stone coffin R121. Under R76, over R120.

Group 2:10
R134 V3 V4 V5 V8
Group 2:10 consists of the original walling of the north transept and the north aisle. The inside face of the north transept's wall was exposed in the excavations in area R. The outside faces of the walls of the north transept and north aisle were exposed in the corner where the met by a small trench V96.

R134 is the contest issued to part of the foundation of the northern and western walls of the north transept. R134 consisted of mortar bonded stones, it was exposed in a band along the inside of the northern wall in the NW corner. No brick or tile inclusions were present within this walling.

Trench V96 was located against the outside face of the wall of the north transept at the corner where it met the north wall of the north aisle. The remains of the original mortar bonded walls of the north aisle (V5) and the north transept (V4/V8) were uncovered where they protruded out from under the modern reconstructions. A layer of redeposited moraine clay (V3) had been dumped against the walls. The wall of the north aisle V5 was the older of the two walls. It was constructed of large stones, tow courses were uncovered. It was almost certainly the foundation of the original wall, not the upstanding masonry. The overlying, reconstructed wall V10 was bonded to its surface by cement. V4, the wall of the north transept appears to have butted V5. It was constructed of large flat stones, one course was exposed. V5 had a slightly different alignment than the overlying reconstructed walls V9 and V6. V5 formed a right angle with V5, unlike the overlying reconstructions which formed an acute angle. In the corner 0.50m of V4 was visible protruding out from beneath V9. The core of the wall (V8) was visible. These original walls were bonded with mortar, as opposed to the cement bonding of the overlying reconstructions and were separated from them physically by silt layer V2 that lay between V4 and V9 and between V5 and V10.

Contexts
R134. Layer of mortar and small stones. Lay along the inside, southern face of the northern wall of the north transept. R134 was also partially exposed along the inside of the transept's western wall. Appeared to be a part of the

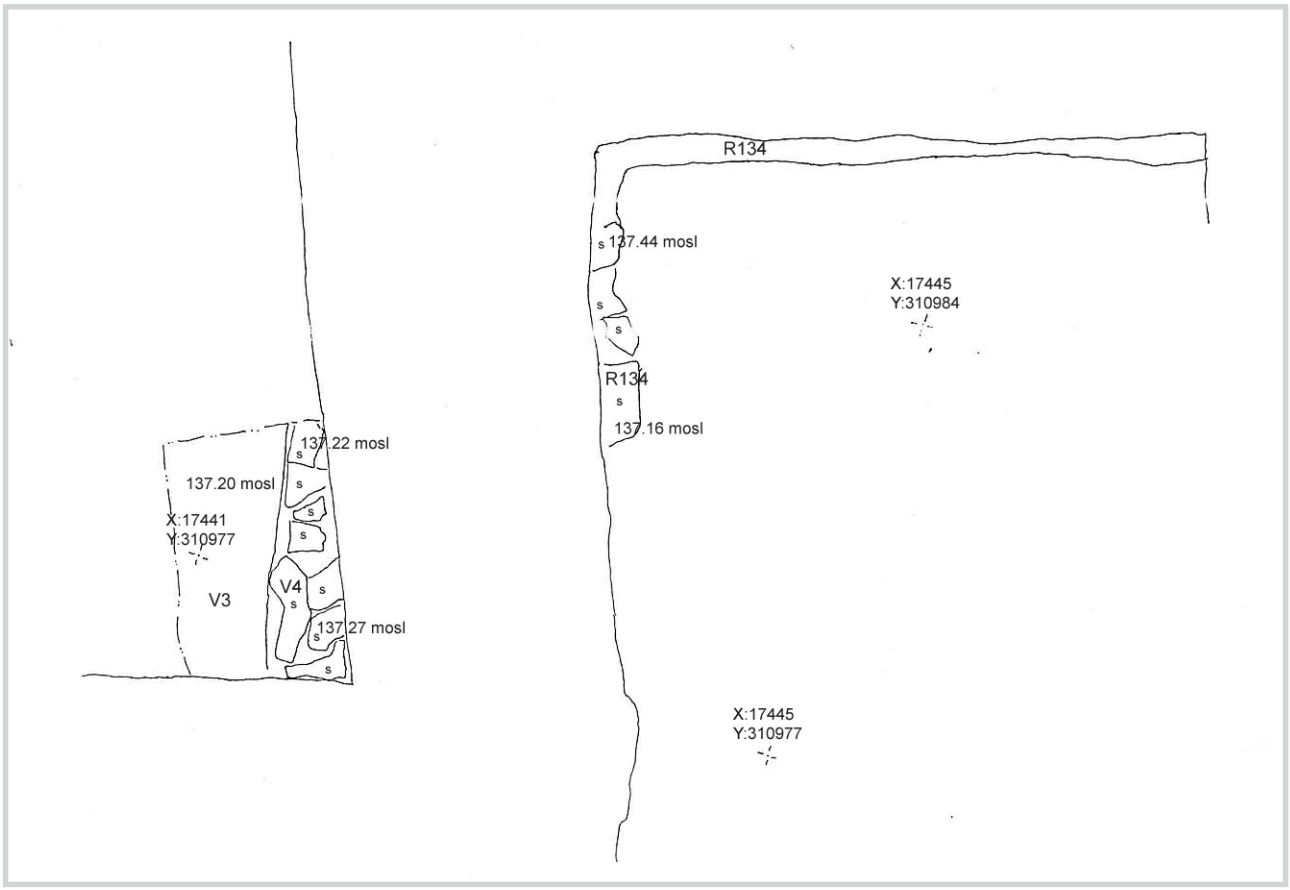


***Fig. 42**. Group 2:10, area R96, north transept.*

wall's foundation. Only exposed in a band along the inside of the wall. Under R79.

V3. Layer of orange brown gravelly clay. Under V2, over V4.

V4. Stone wall, N/S aligned, consisted of large stones, varying in size from 0.60m x 0.30m – 0.25m x 0.25m. The stones had flat upper surfaces and were laid in one even horizontal course. Butted E/W aligned wall V5. Under V2, over V5.

V5. Stone wall E/W aligned, consisted of large stones. This wall was exposed over a length of 0.60m and to a depth of 0.15m - 0.20m. Two courses were uncovered, in some places traces of mortar bonding was visible between the courses. V5 extended 0.15m - 0.18m further north than overlying wall V7. Upon the top of the stones that protruded out to the north lay modern cement, i.e. V7 was bonded to the top of V5 with cement. Under V4.

V8. Light yellowish clay, contained mortar, sand and small stones. Possibly the core of wall V4. Under V9, over V4.

Group 2:11

R73 R167 R270 R283 R345

Group 2:11 consists of a series of layers of sandy silt in the crossing (R73, R167, R270, R283 and R345). None of these layers were excavated but they appeared to be thin, 0.01m - 0.02m thick. R73, R270 and R283 had been scorched on their surface, they lay partially beneath a group of burnt deposits (group 3:6) indicating either that the burning occurred in-situ or the burnt layers were deposited whilst they were still hot. These contexts appeared to overlay a possible mortar surface (group 2:12), and may represent silting over the floor. The mortar surface was not fully exposed, a small section was excavated and R170, a very similar deposit to those of this group was recorded sandwiched between two mortar layers. A similar situation of a silt over a possible mortar surface was recorded in the north transept, (group 2:8).

Contexts

R73. Thin layer of reddish brown sandy silt. The layer appeared to have been burnt. It may have been the scorched upper surface of underlying layer R236. R73 was localised to the northern edge of grave cut R244 in the crossing. The source of the burning was overlying layer R248. Under R248, over R236.

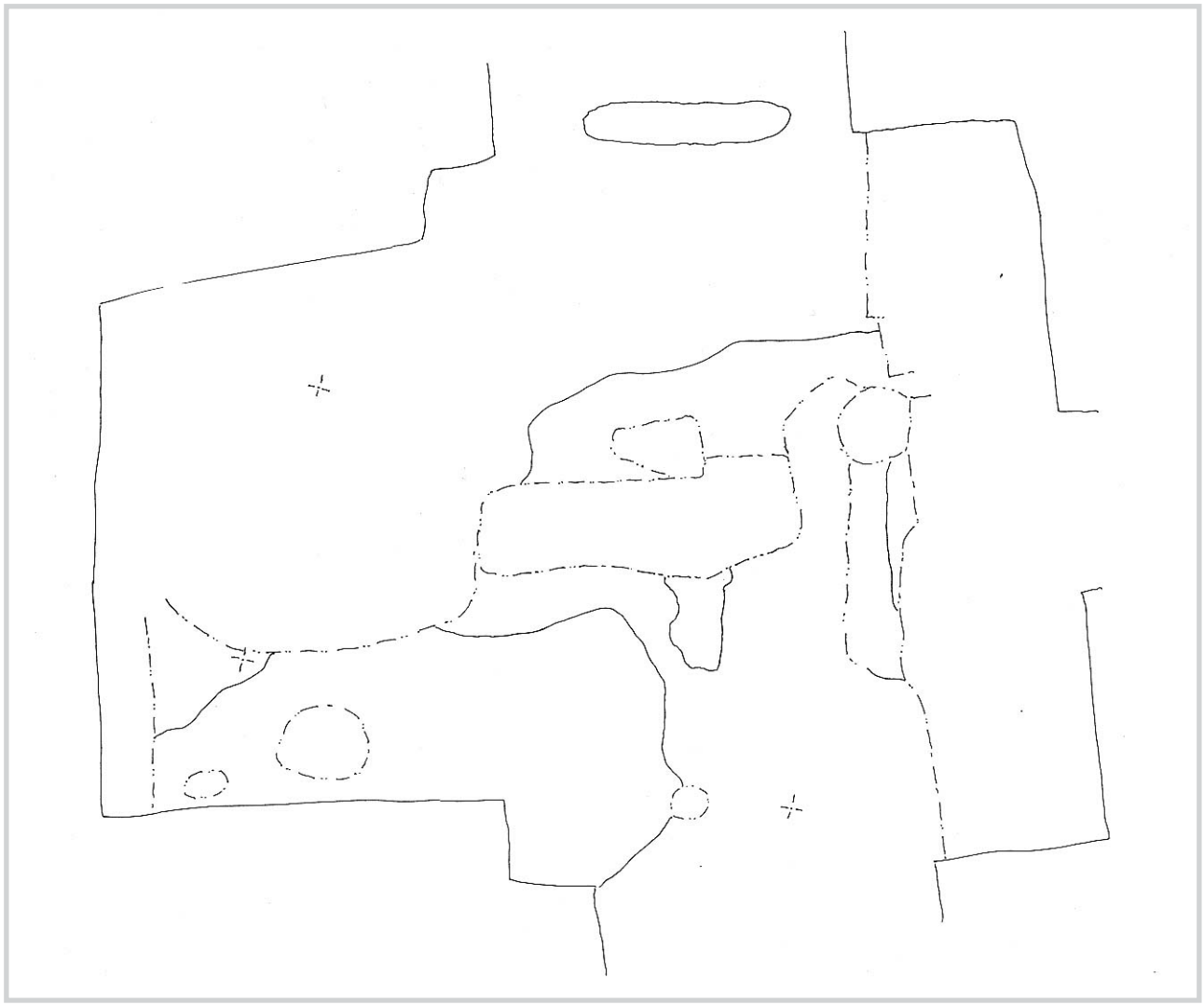


***Fig. 43**. Group 2:11, area R96, the crossing.*

R167. Layer of pale yellowish brown silty sand, localised to the western half of the crossing. Under R168, R246, R309 and R311 over R169.

R270. Compact layer of light brown sandy silt, contained occasional small stones, very small mortar and charcoal flecks. R270 was only exposed in a small area and not excavated, it was overlain by burnt deposit R248 and may have been scorched sand/silt. The layer appeared to be only 0.01m - 0.02m thick, but the small exposed surface may not have been representative of the layer as a whole. It appeared to butt the original step into the chancel R262 on its western side. Under R248, over R262.

R283. Thin layer of pale grey silt, localised to the SE corner of the crossing. The upper surface of the layer was reddish brown and appeared to have been scorched. Under R248, over R284.

R345. Layer of light brown silty sand and small stones, contained beach gravel, the gravel was probably present as a result of mixing with underlying layer R342. R345 was recorded under threshold R60 that separated the crossing and the north transept. Under R248, over R342.

Group 2:12

R169 R170 R284

Group 2:12 consists of two mortar layers (R169 and R284) and a silt layer (R170) that was sandwiched within R169, in the crossing. R169 was partially excavated, it appeared to be several layers of fine mortar with thin silt lenses sandwiched between them. R170 was the most extensive, it also contained a coin, dated to 1206 - 1260, and was given a separate context number. R284 was a little coarser than R169 and overlay stone capping R285. It is possible that these mortar layers represent waste from repairs/rebuilding of the cathedral's masonry but they were spread out horizontally forming a compact and relatively

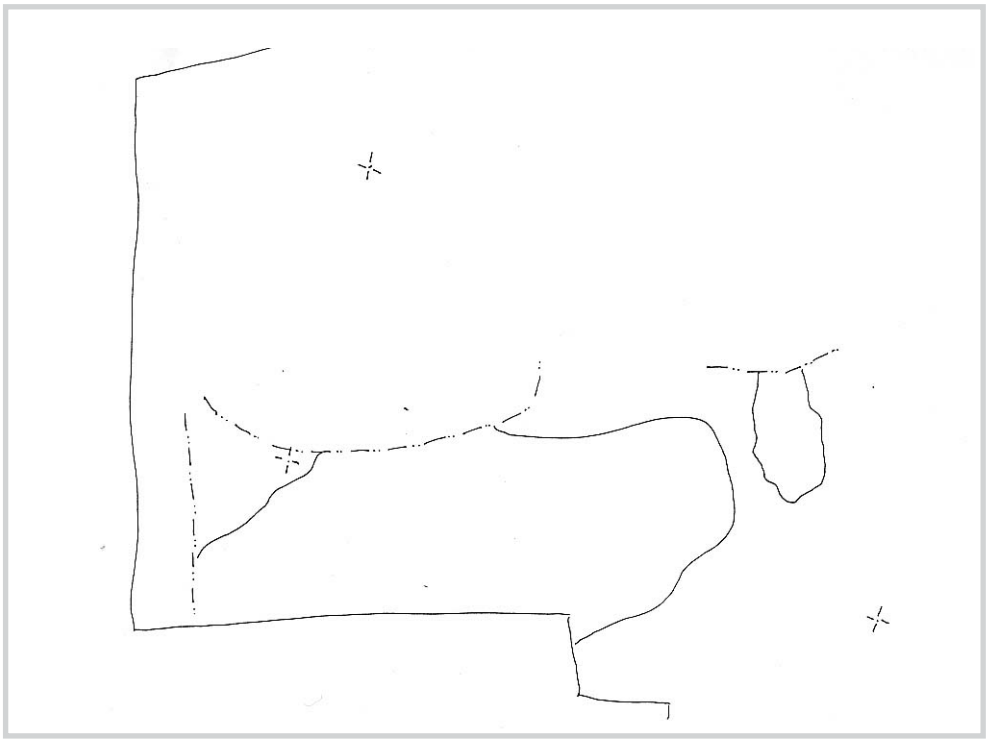


***Fig. 44**. Group 2:12, area R96, the crossing.*

even surface. A number of thin silt layers (group 2:11) lay over the mortars, these were not excavated, the mortar surfaces may have survived over a larger area. A similar situation of a fine thin mortar layer, overlain by a thin silt layer was recorded in the north transept (group 2:8). These are tentatively interpreted as remains of a floor surface that was repaired/re-laid several times, the silts sandwiched in between and overlying them being an accumulation of dust/dirt upon the floor. R169 partially overlay triple grave cut R131, i.e. the latest of the mortar surfaces was laid after the grave was in-filled.

Contexts

R169. Layer of yellowish white mortar with beach gravel inclusions. R169 appeared to be several 'surfaces' of mortar with thin layers of silt in between. It was only partially excavated. R169 is in fact several contexts grouped as one. Silt layer R170 lay between two mortar surfaces, this was given a separate context number as it was more extensive than the others and contained a coin. R169 was not excavated over a large enough area to warrant a separate context to each layer. R169 was only recorded on the southern side of the triple grave in the crossing. It appeared to partially overlie the original grave cut, R131, and fill R127, i.e. some of the mortar surfaces were laid after the grave was back-filled, though perhaps not all of them. R169 butted tower base R280. Under R167, over R127 and R280, contained R170.

R170. Layer of pale grey brown fine sandy silt, sandwiched between the mortar layers in R169. Contained a coin (HKH 11828), from its x-ray it could clearly be identified as an anonymous coin, i.e. not attributable to any specific king, dated to c. AD 1205 - 1260 (See Skaare 1995:24, coin number 178). Part of R169.

R284. Thin layer of compact yellowish grey mortar with small stone inclusions. R284 overlay stone construction R285 and was probably contemporary with one of the floor surfaces of R169. Contained a coin (HKH 11829). Under R283 and R293, over R294, R295 and R300.

Group 2:13

R262 R274 R275 R279 R280

Group 2:13 consists of structural elements of the cathedral in the crossing. Only those elements with a relationship to the exposed layers were recorded. The remains of the original step into the chancel (R262) was visible protruding out from under the cement bonded reconstructed step R247, (group 7:5) that overlay it. Sandy silt layer R270 butted R262, it is therefore probably contemporary with possible mortar surface R169, (group 2:12) i.e. part of the first phase of the cathedral.

R279 and R280 are parts of the foundation to the SW tower in the crossing. On the north side of the tower its foundation R280 was upstanding over the floor levels, creating a 2.80m long (E/W) x 0.65m - 0.80m wide (N/S) stone platform. Its function in this respect is unclear, none of the other tower faces had a similar platform. It may have served as a foundation for a wooden bench or other structure. It is unlikely that it was an altar foundation as it

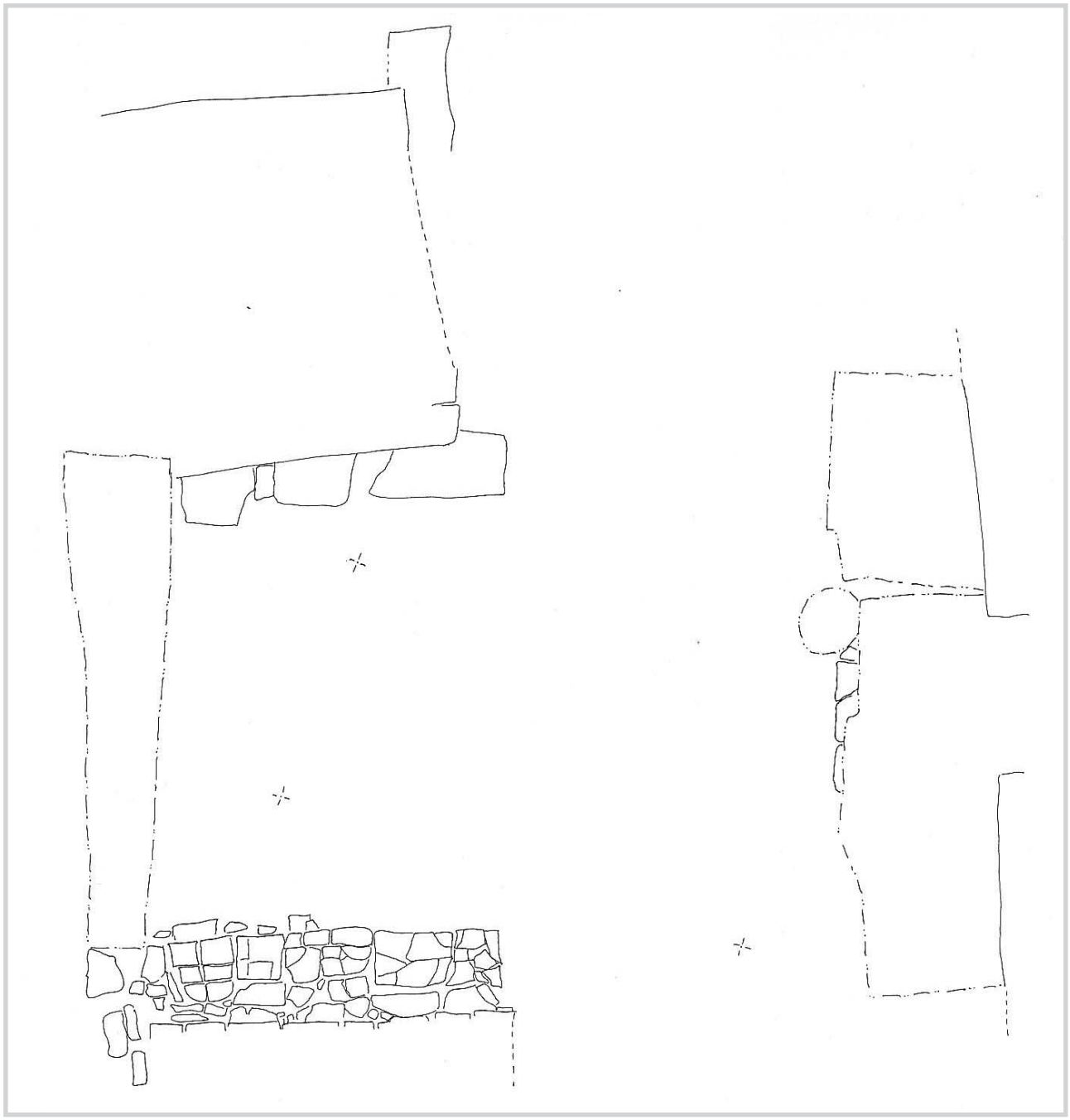


***Fig. 45**. Group 2:13, area R96, the crossing.*

was aligned N/S. Many of the stones were fractured, this damage was most probably caused by falling masonry during the cathedral's decline. R279 was the below ground foundation that R280 rested upon, it was only partially exposed but appeared to be constructed of large stone blocks. Possible mortar floor layer R169 (group 2:12) butted R280.

The base of the masonry of the earliest NW tower base (R275) was exposed on the southern side of the tower base. The top of its foundation (R274) was also exposed to the south and east. The foundation consisted of large mortar bonded stones. The foundation for the secondary tower base R266 (group 3:3) partially overlay the foundation stones of the earlier tower and also butted the base of the masonry.

Contexts

R262. Stone and mortar construction, only partially exposed where it protruded out from under R261, the reconstructed step from the crossing into the chancel. R262 is interpreted as being the lower part of the original step. It consisted of unworked limestone blocks bonded by a pale yellow mortar with beach gravel and burnt lime inclusions. The mortar bonds and also appeared to cover the top of the stones suggesting that the upper part of the step

had been removed. R262 was 1.30m long E/W, 0.20m+ N/S. It appeared as though only the lowest 0.10m of the structure was preserved, but as it was only observed in a small area this is uncertain. The step had a straight western edge, where no stone was present mortar filled the gap. Under R247, R264 and R270.

R274. Foundation for the earliest NW tower base. R274 was only partially exposed on the surface, it consisted of large stones, < 1.10m x 0.50m. Some traces of mortar were visible on the surface. Under R275.

R275. The earliest NW tower base, consisted of relatively regularly sized stones, 0.25m - 0.35m long x 0.30m high. R275 was butted on its eastern face by the later tower, both the foundation (R266) and the upstanding tower base (R277) butted R275. Under R266, over R274.

R279. Foundation for R280, the foundation/bench on the north side of the SW tower in the crossing. The foundation protrudes out slightly from under the masonry R280, and was also partially exposed in the cut of a post hole. Consisted of large limestone blocks bonded with a cream coloured mortar with beach gravel inclusions, it had a slightly different alignment than R280. Under R280.

R280. Foundation of the SW tower in the crossing, 2.80m long (E/W), 0.65-0.80m wide (N/S), 0.15-0.25m deep. Consisted of a single course of large fractured stones bonded with a cream coloured mortar with beach gravel inclusions. Although R280 appeared to be the foundation for the tower, continuing in under the masonry, it stood c. 0.10m above the level of the tile floor R157 and c. 0.20m over possible mortar surface R169, forming a stone platform or bench against the tower wall. The threshold stone between the mid aisle of the nave and the crossing R273 butted R280, i.e. R280 was earlier than R273. Under R169, over R279.

Group 2:14

RG124 RG125 RG126 R127 R131 R147 R148 R150 R161 R162

Group 2:14 consists of a triple grave in the crossing. Three individuals were interred within cut R131: RG124, RG125 and RG126. The grave was situated 0.50m from the inside of the threshold with the nave, in the centre of the crossing, i.e. roughly along the central axis of the cathedral. Another, single, unexcavated grave (group 4:9) was recorded east of R131, immediately in front of the entrance to the chancel. These two graves didn't appear to be stratigraphically contemporary however.

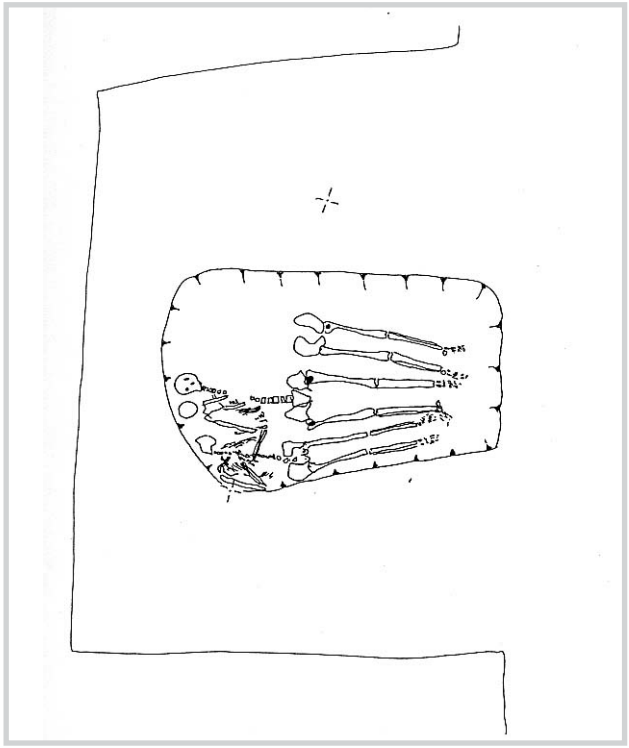


***Fig. 46**. Group 2:14, area R96, the crossing.*

The grave had been disturbed, either by limited antiquarian excavation or robbing, this activity was recorded as R71 (group 7:5). Cut 71 partially truncated the northernmost and central burials, RG126 and RG125 respectively, but didn't disturb the southernmost burial RG124. R71 extended up to the threshold with the nave R273, (group 3:3) i.e. 0.50m outside the western limit of this grave. R131 appeared to have been partially sealed by mortar surface R169, which lay c. 0.20m below the level of the latest floor, the level that R71 was cut from. This grave could not have been visible on the surface therefore when the robbing/excavation took place. That the robbing activity was not confined to within the grave supports this interpretation. Whether R71 robbed out a later grave that lay against the threshold that was visible in the latest floor and continued below the base of that grave into R131, or whether this area was chosen for exploratory digging as it was the likely location of a high status grave is uncertain. A seal stamp (HKH11821) was recovered from R72 the fill of R71. It was not certain whether this was originally buried with RG125 or RG126 or a third individual from the postulated later grave. The seal is associated with canon Thorodd Thorsteinsson who wrote two still existing letters in AD 1346 (DN II, number 274 and DN III, number 233). Mortar surface R169/R170 overlay the grave, it contained a coin dated to AD 1206 - 1260, indicating that the grave was sealed before the seal stamp was in use. This supports the interpretation of a third grave that Thorodd Thorsteinsson was interred in.

***Fig. 47**. Burial RG125, group 2:14, belt buckles lay upon the femurs. Note that the bones were stained reddish brown. Photo Bruce Sampson, NIKU.*

RG126, was the individual on the northern side of the grave, it had been truncated above the pelvis by cut R71. The skull lay in approximately the correct anatomical position but appeared to have been replaced, i.e. not in-situ. An iron belt buckle lay upon the top of the left femur. RG125 was the central burial. The left shoulder and left arm, the right lower arm and hand, some of the vertebrae and ribs on the left side had been removed by cut R71. Some of the ribs however appeared to have been the subject of chemical deterioration rather than being removed by a physical disturbance. These ribs were separated from the area of cut R71 by in-situ bones. An iron belt buckle lay upon the top of each femur and a copper alloy incense-burning bowl lay inverted, immediately south of the skull, between RG125 and RG124. Under the bowl were remains of ash and charcoal. A separate lump of charcoal (R162) lay below the right shoulder of RG125. RG124 was the southernmost individual. This skeleton was complete though some of the bones appeared to have moved. The body lay directly against cut R131, it was curved at the hips slightly, giving the impression that it had been squeezed into the remaining space against the southern edge of the cut.

Many of the bones of these three individuals were stained red. A dark reddish brown organic material (R148) was present over the feet of both RG125 and RG126 and over the pelvis and sacrum of RG125. The red staining on the bones was more extensive than the remains of R148. The staining was most apparent on the legs of all three individuals. This residue, the resultant staining of some of the bones and the belt buckles on RG125 and RG126 may indicate that the bodies were wrapped in leather shrouds. Traces of organic material (R147) were also present under the bodies in the base of the cut. R147 is interpreted as the remains of a wooden platform in the base of the grave that the bodies were laid upon. A thin layer of grey silt (R161) lay in the base of the cut, over R147, partially underlying the burials. R161 was interpreted by the excavator, as evidence of silting in the base of the grave from the demolition deposits in the edges of the cut. This silting must have taken place prior to the interring of the burials in the grave. The fill that lay directly over the bodies, R150, was only 0.10m thick. It consisted primarily of crushed white mortar, and a few larger fragments. It may have been deliberately laid for hygiene purposes as a substitute for a layer of lime. It may also have been formed as a result of silting from the mortar rich layers in the edges of the cut, in a similar manner to R161. The upper surface of the layer was slightly concave, as is typical for silting deposits. The excavator interpreted the layer as silting. If this was the case then it indicates that the grave was open for a period after the bodies were interred, prior to being back-filled. This raises the possibility that the bodies were not laid in the grave simultaneously, there was no direct evidence to suggest this however. The fill of the grave (R127) consisted of sandy silt with mortar and stone fragments. Occasional brick fragments were also registered. The fill of the grave was difficult to distinguish from R72 the fill of the robber cut however, the possibility that the brick fragments were part of R72 cannot be excluded.

***Fig. 48**. Burials RG125 and RG126, group 2:14. Photo Bruce Sampson, NIKU.*

Contexts

RG124. Sub adult skeleton, supine, orientated E/W, head to west. The arms were folded over the chest, some of the vertebrae had moved, but there was no evidence or space for a coffin. The left upper arm and ribs were disturbed, possibly by grave robbing activity, cut R71. RG124 was the southernmost of three skeletons to be interred within cut R131. RG124 is bent a little at the hips and appears to have been squeezed into the space at the southern edge of the grave cut. The bones were stained red, see R148. Under R148, over R161.

RG125. Adult skeleton, supine, orientated E/W, head to west. The left shoulder and left arm were removed by robbing cut R71. The jawbone had been disturbed and lay loose in the back-fill. The left hand was present folded over the right ribs. The right lower arm and hand were missing, as were some of the vertebrae and right ribs. Some of the ribs were very poorly preserved, they should have been in-situ but appeared to have been subjected to chemical deterioration. Organic material R148 and the reddish brown staining of the bones may indicate the bones were wrapped in leather. Two iron belt buckles (HKH 11825, HKH 11826) lay one on the top of each femur and a copper incense burning bowl (HKH 11822) had been inverted by the right shoulder, the ash/charcoal contents lay under the bowl. RG125 was the middle of the three skeletons interred within cut R131. Under R148, over R161.

RG126. Adult skeleton, supine, orientated E/W, head to west. The upper body and skull had been removed by robbing cut R71, but the skull had been replaced in the correct anatomical position. An iron belt buckle (HKH 11827) lay upon the left femur. The leg bones were stained red, see R148. Under R148, over R161.

R127. Fill of light grey brown sandy silt and mortar fragments, contained small stones and occasional brick fragments. Under R71 and R169, over R150.

R131. Grave cut for skeletons RG124, RG125 and RG126. R131 was orientated E/W, it was rectangular/oval in plan with vertical sides and a flat base, 2.15m long x 1.20m wide x 0.65m deep. It appeared as though mortar surface R169 overlay the grave, at least partially. Under R147, over R236.

R147. Fill of dark brown soft organic material. R147 lay in the base of grave cut R131, below silt layer R161. R147 was possibly the remains of a wooden platform in the base of the grave. Under R161, over R131.

R148. Fill of dark reddish brown organic material lying around the bones of skeletons RG125 and RG126. It was not present over all the bones, just over the feet of both and the sacrum and pelvis of RG125. The bones were stained red, the staining was also noticeable where R148 was no longer present as a physical deposit. R148 was possibly the remains of leather shrouds/cloaks. The acidic, tanned leather may account for the staining and decay of the ribs of RG125. Under R150, over RG124, RG125 and RG126.

R150. Fill of white mortar, 0.10m thick, R150 lay over skeletons RG125 and RG126, it had been truncated to the east by R71. R150 lay directly over the skeletons. R150 may have been deliberately laid as lime for hygiene purposes, or was possibly silting of the mortar rich layers in the sides of the cut, indicating an open feature. Under R127, over R148.

R161. Thin fill of grey silt, lay in the base of cut R131, over the remains of wooden platform R147. R161 was

***Fig. 49**. An organic residue beneath the burials RG124 and RG126, group 2:14. Photo Bruce Sampson, NIKU.*

probably washed/silted into the base of the feature. Under RG124, RG125 and RG126, Over R147.

R162. Lump of charcoal found below the right shoulder of RG125. Part of fill R127.

Group 2:15

R285 R294 R295 R298 R299 R300 R342

Group 2:15 consists of a N/S aligned timber and stone structure (R285 and R298) and associated deposits in the crossing. Silt (R295) and beach gravel (R342) layers were dumped around and over the structure, a post hole (R294 and R299) was dug alongside the structure and a large stone slab (R300) was laid against it. The structure was only uncovered over a 1.40m section in the crossing and partially uncovered over a 0.80m section under the threshold that lay between the crossing and the north transept. Although the feature was only partially uncovered a linear depression was clearly visible on the surface of the unexcavated deposits indicating the presence of the feature. The depression was 5m in length, the feature may have been longer however.

The structure consisted of limestone slabs (R285) laid directly upon a timber beam (R298). The depression recorded on the surface may have been caused by the partial rotting of the beam. A mortar and stone deposit (R340) was laid to level up the ground surface prior to the construction of threshold R60 (group 3:2), indicating that subsidence had begun to occur in antiquity. The subsidence may therefore have been due to settling of the structure rather than rotting of the beam or perhaps a combination of the two.

Stone posthole packing R299 was constructed immediately to west side of the stone slabs, the top of the packing was flush with the surface of the slabs. The remains of a post (R294) was present within the post packing. Large stone slab R300 was laid to the north of the post hole, this may have been laid as support for the post packing, it may have had some other function or it may have been coincidentally placed as part of the make-up deposits that surrounded the structure. There was no evidence elsewhere of a second line of stone slabs. As only a small area was uncovered. It was not possible to determine the function of R300. It was also uncertain whether there were more post holes along the structure's length. The stone slabs, R285 formed a linear feature < 0.50m wide. Although they rested upon beam R298, the beam was only 0.15m wide and they also rested upon the make-up deposits that surrounded the beam. No part of the structure was place in a cut, the beam appeared to have been placed upon mortar surface R238, (group 2:17), which is interpreted as a possible working surface connected to the construction of the cathedral. Make-up deposits (group 2:16) were then dumped around it, holding it in place. A silt layer, R295 was dumped over and around the beam and stone capping in the crossing. Under the threshold to the north, a beach gravel layer R342 appeared to have been deposited in the same manner. Remains of mortar floor R284 lay over the stones of R285.

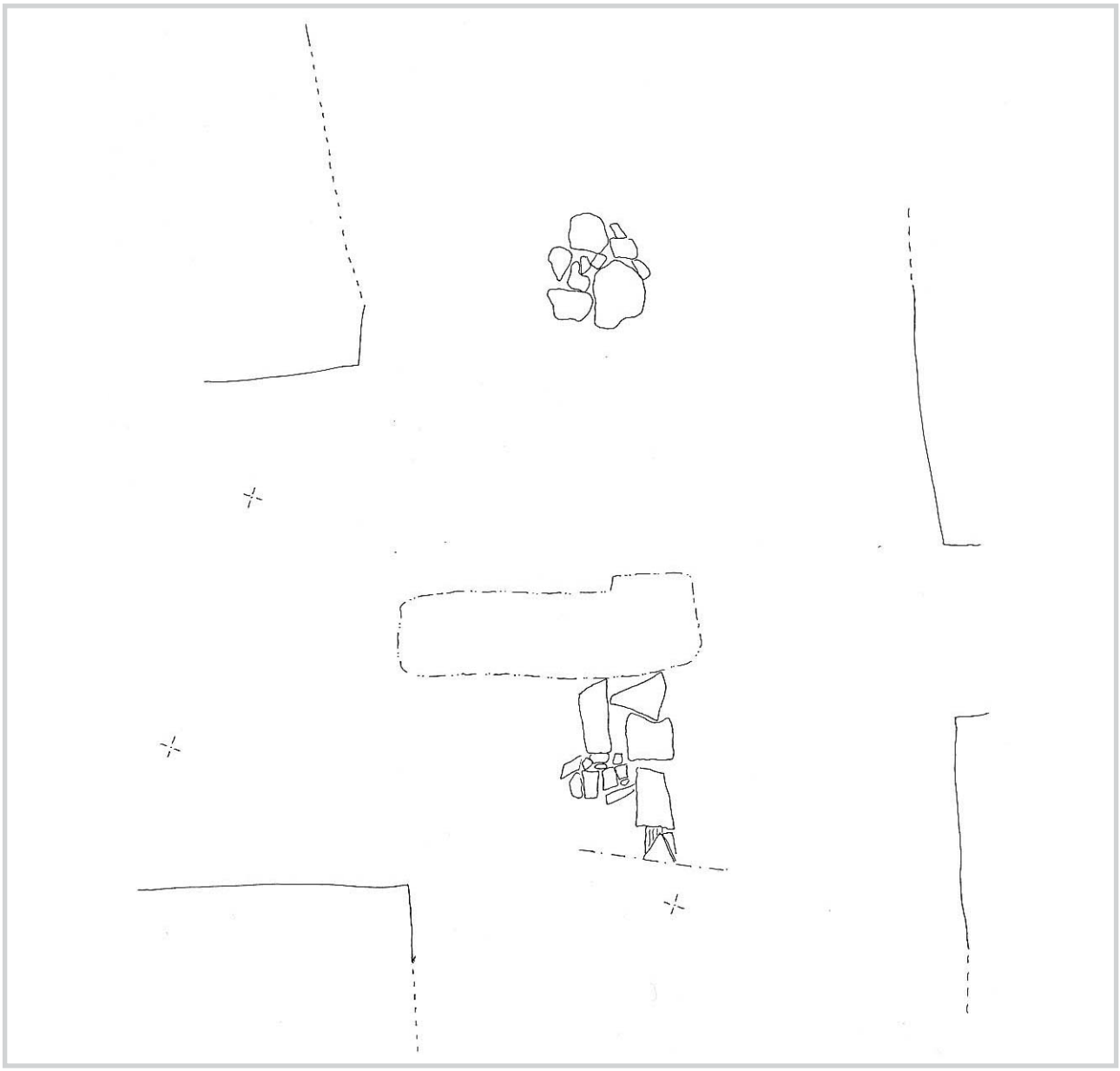


***Fig. 50**. Group 2:15, area R96, the crossing. R285.*

The structure's function was not clear, but it appears to have been connected to either the construction phase or the first period of use of the cathedral. A wood sample from the beam was radiocarbon dated to CAL AD 1170 - 1250 at the 95% level of confidence, placing it within this period. The mortar floor (R284, group 2:12) lay over the slabs, but the post appeared to have been upstanding in the floor. It was not filled in until later (group 3:5). It didn't appear to be connected to scaffolding, especially as the post appeared to continue in use after the floor was laid. The structure is tentatively interpreted as the foundation for a screen that separated the chancel from the nave.

Contexts

R285. Stone structure, consisted of a single, N/S aligned, row of flat limestone slabs, 0.30-0.50m wide. R285 was only partially exposed: over 1.40m in the crossing and over 0.80m under the threshold between the crossing and north transept. The stones lay directly upon the remains of a wooden beam, R298. A depression in the overlying layers could be followed between the two exposed sections of R285, caused by the rotting of beam R298 or settling of the structure, this depression was also visible c. 1m to the south of R285. A posthole R299, was constructed immediately west of R285. R285's function is unclear, it appears to be connected to beam R298, post hole R299 and slab R300. Under R295, over R298.

***Fig. 51**. Group 2:15, area R96 stone slabs R285 looking N. Photo Stan Reed, NIKU.*

R294. Remains of a wooden post within post packing R299. The wood was rotten, the top of the extant wood lay beneath the surface of the stone packing. Fill R293, lay over the post, filling the top of the post hole. It is likely that the post was cut off at ground level after it went out of use. Under R169, over R299.

R295. Layer of grey gravely sandy silt, contained mortar fragments and occasional small stones. The deposit was loose and lay between stone slabs R285 and around underlying beam R298. It appears as though the beam and stone capping were built up rather than being laid in a construction cut, R295 was presumably dumped around the beam and between in the stones, filling in the gaps. Under R284, over R285.

R298. A wooden beam only partially exposed. The wood had decayed slightly but was relatively solid. R298 lay beneath stone slabs R285, the stones lay directly upon R298, sandy silt R295 was dumped around both the beam and the slabs. R298 was c. 0.15m x 0.15m, it was exposed over a length of 1.40m in the crossing, and seen but not exposed under the stones of R285 where they were uncovered under the threshold between the crossing and the north transept. A depression in the overlying layers indicates that R298 and R285 continued into the gap between the towers on both the north and south sides of the crossing. The beam lay upon a compact crushed mortar layer, it was recorded as lying upon mortar layer R238, this layer was only exposed in the profile of grave cut R131 however, i.e. not exposed in plan. This relationship is therefore not 100% certain. A wood sample from the beam was radiocarbon dated to CAL AD 1170 - 1250 at

***Fig. 52**. Group 2:15, area R96 wooden beam R298, stone post packing R299 under stone slabs R285, looking E. Photo Stan Reed, NIKU.*

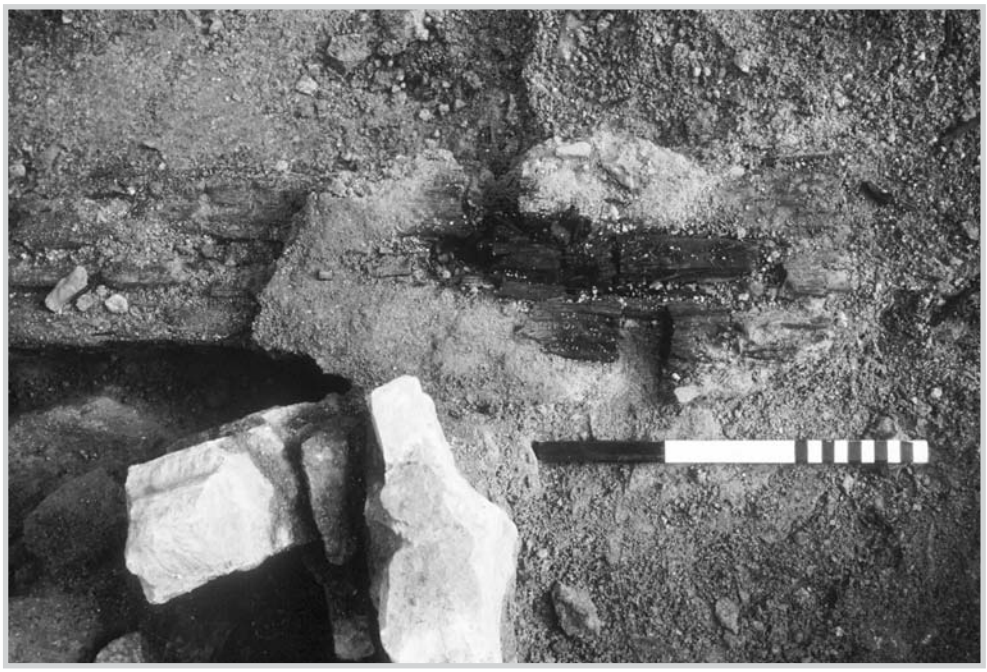


***Fig. 53**. Group 2:15, area R96 wooden beam R298 exposed, part of stone post packing R299. Photo Stan Reed, NIKU.*

the 95% level of confidence (Beta-135935, sample HKH11912). Under R285 and R342, over R238.

R299. Stone post packing surrounding post R294. The stones were laid in a square, two courses high on the southern and western sides, one course high on the northern and eastern sides. Smaller stones were placed between the larger stones as filler. R299 was only uncovered on the surface, it lay immediately west of beam R298 and stone capping R285, the top of R299 was flush with the top of stone capping R285. Post R294 lay below the top of the R299, the resulting void had been 'filled' by R293. Under R294.

R300. A single large limestone block, 0.50m long N/S x 0.20m wide E/W. Only the top of the block was uncovered, it was placed against the packing stones of post hole R299, adjacent to beam R298 and capping stones R285. It is uncertain whether R300 had some structural function together with the post hole and beam/capping stones or whether it was simply dumped as support to the post packing. Under R284, over R299.

R342 Layer of beach gravel, recorded in a small area beneath the threshold, R60, that separated the central crossing from the north transept. R342 overlay beam R298, it was not excavated. Under R345, over R298.

Group 2:16

R236 R237

Group 2:16 consists of two make-up layers (R236 and R237), recorded from the profile of grave cut R131 in the crossing. These deposits were not exposed in plan or excavated. R237 contained a concentration of large building stones, some with traces of mortar on their surface. Both layers contained fragments of mortar. R237 was comprised primarily of mortar except for the concentration of building stones. These layers lay beneath the earliest exposed floor layers of the cathedral. The remains of a stone structure R240 (group 1:3), were recorded in the base of the grave cut. The natural ground level lay beneath the base of the grave cut, i.e. > 0.60m under the level of the earliest cathedral floor. There would therefore have been a need to make-up the ground surface here. The underlying layer R238 (group 2:17), is interpreted as a working surface possibly connected to the construction of the tower foundations. The make-up episode that this group represents presumably occurred therefore after the construction process had begun, these deposits being dumped against the tower foundations. The presence of an earlier structure beneath these layers suggests that the demolition debris in R236 and R237 may have come from an earlier structure.

Contexts

R236. Layer of mid grey brown silty sandy clay, contained mortar fragments and small stones. R236 was recorded from the profile created by grave cut R131, it was not exposed in plan and was not excavated. Under R131, over R237.

R237. Thick heterogeneous layer of white crushed mortar, contained fragments of mortar and small and large stones. The mortar was interspersed with lenses of mid

greyish brown silt that contained small stones. The two deposits were mixed together forming one layer. R237 was recorded from the profile created by grave cut R131, it was not exposed in plan and was not excavated. In the SW corner of the grave a concentration of large limestone blocks were present. Under R236, over R238.

Group 2:17

R238 R239 R241

Group 2:17 consists of a layer of silty sand containing burnt stones (R241), a layer of re-deposited moraine clay (R239) and a compact thin surface of crushed mortar (R238). These layers were exposed in the edges and the base of grave cut R131 in the crossing, they were not excavated. They were deposited over the remains of a stone structure (R240, group 1:3) that lay in the base of the grave cut's western edge. R241 was localised to the western edge of the cut and lay directly over the wall remains. The burnt stones were small and not typical cooking stones. A charcoal sample from the layer was radiocarbon dated to CAL AD 1000 - 1205 at the 95% level of confidence. Clay R239 was the layer the cut bottomed out on. It appeared to be an extensive make-up deposit laid after the stone structure R240 had been demolished. R238 was a thin compacted layer of crushed mortar/sand and stone working debris, it is interpreted as a working surface, i.e. a thin layer formed by the compaction of debris presumably through people walking and working in the area in connection with the construction of the tower foundations. It was present on all four sides of the grave cut and probably covered most, if not all of the area.

Contexts

R238. A thin laminated layer of crushed white mortar and sand, contained small stone fragments and small mortar fragments. The stone fragments lay horizontally. The layer was very friable and crumbled under pressure, i.e. it consisted of loose material that had been compacted. R237 was recorded from the profile created by grave cut R131, it was not exposed in plan, a small test area was excavated. It was present in all four sides of the grave cut, suggesting it covered the crossing. It is interpreted as a working surface, i.e. not a deliberately laid layer but one formed by debris being compacted as the surface was walked upon, possibly in connection with the demolition of structure R240, but more likely during construction of the tower foundations, the stone fragments being stone working debris. Under R237, over R239.

R239. Layer of greenish grey clay, contained occasional medium sized stones and lenses of silty sand, similar to the matrix of underlying R241. R239 was recorded from the profile created by grave cut R131, it was the layer that the cut bottomed out onto, except for the western edge where R240 and R241 were present. It contained no visible traces of cultural material, but didn't appear to be sterile. R239 was probably re-deposited natural moraine clay mixed with lenses of silt. Under R238, over R241.

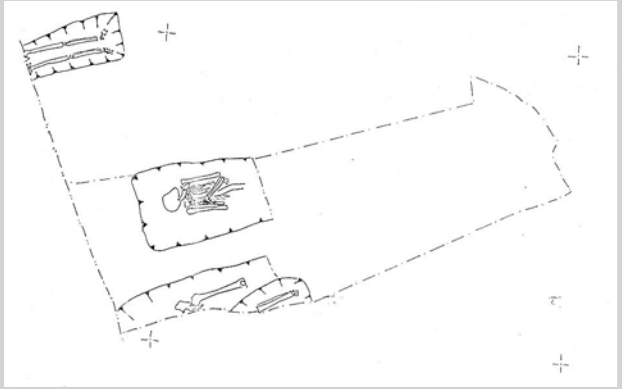
R241. Layer of dark brown gravely silty sand, contained small stone fragments, many of which were burnt, mortar fragments and charcoal flecks. It is possible that R241 filled a cut in the overlying layer R239, the relationship between them was not clear but it was more likely that R241 was a layer beneath R239. R241 was recorded from the profile created by grave cut R131, it was not exposed in plan, a small test area was excavated. The charcoal in R241 was radiocarbon dated to CAL AD 1000 - 1205 at the 95% level of confidence (Beta-135933, sample HKH11865). Under R239, over R240.

Group 2:18

B36 B37 BG38 B63 B64 BG65 B66 B67 BG70 B71 B72 BG74 B75 B76

Group 2:18 consists of four burials (B36, B37, BG38, B63, B64, BG65, B66, B67, BG70, B71, B72, BG74, B75 and B76), the oldest group of graves outside the eastern wall of the chancel in trench B96-4. BG38 lay in cut B36 within fill B37. This grave lay to the north of trench B96-4 in the area excavated in 1991. It was exposed during the machining out of the back-fill of the 1991 excavation. The grave had been cut by the construction cut for the chancel wall B79 (group 3:9), only the lower half of the pelvis, the legs and feet were extant. Burial BG70 had also been truncated by B79. Only the left side of the pelvis, the left femur and a few finger bones were present. The left-hand side of the body was excavated in 1991. The right leg below the knee had been truncated by B80 the construction cut for stone structure B79 and later grave cut B41. Although no bone was present against the chancel wall the

***Fig. 54**. Group 2:18, trench B96-4.*



construction cut clearly truncated this grave. The fill (B72) contained disarticulated human bone, presumably this grave truncated an earlier burial that lay within the area excavated in 1991. BG65 lay 0.50m east of the chancel wall. There was no direct stratigraphic relationship between the grave and the construction of the wall but mortar layer B7 that is interpreted as construction debris overlay the grave. BG65 is interpreted as earlier than the later chancel wall. The grave was truncated to the east by later grave cut B39 and by the construction cut (B80) of stone structure B73. The sacrum, pelvis legs and feet had been truncated. The grave cut B64 was 0.60m - 0.90m deep. There was 0.20m of space between BG65 and the edge of the cut on all sides. The cut appeared to have been dug to fit a coffin, a few fragments of wood (B66) confirm that this was a coffin burial. Three lumps of charcoal (B67) were placed in the grave, two by the right elbow and one immediately west of the skull.

The remains of a lower leg and some anklebones, BG74, are also included in this group. A cut (B76) and fill B75 were identifiable in the base of the trench. The foot bones had been truncated by later grave cut B41. The rest of the grave was excavated in 1991. The position of the leg bones indicates that BG74 was probably truncated by the construction cut for the chancel wall. The physical connection between the two features would have lain in the 1991 excavation area. BG70 and BG74 may have intercut, they lay partially over one another but BG70 lay c. 0.30m higher. If BG74 was the later of the two burials then its grave cut, B76 would have truncated BG70. This relationship is unknown. No corresponding graves for BG70 and BG74 were present on the plan of graves from the 1991 excavation.

The burials in this group did not form as coherent a group as the other burial groups in trench B96-4. They were not laid in a row and were buried at three different depths. They are grouped together because all appeared to be earlier than the construction of the chancel wall. None of the grave fills contained brick fragments. It is possible that more than one phase of burial is represented in this group.

Contexts

B36. Grave cut, E/W orientated, only the eastern half of the grave was excavated, the foundation trench of the east wall of the chancel had truncated the western half. The grave lay within the 1991 excavation area but had not been excavated. The grave was discovered by chance and subsequently excavated during the work in trench B96-4. The cut was 1m+ long, 0.45m wide, 0.30m deep. Under BG38, over B32.

B37. Fill of yellow brown sandy silty clay, contained gravel and small stones. Fill of grave cut B36. Under B79, over BG38.

BG38. Adult skeleton, supine, oriented E/W, head to west. Only the base of the pelvis and the legs and feet were excavated, the grave had been truncated to the west by the foundation trench for the east wall of the chancel. See also B36. The legs were positioned with the heels turned in and the toes turned out. The leg bones were thin, possibly wasted. Under B37, over B36.

B63. Fill of orange brown silty clay and beach gravel fragments, contained charcoal flecks, small stones and two flecks of mortar. Fills grave cut B64. The fill consisted of re-deposited natural, both moraine clay and beach gravel. Under B80, over B66 and B67.

B64. Grave cut, aligned E/W, 1.20m+ long, 0.80m wide, 0.90m deep. The eastern half of the grave had been truncated by later graves. The western half of the cut was roughly rectangular in plan and appears to have been dug to fit a coffin. The edges of the cut were near vertical, there was a gap of c. 0.20m between BG65 and the edge of the cut on all 3 sides, Under BG65, over B32.

BG65. Adult skeleton, supine, oriented E/W, head to west. The grave had been truncated just above the pelvis such that the pelvis and legs had been removed. The right arm was folded up so that the right wrist lay over the right shoulder, the right hand was bent though 90 degrees so that the fingers lay under the chin. The left arm was folded up towards the chest, but the hand was bent down towards the abdomen, the fingers lay against the right arm. Fragments of wood, B66 were recovered suggesting a coffin burial, the cut also appears to have been dug for a coffin, displacement of the finger bones also suggest a coffin burial. There was a gap of c. 0.20m between BG65 and the edge of the cut. The position of the arms and hands, folded tightly against the body initially suggests that the body might have been wrapped, but the evidence for a coffin burial is stronger. Three lumps of deliberately placed charcoal, B67 were recovered, placed around the body. Under B66 and B67, over B64.

B66. A few fragments of wood recovered from grave fill B63, presumably remains of a coffin. Under B63, over BG65.

B67. Three lumps of charcoal deliberately placed around BG65, in the base of the grave cut B64. One lay level with the right elbow, another immediately west of the

skull, a smaller lump lay under the right elbow. Charcoal flecks were present throughout the grave fill B63 but these lumps were larger, 0.03m x 0.01m and clearly deliberately placed. Under B63, over BG65.

BG70. Adult skeleton, supine, oriented E/W. Most of the grave lay within the 1991 excavation, such that only the left side of the pelvis and the left femur were excavated, later grave cut B41 had truncated the left leg below the knee. The grave had also been truncated to the west by the foundation trench for the east wall of the chancel. A few finger bones lay over the pelvis, it was unclear which hand they belonged to. The bones were in poor condition, they appeared to have suffered both chemical and physical damage. No traces of a coffin were present. Under B72, over B71.

B71. Grave cut, aligned E/W, truncated to the west, south and east by the foundation trench for the chancel, the 1991 excavation and an earlier grave respectively. The northern edge was cut at a near vertical angle, rounding to a flat base, it was 1.60m+ long and 0.25m deep. Under BG70, over B32.

B72. Fill of slightly orange silty clay, contained small stones, charcoal flecks, pockets of sand and beach gravel fragments and disarticulated human bone. Fill of grave cut B71, the fill consisted primarily of re-deposited natural clay and beach gravel. Under B79 and B80, over BG70.

BG74. Lower leg and some ankle bones, presumably an adult. The bones lay in the correct anatomical position, and traces of a cut were recorded. The foot bones had been truncated by an earlier grave, the rest of the grave was excavated in 1991. The ankle bones lay at an angle up against the slope of the cut. No traces of a coffin were present. Under B75, over B76.

B75. Fill of orange brown gravely clay silt, contained small stones. Fill of grave cut B76. Under B80, over BG74.

B76. Grave cut, most of the grave was excavated in 1991, the eastern end has also been truncated from above by a later grave. Only the very base of the cut was excavated, 0.80m+ long, 0.30m+ wide, 0.05m deep. Under BG74, over B32.

Group 2:19

M127 MG144 M146 M162 M164

Group 2:19 consists of a burial on the north side of the 'Bishops Foundation' (M146, MG144 and M127), and a probable grave cut and fill on the south side of the 'Bishops Foundation' (M162, M164 in trench M96-14.

Only the feet of MG144 lay within the excavated area, these had been disturbed slightly by later grave cut M140 (group 4:12) that bottomed out on top of MG144. There was clear evidence that MG144 was interred in a coffin. The grave fill contained no brick fragments. The depth of grave cut M127, 0.70m, suggests that the upper part of the feature may roughly reflect the original height of the surface of the churchyard at the time this grave was cut, c. 136.50 mosl. Make up deposits M126 and M138, (group 3:15) overlay this grave, i.e. the level of the churchyard was raised some time after this grave was cut.

Only the northern edge of fill M162 and cut M164 were recorded from the section, the rest of the feature was excavated in 1991. Probably a grave cut, but no skeleton was recorded in the small surviving area. The cut appeared to correspond more to the height of M127 than later cuts M143, M145 M165 and M166 but the upper part of the cut may have been truncated. Fill M162 contained no brick fragments.

Contexts

M127. Grave cut, recorded from section only, 0.70m+ wide, 0.70m deep, the upper part of the cut had been truncated to the south by later grave M140. Skeleton MG144 lay within the cut off centre to the south. Under MG144, over M122.

MG144. Two articulated feet, contained within cut M127. Feet lay to the west, burial was supine, age uncertain. Both feet have been disturbed slightly; some bones were missing. The lower leg bones were visible in the profile. Later grave cut M140 bottomed out on top of this burial, it is likely that the missing bones were removed when M140 was cut. Two coffin nails, points facing upwards, and a few fragments of decayed wood were present, indicating a coffin burial. Under M146, over M127.

M146. Fill of orange brown silty clay, contained small stones and two coffin nails. The fill consisted primarily of re-deposited moraine clay. Contained skeleton MG144. Under M138, over MG144.

M162. Fills of yellow brown silt, contained small stones, gravel and mortar flecks. Fills M164, possibly a grave fill, no human bone was visible but only a small part of the feature remained, the rest was excavated in 1991/2. Under M163, over M164.

M164. Cut, probably a grave cut but most of the feature was excavated in 1991/2, no human bone was recorded in the part of the feature that was exposed. Only the northernmost 0.20m of the cut was recorded, the cut was 0.40m+ deep. Under M162, over M161.

Group 2:20

M122

Group 2:20 consists of layer M122, re-deposited sterile moraine clay. Possibly dumped as make-up, the layer is only 0.10m thick however. It may just have been up-cast from a cut feature dumped in the area, rather than being intended to actively build up the ground surface. Posthole M129 and grave cut M127 was cut through this layer.

Contexts

M122. Layer of yellow brown gravely clay silt. Under M129, over M134.

Group 2:21

J94 J95 J96 J101 J103 J104 J109 J111

Group 2:21 consisted of humus rich silt layers (J94, J95, J96, J103, J104 and J111) in trenches J96-1 - 4 in the NW corner of the churchyard. This activity was registered in all four trenches. Stone working debris (J109) and mortar and a stone deposit (J101) in trench J96-3 are also included in this group. These deposits are different from the rest of the group and may be better represented in a separate group, if that were the case however then the overlying layer J94 would not be included here. The humus rich silts are interpreted as representing a turf horizon, pre-dating the make-up deposits in the overlying groups (4:14 and 4:15). This turf horizon overlies the natural deposits. In trench J96-3, two dumps (J101 and J109) of material connected to the building activity were deposited over the original turf line (J111), but later sealed by another silt layer (J94), possibly indicating that the turf re-established itself. These layers contained stone working debris, animal bone, charcoal and small stones with traces of mortar on their surface, indicative of demolition activity. These deposits were only recorded in trench J96-3 however and were probably not extensive. The demolition/construction activity represented by these contexts may therefore be small scale. The silt layer in trenches J96-1 and 2 was thin and followed the contours of the natural terrain. trenches J96-3 and 4 contained more than one layer in this group, the layers were thicker, but still followed the contours of the natural ground surface. The natural ground surface sloped down to the north in all the trenches except J96-1. The top of the turf in trench J96-1 lay at 135.42 m over sea level, it sloped down to the west, in J96-4 it lay at 135.17 m at the southern edge of the trench and 134.67 m at the northern edge.

Elsewhere around the cathedral the original turf line was covered with extensive make-up deposits. The situation outside the north aisle was interpreted, in the light of the evidence from the 1992 excavations, as being open from before the construction of the cathedral, through the construction period and the first phase of the churchyard. The area was not built up until later in period 4 (see groups 4:14 and 4:15), this turf horizon therefore contained material both pre and post dating the construction of the cathedral. This group and the overlying make-up activities (groups 4:14 and 4:15) corroborate the interpretation made in 1992. It is likely that the overlying make-up activity in period 4 (groups 4:14 and 4:15) didn't occur until the middle of the period. The activity in this group and in group 2:22 (J96-8) probably continued into period 4.

Contexts

J94. Layer of dark grey clay silt in J96-3, the layer contained a lot of charcoal giving it a dark grey colour. The base of the layer contained a high percentage of stone chips mixed from the underlying layer J109, the underlying horizon was unclear. The layer also contained stone fragments some of which were worked, iron objects, two bone combs and occasional brick fragments. Both the upper and lower surfaces sloped down to the north. Under J90, over J109.

J95. Layer of brown silt, stones of all sizes and white mortar lumps in J96-4. The layer was only present in the northernmost 0.50m of the trench, filling the void created where the underlying deposit, J96, sloped down to the north. Under J107, over J96.

J96. Layer of black humus rich silt in J96-4, contained small stones that were concentrated on the surface. Under J95, over bedrock, same as J103, J104 and J111.

J101. Mixed layer of mid grey sandy silt (c. 50%), mortar lumps and flecks (c. 20%), small stone fragments (c. 20%) and gravel/crushed stone (c. 10%) in J96-3. The mortar was pale yellow in colour and present as lumps < $0.03m^3$. The stone fragments were < $0.05m^3$. Some igneous fragments were present, but they were mostly limestone. Some stone fragments had traces of mortar on their surface. Some larger stones, animal bone and charcoal flecks were also present within the layer. Some of the larger stones showed signs of burning on their surface. Under J109, over J111.

J103. Dark brown sandy clayey silt layer in J96-1, contained some large stone fragments from the decayed bedrock beneath and 5 fragments of mortar in the base of the layer. Under J99, over J108, same as J96, J104 and J111, also the same as JL5 (1992).

J104. Fine dark brown humus rich silt in J96-2. The layer lay over and around a group of large stones that were upstanding from the underlying sterile clay. Under J102.

J109. Layer of stone chips and crushed stone mixed with brown silt in J96-3. The stone fragments varied in size from 0.01m to 0.10m, some of the fragments had traces of a yellow mortar on their surface, the crushed stone was virtually powder. The layer was only present along the western edge of the trench. Under J94, over J101.

J111. Fine reddish brown silt, contained a large proportion of decayed bedrock. A small patch of dark reddish brown silt that contained a few charcoal flecks overlay J111, this was probably the remains of an old turf line, both layers were excavated as one. Under J101, over bedrock.

Group 2:22

J139 J140 J141 J142 J143 J144 J145 J146 JG148

Group 2:22 consists of a series of discreet silt/clay layers containing stones, mortar fragments, bone and charcoal (J139, J140, J141, J142, J143, J144, J145 and J146) and a possible burial JG148, in J96-6 in the NW corner of the churchyard. These layers varied from 0.02-0.20m thick. With the exception of J145 and J146 that were only present within a pocket in the bedrock all the layers sloped down to the south following the slope of the natural terrain. They appear to represent dumping of charcoal, bone and other debris. It is possible that these layers were deposited to begin building up the ground level. This group was overlain by extensive make-up activity (group 4:16) and it is more likely that these layers were built up gradually over a period of time. A group of long bones, JG148, were recovered from within layers J141 and J142. The bones were recovered during machining. It was originally thought they were part of an in-situ burial, but when the profile was recorded it appeared as though the bones lay within two relatively thin layers. It seems more likely that JG148 was the remains of a disturbed grave, the bones being collected and deposited here. A sample of one of the bones was radiocarbon dated to CAL AD 1220 - 1310 and 1365 - 1375 at the 95% level of confidence. It is likely that the overlying make-up activity in period 4 (groups 4:16) didn't occur until the middle of the period. The activity in this group and group 2:21 (J96-1 - 4) probably continued into period 4.

Contexts

J139. Layer of reddish brown sandy clayey silt, contained both rounded and edged stones and mortar flecks, these were concentrated in the upper half of the layer and were probably present through intermixing with overlying J138. The layer was recorded from a frozen section. Under J162, over J140.

J140. Dark grey/black silt layer, contained small stones, and charcoal flecks. The layer was 0.05m thick to the south, 0.10m+ thick over the northernmost 0.30m. Both the upper and lower surfaces sloped gently to the north over the southernmost 1m then sharply down to the north over the northernmost 0.70m. The layer was recorded from a frozen section. Under J139, over J141.

J141. Mixed layer of dark grey silty sand with pale yellowish clay lenses. The layer contained charcoal flecks, small stones and animal bone. Burial JG148 appeared to lie within layers J141 and J142. The layer was 0.05m thick to the south, 0.20m to the north. The layer was recorded from a frozen section. Under J140, over J142, contained JG148.

J142. Dark brown/black silty sand layer, contained small stones, charcoal flecks and animal bone. Burial JG148 appeared to lie within layers J141 and J142. The layer was 0.04m - 0.12m thick, both the upper and lower surfaces sloped down to the north. The deposit also fills a hollow in the bedrock and does not extend north of this hollow. The layer was recorded from a frozen section. Under J141, over J143, contained JG148.

J143. Dark grey brown silt layer, contained small stones and some animal bone. The layer varied in thickness from 0.02m - 0.08m, both the upper and lower surfaces slope sharply down to the north. The deposit also fills a hollow in the bedrock and does not extend north of this hollow. The layer was recorded from a frozen section. Under J142, over J144.

J144. Reddish brown silty clay layer, contained a few rounded small stones, occasional charcoal flecks and occasional bone fragments. The layer was only present in the southern half of the trench, 0.10m - 0.15m thick. The layer was recorded from a frozen section. Under J144, over J145.

J145. Light yellowish brown silty clay layer, contained shards of decayed bedrock and a few bone fragments. Only present in the southern half of the trench. The layer was recorded from a frozen section. Under J144, over J146.

J146. Brownish grey sandy silt layer, contained small stones, occasional mortar lumps and occasional charcoal flecks. Only present in the southernmost 0.40m of the trench. The layer was recorded from a frozen section. Under J145, over J161.

JG148. Human long bones recovered during machining, the position of the burial was later located within the section. The burial appeared to have lain within layers J141 and J142. It was not certain whether this was the remains of an in-situ burial or a collection of loose bones. As the profile was frozen when recorded it was not possible to investigate further. The layer sequence however suggests that this may have been a collection of bones from a disturbed burial dumped within layers J141 and J142. A bone sample from the layer was radiocarbon dated to CAL AD 1220 - 1310 and 1365 - 1375 at the 95% level of confidence (Beta-104146, HKH11506). Within J141 and J142.

Group 2:23

JG122 J123 JG124 J125 J167 J169

Group 2:23 consists of two graves (JG122, J123, JG124, J125, J167 and J169) in trench J96-8. Both burials were interred in definable grave cuts. The grave cuts were not defined until grave soil J121 (group 4:19) had been removed. These graves appeared to cut directly into the make-up deposits of group 2:24. J121 is interpreted as representing the final landscaping of the area and the establishment of the terrain of the churchyard. As these graves appear to cut into the earlier make-up deposits it is likely that these individuals were interred during the construction period, prior to the final landscaping of the churchyard. Neither of the fills contained brick fragments. The grave cuts, as defined by the excavation, were only 0.20m - 0.25m deep however. It is possible that they were cut from within or through grave soil J121, it is also possible that they were interred in relatively shallow graves in the knowledge that the area would be built up at a later date.

Contexts

JG122. Right femur recovered from within a linear E/W aligned cut, J167, therefore assumed to be part of an in-situ burial, the rest of the skeleton would have lain outside the excavated area. Under J123, over J167.

J123. Fill of dark brown silt, contained small stones and charcoal flecks. Grave fill, similar to the fill of adjacent grave, J125. Under J121, over JG122.

JG124. The lower leg bones and some foot bones recovered from within grave cut J169. The bones were recovered rapidly due to time constraints. The bones were aligned E/W with the feet to the east and are presumed to be part of an articulated burial. The rest of the skeleton lay outside the excavated area. Under J125, over J169.

J125. Fill of dark brown silt, contained mortar flecks and small stones. Grave fill, similar to the fill of adjacent grave, J123. Under J121, over JG124.

J167. Grave cut, only part of the southern edge lay within the excavated area, 0.60m+ long, c. 0.25m deep. The cut appeared to be E/W aligned. Under JG122, over J135.

J169. Grave cut, only part of the northern edge of the cut lay within the excavated area, 0.80m+ long, 0.20m deep. Under JG124, over J135.

Group 2:24

J126 J127 J130 J131 J132 J133 J134 J135

Group 2:24 consists of a series of make-up dumps in trench J96-8: two layers of rubble (J126, J127,) and of a series of discreet clay/silt layers (J130, J131, J132, J133, J134 and J135). Two of the clay/silt layers (J133 and J135) contained stone working debris. All the layers sloped down to the NW. They appeared to have been dumped here to build up the ground level. The natural terrain slopes away sharply from the western wall of the cathedral and the ground surface was built up considerably. The overlying grave soil, J121 (group 4:19), was 0.75m thick and had a level upper surface. This layer represents the final landscaping of the area. Many of the layers in this group were thin, with relatively clear interfaces between them. They most likely represent refuse from the construction process in the area dumped here over a period of time rather than deposits brought here from other areas of the churchyard as make-up material.

The earliest layers in this group (J126 and J127) consisted of demolition material, primarily from a wall core. A few clumps of mortar bonded stones were recovered along with single stones with traces of mortar on their surfaces. Large lumps of mortar, both yellow and white, were present. The presence of demolition deposits directly over the original turf line (J128, group 1:10), strongly suggests that an existing structure was demolished at an early stage of the cathedrals construction. It is possible that part of the cathedral was torn down and rebuilt, but given the presence of the remains of an earlier stone structure (R240, group 1:3) and extensive early demolition deposits (group 2:16) in the crossing, it is tempting to interpret layers J126 and J127 as demolition material from a

mortared stone structure that was standing in the area prior to the building of the cathedral.

Contexts

J126. Layer of rubble, comprised stones of all sizes (c. 40%), mortar lumps (c. 30% and greyish brown clay silt (c. 30%). Approximately half the stones had traces of mortar on their surface, many of these had mortar on more than one surface, suggesting that they had been fill in the middle of a coffin wall construction. Most of the stones were medium to small in size but some larger stones were also present. The mortar was both yellow and white, but yellow predominated. The mortar lumps were $<0.10m^3$, mortar flecks were also present within the silt matrix. Both the upper and lower surfaces sloped down to the NW, the layer was 0.25m thick to the SE, 0.15m thick to the NW. The layer was loose with many voids. Under J130, over J127.

J127. Mixed layer of grey brown sandy silt (c. 60%), stones (c. 20%) and mortar (c. 20%). The mortar was both yellow and white, there were few mortar lumps, the mortar content consisted of crushed mortar and mortar flecks within the silt matrix. The layer was similar to overlying rubble layer J126, but consisted of finer grained material, the interface between the two was difficult to define but it was clear that there were two distinct layers. Both the upper and lower surfaces sloped down to the NW, but the upper surface sloped down at a slightly sharper angle. Under J126, over J128.

J130. Layer of light greenish grey silty clay, contained gravel, occasional mortar and occasional charcoal flecks. The layer varied in thickness from 0.04m - 0.08m, filling hollows in the underlying rubble layer. Both the upper and lower surfaces sloped down to the NW. Under J131, over J126.

J131. Layer of dark grey/black humus rich clay silt, contained small stones, gravel, charcoal flecks and occasional mortar flecks. The layer was quite loose and didn't cover the entire trench, it was 0.08m thick at the SE end thinning out to the NW. Both the upper and lower surfaces sloped down to the NW. Under J132, over J130.

J132. Layer of brown gravely clay silt, contained small stones, stone content increased towards the base of the layer. Both the upper and lower surfaces sloped down to the NW. Under J133, over J131.

J133. Mixed layer of brown clay silt, gravel and stone chips. Some localised sorting of the three deposits was visible elsewhere all three were mixed together. Both the upper and lower surfaces sloped down to the NW. Under J134, over J132.

J134. Layer of dark, slightly reddish brown gravely clay silt, contained small stones. Both the upper and lower surfaces sloped down to the NW. Under J135, over J133.

J135. Layer of yellow brown gravely silty clay, contained small stone chips. Both the upper and lower surfaces sloped down to the NW. Under J167 and J169, over J134.

Group 2:25

P51 P52 P57

Group 2:25 consists of the remains of the original churchyard wall (P51 and P52) and contemporary stone dump/turf horizon P57. Only one course of the inside southern face of the wall was present, the structure had been truncated prior to construction of the overlying wall P50/P47 (group 4:25). A single line of stones (P52) aligned E/W formed the inside, southern face of the wall. The remains of the silt and rubble wall core (P51) lay to the north of P52. P51 faded out to the north, it had clearly been truncated by the construction of the later wall.

A layer of stones and silt, P57, lay against the wall remains on its inner, southern side. The upper surface of the layer consisted primarily of fine-grained silt. It appeared as though a turf horizon had grown over a stone dump on the inside face of the churchyard wall, forming a soil layer contemporary with the use of the wall. A charcoal sample from P57 was radiocarbon dated to CAL AD 1280 - 1400 at the 95% level of confidence. This dating implies that P57 was open, and 'in use' during period 4. It is likely that the first churchyard wall was constructed at the end of period 2 however, P57 was most likely originally deposited at the same time. The wall was constructed upon turf horizon P55 (group 2:26). P55 was radiocarbon dated to CAL AD 1240 -1300. The later wall P50/P47 (group 4:25) was radiocarbon dated to CAL AD 1420 - 1640, and is interpreted as being constructed in the late medieval period. The extensive make-up dumping that builds up the ground surface in P96 is associated with the construction of the later wall.

The two radiocarbon dates indicate that the wall was constructed some time between AD 1240 and AD 1400. Even though the dating places it at the boundary between periods 2 and 4 it is placed in group 2. Group 2 represents the construction and first use of the cathedral. While it cannot be established with certainty it is most likely that the churchyard wall was constructed as part of this activity.

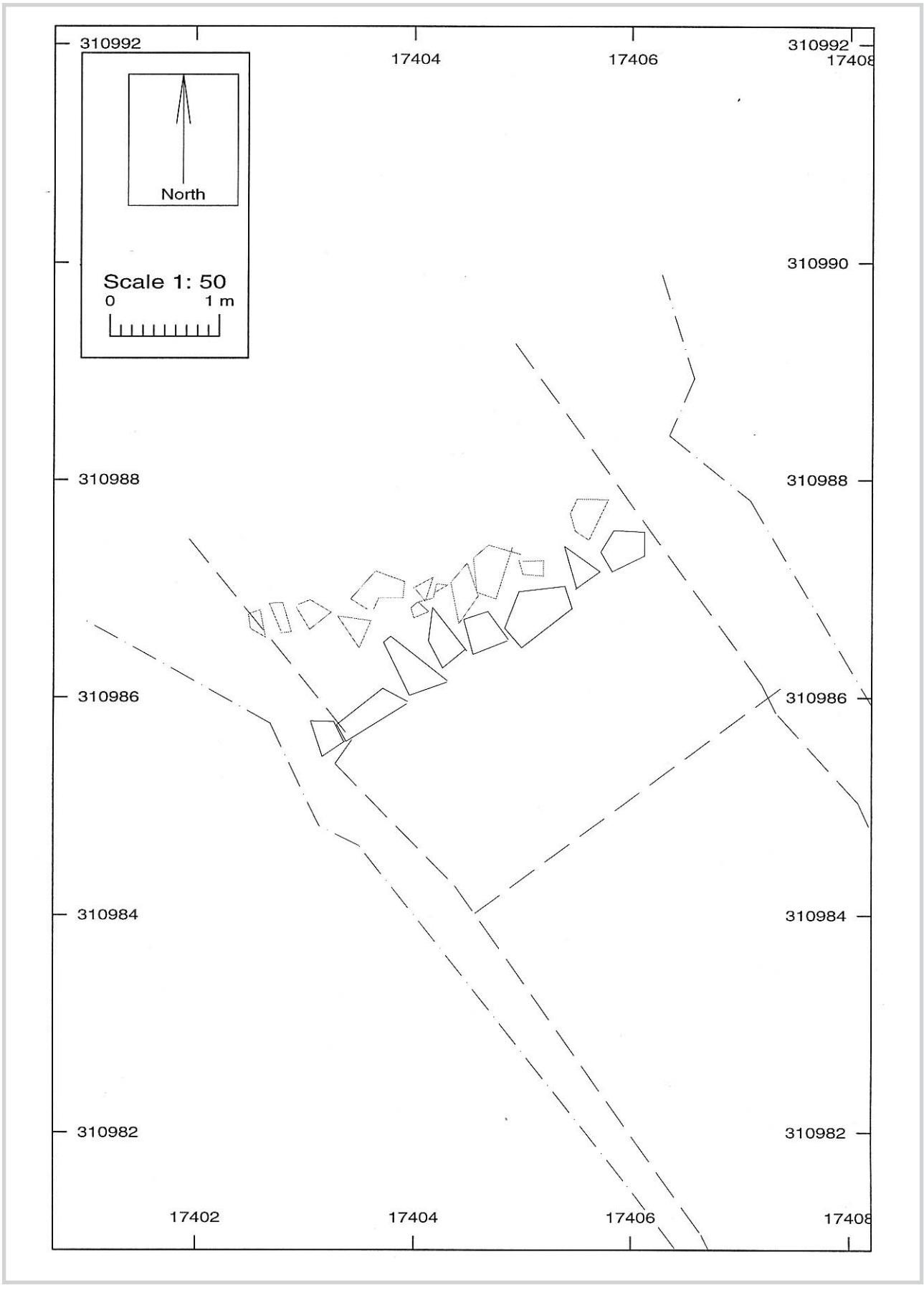


***Fig. 55**. Group 2:25, trench P96.*

Fig. 56. Remains of the first churchyard wall P51/52, group 2:25 in trench P96. Facing W. Photo Stan Reed, NIKU.

The wall and contemporary surface P57 were in use until the 1400's, when the wall was replaced and the ground surface built up (see groups 4:24 and 4:25). The date from P57 of 1280 - 1400 technically places it in period 4, but as it was open and in use through most of period 4 there isn't necessarily a conflict here. The provenience of the charcoal is unknown, it may have been deposited in the layer after the wall was constructed.

Contexts

P51. Dark brown silt and stone rubble, contained occasional charcoal flecks. P51 lay on the northern side of stone wall P52, the silt also lay between the wall stones. The fill was truncated to the north prior to the construction of overlying wall P50. P51 varied in width (N/S) from 0.60-1.20m. Under P50 and P57, over P52.

P52. Single course of large unworked limestone blocks laid in a E/W line, brown silt/rubble deposit P51 lay to the north forming a core for the wall, the northern edge of P51 was truncated prior to the construction of the overlying wall P50. Silt and stone layer P57 butted the wall to the south. P52 was built directly upon an old turf horizon P55.

P57. Layer of brown clay silt and small to medium sized stones contained animal bone, charcoal flecks and a few mortar fragments. The stones were spread throughout the layer both horizontally and vertically. The layer butts wall P52 on its southern face. P57 may be an old turf horizon grown over a stone dump, forming a surface contemporary with the use of wall P52. A charcoal sample from the layer was radiocarbon dated to CAL AD 1280 - 1400 at the 95% level of confidence (Beta-173765, sample HKH11764). Under P56, over P52, same as P54.

Group 2:26

P55

Group 2:26 consists of a layer silt, P55, in trench P96. P55 underlay the remains of the original churchyard wall P52. P55 is interpreted as the remains of the original turf horizon that pre-dates the building of the churchyard walls. A charcoal sample from the layer was radiocarbon dated to CAL AD 1240 - 1300 at the 95% level of confidence. The original turf horizon in area J (groups 2:21 and 2:22) is interpreted as being open from the period prior to the cathedral's construction up into the medieval period. A similar situation appears to have been the case here. The dating suggests that the churchyard wall was not constructed until the end of period 2, probably after the construction of the cathedral was completed.

Contexts

P55. Dark brown humus rich silt, contained occasional small stones and occasional charcoal flecks. P55 was the original turf horizon prior to the construction of the churchyard walls. Oldest wall P52 was built upon P55. A charcoal sample from the layer was radiocarbon dated to CAL AD 1240 - 1300 at the 95% level of confidence (Beta-173764, sample HKH11758). Under P52, over moraine clay.

Group 2:27

D99 DG100 D101 D102 DG103 D104 D105 D108

Group 2:27 consists of the two earliest burials in trench D96. Only the legs and feet of DG100 and the shinbones

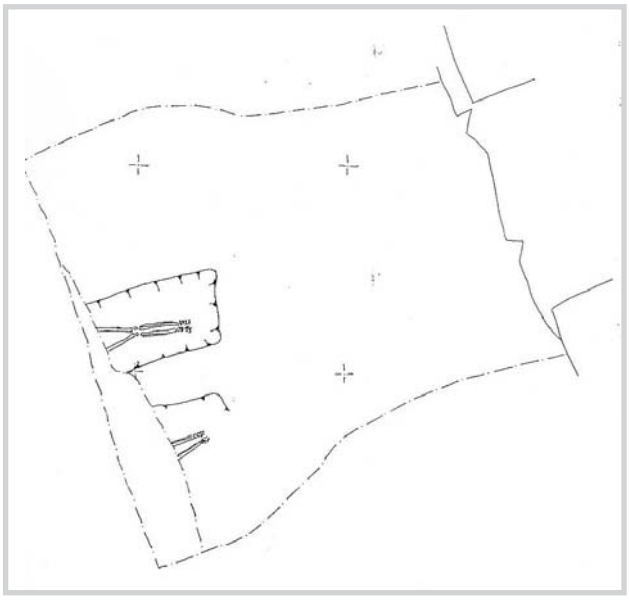


***Fig. 57**. Group 2:27, trench D96.*

and feet of DG103 lay within the excavation. Both burials appeared to be aligned perpendicular to the cathedral. Both were coffin burials. A fragment of wood, D101, from the coffin of DG100 was radiocarbon dated to Cal AD 1010 - 1190 at the 95% level of confidence. Two quartz crystals were laid in the base of grave cut D102, by the right knee and left foot of DG100. Both burials are recorded as cutting D88, even though the cuts were not defined until after D88 had been excavated. There was no indication that the graves had been truncated prior to the deposition of D88. The burials in this group lay in front of the cathedral's entrance, between 134.79 - 135.04 m over sea level. They appear to have been interred during the construction period prior to the building up and landscaping of the churchyard. Fill D99 contained disarticulated human bone, implying that at least one other burial lay to the west outside the excavated area that D102 cut through.

These two graves cut through layers that butted the cathedral's foundation. Although the radiocarbon date spans the period prior to the construction of the cathedral, the graves stratigraphic relationships preclude the possibility of them being older than the cathedral.

Contexts

D99. Fill of brownish grey gravely clay silt, contained mortar flecks, disarticulated human bone and two quartz crystal. Fills grave cut D102. Under G91, over DG100, contained D101.

DG100. Adult skeleton orientated E/W, head to west, supine. Only the lower 2/3rds of the femurs, shinbones and feet lay within the excavation. The knees lay close together, the lower legs and feet were laid at an angle to the south of the axis of the cut. Two quartz crystals, one to the south of the knees and one NE from the feet, were recovered from the fill, near the base of the grave. Wood fragments, D101 indicate a coffin burial. The feet also lay flat and grave cut D102 was larger than necessary for the internment of G100. The body lay roughly in the centre of the cut with c. 0.20m on both sides between it and the edges of the cut. Under D99, over D102.

D101. Wood fragment recovered from fill D99, around DG100, indicating a coffin burial. A wood sample from the layer was radiocarbon dated to CAL AD 1010 - 1190 at the 95% level of confidence (Beta-157801, sample HKH11490). Within fill D99.

D102. Grave cut, 1.20m+ long E/W x 0.70m wide 0.10m - 0.25m deep. Only the eastern half of the grave lay within the excavation, the sides were straight, the east end square. The cut contained DG100, the grave was larger than necessary for the burial of DG100, see DG100. Coffin burial. Under DG100, over D88.

DG103. Adult skeleton orientated E/W, head to west, supine. Only the shinbones and feet lay within the excavation. The ankles and feet lay close together. The feet lay flat. A nail and wood fragment were recovered around the body indicating a coffin burial. The body lay 0.30m in from the northern edge of the grave cut, D105, but the cut was difficult to define. Under D104, over D105.

D104. Fill of light grey clay silt, contained gravel, small stones and mortar flecks. Fill of grave cut D105. A nail with wood attached, D108, indicating a coffin burial was recovered from the fill. Under D81, over DG103, contained D108.

D105. Grave cut, 0.60m+ long E/W, only the northern edge could be defined. Under DG103, over D88.

D108. Remains of a coffin, a wood fragment with a nail through it, recovered from grave fill D104, indicating that DG103 was a coffin burial. Within D104.

Group 2:28

D53 D60 D88 D98

Group 2:28 consists of make-up layers D60, D88 and D98 and general grave soil context D53 in trench D96. For many of the burials in this trench no cut or fill was discernible, these were recorded as within D53. The excavators recorded two extensive N/S aligned cuts that

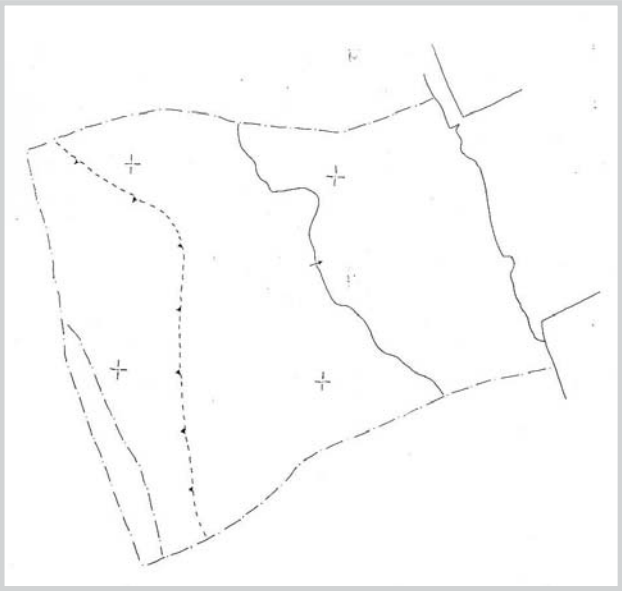


***Fig. 58**. Group 2:28, trench D96.*

these burials supposedly lay in. Cut contexts D64 and D89, and fill D90 were scrapped during post excavation analysis. Fill D53 was retained as a general grave soil context. One of these cuts can be seen as a dotted line 'cutting' D88, in reality this is the result of a series of discreet grave cuts that it was not possible to define. D53 is assumed to have functioned as the churchyard from the point at which the area outside the west front was landscaped after the construction of the original cathedral was completed and up to the Reformation. It was probably covered in the immediate Post-Reformation period, see group 5:5. As such it contains material from, and was reworked during period 4. It is placed in this group, within period 2 however, as it assumed that the original soil layer that was re-worked into layer D53 was deposited at the end of the construction period. The burials in group 2:27 are interpreted as cutting D88, one of the original make-up deposits in trench D96, as such they were presumably buried during the construction period and were therefore not contained within grave soil D53. A number of empty cut features, possibly graves that were never used, (group 5:3) cut through layers that overlay D53, otherwise all the burials in trench D96 are recorded as within this grave soil.

D60 and D88 are make-up deposits dumped against the cathedral's foundation to build up the ground surface to form the churchyard. The foundation of the cathedrals west wall, D110, was not placed in a foundation trench, but built directly on the bedrock. D98 is a thin layer of stone working debris dumped over possible stone structure, D107, after it was no longer in use. D88 has been heavily truncated by grave cuts but appeared to slope down slightly to the west. D60 was only present in the easternmost 2m of the trench against the cathedral foundation. D60 had a horizontal upper surface, it had been cut into by graves but doesn't appear to have originally covered the whole trench. The steps into the cathedral (group 7:16), are all reconstructed and overlay all the graves, i.e. they were built after the churchyard was no longer in use. Layers D34 and D35 (group 5:5), cover the entire trench and seal the burials in period 4, i.e. these layers were also deposited after the churchyard was no longer in use. The latest group of graves in trench D96 (group 4:26) lay between 0.10m - 0.40m under D34/35. It is clear that the upper levels of the churchyard were truncated at some point, possibly to remove the original steps, as no trace of these were found. If this interpretation is correct, the original steps into the western entrance would either have been built upon D60 or upon a layer at a higher level that has since been truncated. No burials were present under D60, supporting its interpretation as part of the platform for the original steps into the cathedral. The latest burial group (4:26) and D60 lay at approximately the same level, supporting the interpretation of a truncation event. The surface of D60 lay c. 1.25m under the level of the threshold into the cathedral.

Contexts

D53. Greyish brown clay silt, contained small stones, clay flecks and brick fragments. This context was originally issued as a fill to a large cut that in reality was a number of discreet grave cuts that it was not possible to define. D53 has been used as a general grave soil context. A number of graves are recorded as within D53. Where physical relationships between the burials were definable these are recorded. Under 34, over D60, same as D54, D88, DL41/42(92) and DL70(92), contained DG42, DG43, DG50, DG51, DG59, DG72, DG44, DG47, DG61, DG62, DG63, DG67, DG68, DG69, DG70, DG71, DG80, DG94, DG95, DG96, DG85, DG91, DG92, DG82 and DG97.

D60. Layer of brown silt, contained small stones and flecks of clay. D60 was dumped against the cathedral foundation as make-up, < 0.40m thick. The layer has been truncated to the west by graves. Underlying make-up layer D88 slopes down to the west whereas D60 has a horizontal upper surface. Under D40, D49 D53 and D73, over D88.

D88. Layer of gravely clay, contained small stones and stone chips, a fragment of slag and a fragment of animal bone. D88 was a make-up deposit, dumped against the

cathedral foundation, building up the ground surface to form the churchyard. It consists of re-deposited moraine clay mixed with stone working debris, c. 0.40m - 0.60m thick. The surface of D88 appears to slope down to the west, but the surface has been heavily truncated by grave cuts. Under D60, D102 and D105, over D98.

D98. Layer of yellow clay and stone chips, the layer was localised to the SE corner of the trench. It was c. 0.10m thick and covered possible stone structure D107, indicating that the structure was no longer in use. Under D88, over D106 and D107.

Group 2:29

D106 D107 D110

Group 2:29 consists of the contexts connected to the construction of the foundation of the cathedral's west wall, D110, in trench D96. D106 was a thin spread of crushed mortar and stone chips that lay along the edge of the foundation. D107 was a spread of stones in the SE corner of the trench, against the foundation. D107 had no structure but may be the remains of a dismantled foundation of some kind, to support scaffolding or some other temporary structure. It may however simply be a pile of stones dumped as make-up, if so it should be grouped with D60, D80 and D98 in group 2:28. D110, the foundation, was built directly upon bedrock with make-up layers dumped against it. It consisted of six courses of mortar bonded flat stones with a total height of 1.60m. The lower two courses extended out slightly from beneath the others. The foundation extended out from under the overlying ashlar masonry by 0.20m, i.e. the foundation was 0.20m wider than the actual wall.

Contexts

D106. Thin layer of crushed mortar and stone chips. The layer butted against foundation D110 and extends up to 0.50m out from the foundation. Respects stone structure D107. Under D98, over D110.

D107. Possible stone foundation. D107 consists of a spread of limestone blocks and water rounded stones of all sizes laid in the SE corner of the trench. It is uncertain whether D107 was the remains of a dismantled stone foundation or support of some kind, perhaps to scaffolding, or whether it was simply a dump of stones. D107 had no discernible structure. Under D98, over D109.

D110. Foundation of the west wall of the cathedral. Consisted of six courses of mortar bonded flat stones, varying in length from 0.40-1.10m and in thickness from 0.15m - 0.30m. The foundation had a total height of 1.60m, the lowest two courses extended 0.05m further west than the overlying courses. The ashlar masonry of the cathedral wall was set back 0.20m, such that 0.20m of the foundation was visible beneath the wall. D110 was built directly upon bedrock and layer D109 (group 1:12), this layer was partly removed, but only to the south, presumably to create a level surface to build upon. A white mortar bonded the stones, gaps were plugged with smaller stones. Under D106, over D109.

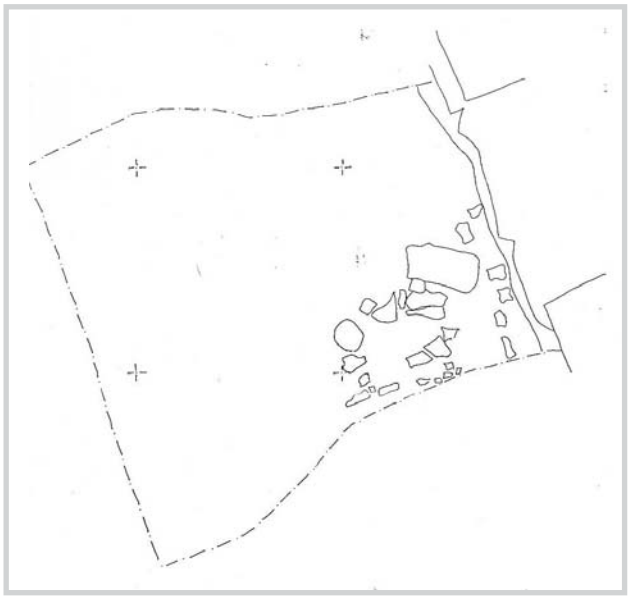


***Fig. 59**. Group 2:29, trench D96.*

Group 2:30

H41 H42 H43 H44 H45 H63 H66 H71 H93

Group 2:30 consists of a series of make-up deposits in trench H96-14. These deposits consisted primarily of stone working debris (H45 and H93), but a series of silts (H41, H42, H43 and H44) and a thin layer of sand and mortar (H71) were also present. These deposits were dumped over the natural ground surface and remains of the original turf horizon (groups 1:14 and 1:15), building up the ground surface by < 0.90m, creating the churchyard. The stone working debris layers consisted of debris from various stages of the stone working process, there was a high degree of mixing between these deposits such that discreet layers could not be identified. There was nothing in the way this layer was formed to suggest these deposits were dumped in discreet events. These deposits are interpreted as being dumped here as make-up, probably brought in from elsewhere as make-up and deposited over a short period of time. Grave soils (H63 and H66) are included in this group. These consisted of re-worked make-up deposits, churned up by the cutting of graves. Although these grave soils contained burials and material

that date to period 4 and were in use during period 4, they are assumed to have been deposited at the end of period 2 as part of the completion of the construction of the cathedral and landscaping of the churchyard.

Contexts
H41. Layer of orange brown silty clay and small stones. The upper surface was horizontal, the lower surface sloped down to the north thickening from 0.20m - 0.35m. H41 was only recorded at the northern end of the trench in the eastern section. H41 was the uppermost of a series of make-up deposits creating the churchyard. Under H47, over H42.

H42. Layer of dark brown silt and small stones, contained mortar flecks, gravel and occasional sandstone fragments. H42 was only recorded at the northern end of the trench in the eastern section, it was 0.10m thick and sloped down to the north. Under H41, over H43

H43. Layer of light brown sandy silt, mortar flecks and small stones. The stones were remains of stone working. H43 was only recorded at the northern end of the trench in the eastern section, it was 0.10m thick and sloped down to the north. Under H42, over H44.

H44. Layer of dark brown silt and gravel. H44 was only recorded at the northern end of the trench in the eastern section, it was only 0.02m thick and sloped down to the north. Under H43, over H45.

H45. Thick layer of stone working debris, <0.55m thick, dumped to build up the ground surface, creating the churchyard. The limestone fragments ranged in size from 0.30m x 0.10m to 0.01m x 0.01m, crushed limestone was also present. In some places discreet deposits of crushed stone and/or stone fragments of varying sizes could be identified but they couldn't be defined as separate layers. Even where localised concentrations were visible there had clearly been a high degree of both horizontal and vertical mixing. These deposits were dumped over the natural ground surface to build up the ground surface to create the churchyard. Under H44, H48, H51, H53 and H55, over H38, same as H56 and HL13(92).

H63. Layer of dark orange brown sandy silt and small stone fragments - stone working debris, contained mortar flecks and brick flecks. H63 was 0.10m - 0.25m thick, it contained graves HG57, HG60, HG62 HG98 and HG99 and is interpreted as a grave soil, no grave cuts were identified. H63 was only recorded from the eastern section, it lay at the southern end of the trench. Under H65, over H56, contained HG57, HG60, HG62 HG98 and HG99, same as H96 and HL18(92).

H66. Layer of slightly orange brown sandy silt and small stone fragments - stone working debris, contained mortar flecks, small brick fragments and occasional charcoal flecks. H63 was < 0.80m thick, it contained burials HG27, HG28, HG29, HG57, HG58, HG60, HG62, HG67, HG68, HG69, HG76, HG77, HG78, HG83, HG84, HG85, HG86, HG87, HG88, HG89, HG90, HG91, HG95, HG98 and HG99, and is interpreted as a grave soil. Three grave cuts were identified in this area, two of them, H82 and H84 that contained G27, G69 and G91 were also filled with grave soil H66. Cut H81 was the only burial with a definable fill, i.e. it was not filled by H66. A large quantity of disarticulated human bone was recovered from H66, in concentrations over the in-situ burials, and dispersed throughout the layer. Apart from H82, H84 and H81 no cuts were identifiable, in the section changes within H66 were identifiable but these couldn't be defined as cuts. Under H97, over H71, contained HG27, HG28, HG29, HG57, HG58, HG60, HG62, HG67, HG68, HG69, HG76, HG77, HG78, HG83, HG84, HG85, HG86, HG87, HG88, HG89, HG90, HG91, HG95, HG98 and HG99, same as HL18(92).

H71. Thin layer, 0.01m - 0.05m thick, of grey sand, brown silt, crushed yellowish mortar and small stones, all mixed together. H71 underlies grave soil H66 and was truncated by graves, it was only present in the northernmost 0.60m of the trench. It may have originally been more extensive and thicker. Under H66, over H38.

H93. Layer of grey crushed limestone fragments. H93 was recorded at the southern end of the western section, cut by grave cuts H82 and H94. H93 was probably originally more extensive but has been truncated by various graves for which no cut could be identified. H93 was dumped as make-up. Under H82 and H94, over H37.

Group 2:31
Q13 Q14 Q16 Q17 Q18 Q19 Q20 Q21 Q30 Q31 Q34 Q35 Q38 Q39
Group 2:31 consists of a seven cut features (Q13, Q14, Q16, Q17, Q18, Q19, Q20, Q21, Q30, Q31, Q34, Q35, Q38 and Q39) in trench Q96. These features were first registered cutting through natural Q48, after silt layer Q4 (group 4:43) was removed. Group 2:32 also consists of cut features that were cut through natural ground, those features are interpreted cooking pits. This group of features could not, with any confidence, be related to the aforementioned cooking activity. No traces of burnt clay were recorded within the cuts and most, if not all, of the

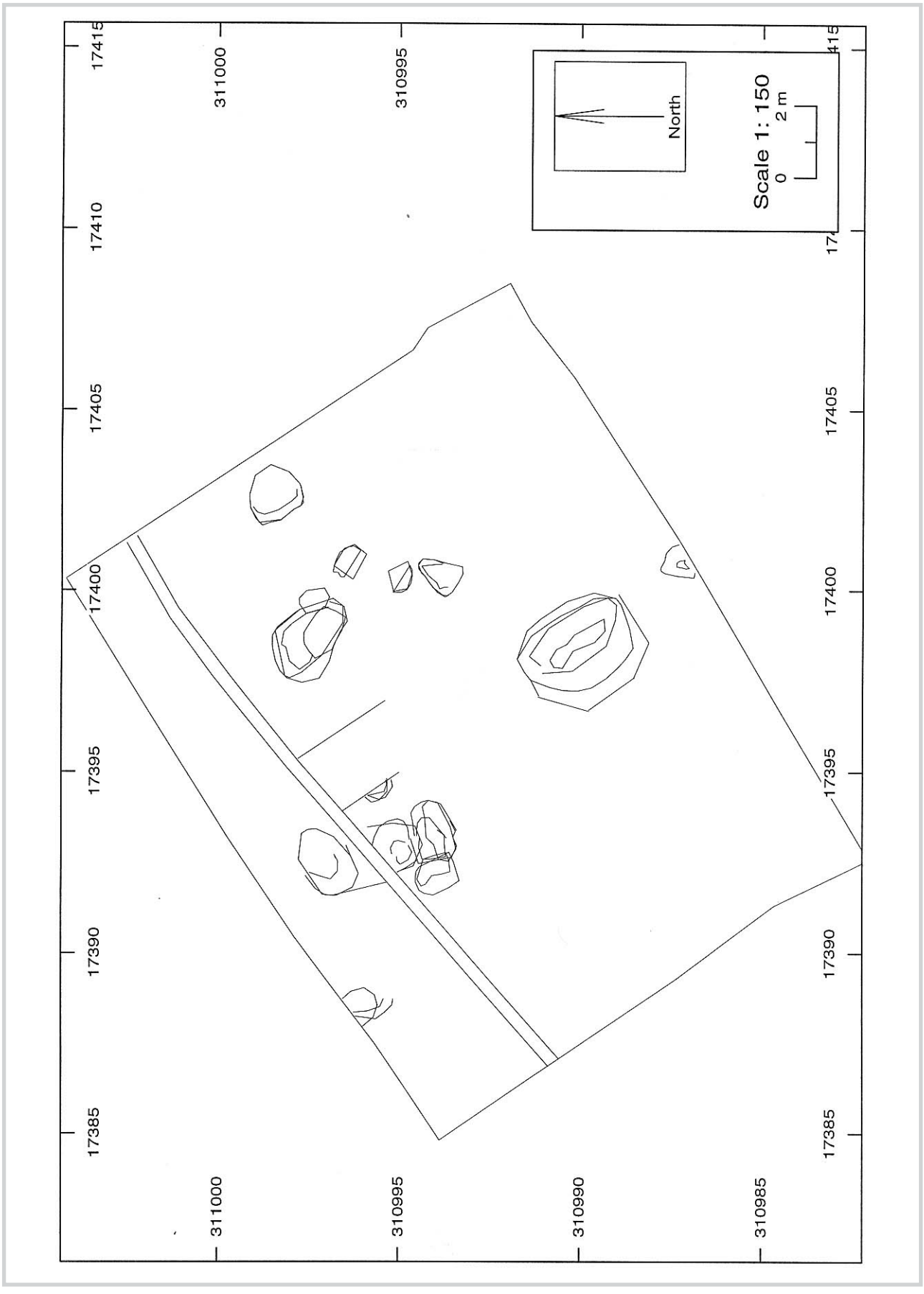


***Fig. 60**. Groups 2:31 and 2:32, trench Q96.*

burnt material in the fills could have been re-deposited from the activity in group 2:32. It is possible that some, or all, of the features in this group were cut through layer Q4 but not registered before it was removed. None of the cuts in this group were deeper than 0.30m. Two of the features (Q16, Q17, Q18 and Q19) were roughly circular, c. 0.80m in diameter. If these features were cut through Q4 and therefore deeper, they would be interpreted as possible post holes. The other features were irregular in form without any obvious function. One of the features in this group (Q13 and Q14) may have been a cooking pit. No brick fragments were present within the fills of these features. This activity could not be empirically dated but the absence of brick fragments suggested it should be placed along with the features in group 2:32 that were radiocarbon dated to the early medieval period.

Contexts
Q13. Fill of dark grey humus rich silty clay, contained occasional charcoal flecks and flecks of orange burnt clay. Under Q4, over Q14.

Q14. Shallow cut feature, lay partially outside the northern section of the excavation. Sub-circular in plan, 0.60m in diameter, 0.05m - 0.15m deep. The edges were diffuse and difficult to define. The fill, Q13 contained a few traces of burnt material, but non was in-situ. Under Q13, over Q48.

Q16. Circular cut with steeply sloping sides rounding to a flat base, 0.80m in diameter, and 0.20m deep. The cut is not deep enough to be a posthole, unless it has been truncated. Under Q17, over Q23.

Q17. Fill of cut Q16, dark grey silty gravely clay, contained occasional small stones, animal bone and charcoal flecks. The animal bone and charcoal may be re-deposited from fill Q23 that the cut Q16 truncated, if so this implies that the feature was back-filled with the excavated material. Under Q4, over Q16.

Q18. Circular cut, near vertical sides rounding to a flat base, 0.80m in diameter, 0.30m deep. The cut is not deep enough to be a posthole, unless it has been truncated. Under Q19, over Q48.

Q19. Fill of cut Q18, dark grey silty gravely clay, contained occasional small stones. Under Q4, over Q18.

Q20. Oval cut, vertical sides rounding to a flat base, 1m NW/SE, x 0.66m NE/SW, 0.35m deep. Fill Q21 contained no indication of function. Under Q21, over Q48.

Q21. Fill of cut Q20, mid grey sandy clay, contained small stones. Under Q4, over Q20.

Q30. Fill of yellow brown sandy clay, contained angular stones with a concentration in the base, occasional charcoal flecks and one bone fragment. Under Q4, over Q31.

Q31. Circular cut feature, 1.60m in diameter, 0.20m deep. The southern half of the feature had sides that were cut at a sharp angle, the edges in the northern half were cut at a shallower angle, flat base. Under Q30, over Q48.

Q34. Roughly triangular cut with rounded corners, c. 1.20m x 1.20m x 1.00, 0.30m deep. The edges were cut at a steep angle, rounding to a flat base. Under Q35, over Q48.

Q35. Fill of light grey clay silt (c. 60%), gravel (c. 20%) and large stones (c. 20%). The fill also contains small stones, the larger stones were loose in the fill with no apparent structure. Under Q4, over Q34.

Q38. Fill of dark grey silty gravel, contained small stones, occasional flecks and lumps of charcoal and occasional flecks of orange burnt clay. The burnt material may be re-deposited from Q41, the fill of Q37 that this feature truncates. Q41 was excavated before Q38, i.e. out of sequence. Under Q4, over Q39.

Q39. Roughly circular cut feature, c. 1m in diameter, 0.30m deep. The sides were cut at a c. 45° angle, slightly steeper towards the SW. The western edge was removed when feature Q37 was excavated, i.e. the two features were excavated in the wrong order. Burnt material in fill Q38 is more likely to have been re-deposited from Q41 than in situ burning. Under Q38, over Q33.

Group 2:32
Q7 Q8 Q9 Q10 Q11 Q12 Q15 Q22 Q23 Q24 Q25 Q26 Q27 Q28 Q29 Q32 Q33 Q36 Q37 Q41 Q42 Q43 Q44
Group 2:32 consists of eight cut features in trench Q96 (Q7, Q8, Q9, Q10, Q11, Q12, Q15, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q32, Q33, Q36, Q37, Q41, Q42, Q43 and Q44). These features were first registered cutting through natural Q48, after silt layer Q4 (group 4:43) was removed. Another group of cut features (group 2:31) also cut through natural. This group consisted of features that contained evidence of the use of hot stone technology. Group 2:31 consisted of features with no clear function.

Three of the features (Q12, Q26, Q29, Q15, Q27, Q28, Q42, Q43 and Q44) inter-cut, on the surface these cuts appeared to form one large feature. The two earliest features

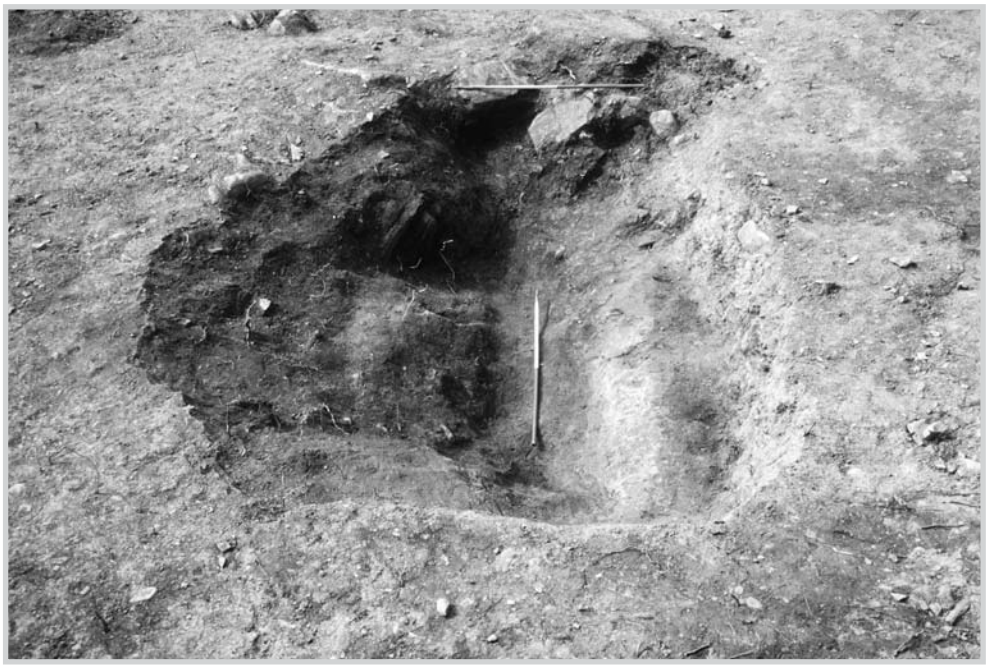


***Fig. 61**. Three inter-cutting cooking pits, Q28, Q29 and Q44 group 2:32 in trench Q96. Facing N. Photo Stan Reed, NIKU.*

(Q15, Q27, Q28, Q42, Q43 and Q44) may have inter-cut, but the relationship between them was unclear. Both appeared to be traditional cooking pits with a concentrated layer of fire-cracked stones and charcoal laying in-situ in the base of the cut. Traces of orange burnt clay, the natural moraine clay that was partially baked during the cooking process, were also recorded: Q27 in the base of cut Q28, and Q43 along the top of the edges of cut Q44. The third of these features (Q12, Q26 and Q29) cut into the centre of the other two features that appeared to have been backfilled prior to the cutting of Q29. It contained a high proportion of fire cracked stones but these may have been redeposited from the fills of the other features. Traces of burnt orange clay were recovered from within the fill, i.e. not in-situ. It is unclear whether Q29 was also a cooking pit or not. Cuts Q28, Q44 and Q29 were 0.50m, 0.60m and 0.70m deep respectively, deeper than the other features in this group. Charcoal from Q27 was radiocarbon dated to CAL AD 965 - 1255 at the 95% level of confidence, whilst a sample from Q43 was dated to to CAL AD 1000 - 1170 at the 95% level of confidence.

Two of the other features in this group also contained in-situ deposits of fire-cracked stones but no burnt orange clay (Q7, Q8, Q24 and Q25). The stones in Q25 were larger than the other burnt stones seen in this area and may have been a hearth or possibly a rubbish pit filled with burnt stones rather than a cooking pit.

The three other features (Q9, Q10, Q11, Q22, Q23, Q32, Q33, Q36, Q37 and Q41) all contained traces of burnt orange clay but no in-situ burnt stone deposits. In one case the burnt clay (Q11) lay partially in-situ but had also been disturbed and re-deposited in the fill. The absence of in-situ layers of burnt stones and the disturbance of burnt clay Q11 indicate that these features were completely emptied, presumably after the heating process was complete. It is possible that these features were used to heat stones that were removed to boil water, as opposed to traditional cooking pits Q28 and Q44 where the food was cooked upon the hot stones within the pit. Once the food was cooked the pit would be opened and the food removed without disturbing the stones to any great degree, leaving them in-situ. The pits that were used to heat stones for boiling water would be emptied completely whilst the stones were still hot. The latter features, Q10, Q22 and Q37, were more irregular in form than Q28, Q29 and Q44, and were slightly shallower. If the above interpretation is correct these features would have been 'dug' a second time when they were emptied, possibly resulting in their irregularity.

In the westernmost third of Q96 the natural consisted of gravels as opposed to moraine clay in the rest of the trench. All the pits were cut into the clay, no features were present in the gravel area. The clay would have had better insulating properties, the concentration of this activity to the clay area was therefore probably deliberate. The features in this group were clearly related to the use of hot stone technology. The apparent differences in the way the stones were treated after they were heated suggests that two different methods of utilising hot stones were in practice in this area. The traditional cooking pit method has been dated to the early medieval period. It is not certain whether the two methods were in use simultaneously or whether the activities were separated in time.

Contexts

Q7. Fill of yellow brown sandy clay, contained occasional small and medium sized stones, animal bone and occasional charcoal flecks. A concentration of burnt stones was excavated along the eastern side and base, charcoal flecks were also present here in a larger concentration, no burnt clay was observed. The fill was truncated to the north by a modern cable trench. Under Q4, over Q8.

Q8. Cut of a sub-circular feature, 1,50m long (N/S), 1.40m wide, 0.30m - 0.40m deep. The sides were cut at a near vertical angle rounding to a flat base. Cuts into the fill of a similar feature to the south and was truncated to the north by a modern cable trench. Under Q7, over Q36.

Q9. Fill of dark grey humus rich clay, contained charcoal flecks. Overlies burnt clay Q11, fills cut Q10. Under Q4, over Q11.

Q10. Cut of an oval negative feature, c. 2m long (NE/SW) x c. 1.3m wide. A concentration of burnt clay, Q11 was present around the SW side. Large stones, from the natural clay were exposed in the side of the cut. The sides slope at a shallow angle. Under Q11, over Q48.

Q11. Yellow/grey clay, contained concentrations of orange burnt clay, most of the burnt clay lumps were within the unburnt clay matrix but there were a few patches that appeared to have been burnt in-situ. The re-deposition of the burnt clay suggests the pit was fully emptied, i.e. the burnt clay was removed form the side of the cut and re-deposited in the base of the feature. Under Q9, over Q10.

Q12. Fill of dark grey humus rich clay silt (c. 60%), and stones of all sizes (c. 40%), the stones were of mixed lithology, including decayed bedrock, water rounded and others. Many of the stones were large, > 50% showed signs of having been burnt, some of these were shattered. The fill also contained charcoal lumps and flecks. It is likely that the burnt stones and charcoal are re-deposited either from fill Q15 to cut Q28, a cooking pit that this feature truncates, or underlying fill Q26. Q12 appears to be the back-filling of probable cooking pit Q29. Under Q4, over Q26.

Q15. Fill of light grey clay silt (c. 80%) and stones (c.20%). The stones were of varying sizes, but most were small and medium sized, many were burnt. The fill also contained charcoal flecks and flecks of orange burnt clay. Approximately 20% of the total fill were stones, but the stone and charcoal content increased down the profile. A layer of burnt stones, many of which were shattered, lay in the base of the fill, directly overlying burnt clay and charcoal Q27. It appears as though context Q15 represents both the original fill of a cooking pit and the back-fill after the pit was emptied. No 'emptying' cut was visible. Under Q29, over Q27.

Q22. Oval cut feature, 2.50m NW/SE, 1.45m NE/SW, 0.40m deep with a 0.55m deep area to the SW. The deeper area contained fill Q32, in-situ burning, the rest of the feature was filled by back-fill Q23. The feature was difficult to define with certainty, three sides sloped at a shallow angle whilst the eastern edge was near vertical. Under Q32, over Q48.

Q23. Back-fill of cooking pit Q22, dark greyish brown sandy silty clay, contained medium sized stones, lumps of charcoal and occasional animal bone. Under Q16, over Q32.

Q24. Cut feature, 1m NW/SE, 0.45m+ NE/SW, 0.25m - 0.30m deep, the feature was truncated to the NE by a trial trench, its original extent is therefore unknown. Q24 may have been a hearth or an emptied cooking pit. Under Q25, over Q48.

Q25. Fill of cut Q24, dark grey humus rich clay (c. 25%) and burnt stones (c. 75%). The burnt stones were fairly large c. 0.10m x 0.10m x 0.10m - 0.15m x 0.15m x 0.15m, the fill also contained charcoal flecks and traces of yellow burnt clay in the base. The burnt stones were larger than those uncovered in the other features in the area, the feature may have been a hearth, but there is little evidence for burning in-situ, the feature may therefore have also been a cooking pit that had been emptied and back-filled with the burnt material. Under Q4, over Q24.

Q26. Fill of yellow brown silty clay (c. 60%) and small and medium stones (c. 40%), most of the stones were burnt. Stones comprised c. 40% of the total deposit, the base of the fill however comprised 75% burnt stones, 25 % silty clay. The fill also contained charcoal lumps and flecks and a thin lens of burnt orange clay which lay near the surface of the fill, this appeared to be re-deposited and not in-situ burning. It is uncertain whether the burnt stones in the base of the feature represent in-situ heating or not, the cut Q29, truncates two other cooking pits and the burnt material may be re-deposited. Under Q12, over Q29.

Q27. Burnt clay lining of cut Q28, the burning is in-situ, as such Q27 is not a fill but burning of the natural clay that the feature cuts through. The clay was bright orange, indicative of high temperatures and oxidising conditions, charcoal lumps and flecks were mixed in with clay. The

burning was present in the base and part way up the NE edge of the cut, the feature was truncated to the SW by Q29. The base of overlying fill Q15 comprised a concentration of burnt stones. A charcoal sample from the layer was radiocarbon dated to CAL AD 965 - 1255 at the 95% level of confidence (Beta-135931, sample HKH11742). Under Q15, over Q28.

Q28. Cut feature, truncated by later cut Q29 to the SW. The feature was probably originally oval c. 3.20m long (NW/SE), 0.35m+ wide, 0.50m deep. The NE edge was cut at a c.60° angle rounding to a flat base, the SW edge was removed by cut Q29. Q28 is the cut of a cooking pit, with in-situ burnt clay and burnt stones in the base, fills Q27 and Q15. Q28 is one of three inter-cutting cooking pits, Q29 and Q44 are the other two. Under Q27, over Q48.

Q29. Oval cut feature, c. 3.20m long (NW/SE), 2.00m wide (NE/SW), 0.70m deep. The sides were cut at a c.60° angle rounding to a flat base. The base was 1m long, 0.40m wide and slightly off centre to the NE with respect to its plan on the surface. Q29 is the latest of three inter-cutting features; cuts Q28 and Q44 lay to the NE and SW respectively. Q28 and Q44 can confidently be interpreted as cooking pits due to the in-situ concentrations of burnt stones and burnt clay in the bases. The burnt stones in the base of Q29 may have been re-deposited material from the truncated fills of the two earlier features. It is likely that Q29 has also functioned as a cooking pit but its interpretation is not as clear as Q28 and Q44. Under Q26, over Q15 and Q42.

Q32. Fill of burnt orange clay, contained burnt stones and lumps of charcoal. Q32 was only present along the southern edge of the feature and the southern part of the base. Possibly originally more extensive but partially removed when the pit was emptied. Under Q23, over Q22.

Q33. Fill of dark grey silty clay, contained burnt stones. Q33 is one of two back-fills in cooking pit Q37, Q33 appears to be deliberate back-filling. Under Q39, over Q36.

Q36. Fill of greyish yellow clay, contained charcoal flecks concentrated in the base of the fill. The clay is present around the edges of the cut, Q37, the central part of the feature is filled by Q33. Q36 overlies burnt deposit Q41 and may represent natural silting of an open feature rather than deliberate back filling. Under Q33, over Q41.

Q37. Oval cut feature, 1.20m long E/W, 0.90m wide (N/S) on the surface, 0.70m x 0.40m in the base. The primary fill Q41 consisted of burnt clay and charcoal but no in-situ burnt stones. Two back-fill contexts were registered, Q36 and Q33, the former may represent silting rather than deliberate back filling implying that the feature may have been open. Under Q41, over Q48.

Q41. Fill of orange burnt clay and charcoal flecks, the fill lay in the base of Q37, c. 0.07m thick, and probably represents the remains of in-situ burning in the base of the cut. Under Q36, over Q37.

Q42. Fill of yellowish brown clay silt (c. 70%) and small stones (c. 30%), some but not all of the stones were burnt. A concentration of burnt stones was present at the base of the fill. Q42 overlies in-situ burning Q43, the burnt stone concentration in the base of the fill may represent in-situ burning and as such be a different context from the back-fill but no interface was recorded during excavation. Under Q29, over Q43.

Q43. Fill of bright orange burnt clay and charcoal lumps and flecks. Only recorded along the NW edge of cut Q44, the burnt clay doesn't form a continuous layer but is present in patches over a 2m section of the edge of the cut. The burning is localised to the uppermost 0.10m of the cut, unlike the other cooking pits where the burning is generally localised to the base of the feature. A charcoal sample from the layer was radiocarbon dated to CAL AD 1000 - 1170 at the 95% level of confidence (Beta-139453, sample HKH11750). Under Q42, over Q44.

Q44. Cut feature, truncated to the NE by Q28 and Q29. The original cut was probably oval, 3.20m long (NW/SE) 1.40m+ wide (NE/SW), 0.60m deep. The SW edge was cut at a shallow c. 30° angle, the NW and SE ends were cut at c. 60° angle, the base and the NE side were truncated by Q29. In-situ burning Q43 was localised to the uppermost part of the NW edge. Under Q43, over Q48.

Group 2:33

S12 S26 S27 S28 S29 S30 S31 S32 S33 S34 S35

Group 2:33 consists of contexts related to the opening of a charcoal burning pit in trench S96 and the subsequent back filling of the feature. The cutting of the feature is documented as group 2:34. The cut to open the feature was recorded as S26, this cutting presumably followed the original cut, except in the base at the eastern end of the pit where some of the carbonised timbers still lay in situ. A layer of gravely silt (S12), that was spread on both sides of the feature may be remains of the up-cast from the opening of the pit. A number of discreet deposits could be recorded in the profile, filling the feature. Two gravel deposits (S32 and S33) were present on both sides

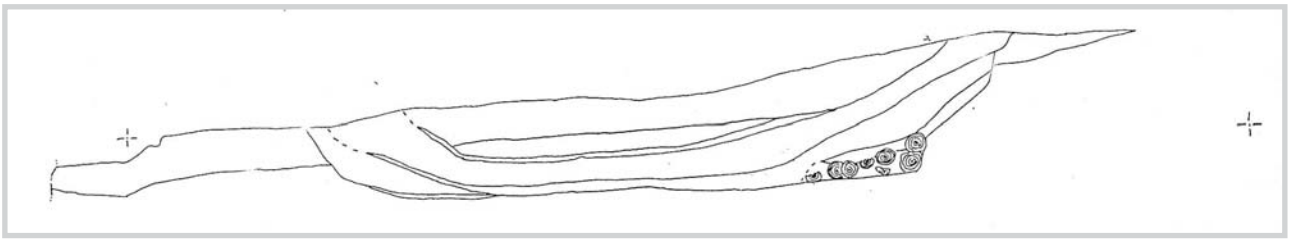


***Fig. 62**. Groups 2:33 and 3:34, trench S96.*

of the cut, these probably represent silting from the bank surrounding the pit. This silting probably took place almost immediately after the charcoal was removed. A series of charcoal and gravely silt layers were present (S29 S30 S31 S34 and S35) representing silting form the gravel bank mixed to varying degrees with small fragments of charcoal debris. S29 may be the remains of a turf line that started to form in the pit after the silting had stopped. Over this lay two other gravely silt fills (S27 and S28). S28 appeared to be deliberate back filling of the pit levelling off the ground surface, S27 may have been natural silting but could also have been deliberate back-filling. The carbonised wood remains that lay in situ in the base of the cut (S25, group 2:34) were radiocarbon dated to CAL AD 1055 - 1085 and 1150 - 1285 at the 95% level of confidence. The opening of the pit and the initial silting presumably occurred shortly after the charcoal was burnt. The formation of a possible turf horizon within the cut (S29) indicates that the silting had stopped. It is unknown for how long the feature remained in this state or when the deliberate back filling occurred. The back filling may have occurred in period 4 but is grouped together with the removal of the charcoal for convenience.

Contexts

S12. Layer of dark brown silt (c. 40%), gravel (c. 40%), burnt stones (c. 15%) and charcoal (c. 5%). Both the burnt stones and charcoal were present in concentrations within the silt/gravel matrix. The charcoal was present both as flecks and small lumps, the burnt stones were water rounded, < 0.10m x 0.10m x0.10m. Under 2, over 13.

S26. Context issued to represent the opening of charcoal burning pit. The feature was recorded from the section and appears to be one cut, but the remains of burnt timber in the base of the feature, S25 indicate it was not fully emptied. The feature is therefore the product of two cutting episodes, the original cut S40 is only extant under the remaining timber S25, the rest of the feature is ascribed to S26, the opening episode. This activity may not have involved actual digging, simply the removal of the turf cover and the carbonised timbers, thus following the shape of the original cut. S26 is recorded as 'cutting' the bank created by the digging of the feature, S13, the bank may have been disturbed slightly by this activity but the relationship is an assumed one rather than one which was clearly indicated by the deposits. Under S32, S33 and S35, over S13 and S25.

S27. Loose silty gravel deposit, filled the upper 0.20m - 0.30m of cut S26. Filled the centre of the feature and was thickest in the centre, thinning as it tapered towards the edges. S27 represents the final back-filling of the feature and levelling off of the ground surface. Under S2, over S28.

S28. Layer of mid grey silty gravel, coarser than overlying S27. 0.10m - 0.20m thick, filled cut S26, slightly off-centre to the west. Underlying fill S29 had a concave profile, S28 partially filled this cavity. S28 had a level upper surface and may represent natural erosion into a partially open feature rather than deliberate back filling. Underlying fill S29 is interpreted as representing a possible turf line within the feature, if this interpretation is correct then S28 was deposited after a hiatus in the natural filling and may have been caused by some disturbance of the remaining bank deposits. Under S27, over S29.

S29. Mixed deposit within the fills of S26. Thin deposit of charcoal and fine-grained silt, the western half of the context was black and comprised pulverised charcoal and silt. The easternmost half consisted of a fine light grey brown silt with lenses of charcoal over, below and within the silt. These deposits formed a single horizon within the fills, it was not possible to separate them into coherent Contexts S29 is tentatively interpreted as representing a developing turf lie within the fills, after the initial silting up of the feature. Under S28, over S30.

S30. Mixed fill of gravel (c. 60%) and charcoal (c. 40%), light grey in colour. The charcoal was present as concentrated lenses and lumps < 0.05m, and also as small flecks within the gravel matrix. The fill was 0.20m - 0.30m thick, it had a concave upper surface and extended across the whole width of the feature. Silting of the bank deposits back into the feature probably formed S30.

S31. Black fill of charcoal (c. 90%) and silt (c. 10%). The charcoal was predominately pulverised but some small lumps, 0.01m - 0.05m in size were present. The fill varied in thickness from 0.05m - 0.20m, it was thickest to the east and was banked up over extant burnt timbers S25. S31 filled the base of the cut in the centre, it probably represents silting up of charcoal shortly after the pit was emptied. Under S30, over S32, S33 and S34.

S32. Mixed fill of brown silt (c. 50%) and gravel (c. 50%), also contained small stones, charcoal lumps and flecks. The fill was c. 0.10m thick and was only present against the eastern edge of cut S26, sloping down at a c. 45° angle. The fill probably represents silting from the bank deposits immediately after the carbonised timber was removed. Under S31, over S26.

S33. Mid grey fill of gravel (c. 90%) and silt (c.10%), c. 0.10m thick, contained small stones and charcoal flecks, directly overlay burnt timbers S25. The fill probably represents silting from the bank deposits immediately after the carbonised timber was removed. Under S31, over S26.

S34. Light grey fill of gravel (c. 80%), silt (c. 10%) and charcoal (c. 10%), the charcoal was present as lenses and mixed with the gravel/silt matrix. The deposit also contained small stones and was only present at the western end of the feature. The fill probably represents silting from the bank deposits immediately after the carbonised timber was removed. Under S31, over S35.

S35. Thin dark grey fill of charcoal (c. 50%) and gravel (c. 50%). S35 was only present in the westernmost 1m of cut S26, and was 0.02m - 0.04m thick. The fill was probably deposited as the carbonised timber was removed. Under S34, over S26.

Group 2:34

S13 S25 S40

Group 2:34 consists of the cut of a charcoal burning pit (S40), the remains of carbonised wood in the base (S25) and bank deposits S13 in trench S96. The pit was opened and most of the carbonised wood removed. The opening of the pit and the subsequent back-filling of the feature is described under group 2:33. This group documents the digging of the pit and burning of the charcoal. The remains of five whole and three split logs were documented at the eastern end of the base of the feature. Why these timbers were not removed along with the rest of the charcoal is unknown. A charcoal sample from the layer was radiocarbon dated to CAL AD 1055 - 1085 and 1150 - 1285 at the 95% level of confidence.

Layer S13 lay on both sides of the pit. It consisted of gravel and silt and is interpreted as up-cast from the digging of the pit, forming a bank on either side. It was thickest to the west, and built up the ground level to the west by 0.40m. The ground level prior to the digging of the pit was c. 0.70m lower to the west. This sloping of the natural terrain suggests that the pit was dug on or very near to the contemporary beach line of Lake Mjøsa. The radiocarbon dating of the carbonised wood is a little inconclusive. The dating allows the interpretation that the charcoal was intended for the industrial processes that were an integral part of the building of the cathedral, perhaps for use in the smithy documented in 1992. The presence of the pit on the beach however suggests it was positioned to allow the charcoal to be easily removed by boat. The charcoal may not therefore have been intended for use in the construction of the cathedral. The radiocarbon dating also allows for the possibility that the pit was dug prior to the building of the cathedral and the charcoal taken elsewhere.

Contexts

S13. Light grey layer of gravel (c. 80%) and silt, (c. 20%). The silt was mixed with the gravel but also present as brownish grey lenses, the layer also contained lenses of yellow silty clay, occasional small stones and charcoal flecks. The layer was probably up-cast from the original digging of charcoal pit S40, it was present on both sides of the feature. Under S12, S26 and S36, over natural.

S25. Five whole and three split, burnt timbers, within a grey gravel in the base of cut S40 at its E end. The deposit covered an area 0.80m long, 0.10m - 0.30m deep, fragments of carbonised wood were present within the gravel. S40 is interpreted as a charcoal burning pit, S25 as the remains of five burnt timbers that were not removed when the pit was emptied. Three of the timbers were 0.10m in diameter, one was 0.06m and one 0.14m. A charcoal sample from the layer was radiocarbon dated to CAL AD 1055 - 1085 and 1150 - 1285 at the 95% level of confidence (Beta-135937, sample HKH11935). Under S26, over S40.

S40. Cut of charcoal burning pit. S40 is the number assigned to the original cutting of the feature, the emptying of the feature, S26 probably followed more or less the original cut. The dimensions of S40 can therefore be assumed to be the same: 5m long at the top, 4m long at the base, 0.80m - 1m deep. S40 survives in the base at the eastern edge where some of the carbonised timber, S25 remained in-situ, i.e. was not removed by S26. Under S25, over natural.

5 Period 3: 1280-1350

5.1 Period 3 summary

5.1.1 Period 3 dating

Period 3 consists of structures and deposits interpreted as being connected to the rebuilding of the eastern end of the cathedral. It therefore excludes contemporary activity in the other parts of the cathedral and churchyard. These are placed in period 4. Period 3 is dated to 1280 - 1350, whereas period 4 is dated to 1260 - 1537. As such period 3 is a sub group of period 4, reserved for the deposits that could be connected to the rebuilding activity.

The outside wall of the chancel was investigated and a number of structural changes were recorded in the crossing and north transept. The interior of chancel and chapels, the area of the cathedral that was actually extended, was not investigated

A coin recovered from mortar surface R169 (group 2:12) indicated that the original crossing was completed and is use by AD 1260, possibly earlier. A seal stamp recovered from the fill of a modern robber cut (R72, group 7:5) belonged to Thorodd Thorssteinsson who is known to have written two letters in AD 1346 (DN II, number 274 and DN III, number 233). The robbing activity cut into a triple grave (R131, group 2:14) disturbing two of the burials. This grave was sealed by the mortar surface, the seal stamp could therefore not have belonged to the individuals interred in that grave as the grave must have been sealed by 1260. The shape of the robber cut suggested that a later grave, that had been dug after the floor level was built up, was the original object of the robbing activity. Seal stamps are known to be buried with their owners (Nyquist 1995:104), two seal stamps were recovered during the earlier excavations from graves that lay outside the chancel in area B (Sellevold 2001:154-6). It is this grave that Thorodd is believed to have been interred in. This implies that the building up of the floor surface in the crossing, part of the remodelling of the eastern end of the cathedral, must have been completed by a short time after AD 1346.

The construction cut for the extended chancel wall (B81, group 3:9) was exposed in trench B96-4. It was sealed by a layer of mortar that was cut by a grave that contained a coin dated to the reign of Eirik Magnusson AD 1280 - 1299. This indicates that the construction of the chancel wall had begun by AD 1299.

Two radiocarbon dates were obtained form layers grouped in period 3: a charcoal sample from burning layer R248 (group 3:6) in the crossing was dated to CAL AD 1020 -1250 at the 95% level of confidence, and a sample from a layer of mortar (M154, group 3:15) from trench M96-11 was dated to CAL AD 1020 - 1300 at the 95% level of confidence. The provenance of the material in layer R248 is uncertain, it may have come from timbers used in the construction of the original cathedral and therefore cannot be taken to date the deposition of the layer. M154 was one of a number of thin dumps of construction debris in M96-11, it spanned periods 2 and 3, it lay a long way from the original cathedral and is therefore tentatively interpreted as being waste from the extension of the cathedral to the east.

5.1.2 Period 3 interpretation

The remodelling of the crossing involved the four tower bases in the crossing being strengthened by adding masonry on one side (see group 3:3). The gap, on the E/W axis, between the tower bases was thus reduced from 4.20m - 4.50m to c. 2.50m. The opening into the chancel was also reduced but was not investigated by this excavation. It is debatable whether this occurred as part of the remodelling of the crossing or later (see Sæther 1998:71-5 and 4.1.2 Period 2 summary). It is unclear whether the narrowing of the space between the crossing and the transepts was intentional or a by-product of the need to strengthen the tower bases.

Three (four) thresholds were constructed in the crossing and transepts during period 3. One of these (R60, group 3:2) lay between the crossing and north transept, butting the extended tower bases. The floor layers were not preserved on either side of the threshold, but it is difficult to interpret it as a physical step. Its function may have been symbolic. It is also possible that it was not constructed until a later period. Thresholds were also placed between the crossing/transepts and the nave/aisles. R278 (group 3:1), the threshold between the north aisle and north transept, was constructed of mortar bonded stones, forming a step up into the transept. The threshold between the south transept and south aisle was not recorded, but it appeared to have been constructed in the same way. R273 (group 3:39, the threshold between the nave and the crossing consisted of a single large stone laid in a cut. It

also formed a step up into the crossing. Both thresholds lay c. 0.20m above the level of the earlier mortar surfaces (R250, group 2:8 and R169 group 2:12). R271, the cut that R273 lay in cut through R169. The construction of these thresholds appears to have been connected to the building up of the floor level in the crossing and transepts by c. 0.20m. Whether they simply replaced earlier thresholds or whether the physical differentiation of the crossing/transepts from the nave/aisles was part of the remodelling of the eastern end of the cathedral is uncertain.

Other activity in the crossing connected to the rebuilding process consisted of postholes and one other cut feature (group 3:5) and evidence of burning in the form of layers of charcoal and ash (group 3:6). It is unclear whether the burning represents a fire or is waste from some activity connected to the rebuilding.

The floor that was laid after the area was built up consisted of square tiles set in a bed of beach gravel. This is placed in period 4 (group 4:8). There was no evidence of a brick floor in the crossing or transepts. If it had been laid here it must have been completely removed prior to the laying of the tile floor. The burning noted above showed signs of being truncated. The tile floor is interpreted as being laid in connection with the rebuilding of the eastern end of the cathedral, but the possibility that another floor surface was laid here and later replaced with the tiles cannot be totally discounted. As period 3 and period 4 overlap the laying of the tiles in the crossing and transepts is grouped in period 4 along with the laying of the tile floor in the aisles. It is however not certain that these two areas were tiled simultaneously.

Outside the chancel wall, in trench B96-4, two layers of burials (groups 3:7 and 3:8) were interred after the construction of the chancel wall had begun. These individuals were buried in two clear rows, the first c. 1.50m out from the chancel wall, the second immediately east of the first row. The chancel wall had a profiled base. It is assumed that once the construction of the chancel was complete that the ground level was built up to this level. The depth of these burials beneath this level strongly suggests that they were interred prior to any building up of the ground level, i.e. the graves were dug whilst the construction process was ongoing.

In area M96, the NE corner of the excavation three postholes were uncovered. Two were located in between two bedrock knolls in trench M96-7 - 10 (group 3:11), and one at the interface between bedrock and moraine clay in trench M96-11 (group 3:16). All had stone post packing and appeared to have been constructed in a similar manner, the post packing being upstanding over the top of the cut with make-up dumps (groups 3:11 and 3:15) building up the ground level to the top of the post packing. The make-up dumping in trench M96-11 consisted primarily of building debris and built up the ground level by 0.30m. This may have been to facilitate burial in the area, but at least one grave was dug in this area prior to the ground surface being made up (group 2:19). The stone working debris was excavated in 1992. It was interpreted as being indicating that a stone masons hut stood in this area. The stone working debris recoded here could have been brought here from elsewhere and dumped as make-up, but the other construction debris in group 3:15 appeared to be in-situ dumping. The postholes could be from temporary structures connected to the rebuilding of the eastern end of the cathedral. A C14 date of AD 1043 - 1262 was obtained from a mortar layer in 1992 and a second date of AD 1322 -1580 from under the stone working debris (see Pedersen E. A: 1994:101). It is possible that the thin layers of mortar are from an earlier phase of construction than the stone working. It is also possible that the stone working debris was dumped later in connection with the construction of the ’bishops foundation’ (group 4:13) or the sacristy.

5.2 Period 3 discussion

Three thresholds were uncovered in the crossing and north transept, all were secondary elements and are interpreted as being connected to the rebuilding of the eastern end of the cathedral. The N/S aligned threshold between the north transept and north aisle (R278, group 3:1) was constructed of mortar bonded stones with a straight edge towards the north aisle. The opposite edge, towards the north transept, was less regular. It lay 0.20m above the level of the tile floor in the north aisle (R24, group 4:5) creating a step up into the transept. The tile floor in the north transept, didn’t survive against the threshold, but would presumably have lain flush with the top of the stones. It lay c. 0.20m above the level of mortar surface (R250, group 2:8) that is interpreted as the original floor surface in the north transept.

A similar situation was recorded in the crossing where N/S aligned threshold R273 (group 3:3) lay flush with the tile floor (R70, group 4:8), but 0.20m over the level of the earlier mortar surface (R169, group 2:12). R273 was a single large stone laid in a cut (R271, fill R272), which cut through the mortar surface, confirming that it was later. The stone was 4m long, 0.50m wide at its southern end, 0.90m wide at its northern end and 0.70m thick. The

edge towards the nave was perpendicular to the axis of the cathedral, the edge into the crossing was angled. The use of a single stone of this size was in direct contrast to the thresholds between the transepts and aisles, that were constructed of smaller stones. This decision was undoubtedly deliberate to reinforce the relative importance of this step, that led directly into the chancel.

A third threshold was also recorded between the crossing and the north transept. It was constructed of a line of mortar bonded stones (R60, group 3:2), their straight edge faced towards the south, into the crossing. The northern edge of these stones was irregular. A line of bricks (R59) had been laid behind the stones to also create a straight edge to the north. The bricks lay 0.05m - 0.10m lower than the stones and were covered by a layer of mortar (R58). Presumably the bricks would not have been visible. They may have been laid to create a straight edge to lay the floor against. No contemporary floor deposits survived on either side. Given the way the step was constructed it is likely that the floor level in the crossing would have been slightly lower. The levels on the preserved tile floor in the crossing (R70, group 4:8) suggest however that any height difference would have been minimal. The threshold was presumably laid to create a symbolic barrier rather that a physical step. No traces of a threshold survived between the crossing and the south transept, it is unlikely that such a threshold existed there.

The N/S aligned threshold between the south aisle and the south transept lay beneath a stone and cement wall (R215, group 7:2) that is interpreted as being modern. It was wider than the threshold, and hung over the beach gravel in the south aisle. The original threshold could be seen beneath R215, but not enough of it was visible to record it.

The four tower bases in the crossing were rebuilt in this period (group 3:3). Each base was added to, the extensions were on the east faces of the western towers and the western faces of the eastern towers. The original tower bases were 4.20m - 4.50m apart (E/W), but the rebuilding reduced this to 2.50m. The additions appeared to thicken the towers on one face only and should perhaps be seen more as buttresses than rebuilding. In each case the rebuild butted the original, but was slightly narrower.

The NW tower base (R277) rested upon a foundation of large stones (R266). R266 butted the ashlar masonry of the original tower (R275, group 2:13). This stratigraphic relationship confirmed the observations made of the standing masonry, i.e. that the towers were rebuilt. Only the rebuild of the NE tower (R267) was exposed. A N/S aligned linear cut (R344), filled with mortar bonded stone rubble lay along the edge of R267. the mortar had a glassy structure and was very hard, it appeared as though it had been exposed to a heat source and had fused. No traces of in-situ burning were recorded adjacent to the feature, but evidence of burning was recorded in the crossing however (group 3:6). It is not clear whether the mortar had this quality because of the mix or whether it was treated after being deposited. The cut may have been the construction cut for the rebuilding of the tower or may have represented small scale repair work to the base of the tower.

The SW tower base (R428) was built upon a foundation (R307) that was very similar to R266 that the NW tower base was built upon. The relationship between R428 and the original tower was not exposed. A cut feature (R318) also ran along the face of the tower and may have been the construction cut for foundation R307. No stratigraphic relationships were observed for the SE tower base.

One, possibly two cut features (R234 and R320, group 3:4) were dug between the SW and SE tower bases, after the rebuilding work, but prior to the tile floor being laid. They were E/W aligned and may have been graves, but they were not thoroughly investigated.

Evidence of burning was recorded in the crossing (group 3:6). A layer of charcoal and stone chips (R248) was present over the eastern half of the excavated area and a small deposit of ash (R168) was present in the SW corner where it filled a depression in the underlying layer R167. The underlying deposits (group 2:11) were scorched indicating that either the burning occurred in-situ or that the charcoal and ash were deposited whilst still hot. The scorching of the underlying deposits was more extensive than R248, suggesting that the burning had originally been more extensive but had been truncated. That R168 was only present in a depression in the underlying layer would support the interpretation of a truncation event removing some of the burning. A charcoal sample from R248 was radiocarbon dated to CAL AD 1020 -1250 at the 95% level of confidence. The wood may have come from the fabric of the cathedral and doesn't necessarily date the deposition of the layer. It was not clear whether R248 indicates that the cathedral caught fire at some point or whether it was simply waste from the construction process, the presence of stone working debris mixed with the charcoal suggests it may have been the latter.

Other activity connected to the rebuilding process in the crossing (group 3:5) included two postholes (R309 and R311) and an irregularly shaped cut feature (R246). These were not excavated. A layer of silt/sand (R268) that was spread over the burning in group 3:6, and R293 a silt/beach gravel deposit filled the top of post packing R299, covering the remains of the post R294 (group 2:15), indicating that the post was no longer in use.

The construction cut (B79, group 3:9) for the chancel wall was uncovered at its outside face in trench B96-4. The cut was N/S aligned and 0.40m wide, it was cut through the natural moraine clay. The remains of a possible stone structure (B73) were also uncovered in this trench. It had been truncated by graves so that only two pillars of stone remained, 0.80m and 4.40m east of the chancel wall. These two pillars may have been part of the same structure, but this is not certain. The stones appeared to have been placed in a cut (B80). Its function is unclear, but it may have been a foundation for a temporary structure connected to the construction of the chancel. The rest of the area outside the chancel wall was excavated in 1991.

Several stone concentrations were recorded in 1991 with separate context numbers and no obvious structural function. The stones recorded here appeared to have been laid in a cut however and should be considered as a deliberate construction, their function is however unclear.

A layer of mortar (B7), waste form the construction process, lay over both cut B79 and B73. The mortar had clearly been deposited whilst wet and had set in-situ. The earliest grave cut (B39) in the overlying group of graves (group 3:8) cut through B7, clearly indicating that these individuals were interred after the construction of the secondary chancel wall had begun.

Four burials were placed in this group (group 3:8), three (BG40, BG43 and BG44) lay side by side in a row, c. 1.50m east of the chancel wall. The fourth burial (BG35) lay 3.75m east of the wall. all four graves lay at approximately the same level. The three graves inter-cut, but the burials were not disturbed. The central burial BG46 appeared to have been a coffin burial, which presumably protected it from disturbance. The earliest of the three (BG40) had a coin in a leather pouch placed upon its chin. The coin could be identified from its x-ray as belonging to the reign of Eirik Magnusson AD 1280-1299. The grave cut for this burial B39 cut through mortar layer B7 that lay over the construction cut for the chancel. This clearly indicates that construction of the extension of the chancel was underway by 1299.

The overlying group of burials (group 3:7) consisted of five, possible six burials. The burial positions mirrored those of the earlier group 3:8, but these graves lay c. 0.40m higher. Four of the burials (BG16, BG18, BG23 and BG26) lay c. 1.50m east of the chancel wall. A fifth burial (BG30) lay c. 3.75m east of the wall. The edge of a cut feature (B60), probably a grave, lay at the edge of the excavated area, no bones were recovered from the fill (B59). The four graves that lay in a row all inter-cut.

The chancel wall had a profiled base, presumably the ground surface was built up to this level (c. 137.40 m over sea level) once the construction activity was complete. The ground surface when the excavation began was c. 136.70 m over sea level. If the ground surface was built up as is assumed, then the uppermost 0.70m of the churchyard outside the chancel must have been removed during the antiquarian clearing of the demolition deposits. The demolition material in the upper layers (group 7:7) contained disarticulated human bone, which supports this hypothesis. The burials in groups 3:7 and 3:8 lay 1.77m - 2.48m under the level of the profiled base of the wall. It is possible that the ground surface was built up such that it sloped sharply away from the chancel. Even taking this possibility into consideration it is highly unlikely that the graves in groups 3:7 and 3:8 were dug to these depths. If the ground surface was built up to the level of the profiled base, as would seem likely, then these graves must have been dug prior to this, i.e. during the construction period.

Three postholes in area M96 were also grouped in period 3. Two lay in trenches M96-7 - 10, (M54 and M68, group 3:11) and one in M96-11 (M129, group 3:16). All three were constructed in the same way. Stone post packing was set in cut, but was upstanding over the edge of the cut. Layers of gravel and stone were then dumped around the postholes building up the ground level to the top of the post packing (group 3:11 in M96-7 - 10 and group 3:15 in M96-11). The two postholes in M96-7 - 10 were dug in an area of moraine clay between two upstanding bedrock knolls. Four discreet layers of stone, gravel and clay were dumped in this area prior to the cutting of the postholes. This dumping (group 3:12) is interpreted as building up the ground surface in connection with the cutting of the postholes, but may have been earlier and unconnected to the postholes. The silt/clay layers dumped around the postholes (M48 and M63, group 3:11) appeared to form a rough surface. The postholes are inter-

preted as being part of a temporary structure connected to the rebuilding of the eastern end of the cathedral. Another bedrock knoll was upstanding between the two postholes in M96-7 - 10 and M96-11, whether all three were part of the same structure is debatable. The 1992 excavations uncovered no postholes in this area (Pedersen E. A. 1994:101). The posthole in M96-11 (M129, group 3:16) was dug against the sloping bedrock such that the surface of the bedrock formed one edge of the cut. The infilling of the postholes (groups 3:10 and 3:14) is also grouped in period 3, this activity was not dated however and may have taken place in period 4.

The make-up deposits dumped around the posthole in M96-11 consisted primarily of waste form the building process (group 3:15). Two discreet layers (M125 and M138) of stone working debris were definable, but M125 consisted of debris from all stages of the stone working process. These two layers built up the ground surface by 0.30m. At the northern end of the trench seven thin layers of mortar, charcoal and stone working debris had been dumped over the bedrock. The mortar layers appeared to have been dumped whilst wet and had hardened in-situ. The stone working debris may have been brought here and dumped as make-up, but the thin layers at the northern end of the trench appeared to be in-situ debris form the construction process. A charcoal sample from one of the mortar layers (M154) was radiocarbon dated to CAL AD 1020 - 1300 at the 95% level of confidence. There was no physical connection between the thick stone chip layers and the thin layers at the northern end of the trench. The date from M154 suggests that this activity may date to period 2. This area lay c. 24m NE of the first chancel however and the dumping of the stone chip deposits is more likely to be connected to the extension of the cathedral towards the east. This building up of the ground surface separates the two grave sequences in this area, group 2:19 and group 4:12.

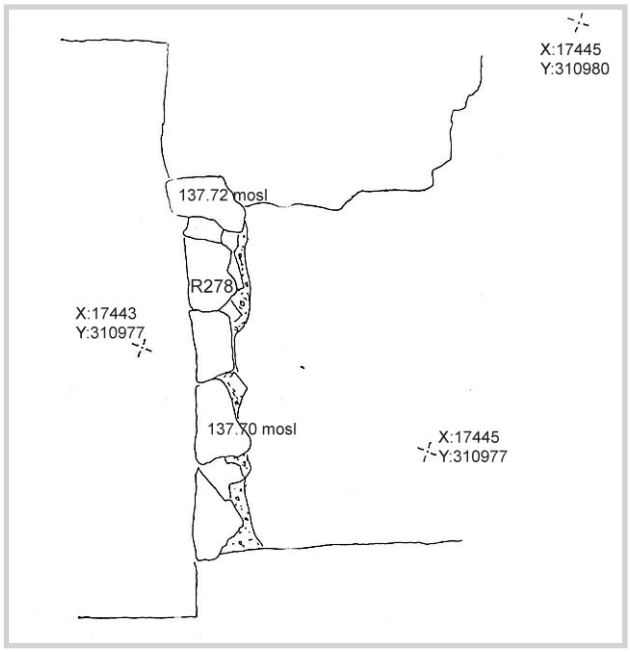
A possible stone path (surface (M86, M91 and M114, group 3:13) was uncovered in M96-7 - 10, west of the upstanding bedrock knolls, north of the north transept. It formed a rough surface of horizontally laid stones. A series of discreet layers and cut features containing animal bone and charcoal and a possible hearth were recorded on either side of the path. It was uncovered in the narrowest part of the trench, it was not possible to determine its alignment. The layers in this group contained brick fragments, but no other dating evidence. They may therefore belong to period 4.

5.3 Group descriptions

Group 3:1
R278
Group 3:1 consists of R278, the N/S aligned threshold between the north aisle and the north transept. It was constructed of stone and brick, but only partially mortared. The northernmost section that contained the bricks butted wall masonry to the east and was not visible in the transept, this section was partially bonded with cement and may have been reconstructed. The threshold's western face towards the north aisle was straight, the tile floor layer, (R24, group 4:5) lay below the top of the threshold. The tile floor was not preserved to the east but was presumably laid flush with the top of the threshold such that there was a step up into the transept. It lay c. 0.20m over the level of mortar surface R250 (group 2:8) that is interpreted as the remains of the earliest floor in the transepts. R278 and the thresholds that defined the boundaries between the crossing and the nave and the north transept and the crossing (R273, group 3:3 and R60, group 3:2 respectively) all appear to be secondary, built in connection with the remodelling of the eastern part of the cathedral. The ground level in the transepts and the crossing appears to have been built up as part of this rebuilding.

Contexts
R278. N/S aligned threshold between the north aisle and the north transept. The southernmost 2m was constructed of five large limestone blocks, roughly dressed, the flat side faced west into the north aisle. The stones were 0.40m wide and 0.50m deep on the eastern side, they

***Fig. 63**. Group 3:1, area R96, north transept.*



were not fully exposed on their western side. The eastern edge was packed with smaller stones and brick fragments set in a yellow mortar to fill in the gaps between the stones. The stones were laid flush with one another at its western face, no traces of mortar were visible. The northernmost 1.40m consisted of smaller unworked limestone blocks and bricks laid two courses wide and two courses deep, this section was much more roughly constructed, in places the stones were bonded with cement. Parts of the northernmost section may have been reconstructed or simply repaired. The brick and stone section of the threshold was only visible from the north aisle, it butted wall masonry to the east. R278 butted the NW tower base to the south and wall masonry to the north. Under R242.

Group 3:2

R58 R59 R60 R224 R340

Group 3:2 consists of a E/W aligned stone and brick threshold between the crossing and the north transept. A line of limestone blocks (R60) was constructed between the two tower bases, butting them to both the east and west. The stones were laid forming a straight edge towards the south, facing into the crossing, flush with the southern edge of both tower bases. Their northern edge was irregular. Here, a line of mortar bonded bricks (R58) was laid forming a straight edge towards the north. R58 butted the stones which stood slightly higher than the bricks. A thin layer of fine mortar (R59) was partially preserved on the surface of the bricks. A mortar and stone deposit R340 was laid to fill in a hollow in the underlying deposits prior to the construction of the structure and a mortar and stone deposits (R224) was dumped to the north of the step as make-up.

The brick line would presumably not have been visible, being covered by mortar layer R59. The bricks function may have been to create a straight edge to lay a floor against. No floor deposits survived on either side of the threshold but the contemporary floor layer would presumably have been laid flush with the top of the threshold in the north transept. The relationship between the tile floor and the threshold in the crossing is uncertain, the floor would presumably have been laid lower than the top of the threshold but would have lain higher than the base of the stones. The threshold's function was probably to create a symbolic barrier rather than a physical step.

Contexts

R58. Layer of fine cream coloured mortar with fine sand and occasional burnt line inclusions. R58 was compact but only 0.01m thick, it covered bricks R59, that together with R60 comprised a threshold between the crossing and the north transept. Under R222, over R59.

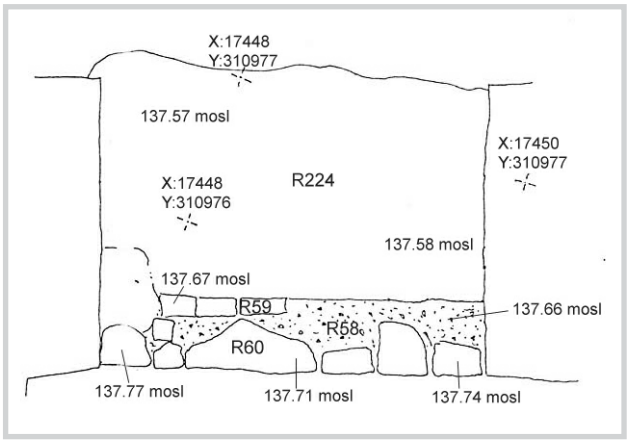
R59. Layer of bricks, laid in a E/W aligned row on the northern side of stone threshold R60 that lay between the crossing and the north transept. The stones are set such that the threshold has a straight edge facing the crossing. The bricks give the structure a straight edge on the northern side to lay the floor against. R59 was covered by mortar layer R58, the bricks would therefore have not been visible on the surface. Under R58 and R224, over R60.

R60. Line of unworked limestone blocks of varying sizes laid in an E/W aligned row forming a threshold between the crossing and the north transept. The threshold was 2.60m long and butted the upstanding ashlar masonry of both the NW and NE tower bases. The stones were laid with a straight edge towards the crossing to the south, the stones northern edge was irregular. Their width varied from 0.30m - 0.40m depending on the individual stone. A line of bricks, R59 was laid along the northern edge giving the structure a straight edge on the northern side also. Under R59, over R340.

R224. Layer of cream mortar and small stones contained small brick fragments. R224 butted bricks R59 and both tower bases. the layer thinned out to the north. It appeared to have been dumped as make-up behind step R60. Under R223, over R59.

R340. Layer of coarse yellow mortar with beach gravel inclusions and small stones. The stones were bonded by the mortar, some of the stones had been worked. The deposit was localised to beneath threshold R60, it filled a depression in the underlying deposits creating a level surface for the laying of R60. R340 was not excavated. Under R60, over R248.

***Fig. 64**. Group 3:2, area R96, north transept.*



Group 3:3
R266 R267 R271 R272 R273 R277 R307 R318 R319 R343 R344 R428
Group 3:3 consists of secondary structural elements of the cathedral in the crossing. The original surveys of the cathedral indicated that the four tower bases of the crossing had been rebuilt. This relationship can be seen in the standing masonry. The tower bases were partially exposed during the excavation in the crossing and transepts.

The base of the rebuild of the NE tower (R267) was partially exposed, the remains of the original tower lay outside the excavation. A N/S aligned linear cut (R344) was defined on the surface 0.40m out from the tower base. Whether R344 was only present west of the tower or whether it continued to the north and south beyond the tower is unknown. It was not excavated. Fill R343 consisted of mortar bonded stone rubble. The mortar was very hard with a glassy structure, it appeared as if it may have been heated to strengthen it. The cut appeared to be cut at a shallow angle. It is interpreted as the construction cut for the rebuilding of the tower but didn't appear to be very wide and may have been connected to repair work rather than the construction.

The NW tower base (R277) butted the earlier tower base R275 (group 2:13). R277 was constructed of ashlar masonry. It was built against the eastern face of the earlier tower base, but was not as wide as the original. R277's foundation, R266, was partially exposed. It consisted of mortar bonded large stones. It partially overlay the foundation of the original tower R274 (group 2:13), and butted the actual tower base R275 (group 2:13). The stratigraphic relationships exposed on the eastern face of the NW tower base confirm the interpretation of two phases of tower constructions. No evidence of a construction cut for the rebuilding was defined however and no empirical dating evidence for this activity was recovered.

SW tower base (R428) was constructed upon foundation R307. R307 was only exposed on the southern, and partially on the eastern, faces of the tower base. The relationship between R428 and the original tower base R280 (group 2:13) was not exposed. The interface between R428 and R307 on the southern face had been obscured by later cement pointing. A cut feature R318 was defined on the surface, 0.70m out from the eastern face of the tower at its NE corner. R318 was filled with a reddish brown silt (R319), it was not excavated. It had been truncated to the south by possible grave R320 (group 3:4). R318 may have run along the eastern face of the tower base in the same way that R344 did with tower base R267, but due to the truncation to the south this is uncertain. R318 may have been the construction cut for the rebuilding of the tower.

No stratigraphic relationships were observed for the SE tower base, only the structural elements of the cathedral that impacted with the excavated layers were recorded. The SE tower base was therefore not given a context number.

The threshold stone between the crossing and nave (R273) is included in this group. It could not be stratigraphically linked to the rebuilding of the towers but logically belongs to this group of secondary structural elements. The threshold consisted of a single large stone that had broken into four pieces. It was laid with a straight edge, perpendicular to the cathedral's main axis, towards the nave. The stone was thicker to the north and the edge towards the crossing was therefore not perpendicular to the cathedral's axis. The stone was laid in a N/S aligned cut (R271) that was 0.40m wide on the stones eastern side. R271 was filled with crushed mortar and sand (R272), probably the same deposits that R271 cut through. It was not excavated but was partially exposed in the sides of later N/S aligned cut R71 (group 7:5).

Threshold R273 butted the original SW (R280) and NW (R275) tower bases (group 2:13). R271 cut through possible mortar floor R169 (group 2:12) that butted the original tower base R280. The threshold is therefore interpreted as not part of the original cathedral. The threshold between the north aisle and north transept (R278, group 3:1) was also probably secondary. The tile floor (R70, group 4:8) in the crossing was laid flush with the top of the threshold. The floor layer in the nave was not uncovered but the floor would have been lower here such that there would have been a step up into the crossing. The floor level in the crossing appears to have been raised as part of the remodelling of the area.

Contexts
R266. Foundation of mortar bonded large stones. R266 was only partially exposed on the surface, it was the foundation of the latest NW tower base R277. R266 lay partially over the foundation (R274) of the earliest tower base, and against the masonry of the actual tower (R275). Under R277, over R275, same as R276.

R267. NE tower base, the foundation was only partially visible, the upstanding base was constructed of ashlar

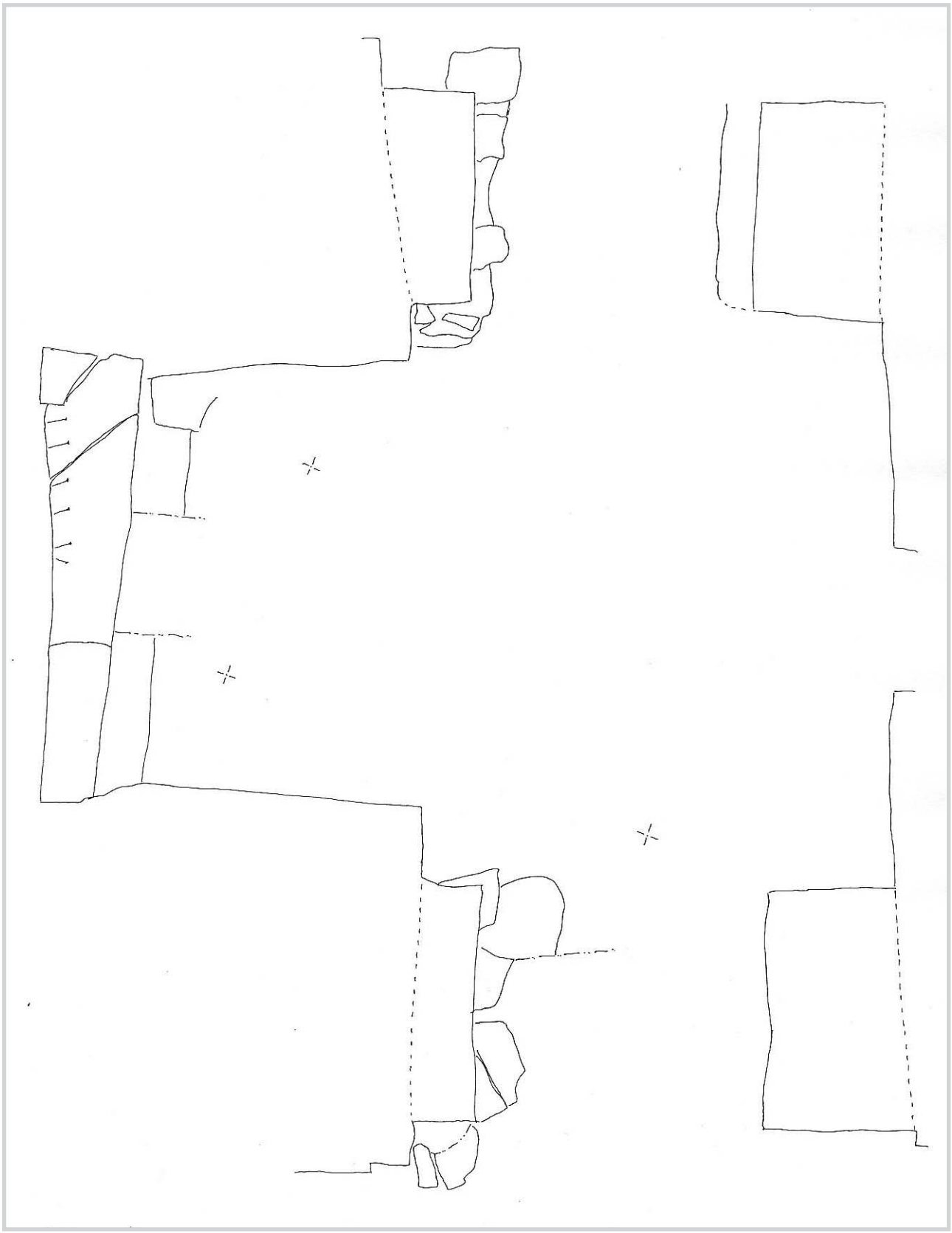


***Fig. 65**. Group 3:3, area R96, the crossing.*

masonry. R267 was the latest NE tower, the interface with the earlier structure was not exposed. Under R344.

R271. N/S aligned linear cut, documented in the crossing on the eastern side of threshold stone R273. The cut was not excavated, it was defined on the surface and the base was documented in the edge of cut R71 that ran right up to the threshold stone. R271 was 3.80m long, 0.40m wide, i.e. extended 0.40m out from R273 on its western side, x 0.50m deep. The cut bottomed out under the threshold stone and is interpreted as a construction cut to place the stone in position. Presumably the other side of the trench lies in the nave, as such the total width of the feature would be greater than 0.90m. Under R272, over R169.

R272. Fill of loose yellow brown sand/crushed mortar, contained mortar lumps and flecks. R272 was not excavated, it was defined on the surface and documented in the edge of later cut R71. It filled cut R271 and was dumped against threshold stone R273. It appeared to consist primarily of the material that was dug through, re-deposited in the trench as back-fill. Under R144, over R273.

R273. Threshold stone laid between the nave and the crossing. The stone was 4m long N/S, 0.50m wide at its southern end gradually widening to the north where it was 0.90m wide. Its thickness was seen in the base of later cut R71, here it was 0.50m deep. The stone was laid with the face towards the nave roughly perpendicular to the cathedral's alignment. The difference in width at the northern and southern ends meant the face towards the crossing was at an angle to the cathedrals axis. It was laid in cut R271, and butted the tower bases to both the north and south. The threshold was a single stone, but had been broken in antiquity into four pieces, probably by falling masonry when the central tower collapsed. Under R272, over R271.

R277. The latest NW tower base, constructed of ashlar masonry. R277 butted the earlier tower base R275. R277 appears to have been added onto R275 on its eastern face, but was not as wide as the original tower base. Under R60, over R266.

R307. Foundation of the SW tower base, (R428). R307 consisted of mortar bonded flat stones, it was only exposed on the southern edge and partially along the eastern face of the tower base. The interface between R307 and R428 was largely obscured by later cement pointing. It is possible that some of the stones recorded as R307 were in fact the foundation to the original tower base, but this relationship was obscured by the cement. Under R428.

R318. N/S aligned linear cut located along the eastern face of the SW tower base. The feature was 0.80m+ long (N/S) x 0.60m wide (E/W), it had been truncated to the south by E/W aligned cut R320. R318 was only defined on the surface and not excavated. It appeared to be associated with work on the foundations of the tower base, it was possibly the construction cut for the latest tower base R428. Under R319, over R169.

R319. Fill of reddish brown sandy silt, contained medium sized stones. R319 was not excavated. Under R167, over R318.

R343. Fill of mortar bonded small and medium sized stones. The mortar was white, but slightly yellowish on the surface, it contained a high percentage of beach gravel inclusions. The mortar was very hard with a glassy texture, almost as though it had been fused together through being heated. Under R60, over R344.

R344. N/S aligned cut feature along the western face of the NE tower base R267, 0.40m out from the tower. The cut was not excavated but appeared to be cut at a shallow angle. It was only defined on the surface alongside the tower base, it was not certain whether the feature continued beyond the northern and southern limits of the tower base. It was filled with mortar bonded stones, and is interpreted as either the construction cut for the widening of the tower base (R67) or a later repair to the foundations. Under R343, over R248.

R428. SW tower base, built of ashlar masonry. R428 was constructed upon foundation R307. It appeared to be secondary, butting original tower base foundation R280 on its eastern face. Under R320, over R307.

Group 3:4

R320 R321 R324

Group 3:4 consists of one, possibly two, cut features (R320, R321 and R324) between the SW and SE tower bases in the corridor between the crossing and the south transept. The features were only defined on the surface and were not investigated. R320 appeared to be an E/W aligned cut feature, filled with R321. R234 was only partially exposed, it may have been a demolition layer but may also have been the fill of a cut feature. R320 had an E/W alignment and could be a grave, if R234 fills a cut feature it may also have been grave fill. These features

were not properly investigated however and their interpretation should be considered insecure.

R320 was sealed by beach gravel (group 4:8). The activity in this group therefore pre-dates the laying of the tile floor. R320 cut R319, the fill of R318, (group 3:3) which is interpreted as being connected to the rebuilding of the SW tower base. The activity in this group appears to have occurred after the rebuilding work was undertaken, but prior to the laying of the tile floor.

Contexts
R320. E/W aligned linear cut, located between the southern tower bases. The cut was only defined on the surface and not excavated, it appeared to run from tower to tower i.e. covered the whole width of the passageway between the towers, 2.40m long (E/W) x 1.20m wide (N/S). The southern edge appeared to be straight, the northern edge was curvilinear and irregular. Possibly a grave cut. Under R321, over R319, R324 and R428.

R321. Fill of mid greyish brown silty sand and beach gravel, contained small and medium sized stones. R321 was not excavated. Under R144, over R320.

R324. Mixed layer of brick fragments, yellowish mortar fragments and beach gravel. R324 was recorded in a 0.50m+ wide E/W aligned band between the southern tower bases. It appeared to have been cut to the north by R320, to the south it was not fully exposed. The character of the deposit suggests it was either a dump of broken up bricks and mortar or the fill of a cut feature, possibly a grave. R324 was not excavated. Under R320.

Group 3:5
R245 R246 R269 R293 R309 R310 R311 R312
Group 3:5 consists of a spread of crushed mortar or sand (R269) spread over burnt layer R248 (group 3:6) in the crossing. Irregularly shaped cut feature (R245 and R246), two possible post- holes (R309, R310, R311 and R312) located between the two southernmost tower bases and R293, the fill of the top of earlier post packing R299 that covered the remains of earlier post R294 (group 2:15). R293 was not excavated until the posthole was identified but it is interpreted as representing the disuse of the post, it appeared to partially overlie mortar surface R169,

***Fig. 66**. Group 3:5, area R96, the crossing.*

(group 2:12) and is placed in this group. The cut features represent a period of activity where there was no floor surface and probably relate to repair/rebuilding work in the area. Possible postholes, R309 and R311 may have been related to construction work, possibly scaffolding.

Contexts
R245. Fill of silt/beach gravel and fragments of limestone and mortar. The silt and beach gravel were mixed together in irregular concentrations. The beach gravel bedding for the tile floor, R144 slumped down into the top of the fill, the beach gravel may be present as a result of the mixing of R144 with the silt rather than as part of the original fill. The feature was not excavated. Under R144, over R246.

R246. Irregularly shaped cut feature, sub circular, 1.60m N/S x 1.40m E/W, not excavated. The feature lay in the crossing south of the threshold into the north transept. Its function is unknown, it didn't appear to be a grave and may have been more than one cut feature. Under R144, over R167.

R269. Layer of yellow sand, contained small fragments of stone and mortar. The layer was very loose and may have been crushed mortar rather than sand. It covered the SE part of the crossing and overlay burnt layer R248. Under R144, over R248.

R293. Fill of mid brown sandy silt and beach gravel, contained mortar fragments and occasional brick fragments. R293 was present in the top of posthole R299, covering the remains of post R294. It appeared to have been deposited after the post was cut off at ground level. its stratigraphic relationship was unclear, it was not defined until the posthole was identified, but appeared to lay partially over R169. There is brick in the fill whereas R169 and its associated layers contain no traces of brick of tile. Under R144, over R169.

R309. Shallow, roughly circular cut, 0.25m in diameter, only 0.10m deep. The sides sloped gently to a rounded base. Possibly a posthole but very shallow. It may have been a depression created by a post standing on the surface rather than a cut feature. Under R310, over R167.

R310. Fill of mid brown gravely silty clayey sand, contained mortar lumps and brick fragments. Under R144, over R309.

R311. Circular cut, steep sides and a flat base. The feature appears to have only been planned on the surface i.e. not after excavation. No dimensions were recorded, but it was interpreted as a post-hole. Under R312, over R167.

R312. Fill of reddish brown gravely silty clayey sand, contained mortar lumps, small stones and brick fragments. Under R144, over R311.

Group 3:6
R168 R248
Group 3:6 consists of burnt deposits R168 and R248 in the crossing. R168 consisted of ash and silty sand, R248 consisted of crushed charcoal, with a few larger fragments, and concentrations of small burnt fragments of limestone. R248 was localised to the eastern half of the crossing, it was also recorded under the threshold R60 that separated the crossing from the north transept. R168 was only present filling a shallow depression in the underlying layer. The underlying deposits (group 2:11) appeared to have been scorched on their upper surfaces, indicating that either the burning took place in-situ, or that the burnt deposits were laid down whilst they were still hot. Some of the underlying scorched deposits were not covered by these two layers however, indicating that the burning/burnt layers were originally more extensive, possibly covering most, if not all of the crossing. That R168 was only preserved in a shallow depression in the underlying layer supports the interpretation of a truncation event removing some of the burnt deposits. This supposed truncation event may have occurred during the remodelling of the eastern end of the cathedral and the laying of the threshold stone (R272, group 3:3) between the nave and the crossing which resulted in an alteration of the ground level in the crossing. Whether the burning was the result of an accidental fire or part of the construction process is unknown, the small stone fragments in R248 may have been stone working debris suggesting the latter. R248 was radiocarbon dated to CAL AD 1020 - 1250 at the 95% level of confidence. The provenance of the wood from the layer is not known however. The wood may have been part of the structure of the cathedral, as such it does not necessarily date the deposition of the layer.

Contexts
R168. Layer of pale grey silty sand and ash. R168 was localised to a small area in the SW corner of the crossing. It filled a shallow depression in underlying layer R167. Under R144, over R167.

R248. Layer of charcoal and small fragments of limestone. There was very little silt in this layer, it appeared to be primarily charcoal dust and small fragments with a few larger fragments where the structure of the wood was

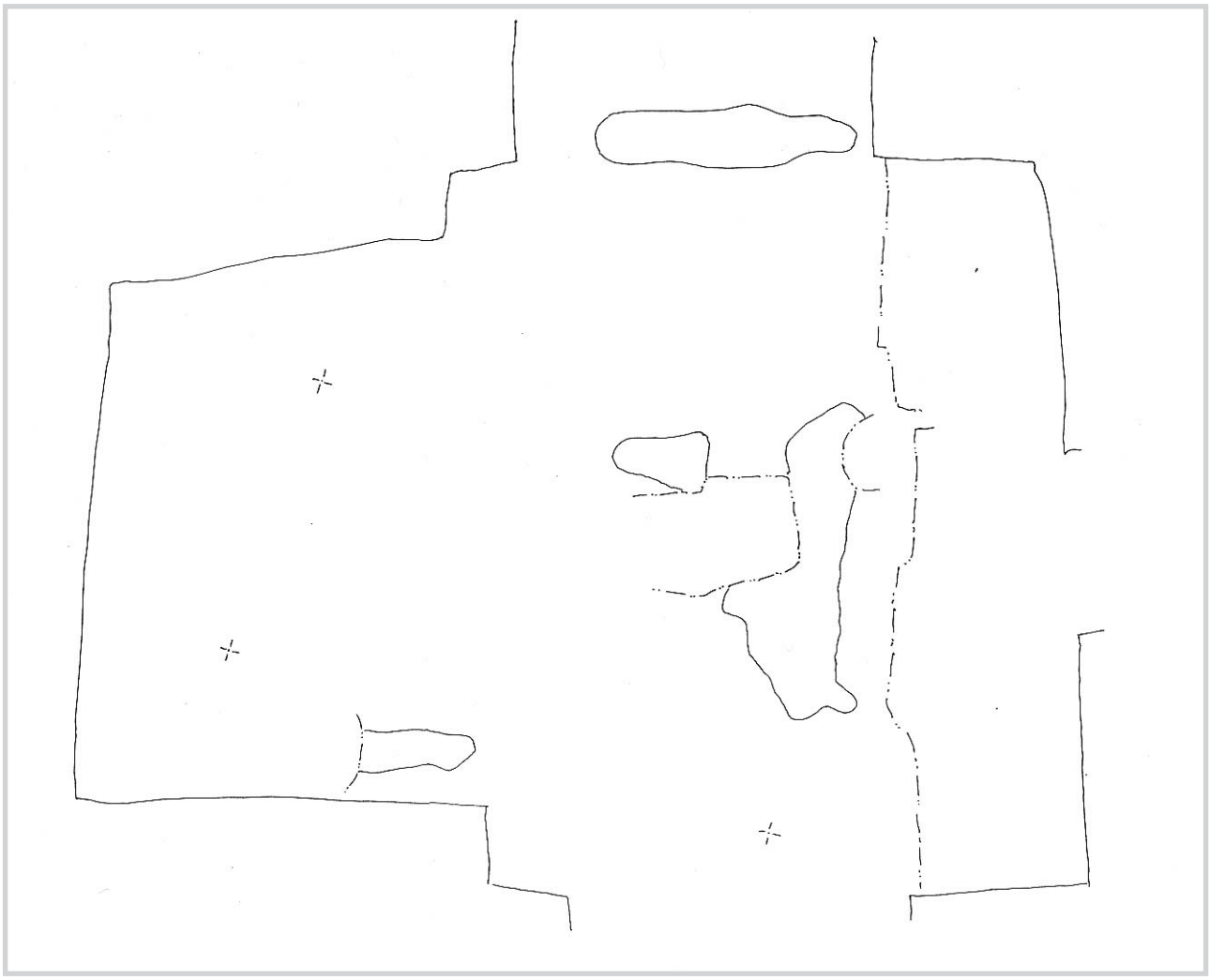


***Fig. 67**. Group 3:6, area R96, the crossing.*

still visible. The limestone fragments were cracked from burning and were present in irregular concentrations. The layer was present in patches in the eastern half of the crossing and under threshold R60, it was not fully excavated. A charcoal sample from R248 was radiocarbon dated to CAL AD 1020 - 1250 at the 95% level of confidence (Beta-135934, sample HKH11866). Under R241, R269, R340 and R344, over R270, and R345, same as R341.

Group 3:7

B14 B15 BG16 B17 B18 B20 B21 B22 BG23 B24 BG26 B28 B29 BG30 B31 B56 B60 B81

Group 3:7 consists of five graves (B14, B15, BG16, B17, B18, B20, B21, B22, BG23, B24, BG26, B28, B29, BG30, B31 and B81) and a probable sixth grave (B56 and B60), of which only 0.10m lay within the excavated area, no bones were visible within fill B56. These graves were the latest excavated graves in trench B96-4 and lay outside the eastern wall of the chancel. BG16, BG18, BG23 and BG26 lay in a row c. 1.50m east of the chancel wall. No contemporary burials lay closer to the chancel. The burials lay at approximately the same level but had inter-cut. B21 the grave cut of BG23 had truncated the right hand side of BG26, and B15, the grave cut of BG16 had removed all but the lower left leg and left foot of BG18. The left foot of BG26 was missing, this may also have been removed by grave cut B15. Grave fills B14 and B22, contained disarticulated human bone, presumably from BG18 and BG26 respectively. B20, the grave fill over BG18 contained an articulated hand. BG23 lay partially outside the area of excavation, its upper right arm would have been excavated in 1991. No corresponding grave was present on the plan of graves from the 1991 excavation.

The fifth burial, BG30, lay to the east of the other four burials, at approximately the same level. A lump of charcoal (B31) was placed over the throat and shoulders of BG30. The lower legs of BG30 were excavated during the first seasons work in 1996 when a small hole was excavated for the construction of one of the foundations, trench B96-1. The western half of the grave was exca-

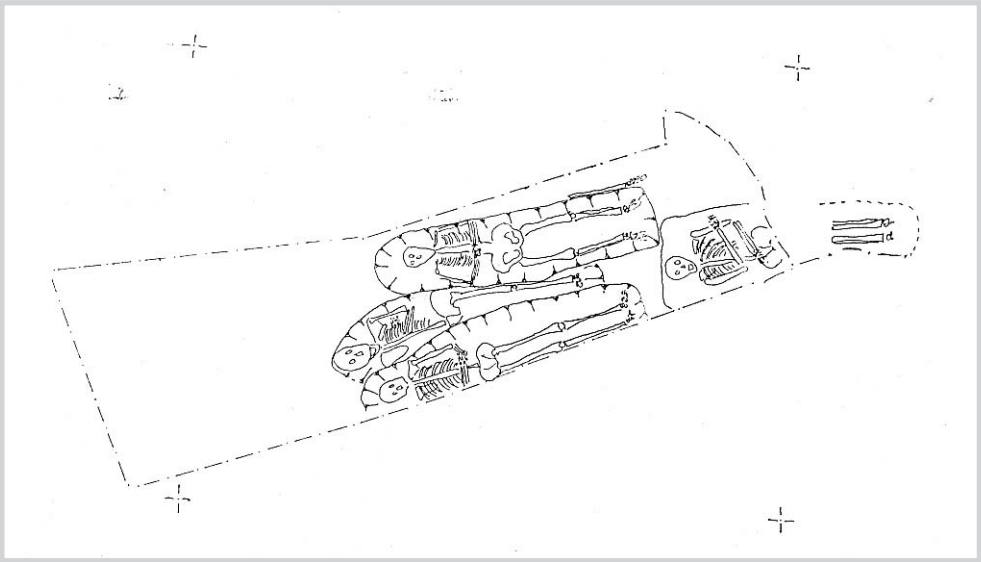


***Fig. 68**. Group 3:7, trench B96-4.*

vated during the second season, when the baulk remaining from the 1991 and 1992 excavations was removed. The femurs of BG30 were missing. The original foundation hole appeared to have been widened removing the missing bones. This digging was undertaken without archaeological supervision.

The grave cuts for these graves were relatively easy to define, with the exception of B81 that had been truncated. No traces of coffins were recovered from these graves. The cuts were first registered where they cut through mortar layer B7 and natural clay B32.

The burials lay c. 0.45m under the top of the natural clay, and 1.77m - 1,91m under the base of the profiled base of the chancel wall. The interface between the profiled base and the foundation was presumably the level of the ground surface once the chancel extension was completed and the ground surface built up. It is highly unlikely that these graves were dug from this level. Even if the ground surface had sloped sharply away from the chancel wall these would have been very deep graves. It is likely that these graves, and those in the underlying group (group 3:8), were dug during the construction period, i.e. prior to the ground surface being built up to the level of the interface between the profiled base and the foundation.

Grave fill B17 contained brick fragments dating it to 1250 or later. A coin find from one of the graves in the underlying group (group 3:8) dates those burials to the end of the 1200's. As both groups of burials appear to be related to the construction period, it is therefore likely that these individuals were interred in the late 1200's/early 1300's.

Contexts

B14. Fill of brown gravely silt, contained small stones and beach gravel fragments. Fills grave cut B15, that contained skeleton BG16. B14 contained disarticulated human bone, presumably from BG18 that the grave cuts through. Under B13, over BG16.

B15. Grave cut, aligned E/W, roughly rectangular, 1.80m long, 0.55m wide, 0.30-0.40m deep. The grave cut into BG18, only the lower left leg of BG18 remained in-situ, and also cut slightly into B17, the fill of grave cut, B24, removing the left foot of BG26. Under BG16, over B17 and B20.

BG16. Adult, skeleton, supine, oriented E/W, head to west. The front of the skull was crushed otherwise the skeleton was complete, but the bones were in a fragile condition. The hands were folded across the abdomen. The skeleton lay close to the edges of the cut, the feet lay up at an angle against the edge of the cut. There were no traces of a coffin, the lack of space between the body and the sides of the cut suggests this was not a coffin burial. Under B14, over B15.

B17. Fill of light yellow brown gravely silt, contained small stones, mortar flecks, brick fragments and disarticulated human bone. Under B15 and B21, same as B25.

BG18. Lower left leg and left foot. The remains were articulated and in the correct position for an in-situ burial. The rest of the skeleton was removed by grave cut B15, for BG16. Disarticulated human bone recovered from B14, the fill of B15 presumably relates to BG18. Under B20, over B81.

B20. Fill of yellow brown silty clay, contained beach gravel fragments, small stones and an articulated hand, filled grave cut B81. The hand was recovered from within the fill, it was not part of an in-situ burial. The hand was given a G number, BG19, but this has since been scrapped. The hand must have belonged to an earlier burial, which was truncated by cut B81, whilst there was sufficient flesh remaining for the bones to remain articulated, this burial would have been excavated in 1991. Under B15, over BG18, contained BG19.

B21. Grave cut, the south side of the cut, and the burial BG23's upper right arm were excavated in 1991. The cut was 2m long (E/W), 0.40m+ wide, 0.50m deep. Under BG23, over B17.

B22. Fill of yellow brown silty clay, contained beach gravel fragments, small stones and disarticulated human bone. Fills grave cut B21 that cuts through earlier burial BG26, the disarticulated human bone recovered from within B22 was probably truncated from BG26. Under B13, over BG23.

BG23. Adult skeleton, supine, oriented E/W, head to west. The arms were folded over the abdomen, the right over the left. The upper right arm, and the whole southern side of the grave cut lay outside the excavated area, presumably these were excavated in 1991, the corresponding G number is unknown. There was no evidence for a coffin. Under B22, over B21.

B24. Grave cut, E/W orientated 1.90m long, 0.40m+ wide, c. 0.10m deep. The grave was truncated to both the north and south by grave cuts B15 and B21 respectively. The grave contained skeleton BG26, that was also truncated by the later grave cuts. There was no evidence for a coffin. Under BG26, over B42.

BG26. Adult skeleton, supine, oriented E/W, head to west. The left foot had been truncated by later grave cut BG15, the right leg and foot, the right side of the pelvis, the right arm and the left hand were truncated by later grave cut B21. The arms were folded over the chest. There was no evidence for a coffin. Under B17, over B24.

B28. Grave cut, E/W orientated. The westernmost 0.80m of the grave was excavated in trench B96-4, the easternmost 0.60m was excavated in trench B96-1, the remaining mid section was presumably removed by machine during a building period when no archaeological personnel were present. The cut was originally 1.70m long, 0.55m wide, c. 0.25m deep. Under BG30, over B34.

B29. Fill of brown silty clay sand, contained gravel and small stones. Fills grave cut B28. Under B52, over B31, same as B54.

BG30. Adult skeleton, supine, oriented E/W, head to west. The easternmost part of the grave, the lower legs, was excavated in trench B96-1, the westernmost half of the grave, from the skull to the pelvis, was excavated in trench B96-4. The mid section of the grave was presumably removed by machine during a building period when no archaeological personnel were present. The lower legs were exposed during initial machining of the trench, the bones were covered and excavated later. The feet were missing, it is uncertain if these were truncated in antiquity or removed during machining. The right arm was crossed over the chest, the right hand lay over the left upper arm, the left arm was folded over the pelvis. There was no evidence for a coffin. Under B31, over B28, same as BG47.

B31. Context issued to a lump of charcoal, deliberately placed on the throat and shoulders of BG30. Under B29, over BG30.

B56. Fill of grey brown sandy silt, contained small stones and mortar flecks. Fills B60, a probable grave cut. Under B52, over B60.

B60. Cut feature, only the southernmost 0.10m lay within the excavated area, the rest of the feature was excavated in 1991, the cut was 0.50m deep. B60 is presumably a grave cut, but no human bone was visible in the section. Under B56, over B32.

B81. Grave cut, contained fill B20, and skeleton BG18. The grave was heavily truncated by B15, no physical cut was discernible. This context was issued during post-excavation to simplify the stratigraphic relationships. Under BG18, over B27.

Group 3:8

B27 B33 B34 BG35 B39 BG40 B41 B42 BG43 B44 B45 BG46

Group 3:8 consists of four graves (B27, B33, B34, BG35, B39, BG40, B41, B42, BG43, B44, B45 and BG46) in trench B96-4 directly east of the chancel wall. Three of the burials BG40, BG43 and BG44 lay in a row at approximately the same level c. 1.50m east of the chancel wall. These burials lay in almost exactly the same position on the E/W axis as the overlying row of burials (group 3:7) but c. 0.40m lower. The three graves inter-cut without disturbing the adjacent burials. B41, the grave cut for BG43 cut into the fill (B45) of the grave of BG46

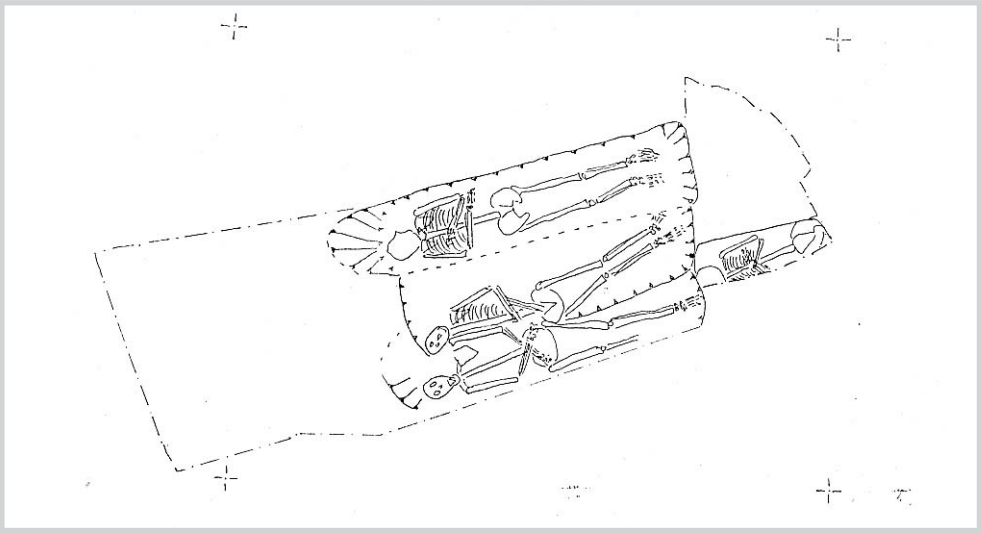


***Fig. 69**. Group 3:8, trench B96-4.*

without disturbing the body. The right side of BG43's torso lay directly over the left side of BG46's torso. Coffin nails were recovered from the fill (B45) around BG46 indicating a coffin which presumably protected BG46 when the adjacent grave was dug. B44, the grave cut for BG46 appeared to have truncated the southern edge of grave cut B39 without disturbing the burial (BG40). The lower half of the lower right leg and right foot of BG43 were excavated in 1991. No corresponding grave was present on the plan of graves from the 1991 excavation. These three burials lay deeper than the earlier graves in group 2:18 and these graves cut through the earlier burials. The disarticulated human bone in the fills is presumably from these earlier graves: B42 containing bone from BG70 and BG74, B27 and B45 containing bone from BG65. The fourth burial, BG35, lay to the east of the other four burials, at approximately the same level. BG35 lay under BG35 (group 3:7), in the same way as the other three burials lay beneath the four other graves in group 3:7.

Coffin nails were present around BG46 indicating a coffin burial. Grave cut B39 had square ends, with space for a coffin around the burial BG40. Some of the bones of BG40 had been displaced and the hands and feet lay flat. Despite the absence of wood fragments or coffin nails the disturbance of the bones and position of the feet suggest that this was a coffin burial. No traces of coffins were registered around BG35 or BG43. None of the grave fills contained brick fragments. A coin in a leather pouch was placed on the chin of BG40. The coin has been tentatively identified as belonging to the reign of Eirik Magnusson (AD1280-1299). BG40 was the earliest burial in this group, despite the absence of brick fragments in the fills, these individuals must have been interred after 1280.

The grave cuts for these graves could be relatively easily defined. The cuts were first registered where they cut through mortar layer B7 and natural clay B32. The burials lay c. 0.90m under the top of the natural clay, and 2.20m - 2.48m under the profiled base of the chancel wall. The interface between the profiled base and the foundation was presumably the level of the ground surface once the chancel extension was completed and the ground surface built up. It is highly unlikely that these graves were dug from this level. Even if the ground surface had sloped sharply away from the chancel wall these would have been very deep graves. It is possible that these graves, and those in the overlying group (group 3:7), were dug during the construction period, i.e. prior to the ground surface being built up to the level of the interface between the profiled base and the foundation.

Contexts

B27. Fill of dark grey brown silty sandy clay, contained beach gravel fragments, small stones and disarticulated human bone. The human bone probably originates from earlier burial BG65, that grave cut B39 truncates. Fill of grave cut B39. Under B81 and B44, over BG40.

B33. Grave cut, E/W orientated, 1m+ long, 0.30m+ wide, 0.20m deep. The southern edge of the cut was excavated in 1991, the eastern end was partially excavated in trench B96-1, partially removed by machine. Under BG35, over B32.

B34. Fill of yellow brown silty clay, contained small stones. Fill of grave cut B33. Under B28, over BG35, same as B55.

BG35. Adult skeleton, supine, oriented E/W, head to west. The easternmost part of the grave, the lower left leg

and foot, was excavated in trench B96-1, the westernmost half of the grave, the left side of the body from the skull to the pelvis, was excavated in trench B96-4. The left arm was present, folded over the right arm over the abdomen, but the left hand was missing, the right lower arm and hand were present. The bones were in poor condition, the body appeared to have been squashed into a small grave. No traces of a coffin were recovered. Under B34, over B33, same as BG48.

B39. Grave cut, E/W orientated, 2.20m long, 0.55m wide, 0.60m deep. The cut was roughly rectangular in plan, no traces of a coffin were present but the cut appears to have been dug to fit a coffin. Under BG40, over B7.

BG40. Adult skeleton, supine, oriented E/W, head to west. The left arm was folded over the chest, the left arm over the abdomen. The bone was in good condition, but had suffered from a little physical damage. No physical remains of a coffin were present, but the shape of the cut, and the level of displacement of the bones, especially the hands and feet, that lay flat, indicate a coffin burial. A coin in a leather pouch, HKH 11540, was placed on the skeletons chin. The coin can be tentatively identified from an x-ray as belonging to the reign of Eirik Magnusson AD 1280 - 1299 (See Skaare 1995:29, coin number 234). Under B27, over B39.

B41. Grave cut, E/W orientated, 2.10m long, 0.45m+ wide, 0.16m deep. The southern edge of the cut lay within the 1991 excavation, the lower right leg and foot bones were missing. The grave truncated adjacent grave fill B45 to the north but didn't disturb the burial BG46. Under BG43, over B45.

B42. Fill of grey brown silty sandy clay, contained small and medium sized stones and disarticulated human bone. Fill of grave cut B41. Under B24, over BG43.

BG43. Adult skeleton, supine, oriented E/W, head to west. The hands were folded over the abdomen, the right hand over the left. The lower half of the lower right leg and right foot were excavated in 1991. The bone was in good condition, no trace of a coffin was present. Under B42, over B41.

B44. Grave cut, E/W orientated, 1.90m long, 0.50m wide, 0.54m deep. The cut was roughly rectangular in plan and appears to have been dug to fit a coffin. No traces of wood remained but 4 coffin nails were recovered from within the fill. Under BG46, over B27.

B45. Fill of very dark grey brown silty sandy clay, contained patches of re-deposited natural orange clay, beach gravel fragments, disarticulated human bone and four coffin nails. Fills grave cut B44. B45 was cut into by grave cut B41, but the burial the fill contained, BG46, was not disturbed. Under B41, over BG46.

BG46. Adult skeleton, supine, oriented E/W, head to west. The left arm was folded over the abdomen, the right arm over the chest. The body was complete and the bone in good condition, despite adjacent grave cut B41 cutting into this grave. BG43 lay almost directly upon the southern side of BG46's torso without disturbing the bones. Four coffin nails were recovered from fill B45, indicating a coffin burial. Presumably the coffin was still intact when the adjacent grave was dug, protecting BG46. Under B45, over B44.

Group 3:9

B7 B69 B79 B80 B81

Group 3:9 consists of layers and structures interpreted as being connected to the extension of the chancel towards the east. These deposits were documented outside the eastern wall of the chancel, in trench B96-4. The cut of the construction trench for the chancel wall was exposed. The cut (B79) extended out 0.40m from the wall and was filled with stones and re-deposited moraine clay (B81). A stone structure (B73) that consisted of large unworked stones stacked upon one another was documented. Fill, B69 had been dumped around the stones holding them together, a skull and other disarticulated human bones were present within the fill. The structure must have been placed within a cut (B80) as it lay below the level of the natural clay. It had been truncated by later graves however and only two pillars of stone were extant, between 0.80m - 4.40m out from the chancel wall. This structure was also exposed in the 1991 excavations over a larger area. It appears to have been recorded as several discreet contexts in 1991, they don't appear to have been interpreted as forming a coherent structure. They were clearly laid in a cut however and were therefore deliberately deposited. The form and function of the structure is unclear but it may have been a foundation for a temporary structure connected to the construction of the chancel wall.

B7, a layer of white mortar, lay over both the chancel wall's foundation (B81) and the stone structure (B73). B7 was a hard layer of bonded mortar not a layer of mortar fragments. The mortar appeared to have been deposited whilst wet and had hardened in-situ. It is interpreted as waste from the rebuilding process. Similar mortar deposits were documented in the NE corner in trench M96-

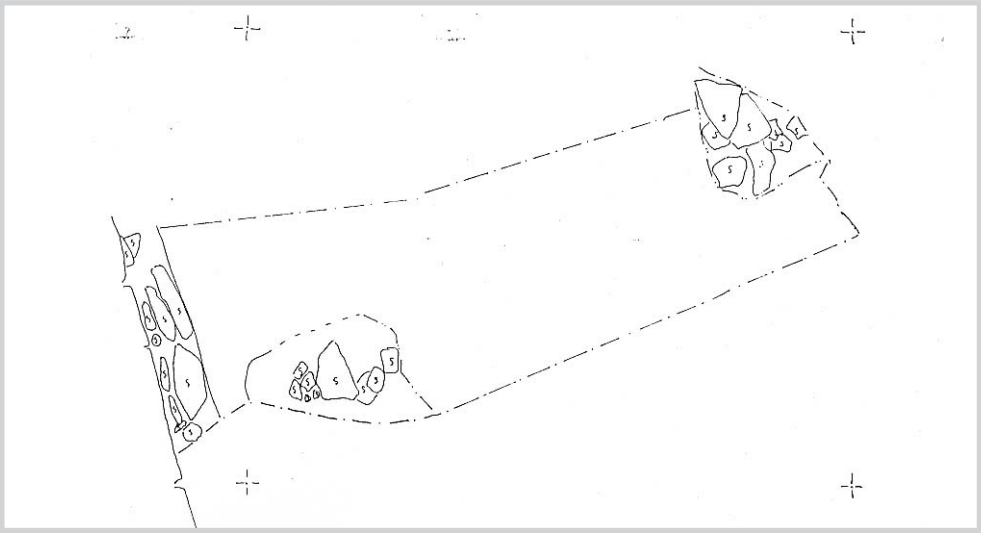


***Fig. 70**. Group 3:9, trench B96-4.*

11, group 3:15). This layer was uncovered in the excavations in 1991 and 1992. A large mortar layer was also uncovered to the SE. A comparison of the mortars indicated that it was related to the construction of the chancel foundations, but that the mortar layer that lay against the wall (B7) was connected to the construction of the standing wall (Pedersen E:A 2000 :197).

The construction cut B79 appears to cut through the natural moraine clay B32. It seems as though the turf and any other overlying deposits that were present in this area prior to the extension of the cathedral were stripped off prior to the digging of the foundation trench. The base of the chancel wall, i.e. the base of the ashlar masonry and its profiled base lay at 137.40 m over sea level, 1.30m above the level of the construction cut, i.e. 1.30m of the foundation stood above the level of the construction cut. The top of the deposits when excavation began was 136.70 m over sea level, 0.70m below the interface between the wall and its foundation. Presumably once the chancel was complete the ground level would have been built up to this level. The removal of the demolition deposits in the late 1800's presumably also removed the upper levels of the churchyard in this area. Disarticulated human bone was recovered from some of the modern demolition deposits that overlay the burials (see group 7:7), supporting the theory that the upper part of the churchyard was removed during the antiquarian investigations.

Contexts

B7. Layer of white mortar, the mortar was present primarily as a surface of mortar, it appeared as though it had been deposited whilst wet and had hardened in-situ, in some places the mortar had broken into lumps and was mixed with silty sand. The mortar contained beach gravel and charcoal flecks, no brick fragments were present within the mortar mix. Under B39, over B73 and B81.

B69. Fill of dark grey silty clay, contained a skull and other disarticulated human bone. Fills cut B80, and was dumped around stone pillar B73. Under B73, over B80.

B73. Stone foundation of large stones stacked roughly upon one another forming a foundation, fill B69 lay around and partially between the stones. The structure was heavily truncated, it was present on both the east and west side of grave cuts B41 and B44. The structure's function is unclear, it was possibly some form of temporary structure related to the building of the chancel. Under B7, over B69, same as BK22 (1991).

B79. Cut for the foundation trench of the east wall of the chancel. The cut extended c. 0.40m out from the wall. Under B81, over B37 and B72.

B80. Cut for stone foundation B73 and back-fill B69. The structure was so heavily truncated that no cut was registered during excavation, this context was issued during post-excavation to rationalise the stratigraphic relationships. Under B69, over B63, B72 and B75.

B81. Fill of orange brown silty clay and large stones. B81 filled R79, the construction cut for the east wall of the chancel. B81 was not excavated. Under B7, over B79.

Group 3:10

M42 M43 M45 M46 M49 M70

Group 3:10 consists of gravel layers (M42, M43 and M49) that were dumped over and around the underlying postholes M54 and M68, (group 3:11) and M45, M46 and M70 that filled the space created by the stone linings

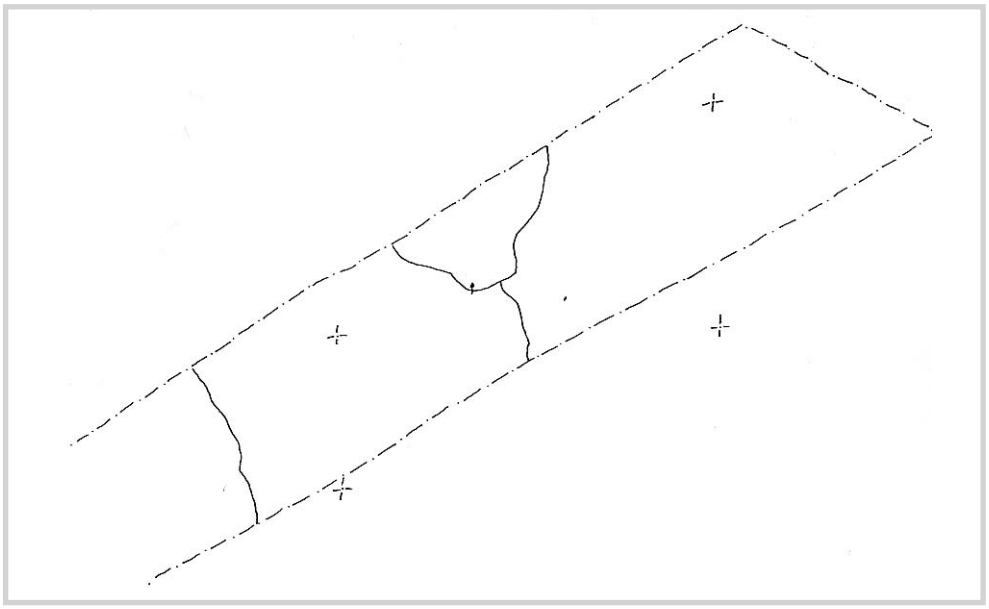


***Fig. 71**. Group 3:10, trenches M96-7 - 10.*

once the posts were removed in trench M96-7 - 10. Fill M46 was a primary fill that appeared to have been washed into the open space, M45 and M70 were deliberate infilling episodes. Layer M42 filled the upper part of posthole M54 but also extended beyond the posthole. This group represents the disuse of posthole group 3:11 .

Contexts

M42. Layer of brownish grey gravel, mixed with a little sand and clay. Partially fills the top of posthole M54, but also extends beyond the cut. Under M41 and M62, over M43, M45 and M70, same as M65.

M43. Layer of yellowish brown silty clay and gravel, contained a few small to medium sized stones. Under M42, over M49.

M45. Fill of fine gravel, mixed with clay and sand, contained a few small wood fragments and a few small bone fragments. Fill of posthole M54, lies over primary fill M46. Under M42, over M46.

M46. Fill of grey clay. The fill is only 0.05m - 0.10m thick and lay in the base of posthole M54, possibly washed in after the post was removed. Under M45, over M51.

M49. Layer of light grey crushed limestone/gravel, fills a shallow, c. 0.50m x 0.50m, depression in the underlying layer M48. Under M43, over M48.

M70. Fill of stone lined posthole M68. Mid greyish brown silt, contained charcoal flecks. Under M42, over M76.

Group 3:11

M48 M51 M52 M54 M63 M68 M69 M76

Group 3:11 consists of two stone lined postholes (M51, M52, M54, M69, M68 and M76), thin gravel layer M63 and compact gravely silt layer M48 in trench M96-7 - 10. Layers M48 and M63 were laid around the stone lining of the postholes M51 and M76, that stood over the top of the cuts (M54 and M68). M48 was very compact and appeared to form a rough surface associated with the postholes. Both postholes lay in a hollow between two knolls of bedrock. Thin gravel layer M63 was used to level off the area to the west, over rough stone layer M66 (group 3:12), but didn't form as robust a surface as that created by M48. The hollow between the bedrock knolls was the only place in this area that it was possible to dig a posthole. They are possibly related to a similarly constructed posthole in M96-11 to the south (group 3:16), that was also dug against the edge of a bedrock knoll. Their function and that of the associated surface(s) is unclear. The most likely interpretation is some kind of temporary structure, with a rough working surface, possibly connected to stone working or some other building activity. The extensive dumps of construction debris in M96-11 (group 3:15) being debris from this activity.

Contexts

M48. Layer of gravely silt, yellow in colour but speckled with grey spots, contained small limestone and beach gravel, very compact. Under M49, over M51 and M63, same as M67 and ML20 (1992).

M51. Stone lining of posthole M54, comprised large flattish limestone blocks and occasional rounded stones. The stones ranged in size from 0.35m x 0.35m x 0.15m –

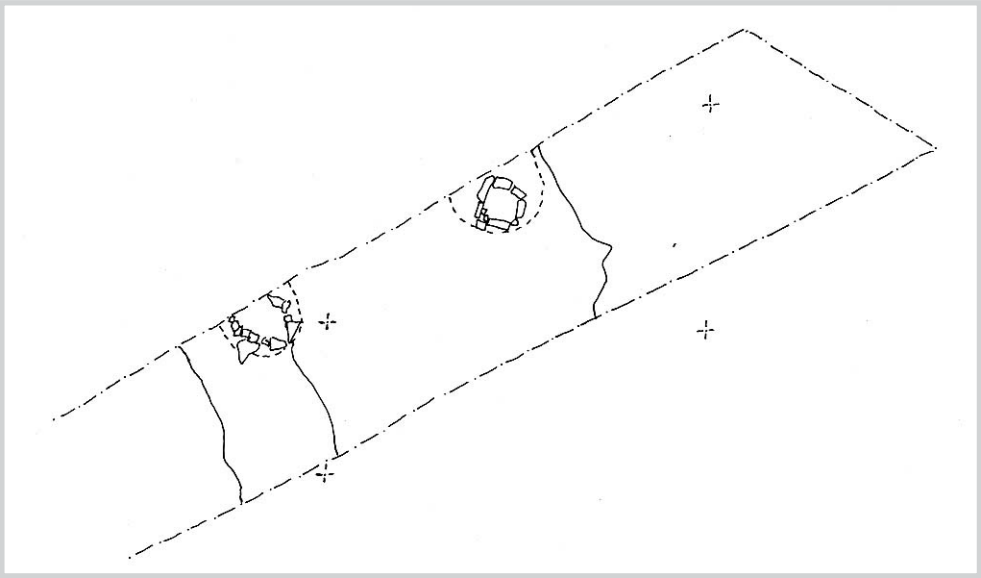


***Fig. 72**. Group 3:11, trenches M96-7 - 10.*

0.20m x 0.20m x 0.05m. The internal depth of the packing was 0.40m. A single course of upright stones formed the lining, a single flat stone formed the base. The packing stones stood c. 0.10m higher than the top of the cut M54, layer M48 extended over the cut and up to the packing stones and lay flush with the top of the stones. Under M48 and M46, over M52.

M52. Back-fill to posthole M54, M52 lay between post packing M51 and cut M54. The fill consisted of loose stones. The fill lay higher than the top of the cut and spread beyond the cut to the south, see M51. Under M51, over M54.

M54. Cut of a stone lined posthole, roughly circular in plan, 1.20m in diameter, the sides were cut at a steep angle, the cut was 0.40m deep. Stone lining M51 stood c. 0.10m above the cut, back-fill M52 also lay over the top of the cut, layer M48 was dumped around the upstanding lining stones. Under M52, over M50.

M63. Layer of greyish brown sandy clay/gravel, the layer was only, 0.01m thick, some of the stones from the underlying layer M66 protruded through the layer. Under M48, over M66.

M68. Cut of a stone lined posthole, appeared to be roughly circular, but lay partially outside the excavated area to the north. The sides were cut at a near vertical angle, the posthole was c. 1.05m in diameter, 0.46m deep. Cut into sterile moraine clay. Under M69, over M50.

M69. Back-fill of posthole M68, consisted of a loose stone fill between stone lining M76 and cut M68. Under M76, over M68.

M76. Stone ling of posthole M68, consisted of large limestone blocks stood on end, no stones were present in the base of the posthole. The average size of the stones was 0.25m x 0.15m. Under M70, over M69.

Group 3:12

M50 M66 M73 M75

Group 3:12 consists of stone make-up layer M66, thin gravely silt/clay layers M73 and M75, and extensive gravely silty clay layer M50 in trench M96-7 - 10. M66, M73 and M75 were localised to the south against the edge of the bedrock knoll, whereas layer M50, covered most of the area. Stone dump M66 was deposited over M50, whereas M73 and M75 lay beneath it.

This group lay over the moraine clay M53, between two upstanding bedrock knolls. It appeared to be dumping/make-up to build up the ground surface prior to the cutting of postholes M54 and M68. It is not certain whether the area was built up in connection with the construction that the postholes represent or whether these layers were dumped here in period 2. There is little evidence of any landscaping in this area in the earlier period however. This area lay further from the original cathedral than it did after the building was extended towards the east. It seems most likely that the building up of the ground was directly in relation to the rest of the activity in this trench. Group 3:12 is therefore placed in period 3.

Contexts

M50. Layer of dark brown silty sandy clay mixed with gravel, contained a few medium sized stones. Under M54, M66 and M68, over M73, same as M71.

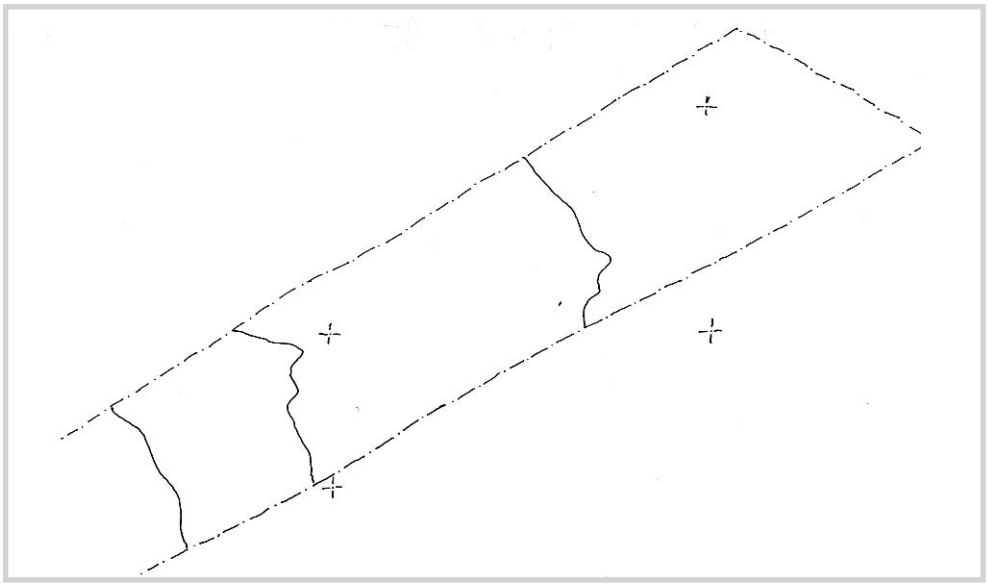


***Fig. 73**. Group 3:12, trenches M96-7 - 10.*

M66. Layer of medium to large stones, > 0.25m^3. Under M63, over M50.

M73. Thin layer of gravel/silty clay, yellowish in colour. Under M50, over M75.

M75. Thin layer of dark brown gravely sandy clay. Under M73, over M53.

Group 3:13

M86 M87 M89 M90 M91 M92 M111 M112 M113 M114 M119

Group 3:13 consists of a series of dumped layers in trench M96-7 - 10. This group consists of two silty clay and stone dumps, a layer of deliberately laid stones that formed a rough surface (M86, M91 and M114), and a number of discreet deposits that respected the upper stone surface M86 (M87, M89, M90, M92, M111, M112, M113, M114 and M119). Silty clay and stone layers M91 and M114 covered the area west of the westernmost bedrock knoll, and appeared to form a bedding for surface M86 which was confined to a c. 7m long area. M86 consisted of large flattish stones laid horizontally. The stones were not laid tightly against one another but were clearly deliberately laid. The underlying stone make-up layers formed a rough surface where deliberately laid horizontal stones were missing. Some of the stones were worn on their upper surface.

There was evidence of a possible hearth or bonfire, west of M86, (M87 and M89). Two discreet silty clay and stone layers (M90 and M92) also lay to the west of M86. To the east a shallow cut (M119) filled with beach gravel (M111) was cut into the stone make-up layers. Two discreet gravely clay layers that contained animal bone and charcoal flecks also lay to the west of M86.

M86 and the underlying make-up layers M91 and M114 appear to form a rough path. Evidence of other activity, a hearth and discreet layers containing animal bone and charcoal were recorded on either side of the path. A number of the layers in this group contained brick fragments. There is no stratigraphic connection between this group and posthole group 3:11 that lay to the east of the bedrock

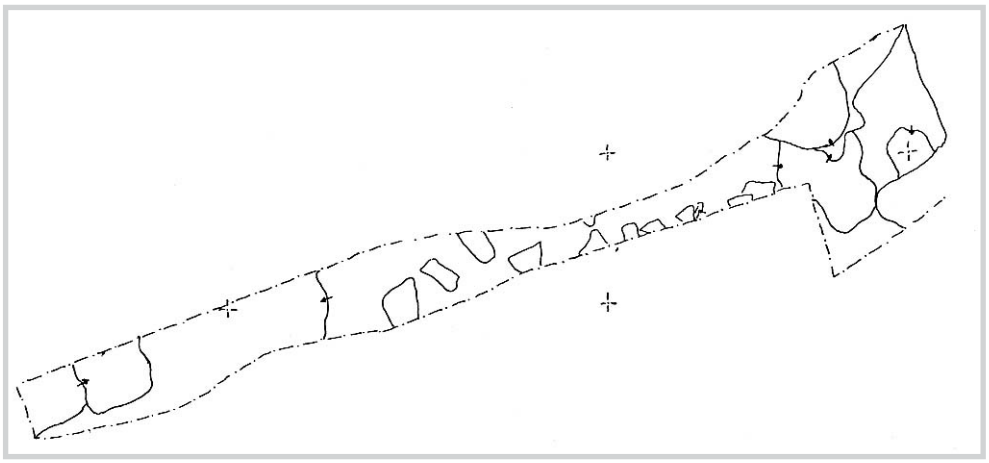


***Fig. 74**. Group 3:13, trenches M96-7 - 10.*

knoll. It is tempting to see all this activity as contemporary but there were no traces of brick or tile in the postholes or the related contexts. Path M86 was documented in the narrowest part of the trench, it is therefore difficult to draw any conclusions as to its orientation or to suggest to what it relates. The 1992 excavations uncovered evidence of a path around the churchyard in this area that was in use up until c. 1250 (Pedersen E. A. 2000:181-2). The 1992 excavations did not uncover any evidence of a later stone path however (see Pedersen E. A. 1994: 78-81).

Contexts

M86. Layer of large flattish stones, > 0.60m x 0.30m x 0.20m. The stones were laid horizontally forming a roughly level surface, with a slight slope down to the west. Under M83, over M91.

M87. Layer of charcoal and scorched sandy silty clay. The layer is confined to a 0.40m x 0.40m area, 0.04m thick. The underlying layer was burnt indicating burning in-situ. Presumably remains of a hearth or bonfire. Under M83, over M89.

M89. Layer of dark brown silty clay and red sandstone fragments, the stones appeared to have been burnt, some of the fragments had traces of mortar on their surface. Under M87 and M92, over M91.

M90. Layer of brown gravely sandy clay, contained medium sized stones. Under M83, over M92.

M91. Layer of brown clay and medium to large stones, some of which appeared to be worn on the surface, the layer contained mortar flecks and brick fragments. Under M86, M89 and M114, over M95, same as M93, M115 and AL6 (1992).

M92. Layer of brown silty sandy clay, contained small stones, and mortar flecks. Under M90, over M89.

M111. Fill of cut M119, consisted of beach gravel. Under M117, over M112.

M112. Fill of greyish brown silty clay, contained beach gravel, small stones, animal bone fragments and a few charcoal flecks. Under M111, over M119.

M113. Compact layer of greenish grey clay, contained concentrations of gravel, animal bone fragments and a few charcoal flecks. Under M119, over M111.

M114. Layer of greyish brown silty clay, contained gravel concentrations, small to medium sized stones, mortar flecks, animal bone and brick fragments. Under M119, over M91.

M119. Cut of a shallow, roughly circular feature, 1.40m+ in length, 0.70m+ wide, 0.30m deep. The feature lay partially outside the excavated area, it had gently sloping sides and a flat base. Under M112, over M114.

Group 3:14

M142

Group 3:14 consists of M142, the back-fill of posthole cut M129, (group 3:16) in trench M96-11 - 15 and BF96. M142 fills the space created by post packing M128. The posthole appears to have been cut through earlier layers and construction debris layers were then dumped around it. A similar construction method was used with posthole M54 in M96-7. M142 consists of a mixture of silt and stone working debris and contains brick fragments, none of the construction contexts of the posthole (group 3:16) or the construction debris contexts (group 3:15) contained brick fragments. It is unclear how long the posthole may have been in-use before it was back-filled by M142, it may have been gradually silted up after the post was removed/rotted.

Contexts

M142. Fill of dark brown humus rich silt mixed with stone chips, contained mortar flecks, brick fragments, animal bone and charcoal flecks. Fills the space within post packing M128, in posthole cut M129. Under M121, over M128.

Group 3:15

M124 M125 M126 M130 M131 M132 M136 M138 M149 M152 M154 M155 M158 M159

Group 3:15 consists of a number of contexts interpreted as waste from construction processes in trench M96-11 - 15 and BF96. Layers of limestone chips and crushed limestone, mixed to varying degrees with silt predominated (M124, M125, M126, M138, M149, M152 and M158). These layers varied in thickness from thin lenses of crushed limestone to an extensive 0.25m thick layer (M125). These deposits are interpreted as debris from stone working. Layer M125 contained stone fragments < 0.20m x 0.20m, as well as crushed limestone, i.e. debris from the whole range of stone working stages. This group also consists of layers of mortar that appeared to have been deposited whilst still wet and that have hardened in-situ forming 'cakes' of mortar (M131, M132, M154 and M159), in some cases these cakes had fused with ele-

ments from the underlying layer. A number of lenses of charcoal rich silt and sand (M130, M136 and M155) were interleaved with the stone and mortar layers.

The mortar layers were concentrated to the northern end of the trench. It is likely that bedrock was exposed in this area when these layers were deposited. The stone chip layers were also present here as thin lenses. To the south where the bedrock sloped down and gave way to moraine clay, the stone chip layers, M125 in particular, appear to have been dumped as make-up. This building up of the ground surface separates the two grave sequences in this area, group 2:19 and group 4:12.

The construction activity that these layers are evidence of, probably took place in this area. Some of the deposits, particularly the mortar layers, lay in-situ. It is likely however, that some of the stone debris, in particular layer M125, had been deliberately re-deposited as make-up to build up the ground surface. Possibly as landscaping after the extension of the cathedral towards the east, but just as likely to facilitate more burials in the area.

A charcoal sample from mortar layer M154 was radiocarbon dated to CAL AD 1020 - 1300 at the 95% level of confidence. There was no physical link between the stone chip make-up layers and the thin lenses of mortar, stone and charcoal. It is possible therefore that the two sets of activities belong to two different periods. There appeared to be very little activity in this area in period 2 however. The area where M154 lay is c. 24m NE of the first chancel. This building activity is more likely to be related to the extension of the chancel to the east. The mortar lenses and stone chip make-up layers have been therefore grouped together and are interpreted as connected to the re-building of the chancel. The radiocarbon date from M154 could place the activity in periods 2 or 3, but it is interpreted as belonging in period 3.

Contexts

M124. Mixed layer of silt, stone chips and crushed stone, contains pockets of greyish brown sand. Under M121, over M130.

M125. Layer of stone chips and crushed limestone mixed with humus rich silt and sand. The layer was not homogenous, with concentrations of humus and sand apparent, the stone chips were < 0.20m x 0.20m, but most were < 0.05m x 0.05m. The layer was < 0.25m thick. Under M126, M165 and M166, over M138, same as M173, M180 and ML4(92).

M126. Layer of silt and stone chips. Under M140, over M125.

M130. Thin layer of humus rich dark brown sand, 0.03m thick. Under M124, over M131.

M131. Layer of yellow mortar, recorded from the section, the layer was 0.25m long, 0.01m - 0.05m thick. It appeared as though the mortar had been deposited whilst wet and had hardened in-situ. Under M130, over M149.

M132. Layer of white mortar, recorded from the section, the layer was 0.70m - 1m long, 0.01m - 0.05m thick. It appeared as though the mortar had been deposited whilst wet and had hardened in-situ. Under M152, over M136.

M136. Thin layer of charcoal and silt, 0.01m thick. Under M132, over M134.

M138. Thin layer of stone chips, 0.05m thick. Under M125, over M128 and M146.

M149. Layer of stone chips and crushed stone < 0.05m 0.05m x 0.05m, mixed with a little sand. Under M131, over M152.

M152. Layer of stone chips and crushed stone. Under M140, over M132.

M154. Layer of mortar, small stones and charcoal flecks. It appeared as though the mortar had been deposited whilst wet and had hardened in-situ, the stones and charcoal appeared to have been mixed with the mortar whilst it was wet but were not necessarily a part of the mortar mix. A charcoal sample from the layer was radiocarbon dated to CAL AD 1020 -1300 at the 95% level of confidence (Beta-173763, sample HKH11752). Under M155 and M157, over M135.

M155. Layer of humus rich dark reddish brown silt, contained charcoal flecks and small stones. Under M156, over M154.

M158. Layer of medium brown sandy silt and stone chips, crushed limestone. Under M153, over M159.

M159. Layer of mortar and dark brown silt. The mortar is present as broken lumps and one concentrated surface of porous sandy yellow mortar, mortar flecks are also present within the silt matrix. Under M158, over M135.

Group 3:16

M128 M129 M137 M145

Group 3:16 consists of a posthole (M128, M129, M137 and M145) in trench M96-11 - 15 and BF96. The cut (M129) was only definable to the south, to the north the natural slope of the bedrock appeared to define the limit of the feature. The feature was 2.10m wide whereas the internal diameter of the post packing, M128, was c. 0.40m. The posthole was back-filled with M137 on the southern side and M145 on the northern side of the post packing. The posthole is possibly related to the postholes in M96-7 (group 3:11).

Contexts

M128. Stone packing within posthole cut M129. The packing consisted of large stones stood on end to form the sides, and laid flat to form the base. Under M138 and M142, over M145, same as M177.

M129. Cut of a posthole, recorded from section, c. 2.10m wide, 1.20m deep. The southern edge was cut at a steep angle, there was no definable cut to the north, it appeared as though the edge of the bedrock formed the northern limit of the feature. Under M137, over M122, same as M178.

M137. Back-fill of posthole, yellow clay and stones. M137 filled the southern side of the feature, between cut, M129 and stone packing M128. Under M145, over M129.

M145. Back-fill of posthole, grey gravely clay silt and stones. M145 filled the northern side of the feature, between cut, M129 and stone packing M128. Under M128, over M137, same as M176.

6 Period 4: 1260-1537

6.1 Period 4 summary

6.1.1 Period 4 dating

Period 4 consists of layers and structures dated to after the cathedral was constructed. All the deposits and structures related to the extension of the cathedral towards the east were grouped together in period 3. As such period 3 could be considered a sub group of period 4.

The beginning of this period is dated by the coin found in mortar surface R169 (group 2:12) in the crossing. This find indicates that the cathedral had been completed and was in use by 1260 (see 4.2 Period 2 discussion). The end of this period is defined by the Reformation. No physical traces of this event were recorded, but it does indicate a theoretical change in the use of the cathedral. There is evidence of activity that is interpreted as indicating that parts of the cathedral were no longer in use. This activity is grouped together in period 5. It is uncertain however whether the interface between the use of the cathedral and the activity in period 5 should be placed at the Reformation or the fire in 1567.

The dating evidence in period 4 doesn't define the limits of the period. The dates merely place the dated deposits within this period. A sample from burnt timber R416, that lay in the SW tower room was radiocarbon dated to CAL AD 1255 – 1395 at the 95% level of confidence. The timber lay within a group of deposits (group 4:1) interpreted a construction debris. The dating implies that the debris may have come from the rebuilding of the cathedrals eastern end. A sample of wood from coffin R226 (group 4:6) in the grave chamber in the north arcade was radiocarbon dated to CAL AD 1310 - 1360 and 1390 - 1520 and 1590 - 1620 at the 95% level of confidence. The cut for the grave chamber was sealed by the tile floor and its beach gravel bedding indicating that the floor was laid in the north aisle after 1310. A seal stamp recovered from the fill (R72, group 7:5) of a robber cut in the crossing can be related to an individual who was alive in AD 1346. He is presumed to have been interred in a grave that was cut after the ground level was raised and a second floor layer laid. This is interpreted as indicating that the tile floor had been laid in the crossing by a short time after 1346 (see 5.2. Period 3 discussion). The laying of the tile floor would thus appear to have taken place between 1310 and c. 1350. It is not certain however that the floor was laid in the crossing and the aisles/nave simultaneously. The two dates cannot therefore be used in this way. Furthermore the possibility that a brick floor was laid in the crossing, completely removed and replaced by a tile floor cannot be entirely ruled out. If this were the case it would be the brick floor that had been laid by c. 1350. This is considered to be unlikely however.

A charcoal sample from R5 (group 4:11) that was uncovered in a test pit in the sacristy was radiocarbon dated to CAL AD 1010 - 1300 at the 95% level of confidence. This dating is in conflict with other evidence that indicates that the Sacristy was built after 1450 (see 6.2 Period 4 discussion). The provenance of the charcoal is uncertain however, it is interpreted as material dumped from elsewhere to level off the ground prior to the laying of a floor surface.

A second churchyard wall was uncovered in trench P96. A charcoal sample from the wall core (P47, group 4:25) was radiocarbon dated to CAL AD 1420 - 1640 at the 95% level of confidence. This dates the rebuilding of the churchyard wall to the latter part of the cathedral's period of use. By association it also dates the building up of the ground surface in trench P96 and possibly also the dumping of building debris along the outside of the north aisle to after 1420.

Two conflicting radiocarbon dates were obtained from a layer of fire cracked stones in trench U96. U30 (group 4:38) was dated to to CAL AD 815 - 840 and AD 855 - 1035 and to CAL AD 1180 - 1420, both at the 95% confidence level. The underlying layer U35 (group 4:40) contained brick fragments however. U30 is therefore dated to between 1250 and 1420.

The presence of brick fragments in layer U90 (group 4:39) and the underlying make-up deposits (group 4:40) date the construction of the churchyard wall U71 (group 4:37) uncovered in trench U96, to after 1250.

Burnt wood in the base of a cut feature in trench S96 (group 4:44) was radiocarbon dated to CAL AD 1450 - 1660 at the 95% level of confidence. The feature contained a stone wall at the eastern end of the cut and a burnt timber floor lay in the base. The western end of the feature was open towards Lake Mjøsa. The feature is tentatively interpreted as a boat house. The dating of the fea-

ture was inconclusive and the feature could have been placed in periods 4, 5 or 6.

6.1.2 Period 4 interpretation

Evidence of remodelling of the SW tower room in the south aisle was uncovered. Most of the structural elements in this room were interpreted as being part of the original cathedral (group 2:1). The documented changes to the room (group 4:2) included brick kerbs, laid along the north and south sides of the room and a single large stone, aligned with the southern brick kerb that may also have been part of this rebuilding. The kerb to the north had a slightly different alignment to foundation R408 (group 2:1) that it was laid against. None of these structures appeared to be load bearing. Their addition to this room was more likely to have been to change its appearance than to alter it structurally. The step between this room and the south aisle (R330/R155, group 2:1) went out of use in this period. The N/S aligned stone setting (R330) remained as a physical threshold between the aisle and the tower room, but the slabs (R155) that lay at a lower level were covered with mortar bonded stones. A succession of slaked lime, burnt sand and charcoal layers were dumped over the area, levelling off the ground surface to the top of the brick kerb that ran along the northern edge of the room. These deposits appeared to be construction refuse. The lime layers were dumped whilst wet and the charcoal layers whilst hot. A radiocarbon date recovered from within this sequence of layers suggested the debris may have originated from the building work at the eastern end of the cathedral recorded in period 3. The uppermost layer R140 may have been the remains of a wooden floor that covered this room. Although it underwent some form of change the area under the SW tower continued to be marked off as a separate room.

Broken up brick and mortar layers (group 4:4) were visible protruding out from under the reconstructed altar foundations that lay against the western faces of the easternmost columns in both the north and south arcades. Modern cement bonded stone altar foundations had been built over the remains of the stone originals against the columns of both the north and south aisles (see groups 7:1, 7:3, 2:5 and 2:7). In these two cases, and probably also on either side of the entrance to the chancel (see group 7:5), the original altar foundation had been constructed of brick and mortar. These had been broken up, but lay partially in-situ. They lay over the remains of the brick floor and are therfore later than the stone altar foundations that were butted by the floor remains. When these altar foundations were constructed is unclear.

A grave chamber (group 4:6) was excavated between two of the columns of the north arcade. The chamber had been emptied in antiquity. The remains of a child's coffin, that rested upon a wooden bier, and part of another coffin, probably full size, that had been filled with slaked lime lay in-situ in the base of the chamber. The child burial was present. The other coffin was empty, but a concentration of bones from a female adult was recovered from the back fill of the chamber. The southern wall of the chamber was constructed of brick whilst the other three were of stone. The brick wall butted the eastern and western walls. This wall appeared to be secondary indicating that the chamber was originally larger. The rest of the chamber to the south was not uncovered. The beach gravel bedding for the tile floor (group 4:5) lay against the outside of the southern wall. No construction cut was visible through the beach gravel indicating that the chamber had been reduced in size prior to the laying of the tile floor.

The tile floor consisted of square red ceramic tiles, most of which were 0.25m x 0.25m, set in a bed of beach gravel. They were uncovered over a large area of the north aisle and between the columns of the north arcade (group 4:5), in the SE corner of the south aisle (group 4:3), over parts of the north transept (group 4:7), in the crossing (group 4:8) and possibly also in the sacristy (group 4:10). Church floors of unglazed tiles of this size have been recorded elsewhere, the tiles are assumed to have been produced in Norway rather than imported (Kielland 1921:147; Stigum 1960; Ekroll 1997:72). One of the tiles in the corridor between the crossing and south transept had beach gravel embedded in the base of the tile indicating that it had been laid upon beach gravel before being fired, clearly indicating that the tile was locally produced.

A square stone foundation (group 4:13) was uncovered outside the eastern end of the church, NE of the chancel. This had been uncovered in both 1998 and 1992 and is known as the Bishop's Foundation (Biskopsfundamentet). It has been interpreted as a foundation for a tower that supported a walkway from the Bishops Residence into the cathedral. In addition to the foundation, two other walls/foundations, were uncovered. One was WSW/ENE aligned and ran from the foundation under the buttress at the external NE corner of the room north of the chancel. The other was NNW/SSE aligned and formed the eastern wall of the cathedral directly north of the chancel. These two walls would have met under the buttress at the NE corner of the room north of the chancel. It was constructed differently form the foundation of

***Plate 2**. Upper brick floor, period 4. The tile floor covered most, if not all of the cathedral. South aisle group 4:3, north aisle group 4:5, north transept group 4:7 and crossing/south transept group 4:8. Areas with bricks are marked with red hatching, areas with only beach gravel acting as bedding for the tiles are hatched blue.*

the chancel wall, but in the same way as the Bishop's Foundation and the other wall. It is possible that the room north of the chancel was constructed at the same time as the foundation. It was not possible to determine conclusively whether the supposed walkway would have entered the cathedral at ground level or the storey above.

A single grave (group 4:12) was recorded north of the Bishop's Foundation. A single grave was also recorded in trench P96 (group 4:22) at the NW corner of the churchyard. Along the west front however, in trenches J96-8, D96 and H96-14, sixty burials were recorded. Of these ten were recorded from the profile of H96-14 (groups 4:31 and 4:32). Only three burials lay entirely within the area of excavation (group 4:26). Two distinct rows of burials could be identified. The complete graves were part of the row that lay closest to the cathedral. The burials in the row to the west were only partially uncovered. The burials in the row nearest the cathedral were the latest in trench D96. The burials recorded from the profile in H96-14 would have lain in the row nearest the cathedral, it was not possible to determine if these were the latest graves in this trench. The upper surface of the churchyard in this area appeared to have been between 136.60 - 136.87 m over sea level. The interface between the foundation and profiled base of the cathedrals west wall lay 0.40m - 0.70m higher, indicating that the ground sloped away from the cathedral even though the ground level had been built up substantially. The relatively horizontal plateau that lies outside the west front today is probably a result of a levelling off of the terrain with demolition deposits from the cathedral. The medieval terrain would have sloped away to the NW to a much greater degree. The steps into the west front, that relate to the flat terrain, are interpreted as a modern reconstruction (see group 7:16), not a late medieval construction as indicated by the 1992 excavations (see Pedersen E. A. 2000:198-99).

There was evidence for the building up of the ground surface along the north side of the north aisle in this period. Two groups (4:14 and 4:15) of make-up dumping were recorded in trenches J96-1 - 4. Group 4:14 was reminiscent of the latest group of make-up dumps in trench P96 (group 4:20). This trench ran down the steep slope at the NW corner of the churchyard from the plateau down to the churchyard wall that stood at the bottom of the slope. The trench was dominated by layers of demolition debris, mixed with some waste from construction processes (group 4:24). A turf horizon (group 4:23) lay over these deposits, indicating a period of stability with no further dumping. This was overlain by two later make-up episodes (groups 4:21 and 4:22). The demolition deposits in group 4:24 butted the secondary churchyard wall and its foundation (group 4:25). This wall replaced stone and turf wall P52 (group 2:25). The new wall was 2m wide and constructed of large mortar bonded stones. A radiocarbon sample from the core dated the construction of the wall and the dumping activity in P96 to after AD 1420.

The churchyard wall was also uncovered along the southern side of the churchyard in trench W96 (see the trench description) and at the SE corner in trench U96 (group 4:37). The wall in these trenches was mortar bonded, but was not as wide as the wall in P96. An excavation in 1916 uncovered two parallel churchyard walls east of the chancel, indicating that the churchyard had been extended towards the east. The wall in U96 was aligned NNE/SSW. It is interpreted as secondary, built to connect the original southern churchyard wall with the newer eastern churchyard wall. It cut through a turf horizon (group 4:39) that continued in use outside of the churchyard after the wall was constructed. This layer and the make-up layers beneath it contained brick fragments indicating that the wall was constructed after 1250. The turf lay over make-up deposits of re-deposited moraine clay and construction debris (group 4:40). This dumping was probably connected to a building phase of the Bishops Residence. A refuse dump of fire cracked stones (group 4:38) was also recorded in trench U96.

Rubbish pits and two possible postholes (group 4:41) were recorded in trench T96 outside of the churchyard. A silt layer, possibly a turf horizon was also recorded. They were not empirically dated but are placed in period 4.

A structure in trench S96 was also placed in period 4, a radiocarbon date implied it could also have been placed in periods 5 or 6. It consisted of a dry stone wall built in a cut feature at its eastern end. The base of the cut was covered by wooden planking that had subsequently burnt. The western end of the feature was open to Lake Mjøsa. The feature is tentatively interpreted as a boat house.

6.2 Period 4 discussion

The SW corner of the south aisle, the room under the SW tower, appeared to have been restructured in period 4. The activity was divided into two groups (2:1 and 4:2), but the area was not fully excavated and in some cases it was difficult to determine which elements were primary and which secondary. Group 4:2 included a line of bricks (R376) that were mortared onto the southern face of foundation R408 (group 2:1), that lay between the respond and the westernmost freestanding column (R377

and R372 respectively, group 2:1). The bricks had a slightly different alignment than R408. They stood 0.10m out from R408 at their eastern end, but were flush against it 2m to the west and formed a kerb along the edge of R408. A similar brick kerb was built into R379/380 (group 2:1) in the SW corner of this room. The bricks in R379/380 were recorded as part of the wall, but were in all probability secondary. They also appeared to have a slightly different alignment than R379 and the southern cathedral wall R384 (group 2:1).

A single large stone R360 was also grouped in period 4. It stood upon a bed of mortared small stones (R348). R360 stood alone but was bounded to the east by R365 (group 2:1) and may have been truncated to the west by later cuts R333 and R378 (group 7:1). Nothing lay beneath the small stones R348, R360 did not appear to be a load bearing structure. Its northern edge was in line with the brick kerb in R379/R380 and may have been an extension of that. R408 and R379/R380 were not parallel, the kerbs that R376, the bricks in R379/R380 and R360 create were parallel and formed a right angle with R330 (group 2:1) the threshold between the SW tower room and the south aisle.

Immediately west of R330 lay stone slabs R155, these lay at a lower level, effectively creating a step up into the aisle. The remains of a layer of small and medium sized stones (R399) were bonded to the slabs with a layer of mortar R347. The whole of the slabs were not exposed, these stones did not cover the whole of the slabs, mortar R347 was more extensive than R399. Silt/charcoal layer R140 (group 4:1) lay over R399. This may have been the remains of a wooden floor in the room that lay flush with the top of the bricks, but covered the earlier slabs. R399 and R347 indicate that the slabs no longer functioned as a surface, but their function is unclear. They may have been laid to build up the level of the slabs to allow R140 to be laid, but either they were not laid over the whole of R155 or they were partially removed prior to the deposition of R140.

The central area of the SW tower room was covered by a series of thin layers of charcoal/carbonised wood, slaked lime and burnt silt/sand. A single layer of mortar and a cut feature, partially filled with lime were also recorded. These deposits were not fully exposed, and only partially excavated in limited test areas, they are grouped together as group 4:1. The uppermost layer(s) R140 and R387 may have been the same layer, representing a decayed or burnt wooden floor. These layers lay upon a series of interleaved slaked lime, charcoal and burnt sand layers. At least one of the lime layers (R393) appeared to have been deposited whilst still wet, it had hardened in-situ and bonded with the underlying layer R394. Similarly at least one of the charcoal layers (R391) was deposited whilst the charcoal was still hot, as it had scorched the underlying layer R392. These deposits are interpreted as dumping of waste from construction activity, the slaked lime being from mortar mixing. A sample from burnt timber R416, that lay in between two lime layers was radiocarbon dated to CAL AD 1255 - 1395 at the 95% level of confidence. It is not certain what construction activity these deposits relate to, but the dating suggests the rebuilding work at the eastern end of the cathedral in period 3. The dumping built up the ground level in this room prior to the laying of the possible timber floor (R140/R387).

Two layers of broken mortar fragments (R26 and R193, group 4:4) were recorded protruding out from underneath the cement bonded altar foundations that butted the easternmost columns in both the north and south arcade (see groups 7:2 and 7:3). The mortar appeared to be the same as the mortar bedding for the brick floor (see groups 2:4 and 2:6), but lay upon the brick floor. A similar situation was observed either side of the entrance to the chancel. The brick and mortar layer documented there (R247, group 7:5) appeared to be totally re-deposited whereas the layers in group 4:4 are interpreted as being partially in-situ, partially re-deposited. They are interpreted as representing the broken up remains of brick and mortar altar foundations. Stone altar foundations under cement bonded reconstructions were documented against several of the columns in the arcades (see groups 7:2, 7:3, 2:5 and 2:7). The stone altar foundations are interpreted as being constructed at the same time as the cathedral, the brick and mortar altar foundations were probably added later.

A grave chamber (group 4:6) was excavated between two of the columns in the north arcade. The chamber had been opened, i.e. excavated, a concentration of human bones (R227), were placed in the SE corner, the bones were probably from one individual, an adult female, but the whole body was not represented (see group 7:3 for the emptying of the chamber). The robbing activity had continued down to the base of the chamber, but some remains still lay in-situ. The lower legs of an infant (RG335) lay in its wooden coffin, which lay upon a bier (R229) in the NE corner of the chamber. The remains of a wooden coffin (R226) filled with slaked lime (R231) but no burial lay in the SW corner. The concentration of bones recovered from the fill were probably the individual that was interred in this coffin. Two beach gravel layers lay in the

base of the chamber, directly over the bedrock. The walls had been plastered. Brick impressions in the plaster suggest that the chamber had a brick floor, but there were also traces of a wooden floor, neither of which were extant. The southern wall was constructed of mortared brick, whereas the other three walls were of mortared stones. The brick wall (R338) butted the eastern (R337) and western (R339) walls, whereas the other walls were interleaved. The southern wall is interpreted as being secondary, i.e. the chamber was originally larger, extending further south, but was reduced in size. The brick and/or timber floors that there were traces of may have been removed when the chamber was rebuilt. A sample of wood from coffin R226 was radiocarbon dated to CAL AD 1310 - 1360 and 1390- 1520 and 1590 - 1620 at the 95% level of confidence. The beach gravel bedding for the tile floor (group 4:5) lay against the outside of the southern wall. No cut for the construction of the chamber was visible, the southern wall must therefore have been constructed prior to the laying of the tile floor.

The tile floor and its beach gravel bedding was uncovered over large areas of the north aisle and between the columns of the north arcade (group 4:5), over most of the area uncovered in the SE corner of the south aisle (group 4:3), in the north transept (group 4:7) and the crossing (group 4:8). Traces of beach gravel were present over the brick floor that was uncovered in the SW corner of the south aisle (group 2:3) suggesting that the tile floor had also been laid there. In some places whole tiles were preserved. Over most of these areas however the tiles had been shattered and were present only as fragments. In some places the shape of the tiles was still visible even though the tile was not 'whole'. They ranged in size from 0.20m x 0.20m - 0.26m x 0.26m, most were 0.25m x 0.25m and were 0.07m thick. The floor was not as well preserved in the crossing and north transept. In the latter area the tile fragments were mixed with mortar fragments and beach gravel. At the east end of the north aisle (R25, group 4:5) and along the northern end of the north transept (R79, group 4:7) brick fragments set in a white mortar filled the gap between the last row of tiles and the cathedral walls. Tile remains (R4, group 4:10) were also uncovered in a test pit in the sacristy. They are tentatively interpreted as the remains of a tile floor. Under the tile remains lay a burnt deposit and a stone dump (R5 and R6 respectively, group 4:11). A charcoal sample from R5 was radiocarbon dated to CAL AD 1010 - 1300 at the 95% level of confidence. These deposits are tentatively interpreted as make-up dumping of material from elsewhere used to level off the ground surface prior to the construction of the tile floor.

A stone structure (group 4:13) was uncovered in trench M96-14 immediately NE of the chancel. This has been labelled the Bishop's Foundation (Biskopens Fundament). Trench M96-11 dissected the structure, the upper 0.60m was excavated. The structure was built up of alternating layers of large and small stones. Its construction cut had been truncated on both its northern and southern sides. The only stratigraphic relationships available were therefore that it was earlier than the truncating features (group 4:12). Trench M96-15 exposed part of the Bishop's Foundation and other structures in plan in the area between the foundation and the cathedral. Three large rounded stones (BF38) were mortared onto the surface of the foundation along its western edge. Presumably these are part of the upstanding structure that the foundation supported. A WSW/ENE aligned short wall of large rounded stones (M193) was uncovered at the northern edge of the foundation. M193 was only exposed on the surface, it was interleaved with the foundation and appeared to have been constructed simultaneously. The buttress at the external NE corner of the room north of the chancel (M198) was constructed over M193. A NNW/SSE aligned wall (M191) lay immediately north of the chancel, effectively forming the foundation of the eastern cathedral wall at this point. It was constructed, as M193 was, of large rounded stones, with a mortar layer spread over the surface of the stones: M190 over M191 and M189 over M193. M191 and M193 would have met under buttress M198. The Bishop's Foundation and these two walls formed three sides of a square, the southern edge was partially enclosed by buttress M194, which was constructed over wall M191. This was a later structure however. It is not clear why there was no southern wall parallel to M193. The centre of this 'square' was filled with silt and stone deposit M187.

The construction technique of wall M191 implies that it relates to the Bishop's Foundation and wall M193. The foundation of the chancel wall was constructed of several courses of mortar bonded, flat stones, it had a straight edge and was probably a coffin wall. M191 was a solid stone wall constructed of large rounded stones, the top of which were covered with layer of mortar. M191 was also slightly wider than the foundation of the chancel. The original surveys of the cathedral assumed that the rooms to the north and south of the chancel were extended eastwards at the same time as the chancel. The room that the Bishop's Foundation lay outside of is directly north of the chancel, such that the southern wall of this room is the northern wall of the chancel. Part of this wall had a profiled base, the same base that the outside face of the western chancel wall had. This implies that it was originally

constructed as an external wall, i.e. that the room NE of the chancel was not constructed until after the chancel was complete (Sæther 1998:62). That the foundation of the cathedral wall at this point (M191) appears to have been constructed using the same technique as the Bishop's Foundation, suggests that the room north of the chancel was built at the same time as the Bishop's Foundation.

The Hamar Chronicle refers to a passageway leading from the Bishops Chapel in the cathedral to the Bishops Residence (see Arnesen 1937). A square stone foundation, comparable with the Bishop's Foundation, was uncovered approximately halfway between the cathedral and the Bishops Residence in 1916 (Dahl 1916:66). The Bishop's Foundation was uncovered by the excavations in 1988 and 1992. These foundations have been tentatively interpreted as the foundation for timber towers that supported a raised passageway. It is uncertain whether this passageway would have entered the cathedral at the ground level or the storey above (see Sæther 1995a:52). Sæther believes the reference to the Bishops Chapel indicates the upper storey as the rooms beneath have no place for an altar (Sæther 1998:68).

A similar passageway is also known from Oslo connecting the Bishops Residence with the west end of the cathedral. Two foundations were uncovered, one 2m west of the cathedral, the next 3m further west. These appear to have been built of stone and were described as pillars rather than towers. They were 2m x 3m and 3m x 3m, this passageway would have led into the upper storey at the west end of the north aisle (see Fischer 1950:96-101). A stone foundation was also uncovered during excavations in Trondheim that may have been related to a passageway between the Archbishops Residence and the western and of the cathedral (Reed et. al. 1997:86). It is not known whether there were more towers in Hamar, other than the two that have been uncovered. Dahl says a shallow trench was dug from the tower he uncovered towards the cathedral. This uncovered the Bishop's Foundation, but nothing in between (Dahl 1916:64-67).

The Bishop's Foundation was 4m wide (N/S) x 2.50m (E/W). Its western side lay c. 2m east of M191, the same distance from the cathedral as the pillar in Oslo. The distance to the next foundation however was greater in Hamar, c. 7m. The tower that was built upon the Bishop's Foundation would have stood very close to the cathedral. If the walkway was connected to the upper storey it would have also been supported in the fabric of the cathedral wall. From a structural perspective it would perhaps be more sensible to have placed the tower further from the cathedral to decrease the span between the Bishop's Foundation and the next tower to the east. The pillars in Oslo seem to have been closer together, it was therefore not so illogical to place the closest pillar in Oslo 2m from the cathedral.

It is difficult to interpret E/W aligned foundation M193 that ran between the Bishop's Foundation and M191, enclosing the area between the tower and the cathedral on the north side. It appeared to be an integral part of the structure, but has no function if the Bishop's Foundation is interpreted as supporting a free-standing tower. M193 seems to indicate that the structure that the Bishop's Foundation supported was connected to the cathedral at the ground level. The most likely explanation for this would be that the passageway entered the cathedral at the ground level. If this were the case however then a similar wall to M193 should have sealed the area to the south side, but there was no evidence of any such structure there. An entrance at ground level would however account for the fact that no standing wall remains survived here. An opening in the chancel wall gives access to the chancel from the room the walkway would have led into. A ground level entrance for the passageway would have given the bishops immediate access to the chancel through this portal without having to move through the transepts or nave. The structural evidence is inconclusive however. On the evidence available it is difficult to determine how the supposed passageway was constructed and whether it entered the cathedral at ground level or the storey above.

A grave and three other cut features were recorded north of the Bishop's Foundation (group 4:12). The grave was excavated in plan, the femurs and lower legs of MG141 lay within the trench. This was probably not a coffin burial. The three other cut features were recorded from the profile, they may have been graves, but no traces of burials were visible. The 1992 excavation uncovered no burials north of the Bishop's Foundation that post dated its construction (Pedersen E. A. 1994:102), but MG141 clearly indicates that this area was used for burial. Grave cut M140, for MG141, was, 0.80m deep. The upper part of the feature had only been marginally truncated if at all. The top of the cut (137.83 m over sea level) therefore reflects the height of the surface of the churchyard in this period. No burials were recorded in trench B96-4 that were attributed to this period. It is likely that the graves from this period were removed when the area was cleared of demolition deposits (see 5.2 Period 3 discussion).

A single burial (group 4:22) was registered in trench P96. The trench was not totally excavated however and more burials could have been present in this area. Only the feet of PG26 were excavated. This was probably not a coffin burial. The grave lay at the top of the slope and probably belongs to the latter part of period 4.

Two, possibly three graves were documented in trench J96-8 that are placed in period 4. Both burials were aligned E/W, JG115 (group 4:17) lay 0.10m over JG116. Both burials had the same position on the E/W axis, i.e. the feet of JG115 lay over the feet of JG116. Few of the graves outside the west front were aligned E/W as these were, most were perpendicular to the cathedral. None of the burials in H96-14 were aligned E/W. In area D96, one of the burials in group 4:26 (HG59) and all of the burials in group 4:29 had this alignment. It is tempting to associate the two burials in J96-8 with those of group 4:29 in area D96. Cut feature J120 (group 4:18) was probably a grave cut, but only a small part of the feature lay within the trench. A general gravel soil context J121 (group 4:19) was included in group 4. It is likely however that the soil that comprises J121 was dumped at the end of period 2. Even though the burials in this layer are interpreted as belonging to period 4, the layer itself should probably have been placed in period 2.

Six groups of burials were uncovered in both trenches D96 and H96-14. One group in D96 (group 2:27) were dated to the construction period and placed in period 2. The latest burials in area D96 (group 4:26) consisted of six individuals, five of which lay c. 1.50m west of the cathedrals west front. Two of the graves in group 4:26 contained two burials. The upper part of the graves had probably been truncated (see 2.4 Period 2 discussion for a discussion of this). The burials lay between 135.52 - 135.97 m over sea level.

Very few stratigraphic relationships could be defined for the other burials in trench D96. In some cases partial or complete grave cuts were visible, but most of the burials are recorded as lying within grave soil D53 (group 2:28). Physical relationships between the burials were used to group them. Other factors included their position on the E/W axis, i.e. how much of the burial extended into the excavation area, and the depth of the burial. It was not always clear which group some of the burials should be placed in. These groupings should therefore be considered as suggestions rather than concrete interpretations.

Group 4:27 consists of seven burials, only the legs and feet of these individuals lay within the excavated area. All the burials in this group lay in the SW corner of the trench. They appeared to respect one another and lay at approximately the same height: 135.54 - 135.82 m over sea level.

Group 4:28 consists of seven burials, only the lower legs and feet of these individuals lay within the excavated area. Four of the burials lay in the southern half of the trench and respected one another. Three lay in the NW corner of the trench and may have inter-cut. The burials in this group lay between 135.08 - 135.42 m over sea level.

Group 4:29 consists of three burials, only the legs and feet of these individuals lay within the excavated area. They were concentrated in the northern half of the trench, none of the burials in the overlying groups lay in this area. Even though two of the graves inter-cut they are grouped together as they were the only burials recovered from this area and all lay at approximately the same level: between 135.21 - 135.32 m over sea level.

Group 4:30 consists of two burials, only the lower legs and feet of these individuals lay within the excavated area. They lay at opposite ends of the trench but lay at the same level: 135.07/135.08 m over sea level.

Two of the burial groups in trench H96-14 were recorded from the eastern profile (groups 4:31 and 4:32). Like group 4:26 in trench D96, these lay nearer the cathedral than the other burials in the trench. These were recorded from the profile, it was not possible to measure exactly how far out from the cathedral they lay. Like group 4:26 group 4:31 included two graves that contained two burials. Four, possibly five graves were recorded in group 4:31, the grave cuts were clearly definable. The top of the graves had been truncated, but probably only c. 0.10m. They ranged in depth from 0.50m - 0.70m, and indicate that the upper surface of the graveyard in this area was slightly higher than 136.75 m over sea level. At the southern end of the trench five burials in group 4:32 lay within grave soil H63 (group 2:30). No grave cuts could be defined for these burials. The grave soil was only < 0.20m thick, the upper part of these graves had clearly been truncated. As these graves were recorded from the profile no bones were uncovered.

The other four burial groups in trench H96-14 were excavated in plan when the western profile was cut back by 0.75m. Like the groups in D96 they were grouped together based on physical relationships, their position on the E/W axis and the depth that they were buried at.

Group 4:33 consists of four burials that were identified as infants and children. These burials lay between 136.03 - 136.31 m over sea level. They appeared to have been buried in a row with the skulls lying at the edge of the excavation. These were the latest burials in the area.

Group 4:34 consists of eight burials that lay approximately in a row such that the shinbones and feet lay within the excavated area. The burials lay between 135.57 - 135.91 m over sea level, though most lay around 135.80 m.

Group 4:35 consists of six burials that lay approximately in a row, such that the middle of their vertebrae and down to the feet lay within the excavated area. The burials lay between 134.94 - 135.18 m over sea level. Two grave cuts were clearly definable to the south, where the bedrock began to rise, the burials were less intensive in this area. One of these graves appeared to contain two burials.

Group 4:36 consists of four burials that lay approximately in a row, such that the pelvis down to the feet lay within the excavated area. HG87 and HG90, at the northern end of the trench lay between 135.55 - 135.68 m over sea level., HG79 and HG85, in the southern half of the trench lay between 135.91 - 135.99 m over sea level. One clear grave was definable at the southern end of the trench. These were the earliest burials in trench H96-14.

The graves in area D96 and those excavated either side of this trench in 1992 were buried in two clear rows. The burials recorded in 1992 that lay in the row closest to the cathedral were 1.15m - 1.90m out from the western wall, the outer row lay between 3.30m - 4m west of the wall (see Pedersen E. A. 1994: 50). The burials in group 4:26 all lay c. 1.50m west of the western wall, these were the latest burials in trench D96. All the other burials in D96 lay 3m+ west of the wall. Two rows of burials were also recorded in trench H96-14 south of D96. Two overlying rows of burials were recorded in area B96 (see groups 3:7 and 3:8), outside the chancel, these lay c. 1.50m east of the chancel wall.

In area D96 the latest group of graves (4:26) lay between 135.52 - 135.97 m over sea level. The upper part of the graves had been truncated. The deepest grave cut registered during the excavation was 0.90m deep (B64, group 2:18). This would give a maximum height for the contemporary churchyard of c. 136.87 m over sea level. The upper surface of the grave soil in the trench north of D96, J96-8 (J121, group 4:19) lay c. 3m out from the cathedral wall at 136.60 m over sea level. The graves in group 4:31 in trench H96-14, south of D96 indicated that the height of the upper surface of the churchyard c. 3m out from the western wall was slightly higher than 136.75 m over sea level. The interface between the western wall's foundation and the profiled base lay at 137.20 - 137.30 m over sea level (Pedersen E. A. 1994:44). A similar height was recorded in 1996. The upper surface of the churchyard outside the west front seems to have sloped away to the west even though the area had been built up. The complete burials that lay within the excavated area (groups 4:17 and 4:26) also sloped down to the west.

The difference in height between the burial groups varied between 0.10m - 0.30m. Only four of the burials from period 4 in trench D96 appeared to have been coffin burials. Given the close proximity of some of these burials there was a surprisingly low degree of inter-cutting. The difference in height between the shallowest and deepest burials in period 4 in D96 was c. 0.75m. This implies that the level of the churchyard was built up through time. No evidence of any change to the ground level was registered until period 5 however. This building up of the ground surface may have taken place gradually.

The ground surface was built up in this period along the northern side of the cathedral. This make-up activity was registered in the small trenches outside the north aisle (J96-1 - 4) and outside the NW corner (J96-6) and in the NW/SE aligned trench P96 that ran down the slope from the NW corner down to the churchyard wall.

Two deposits of re-deposited moraine clay mixed with stones (group 4:15) were recorded in the easternmost two trenches J96-1 and 2. These built up the ground surface by 0.20m - 0.40m. This activity was overlain by make-up dumping of silts and clays that contained varying degrees of debris connected to construction activity (group 4:14). This activity was present in all four trenches and built up the ground surface to between 135.77 and 136.37 m over sea level. The ground level was not only built up but the slope down to the north was levelled off creating a larger area of horizontal terrain. Prior to this make-up activity the area consisted of thin silt layers over bedrock. The building up of the ground surface would have enabled the area to have been used for burials. No burials were recorded in these trenches however. A few burials were registered during the 1992 excavations at the eastern and western ends of this area (see Pedersen E. A. 1994:72).

The make-up dumping in the NW corner also increased the area of horizontal terrain. Trench P96 was dominated by layers of demolition material that had been dumped

down the slope towards the churchyard wall. The trench was not excavated down to natural, it is therefore difficult to determine to what degree the terrain was altered. Twenty-five discreet layers of debris were recorded form the profile of trench P96 (group 4:24). These consisted of stone, brick and mortar demolition material, and construction debris in the form of stone chips and layers that appeared to be unmixed mortar. Some silt layers that contained animal bone and burnt stones were also present. All of the layers in this group sloped sharply down to the north, they were only recorded down the slope. At the very base of the slope the natural ground level was uncovered. At the top of the slope these layers lay beneath the base of the excavation. Trench J96-6 lay at the SW corner of trench P96, it was excavated down to natural. The make-up deposits (group 4:16) were over 1.70m thick in that trench. The layers in group 4:24 built up the ground surface down the slope by over 2m. This group was overlain by a thin compact silt layer P62 (group 4:23) that ran from the top of the slope down to the churchyard wall. This is interpreted as a turf horizon. It indicates the end of the make-up dumping of group 4:24 and a period when the terrain was stabilised at this level. Two further make-up groups (4:20 and 4:21) were recorded over this turf horizon. Group 4:21 consists of two overlying silt layers that lay in the horizontal area at the top of the slope. These are interpreted as grave soils, but no graves were registered cutting through them. Over this group lay a series of silt and clay layers (group 4:20), some of which contained stone chips. These layers were present both at the top of the slope and down the slope towards the churchyard wall. This group extended the area of horizontal terrain at the top of the slope northwards by c. 3m. The level of the terrain after these layers were deposited was c. 135.25 m over sea level. Group 4:20 in P96 was similar to group 4:14 in J96-1 - 4.

The layers in group 4:24 butted the churchyard wall P48 and its foundation P50 (group 4:25) on their southern face. Foundation P50 was a dry stone construction of large stones, one course high with a silt and stone core (P49). A mortar bonded stone wall (P48) with a mortar and rubble core (P47) was built upon P50. P50 was slightly wider than P48 and less regular. P50 was built upon the remains of an earlier dry stone wall P52 (group 2:25). P47 was c. 2m wide, it stood three courses high on its northern side, but only one course high on the inside, southern face. The southern face of the wall had been repaired twice, probably after the churchyard was out of use (see groups 7:14 and 7:15).

A charcoal sample from wall core P47 was radiocarbon dated to CAL AD 1420 - 1640 at the 95% level of confidence. This dates the building of this churchyard wall to the latter part of the cathedral's period of use. The demolition and construction layers dumped down the slope (group 4:24) butted the wall and therefore must have been deposited after 1420. At the top of the slope two other groups of deposits (groups 4:20 and 4:21) lay over the deposits in group 4:24 and are therefore also later than 1420. The layers in group 4:20 were similar to those in trenches J96-1 - 4 (group 4:14). Both these groups appear to have built out the area at the top of the slope northwards. Group 4:14 is tentatively interpreted as also later than 1420. The other make-up group in trenches J96-1 and 2 (group 4:15) consisted of re-deposited moraine clay. Dumping of moraine clay around the northern end of the north transept was recorded in 1992 and dated to shortly after 1250 (Pedersen E. A. 2000:193-4). These layers may therefore be earlier than those in group 4:14.

The amount of demolition deposits, mixed with some construction debris, that was recorded in trenches P96 and J96-6 was over 100m^3. The actual amount of debris dumped around the NW corner of the churchyard was probably considerably larger. Given the dating of the demolition material in trench P96 to after 1420 it is difficult to relate it to a rebuilding of the cathedral. The sacristy has been dated to after 1450 (Pedersen E. A. 2000: 200; Sæther 1998:69), but would not have involved demolition of existing walls to the extent that would have produced this amount of demolition deposits. The Bishops Residence was rebuilt in the mid 1400's however. A ring wall was constructed, possible replacing a more extensive wall and buildings were demolished or reduced in size (see Sæther 1986, 1996 and 2000). It is possible that the demolition deposits recorded here came from the Bishops Residence and not the cathedral. The slope at the NW corner of the churchyard afforded ample space to dump a large quantity of waste. What is not clear is whether these deposits were dumped here because it was a suitable place for dumping or whether they were brought here to deliberately extend the area of the churchyard. Even after the north side was built up and out towards the north there do not appear to have been very many graves dug here. Seven graves were registered in 1992 outside the NW corner and outside the north aisle, near the north transept (see Pedersen E. A. 1994:72), one very shallow burial was registered in a trial trench in 1998 (Hommedal 1998) and one grave (group 4:22) was registered in trench P96. The north side of the churchyard was traditionally a less attractive area to be buried in than the other areas (Sellevold 1999:98). The area could not have been in use as part

of the churchyard for more than 116 years however. This, and perhaps burial tradition, may explain why relatively few burials were recorded here compared to the rest of the churchyard.

In trench Q96 a turf horizon (Q4, group 4:34) that churchyard wall foundation P50 was constructed upon was uncovered. It extended across the whole of the trench. A small cut feature (group 4:42) was documented under the wall. The cut was irregular. It is interpreted as resulting from the removal of a large stone or tree root prior to the construction of the wall. This confirms the impression that the earlier wall P52 (group 2:25) was not as wide as P50.

The churchyard wall was also uncovered in the SE corner of the churchyard in trench U96 (group 4:37). The wall (U71) was constructed of mortar bonded stones with a mortar and stone core. It was aligned roughly NNE/SSW and stood two courses high. No wall remains were visible on the surface in this area. Later deposits had been dumped against U71 and a sill wall, dated to period 6 (group 6:1), constructed over the top of it. An excavation in 1916 uncovered two roughly parallel walls east of the cathedral, 6m - 8m apart (Dahl 1916:65-67). The easternmost of these two walls was the churchyard wall that is still standing today. The westernmost wall is interpreted as an earlier churchyard wall, indicating that the churchyard was extended towards the east, presumably as a result of the extension of the chancel towards the east. U71 is interpreted as a secondary churchyard wall constructed at an angle to connect the original southern wall to the newer eastern extension. A section of the southern wall was uncovered in trench W96 (see the trench description in chapter 2). This had similar dimensions and was constructed in a similar manner to U71. Given that the original churchyard wall uncovered in trench P96 (group 2:25) was a dry stone wall with a silt/stone core, and that the westernmost wall uncovered by Dahl was described as more of a fence than a wall, it is possible that the southern churchyard wall, as uncovered in trench W96, is also secondary. U71 may have been constructed simultaneously with W4 rather than connecting an existing wall to the new eastern wall. The eastern churchyard wall as it stands today is reminiscent of the latest repair/reconstruction of the wall in trench P96 (group 7:14).

The construction cut for the wall (U91) was recorded on the surface, the foundations of the wall were not exposed. U91 cut through earlier silt layer U90 (group 4:39) that is interpreted as a turf horizon. Two deposits of silt, mortar and stones were dumped against the eastern, outside face of the wall (group 4:37), otherwise turf horizon U90 continued to function as an external turf horizon after the wall was constructed and in use.

The make-up dumping that lay under U90, group 4:40 consisted of make-up dumps of re-deposited moraine clay, stone working debris and other silt/clay layers. These built up the ground surface in the westernmost half of the trench by 0.20m - 0.40m+. The natural terrain was not exposed over the whole trench, it undulated and lay partially beneath the level of the excavation. This make-up dumping not only built up the ground but also levelled it off. The presence of re-deposited moraine clay and stone chips suggests the material may be debris from a building phase of the Bishops Residence, the re-deposited clay being upcast from the digging of foundation trenches. The dumping was overlain by a possible turf horizon (U35, group 4:40) at the eastern limit of this activity. Apart from U35, the postholes in group 5:7 and a layer of fire cracked stones (U30, group 4:38) that lay over U35, the easternmost section of U96 consisted only of sterile moraine clay. U30 was only exposed on the southern side of the trench, over a length of 3m, but extended beyond the excavation to the south. A charcoal sample from the layer was dated to CAL AD 815 - 840 and AD 855 - 1035 at the 95% confidence level. The underlying layer U35 contained brick fragments however. A fragment of animal bone, sent as a control of the early date, was dated at the 95% level of confidence to CAL AD 1180 - 1420. Given the presence of brick in the underlying layer, U30 is dated to between 1250 and 1420.

U90 contained brick fragments, as did some of the layers in the underlying group of make-up dumps (group 4:40). This dates the building up of the ground surface, the formation of U90 and the construction of the churchyard wall U71 to after 1250. One of the postholes in group 5:7 that cut through U90 was radiocarbon dated to CAL AD 1520 - 1580 and 1630 - 1950 at the 95% level of confidence and burnt layer U73 (group 5:6) that lay over U90 was radiocarbon dated to CAL AD 1530 - 1560 and 1630 - 1950 at the 95% level of confidence. These dates do not however provide a definite terminus ante quem for this activity.

A series of layers and cut features were recorded in trench T96 (group 4:41) over a 30m section of the trench, approximately north of the Sacristy. Five possible rubbish pits that contained animal bones, charcoal and fire cracked stones, but no brick fragments, two possible postholes that contained brick fragments, layers of humic rich silt and charcoal and a concentration of large stones were

recorded. It is not certain that all the activity gathered in group 4:41 was contemporary. With the exception of the presence/absence of brick fragments no dating evidence was recovered from these deposits. The concentration of large stones (T55/56) was present between the Bishops Residence and the churchyard wall, where Bishops Street is supposed to have run (see Arnesen 1937 and Sæther 1985a:121). A stone surface of large flagstones was uncovered further south in 1948 (Sæther 2001:126). The stones in trench T96 were covered by silt layer T50 and didn't appear to form a deliberately laid surface, they were not comparable with the flagstones to the south.

A cut feature in trench S96 was also included in period 4 (group 4:44). It was recorded from the profile and appeared to have been open towards Lake Mjøsa to the west. A dry stone wall, a single course wide was constructed against the eastern end of the feature and remains of burnt wooden planking were present in the base. A silty gravel deposit was dumped between the wall and the edge of the cut and between the planking and the base of the cut. The rest of the feature appears to have been open. No western edge was present, it is possible that this was eroded by the lake, but there was no other evidence for an erosion event. The feature is tentatively interpreted as a boat house. A sample from the burnt planking was radiocarbon dated to CAL AD 1450 - 1660 at the 95% level of confidence. The dating spans the medieval/post medieval period, the feature could have been placed in periods 5 or 6.

6.3 Group descriptions

Group 4:1

R140 R151 R152 R154 R352 R362 R387 R388 R389 R391 R392 R393 R394 R395 R397 R404 R410 R411 R412 R416 R417 R418 R422

Group 4:1 consists of layers of charcoal/carbonised wood (R140, R154, R388, R397, R410 R412 and R416), layers of slaked lime (R151, R152, R352, R389, R393, R395, R404 and R422), three layers of burnt silt/sand (R362, R392 and R411), a layer of mortar (R394), a thin layer of decayed wood (R387) and a cut feature, partially filled with slaked lime (R417 and R418). These layers were present in the area under the SW tower in the south aisle. Charcoal/silt layer R140 and possible decayed wood layer R387 were the uppermost extant deposits in this group, they had been truncated by extensive cut R331 (group 7:1). The underlying layers were partially exposed in the edges of cut features and through limited keyhole excavation.

A series of charcoal and carbonised timber deposits were interleaved with layers of slaked lime. Burnt silt/sand layers were also present as well as a spread of mortar. A number of the slaked lime layers were compact but crumbled under pressure, one such layer, R393 had bonded with beach gravel and brick fragments from the underlying layer R394, suggesting it had been deposited whilst wet and had hardened in-situ. Burnt silt/clay layer R392 may have been scorched in-situ by overlying charcoal layer R319.

These deposits are interpreted as debris from construction processes, the lime being from mortar mixing, dumped as make-up in the SW tower room of the south aisle. It was suggested during the excavation that the lime layers may have been produced by fallen limestone masonry being sealed by burning timbers and thus being baked. The regular horizontal stratigraphy however, together with the bonding of R393 and the underlying layer strongly suggests that these layers were deliberately deposited construction debris. They covered earlier masonry features and probably covered the whole of the SW tower room, bounded by brick kerb R376 to the north, stone threshold R330 to the east and wall R379/380 to the south. The uppermost layer(s) R140 and R387 may have been the poorly preserved remains of a wooden floor surface, partially burnt in-situ during the fire in 1567. It is possible however that they were structural elements from the cathedral burnt and then strewn over the area. Their regular, horizontal form however supports their interpretation as deliberately laid deposits. A sample from carbonised wood, R416, from within the middle of the sequence was radiocarbon dated to CAL AD 1255 - 1395 at the 95% level of confidence.

Contexts

R140. Layer of dark grey charcoal powder/silt. A few fragments of burnt wood were visible but no structure could be discerned. R140 was present in a 1.40m wide, N/S aligned, band at the eastern end of the area. It had been truncated to the west by cut R331. R140 was 0.08m thick, a slot excavated through the layer revealed a slaked lime layer, R152 beneath. It was not clear whether R140 was the remains of a wooden floor burnt in-situ or debris from a fire spread over the area. Under R327, R331 and R405, over R152.

R151. Layer of light yellowish brown slaked lime, contained occasional burnt brick fragments and occasional animal bones, 0.07-0.10m thick. R151 was spread over stone slabs R155, and also recorded in the SW corner. Under R397, over R154, R328, R347, R360, R371 and R399.

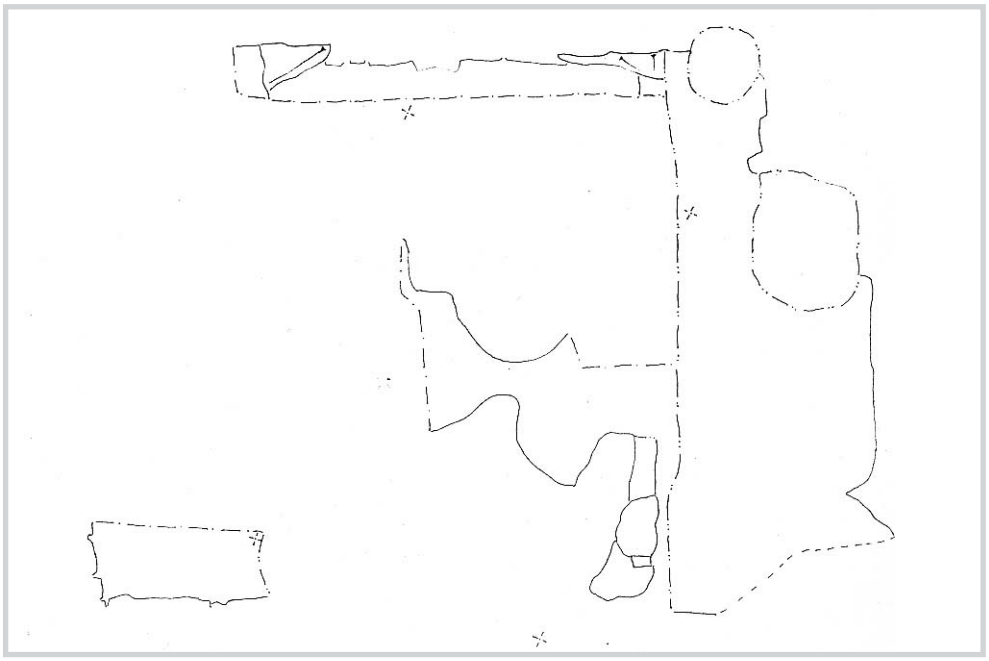


***Fig. 75**. Group 4:1, area R96, south aisle.*

R152. Layer of pale grey/white slaked lime, the layer was compact, 0.05m - 0.07m thick and covered an area 2.5m x 1m in the SW corner. Under R140, over R397.

R154. Layer of charcoal/silt, contained a few beach gravel, sandwiched between slaked lime deposits R151 and R352. Not excavated, only exposed in the side of cut R331, sloped down to the north. Under R151, over R352.

R352. Layer of cream coloured slaked lime, quite compact but crumbled under pressure. Underlay stone construction R360. Under R154, over R362, R410 and R418.

R362. Layer of mid reddish brown silt, contained small stones and mortar fragments. The silt may have been burnt slightly hence the reddish colour, it physically separated wall remains R360 from earlier structure R363. Under R352, over R363 and R385.

R387. Layer of fine orange brown organic silt, overlay burning R388 in the SW corner, 0.03m thick. Possibly the decayed remains of a wooden floor. Under R331, over R388.

R388. Layer of silt/charcoal, recorded in the SW corner, 0.03m thick, a little thicker where it overlay stone structure R390. Under R387, over R389 and R390.

R389. Layer of cream coloured slaked lime, only exposed in a small area in the SW corner where it was exposed by cut R332. Butted wall R380. Under R388, over R391.

R391. Layer of charcoal/silt, 0.02m thick, only exposed in the SW corner in the edge of cut R332. Under R389, over R392.

R392. Layer of light reddish brown silt/clay, flecked with slaked lime. The layer was very compact and friable, 0.03m thick. R392 was probably burnt silt or clay. The overlying layer, R391, was a charcoal layer, it may have been R391 that burnt R392. Not excavated, exposed in the edge of cut R332. Under R391, over R393.

R393. Layer of white/cream coloured slaked lime, quite compact but breaks into blocks under pressure. Gravel and small fragments of brick from underlying layer R394 were bonded to the underside of the layer. It appeared as though R393 was deposited whilst wet and had hardened in-situ, fusing with the underlying layer. Not excavated, exposed in the edge of cut R332. Under R392, over R394.

R394. Layer of creamy white mortar mixed with beach gravel and occasional brick fragments. The layer seems to have been spread out over the area rather than having any structural function. Not excavated, exposed in the edge of cut R332. Under R393, over R395.

R395. Layer of light grey/creamy white slaked lime, contained occasional gravel and small lumps of lime. Overall the layer was loose but contained a few hard patches. Not excavated, exposed in the edge of cut R332. Under R394, over R385 and R380.

R397. Layer of silt and charcoal, 0.05m thick, sandwiched between slaked lime layers R151 and R152. Not excavated. R151 and R152 were excavated to the west, but R397 was not present there, it was possibly just a localised concentration of burnt debris. Under R152, over R151.

R404. Layer of cream coloured slaked lime, packed around and in between stone constructions R350, R375 and R407. R404 also lays up against brick structure R376, and appears to underlay it also. There may have been two separate lime layers. R404 appears to have been deposited as make-up filling in the gaps between various stone structures. Under R351, over R416.

R410. Carbonised wood, possibly a burnt plank, aligned N/S. A similar burnt wood deposit R412 lay beside R410, but the two appeared to be separated stratigraphically by sand/silt layer R411, see R411. Under R352, over R411.

R411. Layer of light greyish brown coarse silt, possibly burnt sand. R411 appeared to lay between two burnt wood deposits R410 and R412. It is possible that R411 was dumped over the wood and that R412 has become mixed with the sand appearing to lie under it. Under R410, over R412.

R412. Carbonised wood, possibly a burnt plank, aligned N/S. A similar burnt wood deposit R410 lay beside R412, but the two appeared to be separated stratigraphically by sand/silt layer R411 (see R411). Under R411, over R396.

R416. Layer of carbonised wood, exposed at both ends of a slot excavated along the southern edge of brick structure R376. No wood was observed in between, i.e. not a continuous layer, unless it was truncated by R331. The wood appeared to have been aligned N/S. R416 was sandwiched between two slaked lime layers R404 and R422. R416 is possibly the same as two burnt wood deposits directly to the south, R410 and R412. A charcoal sample from R416 was radiocarbon dated to CAL AD 1255 - 1395 at the 95% level of confidence (Beta-135932, sample HKH11863). Under R404, over R422.

R417. Cut of a negative feature, only partially excavated, exposed in the base of cut R332. initially assumed to be the east end of a grave, but the feature appeared to be circular, c. 0.70m in diameter. Under R418, over R419.

R418. Fill of rubble, silt and brick fragments, some slaked lime was visible in the base of the feature, not fully excavated. Under R352, over R417.

R422. Layer of slaked lime, similar to R404, burnt wood R416 lay between them. R422 was documented in a slot excavated along the southern edge of brick structure R376, it butted wall R407 and bricks R376. Under R416, over R376.

Group 4:2

R347 R348 R360 R376 R399 R413

Group 4:2 consists of secondary structural remains in the SW corner of the south aisle, in the room under the SW tower. The structural remains in this area were only partially exposed in the edges of cut features and through limited keyhole excavation. It appeared as though there had been some reworking of the standing structures in this room, especially at its southern, northern and eastern edges. As most of the features were only partially exposed it was impossible to record the complete sequence of stratigraphic relationships. The structural elements have been gathered into two groups (2:1 and 4:2). This group is interpreted as representing the reworking of the masonry in the area. Due to the limited nature of the investigation in this area however it is difficult to form these structural elements into a coherent group. Some of the features placed in group 2:1 should perhaps be placed here.

The remains of small stones R399 bonded to earlier stone slabs R155 (group 2:1) by mortar layer R347 were included in this group. The stones didn't cover all of the exposed slabs, but the mortar used to bond them, R347, was more extensive, suggesting the stones originally covered a larger area. Perhaps they were intended to completely cover the slabs but the action was never completed. These contexts would appear to indicate that the slabs were no longer in use. They were perhaps intended to build up the level of the slabs prior to the laying of a floor surface at a higher level. R140/R387 (group 4:1) may be remains of a wooden floor and covered R399 and slabs R155.

Large stone R360 was mortared onto a bed of small stones R348 to the west of R349 (group 2:1). The northern edge of R360 is approximately aligned with the northern edge of R379/R380 (group 2:1), but later truncation has removed any physical connection between them. R379/R380 formed the foundation of the southern wall of the cathedral and was probably built upon the bedrock. R360 consisted of a single large stone bedded on smaller stones and mortar and clearly didn't have a load bearing function. Earlier wall remains R363 (group 2:1) could be seen beneath R360 between it and the southern wall of the cathedral. This walling appears to have been demolished prior to R360's construction. R360 was probably upstanding and visible in the floor plan, it

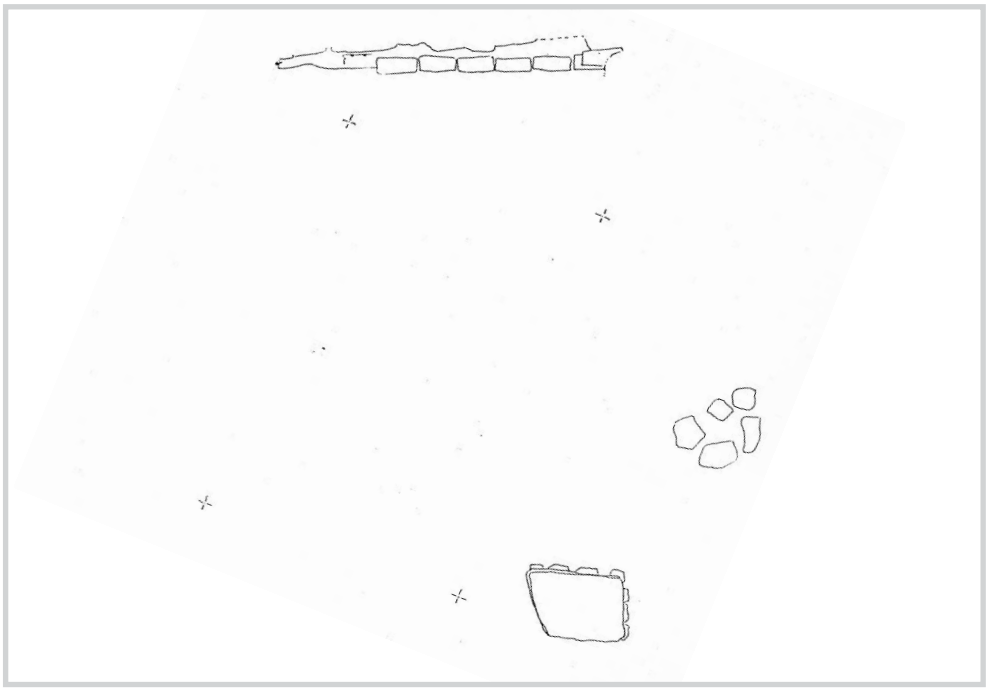


***Fig. 76**. Group 4:2, area R96, south aisle.*

may have been laid to build a kerb against the southern wall as a continuation of the kerb that foundation R379/R380 forms in the SW corner. R360 appeared to be stratigraphically later than R362 and R352 of group 4:1. It is possible that R360 should be placed in a later group of contexts and may even have been part of the reconstruction phase of activity.

An E/W aligned line of bricks R376, one to two courses deep were mortared to the top of the southern face of wall R408 (group 2:1) by mortar R413. Wall R408 ran between the columns (R372 and R377, group 2:1) of the south arcade, at the northern edge of this room. R408 is interpreted as a foundation raft rather than an upstanding wall, but appears to have formed a threshold between the nave and the south aisle between the two westernmost. Bricks R376 appeared to be secondary, they were laid upon part of the foundation of R408 that protruded out slightly from under its southern face. The top of the bricks were laid flush with the top of R408 to the west, but sloped down to the west and weren't present at the western end of the exposed area. The bricks had a slightly different alignment to the apparent face of R408, there was a 0.10m gap between the bricks and walling to the east, but they were laid flush against the walling 2m to the west. The bricks may not have been laid along the entire length of R408 as their apparent alignments converge to the west. The bricks appear to form a kerb to masonry R408 forming a threshold into the SW tower room. Bricks were also recorded mortared into the kerb formed by foundation R379/R380 on the opposite side of the SW tower room.

Contexts

R347. Layer of coarse yellowish brown mortar, c. 30 - 50% beach gravel, also contained small stone inclusions. The mortar covered stone slabs R155, bonding stones R399 to the slabs.

R348. Layer of mortar and small stones that acted as a bedding for large stone R360. R348 protruded out from under the stone on all sides. The mortar was yellowish in colour and fairly coarse, c. 20-30% beach gravel. In places it had a glassy appearance suggesting that it may have been burnt. Under R360, over R362.

R360. A single large limestone block bonded to the underlying deposits by a coarse yellow mortar, R348. The stone was 0.70m E/W x 0.40m x 0.20m. Foundation R365 lay to the east. The northern edge was aligned with R380 to the west. Under R151, over R348.

R376. A single line of bricks, E/W aligned, one to two courses deep, placed along the southern edge of wall/foundation R408. The bricks were bedded in mortar R413. The bricks are secondary and form some kind of kerb. Under R422, over R413.

R399. Remains of stones bonded to the surface of stone slabs R155 by mortar R347. Only a few stones were present. Under R151, over R347.

R413. Mortar bedding for brick kerb R376. A creamy off-white mortar, c. 30% beach gravel. Under R376, over R408.

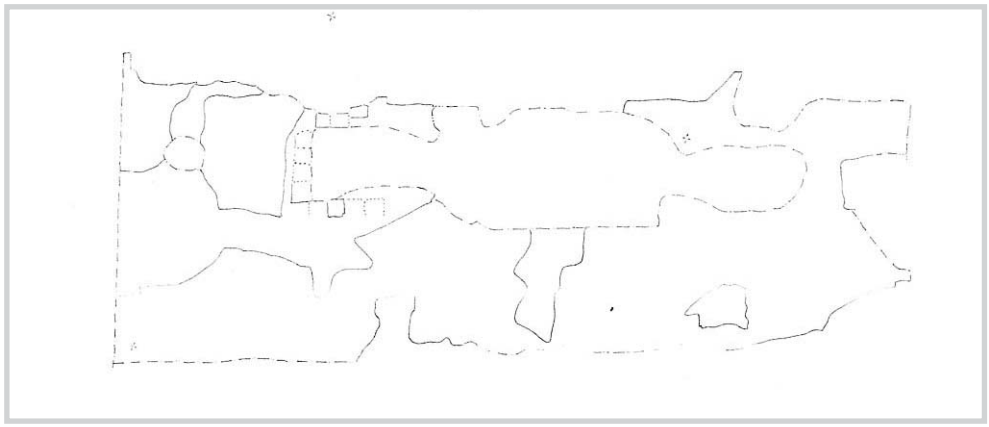


***Fig. 77**. Group 4:3, area R96, south aisle.*

Group 4:3

R156 R157

Group 4:3 consists of a floor surface of square red clay tiles (R157), set in a bed of beach gravel (R156). The tiles were 0.20 x 0.20m - 0.25m x 0.25m in size and laid flush to one another. The floor was extant in isolated patches in the SE corner of the south aisle. The beach gravel bedding layer was present over most of the exposed area, except where it had been truncated by cut features and in a few places along the southern wall where the underlying deposits had been exposed. This floor surface was exposed in the north aisle (group 4:5), the crossing (group 4:8) and the north transept (group 4:7). This tile floor covered most, if not all of the cathedral.

Contexts

R156. Layer of beach gravel - dark grey beach gravel, contained occasional small rounded stones. The layer lay under tile floor R157, R156 acted as a bedding for the tiles. The tiles only survived in patches, but R156 was exposed over most of the excavated area in the SE corner of the south aisle. It was 0.05m - 0.07m thick, not excavated. Under R157, over R190 and R192, same as R27, R81, R86, R106, R114, R144, R223, R254, R255 and R297.

R157. Layer of red ceramic tiles, 0.20 x 0.20m - 0.25m x 0.25m in size, bedded in beach gravel layer R156, forming a floor surface in the SE corner of the south aisle. The tiles were preserved in isolated patches. In some places the tiles were whole, in other places the tiles had shattered into small pieces. The pattern of the floor could still be traced in some areas, where this was possible the tiles are illustrated by dotted lines. Under R186, over R79 and R156, same as R24 R70, R159, R208 R212 and R290.

Group 4:4

R26 R193

Group 4:4 consists of two very similar mortar layers (R26 and R193) that lay beneath reconstructed altar foundations R97 (group 7:3) and R189, (group 7:2) in the northern and south aisles respectively. Both layers were only partially exposed where they protruded out form under the overlying reconstructed, cement bonded, stone altar foundations. In both cases the mortar was reminiscent of the bedding for the brick floor (see groups 2:4 and 2:6), but the remains clearly lay upon the brick floor. A similar situation, i.e. broken mortar fragments underlying reconstructed altar foundations of cement bonded stones, was observed in the crossing on both sides of the entrance to the chancel (R247, group 7:5). These layers are interpreted as the broken up remains of brick and mortar altar foundations that were replaced with cement bonded stone reconstructions. The brick and mortar layer R247 in the crossing appeared to have been mixed with silt and re-deposited, therefore it is grouped along with other modern contexts. These brick altar foundations are presumed to be later than the stone altar foundations that appear to have been constructed simultaneously with the cathedral.

Contexts

R26. Layer of broken fragments of cream mortar, the mortar contained beach gravel inclusions. R26 overlay brick floor R28, reconstructed altar foundation R97 was built upon it. R26 was documented on the northern side of R97, where it protruded out 0.50m from under the foundation. R26 was also present along the western edge of R97 but was mistakenly excavated as a demolition deposit. Similar deposits of broken mortar (and brick) were recorded under reconstructed altar foundations in the SW corner of the south aisle (R193) and in the crossing on either side of the entrance to the chancel. These layers are interpreted as the broken up remains of brick and mortar altar foundations. Under R97, over R192.

R193. Layer of broken up coarse yellow mortar, the mortar contained up to 40% beach gravel. The mortar lumps had a flat smooth upper surface. It varied in thickness

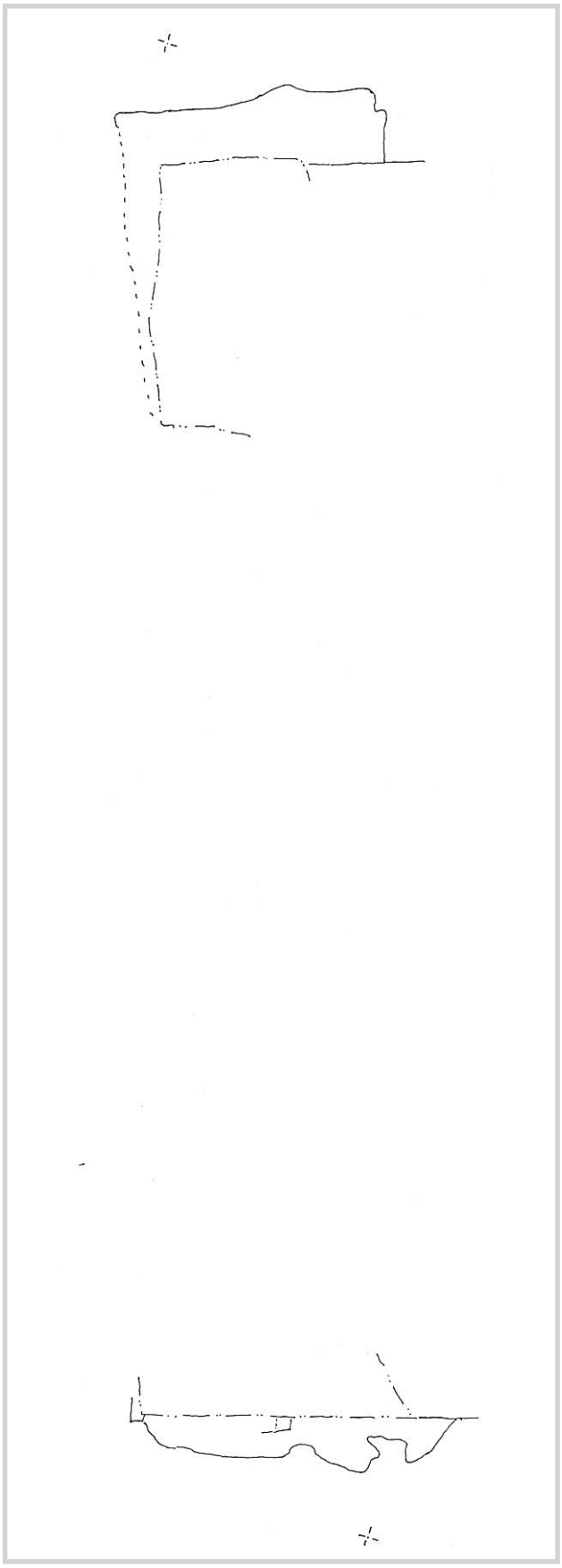


***Fig. 78**. Group 4:4, area R96, north and south aisles.*

from 0.10-0.20m and was laid directly over brick floor R192. R193 lay under reconstructed altar foundation R189 in the SE corner of the south aisle. R193 is interpreted as the remains of a brick and mortar altar foundation. Under R189, over R192.

Group 4:5

R24 R25 R27

Group 4:5 consists of a floor of square red ceramic tiles (R24) in the north aisle, laid in a bed of beach gravel (R27). A brick and mortar deposit (R25) filled the gap between the tile floor and the cathedral wall at the eastern end of the aisle where there was not enough space for a new layer of tiles.

R24 covered large areas of the north aisle, in some places whole tiles were preserved, in others the tiles had smouldered to such a degree that no structure remained. The beach gravel bedding layer was also present between the column bases in the north arcade, indicating that the tile floor had covered those areas but had been removed. The floor was presumably so badly damaged that it was removed either during clearance of the demolition deposits or during renovation work. The floor may also have been truncated in the central part of the north aisle. Later layer R23 covered approximately half of the mid section and half of the eastern end of the aisle. It is unknown whether remains of the floor were extant under R23 or whether R23 represented an area where the floor deposits had been truncated by excavation. No traces of R24 were recorded in the area under the NW tower, remains of the demolition layers (R36 and R85, group 7:3) from the collapse of the cathedral lay in this area. These layers may have been re-deposited after an investigation of the area. The floor layer here would have lain beneath these layers if they were in-situ demolition deposits. It is not known whether this area was marked off as a separate room as the SW tower room was. It is not certain whether R24 would have extended into this area. Between column base R111 and altar foundation R113 traces of the mortar bedding for the brick floor (R98, group 2:6) was visible beneath beach gravel R27, indicating that the brick floor had been removed prior to the laying of the tile floor.

The same tiles were recorded in the SE corner of the south aisle, in the crossing and north transept. R24 was part of an extensive tile floor that covered most, if not all, of the cathedral. This floor surface could not be dated directly. The beach gravel butted the southern wall of the grave chamber (group 4:6), indicating that the chamber was earlier. A radiocarbon date from coffin remains in the chamber indicates that the floor was laid after AD 1310.

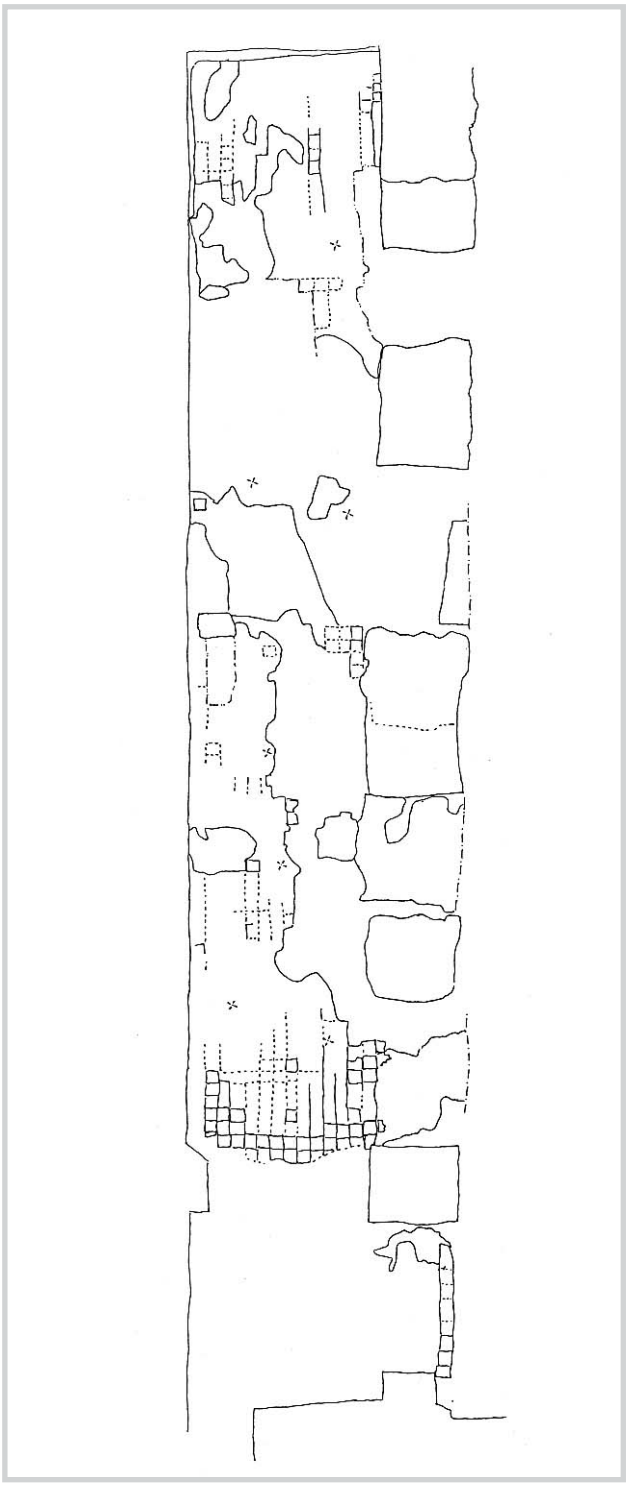


***Fig. 79**. Group 4:5, area R96, upper tile floor R24 in north aisle. Top E.*

Contexts

R24. Floor of square red ceramic tiles, c. 0.24m x 0.24m, bedded in a layer of beach gravel, R27. The tiles lay flush with one another. The floor was extant over approximately half of the north aisle. The tiles were in very poor condition, having suffered both physical damage from falling masonry and frost damage. In some areas, especially towards the western end of the aisle, whole tiles were visible and the pattern of the floor was discernible. In other areas however the floor consisted of small fragments of tile with no visible structure. The floor was not recorded in the area under the NW tower or between the columns of the north arcade, with the exception of a single line of tiles that ran between the reconstructed column base R90 and reconstructed respond R91 (group 7:3) at the western end of the arcade. The tiles had no physical contact with these reconstruction's and appeared to be in-situ. Beach gravel bedding R27 was extant between two of the columns indicating that the floor had been laid here. It was probably in very poor condition and was removed along with the rest of the demolition deposits either during the clearing of the cathedral or during the renovation work. At the eastern end of the aisle a small gap was noted between the rows of tiles and the wall of the cathedral. There was not enough space here for another row of tiles, brick and mortar deposit R25 filled the gap. This may indicate that the floor was laid from west to east in the north aisle. Under R23, R25, R33, R34, R36, R37, R39 and R40, over R27, R79 and R427, same as R70, R88, R157, R159, R208, R212 and R290.

R25. Layer of fine cream mortar with beach gravel inclusions and broken brick fragments. The bricks were set in the mortar, some were half bricks others smaller. R25 lay between tile floor R24 and the cathedral wall at the eastern end of the north aisle against threshold R278 (group 3:1) and for the easternmost 3m of the north wall of the north aisle. It was <0.10m wide and appeared to fill the gap where there was not enough space for a full row of tiles. A similar deposit R79 (group 4:7), was recorded at the northern end of the north transept. Under R1, over R24.

R27. Layer of beach gravel. R27 functioned as a bedding layer for tile floor R24, it was only exposed where the tile floor had been removed. R27 was documented in one relatively large area in the middle of the north aisle, in between column bases R90 and R111 and between column base R111 and altar foundation R188 in the north arcade. It was partially exposed in the area between the westernmost reconstructed column base R90 and the reconstructed respond in the western wall R91 and south of the grave chamber, apparently sealing the chamber's construction cut. Under R24, over R28, R89, R108 and R338, same as R81, R86, R106, R114, R144, R156, R223, R254, R255 and R297.

***Fig. 80**. Remains of the tile floor R24, group 4:5 in the north aisle. Photo Bruce Sampson, NIKU.*

Group 4:6

R225 R226 R229 R230 R231 R233 R235 R325 RG335 R337 R338 R339 R358 R367 R368 R369

Group 4:6 consists of a grave chamber cut into bedrock between column R427 and reconstructed altar foundation R99 in the north arcade. The chamber was constructed of three mortar bonded stone walls (R337, R339 and R358) and a southern wall of mortar bonded bricks (R338). The chamber's internal dimensions were 2.20m E/W x 1.35m N/S. The southern wall of bricks may have been secondary, i.e. the chamber may originally have been larger to the south, but reduced in size. The chamber had been dug into, presumably by an antiquarian investigation. This cut (R232, group 7:3) had truncated the burials in the base of the chamber. The lower legs of an infant (RG335), buried in a coffin (R235) that was laid upon a bier (R229), lay in the base. The remains of a coffin (R226), filled with slaked lime (R231) were also recovered but no bones were present. A concentration of disarticulated human bones (R227, group 7:3), probably of an adult female, were recovered from the fill of the robber cut (R94, group 7:3). These bones were probably from the missing individual that was originally interred in coffin R226. The walls and floor had been plastered with mortar (R225). The chamber may have had a brick floor, traces of a possible wooden floor (R233) were also recorded, but the base had been heavily truncated possibly by the opening of the chamber, but more likely when the chamber was reduced in size. The cut had revealed the remains of two beach gravel layers that were laid in the base as levelling (R230 and R325). A stone kerb (R368) was constructed at the surface along the western edge of the chamber. Brick and mortar deposit (R369) was laid to fill in between kerb R368 and the adjacent column. The cut for the construction of the chamber (R367) was not uncovered. Beach gravel bedding (R27, group 4:5) for the tile floor in the north aisle butted the southern wall of the chamber, therefore the grave chamber must be older than the tile floor. It is this wall that may be a secondary, reducing the size of the chamber. This reduction in size may be contemporary with the laying of the tile floor. A sample of wood from coffin R226, that was presumably interred after the chamber was reduced in size, was radiocarbon dated to CAL AD 1310 - 1360 and 1390 - 1520 and 1590 - 1620 at the 95% level of confidence.

Contexts

R225. White mortar with beach gravel inclusions. R225 covered all four walls of the grave chamber. It was also plastered onto bedrock at the base of the walls. It also appeared as though R225 also covered the base of the chamber but had been truncated. In the SW corner of the base indentations in the mortar that could have been the impressions of bricks were recorded. Under R232, over R338, R355 and R230, same as R234 and R336.

R226. Remains of a wooden coffin, only the western end survived, a number of iron objects associated with the coffin were recovered. A sample of the wood was radiocarbon dated to CAL AD 1310 - 1360 and 1390 - 1520 and 1590 - 1620 at the 95% level of confidence (Beta-173768, sample HKH11909). Under R231, over R230, same as R228.

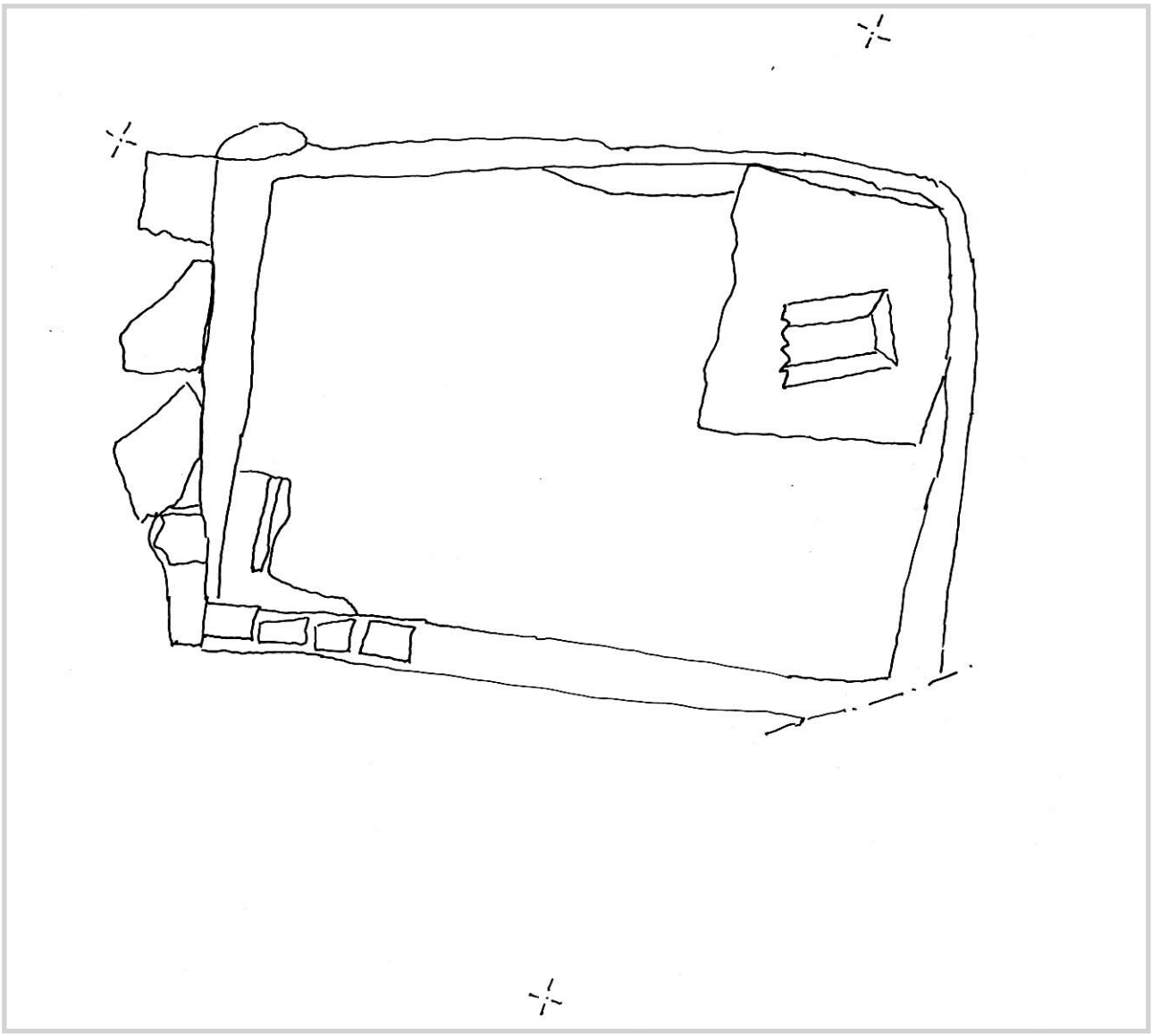


***Fig. 81**. Group 4:6, area R96, north aisle.*

R229. Remains of wooden planking lying at the base of the grave chamber. The planks lay beneath infant coffin R235, they were aligned N/S, nailed together and bordered by a E/W aligned end piece at the southern end. Probably the remains of a bier for coffin R235. Under RG335, over R234.

R230. Fill of beach gravel, small lumps of white mortar and brick fragments. R230 lay in the base of the grave chamber – primary fill, used to level off the base. Under R226, R225 and R234.

R231. Fill of white slaked lime, laid in the base of coffin R226, 0.07m thick. No skeletal remains lay within the coffin. Under R325, over R226.

R233. Strip of wood, laid over mortar R234 in the SW corner of the base of the grave chamber. 0.25m long, N/S aligned. R233 may have been the remains of a coffin or possibly a wooden floor to the chamber. Under R232, over R234.

R235. Remains of a wooden coffin for infant RG335. Only the western end was preserved, the rest had been truncated, a hole in the lid was presumably made to remove the bones. Under RG335, over R229.

R325. Fill of grey clay silt and beach gravel, contained mortar and brick fragments. R325 had been truncated by robber cut R232, it only survived as a thin layer in the base of the feature, butting coffin remains R226. Under R232, over R231 and RG335.

RG335. Infant burial, interned in coffin R235. Only the lower legs were present, the rest of the burial was truncated by robber cut R232, some disarticulated human

bone was recovered from back-fill R94 that may have belonged to this infant. Under R325, over R235.

R337. Eastern wall of the grave chamber, consisted of mortar bonded medium sized flat stones and occasional bricks. The wall was built upon the bedrock in four irregular courses, mortar surface R225 was plastered over the wall. Under R27 and R338, over R367.

R338. Southern wall of the grave chamber, consisted of seven courses of mortar bonded bricks. Mortar surface R225 was plastered over the wall. R337 butted both the eastern and western walls. The three other walls were built of stone, R338 butted the other walls and may be a secondary dividing wall, implying that the chamber was originally larger. Under R225, over R338 and R358.

R339. Western wall of the grave chamber, consisted of mortar bonded medium sized flat stones and occasional bricks. The wall was built upon the bedrock in four irregular courses, mortar surface R225 was plastered over the wall. Under R338, over R367.

R358. Northern wall of the grave chamber, consisted of mortar bonded medium sized flat stones and occasional bricks. The wall was built upon the bedrock in four irregular courses, mortar surface R225 was plastered over the wall. Under R338, over R367.

R367. Construction cut for the grave chamber. The chamber was cut onto bedrock, the cut was not exposed in plan, this number issued for convenience. The chamber must have been cut from a level earlier than the tile floor as the beach gravel bedding for the tiles butts the structure without the cut being visible. Under R230, R337, R338 and R358.

R368. A row of N/S aligned stones placed along the top of the western wall of the grave chamber forming a kerb. Under R1, over R339.

R369. Brick and mortar deposit 'filling' the gap between the grave chamber and the adjacent column, creating a floor surface. Under R1, over R427.

Group 4:7

R75 R76 R79 R223 R254 R256

Group 4:7 consisted of the remains of a red ceramic tile floor (R75, R76 and R256) bedded in a layer of beach gravel (R223 and R254) in the north transept. The tiles were badly broken up but in some places their structure could be discerned. The tiles were 0.26m x 0.26m in size. The floor had been truncated over large parts of the transept, partially by discreet cuts but also over large areas, probably during the removal of the demolition deposits from over the ruin. The floor level was exposed but not excavated. In some areas the stratigraphy was difficult to determine. Against the northern wall a brick and mortar deposit (R79) filled the gap between the last row of tiles and the cathedral wall. A similar situation was observed in the north aisle, (R25, group 4:5). The tile floor was also documented in the crossing (R70, group 4:8), north aisle (R24, group 4:5) and at the eastern end of the south aisle (R157, group 4:3). It is likely that the tile floor covered most of, if not all of the cathedral. The remains of this floor were represented in the north transept by isolated patches of tiles. In the other areas isolated groups of tiles were grouped under one context number, but separate context numbers for each patch were retained in the north transept. Tile deposits (R63 and R68, group 7:4) were interpreted as re-deposited. R76 of this group consisted of tile and mortar fragments, this layer may have been re-deposited. R254 consisted of beach gravel and tile fragments mixed together rather than tile fragments bedded in the surface of the gravel as was the case elsewhere. R76 and R254 are however interpreted as being the remains of in-situ flooring. There appears to have been a greater degree of small scale disturbance and redeposition of the tile fragments in the north transept and also post-depositional reworking of in-situ tile flooring. The floor deposits could not be confidently grouped into one context here, separate context numbers were therefore retained to enable re-interpretation and re-grouping of these contexts if necessary.

Contexts

R75. Floor of square red ceramic tiles, 0.26m x 0.26m. The tiles were broken up, in some places no structure remained whereas elsewhere the shape of individual tiles could be discerned. The tiles were laid flush to one another. The floor surface had been truncated by a number of discreet events. R75 represents the tile floor in the northern half of the north transept. The floor was only exposed in this area, not excavated. Under R74, R77 and R78.

R76. Layer of tile and mortar fragments. No structure was visible within the tile fragments, they were mixed with the mortar fragments. R76 was only exposed on the surface, it was not excavated. It was not clear whether R76 was remains of an in-situ tile floor or re-deposited tile and mortar fragments. The former is most likely as the tile fragments were so concentrated. Under R74, R77 and R78, over R79.

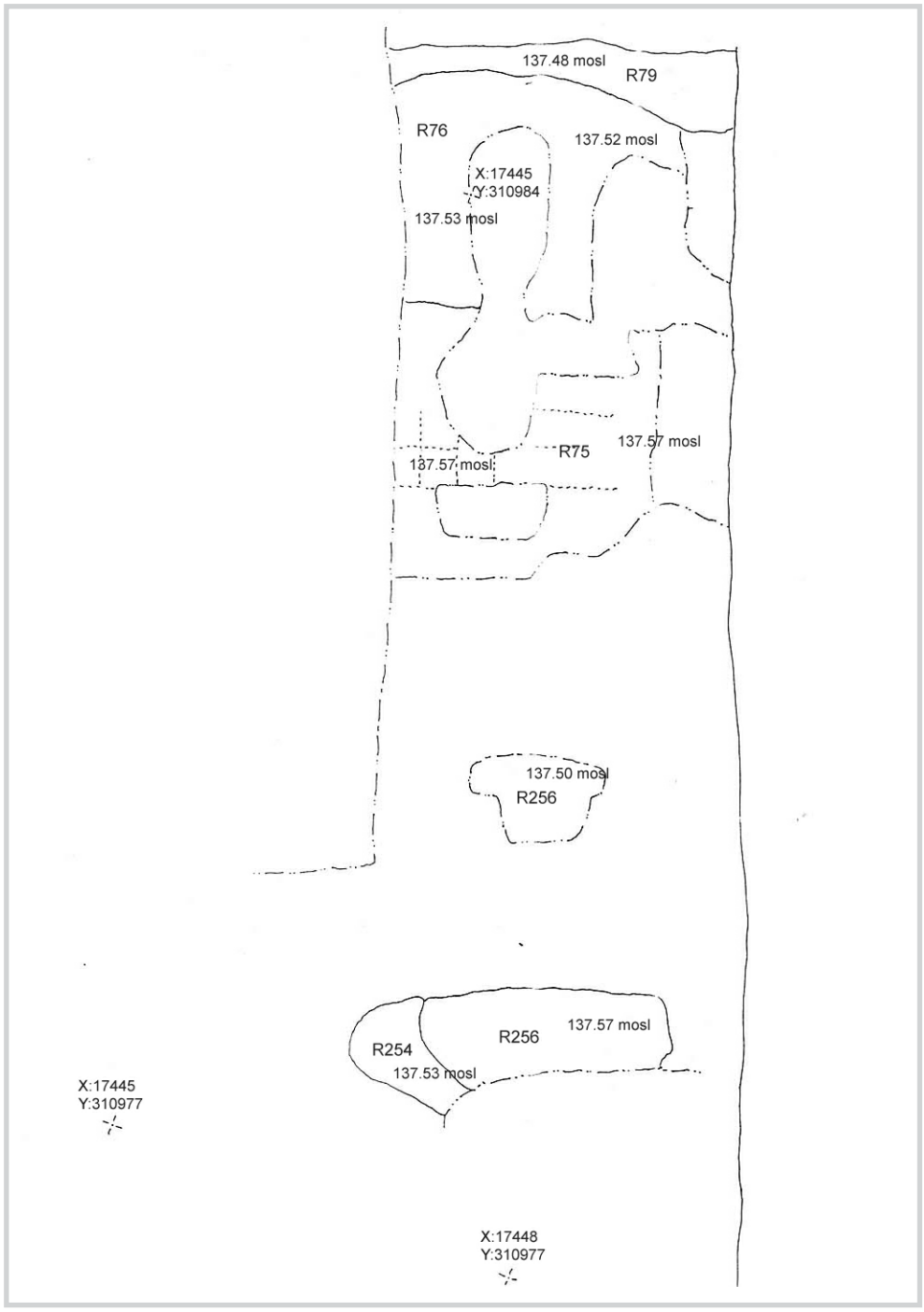


***Fig. 82**. Group 4:7, area R96, north transept.*

R79. Layer of mortar and brick fragments, R79 lay along the inside, southern face of the north wall of the north transept. It was <0.30m wide. The tile floor, R75, was badly disturbed in this area and the stratigraphic relationships were difficult to define. R79 may have served a similar function to R25 in the north aisle i.e. it filled the gap between the tiles and the cathedral wall where there was not enough space for a full row of tiles. Under R76, over R134.

R223. Localised deposit of beach gravel, only present in a depression in underlying layer R224. It butted the northern face of brick line R59 that together with R69 formed the threshold between the crossing and the north transept. R223 was not planned, it covered an area 0.50m in diameter and was 0.05m thick. Under R54, over R224.

R254. Layer of beach gravel and tile fragments mixed together. Presumably the tile floor lay bedded in the beach gravel. The floor must have been removed at some point, probably during removal of the demolition deposits, leaving only a few fragments mixed in with the gravel. The layer was recorded sporadically over the north transept. Under R256, same as R81 and R255.

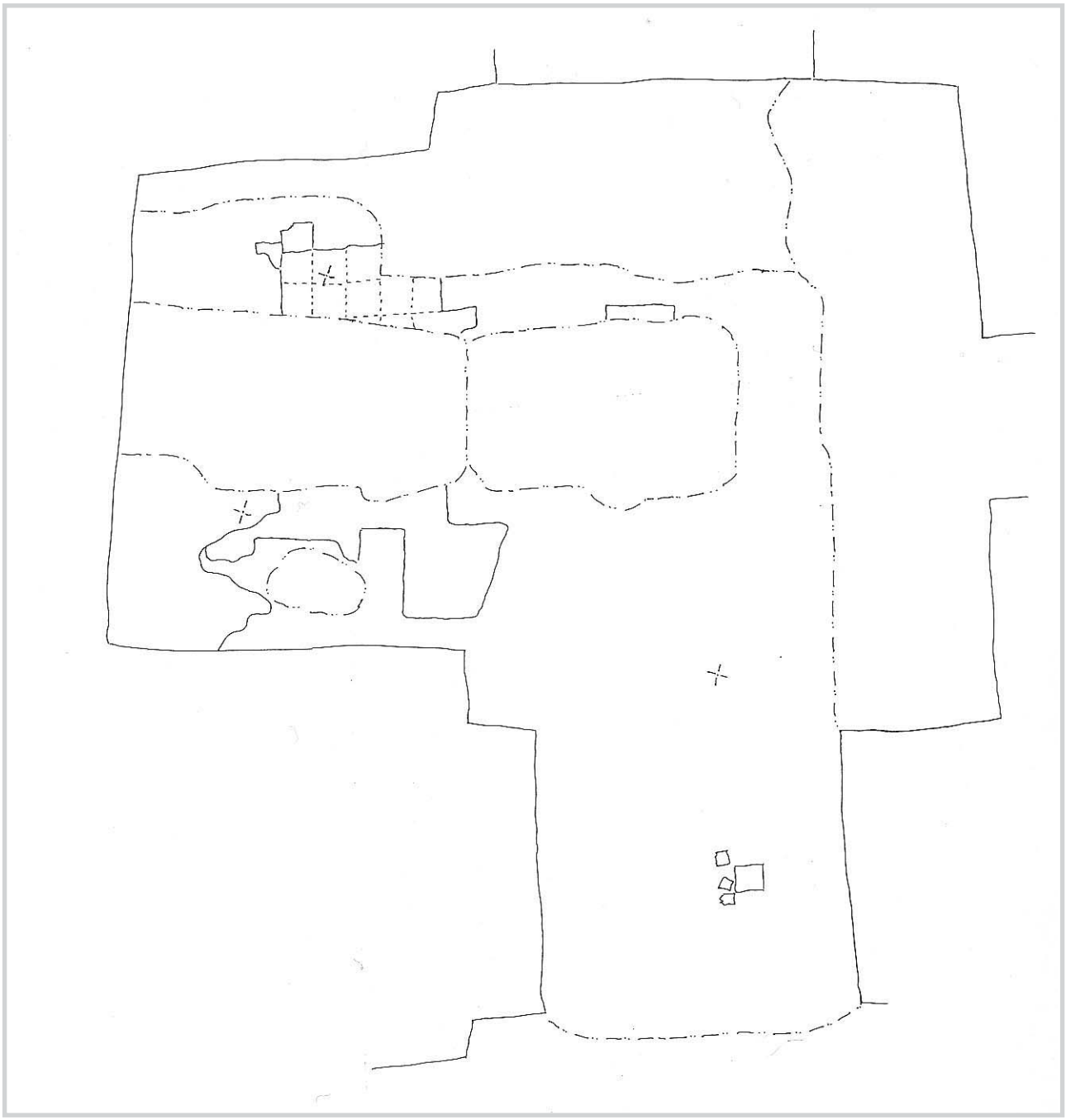


***Fig. 83**. Group 4:8, area R96, the crossing. Parts of tile floor R70.*

R256. Layer of fragmentary red ceramic tiles. the layer consisted only of tile fragments, no structure was observable but it appeared as though R256 was remains of an in-situ floor layer. Under R257, over R254.

Group 4:8

R70 R144

Group 4:8 consists of the remains of a floor of red, square ceramic tiles (R70), set in a bed of beach gravel (R144). The tiles were only present to varying degrees of preservation in the western half of the crossing and in a small area between the crossing and the south transept. The beach gravel layer was more extensive, covering, except where it had been truncated by cut features, most of the crossing and the corridor into the south transept. This indicates that the floor had originally covered the whole of the room and the corridor. The floor lay flush with the top of the threshold stone R273, (group 3:3) that separated the crossing from the nave, but was possibly slightly lower than the threshold into the north transept R60 (group 3:2). The floor was not preserved abutting R60 however. Remains of a square tile floor were recorded in both the northern and south aisles and in the north transept, groups 4:5, 4:3 and 4:7 respectively. Presumably

this floor surface was laid over most, if not the whole cathedral simultaneously. One of the tiles in the corridor between the crossing and the south transept was lifted whole. Beach gravel was embedded in the underside of the tile. The gravel had been pressed into the fabric of the tile. This must have occurred prior to firing and indicates that the tile was produced locally.

Contexts
R70. Tile floor, consisted of square red ceramic floor tiles, 0.25m x 0.25m x 0.07m thick. Remains of the floor were only preserved in the western half of the crossing. The floor had been truncated by cut R71. The tiles were broken up, in some places into small pieces, but to the north of R71 the floor pattern could be discerned, to the south the floor consisted of small pieces of tile. The tiles were laid flush against one another in a bed of beach gravel, R144. Under R71 and R165, over R144, same as R24, R88, R157, R159, R208, R212 and R290.

R144. Layer of beach gravel, 0.10m thick, covered most of the crossing, except where it had been truncated by cut features. R144 was the bedding layer for tile floor R70, the tiles however were only sporadically preserved in the western half of the room. Under R70, R133, R142 and R163, over R168, R243, R245, R269, R272, R310 and R312 same as R27, R81, R86, R114, R156, R223, R254, R255 and R297.

Group 4:9
R243 R244
Group 4:9 consisted of an unexcavated grave, E/W aligned, located in the crossing directly in front of the entrance to the chancel. The grave lay immediately east of the excavated triple grave (group 2:14), but they were not contemporary. R244 appeared to be cut through charcoal layer R248 (group 3:6), whereas the triple grave was earlier. The upper surface of the grave was disturbed by antiquarian digging or other modern activity (R142 and R143, group 7:5). This digging, directly over the grave, may imply it was visible on the surface. The brick and mortar fragments in fill R143 may have been part of a grave marker or base for a grave slab.

Contexts
R243. Fill of loose brownish grey silt and sand, contained small stones, small fragments and flecks of charcoal and occasional small wood fragments. Under R144, over R244.

R244. E/W aligned linear cut, not excavated, 2.20m long, 0.80m wide. The southern edge was linear, the northern edge appeared to be less regular but it was not certain that this edge was correctly defined. It appeared as though the grave was cut through charcoal layer R248 but this was not confirmed. Under R243, over R248.

Group 4:10
R4
Group 4:10 consists of layer R4 exposed in a test pit in the Sacristy. The layer consisted of tile fragments, beach gravel and silt all intermixed. It may have been the remains of an in-situ floor surface but appeared to have been disturbed and mixed slightly with silt. This intermixing may have occurred when the demolition deposits were cleared from the cathedral. Some of the tile deposits in the north transept (group 4:7) had also been mixed in this way.

The layer was only exposed in a small test pit, it is therefore difficult to interpret with any confidence. It is possible that R4 consisted of broken up remains of the tile floor re-deposited here, but it is tentatively interpreted as the remains of an in-situ tile floor in the sacristy.

Contexts
R4. Mixed loose layer of mid brown silt, tile fragments and beach gravel mixed together in approximately equal proportions. The layer also contained small stones. The silt and stone predominated at the top of the layer whilst the beach gravel and tile fragments predominated at the base. Under R1, over R5.

Group 4:11
R5 R6
Group 4:11 consists of a burnt horizon (R5) and underlying stone layer (R6). These layers were exposed in a test pit in the sacristy. Stone layer R6 may have formed a rough stone surface but is interpreted, along with the burnt layer R5, as demolition debris. R5 and R6 were sealed by broken up tile layer R4, (group 4:10). R4 is interpreted as the remains of an in-situ floor, but could have been re-deposited. It is uncertain whether R5 and R6 were in-situ demolition deposits from the 1567 fire, redeposited demolition deposits, as the burnt layers in the south transept appeared to be, or demolition material dumped in this area when the sacristy was constructed as levelling under the tile floor.

A charcoal sample from R5 was radiocarbon dated to CAL AD 1010 - 1300 at the 95% level of confidence. It seems unlikely that R5 was an in-situ demolition deposit resulting from the 1567 fire. Excavation outside the north transept in both 1988 and 1992 showed that the sacristy

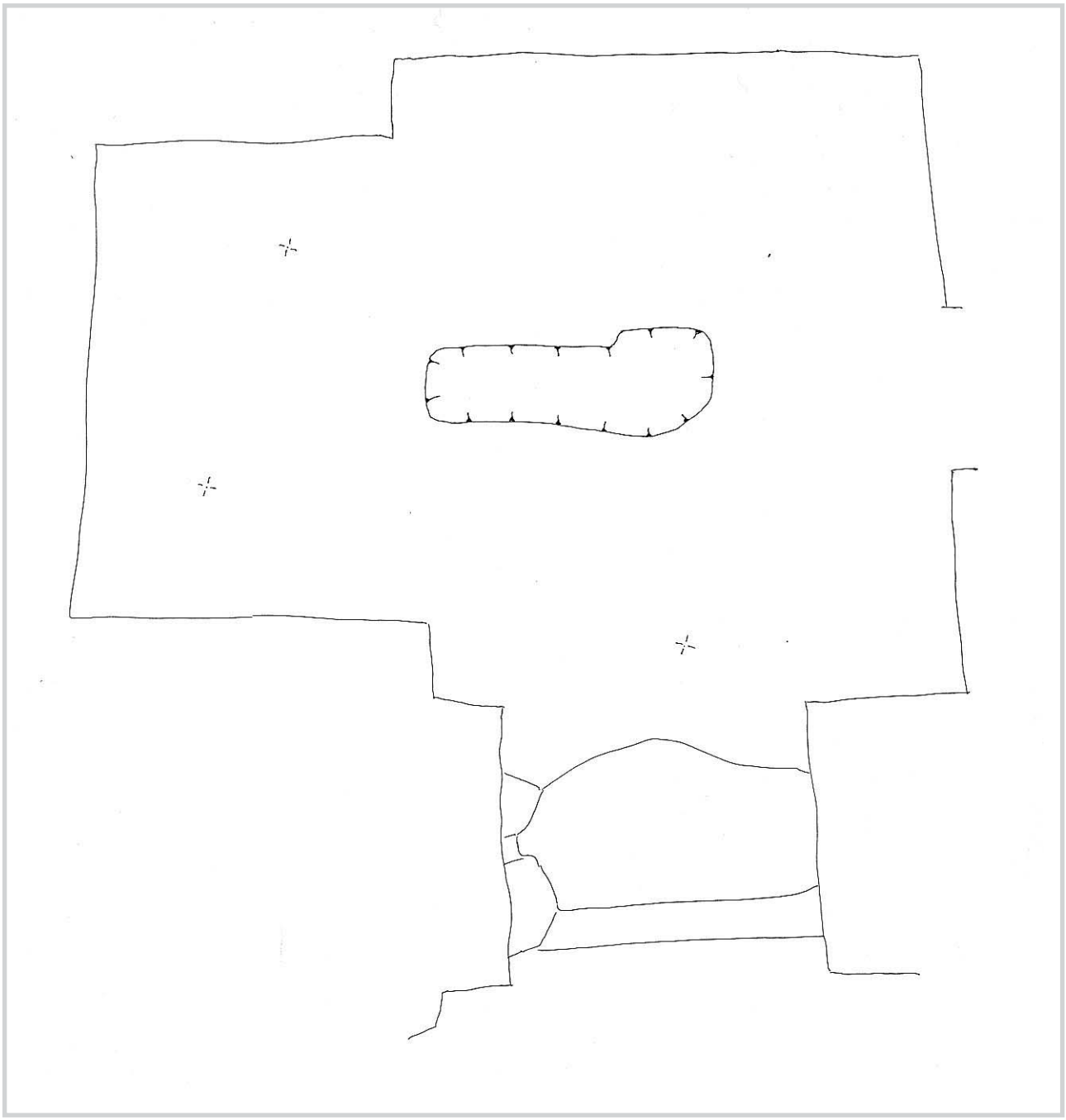


***Fig. 84**. Group 4:9, area R96, the crossing.*

was later than the north transept and has been dated to shortly after 1450 (Pedersen E. A. 2000:200) or slightly later (Sæther 1998:69). If the radiocarbon date was from the roof timbers of the Sacristy then the room would have been built much earlier than this. The radiocarbon date doesn't exclude the possibility that R5 and R6 were in-situ demolition deposits however as the roof timbers may have been re-used. The interpretation of this group hinges upon whether the overlying layer R4 is interpreted as in-situ floor remains or re-deposited tile fragments. The former is the case and R5 and R6 are tentatively interpreted as make-up deposits under the tile floor.

Contexts

R5. Dark grey layer of charcoal and silt, some of the charcoal was present as powder mixed with the silt, but many fragments of charcoal and a few partially carbonised wood fragments were also present. The remains of a plank were visible running across the trench The layer also contained small stones, mortar flecks, tile fragments and iron nails. It is uncertain whether R5 was in-situ burnt debris or whether these deposits are re-deposited as was the case in the south transept. Some of the stones in the underlying layer R6 was visible through R5. A charcoal sample from this layer was radiocarbon dated to CAL AD 1010 - 1300 at the 95%

level of confidence / Beta-173767, sample number HKH11888). Under R4, over R6.

R6. Layer of stone, mortar and sandy silt. The layer was exposed on its surface over 1m x 0.45m. It was difficult to interpret the layer from such a limited investigation. It appeared as though the stones may have been deliberately laid in the silt/mortar mixture. They varied in size but were laid flat, they didn't form a continuous surface however. The stones were partially visible through the overlying burnt deposit. The stones may have formed a rough floor surface but were more likely demolition debris laid to level off the ground surface. Under R5.

Group 4:12

M139 M140 MG141 M143 M151 M165 M166 M171 M172

Group 4:12 consists of the westernmost third of an in-situ grave, (M139, MG141 and M140), and three other cut features of similar dimensions (M143, M151, M165, M166, M171, and M172) in trenches M96-11 - 15 and BF96. These were recorded from section only. The section was closely examined for evidence of burials but none were evident. A number of 'empty graves' were also excavated from churchyard soils in area D (group 5:3). The interpretation of the features in area D and those in group 4:12 remains uncertain, the two groups were probably not contemporary. The fills (M151, M171 and M172) of all three features suggested they were backfilled with the excavated material. The fill of certain grave M139 was significantly different and contained brick fragments. The fills of the other three features contained no brick, but this may reflect the content of the layers they cut through, and does not necessarily imply that they are earlier features. The southern edge of M166 cuts directly against the stones of the 'Bishop's Foundation'. There is no clear stratigraphic evidence to group the 'empty' features with the in-situ burial, but they appear from the profile to be more related to M140 than earlier grave cut M127 (group 2:19).

The depth of grave cut M140, 0.80m, suggests that the upper part of the feature has only been marginally truncated, i.e. that the top of the cut roughly reflects the original height of the surface of the churchyard, c. 137.83 m over sea level.

Contexts

M139. Fill of slightly reddish brown sandy silt contained gravel, small stones, mortar flecks, brick fragments, charcoal flecks and a little animal bone. Contained burial MG141. Under M123, over MG141.

M140. Grave cut, aligned E/W, the eastern end was partly truncated by the 1992 excavation, the western end lay outside the excavated area, 0.65m+ long, 0,75m wide, 0.80m deep. The sides were cut at a near vertical angle rounding to a flat base. The grave cut into an earlier burial, MG144, the bones of which were slightly exposed by M140. Under MG141, over M126.

MG141. Adult skeleton, supine, head to west. Only the legs from the middle of the femurs down to the feet were exposed, the hips and upper body lay outside the excavated area, the outer toes were also missing, probably removed by the 1992 excavation. No 1992 G number could be compared with MG141, it is questionable whether the toe bones were recognised as an in-situ burial. The feet were angled up at the end of the cut suggesting that the body was interred without a coffin, no other traces of a coffin were apparent. Under M139, over M140.

M143. Cut feature, recorded from section only, the sides were cut at a 45 degree angle, with a rounded base, the upper part of the cut and fill had been truncated. Possibly a grave cut but no human bone was visible in the section. Under M151, over M135.

M151. Fill of brown silt, flecked with yellow brown clay, contained stone fragments of all sizes from gravel to small stones. The fill was recorded from the section, no burial or human bone was visible. Under M123, over M143.

M165. Cut feature, recorded from section only, the southern edge was cut at a near vertical angle, the northern edge appeared to be cut at a shallower angle but the uppermost 0.40m has been truncated by M167. The feature was 0.70m wide, 0.70m deep. Possibly a grave cut but no human bone was visible in the section. Under M172, over M173.

M166. Cut feature, recorded from section only, the sides were cut at a steep angle rounding to a flat base, 0.70m wide, 0.60m deep. Possibly a grave cut but no human bone was visible in the section. Under M171, over M173.

M171. Fill of light brown gravely silt and small stones. The fill is probably comprised of re-deposited material from the layers that the feature cuts through, M135 and M173. The fill was recorded from the section, no burial or human bone was visible. Under M123, over M166.

M172. Fill of light brown gravely silt and small stones. The fill is probably comprised of re-deposited material

from the layers that the feature cuts through, M135 and M173. The fill was recorded from the section, no burial or human bone was visible. Under M123, over M165.

Group 4:13

MG160 M161 M187 M189 M190 M191 M193 M194 M198 BF30 BF32 BF33 BF34 BF35 BF37 BF38

Group 4:13 consists of the construction of the 'Bishop's Foundation' and associated walls M190/M191 and M193 in trench M96-11 - 15 and BF96. A trench was excavated through the uppermost 0.60m of the Bishop's Foundation. It was constructed in layers, these consisted of large stones with smaller stones filling in the gaps between them (BF30 and BF35), and levelling layers of smaller stones (BF33) and silt and stones (BF32 and BF34). Remains of the structure that the foundation supported were also recorded, three upstanding stones (BF38) were bonded to the SW corner of the foundation by mortar BF37. No mortar bonding was recorded in the foundation layers. The remains of the fill of the construction trench were preserved on the south side (MG160 and M161), but later cuts (group 4:12) had truncated the construction cut on both the north and south sides, it is therefore not clear when the structure was built. The foundation is interleaved with stone foundation/wall M193 to the NW. M193 was aligned WSW/ENE, it was only exposed on the surface but appeared to be constructed in a similar manner to BF30, mortar layer M189 lay partially over the surface of M193. The wall probably meets NNW/SSE aligned wall M191 under buttress M198. M191 was constructed of large stones with a layer of compact yellow mortar (M190) over them. M190 was not excavated but M191 appeared to be constructed as a solid stone foundation, as M193 and BF30 were, with a capping of mortar (M190) laid over it. M191 had approximately, though not exactly, the same alignment as the east wall of the chancel. It was slightly wider and was clearly not constructed in the same manner. M191 must be secondary to the construction of the chancel. It is debatable whether M191 functioned as a regular external wall, it appears to

***Fig. 85**. Group 4:13, trench M96-15.*

***Fig. 86**. The western edge of the 'Bishops Foundation' and walls M191 and M193, group 4:13, trench M96-15. Facing W. Photo Stan Reed, NIKU.*

form a rough square with wall M193 to the north and the 'Bishop's Foundation' to the east. There was no corresponding structure to the south, but the area was partially enclosed by later buttress M194. These structures partially enclose the area immediately to the west of the 'Bishop's Foundation'. The central area was 'filled' by silt and mortar M187. The 'Bishop's Foundation' has been interpreted as a foundation for a tower supporting a walkway between the Bishops Residence to the east and the cathedral. If this interpretation is correct the walkway would have led to an entrance into the cathedral between the chancel and sacristy. Whether there would have been steps down to an entrance at ground level or whether the walkway would have led directly into the room over the chapel is open to debate (see Sæther 1995:52). Buttresses M194 and M198 were constructed over wall M191, it is uncertain whether they are contemporary or later, they are included in this group because M194 appears to partially close the area to the south.

Contexts

MG160. Remains of human bone, possibly an in-situ grave but also possibly re-deposited bone in the back-fill of the construction cut for the 'Bishop's Foundation'. Within fill M161.

M161. Fill of grey brown silt, contained small and medium sized stones, mortar flecks and disarticulated human bone. The fill was recorded from the section. Some bones were recorded as being from an articulated skeleton, MG160, indicating that M161 was a grave fill, but no cut was recorded. To the north the fill lay directly up against the stones of the 'Bishop's Foundation'. To the south any construction cut has been removed by cut M164. It is possible that MG160 was disarticulated human bone and that M161 is actually back-fill to the cut for the construction of the 'Bishop's Foundation'. Under M164, over BF35, contained MG160.

M187. Dark brown gravely silt, contained mortar and brick fragments. M187 'filled' the area between walls M191 and BF38, buttresses M194 and M198 and the 'Bishop's Foundation' M38. The southern limit of M187 was not documented. Not excavated. Under M37 and M189, over M190 and M193, same as M201.

M189. Layer of white mortar, partially overlay the stones of wall M193 and appeared to extend beyond the wall slightly to the south. Not excavated. Under M186, over M193.

M190. Compact yellowish white mortar, contained inclusions of beach gravel and small brick fragments. M190 lay over stone wall M191. M190 was not excavated, it appeared to be a layer of mortar capping a solid stone foundation. Under M184, over M191.

M191. Stone wall or foundation, appeared to be aligned NNW/SSE, but only the eastern edge was fully exposed. M191 was uncovered between two buttresses, M198 and M194, and continued under them to the north and south respectively. M191appeared to be the foundation for the external wall of the cathedral, directly north of the chancel. No standing external wall remains closed the room to the east off from the churchyard. It was constructed of large unworked stones, some rounded. The stones were partially overlain by unexcavated compact mortar deposit M190. M191 was over 2m wide and over 2.5m long. The layer to the east, M187 butted against the wall. M191 would presumably meet WSW/ENE aligned wall M193 under buttress M197. Under M190 and M187.

M193. WSW/ENE aligned stone wall/foundation, 1.50m+ long, 1.30m+ wide. The wall merged with the 'Bishop's Foundation' to the east and ran under buttress M198 to the west. The northern edge lay outside the excavation. To the west the wall probably connected with roughly perpendicular wall M191 under buttress M198. Mortar layer M189 partially overlay the stones. Silt layer M187 butted against the wall to the south. Under M187 and M189.

M194. Buttress that lay against the outside of the NE corner of the chancel. M194 is the original buttress, it was only exposed in a small area underneath its reconstruction M195. There was a clear break with overlying reconstruction M195. The small exposed part of M194 consisted of medium sized stones bonded with yellow mortar. The buttress butted the chancel wall and was partially built upon wall M191. Under M195, over M190, same as M196.

M198. Buttress that lay against the external NE corner of the room north of the chancel. M198 is the original buttress, it was only exposed in a small area underneath its reconstruction M197. There was a clear break with overlying reconstruction M197. The small exposed part of M198 consisted of medium and large sized stones bonded with yellow mortar. The buttress was partially built upon wall M191. Under M197, over M190.

BF30. Stone foundation, consisted of stones of all sizes, from 0.05m – 0.50m x 1m. The stones were laid irregularly in a layer. Under BF31, BF37 and M163, over BF32.

BF32. Layer of yellowish brown sandy clay silt and stone fragments, contained a few fragments of human bone. BF32 was c. 0.10m thick and lay in between two layers of large stones. Under BF30, over BF33.

BF33. Stone foundation, consisted of stones of all sizes, from 0.05m – 0.50m x 1m, but the average size was considerably smaller than in BF30 and BF35. The stones were laid irregularly in a layer. Under BF32, over BF34.

BF34. Layer of yellowish brown sandy clay silt and stone fragments, contained a few fragments of human bone. BF32 varied in thickness, it was < 0.10m thick and lay in between two layers of large stones. Under BF33, over BF35.

BF35. Stone foundation, consisted of stones of all sizes, from 0.05m – 0.50m x 1m, most of the stones were large, a few smaller stones were used as fill in between the larger stones. The stones were laid irregularly in a layer. Under BF34, over BF36.

BF36. Layer of dark brown sandy clay silt and stone fragments. The layer was not excavated, but was very similar to BF32 and BF34, it presumably had the same function. Under BF34 and M161.

BF37. Layer of yellow coarse mortar, contained inclusions of beach gravel. The mortar lay over BF30 and bonded upstanding stones BF38 to BF30. Under BF38, over M187, same as M188.

BF38. Three large stones one was 0.50m x 0.50m x 0.40m, the other two 0.80m x 0,50m x 0.40m. The stones lay in a row on the western edge of the 'Bishop's Foundation', they were bonded to the surface of the foundation by mortar layer BF37. The stones were upstanding over the level of the foundation by 0.40m, no mortar was used to bind the foundation stones. BF38 appears to be the remains of the structure that the foundation supported. Over BF38, same as M192.

Group 4:14

J77 J79 J80 J81 J82 J83 J84 J86 J87 J88 J89 J90 J91 J92 J93 J97 J98 J100 J107

Group 4:14 consists of make-up deposits, primarily building debris mixed with silts and clays in the NW corner of the churchyard. This group was represented in trenches J96-1, J96-2, J96-3 and J96-4. Layers of lime-

stone fragments from stone working mixed with a silt and silty clays (J79, J83 and J93), a layer of burnt red sandstone/beach gravel (J93) and a thin layer of clay (R97) raised the ground level by 0.15m - 0.30m in J96-1. Layers of limestone fragments from stone working mixed with silts and a silty clay (J82, J88, J91, J98 and J100) and a mortar layer (J92) were overlain by a humus rich silt layer (R77) in J96-2. J77 may have been a turf horizon sealing the make-up deposits. These deposits raised the ground level by 0.60m - 0.70m. Silt/clay layers (J81, J86 and J90) mixed with mortar, stone fragments, and some stone working debris raised the ground level in J96-3 by 0.20m - 0.50m. These layers, J90 in particular were thicker towards the north. Some of the stone fragments had traces of mortar on their surface indicating they had been used in a building, some of these fragments were quite small however and may have been produced by the re-working of building stones recovered from demolition deposits. Four silt layers, (J80, J84, J87 and J107), one of which (J87) contained stone working debris, built up the ground level by 0.50-0.90m in J96-4. These layers were thicker towards the north. Two make-up dumps of moraine clay in trenches J96-1 and 2 were grouped separately (group 4:15).

The terrain was not only built up by this activity, the top of the slope down to the north was also levelled off, increasing the area of horizontal terrain northwards. The ground level in trench J96-1 and 3 was built up to c. 136.00 m over sea level, in trench J96-2 the ground surface was 136.37 m, and in J96-4 the ground surface was 135.77 m. This area was presumably built up so that it could be used for burials. Prior to this make-up activity the area was dominated by thin soil layers over bedrock and was totally unsuitable for burials. Burials were excavated at the eastern and western ends of the area north of the north aisle during the 1992 excavations, but not from the central area (see Pedersen E. A. 1994:72). It is debatable to what extent this area was used for burial even after the area was built up. No burials were uncovered in J96-1 - 4.

Contexts

J77. Dark brown fine humus rich silt in J96-2, contained large stones and occasional mortar fragments. Under J76, over J82.

J79. Layer of limestone chips in J96-1, most varied in size from 0.01-0.05m x 0.05m but a few fragments were larger, > 0.10m x 0.10m, the stone chips were mixed with a brownish grey sandy silt. The layer was 0.15m thick. Under J78, over J83 (also JL3/AL7 92).

J80. Dark brown silt layer in J96-4, contained a few smallish stones. The upper surface was roughly horizontal, the underlying horizon with J84 was very clear. Possibly an old turf line. Under J105, over J84.

J81. Mixed layer of grey brown clay silt (c. 60%), gravel (c. 20%), mortar (c. 10%) and stone chips (c. 10%) in J96-3, the layer contained charcoal flecks and occasional brick fragments. Under J114, over J86.

J82. Layer of stone chips (c. 90%) and dark brown humus rich silt (c. 10%) in J96-2. The stone chips varied in size from 0.05m x 0.05m - 0.10m x 0.15m. Under J77, over J88.

J83. Layer of limestone chips and brown sandy clay in J96-1. The stone fragments varied in size from < 0.10m x 0.15m. The layer contained a lesser percentage of stone chips than overlying J79. The layer was mixed with underlying layer J89. Under J79, over J89.

J84. Layer of dark brown silt in J96-4, contained mortar lumps, small stones and brick fragments. Both the under and overlying horizons were clear. Under J80, over J87.

J86. Layer of gravely silty clay (c. 90%) and stone fragments (c. 10%) in J96-3, most of the stone fragments were small, some had traces of mortar on their surface. At least one fragment was of sandstone, most were limestone. The upper surface of the layer was uneven, sloping down slightly to the NE with two depressions in the surface. Under J81, over J90.

J87. Layer of dark brown silt in J96-4, contained flat stone chips. The layer sloped down to the north. J87 and the underlying layer J107 were excavated as one, in profile however two different layers were identifiable. Under J84, over J107.

J88. Layer of gritty yellow clay and stone chips < 0.10m x 0.15m in J96-2. The layer contained occasional mortar fragments. J88 was similar to overlying layer J82, but the stone content was less and consisted of larger stones, the interface between the two layers was unclear. Under J82, over J91.

J89. Brown sandy silty clay in J96-1, contained small limestone fragments/chips and a few sandstone fragments. The upper surface of the layer was mixed with overlying J83, which suggests that J83 was deposited a short time after J89. Under J83, over J93, same as J88? (also JL3/AL7 92).

J90. Mixed layer of brown grey sandy silt (c. 60%), small stones (c. 20%) and white mortar (c. 20%) in J96-3, also contained larger stone fragments and charcoal flecks. The layer was quite loose and disturbed by roots. Most of the stone fragments were limestone but some sandstone fragments were present, some fragments had traces of mortar on their surface. The layer was not present in the southernmost 0.15m of the trench. The southernmost edge was 0.01m thick, but it became gradually thicker towards the north where it was 0.35m thick. Both the upper and lower surfaces sloped down sharply to the north. Under J86, over J94.

J91. Dark brown humus rich silt and stone chips in J96-2. The stone chips were approximately 0.03m x 0.03m. Under J88, over J92

J92. Layer of mortar in J96-2, both lumps of mortar and crushed mortar, as well as small stones were present. The layer sloped down and faded out to the north. Under J91, over J98.

J93. Layer of black stone fragments. Possibly burnt red sandstone, possibly beach gravel in J96-1. Under J89, Over J97.

J97. Reddish brown clay layer, contained some medium sized stones in the base of the layer. Appeared to be re-deposited moraine clay. Under J93, over J99.

J98. Layer of orange silty clay in J96-2, contained occasional small stones. The layer was thickest at the northern end of the trench, fading out towards the south. Under J92, over J100.

J100. Loose layer of stone chips and dark grey silt in J96-2, contained occasional lenses of mortar. The stone chips varied in size < 0.05m^2. The layer was thicker towards the south, the upper surface sloped down towards the north. Under J98, over J102.

J107. Layer of dark brown silt in J96-4, contained rounded stone fragments. Recorded from profile only. J87 and J107 were originally excavated as one. J107 was lighter in colour and the stones were rounder. Under J87, over J95.

Group 4:15

J99 J102

Group 4:15 consists of two make-up dumps of re-deposited moraine clay mixed with stones, including red sandstone, (J99 and J102) in trenches J96-1 and J96-2 in the NW corner of the churchyard. This group was not represented in J96-3 and J96-4. The ground level in these two trenches was built up by 0.20-0.40m. The overlying make-up group (4:14) was present in all four trenches. These two deposits were separated into their own group as they did not consist of the construction debris that dominated group 4:14.

Contexts

J99. Layer of large fragments of red sandstone (c. 60%) and beige silty sandy clay (c.40%) in J96-1. The layer was 0.25m - 0.40m thick. Under J97, over J103.

J102. Orange brown silty clay layer in J96-2, contained stones of all sizes. The layer wasn't present in the southern end of the trench, at this level the southern end of the trench comprised stones that were upstanding from the underlying sterile. At the northern end of the trench the layer was 0.20-0.25m thick. Under J100, over J104.

Group 4:16

J147 J136 J137 J138 J162

Group 4:16 consists of thick, mortar and stone demolition deposits (J147, J136, J137, J138 and J162) in trench J96-6 at the NW corner of the churchyard. The profile was recorded whilst frozen, in some cases more than one layer may have been recorded under one context. These layers ranged from 0.20m - 0.60m thick. R147 and R136 had roughly horizontal upper and lower boundaries, R137 sloped down slightly to the south, whereas the lower boundary of R138 sloped sharply down to the south. In total this group built up the ground level in the NW corner by 0.85m+ at the northern, and 1.70m+ at the southern end of the trench. The uppermost deposit R147 was exposed by machining, it may have been more extensive than its recorded thickness. This demolition material is used as make-up in the NW corner, building up the ground level and levelling off the terrain further out into the natural slope down to the churchyard wall. This is the same activity as recorded in trench P96 (group 4:24).

Contexts

J147. Grey brown gravely silty clay, contained small and medium sized stones, increasing down the profile, mortar flecks, brick fragments and animal bone. The layer was recorded from a frozen section and may have been more than one layer, 0.40m - 0.50m thick. Over J136, same as P5?.

J136. Loose light grey layer of sandy silt, small and medium sized stones, and mortar, both lumps and crushed. The layer was recorded from a frozen section

and was possibly three separate layers of demolition deposits. The upper surface was roughly horizontal, the lower surface sloped down to the north over the northernmost 1m. The layer was 0.40m thick to the south, 0.60m thick to the north. Under J147, over J137, same as P67?

J137. Compact light grey layer of silty clay, contained small stones, mortar and charcoal flecks throughout. The mortar flecks were concentrated at both the over and underlying boundaries, probably as a result of intermixing with J136 and J138. The layer also contained animal and human bones, these were registered in the profile but not recovered. The layer was 0.05m thick to the south, thickening over the northernmost 1m to 0.20m thick. The layer was recorded from a frozen section. Under J136, over J138.

J138. Layer of white sandy mortar, and small stones. The mortar was very loose and didn't appear to have bonded properly. The layer was not present at the southernmost end of the trench but thickened rapidly and was 0.50m thick at the northernmost end of the trench. The layer was recorded from a frozen section. Under J137, over J162.

J162. Loose layer of very sandy mortar, very similar to J138 but more yellow. The layer was only recorded in the NW corner of the trench. The layer was recorded from a frozen section. Under J138, over J139.

Group 4:17

JG115

Group 4:17 consists of a burial, JG115, that was contained within grave soil J121, (group 4:19) in trench J96-8. No trace of a grave cut or coffin was recorded. The layers above this point had been excavated by machine, the burial was partially exposed by machining. The grave lay partially outside the trench, but was excavated in full. Presumably the grave was cut into J121. JG115 lay directly over another grave JG116 but respected the earlier burial. The feet of the two burials lay in approximately the same position, i.e. they were buried in a row.

Contexts

JG115. Adult/sub-adult skeleton, extended, supine, orientated E/W, head to west. The hands were crossed over the abdomen, with the left hand on top. The bones were in relatively good condition, but the grave was exposed by machine, the ribs and pelvis were partially crushed. It is unclear whether this was damage caused during machining. The skeleton was frozen to the ground when lifted, further damage occurred during lifting. The grave lay partially outside trench J96-8, but the area to the west

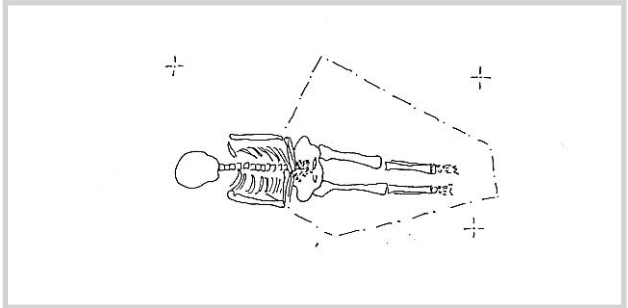


Fig. 87*. Group 4:17, trench J96-8.*

of the trench was machined down to a level which exposed the top of the skeleton. The entire skeleton was therefore excavated. No grave cut or coffin remains were recorded. Within J121.

Group 4:18

JG116 J117 J118 J119 J120

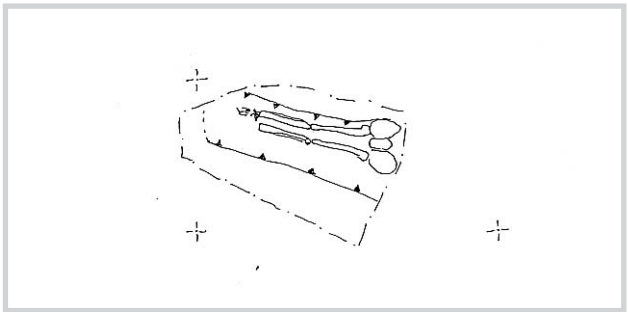
Group 4:18 consists of a burial (JG116, J117 and J118), and a parallel cut feature (J119 and J120) in trench J96-8. Cut J120 was probably a grave cut but only a small part of the feature lay within the trench. Only disarticulated human bone was recovered from the feature, the burial would have lain outside the trench. Only the pelvis, legs and feet of JG116 were excavated, the rest of the burial lay outside the trench. JG116 lay beneath later burial JG115. The feet of the two burials lay in approximately the same position, i.e. they were buried in a row.

Contexts

JG116. Adult skeleton, extended, supine, orientated E/W, head to west. The burial lay partially outside the excavated area, only the left half of the pelvis and both legs were exposed and lifted. The bone was in poor condition and frozen to the ground when lifted. Under J117, over J118.

J117. Fill of mid brown gravely clay silt, contained small stone chips, mortar flecks, charcoal flecks and small frag-

Fig. 88*. Group 4:18, trench J96-8.*



ments of both beach gravel and red sandstone. J117 filled grave cut J118, the fill lay both under and over skeleton JG116. Under J174, over JG116.

J118. E/W aligned shallow grave cut, contained skeleton JG116 and fill J117. The cut lay partially outside the excavated area, 1.20m+ long, 0.60m wide, 0.10m deep. The cut was a little irregular but roughly linear with a rounded eastern end, the sides rounded to the base. The grave had been truncated from above, probably by the burial of overlying skeleton JG115, the cut for JGH115 was not defined. Under JG116, over J121.

J119. Fill of orange brown gravely clay silt, contained mortar flecks, small stones, beach gravel and small red sandstone fragments. Under J174, over J120.

J120. Cut of a linear feature, aligned E/W, only the southern edge was within the excavated area, 0.60m+ long, 0.30m+ wide, 0.25m+ deep. Possibly a grave, but no human bone lay within the excavated area. Under J119, over J121.

Group 4:19

J121

Group 4:19 consists of grave soil J121 in trench J96-8. The layer was c. 0.75m thick, grave groups 4:17 and 4:18 were cut through J121. A third group of burials, group 2:23, appeared to lay beneath this layer, directly cutting the original make-up dumping. The underlying make-up consisted of discreet layers of silts and clays that sloped down to the west. J121 however had a level upper surface and appeared to represent the final building up of the area to cover the foundation of the western wall of the cathedral. The layer was so thick that it is unlikely that it has been truncated to any degree. The upper surface of the layer (135.50 – 135.60 m over sea level) is probably a fairly accurate reflection of the level of the surface of the churchyard at this point. As it is interpreted as being dumped to build up the ground surface after construction of the western wall, J121 should perhaps be placed in period 2.

Contexts

J121. Layer of brown silty clay and small stones, contained occasional medium sized stones, small lumps of mortar and occasional charcoal flecks. The upper half of the layer layer was exposed outside of the J96-8 trench where it was originally numbered J175. The layer was c. 0.75m thick. Under J118, J120, over J123 and J125, contained JG115, same as J175.

Group 4:20

P4 P60 P76 P77 P78 P79

Group 4:20 consists of a series of discreet dumps of silt and stones at the top of the slope in trench P96 (P4, P60, P76, P77, P78 and P79). P75, P76 and P77 contained stone chips and crushed stone debris from stone working. This dumping levels off the top of the slope, increasing the area of flat terrain towards the north.

Contexts

P60. Layer of light greyish brown sandy silt, contained mortar flecks, small stones and brick fragments. The layer extends down the slope, the larger inclusions were concentrated at the base of the slope. Under P3, over P4, same as P39.

P4. Layer of grey silt and small and medium sized stones, contained mortar flecks and occasional brick fragments. The stone content appeared to be stone working debris. Dumped at the top of the slope as make-up. Under P60, over P76, same as P75 and J152.

P76. Layer of greyish brown silt, stone chips and crushed limestone, contained mortar flecks and occasional brick fragments. Similar to P4 but less stone. Under P4, over P79, same as P23.

P77. Layer of orange brown clay silt, crushed stone/gravel and small stones, contained mortar flecks and brick fragments. Under P78, over P5.

P78. Layer of grey silt and small stones, contained mortar flecks and brick fragments. Under P79, over P77, same as P22.

Group 4:21

P5 P6

Group 4:21 consists of two make-up layers of silt in trench P96. These deposits were dumped at the top of the slope to build up the area to form the churchyard. P5 and P6 are interpreted as grave soils.

Contexts

P5. Layer of dark grey, compact clay silt, contained mortar flecks, brick fragments, small stones and a few fragments of bone. Under P77, over P6 and P25, same as P16 and J152.

P6. Layer of dark grey humus rich silt, contained small and medium sized stones, mortar flecks and fragments of bone. Under P5, over P62, same as J153.

Group 4:22

P24 P25 PG26

Group 4:22 consists of a grave cut P24, fill P25 and skeleton PG26 in trench P96. Only the feet of PG26 were excavated. The grave was uncovered in a short trench at the top of slope, dug to accommodate a water pipe. It was defined on the surface but only the area in conflict with the water pipe was excavated.

Contexts

P24. Grave cut, 1.40m long E/W, 0.35m wide, 0.57m deep. The grave was defined on the surface but only the eastern end was excavated. Under PG26, over P62.

P25. Fill of dark brown silty clay, contained gravel, mortar flecks, small stones, occasional brick fragments and occasional fragments of animal bone. The grave was uncovered in the centre of the trench after machining, the grave didn't extend up to the section, the relationship with the overlying layer is therefore uncertain. Under P5, over PG26,

PG26. Adult skeleton, orientated E/W, head to west, only the feet were excavated. The grave was defined on the surface and appeared to be intact, but was only excavated where it conflicted with a water pipe trench at the top of the slope. A nail was found in the fill but the feet lay at an angle following the edge of the cut, indicating that this was probably not a coffin burial. Under P25, over P24.

Group 4:23

P62

Group 4:23 consists of layer of compact, humus rich silt in trench P96. The layer extended down the slope to the churchyard wall covering both the eastern and western sections. P62 is interpreted as a turf horizon. It lay over a series of extensive make-up deposits and represents a hiatus between two periods of make-up dumping (groups 4:24 and 4:20). Grave P24 was cut through P62.

Contexts

P62. Compact humus rich brown silt, contained very small mortar and brick flecks and occasional small stones. The layer was very clean with few inclusions. The layer varied in thickness from 0.01m - 0.12m, in some places it was barely visible but could be followed over the whole length of the both sections. The upper boundary was clear whereas the lower boundary was diffuse. P62 is interpreted as a turf horizon. Under P6 and P24, over P8, P18 and P84, same as P7 and P17.

Group 4:24

P8 P18 P31 P34 P38 P40 P41 P53 P56 P63 P64 P65 P66 P67 P68 P69 P70 P71 P72 P73 P74 P80 P81 P84 P85

Group 4:24 consists of a series of layers of stone and mortar demolition deposits (P8, P18, P31, P34, P38, P40, P41, P53, P56, P63, P65, P67, P68 and P70), and layers containing construction debris, stone working waste (P72 and P74), and possible mortar mix layers (P64, P66, P69, P71 and P73). Some of the layers contained animal bone (P18, P53, P63, P80 and P81). These layers were dumped down the slope in trench P96, building up the ground surface by 2m+. A few silt layers containing relatively small amounts of demolition/construction debris may indicate that there were some breaks in the dumping. The demolition deposits appear to have been sorted, no ashlar masonry was recorded. The demolition material is also deposited in discreet layers, not en masse. The deposits are most likely connected to rebuilding activity as both demolition and construction debris is represented here. The deposits were probably dumped here as it was a convenient place to get rid of the debris rather than being prompted by a need to build up the ground surface. There is no evidence of the slope being utilised in any way other than as a dumping ground. A number of the layers contained animal bone in relatively large quantities, these are presumably rubbish layers, the bone probably being refuse from the meals of those involved in the building work. Some of the layers contained stones that seemed to have been burnt, but not in large quantities.

Contexts

P8. Layer of humus rich silt, yellowish mortar and stones of all sizes mixed together. The layer was originally divided into three layers but later reduced to one. The layer was recorded at the southern end of the section. Under P62, same as J158.

P18. Layer of dark grey beach gravel and silt, contained animal bone and occasional brick fragments. The layer was recorded in the western section only. Under P62, over P40.

P31. Layer of gravel, sand, mortar and medium sized stones. Recorded in the water pipe trench at the top of the slope. Under P38, over P34.

P34. Layer of dark brown silty clay sand and beach gravel, contained small and medium sized stones. Recorded in the water pipe trench at the top of the slope, the layer continued below the base of the excavation. Under P31.

P38. Layer of light brown clay sand and gravel, contained occasional small stones. Recorded in the water pipe trench at the top of the slope. Under P67, over P31.

P40. Layer of brown silty clay sand and mortar, contained small stones and occasional brick fragments. Under P18, over P41.

P41. Layer of brown sandy silty clay, contained brick fragments, mortar and small stones. Under P40, over P63.

P53. Layer of grey sandy silt and large stones, contained mortar and brick fragments and animal bone. Some of the stones had been burnt, others had traces of mortar on their surface. The layer butted against wall remains P52 at the walls southern face, but appeared to have been deposited after P52 went out of use. Under P70, over P71.

P56. Layer of large stones and sand, contained mortar flecks. P56 lay at the base of the slope, <0.50m thick. Under P72, over P57.

P63. Layer of brownish grey sandy silt, small and medium sized stones and mortar, contained brick fragments and animal bone. The layer slopes sharply down to the north, thickening towards the base of the slope. The stone content is greatest at the base of the slope. Under P41, over P64, same as P42.

P64. Layer of brown, gravely silt and mortar, contained small and occasional medium sized stones, some of which were burnt and brick fragments. The mortar was crushed, but a few lumps were present, the lumps were very friable, possibly from a bad mix or maybe also burnt. Under P63, over P65.

P65. Layer of brownish grey sandy silt, contained mortar flecks, small stones and brick fragments. P65 is unlike the rubble deposits in this group as it was predominantly silt. Under P64, over P66.

P66. Layer of crushed mortar, small stones and gravel. The mortar was very sandy and may not have set properly. Under P65, over P67, same as P19.

P67. Layer of small and medium sized stones and mortar lumps. The layer was very loose with many voids between the stones. A few large brick fragments were also present, many of the stones had traces of mortar on their surface. The boundary with P66 and P68 was diffuse. Under P66, over P38, P68 and P69, same as P20.

P68. Layer of white mortar and small stones. The layer's boundaries with P65, P67 and P70 were diffuse. Under P67, over P70.

P69. Layer of coarse yellow brown sand and stones of all sizes, contained flecks of burnt lime, mortar fragments and brick fragments. Under P67, over P70.

P70. Layer of brown sandy silt and small and medium sized stones, contained gravel and mortar. P70 is possibly the upper half of P53. Under P68 and P69.

P71. Layer of yellow brown sand/mortar, small stones mixed with pockets of grey silt, contained gravel and animal bone. The mortar was very sandy, it was not clear if it was a decayed poor quality sandy mortar or a sand mix that was never formed into mortar. The layer also contained lumps of white mortar. Under P53, over P74.

P72. Layer of greyish brown gravely silt and small stones, contained occasional larger stones and mortar. The layer was fairly compact and formed a kind of crust over loose stone layer P56. The stones present in P72 appeared to be stone working debris. Under P73, over P56 and P85.

P73. Layer of crushed mortar and mortar fragments, stones of all sizes and grey silt. The stones and silt were present as concentrations within a crushed mortar matrix. Some of the stones had been burnt. The layer contained small lumps of burnt lime and pockets of yellow brown sand. Under P74, over P72.

P74. Layer of light brown gravely silt, contained small stones and mortar flecks. The stones may be stone working debris, but they were not present in a high concentration. Under P71, over P73.

P80. Layer of beach gravel, mixed with orange brown sand, contained animal bone, small stones and mortar flecks. Only partially exposed at the top of the slope. Under P84, over P72 and P81, possibly the same as P18.

P81. Layer of grey brown clayey sandy silt, quite compact but crumbled under pressure, contained small and medium sized stones some of which were burnt, animal bone, mortar flecks and charcoal flecks. P81 is possibly the remains of a turf horizon, or a developing silt representing a hiatus in the rubble dumping sequence. It was only preserved in a hollow in underlying layer P85, possibly originally more extensive but truncated. Only partially exposed at the top of the slope. Under P80, over P85.

P84. Layer of greyish brown sandy silt, contained stones of all sizes, mortar and brick fragments. Only partially exposed at the top of the slope. Under P62, over P80.

P85. Layer of brown slightly sandy silt, small stones, mortar and flecks of burnt lime. Under P72 and P81, possibly the same as P34.

Group 4:25

P47 P48 P49 P50

Group 4:25 consists of the second churchyard wall in trench P96, built over the remains of the earliest wall P52 (group 2:25). P50 consisted of a coffin wall of a single course of large unbonded stones, the corresponding wall core P49 was of silt and rubble. The overlying wall P48 was a mortar bonded coffin wall, with a mortar and rubble core, P47. P50 varied in width from 2.10m - 2.60m whereas P48 was 2m wide. P50 is interpreted as a foundation for wall P48 rather than as a separate phase of walling. P48 was one course high on the internal, southern side, but three courses high on the external, northern side. The wall was subsequently rebuilt twice on the southern side (P27 and P30, groups 7:14 and 7:15 respectively).

A charcoal sample from wall core P47 was radiocarbon dated to CAL AD 1420 - 1640 at the 95% level of confidence. It is highly unlikely that a wall of this size would have been constructed after the Reformation. The radiocarbon date therefore dates the re-building of the churchyard wall to the latter part of the cathedral and churchyard's period of use. The outside, northern face of the churchyard wall was exposed in trench Q96 prior to being excavated. Wall P50 appeared to have been built upon layer Q4.

Contexts

P47. Wall core for wall P48, consisted of stone blocks of all sizes bonded by a coarse yellowish brown mortar, the mortar contained c. 50% beach gravel, a large number of burnt lime inclusions were also present. The core was only partially bonded to the wall stones, in some places there was no contact. A charcoal sample from the layer was radiocarbon dated to CAL AD 1420 – 1640 at the 95% level of confidence (Beta-173766, sample HKH11765). Under P30, over P48.

P48. Stone wall, consisted of large limestone blocks, laid in three courses on the external, northern side and one course on the southern side. The stones were bonded by the same mortar as was used in core P47, but the mortar was finer with less inclusions. P48 was built upon foundation P50, that was 0.20m wider on both sides. Under P47, over P49.

P49. Rubble and silt core of wall P50, consisted of small and medium sized stones and loose silt, the silt contained mortar flecks, brick fragments and gravel. Under P47, over P50

P50. Stone wall/foundation, consisted of a single course on both the north and south faces forming a coffin wall, filled by silt and rubble core P49. P50 was built with a single line of large stones on the north side and one to two courses and rows of smaller irregularly laid stones on the southern side. Older wall remains P52 lay directly under P50 on the southern side, P52 was truncated prior to the construction of P50. P50 is interpreted as a foundation for mortar bonded wall P47. Under P49, over P51 and Q4.

Group 4:26

D39 D40 DG42 DG43 D48 D49 DG50 DG51 D57 D58 DG59 DG72 D73 D74 D75

Group 4:26 consists of the latest graves in trench D96. Two double burials (D39, D40, DG42, DG43, D48, D49, DG50 and DG51), i.e. two individuals within one grave cut, and two single burials (D57, D58, DG59, DG72, D73 D74 and D75), were recorded. DG50/DG51 and DG72 were aligned perpendicular to the cathedral wall, DG42/DG43 and DG59 were aligned E/W. DG42/DG43, DG50/DG51 and DG72 lay in a row, all the heads were roughly aligned. DG59 lay further west but lay at the same level. The row of burials were the only complete burials excavated in D96. The burials lay closer to the cathedral wall than the other burial groups these lay partly outside the western section. The burials in this group lay between 135.52 – 135.97 m over sea level. They were grouped together because they form a clear grave row. DG59 should perhaps be grouped with other burials but lay over burials in the underlying group.

Contexts

D39. Fill of greyish brown clay silt, contained small stones and beach gravel. Fills grave cut D40. Under D34, over DG42 and DG43.

D40. Grave cut, 1.20m+ long E/W x 0.70m wide x 0.10m deep. The southern half of the cut was excavated in 1992. The grave contained two skeletons DG42 and DG43 a sub-adult and adult respectively. DG42 lay on its side in order to fit into the cut. Under DG42 and DG43, over D60 and DG68.

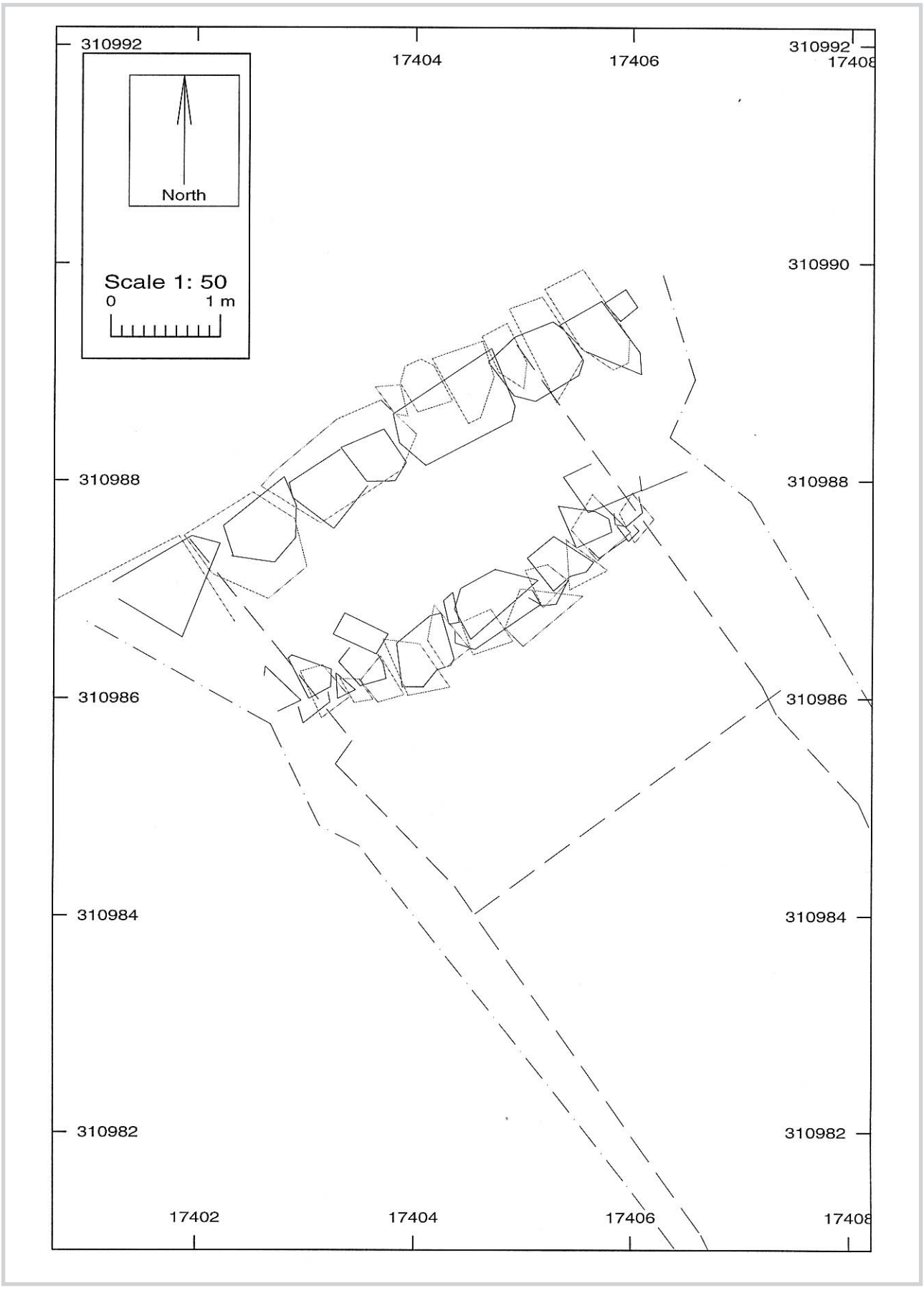


***Fig. 89**. Group 4:25, trench P96.*

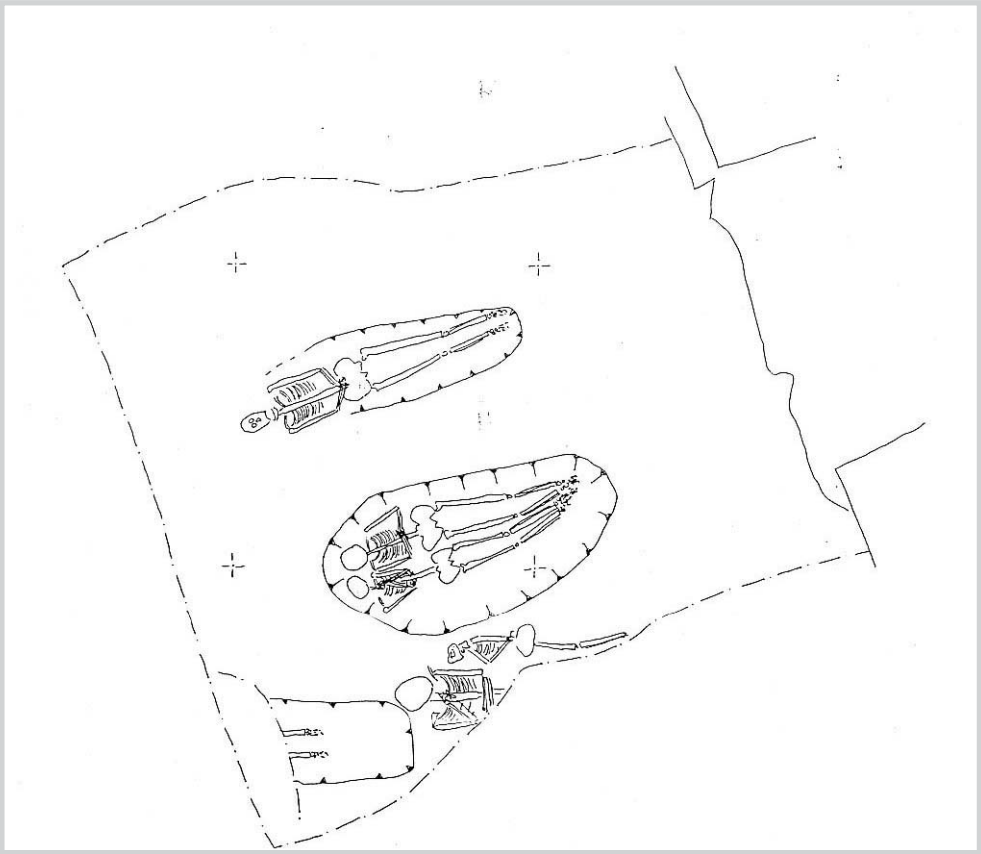


***Fig. 90**. Group 4:26, trench D96.*

DG42. Sub-adult skeleton, orientated E/W, head to west, the body lay on its side in order to fit into the grave cut that also contained DG43. The left arm was folded across the chest, the right arm was folded across the abdomen. The right leg below the knee was excavated in 1992. No evidence for a coffin. Under D39, over D40.

DG43. Adult skeleton, orientated E/W, head to west, supine. Lay within grave cut D40 along with DG42 that lay on its side to the north of DG43. The right arm was folded across the chest, the left arm was folded across the abdomen. From the pelvis and down was excavated in 1992, the upper right arm was also truncated. No evidence for a coffin. Under D39, over D40.

D48. Fill of dark grey sandy silt, contained mortar flecks brick fragments, disarticulated human bone and a quartz crystal. Fills grave cut D49. Under D34, over DG50 and DG51.

D49. Grave cut, 2m E/W x 0.70-1m wide x 0.30m deep. The grave contained two adult skeletons, DG50 and DG51. The bodies lay towards the northern side of the grave, the feet were intertwined. The grave cut was pear shaped and appeared to have been dug to hold two burials. Under DG50 and DG51, over D60 and DG67.

DG50. Adult skeleton, orientated E/W, head to west, supine. Lay within grave cut D49 along with DG51. DG50 lay to the south. The arms were folded over the chest, the right arm over the left. No evidence for a coffin. Under D48, over D49.

DG51. Adult skeleton, orientated E/W, head to west, supine. Lay within grave cut D49 along with DG50. DG51 lay to the north. The right arm was folded over the chest, the left arm was folded over the abdomen. No evidence for a coffin. Under D48, over D49.

D57. Grave cut, 0.80m+ long E/W x 0.50m wide x 0.10m deep. The westernmost 0.60m of the grave was empty, i.e. the feet of DG59 lay 0.60m in from the western edge, it is possible the west end of the cut was over-dug. Under DG59, over D45 and DG68.

D58. Fill of light greyish brown silt, contained brick fragments, beach gravel, flecks of grey clay and disarticulated human bone. Fills grave cut D57.

DG59. Skeleton, only the ankles and feet lay within the excavation. The feet lay 0.60m in from the western end of the grave cut, D57, but the cut may have been over-dug. No evidence for a coffin. Under D58, over D57.

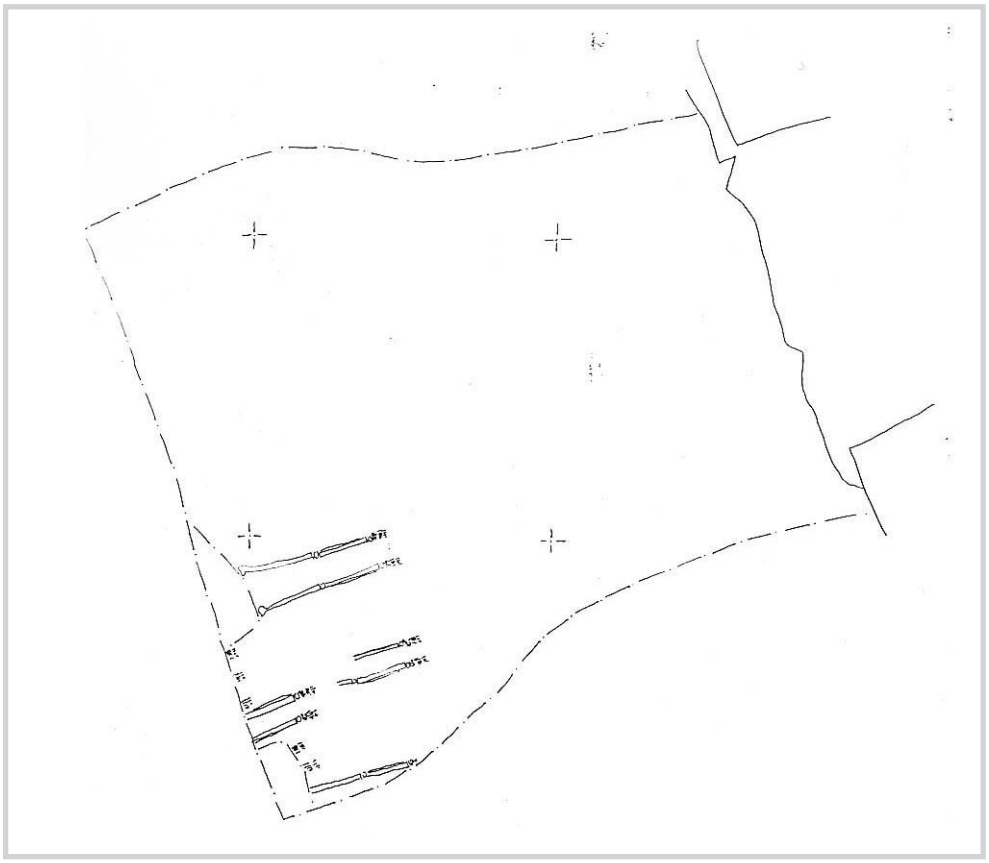


***Fig. 91**. Group 4:27, trench D96.*

DG72. Adult skeleton, orientated E/W, head to west, supine. Lay within grave cut D73. Two lumps of charcoal, D75, were placed over the abdomen. The arms were folded over the abdomen, the feet lay vertically against the end of the grave cut. No evidence for a coffin. Under D75, over D73.

D73. Grave cut, 1.60m+ long E/W x 0.50m wide x 0.30m deep, contained DG72. The western end of the cut was difficult to define, it was only discernible from the elbows down to the feet. DG72 lay a little askew in relation to the axis of the cut: the feet lay against the NE corner, whilst the right upper arm appeared to lie right against the southern side of the cut. Under DG72, over D60 and D84.

D74. Fill of greyish brown sandy silty clay, contained small stones, stone chips, brick fragments, mortar flecks, animal bone and disarticulated human bone. Fills grave cut D73. Under D34, over D75.

D75. Context issued to two small lumps of charcoal. They were deliberately placed over the abdomen of DG72. Under D74, over DG72.

Group 4:27

DG44 D45 D46 DG47 D55 D56 DG61 DG62 DG63 DG67 DG68

Group 4:27 consists of seven burials in trench D96. Only the legs and feet of these individuals lay within the excavated area. All the burials in this group lay in the SW corner of the trench, no cuts were identified. All the burials are recorded as laying within general grave soil context D53. There was no obvious inter-cutting between these graves. Where their alignment was discernible the graves were aligned perpendicular to the cathedral. The burials in this group lay between 135.54 - 135.82 m over sea level. They were groped together because they lay at the same height and appeared to respect one another. Due to its height, DG44 could be grouped together with DG59 in the overlying group.

Contexts

DG44. Left leg and ankle, probably adult. The pelvis, torso and head lay outside the excavation, the left leg and right foot had been excavated in 1992. The grave may have been disturbed from above by grave cut D57. No evidence for a coffin. Under D45, over D46.

D45. Fill of grey sandy silt, contained gravel, brick and mortar flecks. Fills grave cut D46. Under D57, over DG44.

D46. Grave cut, 0.80m+ long E/W, contained DG44. The grave lay partially outside the excavation to the west, the

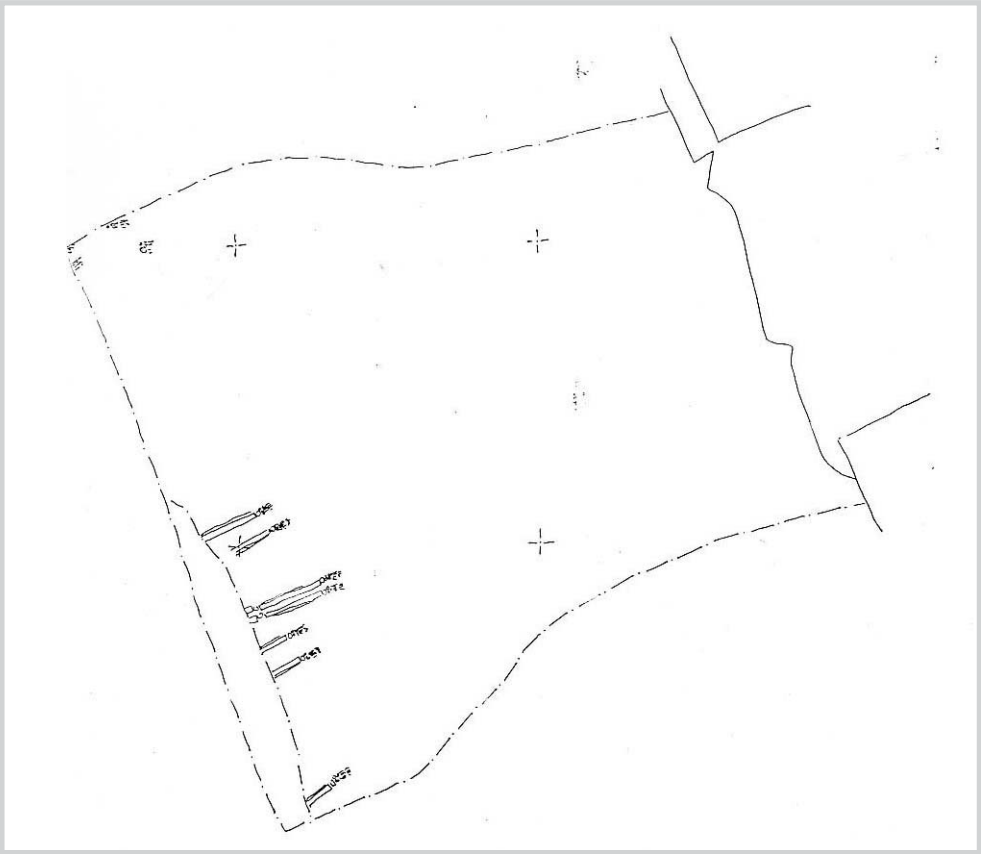


***Fig. 92**. Group 4:28, trench D96.*

southern half had been excavated in 1992, the grave may also have been disturbed from above by grave cut D57. Under DG44, over DG80.

DG47. Remains of two feet, only some of the toe bones lay within the excavated area. No evidence for a coffin. Under D55, over D56.

D55. Fill of greyish brown clay sand, contained mortar/limestone flecks. Fills grave cut D56. Under D34, over DG47.

D56. Grave cut, only the easternmost 0.10m - 0.20m of the grave lay within the excavation. Contained DG47. Under DG47, over DG80.

DG61. Skeleton, only the lower half of the shin bones and the feet lay within the excavation. Probably an adult. No grave cut or traces of a coffin were identified, within grave soil D53, over DG68.

DG62. A few foot bones recovered from the edge of the excavation. So few bones were recovered it was not possible to be certain that this was an in-situ burial. No grave cut or traces of a coffin were identified, within grave soil D53.

DG63. Two feet excavated from the edge of the excavation. No grave cut or traces of a coffin were identified, within grave soil D53, over DG69.

DG67. Adult skeleton, orientated E/W, head to west, supine. Only the lower half of the pelvis and the legs lay within the excavation. The feet were truncated by later grave cut D49. No grave cut or traces of a coffin were identified, within grave soil D53. Under D49, over DG71.

DG68. Adult skeleton, orientated E/W, head to west, supine. Only the legs below the knee and the knee joint of the right femur were present. The burial was truncated by grave cut D57. No grave cut or traces of a coffin were identified, within grave soil D53. Under D57, over D83.

Group 4:28

DG69 DG70 DG71 DG80 DG94 DG95 DG96

Group 4:28 consists of seven burials in trench D96. Only the legs and feet of these individuals lay within the excavated area. Four of the skeletons (DG69, DG70, DG71 and DG80) lay in the southern half of the trench and respected one another, i.e. there was no inter-cutting. DG69, DG70 and DG71 were aligned perpendicular to the cathedral, DG80 appeared to be aligned slightly more to the ENE/WSW than the other burials. DG94, DG95 and DG96 lay in the NW corner of the trench, only the feet and part of

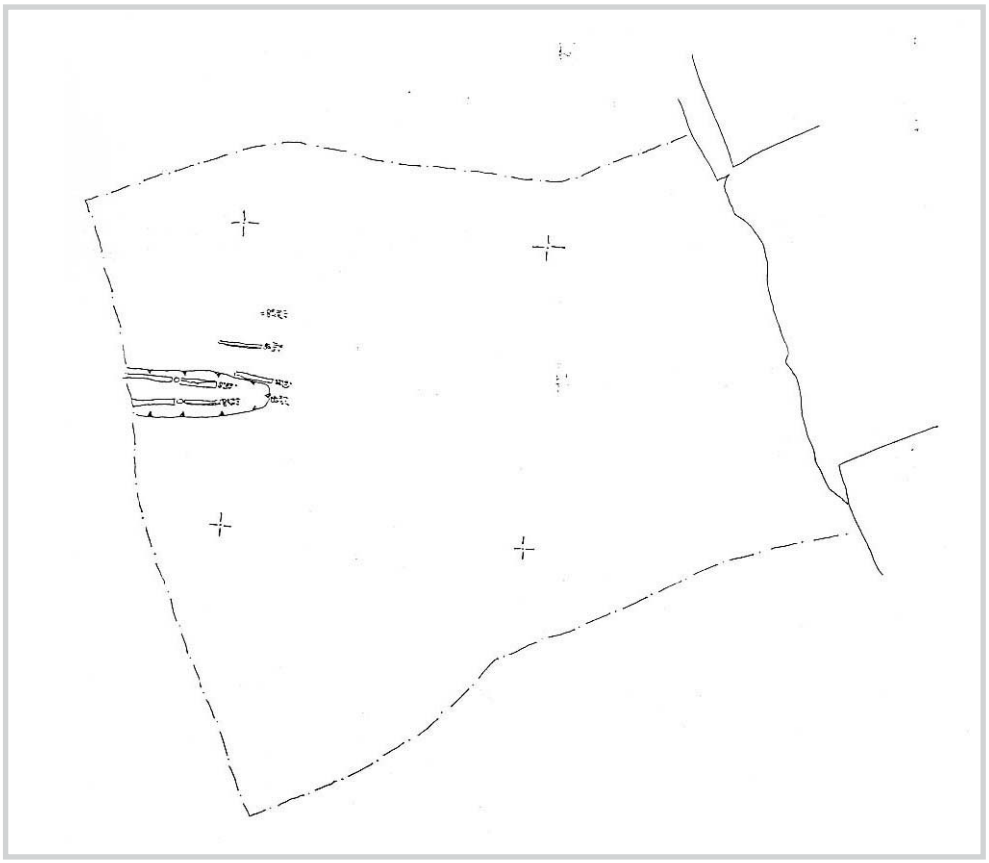


***Fig. 93**. Group 4:29, trench D96.*

the shinbones of DG96 were present within the excavation. These three burials probably truncated one another but so little of the burials were recorded it was not possible to determine what the sequence was. The burials in this group lay between 135.08 - 135.42 m over sea level.

Contexts

DG69. Skeleton, only the lower half of the shin bones and the feet lay within the excavation. Probably an adult. No grave cut or traces of a coffin were identified, within grave soil D53. Under DG63, over D83.

DG70. Skeleton, only the shin bones, feet and the knee joint of the left femur lay within the excavation. Probably an adult. No grave cut or traces of a coffin were identified, within grave soil D53. Under DG67.

DG71. Adult skeleton, orientated E/W, head to west, supine. Only the legs below knee joints of both femurs lay within the excavated area. No grave cut was identified but a few wood fragments associated with the burial indicate a coffin burial. Within grave soil D53. Under DG67.

DG80. Skeleton, only the left foot and the lower half of the left shin bones lay within the excavation. The right foot may have been excavated in 1992. No grave cut or traces of a coffin were identified, within grave soil D53. Under D46 and D56.

DG94. Adult skeleton, orientated E/W, head to west, supine. Only the feet lay within the excavation. No grave cut or traces of a coffin were identified, within grave soil D53, over DG96.

DG95. Adult skeleton, orientated E/W, head to west, supine. Only the left foot lay within the excavation, the right foot may have been excavated in 1992. No grave cut or traces of a coffin were identified, within grave soil D53, over DG96.

DG96. Adult skeleton, orientated E/W, head to west, supine. Only the feet and the lower half of the shinbones lay within the excavation. No grave cut or traces of a coffin were identified, within grave soil D53, under DG94 and DG95.

Group 4:29

D84, DG85 D86 DG91 DG92 D93

Group 4:29 consists of three burials aligned E/W in trench D96. DG91 was truncated by D86, the grave cut for DG85, the disarticulated bone was placed in the fill D84. DG92 had also been truncated but no grave cut or other activity was recorded that can account for this truncation episode.

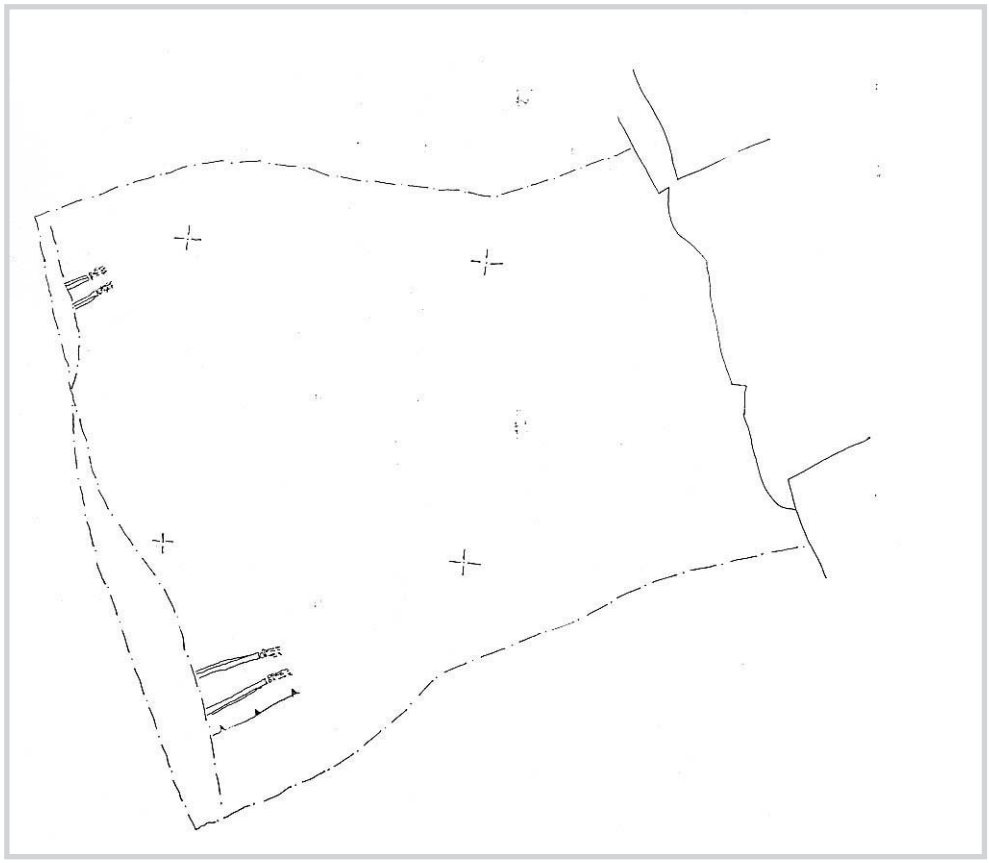


***Fig. 94**. Group 4:30, trench D96.*

Only the legs and feet were excavated. The burials in this group lay between 135.21 - 135.32 m over sea level. This group was concentrated in the northern half of the trench, none of the burials in the overlying groups lay in this area. Even though two of the graves inter-cut they are grouped together as they were the only burials recovered from this area and all lay at approximately the same level. Grave fill D84 contained brick fragments.

Contexts

D84. Fill of dark greyish brown sandy silty clay, contained occasional small stones, brick fragments and disarticulated human bone. The bone is probably from DG91 that the grave cuts through. Under D73, over DG85.

DG85. Adult skeleton, orientated E/W, head to west, supine. Only the legs from the lower half of the femurs and down to the feet lay within the excavation. DG85 lay within grave cut D86, a small wood fragment recovered from the foot end of the grave suggests this was a coffin burial. The feet lay higher than the legs, the burial sloped down slightly towards the head. Under D84, over D86.

D86. Grave cut, 0.90m+ long E/W x 0.30m wide x c. 0.10m deep. Contained skeleton DG84, a fragment of wood recovered from the foot end of the burial suggest this was a coffin burial. The grave cut through earlier burial DG91, disarticulated human bone recovered from the fill D84 probably belongs to DG91. Under DG85, over DG91.

DG91. Adult skeleton, orientated E/W, head to west, supine. Only the feet and the left fibia were present, the burial had been truncated by D86, grave cut for DG85. No grave cut or traces of a coffin were identified. Within grave soil D53, under D86, over D99.

DG92. Adult skeleton, orientated E/W, head to west, supine. Only the feet and the right fibia were present, the burial had been truncated by a grave cut or other negative feature but it is not clear which grave is responsible for the truncation. No grave cut was identified, a small fragment of wood, D93 was recovered by the feet suggesting that this was a coffin burial. Within grave soil D53.

D93. Small fragment of wood, presumably remains of a coffin recovered from around the feet of DG92. Within grave soil D53.

Group 4:30

D81 DG82 D83 DG97

Group 4:30 consists of two burials in trench D96. DG82 lay in the SW corner of the trench. DG97 lay in the NW corner. DG82 was aligned perpendicular to the cathedral,

DG97 was offset slightly to the ENE/WSW. Only the shin bones and feet lay within the excavation, both lay at the same level: 135.07/135.08 m over sea level.

Contexts
D81. Grave cut, 0.70m+ long E/W, only the southern edge could be defined. Contained DG82, coffin nails and a wood fragment in the fill D83 indicate that this was a coffin burial. Under DG82, over D104.

DG82. Adult skeleton, orientated E/W, head to west, supine. Only the feet and the shinbones lay within the excavation. The presence of two coffin nails and a small fragment of wood indicate that this was a coffin burial. Within grave cut D81. Under D83, over D81.

D83. Fill of brown clay silt, contained two coffin nails and a small wood fragment. Fills grave cut D81. Under DG68 and DG69, over DG82.

DG97. Adult skeleton, orientated E/W, head to west, supine. Only the feet and the lower 2/3rds of the shinbones lay within the excavation. The right foot lay partially over the left foot. No grave cut or traces of a coffin were identified. Within grave soil D53.

Group 4:31
HG31 HG32 HG33 HG34 HG35 HG36 H46 H47 H48 H49 H50 H51 H52 H53 H54 H55
Group 4:31 consists of six burials in trench H96-14. All the burials were in definable grave cuts, two were double burials (HG31, HG32, HG33, HG34, H46, H47, H48 and H49) and two were single burials (HG35, HG36, H52, H53, H54 and H55). A shallow feature, possibly the end of a grave (H50 and H51) lay in between the graves. The graves were cut through make-up deposits of stone working debris that were re-deposited in the grave fills. The graves in this group were recorded from the eastern section only, the section was cut back slightly, a few bones from each burial were recovered. Preliminary identification suggested that all were children. Another group of child/infant burials was recorded in more detail in the western section, group 4:33.

Contexts
HG31. Skeleton, recorded from a straightened section, only the tops of the femurs were recovered from the section. HG31 and HG32 lay within cut H47. Possibly a child. Under H46, over H47, same as HG30(92).

HG32. Skeleton, recorded from a straightened section, only part of the pelvis was recovered from the section. HG32 and HG31 lay within cut H47. Possibly a child. Under H46, over H47, same as HG31(92).

HG33. Skeleton, recorded from a straightened section, only part of an upper arm and some ribs were recovered from the section. HG33 and HG34 lay within cut H48, fill H49. Possibly a child. Under H49, over H48.

HG34. Skeleton, recorded from a straightened section, a few bones were recovered from the section but they were very fragmentary. HG34 and HG33 lay within cut H48. Possibly a child. Under H49, over H48.

HG35. Skeleton, recorded from a straightened section, only a few fragmentary bones were recovered from the section, either from a foot or a hand. HG35 lay within cut H53. Possibly a child. Under H52, over H53.

HG36. Skeleton, recorded from a straightened section, only a few fragmentary bones were recovered, probably from a foot. HG36 lay within cut H54. Possibly a child. Under H54, over H55.

H46. Fill of brown sandy silt and stone fragments, the silt and stones were mixed together, some pockets of 'pure' silty sand were present towards the base of the fill, also contained mortar flecks and a fragment of burnt wood under HG31. Fills grave cut H47 that contained two skeletons HG31 and HG32. Under H97, over HG31 and HG32.

HG47. Grave cut, recorded from section, 0.90m+ wide, 0.75m deep, the southern edge inter-cut with adjacent grave cut H48 but it was not possible to determine the relationship between them. The northern edge was cut at a near vertical angle, the southern at a shallower angle. The grave contained two burials HG31 and HG32, the fill H46 consisted of stone working debris redeposited from the layer that the grave cut through. Under HG31 and HG32, over H41.

HG48. Grave cut, recorded from section, 1.30m+ wide, 0.65m deep, the northern edge inter-cut with adjacent grave cut H47 but it was not possible to determine the relationship between them. The edges were cut at a shallow angle rounding to an irregular base. The grave contained two burials HG33 and HG34, the fill H49 consisted of stone working debris that the grave cut through. Under HG33 and HG34, over H45.

H49. Fill of brown sandy silt, gravel and stone fragments from stone working, contained mortar flecks, one large

brick fragment and occasional charcoal flecks. Filled grave cut H48, contained two burials HG33 and HG34. Under H97, over HG33 and HG34.

H50. Fill of light brown sandy silt, stone fragments from stone working and mortar flecks, contained gravel and charcoal flecks. Recorded from section only, fills shallow feature H51, no human bone was recorded. Under H97, over H51.

H51. Cut of a shallow feature, recorded from section only, 0.50m wide, 0.30m deep. H51 lay between graves H48 and H53, but was much shallower and didn't contain any human bone, H51 may be the end of a grave, clipped by the section. Under H50, over H45.

H52. Fill of brown sandy silt, large stones and stone fragments from stone working, contained mortar flecks. Fills grave cut H53, contained burial HG35. Under H97, over HG35.

H53. Grave cut, recorded form section only, 0.40m wide, 0.65m deep. The edges were cut at a near vertical angle rounding to a flat base. Contained HG35. Under H52, over H45.

H54. Fill of light brown sandy silt, gravel and stone fragments from stone working, contained mortar flecks and occasional charcoal flecks. Filled grave cut H53 and contained HG36. Under H97, over HG36.

Group 4:32

HG57 HG60 HG62 HG98 HG99

Group 4:32 consists of five skeletons recovered from grave soils H63 and H96 in trench H96-14. No grave cuts of coffins were recorded. These burials were recorded from the southern end of the eastern section. Only a few bones were recovered from each burial. All the burials lay in the base of the grave soil, these had been truncated from above, the burials lay between 0.25-0.55m under the current ground surface.

Contexts

HG57. Skeleton, recorded from a straightened section, only a few fragmentary bones were recovered from the section, the bones were not identified. HG57 lay within grave soil H63, no cut of coffin were identified. Possibly an older child. Within H63.

HG60. Skeleton, recorded from a straightened section, only the shinbones were recovered from the section. Probably an adult. HG57 lay within grave soil H96, no cut of coffin were identified. Within H96.

HG98. Skeleton, recorded from a straightened section, only the left shinbones were recovered from the section, these were sawn off to remove them to make space for a water pipe. Probably an adult. HG98 lay within grave soil H96, no cut of coffin were identified. Within H96, possibly the same as HG35(92).

HG99. Skeleton, recorded from a straightened section, only some of the toe bones were recovered from the section. Probably an adult. HG99 lay within grave soil H96, no cut or coffin were identified. Within H96, possibly the same as HG35(92).

Group 4:33

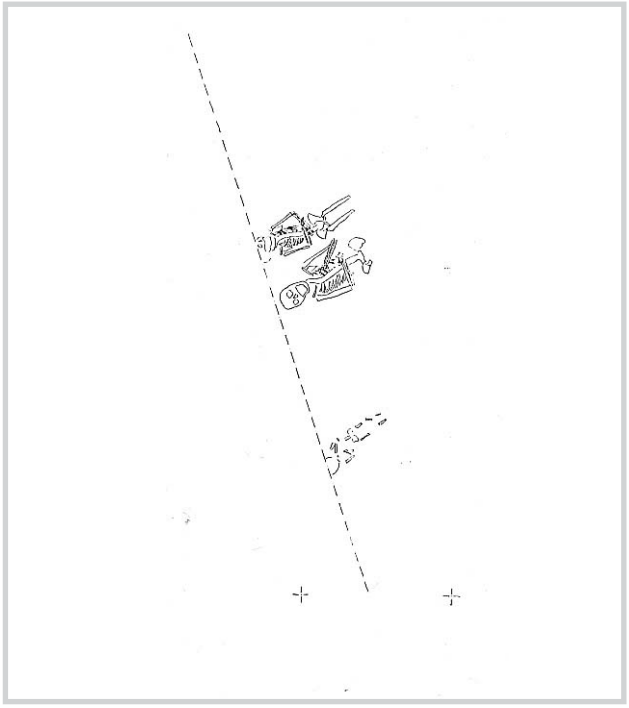
HG28 HG29 HG58 HG78

Group 4:33 consists of four burials in trench H96-14, two infants (HG29 and HG58) and two children (HG28 and HG78). These burials lay between 136.03-136.31 m over sea level. HG58 was recovered from the section, the other three burials were grouped together because they were infant/child burials and also because they were buried in a row, with the skulls laying within the excavation. These were the latest burials in the area.

Contexts

HG28. Child skeleton, orientated E/W, head to west, supine. The lower half of the pelvis and down to the feet

Fig. 95*. Group 4:33, trench H96-14.*



were excavated in 1992. The right hand was folded over the abdomen, the left hand folded over the chest. HG28 lay within grave soil H66, no coffin or grave cut were identified. Within H66.

HG29. Skeleton of an infant, orientated E/W, head to west, supine. The right hand was folded across the abdomen, the left folded up across the chest. The skull lay partially outside the excavation. HG29 lay within grave soil H66, no coffin or grave cut were identified. Within H66, over HG91.

HG58. Skeleton of an infant, the bones were recovered from the section, the burial was not planned. Some ribs and vertebrae, and part of the right arm were recovered, some fragments of the jaw were also recovered, but the upper torso remained within the section, it is possible that the skull had collapsed down onto the chest. The burial was truncated below the pelvis by the machining. HG58 lay within grave soil H66, no coffin or grave cut were identified. Within H66, over HG85.

HG78. Child skeleton, orientated E/W, head to west, supine. The burial below the knees was excavated in 1992. Both hands were folded over the abdomen. HG28 lay within grave soil H66, no coffin or grave cut were identified. Within H66, over HG88.

Group 4:34

HG67 HG68 HG77 HG84 HG85 HG86 HG89 HG95

Group 4:34 consists of eight burials in trench H96-14, the burials lay approximately in a row such that the shin bones and feet lay within the excavation. The burials lay between 135.57-135.91 m over sea level, though most lay around 135.80 m.

Contexts

HG67. Feet and the lower 0.10m of the shin bones, probably an adult, E/W orientated, head to west, supine. A large quantity of disarticulated human bone lay over and around HG67, the bone is possibly from HG86 that this grave truncated. HG67 lay within grave soil H66, no coffin or grave cut were identified. Within H66, over HG68, HG86 and HG95.

HG68. Adult skeleton, only the left femur was recovered but it lay in such a position as to suggest it was part of an in-situ burial, E/W orientated, head to west, supine. The right femur was probably truncated by HG67, the shin bones and feet were excavated in 1992. HG68 lay within grave soil H66, no coffin or grave cut were identified. Within H66, over HG77?

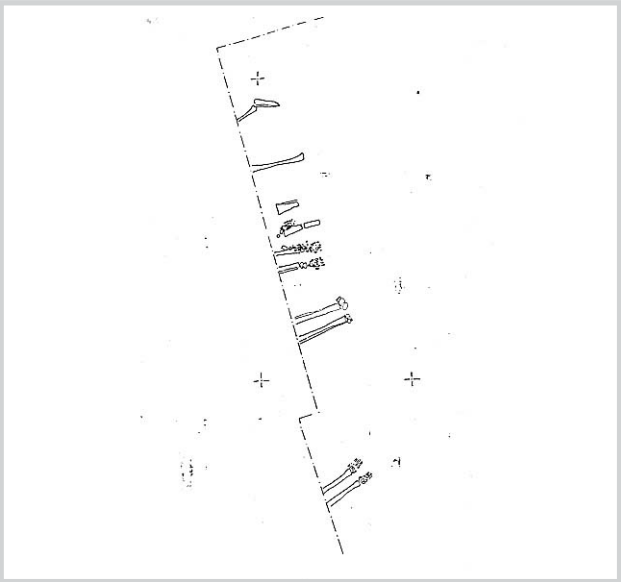


***Fig. 96**. Group 4:34, trench H96-14.*

HG77. Adult skeleton, only the lower half of the left femur and upper half of the left shin bones were recovered, E/W orientated, head to west, supine. The right leg may have been truncated during the burial of HG68. The lower half of the shin bones and foot were excavated in 1992. HG77 lay within grave soil H66, no coffin or grave cut were identified. Within H66, under HG68? over HG76 and HG87.

HG84. Adult skeleton, orientated E/W, head to west, supine, only the shin bones and feet lay within the excavation. The feet bones lay in an area with a lot of disarticulated human bone, the feet were partially excavated as loose bone before it became clear that they were part of an in-situ burial. HG84 may have truncated both HG83 and HG85, the loose bone probably belonged to these two graves. HG84 lay within grave soil H66, no coffin or grave cut were identified. Within H66, over HG83 and HG85.

HG85. Adult skeleton, orientated E/W, head to west, supine, only the right side of the pelvis and the upper 2/3rds of the right femur lay in-situ. The torso had been truncated by a burial that must have lain outside the excavation, the left leg may have been truncated by HG84. The right shin bones and foot were excavated in 1992. HG85 lay within grave soil H66, no coffin or grave cut were identified. Within H66, under HG58 and HG84.

HG86. Adult skeleton, orientated E/W, head to west, supine, only the upper half of the shin bones lay in-situ, the lower half of the shin bones and feet were excavated

in 1992. The legs above the knee had been truncated by HG67. HG86 lay within grave soil H66, no coffin or grave cut were identified. Within H66, under HG67.

HG89. Adult skeleton, orientated E/W, head to west, supine, only the shin bones and ankles lay in-situ, the feet were excavated in 1992. HG89 lay within grave soil H66, no coffin or grave cut were identified. Within H66.

HG95. Adult skeleton, orientated E/W, head to west, supine, only the shin bones and feet lay within the excavation. HG95 lay within grave soil H66, no coffin or grave cut were identified. Within H66, under HG67.

Group 4:35

HG27 HG69 H82 HG83 HG88 HG91 H94

Group 4:35 consists of six burials in trench H96-14, buried approximately in a row, such that the middle of their vertebrae and down to the feet lay within the excavation. The burials lay between 134.94-135.18 m over sea level. Two grave cuts were definable to the south, where the bedrock began to rise. The burials were less intensive there, the grave soils were therefore less disturbed. No discreet grave fills could be defined. Cut H82 contained two burials: HG27 and HG69, only the southern edge of cut H94 was definable, it contained HG91.

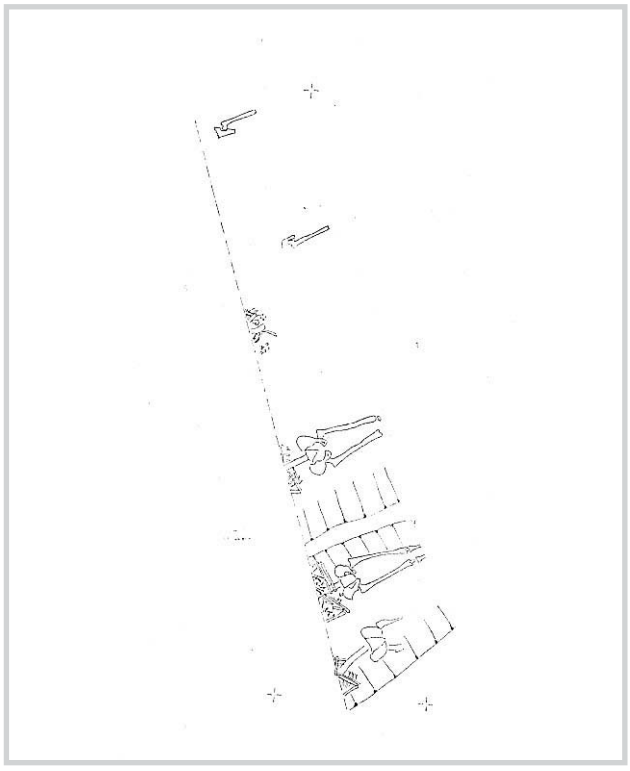


***Fig. 97**. Group 4:35, trench H96-14.*

Contexts

HG27. Sub adult skeleton, orientated E/W, head to west, supine. The grave lay partially outside the excavation, from the middle of the vertebrae down to the top of the shin bones were excavated, the lower 2/3rds of the shinbones and feet were excavated in 1992. The arms were folded over the abdomen. A lump of charcoal was deposited between the femurs. A grave cut, H82 was defined, but both HG27 and HG69 appeared to lay within it, HG27 to the north. No coffin remains were found. HG27 lay within grave soil H66, within cut H82, but with no definable fill. Under HG29, over H82.

HG69. Adult skeleton, orientated E/W, head to west, supine. The grave lay partially outside the excavation, from the middle of the vertebrae down to the middle of the femurs were excavated. The lower half of the shinbones and feet were excavated in 1992. The arms were folded over the chest. A grave cut, H82 was defined, but both HG69 and HG27 appeared to lay within it, HG69 to the south. No coffin remains were found. HG69 lay within grave soil H66, within cut H82, but with no definable fill. Over H82.

H82. Grave cut, filled by general grave soil H66, no distinct fill could be defined. Two burials HG27 and HG69 lay within the cut. H82 lay at the southernmost end of the churchyard in this trench. The cut was 1.20m wide (N/S), 0.40m deep to the south, 0.20m deep to the north. H82 cut into the top of earlier grave cut H81. It is possible that there were two smaller discreet cuts, one for each burial, but only one large cut could be defined. Under HG27 and HG69, over H80 and H93.

HG83. Adult skeleton, orientated E/W, head to west, supine, only the left side of the pelvis and the upper 2/3rds of the left femur lay in-situ. The torso had been truncated by a later burial, possibly HG84. The left shin bones and foot were excavated in 1992. HG83 lay within grave soil H66, no coffin or grave cut were identified. Within H66, under HG84.

HG88. Adult skeleton, orientated E/W, head to west, supine. The grave lay partially outside the excavation to the west, and was truncated to the east such that only the middle vertebrae, and possibly the right lower arm and hand were excavated. The arm and hand may not have belonged to this burial. The grave was truncated to the east by HG78. HG95 lay within grave soil H66, no coffin or grave cut were identified. Within H66, under HG78.

HG91. Sub-adult skeleton, orientated E/W, head to west, supine. The grave lay partially outside the excavation,

from the middle of the vertebrae down to the knees were excavated, the shin bones and feet were excavated in 1992. The arms were folded over the abdomen. No coffin remains were found. HG69 lay within grave soil H66, within cut H94, but with no definable fill. Under HG29, over H94.

H94. Grave cut, only the southern edge was definable, contained HG91, filled by general grave soil H66, no distinct fill could be defined. E/W aligned, 0.60m+ long, 0.25m+ wide, the southern edge slopes at a shallow angle. Under HG91, over H93.

Group 4:36

HG76 HG79 H80 H81 HG87 HG90

Group 4:36 consists of four burials in trench H96-14, buried approximately in a row, such that the pelvis down to the feet lay within the excavation. HG87 and HG90, at the northern end of the trench lay between 135.55-135.68 m over sea level., HG79 and HG85, in the southern half of the trench lay between 135.91-135.99 m over sea level. HG79 lay within grave cut H81, within fill H80. This group appear to be the oldest burials in trench H96-14.

Contexts

HG76. Burial, only the tops of the lower legs lay in situ. The burial must have been truncated from above this point by a later burial, and below this point by the machining, or possibly another burial. The bones lay in the correct anatomical position to be an in-situ burial. HG76 lay within grave soil H66.

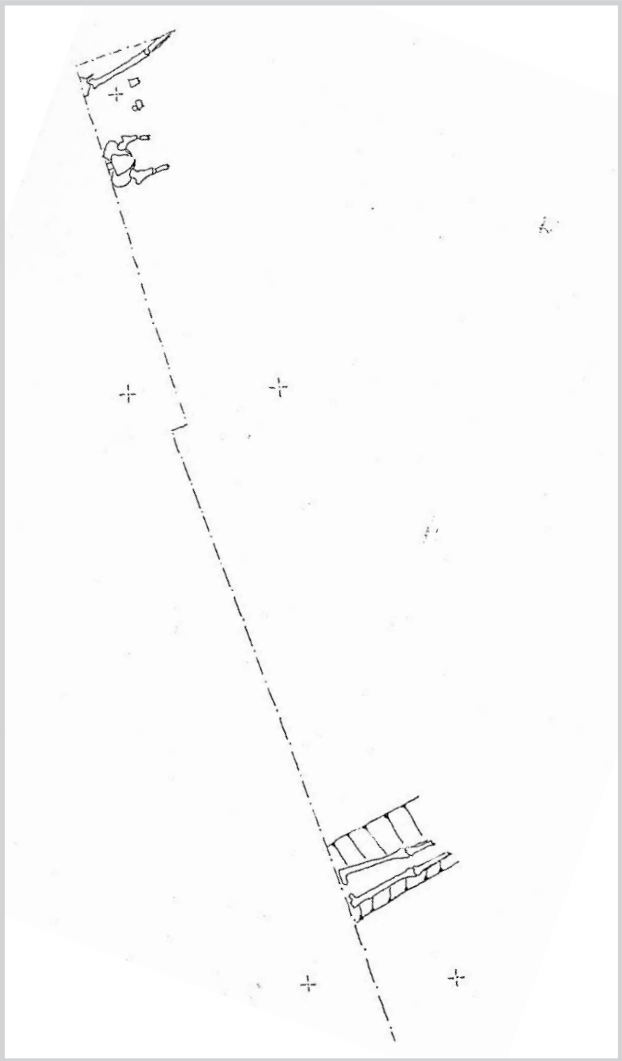


***Fig. 98**. Group 4:36, trench H96-14.*

HG79. Adult skeleton, orientated E/W, head to west, supine. The grave lay partially outside the excavation, from the femurs down to the middle of the shin bones were excavated, the lower half of the shin bones and feet were excavated in 1992. HG79 lay within grave cut H81, within fill H80, no coffin remains were found. Under H80, over H81.

H80. Fill of grey sandy clay mixed with crushed limestone - debris from stone working, contained fragments of decayed bedrock. Fills grave cut H81, contained skeleton HG79. Truncated from above by grave cut H82. Under H82, over HG79.

H81. Grave cut. E/W aligned, 0.80m+ long, 0.50m wide, the southern edge was cut at a sharp angle, the northern edge was cut at a shallower angle. The southern edge and later cut H82 were difficult to distinguish from one another. The grave was cut at the most southerly point possible where the bedrock began to rise. Under HG79, over H37.

HG85. Adult skeleton, orientated E/W, head to west, supine. The grave lay partially outside the excavation, only the left side of the pelvis and the uppermost 2/3rds of the left femur were excavated. The torso had been truncated by an unknown grave that lay outside the excavation to the west, the right side of the pelvis and legs were probably truncated by HG84. The lower half of the left leg was probably excavated in 1992. No coffin remains were found. HG69 lay within grave soil H66, under HG58 and HG84.

HG87. Adult skeleton, orientated E/W, head to west, supine. The grave lay partially outside the excavation, the pelvis, lower vertebrae and upper half of the femurs were excavated, the lower half of the femurs down to the feet were excavated in 1992. Both femurs were broken - physical damage, the pelvis appeared to be in good condition, but broke into pieces when lifted due to hairline cracks. No coffin remains were found. HG69 lay within grave soil H66, under HG77.

HG90. Adult skeleton, orientated E/W, head to west, supine. The grave lay at the northern end of the trench, and lay partially outside the excavation to the west and north. Only the right lower half of the pelvis, right femur and upper half of the right shin bones were excavated. No coffin remains were found. HG69 lay within grave soil H66, under HG76.

Group 4:37

U71 U88 U91 U92 U93 U116 U117

Group 4:37 consists of a stone bonded wall (U71, U91, U92, U116 and U117) and deposits dumped against the eastern face of the wall (U88 and U93) in trench U96. The wall (U71) stood two courses, 0.50-0.60m, high and was aligned roughly NNE/SSW. It consisted of large stones with a stone and mortar core (U116). Traces of a construction cut (U91) were recorded, it ran parallel with the wall's eastern face. Neither the wall nor the construction cut were excavated. Two deposits of silt, mortar and stones (U88 and U93) were dumped against the eastern face of the wall. Both contained brick fragments, U93 also contained animal bones and fire cracked stones. The wall remains lay towards the eastern extent of the churchyard. The eastern limit of the churchyard is marked today by a reconstruction of the churchyard wall, presumably built upon the remains of the original. It runs parallel with the Bishops Residence, but fades out before it reaches the area where trench U96 dissects its trajectory. The churchyard wall is only partially visible on the southern side of the churchyard. No corner is visible in the SE. An excavation in 1916 revealed a structure interpreted as an earlier churchyard wall, approximately parallel with today's reconstruction, but further west (Dahl 1916:65-67. The churchyard was presumably extended to the east after the chancel was extended eastwards. Wall U71 is positioned such that it could be the eastern churchyard wall in this area. Its angled alignment can be explained as connecting the secondary, extended, eastern wall with the original southern wall.

No empirical dating evidence was recovered from the wall. It was overlain by a stone sill wall and other activity interpreted as dating to the post medieval farm, (group 6:1). Its construction cut (U91) cut through silt/turf line U90 that contained brick fragments. It appeared as though U90 remained open after the wall was constructed, i.e. continued to be the turf line outside the churchyard. It is possible therefore that material in U90 was deposited there after the wall was built. The first churchyard wall in trench P96 (P52, group 2:25) has been dated to 1240 – 1400, but is likely to have been built shortly after 1240. P52 was a dry stone wall with a silt and stone core. It was replaced in the 1400's by P48 (group 4:25) a 2m wide wall of large mortar bonded stones. The churchyard wall was uncovered in W96 on the southern side of the churchyard. W4 was also a mortar bonded stone coffin wall, 1.30m wide. U71 was 1.20m wide, it had most in common structurally with W4.

Contexts

U71. Stone wall, aligned roughly NNE/SSW, consisted of large stones, average size: 0.35m x 0.25m x 0.15m. Two courses survive on each side creating a coffin wall, the core of which was filled with white mortar and rubble deposit U116. The wall stands to a height of 0.50-0.60m, it was 1.20m wide. The facing stones were bonded with yellow mortar U117, a different mortar than that used in the core. Construction cut U91 was recorded in plan, the wall was not excavated. Under U92, over U91.

U88. Layer of light brownish grey clay silt and mortar, contained small stones and small brick fragments. The layer was deposited in a 1m wide strip parallel to the eastern face of churchyard wall U71, c. 1m out from the wall, overlies similar deposit U93 that butts the wall. Under U64, over U93.

U91. NNE/SSW aligned cut, parallel to the churchyard wall U71, 0.20m out from face of the wall. Appeared to be the cut for the wall's construction trench, not excavated. Under U71, over U90.

U92. Fill of brownish grey sandy silt, contained fragments of yellow mortar. Filled cut U91, the construction cut for churchyard wall U71. Not excavated. Under U75, over U91.

U93. Layer of dark grey gravely silt, small stones and yellowish mortar fragments, all three were mixed together and also present in localised concentrations. The layer also contained brick fragments and animal bone. Some of the stone fragments have traces of mortar on their surface, some of the stones were fire cracked. The layer was dumped against the eastern face of wall U71, it was 0.15m thick against the wall tapering away to the east. Under U88, over U92.

U116. White mortar and stone rubble deposit, formed the core of coffin wall U71. The mortar was different from U117, the mortar that bonds the fabric of the wall. Part of U71.

U117. Yellow mortar that bonded the stones of wall U71. Part of U71.

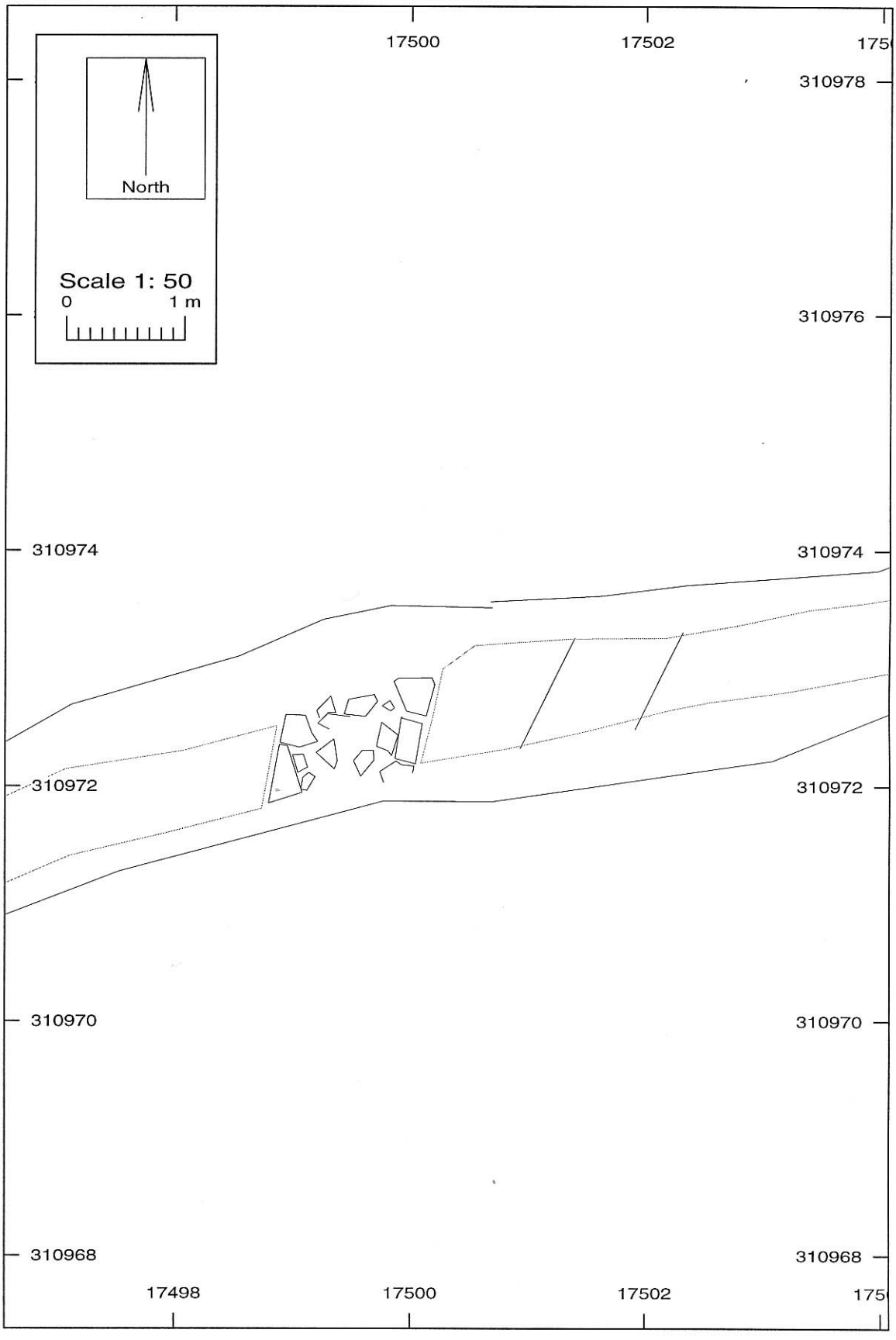


***Fig. 99**. Group 4:37, trench U96-14.*

Group 4:38

U30

Group 4:38 consists of a single layer U30, a dump of fire-cracked stones in trench U96. The stones were mixed with a silt/ash layer and contained charcoal flecks and occasional animal bone. This group represents dumping of waste from cooking or brewing. Two radiocarbon dates from the layer conflict. A charcoal fragment was dated to CAL AD 815-840 and AD 855-1035 at the 95% confidence level whilst a fragment of animal bone, sent as a control of the early date, was dated at the 95% level of confidence to CAL AD 1180-1420. Layer U30 overlies layers that contained brick fragments and must therefore have been deposited after the latter half of the 1200's. It is possible that the debris that makes up layer U30 is older and has been re-deposited here, but the layer overlay a turf horizon that overlay a series of extensive make-up dumps. There was nothing in the stratigraphy to suggest that U30 was part of a make-up phase, it appeared to be a localised deposit, dumped in a pile rather than spread over the area. It is interpreted as a dump of refuse dumped between 1250 and 1420, due to the second radiocarbon date and the presence of brick in the earlier layers. The early radiocarbon date is assumed to be wrong, i.e. that the real date of the material lies outside the 95% confidence level.

Contexts

U30. Layer of fire-cracked stones and charcoal flecked dark grey silt/ash, contained occasional animal bone fragments. Some of the stones have been burnt on more than one face, indicating re-use. The layer was 0.25m thick, it continued beyond the excavation to the south, but had been truncated to the north by a modern cable trench, the layer was 3m long (E/W). Two radiocarbon dates were obtained form this layer. A charcoal sample was radiocarbon dated to CAL AD 815 -840 and 855 - 1035 at the 95% level of confidence (Beta-135936, sample HKH11931). A fragment of animal bone however was radiocarbon dated to CAL AD 1180 - 1420 at the 95% level of confidence (Beta-157800, animal bone was not registered in the data base). Under U31, over U35.

Group 4:39

U90

Group 4:39 consists of a turf horizon that covered most of the western end of trench U96. It was present on both sides of the churchyard wall U71 (group 4:37). U91, the construction cut for the wall cut through this layer. It extended c. 1m west of the wall on its western side and c. 7.5m east of the wall on its eastern side. Against the wall it lay at 132.70 m over sea level, sloping down to the east to 132.50 m. U90 was a turf horizon, even though it predated the construction of U71 it also appeared to have been the external turf horizon after the wall was in use. With the exception of U88 and U93 (group 4:37) that were dumped against the wall, U90 was not covered until after the wall was out of use. If this interpretation is correct then U90 would have been open and 'in use' as the turf horizon from some time after 1250 through into the post medieval period.

Contexts

U90. Layer of dark brown humus rich silt, contained mortar and brick flecks and a little gravel. The layer was recorded under three separate contexts, in total it covered an area c. 7.50m long on the eastern side of churchyard wall U71 and c. 1m long on the western side of the wall. U90 appeared to be a turf horizon that appeared to predate the construction of churchyard wall U71. Under U89 and U91, over U101 and U104, same as U94 and U95 and possibly U35.

Group 4:40

U35 U36 U42 U96 U107 U108 U111 U112 U114 U115

Group 4:40 consists of a series of make-up dumps of stone (U96 U107 and U112), silty clays, mainly re-deposited moraine clay (U111, U114 and U115), stone working debris (U96 and U108), silt (U42) and clay/mortar (U87) in trench U96. This dumping sequence is partially overlain by probable turf horizon U35 that covered c. 5m of the eastern part of the trench and U90 (group 4:37), a turf horizon that covered the westernmost section of the trench up to the churchyard wall and beyond. U35 and U90 may have been part of the same turf horizon, that they were the same layer was not immediately obvious however. Not all of these layers were fully excavated, the natural terrain was not fully exposed. Earlier activity than that represented by group 4:40 can't be excluded but it appeared as though these layers represent an extensive series of make-up dumps, levelling off the undulations in the natural terrain and building up the ground level by 0.20-0.40m+. The presence of re-deposited moraine clay and stone working debris suggests the deposits may have come from a re-building phase of the Bishops Residence, the clay being up-cast from foundation trenches. A re-building phase of the Bishops Residence may also account for the desire to landscape the area. No empirical dating evidence was recovered but the presence of bricks in some of the layers dates this activity to after 1250.

Contexts

U35. Layer of dark brown gravely silty clay, contained mortar flecks, brick fragments, small stones, charcoal

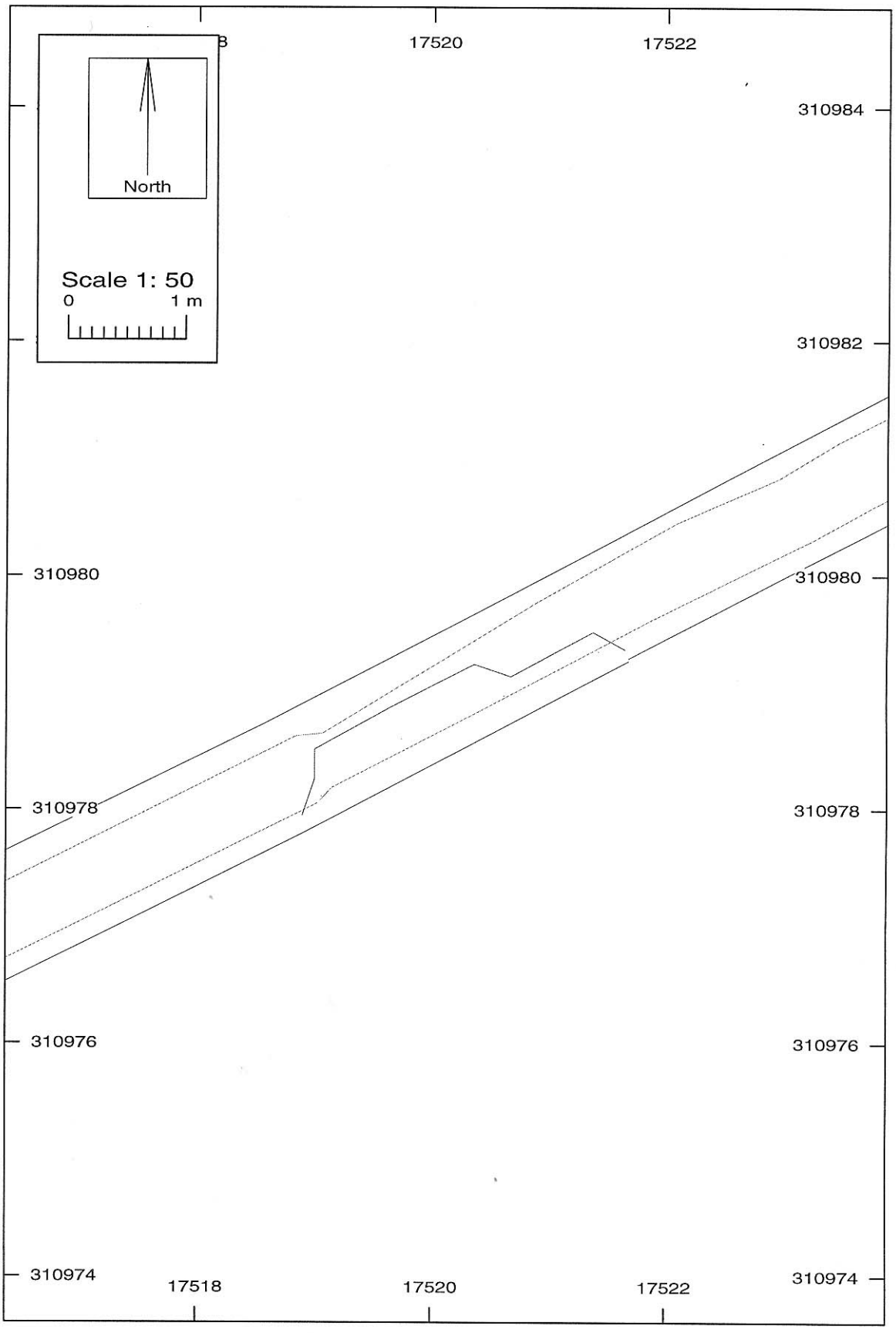


***Fig. 100**. Group 4:38, trench U96.*

flecks and animal bone. U35 possibly represents a turf horizon. Under U30, over U42, same as U45 and U90?

U36. Layer of medium and large stones mixed with brown silty clay, a few bricks were also present. The stones were both angular and rounded. This layer was recorded in both the eastern and western ends of the trench, but didn't form one continuous layer. Under U111, over U87, same as U46 and U85.

U96. Layer of gravel, contained small stones and occasional mortar and brick fragments. Under U100 and U103, over U108.

U42. Layer of dark brown humus rich sandy clay, contained mortar flecks, brick fragments and charcoal flecks. Under U35, over U36.

U87. Layer of dark greyish brown sandy clay and mortar fragments, contained small stones. Under U85, over U8.

U96. Layer of gravel, contained small stones, brick and mortar fragments. Under U100 and U103.

U107. Layer of large limestone slabs, dumped over a 2m long area. The slabs were laid flat but appeared to be dump of stones rather than a laid surface. Under U96, over U112.

U108. Layer of stone chips, contained occasional mortar and brick fragments. Debris from stone working dumped as make up. Under U96, over U111 and U114.

U111. Layer of greyish brown sandy silt, contained stones mixed in from underlying U36 and occasional charcoal flecks. The layer was not fully excavated, 0.35m+ thick. Under U108 and U115, over U36.

U112. Layer of brownish grey clay silt and medium sized limestone blocks, contained gravel, mortar flecks and brick fragments. The stones were fairly densely packed creating a roughly level surface. Under U107, not excavated.

U114. Layer of mid brown sandy clay silt, contained occasional small stones and charcoal flecks. Not excavated but appeared to be a levelling layer, dumped to level off the ground surface over a hollow in the natural terrain. Under U108, over U115.

U115. Layer of greenish grey clay, contained small stones. Fills a hollow in the underlying natural terrain, consists of re-deposited moraine clay. Under U114, over U111.

Group 4:41

T37 T38 T40 T41 T42 T43 T45 T46 T50 T51 T52 T53 T54 T55 T56 T65 T66 T68 T69 T71

Group 4:41 consists of deposits in trench T96 that may be of medieval origin. Five cut features (T37, T38, T40, T41, T42 T43 T51, T52, T65 and T68) were recorded from the profile. The features were of varying sizes, but they were recorded from the profile and it is not known at what angle the trench dissects these features. Their dimensions could therefore be distorted by the angle of sectioning. The fills were very similar, all contained fire cracked stones, most contained animal bone and charcoal and none of them contained any brick fragments. Not all of the cuts were fully exposed, no traces of burnt clay, typical of the pits in trench Q96 (group 2:32) were visible. These features are interpreted as rubbish pits, but may be cooking pits dug to heat stones for boiling water, the pits later being filled with the debris from the cooking process.

Two possible postholes (T45, T46, T51, T52, T53 and T54) were recorded. Cut T45 was documented in the base of the trench, this feature may have been a posthole but this was not certain. Cut T51 contained remains of a post (T53) and stone post packing (T54) and was clearly a posthole. Both posthole fills contained brick fragments. T51 cut through an humus rich silt layer (T50), that possibly represents an old turf line. T50 was only documented in the southern profile, over c. 5m between posthole T53 and pit T68, it partially overlay stones T55/T56. T50 contained charcoal, animal bone fragments, slag and a bone needle, no brick fragments were visible in T50. A thin layer of soot/charcoal (T66) was present on the eastern side of pit T68, to the west of the pit lay two thin layers of grey clay (T69) and humus rich clay (T71), these layers lay over T50.

A concentration of large and smaller stones (T55/T56) were documented under T50 approximately where Bishops Street is believed to have run. T50 partially overlay the stones but did not cover them completely. Bishops Street, according to the Hamar Chronicle (see Arnesen 1937) is generally assumed to have run between the Bishops Residence and the churchyard wall and away to the north. This stone concentration lay approximately along this alignment. The stones lay upon and partially in the sterile moraine clay, they had no apparent structure and didn't appear to form a surface of any kind. Despite laying in approximately the correct position to be the re-

mains of Bishops Street they are not interpreted as a deliberately laid road surface.

All the features and layers in this group were present within a 30m section of the trench approximately north of the sacristy, leading up to Bishops Street. Apart from the two postholes no brick fragments were present within this group. One of the pits T68 cut through T50, the others cut through sterile clay. The postholes, T50 and the pits could perhaps have been divided into three separate groups of activity. Apart from the presence of brick fragments no dating evidence was available for this activity, as they were all present in the same area they have been grouped together as medieval activity. It is unclear whether this activity was originally more extensive and later truncated or whether it was confined to a limited area, west of Bishops Street. The activity is outside the churchyard wall and was probably connected to the domestic activities of those involved in the construction work.

Contexts

T37. Cut feature, recorded from section, visible in both sections, 1.20m long (E/W), 0.95m+ wide (N/S), 0.35m deep. The eastern edge was cut at a shallow angle, the western edge was near vertical, but it is unclear whether the trench dissects the feature at a right angle or not, i.e. the recorded dimensions and profile may not exactly reflect the original feature. Under T38, over T44.

T38. Fill of small stones (c. 70%) and light brown silty clay, some of the stones were 'fire-cracked'. A small bone fragment was recovered from the profile. Under T39, over T37.

T40. Cut feature, recorded from section, 2.15m long (E/W), 0.40m+ deep, the base of the feature lay beneath the bottom of the trench. The sides were cut at a sharp angle, but it is unclear whether the trench dissects the feature at a right angle or not, i.e. the recorded dimensions and profile may not exactly reflect the original feature. Under T41, over T44.

T41. Fill of small stones (c. 70%) and greyish brown clay (30%), some of the stones were 'fire-cracked'. T41 continued beneath the bottom of the trench, i.e. the cut was not bottomed. Charcoal was visible at the base of the trench as a lens to the west and spread flecks to the east. One bone fragment was visible in the profile. Under T39, over T40.

T42. Cut feature, recorded from section, 2.20m long (E/W), 0.45m+ deep, the base of the feature lay beneath the bottom of the trench. The eastern edge was cut at a steep angle whereas the western edge was shallower, but it is unclear whether the trench dissects the feature at a right angle or not, i.e. the recorded dimensions and profile may not exactly reflect the original feature. Under T43, over T44.

T43. Fill of small stones (c. 70%) and greyish brown clay (30%), some of the stones were 'fire-cracked', larger stones were visible towards the base of the trench. T41 continued beneath the bottom of the trench, i.e. the cut was not bottomed. Contained occasional charcoal flecks. Under T39, over T42.

T45. Cut feature, recorded in the base of the trench, the feature was only partially accessible as it was uncovered after cables had been laid in the trench, 0.50m long (E/W) x 0.30m+ wide. The feature was tentatively interpreted as a posthole and may have been round or oval in plan. Under T46, over T44.

T46. Fill of dark greyish brown sandy silty clay, contained a number of medium sized stones, small brick fragments and animal bone fragments. The stones may be remains of post packing. Under T48, over T45.

T50. Dark brown humus rich clayey silt with some lighter flecks, contained charcoal flecks, animal bone, slag and a bone point. One very small brick fragment was recovered from the interface between T50 and modern fill T65, it is most likely that this came form T65, i.e. T50 did not contain any brick fragments. The layer was present over c. 5m, truncated at both ends by modern cut features, and varied in thickness from 0.10-0.30m, depending on undulations in the underlying natural clay. T50 was interpreted as a possible buried turf line. Under T51 and T69, over T55/56.

T51. Cut feature, roughly rectangular in plan with rounded corners, the sides were cut at a sharp angle rounding to a flat base, c. 0.60m (E/W) x 0.40m (N/S) x 0.40m deep. The feature contained remains of a post, T53 and post packing, T54 and was interpreted as a posthole. Under T52, over T50.

T52. Fill of dark brown humus rich silty clay, contained occasional brick fragments and a number of stones 0.04m - 0.10m in diameter. T52 was back-fill of posthole T51 around post packing T54. Under T54, over T51.

T53. Remains of a wooden post, the wood was fairly rotten but the shape of the post could be determined, c. 0.20m in diameter. Under T49, over T54.

T54. Stone packing around post T53, within cut T51, comprised two large stones standing on end on the eastern and western sides of the post. Under T53, over T52.

T55/56. Two contexts issued to the same group of stones and later merged. The context comprised a number of large stones 0.20m x 0.30m x 0.30m with smaller stones in between. The stones lay at the interface between sterile moraine clay T67, and the overlying layer T50, that was interpreted as a buried turf line. It was unclear whether the stones were part of a deliberately laid structure, a dump of rubble or stones moved to the surface through frost heave. The stones were only present in a concentrated area in line with the supposed route of Bishops Street, i.e. the corridor between the Bishops Residence and the churchyard wall, but the stones uncovered here had no clear structure or 'surface'. Under T50, over T67.

T65. Mixed fill of small stones (c. 70%) and dark brown silty clay (c. 30%), some of the stones were 'fire-cracked'. A small bone fragment was recovered from the profile. Under T63, over T68.

T66. Small lens of humus rich silt and charcoal flecks/soot. Only present to the east of cut feature T68, that has been interpreted as a cooking pit, it is possible the T66 is waste from the burning within the pit. The relationship was a little unclear but T66 is recorded as cut by T68, this relationship was assigned during post-excavation analysis. Under T68, over T67.

T68. Cut feature, recorded from the profile, irregular shape, 2.50m wide at the top, 1.20m wide at the base of the trench, the bottom of the feature lay beneath the base of the trench, 0.60m+ deep. The cut was recorded from the profile drawing during post excavation analysis. The context number was issued in the field but no details recorded. Under T65, over T66 and T71.

T69. Thin layer of grey clay localised to the western side of cut T68. Under T71, over T50.

T71. Thin layer of brownish grey humus rich clay localised to the western side of cut T68. Under T49, over T69.

Group 4:42

Q5 Q6

Group 4:42 consists of a small cut feature (Q5 and Q6) that was partially excavated where it protruded out from under the churchyard wall (P50, group 4:25) in trench Q96. The excavated part of the feature was irregular, it is interpreted as a hole created by a tree root or large stone that was removed to facilitate the construction of the wall.

Contexts

Q5. Cut feature, located under the churchyard wall, only the northern half was excavated. Approximately rectangular, oriented NE/SW, near vertical sides rounding to a flat base, 0.80m + long, 0.50m wide, 0.45m deep. A number of other disturbances were registered under the wall, see Q4, but Q5 was clearly a cut feature, its function however may have been the same as the aforementioned disturbances i.e. to remove upstanding stones/roots prior to the construction of the churchyard wall. Under Q6, over Q4.

Q6. Fill of cut Q5, very dark grey brown silty clay, contained animal bone fragments. Under Q3, over Q5.

Group 4:43

Q4

Group 4:43 consists of a layer of clay silt (Q4) that covered the whole of trench Q96. Churchyard wall P50 (group 4:25) appeared to have been partially constructed upon Q4. A number of cut features were visible cutting natural Q48 (group 1:18) once Q4 had been machined off. These features have been divided into two groups (2:33 and 2:32), it is possible that group 2:31 were cut through Q4 but not noticed until the layer was removed. Q4 appeared to be a subsoil, no traces of a turf line were recognisable on the surface of the layer. It contained a higher percentage of gravel to the west where the natural terrain consisted of gravel deposits. The interface between Q4 and Q48 was diffuse in this area. This intermixing could be taken to indicate that the soil had been ploughed. Q4 contained no direct dating evidence but wall P50 was radiocarbon dated to 1420 - 1640. The wall is interpreted as being constructed in the late medieval period. Q4 is therefore interpreted as the remains of a soil layer formed outside the churchyard wall during the medieval period. It was overlain by a primarily post-medieval soil horizon (group 6:6) that butted the churchyard wall.

Contexts

Q4. Layer of yellow brown clay silt, contained small stones, gravel and occasional charcoal flecks. The layer was not homogenous, it was , 0.10-0.20m thick and contained a higher percentage of gravel to the west where the natural consists of gravel. Q4 appeared to seal a number of cut features, but the churchyard wall was built upon this layer. In a number of places the wall had sunk into Q4, but the construction of the outside face of the wall

clearly post-dated the deposition of this layer. Q4 had been truncated in a number of places under the wall, but only one clearly cut feature, Q5 (group 4:42) was registered. The other intrusions appeared to be have been created by the removal of upstanding pieces of bedrock to create a level surface for the construction of the wall. The resulting holes were filled with a gravely silt, similar to Q3. Q4 may be the remains of an old subsoil. Under Q5, over Q7, Q9, Q12, Q13, Q17, Q19, Q21, Q25, Q30, Q35 and Q38.

Group 4:44

S14 S15 S16 S18 S19

Group 4:44 consists of a cut feature (S14) documented from the profile of trench S96. An irregular dry stone wall (S16) was constructed against the eastern end of the cut and a partially burnt, plank floor (S18) lay in the base of the cut. The western end of the cut appeared to be open towards Lake Mjøsa. The deposits the feature cut through to the west, and therefore the cut itself may have been eroded by the lake. It is more likely however that the feature was dug with its western end open to the lake shore. A silty gravel deposit (S15) was deposited between the stone wall and the eastern edge of cut S14, acting as back-fill, stabilising the wall. A similar deposit (S19) was laid under the planking acting as a bedding. The planking was recorded from the profile. A charcoal sample from the layer was radiocarbon dated to CAL AD 1450 – 1660 at the 95% level of confidence.

As this feature was recorded from the profile it is difficult to interpret, but it appeared to be some form of underground structure. That it was open towards the beach may be the result of erosion but was more likely a reflection of its original form. It is tentatively interpreted as a boat house. The radiocarbon date places it either in the late medieval period or early post-medieval period. It is placed in period 4, but could also have been placed in period 6.

Contexts

S14. Cut of a negative feature, the cut was registered in both profiles, its NE edge appeared to be aligned SE/NW, i.e. slightly oblique to the trench. This edge was 0.70m deep and cut at a near vertical angle rounding to a flat base. The base was at least 4m long, there was no return cut to the SW. The feature had been truncated in the north profile, only 1.50m of the base was extant. A rough, unbonded stone wall, S16, was built against the NE edge, and a burnt plank floor, S18, laid in the base. In the southern section it appears as if the feature simply fades out, i.e. there is no evidence of truncation. The open end faces Lake Mjøsa, it is possible the SW edge was removed by erosion, it is however possible the feature was deliberately constructed in this manner, perhaps as a boat house or other feature cut into the shoreline and open to the lake. The feature was filled by rubble deposit S17. Under S15, over S36.

S15. Mid grey silty gravel, contains small stones, no other inclusions were visible. Acts as a back-fill between stone wall S16 and cut S14, only recorded in the south profile, in the north profile wall S16 appears to have been built flush against the cut. Under S16, over S14.

S16. Irregular dry stone structure at the E end of cut S14. The stones were laid both on end and on their sides, 4 - 5 courses high, one course thick. In the south profile there was a back-fill, S15 between the stones and the cut. In the north profile the stones were built flush against the cut. The feature was back-filled by stone rubble fill S17, but S16 could clearly be defined as a deliberately constructed wall. Remains of a burnt wooden floor, S18, butted S16 at its base. The SW end of the feature may have been eroded, it is therefore uncertain whether there was a corresponding wall to the SW. Under S19, over S15.

S18. Remains of burnt wooden planking, 0.04m thick, covered an area 2.90m in length, but was not continuous over the entire area. The continuous area to the east appeared to be a single plank whereas to the west the remains of several separate planks were laid roughly perpendicular to the trench. The wood was carbonised on its upper surface but not burnt completely through. The wood butted stone wall S16 that was built against the NE edge of cut S14. S18 lay 0.50m under the top of this wall and the cut, faded out to the SW. The cut feature may have been open to the SW or may have been truncated.

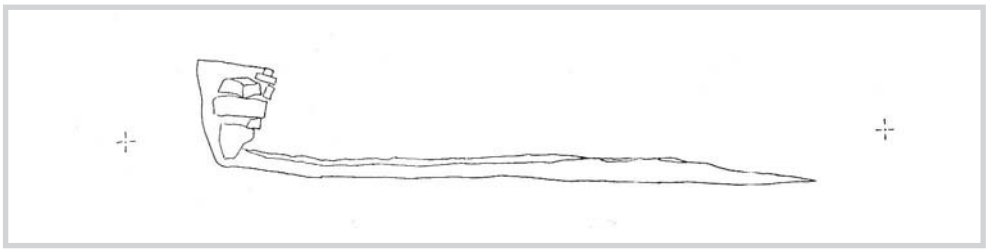


***Fig. 101**. Group 4:44, trench S96.*

S18 fades out to the SW, but S19 that acts as a bedding for the flooring continued 0.80 further west than S18, suggesting that S19 originally extended further west. A charcoal sample from the layer was radiocarbon dated to CAL AD 1450 – 1660 at the 95% level of confidence (Beta-157804, sample HKH11917). Under S17, over S19.

S19. Mid grey brown gravely silt, contained small stones, brick fragments and charcoal flecks. The layer was c. 0.10m thick, it underlay burnt timber planking S18 and butted stone wall S16 at the NE end of cut S14. Appears to have been laid as backfill behind wall S16 and bedding for planking S18. It extended 0.80m further to the SW than the remains of the planking. Under S18, over S16 and S25.

7 Period 5: 1537-1600

7.1 Period 5 summary

7.1.1 Period 5 dating

Period 5 is defined as immediately succeeding the Reformation. The activity grouped here is interpreted as relating to a period when the cathedral was either out of use or only partially in use. The Reformation could not be traced directly in the archaeological deposits. The beginning of this period could have been set at the fire in 1567 that destroyed the cathedrals roof, tower and internal fittings, rather than the Reformation. Apart from group 5:6 however this event was not directly recorded either. The decline of the cathedral was a gradual process. The written sources indicate that attempts to restore the cathedral effectively ended in 1584 when the cathedral school was moved to Vang (see 7.1.2 Period 5 interpretation). The later boundary of this period could have been placed at 1584, but is set at 1600. The activity inside the cathedral (group 5:1) and outside the west front (groups 5:2, 5:3, 5:4 and 5:5) was not empirically dated. It is interpreted as being connected to the repair/gradual decline of the cathedral. This decline is historically dated to the 1500's, more specifically from 1537 to 1584. It is the interpretation of the activity in groups 5:1 to 5:5 that defines period 5. If this activity had been interpreted differently 1537 – 1600 would probably not have been divided up into a separate period. As such period 5 is defined by interpretation rather than any empirical evidence and is entirely a subjective period definition

Two groups (5:6 and 5:7) of activity in trench U96 are included in period 5. In each group radiocarbon dates that spanned periods 5, 6 and 7 were obtained: CAL AD 1530 - 1560 and 1630 - 1950 for group 5:6 and CAL AD 1520 - 1580 and 1630 - 1950 for group 5:7, both dates are at the 95% level of confidence. Group 5:6 is interpreted as being connected to the fire in 1567. Group 5:7 was more difficult to place. Both these groups appeared to be overlain by a silt layer that is interpreted to period 6. Group 5:7 is placed in period 5 more by default than by any secure connection.

7.1.2 Period 5 interpretation

Whilst the Reformation was decisive for the future of the cathedral, its decline and eventual abandonment cannot be attributed to the Reformation alone. There is evidence that the cathedral was in a poor state of repair prior to the Reformation (see Pedersen, R. 1995:45). The cathedral also caught fire after the Bishop's Residence and other buildings were destroyed by Swedish forces in 1567. The tower, roof and internal fittings were destroyed in the fire. The possibility of demolishing the cathedral had been discussed after the Reformation, but funds were eventually secured to restore it. The canons in Hamar were allowed to remain in office after the Reformation, despite the bishop being arrested and the bishopric being incorporated into Oslo bishopric in 1539. The cathedral school was re-established in 1572. It is uncertain when it had been disbanded, it may have been after the fire in 1567. By 1575 it appears as though the roof over most of the cathedral had been rebuilt/repaired. In 1582 further funds were secured for more repair work and for the maintenance of a priest to perform services. The nearby parish of Furnes was re-organised to provide the cathedral with parishioners. By 1584 however the cathedral school was moved to nearby Vang, the cathedral was considered to have no natural parishioners and was left to decay (see Arnesen 1937:41-43 and Tvengsberg 1969:87-88 for the sources for the above and Pedersen 1995:29-48 and 64-66 for a deeper discussion). Pedersen suggests that the cathedral school may have given the impetus for the continued funding of the cathedral i.e. to provide the pupils at the school with practical training (see Pedersen 1995:43).

Tor Sæther has suggested that after the fire the canons used the chancel and possibly also the southern chapel as the church, abandoning the rest of the cathedral. The opening into the chancel is walled in with re-used stone from elsewhere and there is evidence that a door was fitted here. Sæther has found evidence of post-medieval restoration work in the chancel and chapels (see Sæther 1998:71-5). As the nave/aisles were the lay area of the cathedral, and the cathedral had no natural parishioners this argument is a reasonable one. Pedersen's suggestion, that it was the cathedral school that gave meaning to the continuance of the cathedral could be taken as supporting this interpretation.

Group 5:1 consists of three probable and six possible graves in the north aisle of the cathedral. The graves lay flush with the surface of the tile floor. The graves were marked on the surface by coarse stone and brick settings and in one case by a fill of charcoal and silt. They were not what would be expected of high status burials inside

the cathedral. They are interpreted as being dug after the north aisle was out of use. The charcoal fill (R109) may indicate that the grave was dug through the debris after the 1567 fire. The graves that could be measured were short and probably child burials. The presence of burials cut after the aisle was no longer in use appears to support Sæther's interpretation that the eastern end of the cathedral continued to function as a church after the lay area was abandoned.

Outside the west front there is evidence that the original steps into the cathedral were removed. After this truncation event two phases of make-up dumping were registered (groups 5:4 and 5:5). Each included evidence of some form of construction activity, a posthole in group 5:5 and mortar and sand layers in group 5:4. Traces of stone debris were mixed with make-up deposits in the adjacent trench J96-8 (group 5:2). Five E/W aligned cut features (group 5:3) were dug through these make-up deposits in area D96. They were smaller than full size graves, they could be interpreted as child/infant graves, but apart from disarticulated bone in two of the fills, they contained no evidence of burials.

That both the burials in group 5:1 and the empty features in group 5:3 appear to have been dug to contain children can be related to the fact that the cathedral school was still in use. None of the features were large enough to accommodate an adult burial. The documentary evidence that the cathedral lacked parishoners after the Reformation would seem to support the dating of these features to after the Reformation. The small scale building refuse that was present is connected to the attempts to restore the cathedral or to remodel it to meet the reduced needs of the remaining canons. Why the steps at the west front were removed is unclear. The written evidence for repair work indicates that several attempts were made to acquire funds. It is likely that the repair work was carried out in stages. It is possible that the intention was to replace the steps, but the work was never completed. It is also possible that if the nave was no longer in use, the western entrance may have been closed off in some way.

Two groups of activity in trench U96 were included in period 5. The remains of burnt planking (group 5:6) was radiocarbon dated to CAL AD 1530 – 1560 and 1630 - 1950 at the 95% level of confidence. This is interpreted as debris from the 1567 fire. A series of postholes were also documented. One of these was radiocarbon dated to CAL AD 1520 – 1580 and 1630 – 1950 at the 95% level of confidence. The postholes are difficult to interpret.

7.2 Period 5 discussion

Eight stone settings (group 5:1) were uncovered in the north aisle. Not all were fully exposed. None of the features were excavated, but three could clearly be identified as graves. The other five were not as easily interpretable. R38 was probably more than one feature, but could not be defined as such. A silt/charcoal fill (R109) was also probably the fill of a grave. With the exception of R109 the upper surface of the other deposits consisted of stones and brick fragments. All lay approximately level with the surface of the tile floor (group 4:5). It was normal practice for grave slabs to be laid flush with the surface of the contemporary floor (Rodwell 1989:158). If these stone settings had been bases for grave slabs then the slabs would have stood proud above the floor level. If the graves were contemporary with the use of the cathedral it is unlikely that these rough stone and brick settings, and silt/charcoal fill (R109), would have been left to mark the graves in the tile floor. These graves are therefore interpreted as being dug after the north aisle was no longer in use. The full length of only three of the graves was definable, these were 1.50m, 1.30m and 1.05m long. The dimensions suggest that they were child burials.

Outside the west front in trench D96 five empty cut features (group 5:3) were recorded. They were all aligned perpendicular to the cathedral and appeared as though they were graves. Apart from disarticulated bone in two of the fills they were all empty. The cuts were between 0.70m – 1.30m in length, were shorter than full size graves. If they were dug to contain burials they must have been intended for children or infants. Infant graves have been known to be empty or to contain only a few bone fragments, the burials having decaying completely (Rodwell 1989:160-163). Child/infant burials in trench H96-14 (group 4:33), a few metres to the south were preserved however. Many child and infant burials were also recovered from this area in the 1992 excavations (see Sellevold 2001:187). The disarticulated bone in these features could be from graves that were cut through, rather than the remains of in-situ burials. Whether these features contained child and infant burials that have decayed or whether they were never used is unclear, the latter explanation is considered to be most likely.

These features were dug into make-up layer D27 (group 5:4) that covered the whole of trench D96. This silt layer was grouped together with small spreads of sand and crushed mortar. These lay both below and over D27. A posthole from the underlying group (5:5) was filled in after the post had been removed. The sand and crushed mortar appeared to be refuse from small scale construc-

tion activity. Further evidence of such activity was present in trench J96-8 (group 5:2) immediately north of D96. The silt and clay layers in this group contained stone working debris, but were not dominated by this material.

The posthole was cut through two earlier make-up layers of silt and clay (D35 and D36, group 5:5) that between them covered the whole of trench D96. Only one posthole was present in D96, it had a stone post packing, the post had been removed prior to the deposition of D27. A posthole, probably contemporary, was documented in area DI in 1992, to the north of the one documented here (see Pedersen E. A. 1994:45). These may have been scaffolding supports.

Graves were recorded under layers D35 and D36. These graves appeared to have been truncated prior to the deposition of these two layers. This truncation event has been related to the removal of the original steps into the west front (see 4.2 period 2 discussion). This truncation event was also documented in 1992. The evidence from these layers is interpreted in both cases as being related to construction work and the truncation event as removing the original steps. The evidence from the 1992 excavations is interpreted however as indicating that these layers were deposited during the medieval period and that the steps that are present today were built after 1450 (see Pedersen E. A. 1994:44-49). The steps were excavated in 1996 and appeared to be of recent date, being partially constructed with cement and sealing all the medieval deposits. They were not cut into medieval layers as interpreted in 1992, but were built upon the ground surface (see group 7:16).

The graves in group 5:1 appear to indicate that the north aisle was used for burials after going out of use. As the steps outside the west front appear to have been removed prior to the activity in period 5, and not replaced until the modern renovation of the cathedral, this activity is associated with graves in group 5:1 as being dated to after the cathedral ceased to function.

It is possible that the activity outside the west front, grouped in period 5, is medieval in date as was interpreted in 1992. The interpretation of this material in both cases hinges on the dating of the steps. If the were medieval in origin then a second set of steps must have been built upon D27, removed and replaced by the modern reconstructions that were excavated in 1996.

Two groups of activity in trench U96 are also placed in period 5. They are not connected to the activities in and around the cathedral, but can be dated to the period around the Reformation. A layer of burnt planks and a silt that contained burnt stones (group 5:6) were uncovered. A charcoal sample was radiocarbon dated to CAL AD 1530 - 1560 and 1630 - 1950 at the 95% level of confidence.

Eleven cut features (group 5:7) are also grouped in period 5. Eight of these were probably postholes, the other three are uncertain. Stone post packing and post remains were present in some. The postholes were spread over the length of the trench with no clear pattern. Trench U96 was only 1m wide however, presumably there were more postholes outside of the limits of the trench, the real patterning, if there was one, was therefore not uncovered. A wood sample from one of the posts was radiocarbon dated to CAL AD 1520 – 1580 and 1630 – 1950 at the 95% level of confidence.

Both of these groups of activity were overlain by silt layers that are interpreted as representing a hiatus in the post medieval period, and activities related to the post-medieval farm (groups 6:2 and 6:1 respectively). The radiocarbon dates for groups 5:6 and 5:7 are ambiguous. Given that they appear to pre-date a hiatus in the post-medieval period they are interpreted as dating to the period around the Reformation. Partial destruction of the Bishops Residence was documented in 1453, 1502 and 1507, it may also have been damaged at the Reformation, and was finally destroyed in 1567 (see Tvengsberg 1969: 85-6). The dating of the burnt deposits dates when the wood was cut down, not the deposition of the layer. It would appear to indicate that either the Reformation or the fire in 1567 were the cause of the burning, the latter is the more likely. The postholes are more difficult to interpret.

7.3 Group descriptions

Group 5:1
R29 R30 R31 R33 R34 R35 R37 R38 R39 R40 R41 R109 R110
Group 5:1 consists of three stone covered graves (R29, R30, R31, R33, R34, R35 and R37), five possible stone covered graves (R38, R39, R40, R41 and R110) and one possible grave filled with charcoal and silt (R109). These features were present in the north aisle. They were recorded on the surface only, none were excavated. Layer R23 (group 7:3) partially overlay most of these features such that they weren't fully exposed. Three of the features (R33, R34 and R37) were very convincing as stone settings marking graves, cut numbers were issued to these features even though they were not excavated. Stone set-

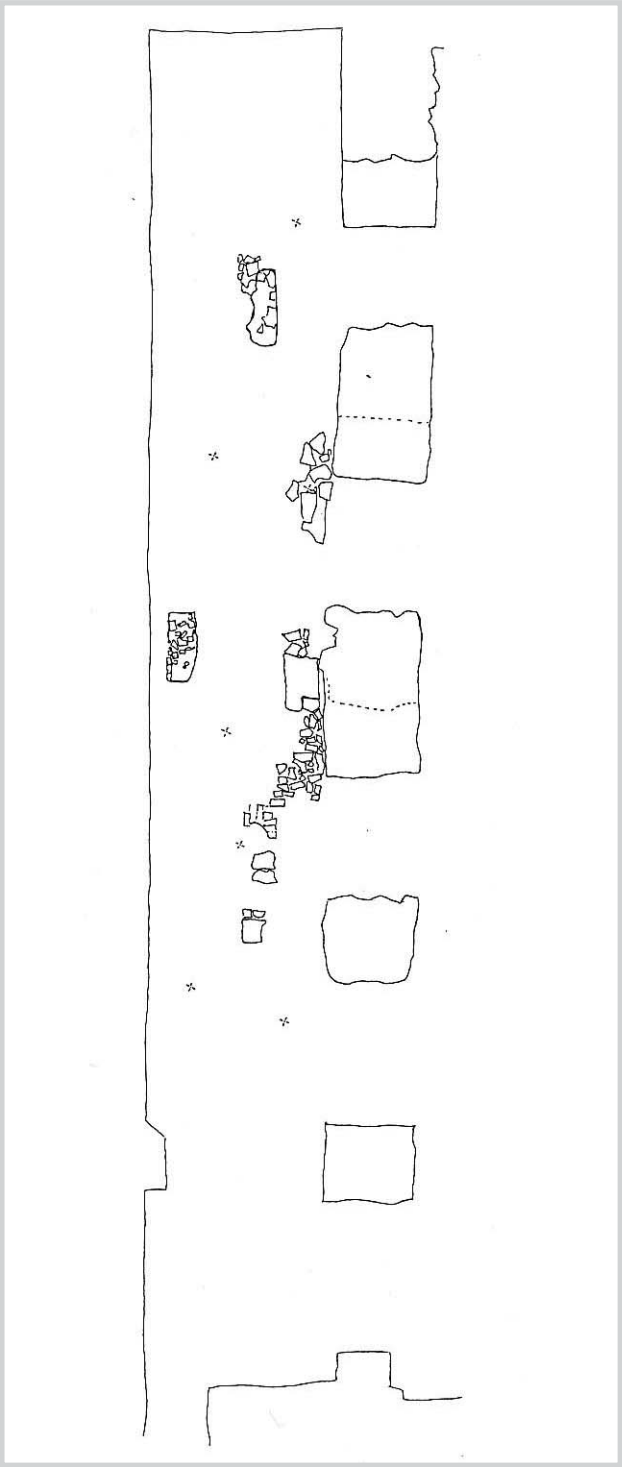


***Fig. 102**. Group 5:1, area R96, north aisle. Top E.*

tings R39 and R40 and charcoal fill R109 were fairly convincing as graves, but R39 and R40 were only partially uncovered. R38 and R41 may have been the remains of more than one grave. It is possible that these contexts were just localised concentrations of stones within layer R23, but this didn't appear to be the case. If the three clearly identifiable graves had not been present the other stone features may not have been interpreted so confidently as possible graves.

The stone layers that lay in the top of the grave fills were laid flush with the surface of tile floor R24. The graves would have been visible in the cathedral floor, but the stone cappings that marked the graves were very roughly laid and in marked contrast to the regular layout of the floor. They do not appear to be foundations for grave slabs as these would have been upstanding over the floor level. It is possible that these graves were dug after the cathedral was out of use and roughly marked with these stone settings. Without empirical dating evidence this interpretation should be used cautiously. The three complete graves whose dimensions were definable (R34, R37 and R109) were 1.50m, 1.30m and 1.05m long respectively. That these graves appear to have been short could indicate that they were child burials.

Contexts

R29. Flag stone and brick layer, filling the top of grave cut R33. The grave was defined on the surface but not excavated. The stones were medium sized, of mixed lithology, laid to form a rough surface. Under R23, over R33.

R30. Fill of silt, crushed mortar and brick fragments, stone surface lay upon R30. Fill of grave cut R34. Under R1, over R31.

R31. Flag stone layer, partially filling the top of grave cut R34. The stones didn't cover the whole grave, they lay upon fill R30. Under R30, over R34

R33. Grave cut, 0.80m+ long E/W x 0.45m+ wide. The grave lay in the north aisle and was defined on the surface but not excavated. Later layer R23, lay partially over the grave, such that its full limit couldn't be defined. The grave appeared to be cut on the southern side by grave R34. Under R29, over R157.

R34. Grave cut, 1.50m long E/W x 0.50m+ wide. The grave lay in the north aisle and was defined on the surface but not excavated. Later layer R23, lay partially over the grave on its northern side, such that its full limit couldn't be defined. The grave appeared to cut into grave R33 to the north. Under R30, over R24.

R35. Layer of small and medium sized stones, partially filling the top of grave cut R37. The stones didn't cover the whole grave, they lay upon the silt fill. Under R1, over R37.

R37. Grave cut, 1.30m long E/W x 0.55m wide. The grave lay in the north aisle and was defined on the surface but not excavated. Under R35, over R24.

R38. Layer of stones of all sizes and bricks, both whole and fragmentary. R38 lay in the north aisle and covered an area 2m long E/W x 0.50m - 1m wide. R38 was possibly the top of two separate graves, but it was not possible to define separate features on the surface. R38 was overlain by later layer R23 to the north, i.e. the whole feature was not exposed. Under R23.

R39. Two large flagstones laid side by side, 0.50m+ long E/W, 0.45m wide. The stones lay in the north aisle, they were bounded to the N and S by tile floor R24, but overlain by later layer R23 to the E and W, i.e. the whole feature was not exposed. R39 may have been flagstones marking a grave. Under R23, over R24.

R40. A single large and two medium sized stones laid side by side, 0.60m+ long E/W x 0.45m+ wide. The stones lay in the north aisle, they were bounded to the N and E by tile floor R24, but overlain by later layer R23 to the S and W, i.e. the whole feature was not exposed. R39 may have been flagstones marking a grave. Under R23, over R24.

R41. A group of large stones at the NE corner of the grave chamber in the north aisle. R41 covered an area c. 2m long E/W x > 0.80m wide. The stones were partially overlain by later layer R23 i.e. the whole feature was not exposed. R41 may have been flagstones marking several graves. Under R23.

R109. Layer of charcoal and silt, contained mortar and brick flecks. R109 covered an area 1.05m long E/W x 0.70m wide immediately north of altar foundation R118 in the north aisle. R109 probably filled a cut, the layer was described after the ground had frozen. It was therefore not possible to define a cut. It is likely that R109 was a grave fill, the charcoal content of the fill suggests it may have been cut through a fire horizon, possibly that of 1567. Stone concentration R110 lay over the eastern limit of R109. It was not clear whether R110 was part of fill R109 or a separate, if so R109 probably cut into R110. Under R23, over R110.

R110. Four medium and large stones and a brick fragment laid at the eastern limit of charcoal R109. They covered an area c. 0.60m x 0.60m. R110 may be part of fill R109 or the fill of a separate feature truncated by R109. Under R109.

Group 5:2

J177 J172 J173 J174

Group 5:2 consists of a thin layer of beach gravel (J171) and three silt/clay layers (J172, J173 and J174). These deposits overlay the latest graves in trench J96-8. No empirical dating evidence was recovered from this group of contexts, but they appeared to seal the graves in trench J96-8. The layers in this group contained stone working debris and are similar in character to those in group 5:4 in trench D96 to the south. Group 5:4 is interpreted as

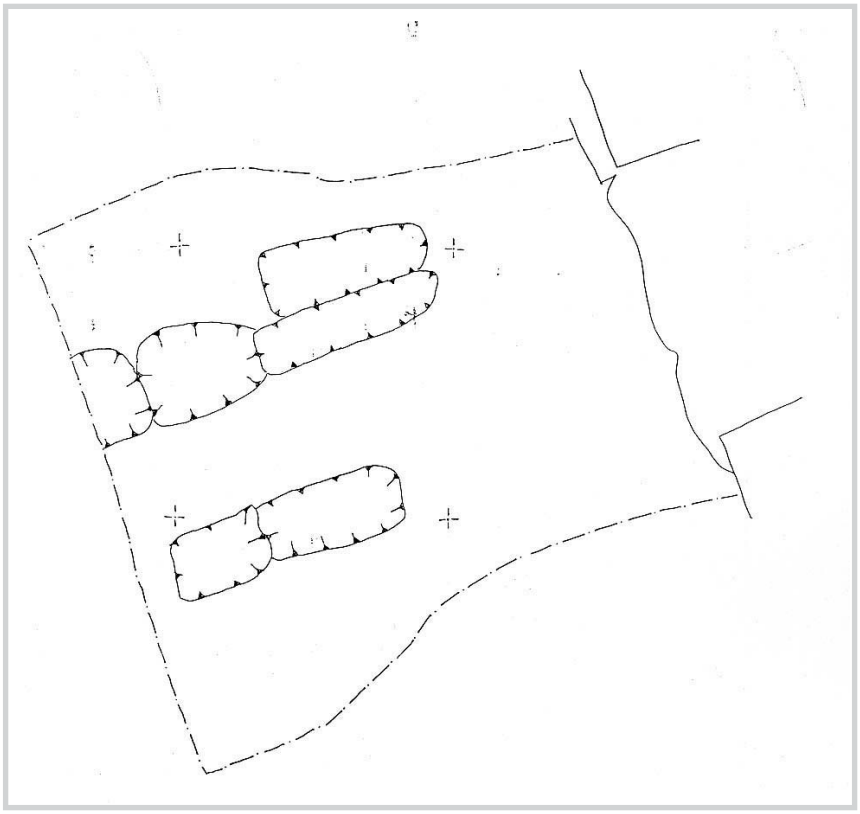


***Fig. 103**. Group 5:3, trench D96.*

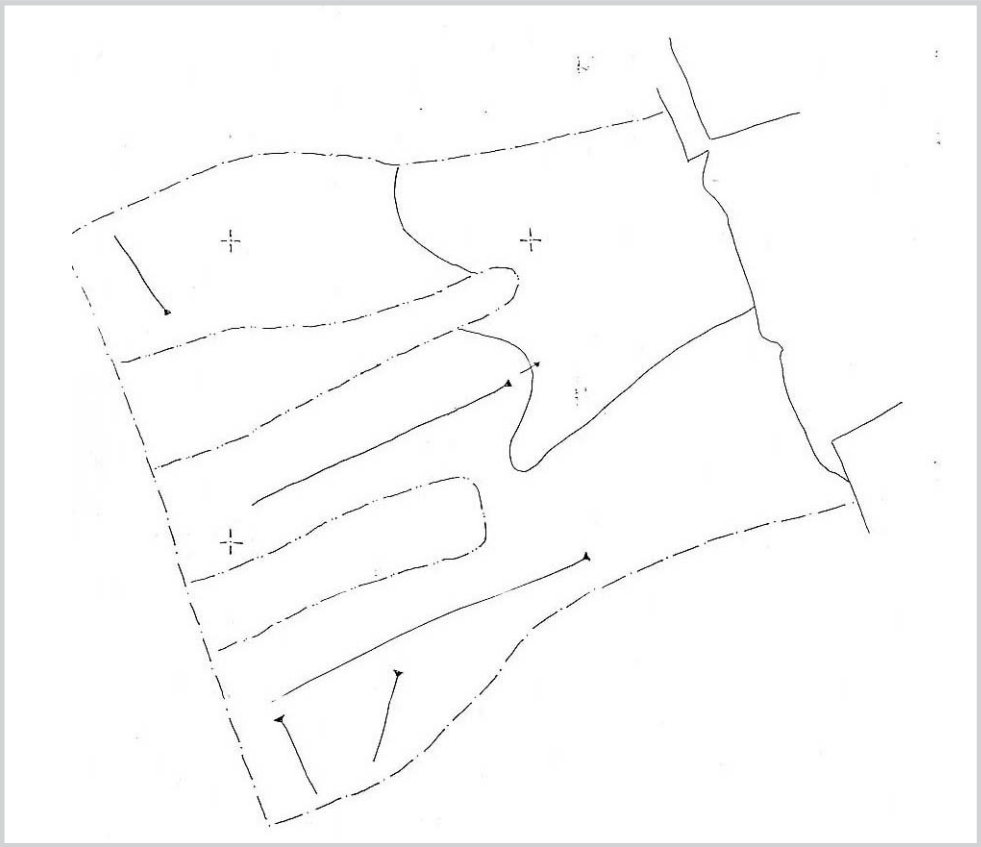


***Fig. 104**. Group 5:4, trench D96.*

make-up dumping after the churchyard was out of use and of containing evidence of small scale building activity. Group 5:2 is tentatively associated with group 5:4 in trench D96.

Contexts
J177. A thin lens of beach gravel. Under J171, over J172.

J172. Layer of yellow gravely clay silt and stone chips, contained mortar flecks. Both the upper and lower surfaces slope down to the west, the layer was 0.25m thick to the east, 0.15m to the west. Under J177, over J173.

J173. Layer of orange brown gravely silty clay and stone chips. Both the upper and lower surfaces were roughly horizontal in the eastern half of the trench, but sloped down to the west in the western half. Under J172, over J174.

J174. Layer of grey gravely clayey sandy silt and small stones, contained mortar flecks and brick fragments. The layer was 0.30m thick to the east thinning to 0.10m to the west. Under J173, over J117 and J119.

Group 5:3.
D15 D16 D17 D18 D19 D20 D21 D22 D23 D25 D28 D29.
Group 5:3 consists of five linear, E/W aligned cut features in trench D96, they appeared on the surface to be small graves, but no burials were present and only two of the fills, D17 and D23 contained disarticulated human bone. The cuts ranged in length from 0.70-1.30m, in width from 0.35-0.70m and in depth from 0.20-0.60m, in most cases the base sloped down slightly to the west, following the slope of the terrain. D25 lay partially outside the excavated area. The cuts, D16, D18, D20, D22, D25 and D29 lay against one another but didn't appear to inter-cut.

Contexts
D15. Fill of grey brown sandy silt, contained clay lumps and small stones. Under D14, over D16.

D16. Cut feature, 1m long (E/W), 0.50m wide, 0.47m deep, cut with sloping sides rounding to the base that sloped down slightly to the west. Under D15, over D24.

D17. Fill of reddish brown sandy silt, contained lumps of clay, mortar flecks and stone fragments. Under D14, over D18.

D18. Cut feature, 1.30m long E/W, 0.35m wide, 0.50-0.60m deep, cut with sloping sides rounding to the base, base slopes down slightly to the west. Under D17, over D24.

D19. Fill of dark grey brown sandy silt, contained beach gravel fragments, concentrated in the uppermost part of the fill. Under D14, over D20.

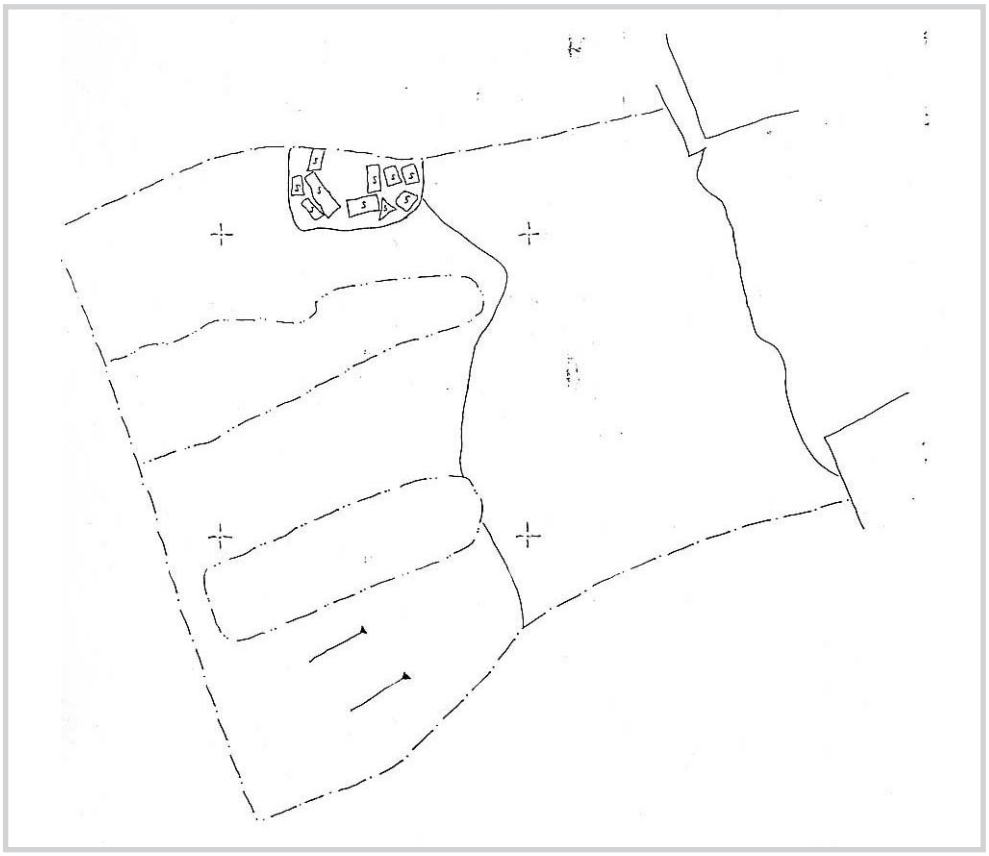


***Fig. 105**. Group 5:5, trench D96.*

D20. Cut feature, 0.70m long E/W, 0.45m wide, 0.20-0.40m deep, cut with sloping sides rounding to the base that sloped down slightly to the west. Under D19, over D27.

D21. Fill of reddish brown silty sand, contained small stones and gravel. Under D14, over D22.

D22. Cut feature, 0.80m long E/W, 0.40m - 0.65m wide, 0.30m - 0.35m deep. The cut had sloping sides that rounded to the base that sloped down slightly to the west. Under D21, over D27.

D23. Fill of light brown humus rich sand, contained small stones, beach gravel fragments and disarticulated human bone. Under D14, over D25.

D25. Cut feature, only part of which lay within the excavated area, 0.40m+ long E/W, 0.70m wide. Under D23, over D27.

D28. Fill of reddish brown silty sand, contained small stones and beach gravel fragments. Under D14, over D29.

D29. Cut feature, 1.20m long E/W, 0.50+m wide, 0.50m - 0.60m deep, cut with sharply sloping sides rounding to a flat base. This feature was excavated and recorded as being sealed by layer D27, making it older than this group of features, it is more likely that the feature was cut through D27, but not identified until the layer was removed. Under D28, over D27.

Group 5:4

D24 D26 D27 D30 D37

Group 5:4 consists of sand and mortar spreads, both above (D24 and D26) and below (D30) compact silt layer D27. D27 covered the whole of trench D96 and appeared to be a make-up layer, it varied in thickness from 0.10m - 0.30m. Posthole D38, (group 5:5) was in-filled with D37, prior to D27 being deposited. A series of negative features (group 5:3) were cut through D27.

Contexts

D24. Layer of grey brown gravely silt, contained mortar flecks. The mortar flecks may be indicative of masonry work. Only present in the NE corner of the trench. Under D16 and D18, over D26.

D26. Layer of crushed mortar. Only present in the NE corner of the trench, possibly indicative of masonry work. Under D24, over D27, same as DL15(92)?

D27. Layer of compact brown silt, contained beach gravel and flecks of clay. D27 covered the whole trench, it varied in thickness from 0.10-0.30m. The layer was

thickest against the cathedral foundation. Under D20, D22, D25, D26 and D29, over D30 and D37, same as DL33(92)?.

D30. Two small, 1m x 1m patches of light grey sand and crushed mortar. The layers were c. 0.05m thick and were present on both the southern and northern sides of the trench. Under D27, over D33, same as D32 and DL32(92)?

D37. Fill of brown silt, contained mortar flecks and brick fragments. D37 fills the space between post packing D41 in posthole D38. No traces of a post were present. D37 was presumably deposited after the post was removed. Under D27, over D41.

Group 5:5

D33 D34 D35 D38 D41

Group 5:5 consists of make up dumps of re-deposited natural moraine clay (D34) and compact silty sand (D35). These two layers overlapped slightly, they were 0.20m - 0.30m thick and together covered the whole of trench D96. Graves began to be identifiable under these deposits, in some cases cuts were clearly discernible, there was no indication that those graves were cut through these layers. Posthole, cut (D38) and post packing (D41) cut through D35. No other postholes were recorded, D38 may be connected to small scale building work. The overlying layers (group 5:3) contained mortar spreads indicative of masonry work. This group may represent make-up dumping after the churchyard was out of use, prior to small scale building work. If this interpretation is correct the churchyard layers must have been truncated prior to these contexts being deposited. Truncation may have been connected to removal of the original steps.

Contexts

D33. Layer of greyish brown sandy silt, contained beach gravel. Only present in the SW corner of the trench filling a shallow depression in underlying layer D35. Under D27, over D35.

D34. Layer of orange brown silty clay, contained beach gravel. D34 was present in the eastern half of the trench, against the cathedral wall. Under D35, over D39, D45, D48 D53, D55, D58 and D72, same as DL23(92)?

D35. Compact layer of grey brown silty sand, contained clay flecks, beach gravel, mortar flecks and small brick fragments. D35 covers the western half of the trench. Under D33 and D38, over D34, same as D36.

D38. Cut of a posthole, 0.90m E/W, x 0.50m N/S x 0.60m deep. The sides were cut at a near vertical angle, stone post packing was laid directly against the cut. Under D41, over D35.

D41. Stone post packing in posthole D38. consisted of large stones lining the cut, no stone was placed in the base. The internal space implies the post had a diameter of c. 0.30m. Under D37, over D38.

Group 5:6

U73 U89

Group 5:6 consists of a two layers that bear witness to a fire in trench U96. U73 consisted of charcoal, possibly burnt planks, U89 was a silt layer that contained burnt stone fragments. Both layers were thin, < 0.05m thick, they covered an area from 2.60m east of the churchyard wall U71 (group 4:37) up to the corner of the barn. They lay at 132.76 m over sea level to the west, sloping down to the east, where they lay at 132.22 m over sea level. A charcoal sample from U73 was radiocarbon dated to CAL AD 1530 - 1560 and 1630 - 1950 at the 95% level of confidence. It is unclear whether the burning was in-situ or not. The C14 date gives a date for when the wood stopped growing, or was cut down, not the deposition of the layer. It is possible that the burning was connected to the conflict at the Reformation, but was more likely the result of the fire in 1567.

Contexts

U73. Layer of charcoal, in places the layer appeared to consist of burnt planks, but over most of the layer no structure was visible. The planks appeared to be aligned both N/S and E/W. The layer was 0.03m thick and 6.30m long, it covered an area from the corner of the barn towards the west. A charcoal sample from the layer was radiocarbon dated to CAL AD 1530 - 1560 and 1630 - 1950 at the 95% level of confidence (Beta-157802, sample HKH11883). Under U64, over U89, same as U4.

U89. Layer of greyish brown silty clay, contained lumps of mortar, brick fragments and fragments of burnt limestone. Covered an area c. 3m long, the layer was 0.02m - 0.05m thick. Under U73, over U90.

Group 5:7

U1 U2 U3 U5 U6 U7 U9 U10 U11 U12 U13 U14 U15 U16 U18 U19 U25 U26 U31 U32 U33 U37 U38 U39 U40 U41 U100 U101 U102 U103 U104 U105 U106 U109 U110

Group 5:7 consists of eleven cut features in trench U96, eight of which were postholes (U1, U5, U9, U14, U31,

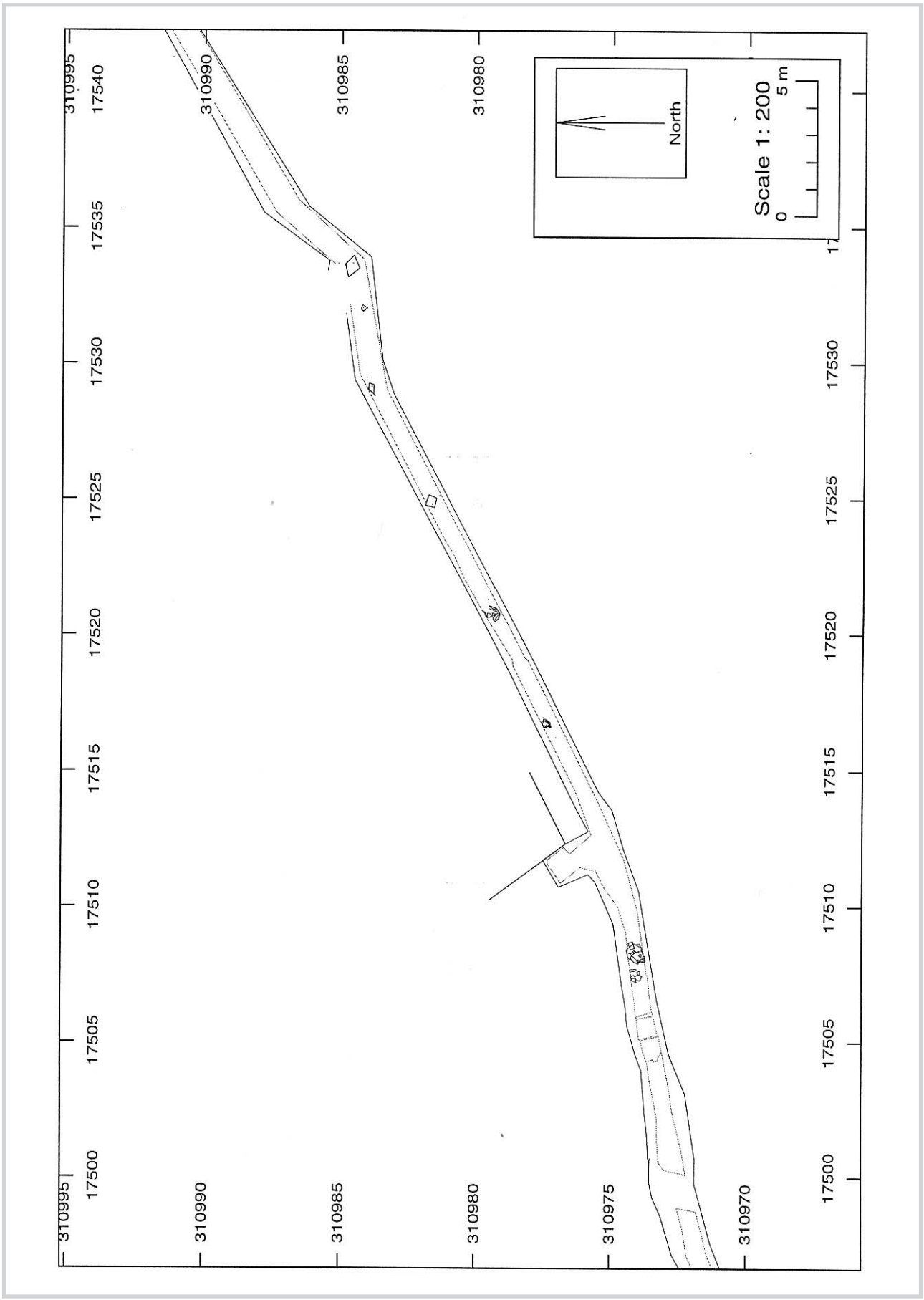


***Fig. 106**. Group 5:7, trench U96.*

U38, U100 and U103). Remains of the posts were present in four (U2, U9, U16 and U103), five had stone packing lining the cut (U5, U31, U38, U100 and U103). The remaining three features (U12, U18 and U25) were probably not postholes. These may not have been cut features at all, U12 may be the depression created by removing a large stone.

Two of the postholes (U100 and U103) were excavated in the western half of the trench. These were contemporary and lay only 0.15m apart. The other postholes lay in the eastern section of the trench, these were cut into natural. It is not certain that all these features were contemporary but it seems likely. There was no stratigraphic relationship between the postholes in the west and those in the east. U100 and U103 lay 18m west of U14. The postholes function is uncertain. A wood sample from post U105 was radiocarbon dated to CAL AD 1520 - 1580 and 1630 - 1950 at the 95% level of confidence.

Contexts

U1. Fill of brownish grey gravely humus rich silt, contained mortar flecks and small brick fragments. Fills posthole U2. Under U23, over U3.

U2. Cut of posthole, 0.30m in diameter, 0.35 m deep. Under U3, over U8.

U3. Wood remains in posthole U2. Remains of the post. Under U1, over U2.

U5. Cut of posthole, oval in plan, 0.60m x 0.70m x 0.30m deep. Under U7, over U8.

U6. Stone packing of posthole U5, consisted of medium sized stones placed around the edge of the cut. Under U23, over U7.

U7. Fill of brownish grey gravely silt, back-fill of posthole U5, behind post packing U6. Under U6, over U5.

U9. Cut of possible posthole, 0.22m in diameter, 0.15m deep. Contained wood remains U111. Possibly a truncated posthole. Under U11, over U8.

U10. Fill of brownish grey humus rich silt, contained small stones and occasional brick fragments. Back-fill of possible posthole cut U9, around post U11. Under U23, over U11.

U11. Wood remains in posthole U9, remains of the post. Under U10, over U9.

U12. Cut feature, 0.80m in diameter, 0.15m deep. Cut into the natural clay may be a depression after removal of a large stone rather than a cut feature. Under U13, over U8.

U13. Fill of dark brown humus rich silt, contained brick fragments, animal bone, mortar flecks and charcoal flecks. Fills cut U12. Under U23, over U12.

U14. Cut of posthole, 0.53m in diameter, 0.33m deep. Contained wood remains U16, a concentration of stones in the natural clay may have formed a rough packing. Under U16, over U8.

U15. Fill of humus rich silt, contained small stones, mortar flecks and brick fragments. Fills posthole cut U14, around post U16. Under 23, over U16.

U16. Wood remains in posthole U14, remains of post. Under U15, over U14.

U18. Cut feature, possibly a truncated posthole, 0.38m in diameter, 0.28m deep. Under U19, over U8.

U19. Fill of greyish brown silty sand, contained gravel and small stones. Fills cut U18. Under U23, over U18.

U25. Cut feature, 0.30m in diameter, 0.23m deep. The cut's function is uncertain, not obviously a posthole. Under U26, over U8.

U26. Fill of dark greyish brown sandy silt, contained gravel and small stones. Under U23, over U25.

U31. Cut of posthole, only half of the feature lay within the excavation, 0.52m long E/W x 0.32m+ N/S x 0.50m deep. Under U37, over U30.

U32. Fill of dark brown sandy clay, contained mortar flecks, brick fragments small stones and charcoal flecks. Fill of posthole U31, fills the space within post packing U33, presumably deposited after the post was removed/rotted. Under U23, over U33.

U33. Stone packing of medium and large stones standing on end around the cut of posthole U31. Under U32, over U37.

U37. Fill of greyish brown sandy silt, back-fill behind and around stone packing U33 in posthole cut U31. Under U33, over U31.

U38. Cut of posthole, 0.35m in diameter, 0.32m deep. Under U41, over U36.

U39. Fill of dark brown silt clay, contained brick fragments, mortar flecks, small stones and charcoal flecks. Fill of posthole U38, fills the space within post packing U40, presumably deposited after the post was removed/rotted. Under U23, over U40.

U40. Medium sized stones standing on their ends placed around the posthole cut U38 acting as post packing. Under U39, over U41.

U41. Fill of dark greyish brown silty clay, back-fill behind and around stone packing U40. Under U40, over U38.

U100. Cut of posthole, 0.47m in diameter, 0.53m deep. Under U109, over U96.

U101. Fill of dark brown humus rich silt, contained brick fragments, mortar flecks and wood fragments - remains of the post. Under U90, over U102.

U102. Stone packing in posthole U100, consists of stones of varying sizes laid around the edge of the cut and in the base of the cut. Under U101, over U109.

U103. Cut of posthole, 0.73m in diameter, 0.32m deep. Under U110, over U96.

U104. Fill of greyish brown sandy clay, contained small stones and brick fragments. Filled posthole cut U103. Under U90, over U105.

U105. Wood remains in posthole U103, remains of the post. A wood sample from the post was radiocarbon dated to CAL AD 1520 - 1580 and 1630 - 1950 at the 95% level of confidence (Beta-157803, sample HKH11902). Under U104, over U106.

U106. Post packing in posthole U103, consisted of medium sized closely packed limestone blocks, lining the cut and base of the posthole. Under U105, over U110.

U109. Fill of charcoal flecks, lay in the base of posthole cut U100. Under U106, over U100.

U110. Fill of greyish brown sandy silty clay, contained occasional brick fragments and occasional charcoal flecks. Primary fill of posthole cut U103. Under U106, over U103.

8 Period 6: 1600-1847/50

8.1 Period 6 summary

8.1.1 Period 6 dating

Period 6 is defined as dating from 1600 - 1847/1850. The cathedral was out of use by 1600 and the county governor no longer resided at here. The area of Storhamar remained the property of the crown and was leased out. It was eventually sold, but not built up into a serious concern before 1716. The main house can be seen from map evidence to have been constructed by 1772. It was damaged by a fire in 1850 and subsequently demolished (Pedersen 1990:39). The end of this period is placed at 1840/1850. The first indications of clearance work in the ruin are from the 1840's (Pedersen 1998:129-33). The cellars under the main house at the farm are presumed to have gone out of use after the fire in 1850, the limit of this period is set at 1840/1850. 1840 marks the beginning of a new phase in the cathedrals history, but the cellars are presumed to have continued in use until the fire in 1850.

None of the structures in this group have been empirically dated. The cellars contained C17th brick and were constructed using a technique common in the post-medieval period.

Sources from the early 1700's describe many of the medieval buildings as still standing. This can be taken to indicate that there had been little building activity since the county governors time (Pedersen 1990:33-4). The churchyard wall in trench U96 (group 4:37) appeared to be standing into the post medieval period, but was covered by the activity in group 6:1. This appears to indicate that the building and drain in group 6:1 were more likely to have been constructed in the latter part of the farm period and that the silts that lay under it (group 6:2) belong to the earlier phase.

A sill wall in trench T96 (group 6:4) was overlain by a silt layer that contained ceramic from the 1700's. This does not directly date the building however. Most of the contexts in period 6 were placed here through interpretation rather than solid dating evidence.

8.1.2 Period 6 interpretation

Period 6 consists of deposits and structures interpreted as belonging to the post medieval farm. The structural evidence consists of fragmentary remains of the main house and the cellars beneath it (group 6:10), a wall and drain in trench U96 (group 6:1), a sill wall in trench T96 (group 6:4) and a stone foundation of unknown function in trench T96 (group 6:5). Silt layers in trenches U96 (group 6:2), T96 (group 6:3), Q96 (group 6:6) and S96 (group 6:8) are interpreted as being turf horizons related to this period. With the exception of the drain in trench E96-3 (group 6:11) all of this activity was registered outside the churchyard.

This period covers 250 years. If a full picture of the post medieval activity was available it would probably be divided into several phases. The deposits grouped together here were recorded from trench profiles spread over a large area. They do not form a coherent picture of the farm activity and it was not possible to determine which elements were contemporary. They are grouped together more by default, i.e. they were not medieval and not modern, rather than because of any coherent connection between them.

8.2 Period 6 discussion

A cellar complex and remains of the main house of Storhamar farm were uncovered (group 6:10) south of the churchyard. The location and to a large degree the plan of the building are known (see Pedersen 1990). That cellars, believed to be of medieval origin, stood under this building was also known (Løberg 1945:15-6). The area is believed to have been part of the ecclesiastical centre in the Middle Ages, many of the buildings that stood here could have had cellars. A cellar complex, south of the one uncovered by the excavations are believed to be re-built medieval cellars. The two cellars in group 6:10 appear to be later. Both the construction technique and some of the bricks used in the one of the vaults indicate a post medieval date. The top of a third vaulted ceiling was partially uncovered, the stones in it were bonded with mortar, possibly implying a medieval date. It appeared to have been built after one of the post-medieval cellars however, this was not confirmed however. The west wall of cellar X12 appeared to have been convex, suggesting it may have been the outside wall of another cellar to the west. No cellar remains were visible on the surface to the west however.

Remains of the main house of Storhamar farm were uncovered over the top of these cellars. These are presum-

ably the remains of the ground walls and other structures. Not enough of the building was uncovered to interpret it.

Other structures are interpreted as being part of the farm were uncovered in trenches U96 (group 6:1), T96 (group 6:4) and E96-2 (group 6:10). Two silt layers (group 6:29 covered most of the western end of trench U96, butting the medieval churchyard wall (U71, group 4:37). These layers post date the wall, but indicate that it was still a feature in the landscape. These layers were turf like, they may have been created as a combination of dumping and natural turf formation. Over these layers a series of stone rubble layers were deposited, a drain and a stone wall were constructed (group 6:1). A dry stone sill wall, ENE/WSW aligned, was built over the top of the churchyard wall. A shallow cut was registered, presumably dug to level off the older masonry. This wall (U69) was uncovered along the edge of the trench, roughly parallel with the trench. It lay outside the excavation to both the east and west. The inside of the building it is part of must have lain to the north. No return walls were registered in the excavated area. A stone drain (U55) was constructed 3m to the east. It was constructed of two rows of stones, WNW/ESE aligned. The stones stood upon stone layer U77 that formed the base of the feature. A capping stone was visible in the profile, but none were in place in the excavated area. Two layers of stones had been dumped against the drain on its west side to stabilise the stones. The uppermost of these two layers (U58) formed a rough surface. It lay flush with both the wall and the drain and had a fall through 0.50m - 0.60m down to the drain. The drain sloped down to the ESE. This fall appears to have been deliberate to lead water or other refuse down to the drain and away from the area.

Another drain (group 6:11), constructed in a similar manner, was uncovered in a small trench (E96-2) inside the churchyard. This feature is unlikely to have been part of the churchyard and is interpreted as part of the post-medieval farm.

The top of a probable dry stone sill wall (T12, group 6:4) was uncovered in trench T96. The layer that overlay the stones T11 (group 6:3) appeared to be a turf horizon that had grown up after the building was out of use. This layer contained a ceramic fragment dated to the late 1700's. No return walls were present within the excavated area. A map from 1823 shows buildings nearby, but nothing exactly in this area. This area in 1823 seems to have been reserved for the working farm buildings, separating them from the residence to the SW (Pedersen R. 1990:60).

A stone foundation (T19, group 6:5) was uncovered in the edge of trench T96, in the area north of the barn that was dug to house an inspection pit. Only the below ground foundation was present. It appeared as though the trench had clipped the corner of the feature. It consisted of 8/9 courses of stones laid in a cut, the space between the stones was filled with clay. No dating evidence was recovered. The foundation is tentatively interpreted as a foundation belonging to the farm, but the possibility that it was of medieval origin cannot be discounted. Its function was unknown.

Sporadic traces of a turf horizon were uncovered other places in this part of trench T96, and over a larger part of the western section of the trench that led down to trench Q96. The turf in that part of the trench lay over natural, it may have developed over a long period of time. Similar post-medieval turf horizons were recorded in trench Q96 (group 6:6) and trench S96 (group 6:8). In the latter trench a number of contexts were issued to possible turf remains. Some of these deposits were localised to small areas and may have been the remains of subsoils, the overlying turf having been truncated. It is possible that there had been two successive turf horizons in trench S96. A concentration of charcoal (group 6:7) was recorded from the profile in trench S96. It lay in the top of the turf horizon (group 6:8). It is not clear what this charcoal related to.

The post-medieval turf horizon was recorded over a large part of the area north of the churchyard. In trench Q96, the turf horizon (Q3) lay over an earlier turf layer Q4 (group 4:43) that the churchyard wall (P50, group 4:25) was built upon. The wall was constructed after 1420, Q3 may therefore date back to the medieval period. It was overlain by layers that contained material related to the restoration work. It is likely that the layer had its origins in the medieval period, continued to develop and formed the ground surface through the post-medieval period. This is probably the case for most of the turf horizon in trenches T96, Q96 and S96. This relationship could only be demonstrated in trench Q96 however because of the relationship with the churchyard wall.

8.3 Group descriptions

Group 6:1
U53 U54 U55 U57 U58 U62 U63 U66 U67 U69 U70 U72 U75 U77
Group 6:1 consists of a number of make up layers of stone rubble (U53, U58, U66, U67 and U75), a stone

drain (U55 and U75), a stone wall (U70, U69 and U72) and a silt deposit U54 that represents the silting up of the drain in trench U96. Stone drain U55 was aligned ESE/WNW, it was constructed of two rows of standing stones that were laid upon a deliberate stone dump U77. U77 had a fall towards the south, it formed the base of the drain, but also spread beyond it. Two stone layers dumped to the west of the drain U53 and U58 butted the drain stones holding them in place. The uppermost stone layer U58 formed a rough, unconsolidated stone surface. It lay flush with the top of the drain and also flush with the top of stone wall U69. It had a fall from the wall (c. 133.40 m over sea level) to the drain (132.80-132.90 m over sea level.), presumably to lead water or other liquid refuse away from the building into the drain. Wall U69 was constructed of two courses of dry stone walling, it lay along the northern section with a ENE/WSW alignment. Cut U72 levelled off the top of earlier wall U71 (group 4:37) to enable the construction of U69. Only the mid section of the wall was uncovered, no return walls were visible. Wall U69 lay over the earlier wall U71 that is interpreted as a later churchyard wall. The make-up layers were necessary to build up the ground level to cover the earlier wall remains. U62 and U63 were stone dumps to the east of drain U55, they didn't extend up to the drain, but may have been truncated.

Wall U69 is interpreted as a sill wall for a timber building, the wall, drain and associated surface are presumably associated with the post medieval farm. They were not empirically dated but clearly post date the use of the churchyard.

Contexts

U53. Layer of greyish brown sandy silty clay mixed with mortar fragments, contained brick fragments. U53 butted earlier upstanding wall U71, building up the ground surface, and overlay the construction cut for contemporary wall U69. Under U58, over U55 and U70, same as U67.

U54. Fill of dark brown humus rich silt, contained mortar flecks, brick fragments occasional small stones charcoal flecks, fragments of animal bone, glass fragments and iron objects. Filled stone lined drain U55, represents the silting up of the drain. Under U51, over U55.

U55. Stone drain, consisted of medium sized stones and one large lump of mortar. Two parallel lines of upstanding stones formed the drain, the structure was not complete as some of the stones had been robbed out. A stone in the northern section may indicate that the drain had a stone capping, but no capstones were present in the excavated area. The drain wasn't laid in a cut but appeared to have been built upon localised stone dump U77 that creates a fall to facilitate drainage. As such U77 forms the base of the drain. Stone layers U53 and U55 were dumped around the drain forming a rough contemporary surface flush with the top of the drain and supported the stone lining. Under U54 and U53, over U77.

U57. Thin layer of beach gravel, dumped over stone layer U58. U58 is interpreted as a rough stone surface, U57 was probably deposited as a form of repair/consolidation. Under U65, over U58.

U58. Layer of stones of all sizes, laid to form a rough unconsolidated surface between wall U69 and drain U55. U58 lies flush with both the wall and the top of the drain, with a fall towards the drain. Under U57, over U53, same as U67.

U62. Layer of dark grey sandy silt and medium sized stones, contained occasional charcoal flecks and occasional brick fragments. The layer forms a rough stones surface, west of drain U55. U62 was only covered an area c. 1m x 1m, it was probably a repair of underlying rough surface U63. Under U65, over U63.

U63. Layer of dark grey silt and small and medium sized stones, occasional brick fragments were also present. The layer forms a rough stone surface to the west of stone lined drain U55, the layer doesn't extend up to the drain. Under U62, over U64.

U69. Stone wall, consisted of two courses of unworked limestone blocks (average size 0.30m x 0.25m x 0.10m), the stones were unbonded. The wall was aligned ENE/WSW, it lay along the northern section, 4.5m of it lay within the excavation. The wall was laid in a shallow cut U72 that truncated an older perpendicular stone wall. Cut U72 has a levelling function rather than being a foundation trench. U69 was presumably a sill wall of a timber building. Under U70, over U72.

U70. Fill of brown clay silt, contained medium sized stones, mortar flecks and occasional brick fragments. Filled cut U72, and was dumped around wall U69. Under U53, over U69.

U72. Linear cut, only the southern edge lay within the excavation. The cut contained stone wall U69 and back-fill U70. U72 was only defined where wall U69 crossed earlier perpendicular wall U71, cutting into the top of U71 to create a level surface for wall U69. U72 is not a founda-

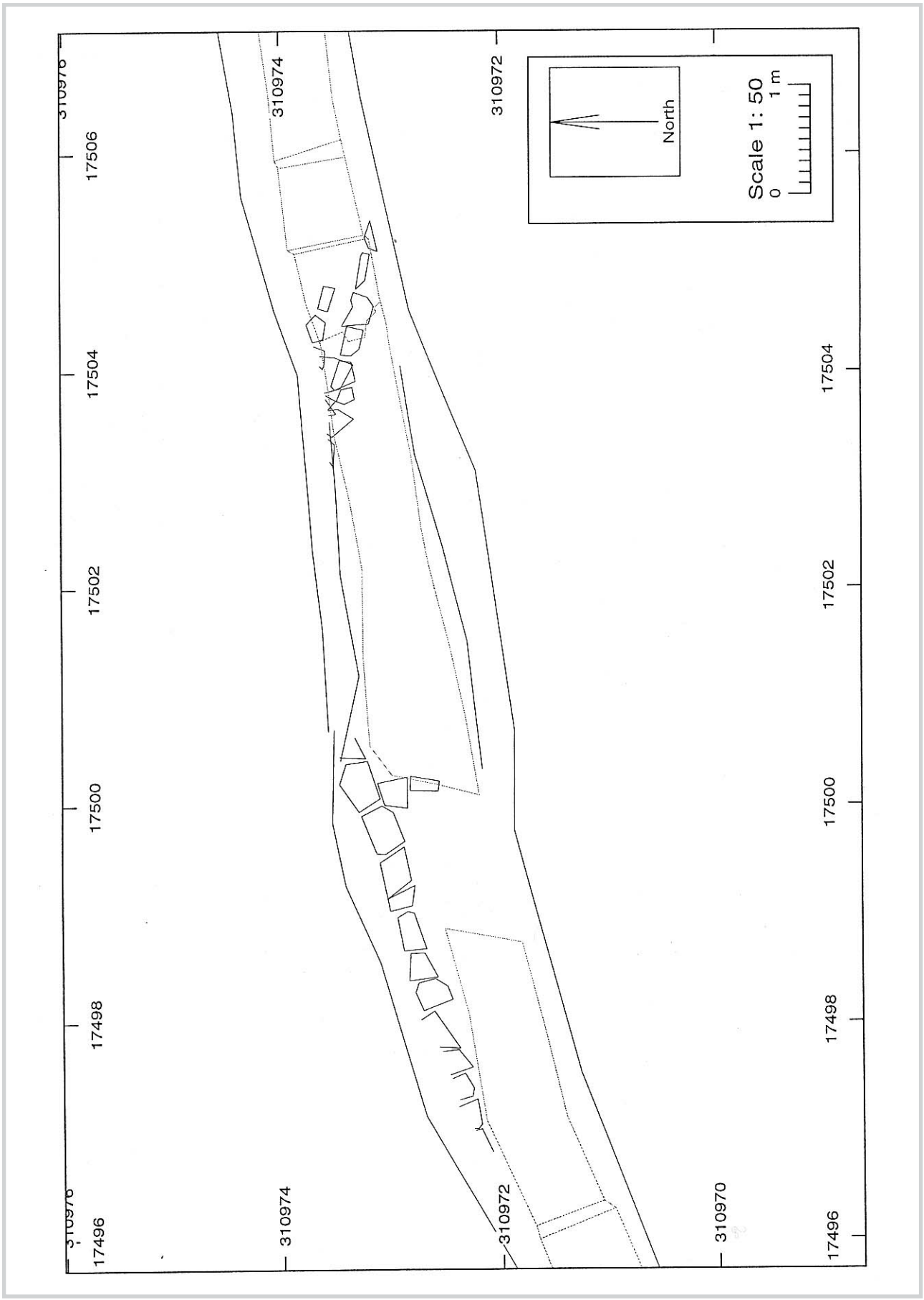


***Fig. 107**. Group 6:1, trench U96.*

tion cut merely a levelling episode. Under U69, over U52 and U75.

U75. Layer of dark brown silt and large stones, contained occasional mortar flecks. U75 lay on the west side of earlier wall U71, building up the ground level prior to the construction of wall U69, 0.40m thick. Under U72, over U92.

U77. Layer of stones of all sizes, dumped in a localised area to form a base for stone drain U55. U77 had a fall towards the south. Stone drain U55 was constructed upon U77. Under U55, over U64.

Group 6:2
U52 U64
Group 6:2 consists of two similar silt layers in trench U96 (U52 and U64) that covered most of the western half of the trench, from c. 2m west of the corner of the barn up to the churchyard wall U71. U52 butted the wall. The thickness of the two layers varied from 0.10-0.40m. At their western limit they lay at 132.83, to the east 132.55 m over sea level.

These layers clearly pre-date the structural activity interpreted as connected to the post medieval farm (group 6:1). The layers in this group contained stones and other inclusions but were also turf like. Even though U52 butted the churchyard wall, the layer was almost certainly not contemporary with the wall. These layers are interpreted as dating to the post-medieval period, representing a hiatus when there was little activity. That U52 butted the churchyard wall implies that it was a feature in the terrain, but not necessarily that it still functioned as a churchyard wall.

Contexts
U52. Layer of dark grey humus rich silt and stones of all sizes, contained mortar flecks and brick fragments. Under U72, over U64.

U64. Layer of dark greyish brown clayey silt, contained mortar fragments, brick fragments small stones, charcoal flecks and animal bone. Under U52, U63 and U77, over U73 and U88.

Group 6:3
T11 T15 T16 T39
Group 6:3 consists of four silt deposits in trench T96 (T11, T15, T16 and T39). T11 was probably the remains of a turf line that had grown over wall remains T12 (group 6:4). A ceramic fragment dated to the late 1700's was recovered from this layer. T15 and T16 were silt layers in the N/S aligned part of the trench. They were only exposed over a limited area, they may have been contemporary with T11, but may also have been contemporary with the contexts in group 6:4. T39 was a thick silt layer in the western half of trench T96. It was possibly the remains of turf that had developed over a long period, including the post medieval period. It overlay sterile clay over a large part of the trench.

Contexts
T11. Mid brown silt, contained small stones, occasional brick fragments and mortar flecks, very fine grained, possibly a buried turf line. Partially overlay stone wall T12, it was exposed over c. 5m. It was truncated to the south and extended beyond the exposed area to the north. A 0.70m x 0.70m slot was excavated through the layer, a number of iron objects and a ceramic fragment dated to the late 1700's were recovered. Many other fragments of the same ceramic were recovered from the surface of the deposit after machining, along with some modern glass, these were recorded as unstratified finds. Apart from the trial slot the layer was not excavated. Under T10, over T13.

T15. Layer of mid brown silt (c. 80%) and beach gravel fragments (c. 20%), contained small stones but no other inclusions. Under T17, over T16.

T16. Light grey gravely silt contained small stones, occasional brick fragments and mortar flecks. The layer appeared to slope down to the south. Under T15, not excavated.

T39. Extensive brown humus rich silty clay layer that covered most of the western part of the trench, contained gravel, small stones and small brick fragments. Under T47 and T48, over T38, T41 and T43.

Group 6:4
T12 T13 T14
Group 6:4 consists of a stone wall T12. The upper surface of the stones were exposed in the base of the NW/SE aligned section of trench T96. A small test slot was excavated against the western edge of the structure. A loose silt layer T13 butted the stones. The upper surface of a sandy clay layer (T14) was exposed in the base of the slot. Wall T12 appeared to have been laid upon this layer. T14 also contained stones, some of which had traces of mortar on their surface. The layer that lay over T12, T11 (group 6:3) is interpreted as a turf line that had grown over the wall indicating it was out of use. A ceramic frag-

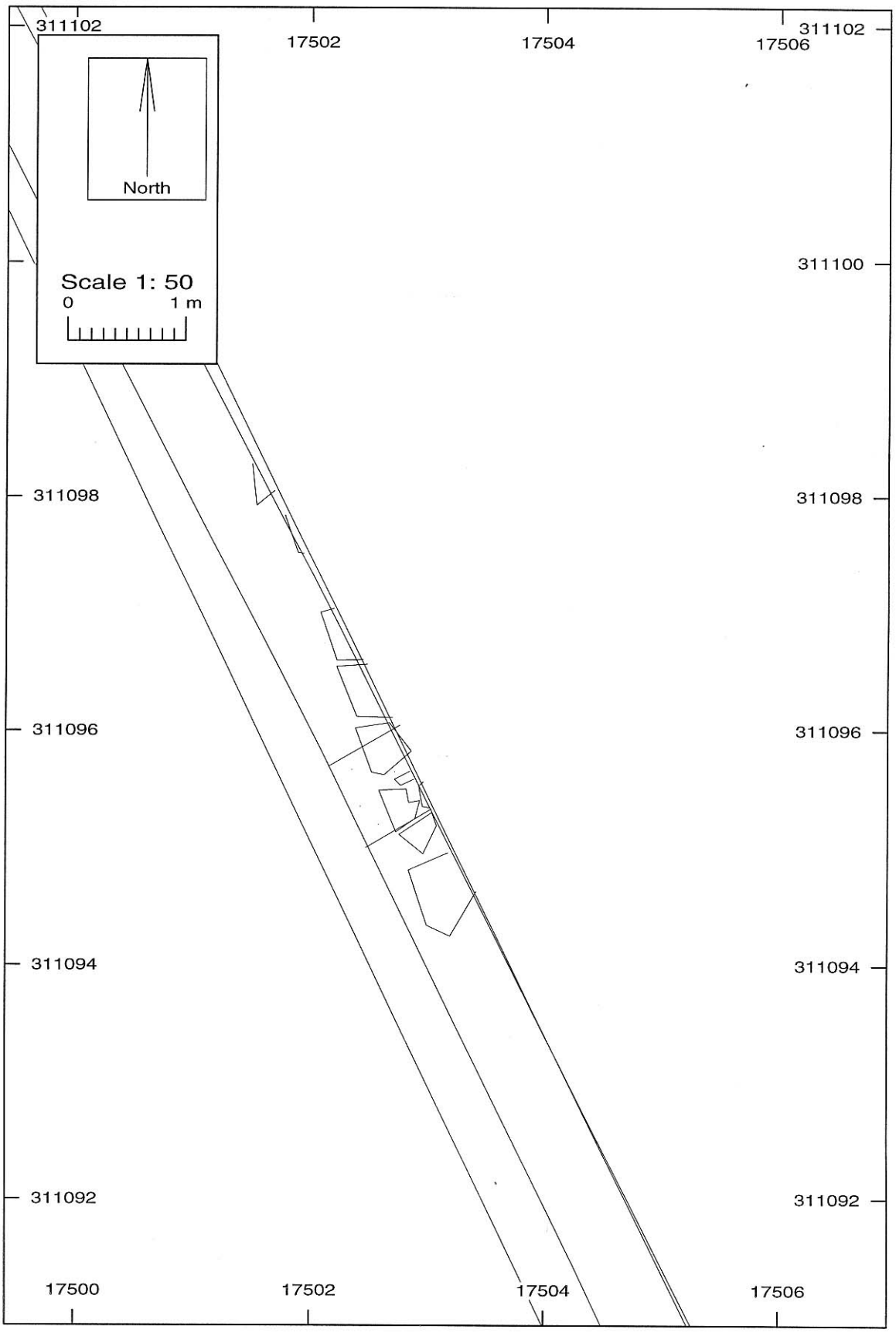


***Fig. 108**. Group 6:4, trench T96.*

ment dated to the late 1700's was recovered from T11. This evidence suggests that T12 was the remains of the sill wall of a timber building related to the post medieval farm. The layer under T14 contained stones with mortar on their surface but this layer probably represents levelling prior to the construction of the building and does not necessarily indicate that a stone building stood here. What is clear however is that despite this part of trench T96 being dominated by modern deposits there is earlier activity preserved at a lower level. The natural clay/bedrock was not exposed in this part of the trench.

Contexts

T12. Stone structure, interpreted as a sill wall, consisted of large unbonded stones, both angular and rounded laid on their long axis with flat upper surfaces. The stones varied in size from 0.40-0.60m x 0.60m, some smaller stones, 0.20m x 0.20m x 0.20m were laid where necessary to complete the upper surface of the structure. It was aligned roughly N/S and was 3.90m+ in length, it had been truncated to the north and lay outside the excavated area to the south. The structure was uncovered in the base of the trench, apart from a trial slot excavated through layer T11, only the upper surface of the structure was uncovered. The southern end of the structure was c. 0.15m lower than the northern end. Under T13, over T14.

T13. Loose layer of mid grey gravely silt, contained concentrations of small stones, both angular and rounded, brick fragments and mortar flecks. The layer butted against the western face of wall T12, only exposed in a 0.70m x 0.70m test slot dug against the wall. T13 was partially excavated. Under T11, over T12.

T14. Mixed deposit of greenish grey sandy clay (c. 80%) and small and medium sized stones, some of which had traces of mortar on their surface. Only exposed in a 0.30m x 0.30m test slot, appears to underlie stone wall T12. Under T12, not excavated.

Group 6:5

T19 T20

Group 6:5 consists of a stone and clay foundation (T19 and T20) exposed in the eastern edge of the hole dug to house a new inspection pit in trench T96. The hole was situated to the north of the barn. The structure was only present in the eastern profile, the exposed stones probably formed the NW corner of the structure. The stones were bonded with clay, no mortar was present as bonding, none of the stones had traces of mortar on their surface. The structure was laid in a cut, that was dug through the natural clay. T19 was clearly a foundation, not part of a structure that stood above ground level. Its date and function are unclear. It could not be related to any part of the medieval Bishops Residence, or to the post medieval barn. The structure may be part of an earlier farm building that preceded the barn that is standing today. But one would have expected building stones from the cathedral or Bishops Residence to have been re-used in this structure if that were the case. There was however no signs of re-used stone, no brick fragments or any other modern material used in the construction. Given the lack of dating evidence it is tentatively interpreted as a foundation related to some structure connected to the farm. The possibility that it was the foundation for a structure of medieval origin should not be discounted however.

Contexts

T19. Stone and clay structure, interpreted as a foundation, filled cut T20, none of the structure stood above the top of the cut. The structure was exposed in section only, in a separate part of trench T96 dug for a new inspection pit. The structure was present in only one of the sections, it appeared as though the exposed stonework formed the corner of the feature. It consisted of eight or nine courses of stones of varying sizes, both angular and rounded stones. A blue grey sandy clay was used as bonding in between the stones which appeared to have been laid in rough irregular courses. A c. 0.10m thick yellowish clay that contained small stones lay between the stones and the edges of the cut, the presence of this deposit also suggests that the stones were lain in courses and the gap at the sides back-filled rather than being a rubble and clay fill that was tipped into the cut. The exposed area was 1.60m wide x 1.30m deep. If it was the corner of the foundation that was exposed, then 1.60m is not the real width of the foundation. Under T1, over T20.

T20. Cut feature, filled by stone and clay foundation T19, see T19. Cut into natural clays which were partially used as back-fill/bonding. Under T19, over natural.

Group 6:6

Q3 Q49

Group 6:6 consists of a post medieval soil layer in trench Q96. Q3 was only defined in a 2m wide band against the churchyard wall to the south. Q49 is a number issued post excavation to the lower half of silt layer Q46.

Q46 covered the whole trench and was machined off. It was clear from the profile of adjoining trench S96 that Q46 consisted of two separate silt layers that belonged to two different phases of activity. Q49 was issued to the lower half of Q46, to correspond to layer S7. It is likely

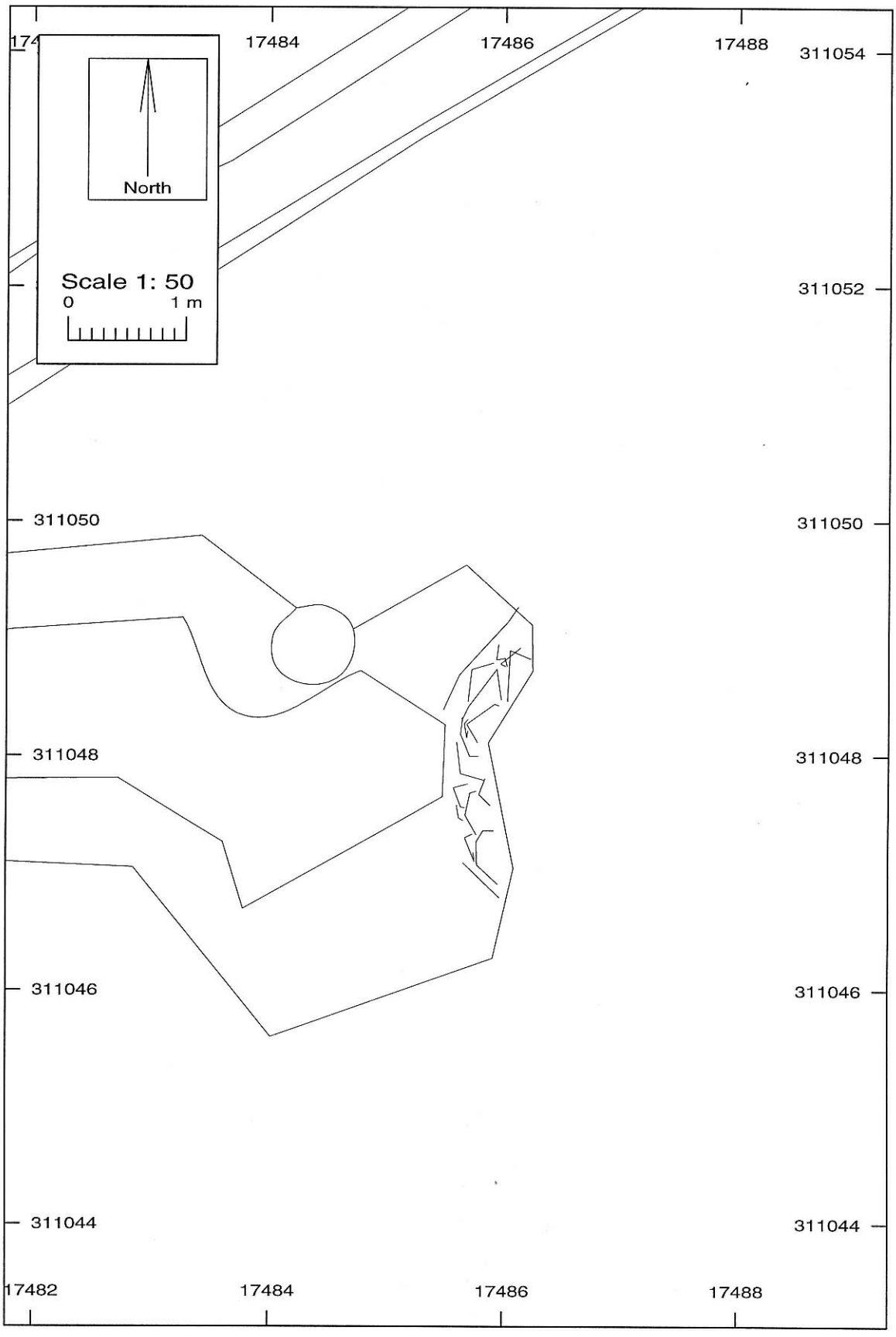


***Fig. 109**. Group 6:5, trench T96.*

that Q3 is the same as Q49, i.e. that the two silt layers were correctly defined against the churchyard wall where layers Q2, Q40 and Q45 lay between Q46 and Q3, but that Q3/Q49 was machined out over the rest of the trench as part of Q46. Q3 was excavated by hand and clearly butted the churchyard wall, the interface with underlying Q4, the layer that the wall was constructed upon, was relatively clear. The wall appears to have been constructed in the late medieval period. This group is the same as group 6:8 in S96, and is interpreted as representing a late medieval soil horizon that continued to develop during the post-medieval period.

Contexts
Q3. Dark grey, slightly humus rich gravely silt, contained occasional brick fragments and charcoal flecks. The layer was excavated by hand, it contained few inclusions and no finds to indicate its date. The layer butted the northern face of the churchyard wall. It was present across the entire E/W axis of the trench and extended c. 2m out from the churchyard wall (N/S). The layer is possibly an old turf line, but is only present along the north face of the churchyard wall.
Under Q49, over Q6, possibly the same as Q49.

Q49. Context issued during post-excavation analysis to represent the lower half of Q46. See description of Q46. Under Q2, over Q3, same as S7, possibly the same as Q3.

Group 6:7
S4 S5
Group 6:7 consists of a layer of charcoal and silt (S5), overlain by a discreet layer of silt (S4) in trench S96. S4 was only present over the charcoal. These layers were c. 3m long, they were possibly the result of charcoal burning of recent date. They were not related to charcoal burning pit S40 (group 2:40).

Contexts
S4. Mid brown fine silt contained small stones small brick fragments, mortar lumps and charcoal flecks. Only present over 3.20m of the northern section where it overlay charcoal deposit S5, the layer didn't extend beyond charcoal S5. Possibly the remains of turf lain over the charcoal. Under S2, over S5.

S5. Mixture of charcoal lumps < 0.10m, and grey brown silt, c. 50/50%, also contained occasional small stones, brick fragments and animal bone. Only present over c. 3m of the northern section where it was overlain by S4. The charcoal is concentrated in the base of the deposit but is also spread throughout. The structure of the original wood was still visible in some of the charcoal lumps. The deposit appears to lie in a shallow cut or depression, and doesn't appear to have been disturbed by ploughing. Under S4, over S6.

Group 6:8
S6 S7 S8 S10 S11 S21 S22 S23 S24 S36
Group 6:8 consists of a series of layers (S6, S7, S8, S10, S11, S21, S22, S23, S24 and S36) that were recorded in various places along the length of trench S96 in both profiles. Some were discreet layers only present over short stretches (S23 and S24), others covered most of the trench (S6 and S7). A possible open shallow cut feature (S10) was also included in this group. They were interpreted as possible old turf lines and/or subsoils. Some of these deposits may originally have been more extensive but were possibly truncated (S8, S11 and S36). If so there may be two separate phases of turf separated by a truncation event. No other activity was registered between this possible truncation event, however, and all these contexts have been grouped together. This group represents a turf horizon in trench S96 that probably spans the post medieval period and possibly also dates back into the period of use of the cathedral. Both brick fragments and burnt stones were present in these layers. The sterile deposits in S96 were not issued context numbers. They consisted of interleaved layers of gravel, deposited by Lake Mjøsa. The interface between these gravel deposits and the moraine clay was recorded within trench Q96. The upper surface of the gravel slopes gently down towards the lake. Apart from the section of the trench west of the path, down towards the beach where the beach line appears to have been built out (see group 7:21), the current terrain is a fairly good reflection of the slope of the natural ground surface. The deposits in S96 varied in thickness from 0.20 – 0.80m, and were thinnest towards the path in the west.

Contexts
S6 and S7. Light to mid brown slightly sandy silt, contained small stones, some burnt, small brick fragments, small lumps of mortar, fragments of animal bone and charcoal flecks. Documented in the field as two separate contexts with a very diffuse interface, the soil becomes lighter and the inclusions decrease down the profile. Interpreted as plough soil. There was localised intermixing with the underlying gravel. Varied in thickness from 0.10m - 0.40m Under S5, over S7, same as S23 and Q49.

S8. Dark grey silty gravel, contained occasional charcoal flecks, a few small mortar lumps and brick fragments, these are possibly intrusive. Present only in discontinuous shallow irregular depressions in the underlying natural

deposits, possibly originally a more extensive layer that was truncated and only survives within these depressions. In the southern section the deposit is < 0,20m thick and contains occasional burnt stones. Under S7, over S10.

S10. Cut of a shallow feature, recorded in the southern section only. 0.55m wide x 0,33m deep, filled by silty gravel deposit S8 that was also present in shallow depressions. S10 appears to be a cut feature with gently sloping sides and a rounded base. A few fragments of burnt limestone and brick were present in the surface of fill S8 but these may have been pressed down from above. As the feature was filled by a more extensive layer it was probably 'open'. Under S8, over natural.

S11. Dark brown mixture of humus rich silt and gravel, c. 50/50%, contained no inclusions. Fills shallow depressions in the underlying natural gravel, possibly originally a more extensive layer that was truncated and only survives within these depressions. Under S2, over natural, same as S8, S22 and S36.

S21. Layer of mid grey brown clayey gravely silt, quite humus rich, contained small stones, brick fragments and occasional mortar flecks. The layer contained few inclusions and sloped down towards the west. It appeared to be a turf layer, buried by modern dumping. Under S37, over S38.

S22. Mid grey brown silty gravel contained small stones, occasional brick fragments and mortar flecks. More extensive in the southern section, overlies natural. Under S19, over natural, same as S8, S11 and S36.

S23. Mid brown slightly humus rich gravely silt, contained small stones, occasional brick fragments and occasional charcoal flecks. Only present over 1.20m in the northern section, east of charcoal burning pit S40. Possibly an old turf line, with S24 as its subsoil. Probably the same as S6 and S7 further east, but S23 and S24 could be defined as two separate layers, unlike S6 and S7. Under S2, over S24.

S24. Grey brown silty gravel, contained small stones and occasional charcoal flecks. Only present over 0.80m in the northern section, east of charcoal burning pit S40. Possibly an old subsoil with S23 as the overlying turf line. Probably the same as S6 and S7 further east, but S23 and S24 could be defined as two separate layers, unlike S6 and S7. Under S23, over natural.

S36. Dark grey layer of gravel (c. 60%) and silt (c. 40%), contained small stones, occasional brick fragments and occasional charcoal flecks. Recorded in the northern section only, 0.80m long, truncated to the west by S14. Probably the same as S8, S11 and S22, possibly the remains of a truncated subsoil. Under S14, over S13.

Group 6:9

S17

Group 6:9 consists of S17, a rubble deposit that filled cut feature S14 (group 4:44) in trench S96. A stone and timber structure was constructed within cut S14, this structure was possibly open towards Lake Mjøsa. S17 was dumped to fill in this cut after the structure was no longer in use. S17 like the feature itself tapers off towards the lake to the west.

Contexts

S17. Mixed deposit, consisted of gravel (c. 40%), silt (c. 30%) and stones (c. 30%). The stones were within the gravel/silt matrix and varied in size from 0.10m x 0.10m x 0.10m - 0.20m x 0.20m x 0.20m, limestone, water worn stones and other lithologies were present, some of the stones were burnt. The rubble also contained some smaller stones, brick fragments, charcoal flecks and small wood fragments. The deposit butted against stone structure S16, which was built within cut S14. S17 appears to be a rubble backfilling of the cut feature, after it has gone out of use. The feature had no cut to the SW, S17 thins out to the SW. Under S21 and S39, over S18.

Group 6:10

X1 X2 X3 X4 X5 X6 X7 X9 X10 X11 X12 X13 X14

Group 6:10 consists of three cellars (X1, X3, X6, X11 and X12) and fragments of the building that stood over the cellars (X2, X4, X5, X7, X9, X10, X13, and X14). The cellars were exposed by maching. That cellars were present in this area was known from earlier accounts. A window shaft in the east wall of cellar X11 was opened by machining, access to cellars X11 and X12 was gained through this opening. The top of the cellar vaults were exposed on the surface, along with the top of a third vault (X3) and other building remains. All three cellar vaults (X3, X11 and X12) consisted of small stones set on their sides. X11 and X12 were bonded by a grey silty clay that was mixed with lumps of mortar. Vault X3 was bonded with a white mortar. The use of clay mixed with mortar is a typical bonding material for post medieval cellars in Hedmark (Tor Sæther pers. comm.). The use of mortar in X3 was at first taken to indicate that it could have been of medieval origin, it appeared however as though it was built after X11. The vault of the corridor between cellars

X11 and X12 (X1) was also exposed, this was constructed of small red bricks, laid on their sides and bonded with the same clay/mortar mixture as X11 and X12.

The cellar walls in X11 and X12 were constructed of stones of all sizes bonded with the same clay/mortar mixture as was exposed in the vaulting. The floors were covered with soil and debris, including modern material. X11 and X12 were connected by a passageway, entrance to the cellars would have been via a doorway in the north wall of X12. This had been filled in with rubble and was not exposed on the surface. An angled shaft (X6) was present in the east wall of X12, leading up to the surface. This could have functioned to allow in air and light, but was most likely constructed to load goods into the cellar. A stone bench was built into the west wall of X12. All the walls were built vertically with a concave vaulted ceiling. The west wall of X12 however was slightly convex, a possible explanation for this could be that this was the outer wall of an earlier cellar to the west. No vaulting was visible on the surface to the west however. The observed curve in the wall may have been coincidental. A doorway appeared to have been walled in in the west wall of X11, but again no evidence of another cellar to the west was visible on the surface.

Various parts of the building that stood over the cellars were uncovered. Two perpendicular walls (X5 and X7) were partially uncovered at the eastern end of the area. A E/W aligned wall (X4) was partially uncovered at the southern edge of the area. It was parallel with X5, that lay 5m to the north. Another E/W aligned wall (X9) was uncovered only 1m south of X5. Both X5 and X9 ran over the top of the cellar vaults. A N/S aligned wall (X10) ran perpendicular to these walls, parallel with X7, 6.5m further west of it. X10 lay to the west of the cellars. All of these walls were constructed of large stones and bonded with the same clay/mortar mixture used in the cellar vaults. West of X10 an E/W aligned flagstone culvert and a row of loose stones (X14) that may have formed a ground wall were partially uncovered.

Contexts

X1. Brick vault, consisted of small red bricks laid on their sides in two layers. The bricks were bonded with a grey silty clay that contained small lumps of white mortar. The top of the vault was exposed by machining.

X2. Four large stone slabs, c. 0.40m x 0.60m, laid in a N/S axis over stone wall X5.

X3. Top of a vaulted ceiling, consisted of small stones laid on their sides, bonded with a white mortar. The upper surface of the vault was exposed in a small area, 1.5m x 1.6m, at the southern edge of area X96. It was not fully exposed, it appeared to be later than vault X11, but could not be clearly related to the other structures in the area. The cellar room was not entered. A hole was made in the top of the vault during machining, the cellar appeared to have been filled in with rubble.

X4. Structure consisting of large stones, only partially uncovered at the southern edge of the excavated area. The structure appeared to be aligned E/W. Possibly a ground wall, parallel to X5.

X5. Ground wall, consisted of large stones, 0.20m x 0.20m - 0.50m x 0.50m, aligned E/W. The stones were bonded with a grey silty clay that contained small lumps of white mortar.

X6. Stone shaft into cellar room X12, consisted of flat stone slabs, 0.40m x 0.40m - 0.60m x 0.60m x 0.10m thick, bonded with a grey silty clay that contained small lumps of white mortar and brick fragments. The shaft was recorded both on the surface and within the cellar room, it was constructed at an angle giving access to the cellar, possibly for ventilation or for loading goods into the cellar.

X7. Ground wall, consisted of large stones, <0.50m x 0.50m, aligned N/S. The stones were bonded with a grey silty clay that contained small lumps of white mortar. Some of the stones were re-used ashlar masonry. X7 was perpendicular and contemporary with wall X5.

X9. Ground wall, consisted of large stones, 0.30m x 0.30m - 0.40m x 0.40m, aligned E/W. The stones were bonded with a grey silty clay that contained small lumps of white mortar. X9 was parallel with wall X5 and lay over the northern edge of cellar vault X11.

X10. Ground wall, consisted of large stones, 0.20m x 0.20m - 0.50m x 0.50m, aligned N/S. The stones were bonded with a grey silty clay that contained small lumps of white mortar. X7 was perpendicular and contemporary with wall X5. Same as X8.

X11. Vaulted cellar room, 4.5m (E/W) x 3m (N/S). The top of the vault was uncovered by machining, it consisted of small stones laid on their sides, bonded with grey silty clay. X11 appeared to be earlier than adjacent vault X3. Wall X9 was built over X11.

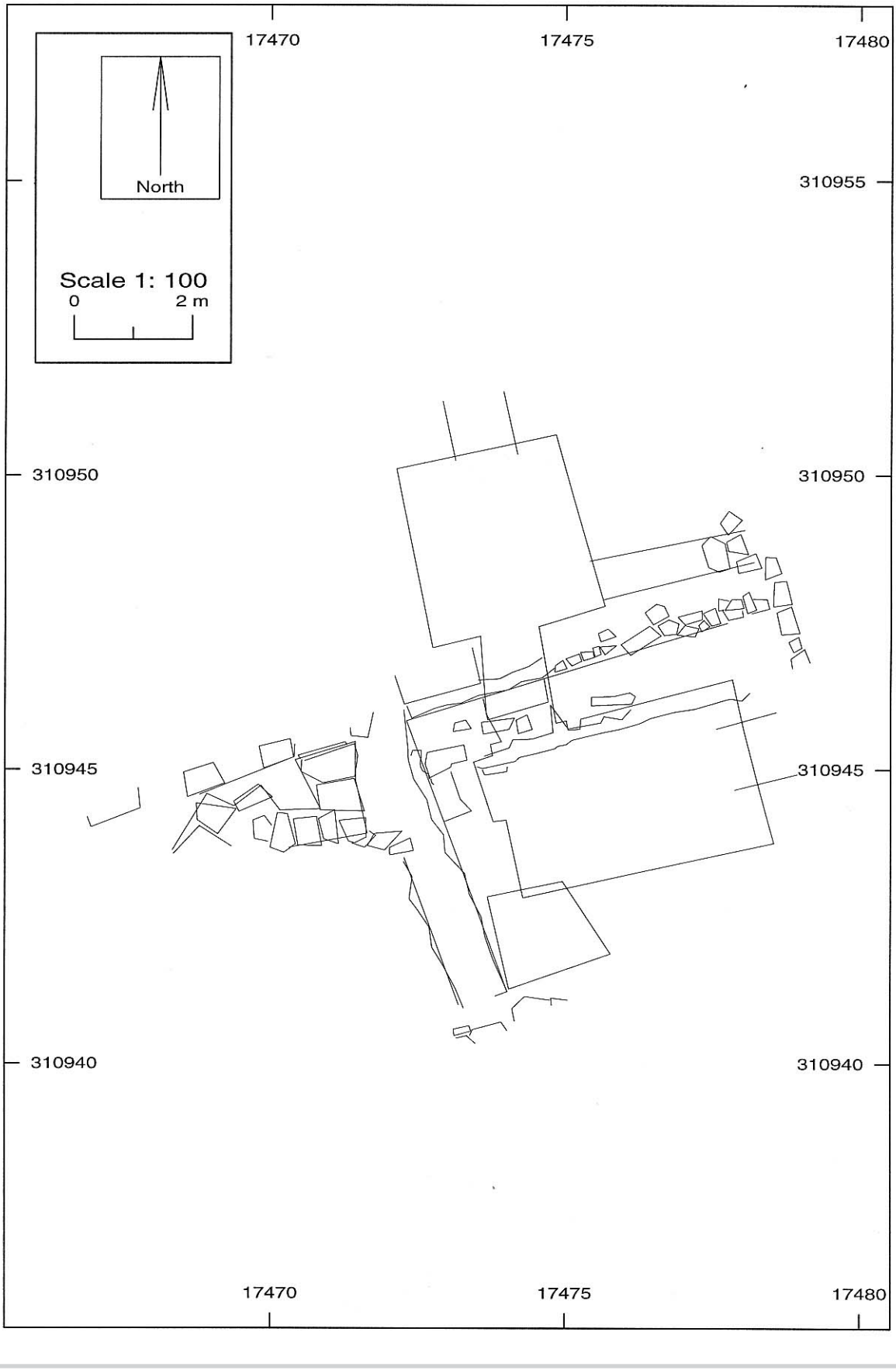


***Fig. 110**. Group 6:10, trench X96.*

X12. Vaulted cellar room, roughly 3m x 3m. A small section of the top of the vault was uncovered by machining, it consisted of small stones laid on their sides, bonded with grey silty clay.

X13. Stone culvert, consisted of large flag stones capping a stone lined shaft, 0.20m deep. The flag stones were exposed over an area of 2m x 1.5m, two stones were lifted exposing the shaft. It appeared to have an approximate E/W alignment, trending towards NE/SW at the western end of X96. The structure appeared to be bounded by wall X10 to the east, it continued outside the trench to the west. Same as X15

X14. Stone structure, consisted of large, 0.30m x 0.40m x 0.50m, unbonded rounded stones. The structure was only partially exposed along the northern edge of the trench, but may have formed an E/W aligned ground wall. X14 appeared to have been partially constructed upon X13.

Group 6:11

E9 E10 E13

Group 6:11 consists of a stone drain (E10), aligned NE/SW. The drain consisted of two parallel rows of stones, c. 0.20m high. Only 1.5m of the drain was exposed, it continued beyond the trench to both the NE and SW. It was exposed by machining and had been damaged. It appeared to be laid upon a probable turf horizon (E13), and had been filled by a silty clay deposit (E9). The feature was not dated but was similar in construction to the drain in trench U96 (group 6:1). It is unlikely to be related to the period of the churchyard and is interpreted as being related to the activity of the post medieval farm.

Contexts

E9. Fill of grey brown silty clay, contained gravel and small stones. Filled stone drain E10. Under E12, over E10.

E10. Two parallel lines of stones, aligned NE/SW. The NW edge had been disturbed by machining. The feature appeared to be a drain, it was 0.50m wide and 1.50m+ long, it continued beyond the trench to both the NE and SW. It consisted of stones 0.30m - 0.35m long, 0.20m high, these were laid upon layer E13, not laid in cut. Under E9, over E13.

E13. Layer of grey brown humus rich silt. The layer was partially exposed in the base of the trench, the layer was not excavated. Stone drain E10 was laid upon this layer. Under E10, not excavated.

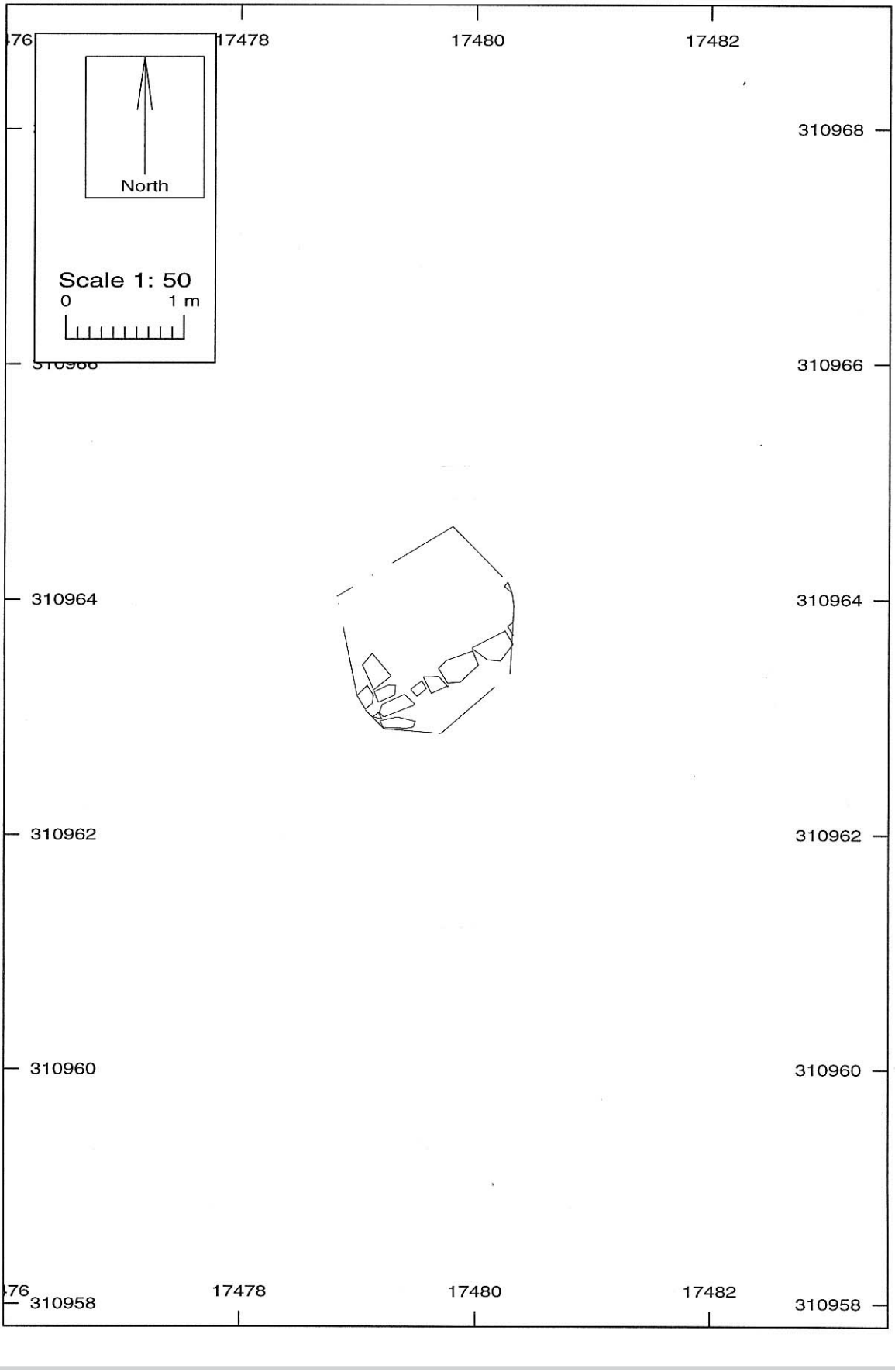


***Fig. 111**. Group 6:11, trench E96-3.*

9 Period 7: 1840/50-1996

9.1 Period 7 summary

9.1.1 Period 7 dating

None of the deposits in period 7 were empirically dated, but some showed clear signs of being modern in origin. Several of the structures inside the ruin were cement bonded indicating that they have been at least partially reconstructed. The steps into the west front (group 7:16) contained modern glass and other material. Some of this was probably intrusive, but not all of it.

The beginning of this period is set at 1840/50 as the clearance work inside the ruin probably began in the 1840's. The cellars in period 6, probably didn't go out of use until 1850, therefore the boundary has two dates. The end of this period is set at the beginning of NIKU's excavations. This date coincides with the beginning of the construction of the protective structure.

9.1.2 Period 7 interpretation

Inside the ruin there was evidence of some reconstruction of several features. All the altar foundations were cement bonded. Four of these appeared to have been built upon layers of broken up brick and mortar fragments. These were interpreted as being stone reconstructions of mortar and brick originals. Photographic evidence of one of these altar foundations, the least convincing example of this occurrence, suggests that the stone altar foundation may be original. All the other altar foundations appeared to be built upon stone originals. In some cases the originals and reconstructions were of slightly different dimensions. Several of the column bases in the north arcade also appeared to have been partially reconstructed. In one case a layer of silt lay between the reconstruction and the remains of the original column (see group 7:3).

The southern wall of the south aisle appeared to be a reconstruction, this was observed at both the SW corner and at the eastern end of the aisle. The outside face of the corner where the walls of the north aisle and north transept met was investigated. The standing masonry here was reconstructed. A layer of silt partially lay between the original walls and the reconstructions. The north aisle wall consisted of two phases of reconstruction. The north transept wall was reconstructed at the wrong angle. This wall was probably just re-faced, i.e. the core of the wall is original. The southern wall of the south transept is also a reconstruction.

It was not certain that all the structural features placed in period 7 were completely reconstructed. Some appeared to be, but others may consist of the original stonework repointed with cement.

The steps into the west front were also a modern, cement bonded, reconstruction. There was evidence of a truncation event, probably at the end of the medieval period, that removed the original steps. Whether the steps were replaced in the late medieval period and restored/rebuilt after the demolition deposits were cleared or whether they were never rebuilt and the steps excavated here laid as part of the restoration of the cathedral is unclear. A newspaper report on the work undertaken in 1884-5 appears to indicate that the step into the cathedral, i.e. the threshold, was uncovered then, steps in the plural are not mentioned ("… og den gamle Indganstrappe ligger fri." See Pedersen R. 1999:66). The plans drawn by Didriksen in 1886 and Nordhagen in 1903 both show steps into the western entrance. In each case the steps are drawn differently, neither of these correspond with the steps excavated in 1996. The early surveys probably represent the steps schematically. Extensive restoration work was undertaken around the west front with new ashlar masonry in 1884-5 (see Pedersen, R. 1999:74). It is likely that the steps were also built then.

Several episodes of excavation were also registered inside the ruin. The grave chamber that lay between the columns of the north arcade was opened and a triple grave in the crossing was also partially disturbed. Another grave that lay on the surface over the triple grave was probably completely removed. A further grave in the crossing appears to have been investigated but not disturbed. This digging may simply have removed the grave slab without cutting into the grave. Graves at the eastern end of the south aisle were opened, up to six separate graves may have been disturbed. A similar situation was recorded in the north aisle, but the disturbance there was more amorphous. It may have been related to the investigation of graves, but was probably caused by several, possibly unconnected factors. The grave chamber and the triple grave were excavated during this project. The disturbances in the aisles was defined on the surface, but not investigated further. In the aisles the degree of disturbance is unclear. Digging also appears to have been undertaken at the western ends

of both aisles, in the rooms under the western towers. The demolition deposits that were dug through were re-deposited in these areas after the digging was complete. The SW tower room was partially excavated, the digging there was 0.30m - 0.40m deep. The degree of disturbance in the NW tower room is unclear. The south transept appears to have been totally excavated and the burnt debris that was dug through re-deposited in the area. Other smallscale digging connected to restoration work, post holes and other investigations was also registered in the aisles, crossing and north transept.

Outside the cathedral, around the NW corner and the west front, demolition deposits had been re-deposited after the initial clearance, building up the ground level. Even though the terrain was built out during the medieval period, the slope of the natural terrain at the NW corner was further reduced and levelled of by the dumping of demolition deposits in the modern period. Dumping of demolition deposits was also registered in trench S96, building out the beach line of Lake Mjøsa. Rubble dumping, not demolition deposits, was registered at the eastern end of trench T96. This was in all probability connected to the infilling of marshy ground.

Outside the chancel, in trench B96-4 the ground level appeared to have been sunk below the level of the medieval ground surface. Graves were probably removed. The layers dumped here in the modern period contained medieval window glass, iron objects and disarticulated human bone.

9.2 Period 7 discussion

Inside the ruin a number of the structural elements appeared to have been either partially or wholly reconstructed. In addition a number of intrusions were recorded. Postholes were recorded in the SW (group 7:1) and SE (group 7:2) ends of the south aisle and in the SW corner of the crossing (group 7:5). In the SW corner three postholes were present, in the other two areas only two were recorded. Two of those in the SW corner and the two in the crossing were excavated. They varied in depth from 0.35m - 0.50m, none had any post packing. Those in the SE corner were not excavated, it was not certain that they were postholes. These features lay close to the standing masonry and are interpreted as being from scaffolding erected during restoration work. No postholes were recorded in the north aisle where the masonry didn't survive to any height. Two cut features (group 7:2) were recorded alongside the easternmost freestanding column in the south arcade and the respond that connected the arcade to the SW central tower base. These were not excavated. In each case cement had been applied to the masonry over the area where the cuts were registered. These cuts are interpreted as being related to repairs to the standing masonry and foundations.

Two large cuts were recorded in the SW tower room (group 7:1). One of which (R331) was dug right up against the western wall and truncated the upper deposits over all but the easternmost 1.50m of the room. A large intrusion (R186, group 7:2) was registered in the centre of the area uncovered at the eastern end of the south aisle. The shape of this feature suggests that it is the result of the opening of graves that were visible in the floor. The shape of the cut suggests as many as six graves may have been disturbed. The fill (R160) spilled out over the edge of the cut, it was partially removed to better define the area of the intrusion. It is possible that this intrusion is the result of several localised cuts, but it appeared as though R160 was one mixed fill.

A similar situation was documented in the north aisle, mixed layer R23 (group 7:3) was documented over a large part of the middle of the north aisle. It was present in several areas, all of which were amorphous. In some places part of R23 was removed as part of the cleaning of the area after the turf was removed. The edges of R23 were diffuse, no clear cuts were definable. The excavation in the aisle stopped at an arbitrary level determined by the height of the new floor, it was not possible to investigate R23 further. It is unclear whether R23 was the fill of several separate cut features or whether it filled depressions in the underlying deposits. It is so amorphous that it is probably a result of both factors. If this is the case, in-situ floor deposits may be preserved in some places under R23. Photos and drawings of the ruin show that the east end of the north wall of the aisle had been levelled to ground level. If this area was used as an 'entrance' to the ruin, it is possible that R23, in part, 'fills' a depression in the floor caused by erosion of the fragmentary floor deposits. If it had been excavated it is likely that R23 would have been divided up into several contexts. R23 is probably the result of several separate disturbances.

At the west end of the north aisle mortar (R85) and charcoal (R36) layers (group 7:39) covered the area under the SE tower. It is possible that these were in-situ demolition/fire deposits, but this is unlikely. R85 was similar to R153, the fill of the cut in the SW tower room. These layers are interpreted as demolition deposits re-deposited after an antiquarian investigation. Given the documentary references to a crypt at the west end (see 4.1.2 Period 4

summary) it is unlikely that this area would have escaped investigation.

The grave chamber in the north arcade (group 4:6) was emptied. The cut R232 (group 7:3) extended up to all four walls, none of the original fill lay in-situ. Remains of two coffins were in-situ in the case and some bones form a child burial lay in-situ (see group 4:6). A concentration of bones from an adult female (R227) were recovered from the fill R94. Whether it was emptied as a result of an antiquarian investigation or as robbing is unclear. Nicolaysen, writing in 1893 identified the chamber and the grave in the crossing as already emptied (Nicolaysen 1893:20).

The position of the grave in the crossing drawn by Nicolaysen, corresponds with part of robber cut/antiquarian investigation R71 (group 7:5). Stone slabs R424 were laid in the top of part of fill R72, marking the grave/excavation. Whereas Nicolaysen clearly drew a single grave, the robbing activity and the slabs covered a larger area. R71 cut down into an earlier triple grave (group 2:15). This grave was partially sealed by mortar surface R169 (group 2:12), that contained a coin dated to 1220 – 1260. The backfill of the robber cut R71 contained a seal stamp associated with Thorodd Thorsteinsson who is known to have been alive in 1346. The triple grave would not have been visible on the surface of the tile floor, the seal stamp is interpreted as belonging to an individual that was interred in the grave that Nicolaysen drew. Cut R71 extends up to the threshold stone at the crossing's boundary with the nave, here it is the width of a single grave. To the east it opens out and becomes deeper. It appears as though the digging began with the single grave that was visible on the surface, that contained the burial of Thorodd, and then continued down into the earlier triple grave. The later grave was completely removed, whereas the earlier burials were only partially disturbed. Whether the seal stamp was deliberately returned to the fill or simply not seen is unclear. That Nicolaysen drew a single, opened grave indicates that there may have been two stages of digging here. The bones of Throrodd may have been removed by the first excavation.

A second grave in the crossing also appears to have been investigated, but only on the surface. Shallow cut R142 (group 7:5) cut down onto grave R244 (group 4:9). R142 was wider than the grave, it may have cut into the top of the grave fill, but the burial was not disturbed. The fill (R143) contained brick and mortar fragments. These may have been part of a brick and mortar grave covering, or base for a grave slab. If so cut R142 may have removed the grave slab.

A linear E/W aligned cut was also recorded in the crossing (R133, group 7:5). It lay along the southern side of the NW tower base and continued along the southern side of threshold R60 (group 3:2). The cut could not be connected to any repair work as the cuts in group 7:2 in the SE corner of the south aisle could. It is interpreted as an antiquarian investigation of the tower foundation.

A series of discreet layers and spreads, primarily of mortar and tile fragments, and two small cut features were recorded in the north transept (group 7:4). These are interpreted as waste from digging, possibly from the excavation undertaken in the 1970's.

In the south transept a series of layers that consisted primarily of charcoal and silt, and three cut features were uncovered (group 7:6). The most extensive layer, R296 was recorded in one place as 0.25m thick. R296 lay over a collection of medieval bricks R302 that lay upon a mortar surface. The bricks were uncovered in the SE corner of the transept. They were not bonded to the mortar, they had been placed upon it. There were traces of mortar on the upper side of the bricks. They were clearly re-deposited. The mortar layer may have been in-situ, but it was not fully uncovered. A cut R271 was defined along the inside of the southern wall (R286) and partly along the western wall. The wall is a reconstruction. R271 was a construction cut for the reconstruction. The charcoal and silt deposits were not in-situ fire deposits. They were clearly re-deposited, presumably the transept has been excavated and the excavated material re-deposited in the area. That there were cut features dug through the silt indicates digging in the area after it was excavated.

Other sections of walling appeared to have been reconstructed. The southern wall of the south aisle consisted of a single course of cement bonded stones. It was recorded in both the SW (group 7:1) and SE (group 7:2) corners of the south aisle. In the SW corner the wall had been built upon a levelling dump of demolition deposits. In the SE corner a cut for the reconstruction (R213) could be defined on the surface. It cut through the beach gravel bedding for the tile floor (group 4:3), clearly indicating that the wall was a reconstruction. A short wall (R215, group 7:2) ran between the south aisle and south transept, covering the threshold. This wall was cement bonded, it hung over the beach gravel (group 4:3) layer to the south, it was clearly built after the floor layers had been laid. It may have been constructed after the cathedral was out of use and later given a cement bonding, or may be a modern reconstruction. Why it was constructed is unclear, the original threshold could be glimpsed beneath R215.

Two altar foundations in the SE corner (group 7:2), three in the north aisle (group 7:3) and two in the crossing (group 7:5) are interpreted as being reconstructions. All were built upon the remains of the originals. It appeared as though, in each case, a single course of cement bonded stones had been laid over the original altar foundation. It is possible however that in some cases these stones may have lain in-situ and been re-bonded with cement. The altar foundations that lay against the easternmost responds in both the north and south aisle, and the two altar foundations and the step into the chancel in the crossing were all built upon layers of broken up brick and mortar fragments. These were interpreted in the field as being the remains of original brick and mortar altar foundations that had been replaced with stone reconstructions. Photographic evidence, possibly dating from 1850 (see Pedersen, R. 1998:132), shows a stone altar foundation against the respond in the south aisle, implying that the stone altar foundation R189 may have been original. The step into the chancel (R261, group 7:5) was also cement bonded and laid upon broken up mortar and brick layer R247. Given the possibility that R189 was an original stone altar foundation, there is some doubt as to whether R97, R260, R261 and R263 replaced brick and mortar originals or not. If they did not then the rubble layer that they all lay upon has no clear explanation.

Three of the columns in the north aisle appeared to have been reconstructed (group 7:3), at least partially. The fourth, R427 (group 2:7) was also probably partially reconstructed, but is grouped with the original elements. R111 should probably also have been grouped with the original elements. It had been partially rebuilt with cement, but probably consisted of the original stones. R90 appeared to be a reconstruction, simply marking the position of the original arch base, it is unlikely that it consisted of the original stones. R95 was built upon the remains of the original column R96 (group 2:7). A layer of silt separated the original from the reconstruction. Both R90 and R95 consisted entirely of cementbonded stones. Against the western wall a profiled stone (R91) was also a reconstruction. It marked the position of the original respond, it was not bonded with the wall but simply rested against it.

In a small trench outside the cathedral, at the corner between the north aisle and north transept, the foundations and the base of the two walls were uncovered. Two phases of reconstruction (group 7:4) and one of original (2:10) masonry were apparent for each wall. The wall of the north aisle consisted of flat roughly worked stones (V10), overlain by a profiled base and ashlar masonry (V7). The north transept consisted of two phases of rough stone walling (V6 and V9), with stones of all sizes. No ashlar masonry was present. These two could be divided into an upper (V6) and lower (V9) phase by a visible shift in the masonry and by their relationship to the wall of the north aisle. Two contexts were issued in the field, but it is possible that the wall of the north transept was re-constructed in one action. The lower course of the north transept wall (V9) butted V10, indicating that the wall of the north aisle had been reconstructed first. At the upper course however V7 of the north aisle butted V6, indicating that the transept wall was completely reconstructed before the profiled base and ashlar masonry were added to the north aisle. A layer of silt (V2) extended in between V10 and V9 and the original masonry of each wall (group 2:10). The reconstructed transept wall doesn't form a right angle with the wall of the north aisle. The original wall V4 does however (see group 2:10). The reconstruction is therefore not a representation of the original wall's alignment. A possible explanation for this is that V10, the lower course of the wall of the north aisle may have been built slightly too far to the east. Silt layer V2 covered the orignal transept wall. V9 was built upon V2 clearly indicating that the original was not uncovered when the reconstruction of the transept wall took place. As the original wall was not uncovered, the end of wall V10 may have been taken to represent the corner. This point was then connected to the real NW corner of the north transept. It is likely that the only facing of the transept wall was reconstructed, the core of the wall is assumed to be original.

The upper part of two buttresses west of the Bishops Foundation in trench M96-15 appeared to have been rebuilt (M195 and M197, group 7:9). They lay directly upon the remains of the original buttresses (group 4:13). M197 was not as wide as the original buttress (M198).

The churchyard wall in trench P96 had been rebuilt twice on its inner, southern face. The churchyard wall along the northern and eastern sides of the churchyard appeared to have been reconstructed. Where the wall was excavated in trench P96 however, the outer, northern edge of the wall consisted of stones from the late medieval wall (P48, group 4:25), but the core and inner, southern edge were reconstructions. The inside face of the medieval wall had collapsed or been torn down, and repaired twice. The earliest of these two repairs (group 7:15) consisted of mortar bonded stones (P30) and a mortar and stone core (P29). The yellow mortar was poor quality and very friable. The overlying wall repair P27 was a dry stone construction with a silt and stone core (P28). A cut (P61, group 7:14) had been dug along the inside, southern face of the wall to facilitate one of these repairs, most likely the latter (P27). It is possible that P30/P29 was late medieval in origin, but the underlying wall (P48,

group 4:25) was constructed after 1420. Both P30, and the overlying P27 lay to the north of the medieval wall reducing the width of the wall by 0.20m.

The steps into the west front were excavated in trench D96 (group 7:16). They were constructed as a series of stone boxes with stone and silt cores, each box smaller than the next creating four steps. A fifth 'box' (D3 and D4) lay under step D1 acting as a foundation. Flagstones D65 had been laid in front of the steps. Modern material was recovered from between the stones and within the core of the steps. Some of this may be intrusive, but D4, the core of step D3, also contained modern material. This step was not exposed on the surface. The material cannot therefore be intrusive. The step D3 was also cement bonded. D11, that lay against the steps on their southern side, contained nails and slag. Nails and slag were also recovered from some of the cores of the steps. Similar finds were also recovered from the turf inside the ruin.

The 1992 excavations interpreted the steps as constructed in the medieval period, after 1450. They appeared to be a modern reconstruction however. The 1992 interpretation was based on the observation that they were cut through a charcoal layer that was radiocarbon dated and assumed to be an in-situ fire layer. This layer was uncovered in trench H96-14, south of the steps. H97 lay between re-deposited demolition deposits and the top of graves that had clearly been truncated. This truncation most likely occurred when the demolition deposits were cleared from the west front. If this is the case then the layers above this truncation event, including the charcoal horizon are therefore re-deposited. The original steps are assumed to have been removed (see 4.2 Period 2 discussion).

A thick layer of re-deposited demolition deposits was recorded around the NW corner and along the west front. It was present in trenches J96-3 and 4 (group 7:11), P96 (group 7:14), J96-8 (group 7:13) and H96-14 (group 7:17). It was machined off in trench J96-6 and not recorded. It was not present in trench D96. It was therefore dumped after the steps were constructed. The layer varied in thickness from 0.30m – 0.75m. It consisted of loose mortar, brick fragments and stones of sizes. The layer had probably been sorted prior to deposition.

A silt layer was present under the turf in trenches J96-1 - 4 (group 7:10) and J96-8 (group 7:12). In trench M96-7 - 10 at the NE corner of the churchyard a series of silt, clay and stone layers were uncovered, many contained animal bone fragments (group 7:8). These layers may be refuse from the post medieval farm. If so they should have been placed in period 6. In trench M96-11 - 15 and BF96 modern silt layers also lay under the turf (group 7:8). A modern foundation of unknown function was recorded from the profile of this trench.

In B96-4 the silt layers that lay under the turf (group 7:7) contained demolition material, window glass fragments, iron objects and disarticulated human bone. The top of the turf lay c. 0.70m under the level of the interface between the chancel wall's foundation and the profiled base of the wall. The medieval ground surface is assumed to have lain flush with the top of the foundation. This would imply that the uppermost 0.70m of the churchyard had been removed, probably when the demolition deposits were cleared. The material in these layers, the window glass and disarticulated human bone are assumed to have been re-deposited from the deposits that were removed.

Modern activity was also recorded outside the churchyard. In trench U96 (group 7:18), modern deposits had been dumped along the edge of the barn, a number of modern intrusions were also registered in this area. In trench T96 a series of modern rubble deposits were dumped at the eastern end of the trench (group 7:19). These deposits continued beneath the base of the trench. They were probably dumped to fill in the marshy ground at the edge of the pond that is known to have lain to the east, under the museum parking lot. These deposits can be taken as roughly marking the western limit of the marshy ground. Several modern intrusions were also recorded in trench T96. A large stone structure was uncovered at the northern limit of the NW/SE section of the trench. An iron pipe lay beneath the structure indicating that it was modern. Its function is unknown.

In trench Q96 a series of re-deposited demolition layers lay against the outside face of the churchyard wall (group 7:20). These deposits were localised to outside he churchyard wall and were not present across the trench. At the western end of trench S96 (group 7:21) demolition deposits, presumably from the cathedral, had been dumped towards Lake Mjøsa effectively building out the beach line by several metres.

9.3 Group descriptions

Group 7:1
R153 R325 R327 R329 R331 R332 R333 R361 R364 R378 R401 R405 R406 R425 R426
Group 7:1 consists of turf horizon R401 that covered the whole of the SW corner of the south aisle and other mod-

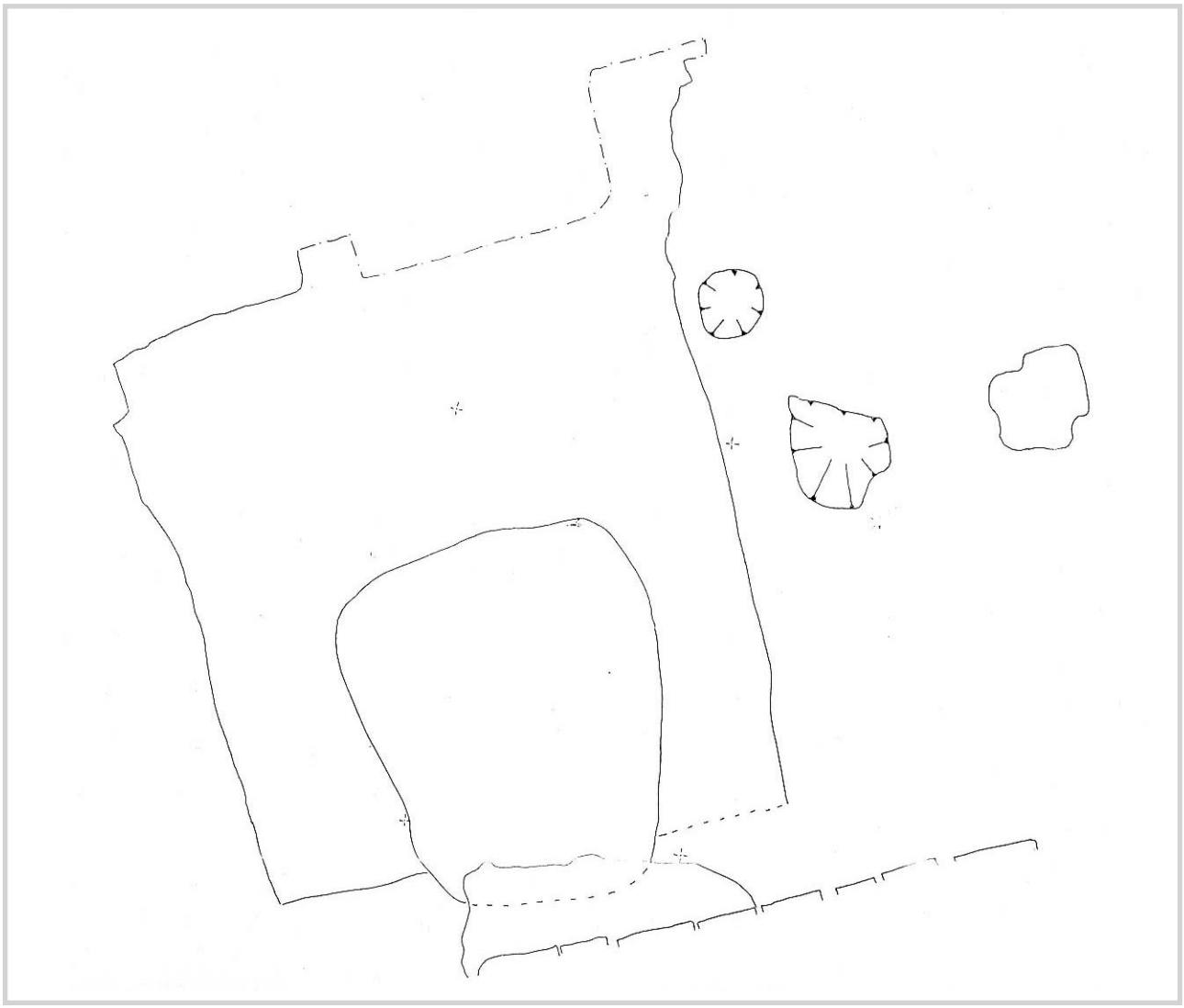


***Fig. 112**. Group 7:1, area R96, south aisle.*

ern/antiquarian activity in this area. Three post holes (R326, R327, R329, R405, R406, R425 and R426) were recorded. Two cut through the medieval deposits in the SW corner and were probably related to reconstruction work. The third (R425 and R426) cut through brick floor (R178, group 2:3). This feature was not excavated. It is possible it was not a posthole, but that it was formed by a large falling stone puncturing the floor deposits. It is considered to be a posthole however, associated with R327 and R405. Two cut features, (R153, R331, R361, R332 and R333) were also recorded in the SW corner tower room. R331 was the number issued to a cut that was assumed to cover all but the easternmost 1.50m of the room. The feature's western edge was clearly defined, to the north south and west however it appeared to extend right up to the standing masonry. The uppermost fill (R153) lay flush with the top of the medieval layer (R140, group 4:1) that the feature cut through. If the level of R140 reflects the original top of the medieval deposits in he SW tower room then R331 must have truncated the uppermost 0.30-0.40m. Cut R332 was recorded roughly in the centre of the room. It was only partially excavated. The feature was c. 0.25m deep, it cut through the fills of R331. It was difficult to define and may not have been a separate feature just a mixed fill within cut R331.

Part of the southern wall of the cathedral, R364, appeared to be a reconstruction. It consisted of a single course of cementbonded stones and was built upon demolition deposit R378. The demolition deposit may have been deliberately dumped here as levelling prior to the construction of R364. The wall R364 was slightly curved and connected two sections of extant medieval walling, R384 to the west, R366 to the east (group 2:1). Why the original walling had been removed in this area is unknown.

Contexts

R153. Fill of white mortar and stones of all sizes, contained brick fragments and charcoal flecks. Some of the

stones were worked, some had traces of mortar on their surface. Under R332, over R361.

R326. Fill of dark brown sandy silt, contained small stones and brick fragments. Filled posthole cut R327 it was back-fill deposited after the post was removed. Under R141, over R329.

R327. Cut of a posthole, 0.75m in diameter, 0.35m deep, the sides were cut at a near vertical angle rounding to a flat base. Under R329, over R140.

R329. Possible stone packing to post hole R327. Excavated as such, but the stones may have been part of layer R347. Under R326, over R327.

R331. Cut feature, only partially excavated. The eastern edge was linear, aligned N/S and easily defined, the feature's limits to the north, south and west were not clear, it is likely that the cut extended up to the cathedral walls on these sides. Where excavated the cut was c. 0.40m deep, it truncated the upper medieval deposits. Under R361, over R140 and R387.

R332. Cut of an oval feature, only partially excavated. The western edge was relatively clear but the rest of the feature was difficult to define, R332 appeared to cut into an older feature, which further complicated definition of the cut. 2.50m long N/S x 2m wide, 0.20-0.30m deep. Under R333, over R153.

R333. Fill of brown silt, crushed mortar, stones of all sizes, brick fragments and modern glass. Fills cut R332.

R361. Fill of grey sandy silt, contained mortar and brick flecks. R361 was deposited in the base of cut R331, it may represent silting in the base of the feature. Under R153, over R331.

R364. Section of the southern cathedral wall, interpreted as a reconstruction. 1.50m wide, one course deep, ranging from 0.15m - 0.30m thick. The wall appears to be slightly curved connecting two sections of original walling R384 to the west with R366 to the east. The upper surface was bonded with cement, the walling was constructed, at least partially, over the top of demolition deposit R378. Under R141, over R378.

R378. Layer of brown silt, crushed mortar and stones of all sizes, the stones were within a mixed silt/mortar matrix. Some concentrations of silt and mortar were also present. The layer also contained large brick and tile fragments. R378 was very similar to fill R333, but with a greater incidence of brick and stone. Reconstructed wall R364 was constructed partially upon R378, the brick and stone concentration may have been dumped here to act as a kind of levelling/foundation. Under R364, over R384.

R401. Turf, contained modern nails and glass. Over R326, R333, R364, R372, R383 and R406.

R405. Cut of a posthole, 0.50m in diameter, 0.50m deep. The sides were cut at a steep angle rounding to a flat base. Under R141, over R405.

R406. Fill of brown silt, contained stones, brick fragments, mortar flecks and charcoal flecks. Fills post hole cut R405, it was back-fill after the post was removed. Under R401, over R405.

R425. Cut of probable posthole, sub-circular, 0.70m in diameter. The feature was not excavated, it appeared to cut through brick floor R178. Under R426, over R178.

R426. Fill of brown silt and large stones. Fills probable posthole cut R425, not excavated.

Group 7:2

R160 R180 R181 R182 R183 R184 R185 R186 R187 R189 R209 R210 R211 R213 R214 R215 R216

Group 7:2 consists of modern/antiquarian activity in the SE corner of the south aisle. Turf covered the whole area except where stone structures were upstanding. Two cuts along the southern edge of the easternmost respond and the column base immediately to the west in the south arcade, (R182, R183, R210 and R211) respectively, were documented. These are interpreted as being connected to repair work on the fabric of the columns. The fill of the easternmost, R210 contained cement fragments, the surfaces of the columns had been restored with cement in the areas where the cuts lay. Two unexcavated circular cut features (R180, R181, R184 and R185), were possibly postholes connected to reconstruction work on the fabric of the cathedral. Two reconstructed altar foundations R187 and R189 were also documented, both consisted of a single layer of large stones bonded with cement, positioned on the western side of the column bases. In each case the remains of an older structure were visible under the reconstruction. The westernmost, R187 was built upon the original stone/mortar altar foundation R179 (group 2:3), whereas the easternmost, R189 was built upon broken up mortar surface R193 (group 4:4). Cement bonded stone altar reconstructions overlying mortar surfaces similar to R193, were recorded west of the corre-

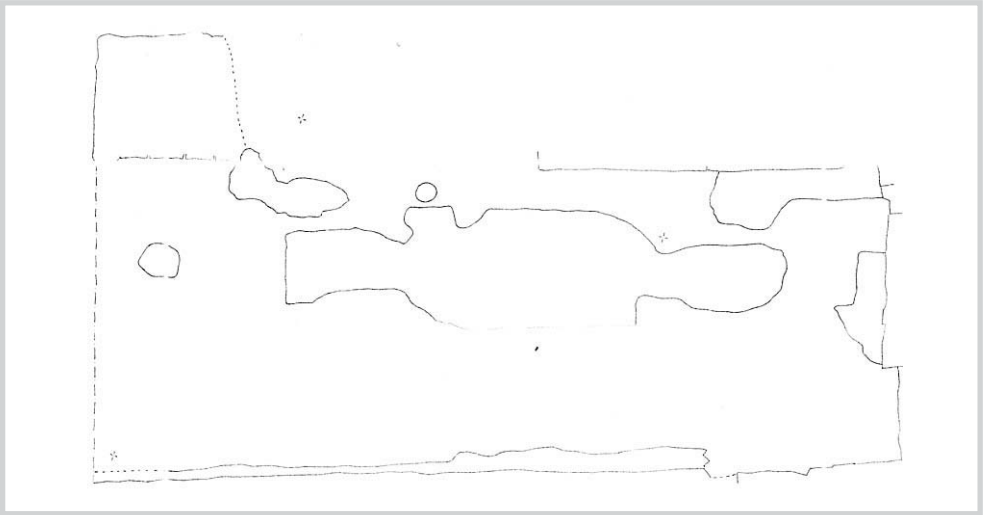


***Fig. 113**. Group 7:2, area R96, south aisle.*

sponding column base in the north aisle, R97 (group 4:4), and west of the entrance to the chancel, on both the north and south sides of the portal, (see 6.1.2 Period 4 summary). These were unlike the other altar foundations that overlay stone structures. These four may have replaced altar foundations in brick, the mortar layers being bedding for the bricks.

Two reconstructed stone walls were also documented, the southern wall of the cathedral, R216, that lay in cut R213 with back-fill R214, and N/S aligned short wall, R215, than ran from R216 in the south to the column base in the north, blocking the entrance from the south aisle into the south transept. R213 appeared to be a form of construction cut for the reconstructed wall R216. Extant medieval masonry at the eastern end of this area, R217 has the same northern boundary as cut R213 suggesting that the original wall may have extended slightly further north than the reconstruction. It is possible that some of the stones in R216 may have been part of the original wall that still were in-situ, but the structure as a whole is largely reconstructed. The cut R213 along its inner face cut through the medieval floor deposits clearly indicating the inner edge of the wall had been rebuilt in the modern period. R215 was only one course high but hung over beach gravel/silt layer R209, with a void between the stones and the layer. Both R216 and R215 were built upon stone/mortar constructions, presumably the original walls, R217 and R218 respectively (group 2:5).

A large E/W aligned irregular cut, R186 and its fill R160 were also recorded. The feature was not excavated. The fill spilled out over the edges of the cut, and partially overlay the medieval floor remains. The cut that was numbered R186 may have resulted from several cutting actions. The top of these cuts were filled by one fill, R160. The cuts were in all probability the result of the investigation of graves during the antiquarian work on the

***Fig. 114**. Group 7:2, area R96 R187. Photo Bruce Sampson, NIKU.*

ruin. R160 filled the resulting depression. As such cut R186 represents the disturbance of these graves, possibly up to six graves. R186 may have followed the original grave cuts. What is unclear is whether the graves were completely excavated or whether this action simply removed the grave slabs. The presence of disarticulated human bone in the fill R160, strongly suggests that at least one burial was disturbed. It is also unclear whether these graves were dug during the use of the south aisle or whether, like group 5:1 in the north aisle, they may have been dug after the aisle was no longer in use.

Contexts
R1. Turf and topsoil. Over R160, R181, R183, R185, R187 R189, R210, R214 and R215

R160. Fill of dark greyish brown sandy silt and stones of all sizes, contained brick and mortar fragments and disarticulated human bone. Filled cut R186 and continued beyond the edges of the cut, i.e. covered a larger area than the cut. In reality R186 was probably a series of cuts, but only one fill could be identified. It is possible that R160 was deposited in a depression, created by antiquarian investigation of graves. As such the cuts and fills would lay beneath R160. It is also possible that the whole area was dug up and filled in one episode. Under R1, over R186.

R180. Circular cut, 0.50m in diameter, unexcavated. Located in the NW corner, probably a posthole. Under R181, over R157.

R181. Fill of brown sandy silt, contained brick and mortar flecks and small stones. Fills cut R180. Not excavated. Under R1, over R180.

R182. Cut along the southern side of the easternmost freestanding column base in the south aisle, the column forms the northern limit of the cut. It was 1.50m long E/W, 0.50m wide and irregular in form, it was not excavated. R182 was similar to R211 that cut along the southern side of the easternmost respond in the south aisle. Cement had been used around both R182 and R211, the cuts are almost certainly related to this restoration work. Under R183, over R157.

R183.Fill of pale grey silt, mortar and medium sized stones. Filled cut R181. Not excavated. Under R1, over R182.

R184. Circular cut, 0.25m in diameter, probably a posthole, not excavated. Under R185, over R156.

R185. Fill of light greyish brown sandy silt, contained mortar and brick flecks and small stones. Under R1, over R184.

R186. Large irregular rectangular cut, 6.50m long (E/W), 0.60m - 1.60m wide, not excavated. In reality R186 may have been a series cutting episodes. It appeared as though the cut had one fill, R160, that also spilled out over the edges of the cut, overlying the medieval floor deposits. R186 represents the opening of several graves in this area, possibly up to six in total. Whether these graves were opened in one episode or by several separate cuts is unclear. The resulting depression appears to have been filled with one mixed fill. Under R160, over R157.

R187. Stone construction butting the easternmost freestanding column in the south aisle on its western side. R187 consisted of large limestone blocks bonded with cement. R187 was built over a stone and mortar construction R188. R187 is interpreted as a modern reconstruction of an altar foundation, the original R188, lay beneath R187. Under R1, over R178 and R188.

R189. Stone structure, consisted of a single layer of medium and large limestone blocks bonded with cement. The structure covered an area 2m x 1.80m west of the easternmost respond in the south aisle. A layer of broken up mortar fragments R193 appeared to continued under the stones on the southern side, this relationship was not confirmed however. R189 is interpreted as a reconstructed altar foundation. Under R1, over R193.

R209. Layer of dark brown silt and beach gravel mixed together, contained small stones and mortar fragments. The mortar fragments were reminiscent of R158, the mortar bedding for brick floor R192. R209 was localised to the area immediately west of threshold R215, extending under the threshold. It is possible that R209 fills a shallow depression, not excavated. Under R215, over R156.

R210. Fill of grey sandy silt, contained small stones and cement fragments. Filled cut R211. Under R1, over R211.

R211. Cut, ran along the southern edge of the respond at the east end of the south aisle. 2.20m long E/W, 0.40m - 0.70m wide. The cut was not excavated, it was filled by R210 that contained cement, a similar cut was recorded against the southern edge of the column base to the west. Under R210, over R156.

R213. E/W aligned cut, 8m+ long, extending over the whole excavated area except for the easternmost 2.50m, 0.20m - 0.30m wide. The cut ran along the inside face of the southern cathedral wall. The extant walling R216 appeared to be a reconstruction. R213 is interpreted as a 'construction trench' for this reconstruction. Under R216, over R156.

R214. Fill of brown silt, small and medium stones, brick and mortar fragments and occasional whole bricks. Some of the larger stones may have protruded up into the layer from an underlying layer/structure. R214 fills cut R213 and was dumped against wall R216. Under R1, over R216.

R215. Short section of N/S aligned, cement bonded walling between the southern cathedral wall and the respond at the eastern end of the south aisle. R215 butts the respond and is bonded to southern wall R216. It overlay mortar bonded walling R218 and layer R209 to the west. It covered the threshold between the south aisle and south transept. Its function, and when it was constructed are unclear. Under R1, over R209, same as R308.

R216. E/W aligned stone wall, the southern wall of the cathedral, cement bonded, appeared to be a reconstruction. The wall was interleaved with N/S aligned reconstruction R215 to the east. Both these walls were constructed upon mortar bonded stone structures, R217 and R218. A cut, R213, ran alongside the inside face of the wall, apart from the easternmost 2.50m where earlier wall remains R217 stood. R213 appeared to be a form of construction trench for R216. Under R214, over R213.

Group 7:3

R23 R36 R85 R90 R91 R94 R95 R97 R99 R111 R119 R227 R232

Group 7:3 consisted of modern/antiquarian activity in the north aisle and along the north arcade. R23 was the context issued to a mixed layer that covered a large part of the eastern end of the north aisle. R23 appeared to have been deposited in depressions or cuts where the floor and other structural remains hadn't survived. As the area was only cleaned down to an arbitrary level, not excavated, it was not possible to determine if the floor lay at a lower level or had been removed by antiquarian investigations. A similar situation was recorded in the SE corner of the nave, where R160 (group 7:2), filled a number of graves that had probably been opened. The NW corner was covered by mortar (R85) and charcoal (R36) layers, these may have been remains of the demolition deposits but are more likely to be re-deposited, 'filling' the area after an antiquarian investigation, in the same way that R23 did.

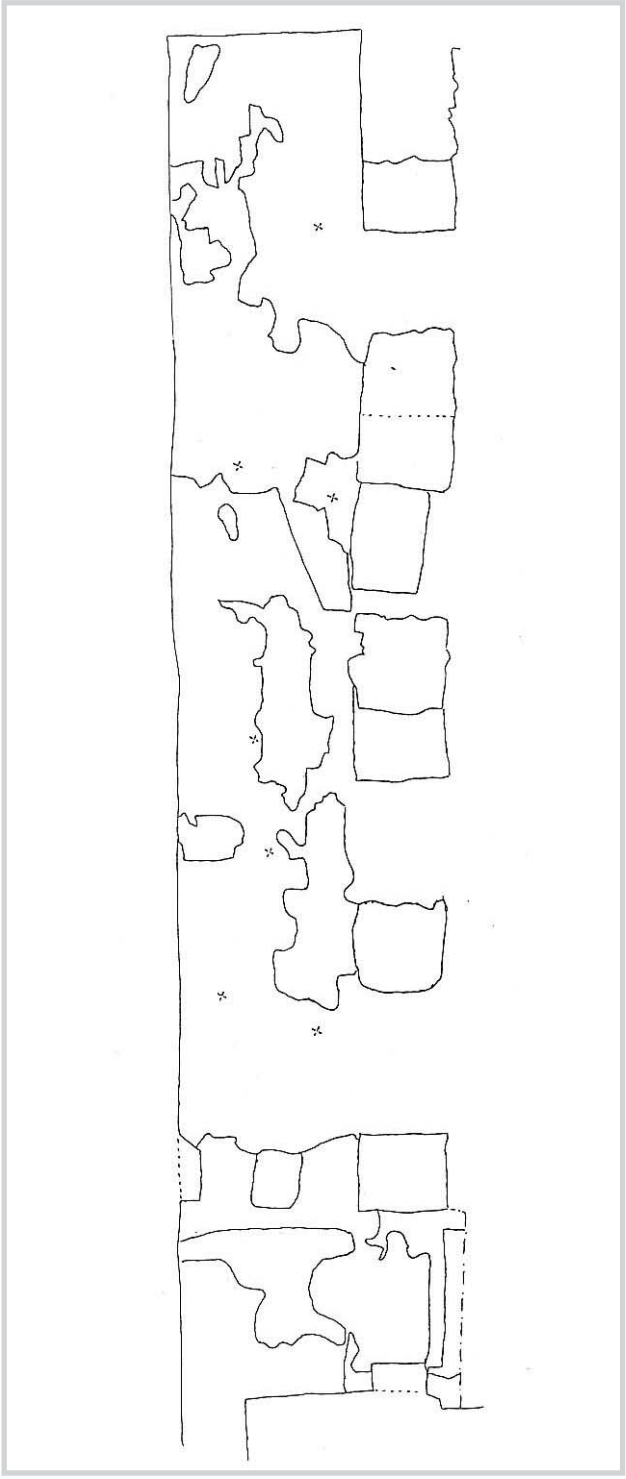


***Fig. 115**. Group 7:3, area R96, north aisle. E up.*

Three of the columns (R90, R95 and R111) of the north arcade, the profiled stone set against the western wall (R91), and three altar foundations (R97, R99 and R119) that lay on the western side of the columns in the north arcade appeared to have been at least partially reconstructed. All of the reconstructions were cement bonded and were built upon the remains of their original stone predecessors, (group 2:7) with the exception of R97 that

overlay broken up mortar surface R26 (group 4:4). R26 may also have been remains of an original altar foundation in brick and mortar. The rebuilding is assumed to have taken place during antiquarian restoration work. In a number of places gaps were visible between the stones, no traces of mortar cores were visible. These structures were only exposed on the surface. Whether they were complete reconstructions or consisted of original stonework that had been repaired and re-pointed with cement was difficult to establish. Some were of differing dimensions than the originals and in one case, between reconstructed column R95 and the original R96 (group 2:7), a layer of silt was present physically separating the original from the reconstruction.

A cut (R232) and fills (R94 and R227) was documented cutting into a grave chamber in the north aisle. These contexts represent antiquarian excavation of the chamber. A concentration of bones (R227) probably from one individual appeared to have been collected and placed in the fill.

Contexts

R23. Mixed layer of greyish silty sand/mortar, contained beach gravel, brick fragments, stones of all sizes and charcoal flecks. The layer was present over a large part of the north aisle of the nave, it lay directly under the turf and may have been even more extensive but removed with the turf, R1. The north aisle was not excavated, only cleaned down to the level of the latest floor, R23 appears to be modern in date, it lay between the patches of surviving floor and other structural remains. It was probably deposited after the demolition deposits were cleared away in the 1800's and 'fills' depressions in the floor, or places where the floor layers have been excavated by antiquarian investigations. Under R1, over R24, R29, R38, R39, R40, R41 and R109, same as R32.

R36. Layer of charcoal and silt, the two were mixed together but were also present as localised concentrations. R36 was recorded at the western end of the north aisle. It partially overlay tile floor R24. R36 and mortar R85 appear to be either remains of the demolition deposits not fully cleared away or demolition deposits re-deposited after an antiquarian investigation, more likely the latter. R36 and R85 merged together, it was not possible to determine their stratigraphic relationship. Under R1, over R24, same as R82.

R85. Layer of pale cream mortar and small to medium sized stones, contained brick fragments. R85 was deposited at the western end of the north aisle. See R36. Under R1, over R24, same as R87.

R90. Column base, the westernmost column base in the north aisle of the nave. 1.80m long N/S x 1.50m wide E/W, one course high, consisted of large cement bonded stones, it was a reconstruction to mark the column's assumed position. R90 was built upon foundation R89. Under R1, over R89.

R91. Large profiled stone placed against the west wall of the cathedral. The stone was a copy of how the original would have looked. The original would have been built in to the western wall acting as a respond. Under R1, over R84.

R94. Fill of light grey silty sand and stones of all sizes, contained mortar and brick fragments, and disarticulated human bone, a concentration of which was given a context number R227. R94 fills robber cut R232 that was dug into a grave chamber between the columns in the north arcade. Under R1, over R232, contained R227.

R95. Reconstructed column base, the easternmost freestanding column in the north arcade. Consisted of large limestone blocks bonded with cement. R95 was the context issued to the uppermost 1-2 courses of the original column foundation R96. A thin layer of silt separated R95 from R96. Under R1, over R96.

R97. Reconstructed altar foundation, lay against the western face of respond at the eastern end of the north arcade. Consisted of a single layer of large limestone blocks bonded with cement. R97 was built upon mortar layer R26, and partially over brick floor R28. Under R1, over R26.

R99. Reconstructed altar foundation, lay against easternmost freestanding column in the north arcade, R95. Consisted of a single course of large limestone blocks bonded with cement. R119 was built over original altar foundation R100. Under R1, over R100.

R111. Column base in the north arcade. 1.20m+ high, consisted of large stones apparently bonded with cement, it is possible that cement had been used to fill cracks and gaps in the masonry, rather than indicating that the whole column was reconstructed. This context just represents the repair work. The column was 2m in diameter x 1.20m high. R111 was built upon stone foundations R89 and R113. Under R1, over R108 and R113.

R119. Reconstructed altar foundation, lay against the western face of column R427 in the north aisle. Consisted of large limestone blocks bonded with cement. R119 was

built over original altar foundation R118. R118 was 0.10m wider than R119 on the north side, to the south R119 was widest. Under R1, over R118.

R227. A localised concentration of disarticulated human bone recovered from fill R94 in the SE corner of the grave chamber, the bones appeared to belong to the same individual, a young woman, the whole skeleton was not represented, but the bones appeared to have been collected and placed here. Within R94.

R232. Cut of a robber trench dug into a grave chamber. Probably an antiquarian investigation. Only a few remains in the base of the chamber survived, i.e. the whole chamber was excavated. Under R232, over R225, R225 and R333.

Group 7:4

R50 R51 R52 R53 R54 R55 R57 R61 R62 R63 R64 R65 R66 R67 R68 R69 R74, R78, R77 R78 R220 R221 R222 R253 R257 V1 V2 V6 V7 V9 V10

Group 7:4 consists of modern activity in the north transept and trench V96. Under the turf in the north transept (R50) lay a series of discreet layers and spreads consisting of mortar (R51, R53, R54, R61, R62 R64 and R78), tile fragments (R63 and R68) beach gravel (R52 and R64), silt layers (R62, R77, R253 and R257), and two cut features (R55, R57, R66 and R67). Many of these layers appeared to consist of re-deposited material, possibly from excavations in the area. A N/S aligned trench along the inside face of the western wall of the north transept was excavated in the 1970's. The re-deposited material may originate from this excavation. It may also have been deposited after antiquarian or other small scale investigations. It was not certain that all of these layers were of modern date, but no other function could be attributed to them, they did not appear to be in-situ floor layers, R253 may be of medieval origin.

Trench V96-1 was located against the outside face of the wall of the north transept at the corner where it met the north wall of the north aisle. Under the turf and topsoil (V1), lay a layer of silt (V2) that extended in between the phases of walling of both the north transept and the north aisle. The walling that lay above V2 was cement bonded and clearly reconstructed. Two phases of reconstructed walling were discernable in both walls. V7 was the context number issued to the upstanding E/W aligned wall of the north aisle. This was built up with modern ashlar masonry. It consisted of a profiled base with a single layer of ashlar masonry below the profile. It was stratigraphically the youngest wall, but possibly contemporary with the uppermost phase of the N/S aligned wall of the north transept (V6). V6 was constructed of unworked stones of varying sizes. V6 lay upon V9 that was constructed in a similar manner to V6. V9 could be separated from V6 by a slight shift in the masonry and its stratigraphic relationship to the contemporary wall of the north aisle V10. In the overlying phase the walling of the north aisle wall V7 butted the wall of the north transept V6, in the lower phase the relationship was reversed: V9 butted V10. V10 was constructed of stones with a flat outer face, but not the ashlar masonry used in V7. V9 and V10 appeared to partially rest upon a layer of silt (V2) that separated them from the remains of the original walls that they lay upon. Only the outside faces of the walls were uncovered. It is possible that the documented reconstructions apply only to the face of the walls, the inner cores may consist of the original medieval masonry.

Contexts

R50. Turf and topsoil. Over R55, R57 R61, R62 R68 R77, R78, R220, R221 and R242.

R51. Mixed layer of silt and mortar, contained small stones and brick flecks. Modern layer, possibly up-cast from an excavation. Under R50 and R69, over R52.

R52. Layer of beach gravel, contained occasional mortar and brick flecks. Only present in the western part of the north transept. Under R51, over R53.

R53. Layer of mortar and small stones, the mortar was crushed and very sandy. The layer was compact but crumbled under pressure. R53 covered most of the north transept. Under R52 and R67, over R54, R257 and R258.

R54. Layer of light grey crushed sandy mortar, contained small stones, beach gravel and brick fragments. Under R53, R65, R66 and R222, over R223 and R249.

R55. Fill of light brown silt, contained small stones, mortar and brick fragments. Fills R66.

R57. Fill of brown silt, contained mortar and brick fragments. Under R50, over R67.

R61. Layer of coarse yellow brown mortar and brick fragments. The brick fragments were loose within the mortar matrix, i.e. not a brick surface set in mortar. R61 butts the inside, northern edge of step R60 in the north transept. Under R50, over R58.

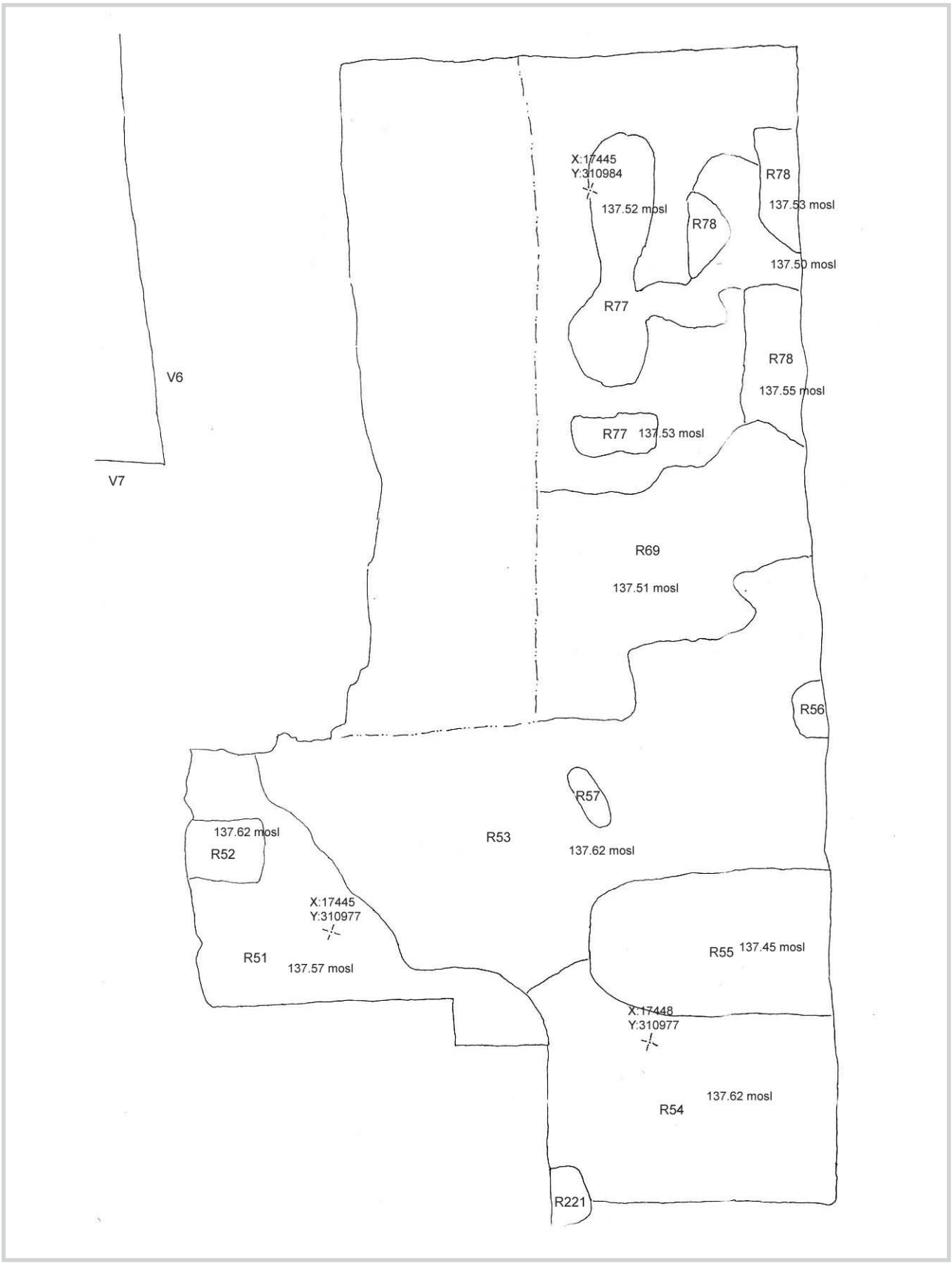


***Fig. 116**. Group 7:4, area R96, north transept.*

R62. Layer of reddish brown silt and mortar fragments, contained small stones and brick fragments. Under R50, over R63.

R63. Three isolated islands of red ceramic tile fragments located to the north of threshold R60. The tile fragments were dried up by the heaters used in the tent and became pulverised. These tile fragments were most likely re-deposited rather than an in-situ floor. They were not planned. Under R62, over R63.

R64. Compact layer of cream mortar and small limestone fragments. The mortar contained beach gravel inclusions. R64 was spread under tile fragments R64, it was only present north of threshold R60. Under R63, over R65.

R65. Layer of beach gravel, R65 lay beneath mortar layer R63 that tile fragments R63 lay upon, it was only present north of threshold R60. Under R64, over R54.

R66. Cut feature, 1.70m long N/S x 1.20m wide. The southern edge was cut against the masonry of the NE mid-tower column base. Under R55, over R54.

R67. Cut feature, roughly semi-circular, 0.40-0.45m in diameter. Cut against the eastern wall of the north transept. Under R57, over R53.

R68. Patch of broken tiles, stones and mortar mixed with a little clay. Only covered a small area. Under R50, over R69.

R69. Layer of brown silt, localised to beneath R68. Under R68, over R51.

R74. Layer of broken up mortar fragments and occasional brick/tile fragments. R74 was located in the north transept, its relationship with adjacent tile floor R75 was not certain but R74 is almost certainly later. Under R50, over R75 and R76, same as R80.

R77. Layer of grey silt, contained disarticulated human bone. R77 appeared to be re-deposited grave fill. Under R50, over R157.

R78. Three unconnected spreads of mortar, overlying the tile floor remains, R75 and R76 at the northern end of the north transept. It was uncertain whether the tile floor R75 was extant beneath R78 or whether R78 was the fill of a cut feature that had truncated the floor. Under R50, over R75 and R76.

R220. Layer of loose sandy silt, brick and tile fragments and mortar fragments. R220 was dumped over the eastern end of R59, a double line of bricks on the northern side of stone threshold R60. R220 appeared to be a modern dump of demolition/broken up floor debris. Under R50, over R59.

R221. Fill of mid brown silt, brick fragments, mortar fragments and small and medium sized stone fragments. Fills cut R222 and appears to consist of the material that R222 cut through. Under R50, over R222.

R222. A 0.50m diameter cut. placed against the NE mid-tower base on the north side of threshold R60 in the north transept. The cut exposed the foundations of the tower. It appeared to have been back-filled with the material the cut truncated, suggesting it was back-filled shortly after being dug. Under R221, over R54.

R242. Layer of crushed mortar and silt, contained mortar fragments, small stones and brick/tile fragments. Under R50, over R250, R252 and R253.

R253. Layer of brown silt, contained mortar and brick fragments and small stones. Under R242.

R257. Layer of brown humus rich silt, contained brick and mortar fragments and disarticulated human bone. R257 appeared to be re-deposited grave soil. Under R53, over R157, same as R258.

V1. Turf and topsoil, contained modern glass. Over V7

V2. Layer of silt, contained mortar flecks and small lumps. Under V10, over V3 and V4.

V6. Stone wall, N/S aligned, consisted of unworked stones of varying sizes. V6 was part of the outer wall of the north transept. The masonry appeared to be bonded with cement. V6 rested upon wall/foundation V9. Under V7, over V9.

V7. The upstanding masonry of the outer cathedral wall of the north aisle, recorded where it met the outer wall of the north transept, over trench V96. V7 consisted of ashlar masonry, probably modern, bonded with cement. The face of the wall here was reconstructed. It is not known whether the core of the wall is original or not. V7 butted the reconstructed outer wall of the north transept V6. under V1, over V6.

V9. N/S wall, the outer wall of the north transept. The stones varied in size from 0.10m x 0.20m – 0.15m x 0.40m. V9 consisted of one to two courses, they appeared to be bonded by cement. The cement bonding may have just been on the surface but the outer face of the wall is interpreted as being reconstructed. Silt layer V2 lay between V9 and the underlying original wall V4. Under V6, over V8 and V10.

V10. Stone wall, E/W aligned. V10 is the number given to the lowest course of V7. It appeared to be bonded with cement. The stones had flat a outer face, but were not ashlar masonry. N/S aligned wall V9 butted V10 at the corner. Silt layer V2 lay between V10 and the underlying original wall V5. Under V9, over V2.

Group 7:5

R71 R72 R132 R133 R142 R143 R163 R164 R165 R166 R247 R260 R261 R263 R424

Group 7:5 consists of modern activity in the crossing, probably the result of antiquarian investigations during or after the restoration projects. A shallow linear cut (R132 and R133) was dug along the NW tower base (R275/277) and the threshold into the north transept, (R60) exposing the foundations of the tower base (R274/R276). This was probably the result of an investigation of the foundations of the column bases. No restoration work was visible on the masonry. An E/W aligned trench (R71 and R72) was dug into an earlier triple grave, disturbing bones from two burials (RG125 and RG126) and probably removing some grave objects, though seal stamp (HKH11821) was recovered from the fill R72. Limestone slabs R424 lay in the top of the fill. These were visible on the surface, they didn't cover the whole of the grave, but covered most of the robbing/excavation activity. They appear to have been laid to mark the grave, the digging is more likely therefore to be a result of an antiquarian excavation than robbing. Didriksen's plan of the ruin from 1886 shows a grave against the threshold into the crossing (see Nicolaysen 1893). R71 was located over this grave but was wider to the east. A single grave was shown on the plan, Nicolaysen says it had been opened. The single grave that was clearly visible on the surface must have been the reason for the original investigation, this clearly continued to a lower level to the east and was wider, also disturbing the burials in the triple grave (group 2:14). It is possible that R71 is the result of two cutting episodes.

Another E/W aligned cut feature, (R142 and R143) was dug immediately to the east, in front of the entrance to the chancel. This was only 0.20m deep, it bottomed out on earlier grave (R243 and R244, group 4:9), this grave was not excavated. R142 was wider than R244 but was placed directly over it. It is almost certainly antiquarian activity locating grave R244, possibly to remove a grave slab. The grave itself was not disturbed. The bricks and mortar in the fill R143 may be the remains of a base for the slab.

Two altar foundations (R260 and R263) and a step into the chancel (R261) were constructed against the chancel wall, the altar foundations stood on either side of the step. All three structures consisted of cement bonded stones and were built upon a bed of broken brick and mortar fragments (R247). These were probably broken fragments from underlying mortar surfaces R259 that are interpreted as the remains of the original brick and mortar altar foundations. R260, R261 and R263 are assumed to be part of the restoration of the cathedral, after the overlying rubble was cleared. Similar cement bonded stone altar foundations were constructed over brick and mortar rubble layers against the easternmost column bases in both the north and south arcades, see groups 7:2, 7:3 and 4:4. A stone (R262, group 2:13) was visible protruding out from underneath reconstructed step R261. R262 is interpreted as part of the original step into the chancel. Layer of brick and mortar, R247 lay in between the original step and the reconstruction. It appeared to have been laid as a levelling deposit prior to the reconstruction of the altar foundations and step.

Two postholes (R163, R164, R165 and R166) were dug in the SW corner of the crossing, these were probably for scaffolding or some other type of support connected to restoration work. Modern post holes a similar distance, 0.30m - 0.50m, from the masonry were also documented in the SW (group 7:1) and SE (group 7:2) corners of the south aisle.

Contexts

R71. E/W aligned cut, the eastern end lay against the threshold in the mid tower, c. 2m long, 1.26m wide x 0.40m deep. R71 cut into earlier graves, removing some of the bones and probably removing grave objects. At least one of the graves was probably visible on the surface as the cut follows the grave cut quite accurately on the north side. Under R72, over R70.

R72. Fill of light grey brown sandy silt, contained mortar, beach gravel small and medium sized stones, brick fragments and modern bottle glass. The fill is primarily re-deposited grave fill. A layer of large limestone slabs, R424 were laid in the top of fill R72. Under R424, over R71.

R132. Fill of sand and mortar, contained brick fragments. Fills cut R133. Under R1, over R133.

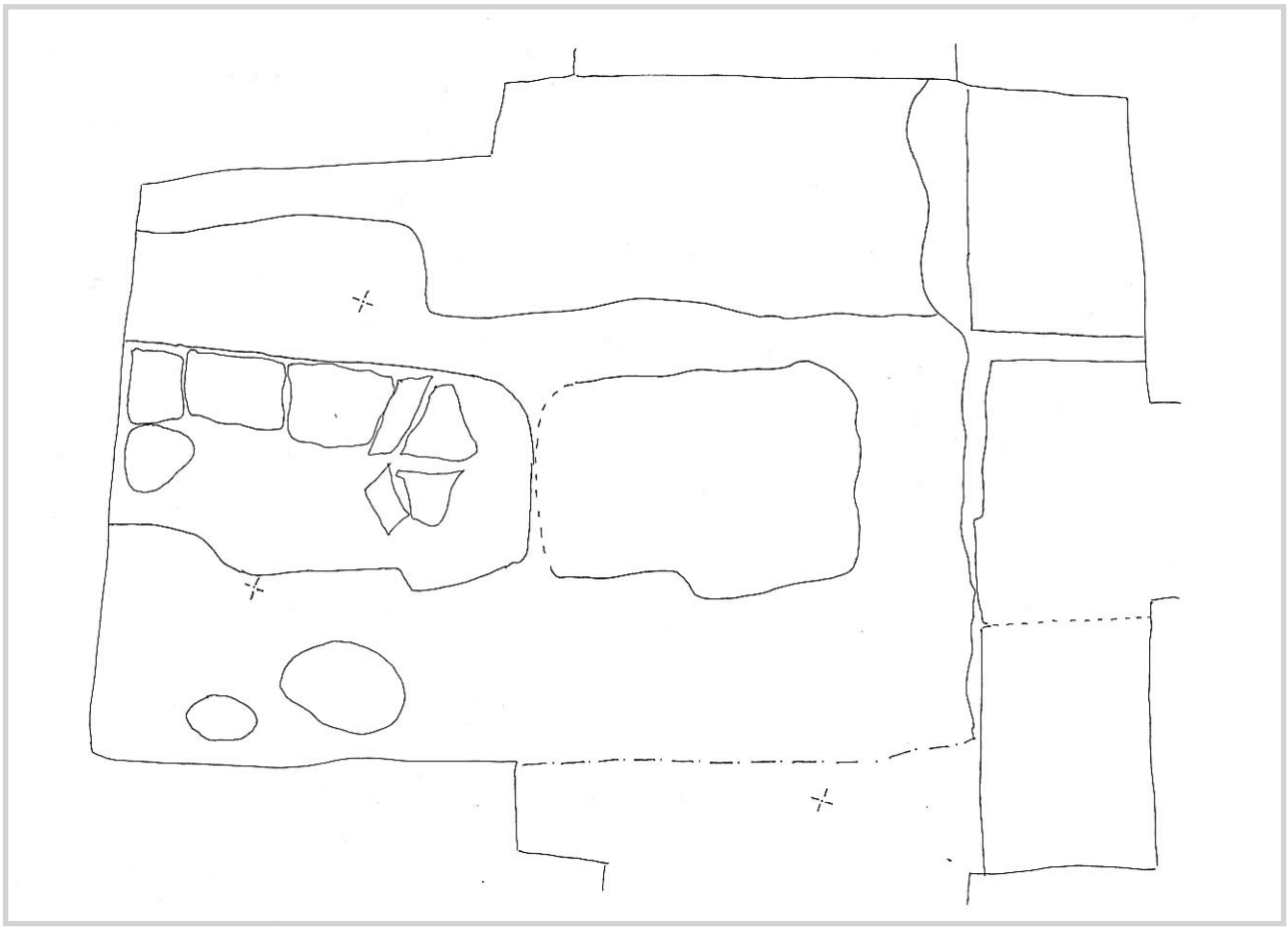


***Fig. 117**. Group 7:5, area R96, the crossing.*

R133. Linear, E/W aligned cut, R133 ran along the south side of the SW column base in the mid tower, 5.10m long, 0.30-1.50m wide x 0.10m deep. The southern edge is linear, the northern edge follows the column base and step R60. R133 was probably created by an antiquarian investigation of the column base. Under R132, over R157.

R142. E/W aligned cut, 2m long, 1m wide, 0.20m deep. The sides sloped at a shallow angle the base was concave. Under R143, over R144.

R143. Fill of mid brown silty gravely sand and brick rubble, contained some medium sized stones and some largish lumps of white mortar. Over R142.

R163. Cut of a roughly circular feature with vertical sides, 0.70m in diameter, 0.54m deep. Under R164, over R144.

R164. Fill of grey brown clay sand, contained mortar, brick and stone fragments and a piece of modern iron. Over R163.

R165. Cut of a small circular feature, irregular shaped sides cut at a steep angle with a curved base, 0.44m in diameter, 0.24m deep. Under R166, over R70.

R166. Fill of loose mid brown clayey silty sand, contained brick and mortar fragments and occasional small stones. Over R165.

R247. Layer of mortar and brick fragments, the mortar fragments had a flat upper surface. R247 was visible where it protruded out from under the reconstructed altar foundations R260 and R263 and reconstructed step R261. R247 appeared to be the remains of a broken up mortar and brick structure. Possibly original altar foundations that lay on either side of the chancel entrance. The originals may have been broken up during the removal of the original altars or by falling masonry. Under R260, R261 and R263, over R262, same as R264, R259, R265 and R292.

R260. Cement bonded stone construction, 1.70m long N/S x 1.10m wide x 0.20m - 0.30m deep. R260 consisted of a single course of medium and large stones situated in the NE corner of the crossing on the north side of the en-

trance to the chancel. It was built upon broken up mortar surface R247. R260 appeared to be a reconstructed altar foundation. Over R247.

R261. Cement bonded stone structure, forming a step from the crossing into the chancel. R261 appeared to be a reconstruction, the original structure R262 was visible protruding out from under R261 by 0.20m on its west side. Broken up mortar and brick layer R247 lay between the reconstruction and original step. Over R247, same as R268.

R263. Cement bonded stone construction, 1.60m long N/S x 1.20m wide x 0.25m deep. R263 consisted of a single course of medium and large stones situated in the SE corner of the crossing, on the south side of the entrance to the chancel. It was built upon broken up mortar surface R247. R263 appeared to be a reconstructed altar foundation. Over R247.

R424. Nine limestone slabs ranging in size from 0.60m x 0.50m - 0.40m x 0.20m. The slabs were laid to form one complete E/W aligned row, 2.70m long and another partially complete row to the south, total width 0.90m. The slabs had a horizontal upper surface, they were laid in the top of fill R72, the northern edge was linear, respecting the edge of cut R71. Some of the slabs appeared as though they may be fragments of one large broken slab. This context was originally given the number R60 but due to double numbering has been allocated R242. Over R72.

Group 7:6

R286 R288 R289 R291 R296 R301 R302 R303 R304 R305 R313 R314 R315 R316 R317 R322 R323

Group 7:6 consists of antiquarian activity in the south transept. This group is separated from the antiquarian activity in the crossing (group 7:5), the boundary between these groups lay at the southern edge of the tower bases. A number of cut features were recorded in plan (R288, R314, R315, R316, R322 and R323) but were not excavated. A further cut feature R291 was recorded along the inside faces of the southern and partly along the western walls of the transept. This was filled with R305, and appeared to be a construction cut for the reconstruction of the southern wall R286. A number of distinct silt and charcoal deposits were recorded, (R296, R301, R304, R313 and R317). R296 was the most extensive, covering most of the transept, it was truncated by the above mentioned cut features. These layers clearly consisted of debris from a fire but appeared to be re-deposited.

R296 lay over a setting of medieval bricks R302 that were placed upon mortar layer R303 in the SE corner of the transept. The bricks were laid upon the mortar surface but were not bonded to it. They were not laid flush to one another or in a consistent pattern and did not appear to be remains of in-situ flooring. R296 lay over and between the bricks, some of the burnt material from layer R296 had filtered down under the bricks. The only traces of mortar on the surface of the bricks were on the upper side. The mortar surface R303 was only partially exposed and may possibly have been an in-situ medieval deposit.

Contexts

R286. Southern wall of the south transept. A trial trench was excavated against the inside face of the wall. The uppermost 0.30m was constructed with a flat vertical face, under this level the wall was more uneven. The whole structure appeared to have been constructed with modern cement but it is possible that the walling was just pointed with cement. A 'construction' trench R291, could be defined along the inside face of the wall, cutting the re-deposited layers. Under R305, over R291.

R288. Fill of grey silt, contained large stones, mortar lumps, brick fragments, iron objects and three coins. The surface of the layer was exposed and cleaned but not excavated. The finds were recovered from the surface. R288 appeared to fill cut/depression R315. Under R289, over R315.

R289. Layer of silt and mortar lumps, more than one type of mortar appeared to be present within this layer. Also contained brick fragments. Under R1, over R288.

R291. Cut feature, aligned E/W, recorded along the inside edge of the southern wall of the south transept and along the southernmost 4m of the edge of the western wall. The feature was defined on the surface. It was 1m wide. A trial trench through the feature revealed it was 0.70m+ deep. R291 was filled with R305, wall R286 appeared to be a reconstruction, for which R291 was the construction cut. Under R286, over R301.

R296. Layer of dark grey charcoal/silt, contained fragments of burnt stone, metal slag, and occasional lumps of mortar. R296 covered most of the south transept, but had been truncated by a number of cut features. It was not excavated but in one place it was recorded as 0.25m thick. Under R301, R315, R316 and R323, over R302 and R313.

R301. Layer of grey silt, contained stones, charcoal, mortar flecks and lumps of modern cement. Under R291 and R304, over R296.

R302. A concentration of medieval bricks, (c. 0.26m long x c. 0.12m wide) placed against the eastern wall in the SE corner of the south transept. The bricks were not laid in a distinct pattern. They lay upon mortar layer R303, but were not bonded to it. There were traces of mortar on some of the bricks but only on the upper half, as if they had been re-laid upside down. Silt/charcoal layer R296 lay over the bricks but in some places had worked its way under the bricks, indicating some movement, supporting the observation that they were not bonded to mortar R303. Under R296, over R303.

R303. Layer of yellowish white mortar, contained occasional small stone inclusions. Bricks R302 lay upon this layer but were not bonded to it. The layer was only partially exposed. Under R302.

R304. Layer of grey silt, contained stones, charcoal, mortar flecks and beach gravel. Under R1, over R301.

R305. Fill of grey silt, contained fragments of modern cement, stones of all sizes and brick and mortar fragments. Under R1, over R286.

R313. Layer of silt and mortar, contained large stones. Not fully exposed. Under R296, over R317.

R314. Fill of dark grey silt, contained stones, mortar lumps and flecks, occasional brick fragments and fragments of modern cement. Under R1, over R316.

R315. Cut feature, c. 2m long (E/W), x 1.5m wide (N/S). The feature was not excavated, it was wider at the western end. It was possibly a grave but appeared to be modern. Its similarity to a grave may be a coincidence. Under, R288, over R296.

R316. Cut feature, only defined in plan, 2.70m long (N/S), 0.35m – 0.40m wide. The cut was defined along part of the east wall of the south transept. It was not excavated. Under R314, over R296.

R317. Layer of silt containing occasional mortar and brick fragments and an iron object. R317 contained relatively few inclusions compared to the other deposits in the south transept. Not fully exposed. Under R313.

R322. Compact fill of dark brown silt, mixed with sand and beach gravel, contained brick fragments, mortar and charcoal flecks. Under R1, over R323.

R323. Cut feature, not fully exposed or excavated. Under R322, over R296.

Group 7:7

B3 B4 B5 B6 B8 B12 B13 B52

Group 7:7 consists of a turf horizon (B3) silt and clay layers (B4, B5, B6, B8, B13 and B52) and a layer of beach gravel (B12) in trench B96-4. Some of the layers contained demolition deposits (B4, B5 and B6), B6 and B13 contained disarticulated human bone. The demolition deposits consisted of large lumps of mortar, brick and stone fragments, various iron objects and slag as well a concentration of window glass fragments and a fragment of a lead window came. The stone and brick fragments had clearly been sorted and despite the presence of window glass and other objects these layers are not interpreted as in-situ demolition deposits. The demolition material was most likely re-deposited after the clearance of the original, extensive demolition deposits in the late 1800's/early 1900's. The turf horizon, B3 lay 0.70m below the base of the wall/top of the foundation of the outer wall of the chancel. This is assumed to have been the ground level during the use of the cathedral. This implies that the upper levels of the churchyard have been removed, probably when the demolition deposits were cleared. The presence of re-deposited human bone in some of the layers supports this interpretation.

Contexts

B3. Turf and topsoil. Over B4, same as B49.

B4. Mixed layer of dark grey sandy silt, mortar, both lumps and flecks and small and medium sized stones. The layer also contained window glass, iron objects, slag, many small brick fragments and a fragment of a lead window came. Under B3, over B5.

B5. Layer of silt mixed with lumps of mortar, contained animal bone. Under B4, over B6 and B51, same as B50.

B6. Layer of silt, stone and mortar, contained both animal and human bone fragments. Under B5, over B8.

B8. Compact layer of yellow brown sandy silt, contained small stones brick fragments and animal bone fragments. Under B6, over B12 and B52, same as B51.

B12. Layer of beach gravel mixed with a little silt, contained a few small stones. Under B8, over B13.

B13. Layer of brown gravely sandy silt, contained loose human bone fragments. Under B12. over B14 and B22.

B52. Layer of yellow brown clay, contained large stone fragments. Under B8, over B29 and B56.

Group 7:8

M30 M34 M35 M37 M38 M39 M40 M41 M44 M47 M62 M64 M72 M82 M83 M84 M85 M110

Group 7:8 consists of modern turf and topsoil (M30) and a series of make-up layers of silt/clay and stone (M35, M37, M38, M39, M40, M41, M47 and M83), stone and tile (M34 and M44) and silt and gravel (M62, M64 M72, M82, M84 M85 and M110). These layers were present in trenches M96-7 - 10. Many of the layers contained brick fragments and some animal bone.

Contexts

M30. Turf and topsoil. Covered the whole trench, a pile of stones and a discreet turf deposit. Spoil remains from the 1992 excavations were found within the turf horizon. Over M37, M64 and M82, same as M31, M32, M33, M60 M80 and M81.

M34. Layer of medium sized flat limestone fragments mixed with whole and fragmented bricks and roof tiles. Present in a 1m wide, 2.50m long band at the NW end of the trench. Under M37, over M38 and M62, same as M36 and M61.

M35. Layer of dark brown silty sand, contained mortar lumps and flecks, medium sized stones, and brick fragments. Under M39, over M41.

M37. Layer of silty sand, contained small stone fragments, mortar flecks, brick flecks and a few animal bone fragments. Under M30, over M34, same as ML14(92).

M38. Compact layer of grey sandy clay, contained small and medium sized limestone fragments, mortar flecks and brick fragments. Only present in a 0.60m x 0.50m area, possibly originally more extensive but truncated. Under M34, over M40.

M39. Layer of mid brown silty sand and large stones. Under M40, over M35.

M40. Layer of dark brown sandy silty clay, contained many tile fragments and medium sized stones. Bedrock protruded through the layer towards the SE. Under M38, over M39.

M41. Layer of mid brown sandy silty clay, contained small stones and mortar flecks. Bedrock protruded through the layer to the south and east. Under M35, over M42 and M44, same as AL16(92).

M44. Layer of stones of all sizes. The stones are unbonded and appear to have been dumped as levelling/make up. Under M41, over M47.

M47. Layer of dark brown sandy silty clay, contained small stones and brick fragments. Under M44, over M48.

M62. Layer of clay, sand and gravel, contained small stones. Under M34, over M65.

M64. Layer of dark grey brown sandy silt, contained mortar flecks and small lumps and gravel. The layer lay over bedrock and varied in thickness after the undulations in the bedrock. Under M30, over M72, same as M74 and ML2(92).

M72. Layer of gravely silty clay, the layer lay in a depression in the bedrock. Under M64, over bedrock.

M82. Layer of dark grey brown silty sand and small stones/gravel, contained brick fragments. Under M30, over M110, same as AL2(92).

M83. Layer of silty sand, contained stones of varying sizes, mostly small, mortar flecks, brick fragments and gravel. Under M85, over M86, M87 and M90.

M84. Layer of light grey gravely sandy clay, contained small stones. Under M110, over M85 and M111, same as M117 and AL8/12(92).

M85. Layer of brownish grey sandy clay, contained small stones and beach gravel fragments. Under M84, over M83 and M114, same as M118, same as AL8/12(92).

M110. Layer of gravel/crushed limestone. Under M82, over M84, same as AL7(92).

Group 7:9

M120 M121 M123 M153 M156 M157 M163 M167 M168 M169 M184 M185 M186 M195 M197 BF31

Group 7:9 consists of modern activity in trenches M96-11 - 15 and BF96: turf and topsoil (M120), a stone foundation of unknown function, placed directly to the north

of the 'Bishops Foundation' (M167, M168 and M169), modern reconstructions of two buttresses M195 and M197, a number of silt layers that lay directly under the topsoil north of the 'Bishops Foundation' (M121, M123, M153 and M156), and to the west of the 'Bishops Foundation' (M185 and M186) the remains of a modern path (M157) a silt layer dumped against the south side of the 'Bishops Foundation' (M167), a decayed mortar deposit M184 that lay over wall remains M190/M191 and modern material that had fallen between the stones of the 'Bishops Foundation' (BF31).

Contexts
M120. Turf and topsoil. Over M153, M156, M157 and M168.

M121. Layer of brown gravely silt, contained mortar flecks, brick fragments, stone fragments, modern glass and nails. Under M167, over M123, M124, M142 and M151, same as ML2(92).

M123. Layer of yellow brown humus rich sandy silt, contained brick fragments, mortar flecks and animal bone. Under M121, over M139, M168 and M171, same as M170 and ML3(92).

M153. Layer of brown humus rich sandy silt, contained limestone fragments, brick fragments, mortar flecks, and beach gravel, all present in concentrations and also spread throughout. Under M120, over M158.

M156. Layer of dark brown humus rich silt, contained mortar flecks, brick fragments and charcoal flecks. Under M120, over M155.

M157. Mixed layer of grey clay and gravel, possibly the remains of a modern path. Under M120, over M154.

M163. Layer of brown silt, contained small stones and mortar flecks. M163 lay on the south side of the 'Bishops Foundation', butting against the stones. The layer also sealed grave fills M161 and M162. Over M162 and BF30.

M167. Shallow cut for stone foundation M169. The cut was recorded from the profile, c. 1.20m wide x 0.55m deep, the sides were cut at a shallow angle rounding to a flat base. Under M169, over M121.

M168. Fill of mid brown silt and small and medium sized stone fragments, contained mortar flecks and be fragments. The fill lay under and around stone foundation M169, within cut M167. Under M120, over M169.

M169. Stone structure, set in cut M167, comprised three courses of flat stones set in a white sandy mortar. The upper course of stones were upstanding 0.10m above the level of the cut. Appears from its stratigraphic position to be relatively modern. Under M168, over M167.

M184. Layer of reddish decayed mortar, contained inclusions of beach gravel and brick fragments. The mortar lay over wall remains M190 and M191. M184 was probably decayed mortar from M190 rather than a deliberately deposited layer. Under M120, over M190.

M185. Layer of grey mortar, contained inclusions of beach gravel. Only present in two 0.50m x 0.50m patches. Under M120, over M186, same as M200.

M186. Layer of grey gravely silt, contained small stones and a few fragments of human bone. Under M185, over M37 and M189.

M195. Reconstruction of buttress M194. M195 consisted of large limestone blocks bonded with cement, it lay upon the remains of M194. Over M194.

M197. Reconstruction of buttress M198. M197 consisted of large limestone blocks bonded with cement, it lay upon the remains of M198 that extended 0.10-0.40m out from underneath M197 on its southern side. Over M198.

BF31. Layer of dark grey clayey silt. BF31 lay in between the stones of BF30. BF31 contained modern material that probably fell in between the stones after they were cleaned and recorded in 1992. Over BF30.

Group 7:10
J74 J78
Group 7:10 consists of the turf and topsoil R74 and the underlying modern silt layer J78. These deposits were recorded in all four trenches, J96-1, J96-2, J96-3 and J96-4 in the NW corner of the churchyard.

Contexts
J74. Turf and topsoil. Over J78, same as J75, J110 and J112 also the same as JL1 (1992).

J78. Loose layer of brown silt, smallish crushed limestone fragments, mortar and brick fragments. The layer was 0.25m thick. Under J74, over J79, same as J76, J106 and J113, also the same as JL2 (1992).

Group 7:11
J105 J114
Group 7:11 consists of thick demolition deposits of mortar and stone (J105 and J114) in the westernmost trenches, J96-3 and J96-4, in the NW corner of the churchyard, J114 in J96-3, J105 in J96-4. J105 and J114 are almost certainly the same heterogeneous layer. This layer was the same as J135 and P3 and also the same as JL 13 and DL13 (1992).

Contexts
J105. Demolition deposit of yellow and white mortar, 0.25m - 0.30m thick. The uppermost 0.05m was intermixed with the overlying silt layer J106. Under J105, over J80, same as J114.

J114. Mixed layer of white mortar (c. 50%), mid grey clay silt (c. 30%) and large stones (c. 20%) in J96-3. The mortar was present both as crushed mortar mixed with the silt and as lumps of mortar. The layer also contained brick fragments and charcoal flecks. The layer was 0.30m thick at the SE corner of the trench increasing to 0.40m to the NW. Under J113, over J81, same as J108.

Group 7:12
J168 J170
Group 7:12 consists of the turf, J168, and modern silt layer J170 in trench J96-8.

Contexts
J168. Turf and topsoil. Over J170.

J170. Layer of brown silt mixed with crushed mortar and small mortar lumps. The mortar is probably present due to intermixing with the underlying demolition deposits. Under J168, over J176.

Group 7:13
J171 J176
Group 7:13 consists of demolition deposits (J171 and J176) of stone and mortar in trench J96-8. These layers are interpreted as re-deposited demolition deposits, i.e. they were laid down after the original demolition deposits were cleared away and the cathedral was exposed.

Contexts
J176. Layer of stone and mortar, only recorded in the western profile. Under J170, over J171.

J171. Light grey silt, mortar, brick fragments and small and medium sized stones. The layer was not homogenous, localised concentrations of mortar, silt and stones were present throughout. The upper surface was roughly horizontal, the lower surface sloped down to the west, the layer was 0.20m thick to the east, 0.45m thick to the west. Under J176, over J177, same as J163.

Group 7:14
P1 P2 P3 P27 P28 P58 P61
Group 7:14 consists of modern dumping layer P1 that lay at the top of the slope of trench P96, turf and rubble layer P2 that covered the whole trench, thick mortar/stone demolition layer P3, and a cut feature (P58 and P61) connected to the reconstruction of the churchyard wall (P27 and P28).

P3 was part of an extensive demolition deposit registered in the NW corner of the churchyard, it was well sorted and is interpreted as dumping after the clearance of the rubble deposits in the 18/1900's, i.e. not in-situ demolition deposits.

Cut P61 ran alongside the inside, southern face of the churchyard wall, exposing the stonework. Presumably to facilitate the reconstruction of the southern face. Reconstruction P27 consisted of large un-bonded stones laid along the southern face, existing stonework from a medieval wall phase, (P47, group 4:25) formed the northern edge of the wall, P28, silt/stone deposit formed the core of the wall. On the surface it appeared as though the whole of the upper part of the wall was reconstructed. P27 was built upon an earlier mortar bonded reconstruction of the southern face (P30, group 7:15).

Contexts
P1. Layer of gravely clay and modern material, lay at the top of the slope, possibly deposited after the 1992 excavation. Over P2, same as P12.

P2. Layer of turf and topsoil mixed with rubble, up to 0.40m thick down the slope. Under P1 and P61, over P3, same as P21 and P59.

P3. Thick layer of crushed mortar and stones of all sizes, contained brick fragments. The layer was < 0.70m thick, in the western section it was recorded as three separate layers, P13, P14 and P15. Under P2, over P4 and P60, same as P13, P14, P15, J86, J114 and J165.

P27. Reconstruction of the churchyard wall, consists of large stones, both angular and water rounded, laid on the southern, inside edge of the churchyard wall. The northern edge consisted of an earlier phase of walling that was still standing. The core of the wall was filled with P28

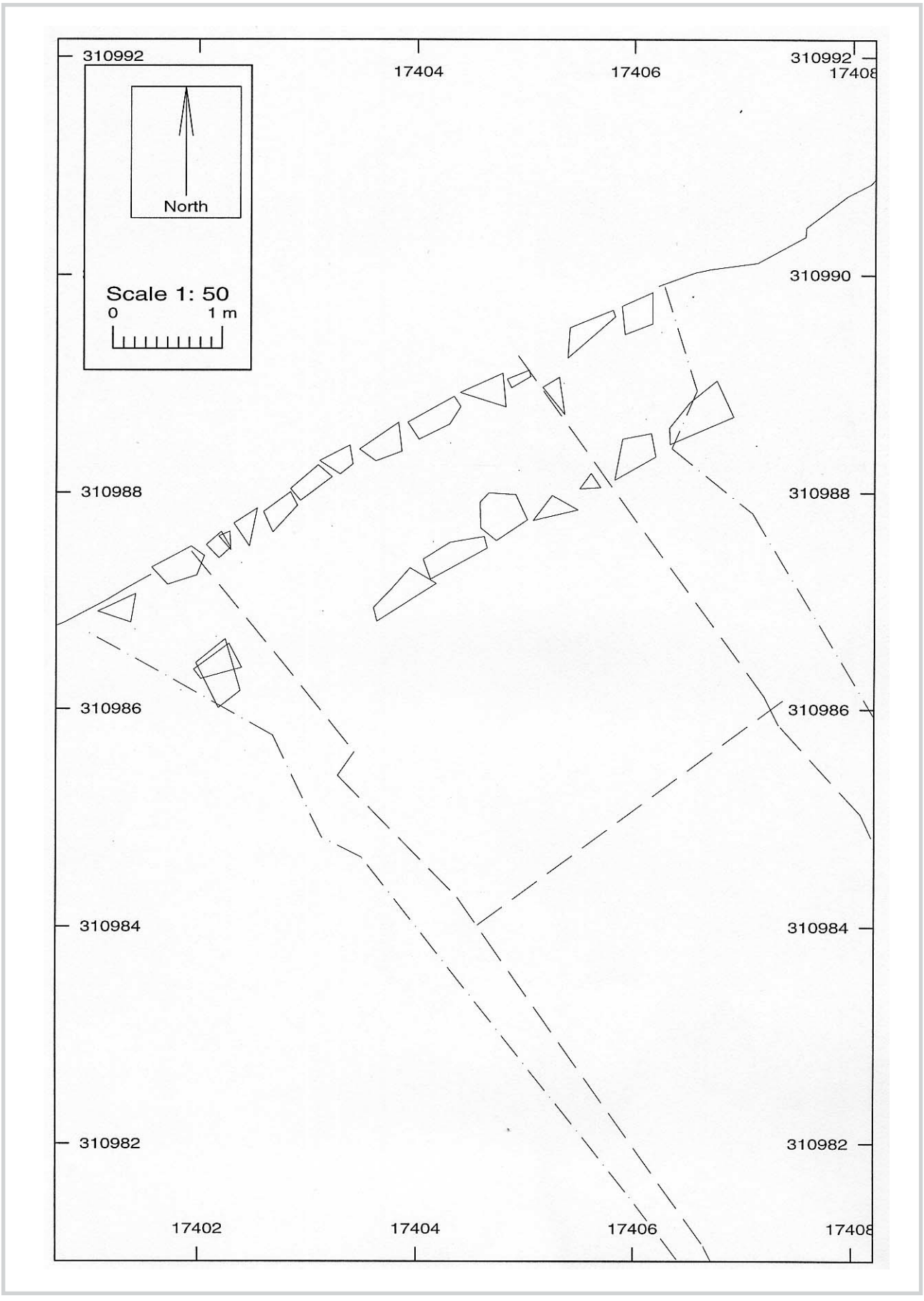


***Fig. 118**. Group 7:14, trench P96.*

that consisted of silt, stone and brick fragments. Under P58 and P28, over P30.

P28. Fill of loose brown silt, medium and small stone fragments and brick fragments. P28 fills the gap between wall stones P27 and earlier existing wall stones P47, forming a wall core. Over P48.

P58. Fill of loose brown silt, lumps and flecks of mortar and gravel, contained small and occasional medium sized stones and brick fragments. The fill was heavily disturbed by roots to the east. Filled cut P61 that ran along the inside, southern face of the churchyard wall. Over P27 and P61.

P61. Cut feature, recorded in both the eastern and western sections, not excavated in plan. It presumably ran along the inside, southern edge of the churchyard wall, 0.60m wide, 0.80m deep. The feature was shallower to the west. It cut into the deposits that butted the wall(s), exposing the stones. Two phases of restoration/repair of the wall were documented, P61 is probably connected to the construction of the latter: wall P27 and core P28. Under P58, over P2.

Group 7:15

P29 P30

Group 7:15 consists of a repair of the churchyard wall on the inside, southern face. P30 was one course high, bonded by mortar/rubble wall core P29. Remains of older wall P47 were standing to the north and formed the northern edge of the wall. P30 was built in from the southern edge of P47, reducing the thickness of the churchyard wall by c. 0.20m. Overlying reconstruction P27 is interpreted as a modern reconstruction, P30 is undated and difficult to date. It is bonded by a poor quality mortar and may be a late medieval repair.

Contexts

P29. Wall core of coarse yellow mortar and small and medium sized stones. The mortar contained inclusions of slaked lime, beach gravel, charcoal and brick flecks and was very friable. Bonds wall P30 to underlying wall remains P47. Under P27, over P30.

P30. Single course of stones forming a repair of the churchyard wall on its southern side. The stones lay upon earlier wall P47 that was still standing on the northern side. P30 was bonded by mortar/rubble wall core P29, no mortar lay between the wall stones but the core bonded them together and to the underlying wall. P30 was built in from the edge of the earlier wall reducing the thickness of the wall by c. 0.20m. Under P29, over P48.

Group 7:16

D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D66 D65 D76 D77 D78

Group 7:16 consists of the flagstones and steps that lead up to the entrance at the west front of the cathedral. (D1, D2, D3, D4, D5, D6, D7, D8, D9, D10 D65 and D66), localised deposits on the south side (D11) and northern side (D76, D77 and D78) of the flagstones and steps, and localised levelling layers/dumps (D12, D13 and D14) under the flagstones D65.

The steps were mostly constructed as rectangles of large stones, using the cathedral as one edge of the rectangle, the cores were filled with silt and stones. These rectangular boxes became gradually smaller, so that each step protruded out from underneath the overlying one. Flagstones D65 were laid in front of the steps. Modern material was recovered from the cores of the steps, this may have been intrusive. They were cement bonded, but it is possible that the cement bonding was applied to an existing structure. Step D3 however lay under step D1, acting as a kind of foundation. The step was cement bonded and the core D4 also contained modern material. This step was not visible on the surface, the modern material could not have been intrusive and the step could not simply have been repointed with cement. This clearly indicates that the structures were modern. The steps are interpreted as a modern reconstruction, they are stratigraphically later than all the burials in D96.

Contexts

D1. Upper step into the cathedral's western entrance, consisted of stones of varying sizes, bonded by silt D2. Under D2, over D4.

D2. Brown silt that lay between the stones of step D1, probably more silting between stones than bonding, contained various modern finds. Over D1.

D3. Row of stones, lay under the western edge of step D1, between D3 and the cathedral wall lay D4. D3 wasn't visible on the surface. The stones were bonded by cement. Under D4, over D6.

D4. Brown silty sand that filled the core of step D3, contained small stones, brick fragments, fragments of human bone, and modern material. Under D1, over D3.

D5. Step of large stone blocks bonded with cement. The stones were laid in a line c. 1.5m out from the cathedral

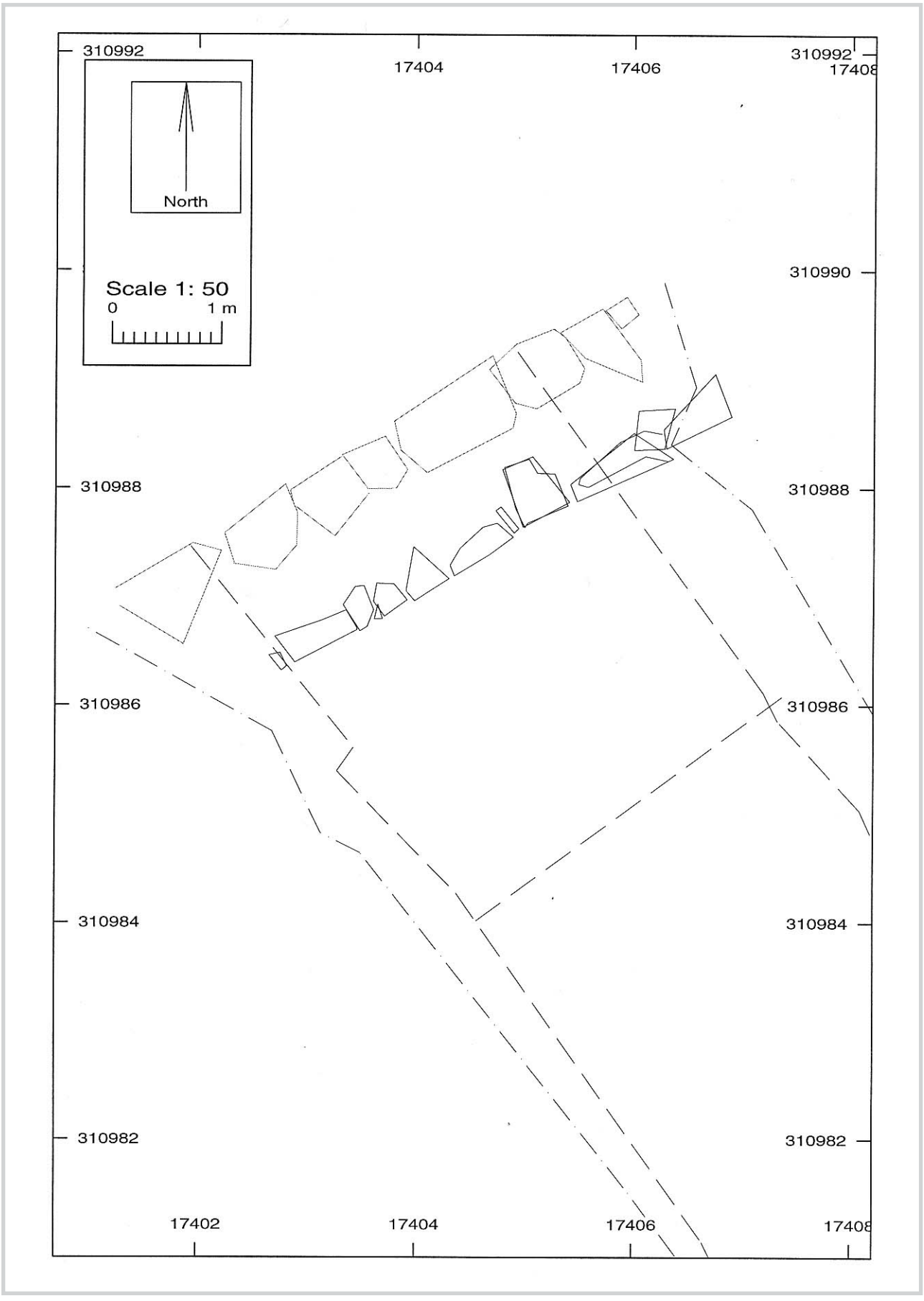


***Fig. 119**. Group 7:15, trench P96.*

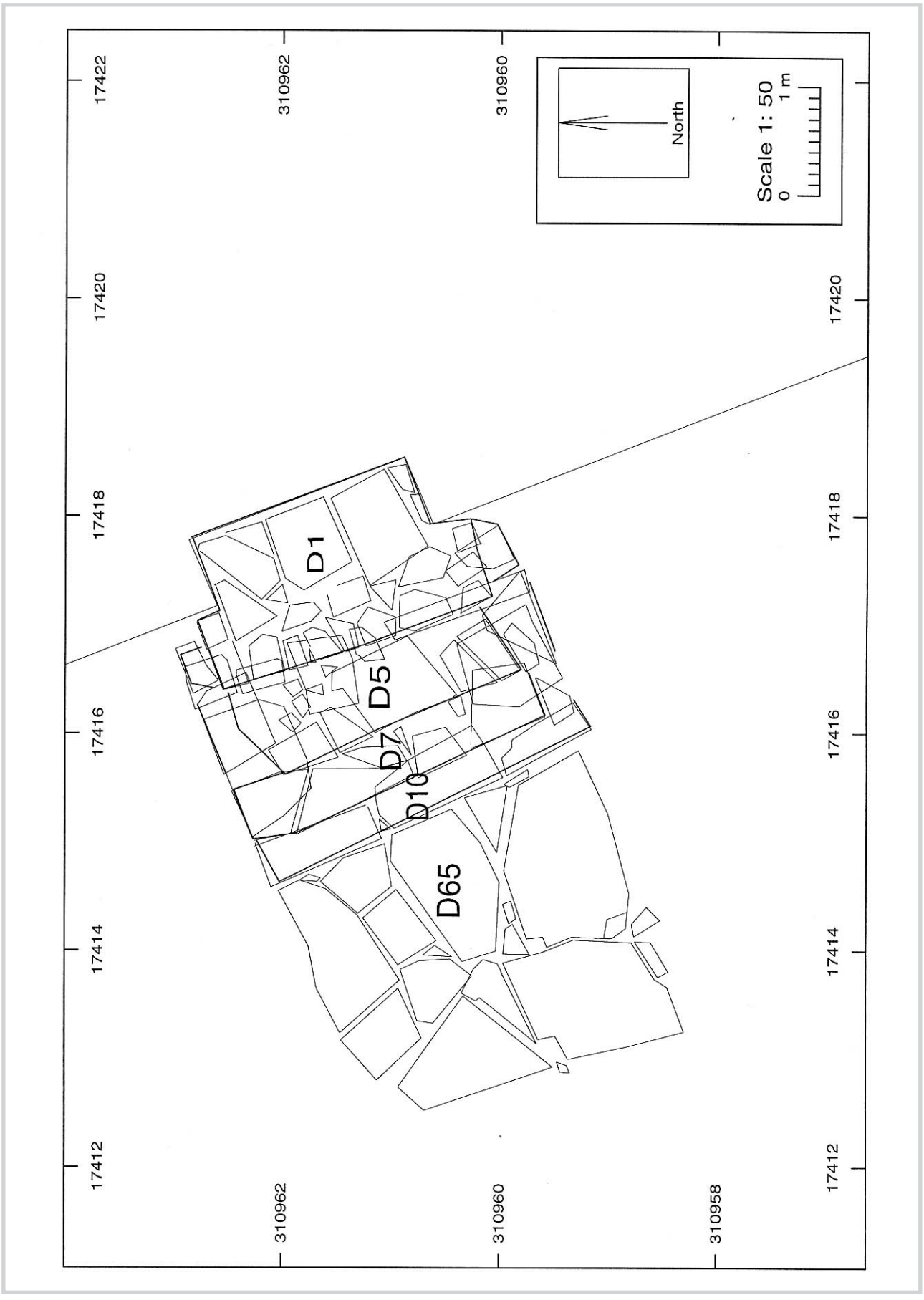


***Fig. 120**. Group 7:16, trench D96.*

wall. The outermost 0.75m - 0.90m of step 5 was visible, the rest lay under step D1. Under D6, over D8.

D6. Brown silty sand that filled the core of step D5, contained small stones brick fragments and modern glass. Under D3, over D5.

D7. Stone blocks laid in three rows, two of which are perpendicular to the cathedral, the third was parallel to the cathedral joining the other two forming a rectangular step with the cathedral wall. The step extended c. 2m out from the cathedral. The core of the rectangle was filled with D8. The outermost 0.5m of step D7 was visible, the rest lay beneath step D5. Under D8, over D9.

D8. Light brown sandy silt that filled the core of step D7, contained small stones, brick fragments mortar flecks and modern glass. Under D5, over D7.

D9. Light brown gravely clay that filled the core of step D10, contained small stones, mortar flecks, brick fragments and modern glass. Under D8, over D10.

D10. Step of large stones laid in a rectangle, the outermost 0.40m of the step was visible, the rest lay beneath step D7. D10 didn't extend right up to the cathedral wall. The core was filled by D9. Under D9, over D12 and D13.

D11. Layer of brown gravely humus rich silt, contained brick fragments, small stones, nails and slag. D11 lay against the southern edge of flagstones D65 and steps. Under D78, over D65.

D12. Compact layer of brown gravely silt, contained beach gravel. Only present in the NW corner of the trench under flagstones D65. Under D10 and D65, over D14.

D13. Layer of light yellowish brown sandy silt, contained small stones. Only present in a small area in the SW corner of the trench. Under D65, over D14.

D14. Dark brown silt, contained beach gravel and brick fragments. D14 covered the NW corner of the trench and overlay the underlying cut features. Under D12 and D13, over D15, D17, D19, D21, D23 and D28.

D65. Layer of large flagstones laid in front of the steps at the west front of the cathedral. Under D66 and D11, over D12 and D13.

D66. Brownish grey silt that lay between flagstones D65, contained modern material. Over D65.

D76. Turf and topsoil on the northern side of the flagstones and steps. Over D77, same as DL1(92).

D77. Layer of light yellowish brown gravely silt and crushed mortar. Lay on the northern side of the flagstones and steps. Under D76, over D78, same as DL2(92).

D78. Layer of yellowish crushed mortar and gravel. Lay on the northern side of the flagstones and steps. Under D77, over D11, same as DL3(92).

Group 7:17

H39 H40 H64 H65 H73 H74 H97

Group 7:17 consists of modern layers in trench H96-14. Turf and topsoil (H39), re-deposited demolition deposits (H40, H73 and H74) and a thin charcoal rich silt (H97) that lay sandwiched between these demolition deposits and the top of the graves. Silt/sand layers (H64 and H65) lay in pockets over the grave soil H63 (group 2:30) at the southern end of the trench. It appeared as though the surface of the grave soils had been truncated, it is likely that the original turf horizon was removed along with the demolition deposits in the 18/1900's. H97 was presumably deposited after this truncation episode, prior to the re-deposition of demolition deposits H40, H73 and H74. The latter two 'fill' the top of a deep depression/cut at the southern end of the trench. H64 and H65 'filled' hollows in the underlying grave soils H63. The underlying grave soils have clearly been truncated. That H64 and H65 were only present in hollows in the underlying layer could be taken to indicate that they have also been truncated. It is possible that these two layers are medieval in origin and should have been placed in group 2:30.

Contexts

H39. Turf and topsoil. Over H40, same as H75.

H40. Layer of pale yellowish mortar, brown silt and large stones. The stones were concentrated to the northern end of the trench, the silt and mortar were mixed together in varying concentrations. The layer varied in thickness from 0.15m - 0.30m. H40 probably represents demolition deposits re-deposited after renovation work in the 18/1900's. Under H39, over H73 and H97, same as H72, HL11(92) and HL12(92).

H64. Layer of dark brown silty sand, contained large and small stones, recorded from section only. Appeared to fill hollows in the underlying layer H63. Under H97, over H65.

H65. Layer of crushed mortar and dark brown silt, mixed together, contained small stones, recorded from section only. Appeared to fill hollows in underlying layer H63. Under H64, over H63.

H73. Layer of sand and crushed mortar, the layer was 0.10m - 0.20m thick, thickening and sloping down to the south. Under H40, over H74.

H74. Layer of stones of all sizes and mortar, some of the stones had traces of mortar on their surface. The layer was 0.05m - 0.15m thick, thickening and sloping down towards the south where it filled a hollow in the bedrock. H74 was stratigraphically over natural, H37, but from the 1992 excavation it was clear that there were a number of layers below this that filled a deep hollow in the bedrock/cut feature. Under H73, over H37.

H97. Thin layer of dark brown sandy silt, contained gravel and charcoal concentrations. H97 was only 0.01m - 0.05m thick, it lay sandwiched between re-deposited demolition deposits H40 and grave soil H66. Under H40, over H46, H49, H50, H52, H54 H64 and H66.

Group 7:18

U20 U21 U22 U23 U24 U28 U51 U61 U65 U74 U78 U79

Group 7:18 consists of modern activity in trench U96: a cable trench (U24 and U28), inspection pit (U20 and U21), a modern path (U22), turf and modern dumps (U23, U51, U61 and U74) and a modern cut against the barn wall (U78 and U79).

Contexts

U20. Modern cut for construction of an inspection pit. Under U21, over U23.

U21. Fill of modern cut U20. Under U22, over U20.

U22. Modern path of cobblestones set in gravel. Over U21, U27, U29 and U34.

U23. Layer of sandy silty clay, contained small and medium sized stones, brick fragments, mortar flecks and a clay pipe fragment. Varied in thickness from 0.30m - 0.70m, covered most of the eastern part of the trench. Under U20, U24 and U27, over U1, U6, U10, U13, U15, U19, U26, U32 and U39.

U24. Cut of a modern cable trench. Under U28, over U23.

U28. Gravel fill of cable trench. Under U22, over U24.

U51. Turf and topsoil layer, covered the western part of the trench. Under U78, over U54, U61, U65 and U74, same as U60. .

U61. Thin layer of silty clay sand, 0.03m thick, documented against the barn wall. Contained mortar flecks, brick fragments, small stones and gravel. Under U51, over U80.

U65. Layer of dark grey sandy silty clay, contained charcoal flecks, beach gravel and occasional brick fragments. Under U51, over U57 and U62.

U74. A layer of dark grey humus rich silt and modern material. Over U66.

U78. Cut feature placed against the wall of the barn, the cut was initially interpreted as a construction cut for the barn, but was modern. Under U79, over U51.

U79. Fill of U78, contained modern material, appeared to have been deposited fairly recently. Over U78.

Group 7:19

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T17 T18 T21 T24 T25 T26 T27 T28 T29 T30 T31 T32 T33 T34 T35 T36 T47 T48 T49 T57 T58 T59 T60 T61 T63

Group 7:19 consists of modern activity in trench T96. The trench was excavated in three separate sections. The turf (T1, T48 and T58) was numbered in each section. The western half of the NE/SW aligned section and the NW/SE aligned section consisted mostly of modern activity, predominantly dumping of rubble (T7, T18 and T33), gravel (T5, T49 and T62) and silt/clay deposits (T4, T6, T21 T22, T24, T25, T26, T27, T32, T35, T59, T60 and T63). A lens of mortar (T25) was also present sandwiched between the modern deposits. A number of modern cut features were also present (T2, T3, T9, T10, T30, T31, T36 and T57). A tarmac (T31) and a gravel (T47) path were also present. There was very little modern activity in the western part of the NW/SE aligned section of the trench.

A large stone structure (T17) was partially uncovered towards the northern end of the trench near the Museum Cafe. It was bonded by a sandy clay layer (T8) that also extended beyond the structure. T17's function is unclear but an iron pipe was seen under it, it was clearly of relatively modern date.

Contexts

T1. Turf and topsoil, contained small stones, brick and mortar fragments. Present over the whole trench. Over T2, T18, T21 and T22.

T2. Modern mixed fill of yellow brown sandy clay, blue grey clay and brown silt, contained stones of all sizes. Under T1, over T3.

T3. Cut feature, recorded from section, 3.60m long, 0.65m deep, part of the southern edge was visible in the base of the trench, it appeared to be aligned NE/SW. Under T2, over T4 and T8.

T4. Modern mixed deposit of blue grey clay, yellow brown sandy clay and brown silt. The deposits were mixed together but in places they also formed distinct 'layers'. Under T3, over T6.

T5. Mid grey gravely silt (c. 90%) and mortar flecks (c. 10%), contained small stones and brick fragments. Under T6, over T7.

T6. Mid grey silty clay, contained small stones, brick fragments and mortar flecks. Under T4, over T5.

T7. Loose rubble deposit, consisted of dark brown clay silt (c. 60%) and large stones (c. 40%). The stones were present in localised concentrations and also spread throughout the deposit. Contained brick fragments, mortar flecks and a few whole bricks. Under T5, not excavated.

T8. Extensive layer of grey green sandy clay, contained small and medium sized stones. Varied in thickness from 0.10m - 0.70m. Present in the northernmost 17.5m of the trench, bonds stone structure T17, and also extends beyond the structure. Under T3 and T18, over T9 and T17.

T9. Mixed fill of gravely silty clay (c. 70%) and stones of all sizes (c. 30%), contained brick fragments and mortar lumps. The fill was quite, loose, only the uppermost 0.20m was excavated, the stone content appeared to increase down the profile indicating that the deposit consisted primarily of rubble. Under T8, over T10.

T10. Cut feature, aligned roughly NE/SW, only the uppermost 0.20m was exposed, recorded from section only. Under T9, over T11.

T17. Structure of large unworked stone blocks ranging in size from c. 1m x 1m x 0.50m - 0.50m x 0.50m x 0.50m. The structure had a flat upper surface, it filled the whole width of the trench and was 2.50m long (N/S). The stones appeared to be bonded by T8, which was also present as a thick layer to the south. A modern iron pipe was recovered from under the structure. Under T8, over T15, same as T28.

T18. Rubble layer, comprised of mid brown gravely silt (c. 80%) and stones of all sizes (c. 20%), contained mortar lumps and flecks and brick fragments. Under T1, over T8.

T21. Mid brown humus rich silt, contained gravel, small stones, brick fragments, mortar flecks and modern material. Under T1, over T23.

T22. Dark brown humus rich clay silt, contained, brick fragments, mortar flecks and modern material. Under T1, over T23.

T24. Dark brown humus rich silty clay, contained brick fragments, mortar flecks and modern material. Under T27, over T25.

T25. Lens of white mortar, 4.50m long, 0.10m thick. Under T24, over T26.

T26. Dark brown/black humus rich silt, contained charcoal and modern material. Under T25, over T23.

T27. Mixed yellowish brown layer of gravel, sand and stones, contained modern material. Under T1, over T24.

T29. Fill of brown sandy silt, contained stones of all sizes, brick fragments, clay lumps and lenses and mortar flecks. Over T30.

T30. Cut of a modern cable trench, 0.50m deep. Under T29, over T32.

T31. Modern road surface of tarmac with a gravel bedding. Under T36, over T1 and T33.

T32. Mid brown humus rich silt contained small stones, occasional brick fragments and mortar flecks. Under T30 and T33, over T7.

T33. Mixed orange brown layer of sandy clay (c. 70%) and small stones (c.30%), contained occasional brick and mortar fragments. Under T31, over T32.

T35. Dark brown sandy silt, contained small stones, brick fragments, and yellow and grey clay lumps and lenses. Over T36.

T36. Cut of modern feature, no pipe or cable was visible, but the feature was not bottomed. Under T35, over T31.

T47. Modern gravel path. Over T48.

T48. Turf and topsoil. Under T47, over T39 and T46.

T49. Gravel make-up layer, < 0.40m thick. Under T57, over T53 and T71.

T57. One number issued for both cut and fill of a 5m long (E/W) modern cut feature, not bottomed. Under T58, over T49 and T61.

T58. Turf and topsoil. Over T57 and T59, same as T62.

T59. Mid brown humus rich silt. Under T58, over T60.

T60. Light grey clay mixed with humus rich silt and gravel. Under T59, over T61.

T61. Grey clayey gravely silt. Under T57 and T60, not excavated.

T63. Brown humus rich silty clay, contained gravel and small brick fragments. Under T62, over T65, same as T64.

Group 7:20

Q1 Q2 Q40 Q45 Q46 Q47

Group 7:20 consists of the turf and topsoil (Q1), modern soil (Q45, Q46 and Q47) and demolition (Q2 and Q40) layers in trench Q96. Only the turf Q1 and silt layer Q46 covered the whole trench. The other deposits were dumped against the churchyard wall that formed the southern limit of trench Q96. These layers are interpreted as being dumped here during the reconstruction of the churchyard wall (group 7:14), probably in the 1900's.

Contexts

Q1. Turf and topsoil, grey brown humus rich clay silt, contained small stones and brick and mortar fragments. Over Q47.

Q2. Layer of white mortar, contained medium sized stones and occasional brick fragments. The layer butted the northern face of the churchyard wall and was present across the entire trench (E/W), extended c. 1m out from the churchyard wall (N/S), c. 0.20m thick against the wall tapering away to the north. Towards the western end of the trench the mortar was predominately yellow and the layer contained less stones. The layer is localised to the northern side of the churchyard wall and appears to be a demolition deposit of relatively modern origin, probably related to reconstruction of the wall in the 1900's. Excavated by hand and machine. Under Q45, over Q49.

Q40. Layer of white mortar and large stones, contained brick fragments. Present in the eastern part of the excavated area, the layer was c. 0.60m thick to the SE tapering away to the NW. Both the upper and lower surfaces were irregular. The layer probably represents dumping of demolition deposits during the reconstruction of the churchyard wall in the 1900's. Under Q46, over Q45.

Q45. Layer of dark greyish brown silty clay, contained small stones. The layer butted against the NE face of the churchyard wall. Only present in the eastern half of the trench. Under Q46, over Q2.

Q46. Layer of mid greyish brown gravely silty clay, contained small and medium sized stones and brick fragments, covered most of the excavated area. Once trench S96 had been excavated it became apparent that two separate contexts had been recorded as Q46, a new context, Q49 has been created to represent the lower part of this soil layer. The evidence from trench S96, where the soils were separated by other contexts, suggests that the two stratigraphic units belong to different groups. Under Q47, over Q40, same as S2.

Q47. Layer of light brown clay, only recorded in the northernmost 3m of the excavation, 0.30m+ thick. Under Q1, over Q46.

Group 7:21

S1 S2 S3 S9 S20 S21 S37 S38 S39

Group 7:21 consists of modern activity in trench S96. Topsoil and subsoil layers S1 and S2 covered the whole trench, except where modern path S9 was present. Modern dumping deposits S20 and S37 were recorded at the western end of the trench towards Lake Mjøsa. These layers consisted of what appeared to be demolition deposits from the cathedral mixed with modern material. They may have been dumped there to build out the shoreline. A possible turf line of recent date (S21) underlay these deposits. Cut S39 and gravel fill S38 were also included in this group. The date of this activity was not certain but is more likely to be of recent origin.

Contexts

S1. Turf and topsoil. Humus rich dark brown clay silt, contained occasional small stones. Under S3, over S9 and S20, same as Q1.

S2. Mid to dark brown slightly sandy silt, contained small and occasional larger stones, small brick fragments, small lumps and flecks of mortar and occasional charcoal flecks. Some of the stones display traces of burning on their surface. The layer varies in thickness from 0.10m - 0.40m, it is generally thicker to the east where there are also more inclusions. The layer is extensive covering the whole trench. Under S9 and S37, over S4, S11, S12, S17, S23 and S27, same as Q46.

S3. Modern gravel path, cut down into layers S1 and S2, 1.40m wide, 0.40m deep. Over S1.

S9. Modern dump of light grey clay. Under S1, over S2.

S20. Mixed deposit of mid grey clay silt (c. 60%), small and medium sized stones (c. 20%) and mortar lumps (c. 20%). Some of the stones had traces of mortar on their surface and some were burnt. The layer also contains brick fragments, charcoal and wood fragments and modern glass. The layer was loose and unconsolidated, it increased in thickness towards the west and is present up to the edge of the beach. It appeared to be modern filling and make up of the shoreline using demolition deposits from the cathedral. Under S1, over S37.

S21. Mid brown slightly clayey gravely silt, quite humus rich, contained small stones, brick fragments and occasional mortar flecks. Sloped down towards the west, < 0.20m thick. The layer had few inclusions, it was buried by modern dumping and was probably a turf line of recent date. Under S37, over S17 and S38.

S37. Modern dumping layer, consisted of dark grey clay silt (c. 60%), gravel (c. 20%) and stones of all sizes, limestone, water worn and others (c. 20%). Also contained brick fragments and charcoal flecks. Similar to S20 but not the same context. Under S20, over S2 and S21.

S38. Dark grey deposit of gravel (c. 40%), silt (c. 40%) and small to medium sized stones (c.20%), also contained brick fragments, mortar lumps and charcoal flecks. Fills cut S39 to the east but fades out to the west, i.e. there is no return to cut S39. Under S21, over S39.

S39. Possible cut, only registered in the northern section and only has an eastern end, either open towards Mjøsa or eroded by the lake. Cuts into the fills of cut S14, and into natural, 0.60m deep, cut at a c. 60° angle rounding to a flat base, c. 3m long. Under S38, over S17.

10 Summary

10.1 The excavated graves and development of the churchyard

10.1.1 Graves

The remains of 90 individuals were recovered from the 1996-1998 excavations. The 1988, 1991 and 1992 excavations combined uncovered 482 intact graves and evidence, including disarticulated bone, for over 1000 individuals (see Sellevold 2001:93 and 121).

Burials were excavated from the following trenches, the number of individuals is given in brackets: B96-4 (13), D96 (27), E96-1 (4), H96-9 (1), H96-10 (2), H96-14 (32), J96-8 (4), M96-11 (2), P96 (1), and R96 (4). The southern side of the churchyard that produced so many burials in the earlier excavations was only investigated by three small trenches H96-9, H96-10 and E96-1. Only a small proportion of the area outside the east wall of the chancel B96-4 was excavated. Three quarters of the burials recorded during this project were from outside the west front, from trenches H96-14, D96 and J96-8.

In many cases, especially outside the west front, it was difficult to define grave cuts. In the well draining soils around the churchyard remains of coffins were sparse. In addition to fragments of wood, nails, post-mortem movement of the bones and the position of the feet were used as indicators of a coffin burial. The bones could only move around after the flesh had decayed if they had the space of a coffin in which to do so. Likewise the feet would be more likely to fall flat if they were within a coffin. In the absence of direct evidence, the position of the feet was used as an indicator.

Eleven of the registered individuals were probably buried in coffins: BG40 BG46 BG65 DG71 DG82 DG85 DG92 DG100 DG103 MG144 and RG335. RG335 was an infant recovered from the grave chamber in the north arcade (group 4:6). Remains of the coffin and its lid were preserved, as was a bier that the coffin rested upon. The remains of a second coffin in the chamber was empty. This had been filled with burnt lime. A collection of bones recovered from the backfill of the feature were in all probability the remains of the individual that was buried in this coffin. This burial is not one of the eleven noted above.

In addition to the grave chamber a triple grave was excavated in the crossing (group 2:14). Two of the burials had been disturbed by robbing activity. Some of the bones were stained reddish brown. Three belt buckles were recovered, one on the top of each femur of the northernmost individual and one on the top of the femur of the middle individual. These burials appeared as though they may have been wrapped in shrouds, the decay of which stained the bones. A thin layer of organic residue was also present in the base of the grave. This may indicate a bier or wooden flooring. A copper bowl that contained ash and charcoal had been upturned near the head of the middle individual. This was probably an incense burner used in the burial procession.

In addition to the aforementioned triple grave it is possible BG65 was also wrapped in a shroud (group 2:18). The grave cut was spacious, there had been some movement of the bones and traces of wood were recovered all of which suggest a coffin burial however.

Charcoal had been placed around or on the body in six cases: BG30 BG65 DG72 HG27 HG31 and RG125. A copper bowl that contained ash and charcoal was also recovered from the triple grave in the crossing. A coin in a leather pouch had been placed on the chin of BG40. Small lumps of crystal were recovered from two graves where they appeared to have been deliberately placed around the bodies: double burial DG50/DG51 and DG100.

Where grave cuts were definable four double burials were recorded: DG42/DG43 DG50/DG51 HG31/HG32 and HG33/HG34, and one triple burial in the crossing (RG124 RG125 RG126). At both the eastern (groups 3:7 and 3:8) and western (group 4:26, 4:31 and 4:32) ends of the churchyard a row of burials lay c. 1.50m out from the cathedral wall. All the aforementioned double burials lay outside the west front in the row nearest the cathedral. These also appeared to be the latest burials in this area.

There was evidence of possible graves in the floor of the north aisle (group 5:1). None of these were excavated. The graves were marked with rough stone settings. These graves are interpreted as having been dug after the lay area of the cathedral was no longer in use. There was also evidence that graves had been dug at the eastern end of the south aisle. It appeared as though they had been

opened. A stone lined cist was partially uncovered in the north transept, built flush against the walls in the NW corner (group 2:9). A second grave in the crossing was defined on the surface, but not excavated (group 4:9). The upper fill of the grave had been removed, but the burial did not appear to have been disturbed.

A burial chronology based on changes in the position of the arms and hands has been worked out by Kieffer-Olsen, based on material from Denmark. The chronology was tested during the 1992 excavation. The original dating was modified slightly, but it appeared as though it could be applied to the Hamar material (Pedersen E. A. 2000:180). After adjustment for the Hamar material by Pedersen, the chronology is:

- A - arms and hands along the sides of the body (1000 - 1250)
- B - arms and hands folded over the pelvis (1000 - 1350)
- C - arms and hands folded over the abdomen (1250 – 1450/1500)
- D - arms and hands folded over the chest (1350 - 1500)

Many of the burials excavated during this project lay partially outside the excavated area. The arm position was recorded for only 19 of the ninety burials. No examples of arm position A were recorded. BG43 and DG72 had arm position B. BG16, BG23, DG51, HG2, HG78 and RG125 had arm position C. BG40, BG46, DG42, DG43, DG50 and HG28 had a combination of arm positions C and D. BG26, BG65, DG26 and DG50 had arm position D.

Only for burials BG65 and RG124, both with arm position D, is there a conflict between other dating evidence and the arm position chronology. Both of these burials may have been buried in shrouds however, which would have forced the hands up over the chest into position D. The grave relationships and other dating evidence did not conflict with the arm position chronology.

10.1.2 The churchyard

The cathedral was built upon a limestone ridge, slightly askew to the alignment of the ridge. At the NW corner of the cathedral the ridge slopes away sharply. The western wall was built out into the slope. The foundations were built upon bedrock and make-up deposits dumped against them to build up the ground level. A variety of material was used, re-deposited moraine clay, stone working debris and demolition deposits of uncertain origin. The churchyard at the western end of the cathedral was built up as part of the construction of the cathedral (groups 2:24, 2:28 and 2:30). Graves appear to have been dug before the ground level was fully built up (groups 2:23 and 2:27). The NW corner and north side appear to have been open, only thin silt layers accumulated there (groups 2:21 and 2:22). The ground surface must have sloped sharply away from the NW corner of the cathedral until it was built up some time after 1420 (groups 4:16, 4:20, 4:21, 4:23 and 4:24). This make-up dumping appears to have built up the ground surface considerably, and also built out the area of horizontal terrain towards the north. There was evidence of graves being dug in this area after the terrain was changed, but the area did not appear to have been extensively used for this purpose (see 6.1.2 Period 4 summary for a discussion).

The ground level at the NE corner was also built up, probably in connection with the extension of the chancel towards the east (group 3:15). One burial was registered in trench M96-11 that pre-dated this activity and one that post-dated it. It is debatable whether the use of the area for burials was the primary reason for this change in the terrain.

A trench was dug through the churchyard wall in P96. The original wall was a stone and turf construction (group 2:25), built after 1240. The ground surface appears to have had the same level on either side of the wall. It was replaced after 1420 by a mortar bonded wall of large stone blocks (group 4:25). Extensive make-up dumping of rubble accompanied the building of this wall (group 4:24). It functioned as a retaining wall, the ground surface was now higher on the inside than the outside of the churchyard. The wall was repaired twice on the inside face, probably as part of the modern restoration work (groups 7:14 and 7:15). A dry stone wall reconstruction with a turf core runs along the north, south and eastern sides of the churchyard today. In trench P96 the external face and uppermost stone of this wall were actually part of the medieval wall.

A mortar bonded stone structure, interpreted as the churchyard wall, was uncovered in trench U96 (group 4:37). This was constructed after 1250. An excavation in 1916 uncovered the easternmost churchyard wall, now reconstructed, and a parallel stone structure, described as a fence (Dahl 1916:65-66). This was probably the original churchyard wall, the same as the stone and turf wall uncovered in P96. The later wall was presumably rebuilt to the east after the chancel was extended. The wall uncovered in U96 is interpreted as being built to connect the existing southern wall with the extension to the east. A section of the southern wall was uncovered in trench

W96. This was a mortar bonded stone wall and functioned as a retaining wall. It is unclear when it was constructed, but given the evidence from trenches P96 and U96 it is likely that this was secondary, possibly built at the same time as the wall in U96. This raises the question as to whether the original southern wall was a retaining wall or not, and whether the terrain on the southern side has also been altered.

10.2 The development of the cathedral

Remains of a mortar bonded stone structure were uncovered in the base of a grave in the crossing (group 1:3). It appeared to be the remains of a wall that lay c. 0.50m under the level of the earliest floor. The ground level was partly built up over this structure with demolition deposits. Some of the stones in these deposits had traces of mortar on their surface (group 2:16). Outside the west front, primary make-up layers in trench J96-8 also consisted of demolition deposits (group 2:24). The presence of a mortared wall and demolition deposits used as primary make-up strongly suggest that a stone structure, presumably a church, stood on the site prior to the construction of the cathedral. The available evidence however gives no indication as to the size or layout of this structure, or whether it had been completed when the construction of the cathedral began.

Two foundation rafts were partially uncovered at the west end under the columns of both the north and south arcades (groups 2:7 and 2:1 respectively). They were only uncovered at the western end, it is not known whether these foundations extended under the whole length of the arcades or whether they were an extra foundation at the west end. Five altar foundations were laid on the western face of certain columns in both arcades. The altar foundations that are visible today appeared to be reconstructions however (see groups 7:2 and 7:3). Two of these may have been added later and constructed of brick and mortar. Two further brick and mortar altar foundations may have been added either side of the chancel arch (see group 4:4).

A linear, N/S aligned stone and timber structure ran across the crossing in front of the chancel arch (group 2:15). The feature was only exposed in a small test pit, but could be traced over a length of 5m by a depression in the overlying deposits. It consisted of flat stones laid upon a timber beam. The original mortar floor (group 2:12) was laid upon the stones. A posthole that was part of the structure appeared to continue in use after the floor was laid. The structure is interpreted as the foundation of a screen that separated the chancel from the nave. It was only in use during the first period of the cathedral, going out of use after the floor level was raised.

The floor in the crossing is assumed to have been raised in connection with the rebuilding of the east end of the cathedral. The thresholds that demarcate the crossing and transepts from the nave and aisles (groups 3:1, 3:2 and 3:3) were laid in connection with this raising of the floor level, they were not part of the original cathedral. The central tower was also rebuilt as part of the remodelling of the eastern end. The gap between the original tower bases (group 2:13) on the E/W axis was 4.20m - 4.50m, masonry was added to each base (group 3:3), narrowing the gap between them to 2.50m. This narrowing effectively created a ‘corridor’ between the crossing and the transepts. Whether this was a consequence of the need to strengthen the tower bases or a deliberate act is unclear.

The original floor in the crossing and north transept probably consisted of thin layers of mortar (groups 2:8 and 2:12). The layers were only exposed in two limited areas, a small area was excavated. The mortar had been relaid several times, thin layers of silt/dust lay sandwiched between the mortar layers. The earliest floor remains uncovered in the north and south aisles were of bricks set in a bed of mortar (groups 2:3, 2:4 and 2:6). The bricks were laid in pairs; adjacent pairs were placed perpendicular to one another. No traces of the brick floor were present in the crossing or north transept, no trace of the mortar floor was uncovered in the aisles. Whether this situation is a reflection of the real development of the flooring in the cathedral is unclear. One possible interpretation is that the floor in the crossing and transepts was laid prior to the introduction of brick as a building material, whereas the nave and aisles were completed later and the new material taken into use. A coin recovered from the mortar floor in the crossing implies it had been laid before 1260. A find from a grave in 1992 indicates that brick was in use in Hamar by 1263 (Pedersen 2000:196). The latest floor in the crossing, transepts, aisles and possibly also the sacristy consisted of large, c. 0.25m x 0.25m, unglazed red tiles set in a bed of beach gravel (groups 4:3, 4:5, 4:7, 4:8 and 4:10). The tiles were laid in the crossing and transepts after the floor level was raised by 0.20m and the thresholds constructed. A seal stamp, connected to an individual that was alive in 1346 was recovered from the backfill of a robber cut in the crossing. The seal stamp is interpreted as coming from a grave that was dug after the ground surface was raised. This would appear to indicate that the tile floor had been laid by a short time after 1346. The only dating of the tile floor in the aisles was through association with the grave chamber, this indicated it was

laid some time after 1310. It is not clear whether the tiles were laid in the eastern part of the church and the lay area simultaneously.

A possible point of contention with the interpretation of the laying of the brick and mortar floors could be that it is unlikely that a prestigious new material would be used for the lay area leaving the eastern end with an 'old fashioned' mortar floor. A coin in a grave that cut through construction debris related to the extension of the chancel towards the east indicates that the construction was in progress already by 1299 (see group 3:9). It appears therefore that the first cathedral would have been completed and in use a maximum of 50 years (assuming brick was introduced after 1250) before the extension towards the east was started. The floor levels in the crossing and transepts are assumed to have been altered as a part of this rebuilding. It is debatable therefore how long the supposed disparity between the floors of the nave and crossing was in place. The rebuilding of the eastern end is considered to be a redevelopment in gothic style. The first use of gothic architecture outside of Nidaros was in Bergen in 1230 (Ekroll 1997:44). The eastern ends several important churches were rebuilt in the 1200's: St Mary's in Bergen was rebuilt after a fire in 1248, St Mary's in Oslo was rebuilt in the first half of the 1200's, St. Halvard's in Oslo was rebuilt after a fire in 1254 and Stavanger cathedral was rebuilt after a fire in 1272 (see Lidén 1981:84-88 and Ekroll 1997:44-45). It is not inconceivable therefore that the remodelling and 'renewal' of the eastern end of the cathedral was already being considered as the western end was completed. The apparent disparity between the floor surfaces could have been viewed as temporary.

The extension of the chancel was dated in 1992 by inference to after 1300, possibly as late as 1350 (Pedersen E. A. 2000:197). The evidence uncovered in trench B96-4 however had a direct and unequivocal connection to the construction activity and dated the extension as being in progress by 1299.

The transepts were interpreted as being secondary additions to the cathedral, built or extended between 1250 and 1350 (Sæther 1998:59-61; Pedersen E. A. 2000:193-4). This interpretation is based in part on the observation of the outside of the north wall of the north transept in both 1988 and 1992. A mortar foundation/raft that was part of the wall contained brick fragments, dating it to after 1250. The foundation of this wall was also exposed on its inside face in this excavation (R134, group 2:10). No brick fragments were observed on the inside of the wall however. The foundation exposed on the outside of the wall also extended beyond the wall. Given the apparent absence of brick on the inside of the wall, the possibility that the raft on the outside was a secondary addition to strengthen the wall should be considered.

The foundations of the north wall of the north aisle and the west wall of the north transept were exposed on their outside faces where they met in trench V96 (group 2:10). The foundation of the north transept appeared to butt the foundation of the north aisle. In the SE corner of the south aisle the remains of two walls were exposed where the south wall of the aisle met the west wall of the south transept. The remains of the brick floor butted the walls strongly suggesting they were part of the original walls. They were only exposed on the surface, appearing to butt one another rather than being interleaved. It was not clear which was earlier.

The evidence recorded in the 1996 excavations is inconclusive. The absence of brick from the foundation on the inside of the wall of the north transept would appear to contradict the basis for the earlier interpretation. That the walls at both the northern and southern corners appear to butt one another would appear to support an interpretation of the transepts not being contemporary with the aisles. Whether this relationship is relevant depends on how the construction of the cathedral progressed, i.e. whether the foundations were laid out in one episode or whether they were built out in sections. If the latter was the case the observed relationships between the walls doesn't necessarily indicate that the transepts were later additions.

There was evidence from the SW corner of the south aisle that it had been remodelled (see groups 2:1 and 4:2). The area under the tower was divided off from the south aisle by a stone threshold. On the west side of this threshold lay a step down into the room. No trace of the original floor was uncovered. The room appeared to have been remodelled at a later date. The level was raised and a possible wooden floor laid over the area. The step was covered over, but the threshold continued to mark off the area as a separate room. The northern and southern boundaries were remodelled with a brick kerb. These changes appeared to be more cosmetic than structural.

A large stone foundation outside the eastern end of the cathedral was partially excavated (group 4:13). The structure had been exposed in 1988 and 1992. It was interpreted as the foundation for a tower that supported a walkway from the Bishops Residence to the cathedral. It

is possible that the room north of the chancel and immediately west of the foundation was constructed at the same time as the foundation. It was not possible to conclusively determine how the supposed walkway had been constructed or how it entered the cathedral.

10.3 The area outside the churchyard

Evidence of an old beach line of Lake Mjøsa was uncovered in trench Q96. This took the form of an interface between the moraine clay and interleaved layers of gravel. The gravels dominated throughout trench S96 down to Mjøsa and the clay dominated to the east in trench T96. The boundary lay at c. 129.00 m over sea level.

It had been suggested (Sæther 1995a:81) that a pond extended along the northern side of the Bishops Residence in the medieval period, functioning as a defensive feature. Moraine clay was uncovered in the base of trench T96 along the north side of the post medieval barn. The natural terrain in T96 clearly indicated that the pond did not extend so far west. Dumping of modern rubble at the eastern end of trench T96 may indicate that the pond extended approximately up to the point at which trench T96 turned to the NW.

Cooking pits and pits used to heat stones to boil water were excavated in trench Q96 (group 2:32). Evidence for the use of both types of hot stone technology were present in this trench. It was not possible to determine whether they were contemporary or not. Radiocarbon dates from two of the cooking pits indicated that they could be related to the construction of the cathedral or could be earlier.

A charcoal burning pit was recorded from the profile of trench S96 (group 2:33 and 2:34). This was placed on the contemporary beach line of Lake Mjøsa. It is unclear whether the charcoal was intended to be used in the construction of the cathedral or removed by boat to elsewhere. A radiocarbon date obtained from the feature was inconclusive. The charcoal burning could be dated to the construction period of the cathedral or earlier.

The area along the north side of the churchyard, trenches S96, Q96 and T96, appeared to have been open terrain during the use of the cathedral and beyond into the period of the post medieval farm. Some rubbish pits, in all probability of medieval date, were recorded in trench T96 (group 4:41). A collection of large stones along the line of Bishops Street did not appear to have been deliberately laid (see group 4:41). A sill wall and a stone foundation presumed to relate to the post medieval farm were also uncovered in trench T96 (groups 6:4 and 6:5), the foundation however may have been of medieval date.

Along the southern side of the churchyard, post 1250 make-up dumping was the earliest activity recorded (group 4:40 in trench U96). This was overlain by a turf horizon (group 4:39). The secondary churchyard wall (group 4:37) was built after this turf had established itself. The turf appeared to continue to form the external surface after the wall had been constructed. Evidence of burning (group 5:6), possibly from the 1567 fire, was dumped over this turf and a series of post holes (group 5:7) of unknown function were cut through it. The ground level was built up in the post medieval period and a sill wall and drain relating to a phase of the farm were constructed (group 6:1).

Further evidence of activity connected to Storhamar farm was uncovered in the form of cellars under the main house in trench X96 (group 6:10). The cellars were constructed in the post medieval period.

In the modern period there appears to have been some dumping of demolition debris to build out the beach line of Lake Mjøsa at the western end of trench S96 (group 7:21).

No evidence for the medieval secular settlement was uncovered.

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