

## An Archaeological Watching Brief at Holy Jesus Hospital, Newcastle upon Tyne



**ARS Ltd Report No. 2013/83**

February 2014

**OASIS no. archaeol5-165287**

---

**Compiled By:**

Craig Huddart and Scott Williams  
Archaeological Research Services Ltd  
The Eco Centre  
Windmill Way  
Hebburn  
Tyne and Wear  
NE31 1SR

**Checked By:**

Chris Scott MIfA  
Tel: 0191 477 5111  
Fax: 0191 477 7687  
admin@archaeologicalresearchservices.com  
www.archaeologicalresearchservices.com

---



# An Archaeological Watching Brief at Holy Jesus Hospital, Newcastle upon Tyne

ARS Ltd Report 2013/83

February 2014

Archaeological Research Services Ltd

---

## Contents

	List of Illustrations.....	
	List of Tables.....	
	Executive Summary.....	2
1.	Introduction.....	3
2.	Location and Geology.....	3
3.	Historical and Archaeological Background.....	4
4.	Aims and Objectives.....	5
5.	Methodology.....	5
6.	Evaluation Results.....	6
7.	Human bone assessment.....	16
8.	Radiocarbon dating.....	19
9.	Discussion.....	21
10.	Publicity, Confidentiality and Copyright.....	21
11.	Statement of Indemnity.....	21
12.	Acknowledgments.....	22
13.	References.....	22
	Appendix I: Context register	
	Appendix II: Photographic register	

## List of Illustrations

Figure 1. Site location.....	3
Figure 2. Approximate location of works, shown in blue .....	5
Figure 3. East facing view of opening of Trench 1. ....	6
Figure 4. South facing view of Trench 1, showing exposed cast iron pipe. Scale = 1m.....	7
Figure 5. East facing view of Trench 1. Scale = 1m.....	8
Figure 6. West facing view of Trench 1. Burial 1 apparent to right of shot. Scale = 1m. ....	8
Figure 7. North facing view of Trench 1. Burial apparent in foreground. Scale = 1m.....	10
Figure 8. Showing position of burial 1 at northern end of Trench 1. Scale = 1m.....	10
Figure 9. Burial 1. Scale = 1m.....	11
Figure 10. Opening of Trench 2.....	12
Figure 11. North facing view of Trench 2, showing exposed waste pipe (009).....	12
Figure 12. Trench 1 sections .....	13
Figure 13. Trench 1 plan.....	14
Figure 14. Trench 2 plan and section .....	15
Figure 15. Skeletal Inventory Diagram.....	18
Figure 16. Calibration graph for the Burial 1 sample. ....	20
Figure 17. Recalibrated date range taking into account the marine influence. ....	20

## List of Tables

Table 1. Radiocarbon dating results, prior to recalibration .....	19
---	----

## **Executive Summary**

*In October 2013 Archaeological Research Services Ltd was commissioned by The National Trust to undertake an archaeological watching brief for the purposes of monitoring ongoing maintenance of the drainage system in the grounds of Holy Jesus Hospital in Newcastle Upon Tyne. It was deemed necessary to relay a section of failed sewer and install an inspection chamber. This scheme of archaeological works related to drain diversion works to be carried out by Seymour's. The works were carried out in the grounds of Holy Jesus Hospital, which is a Grade II\* listed building and is also listed as the John George Joicey Museum (1116207). The proposal involved excavation to a maximum drainage depth of 0.46m and a manhole depth of 0.6m*

*Holy Jesus Hospital lies within the site of a former Augustinian Priory (HER 1436). The Priory was suppressed and dissolved in 1539 and Holy Jesus Hospital was founded and built in the grounds of the former priory in 1681. A Grade II\* listed building known as Austin Friars Tower (HER 4826) is attached to the northern wall of Holy Jesus Hospital and dates from the 13<sup>th</sup> Century.*

*The watching brief comprised two trenches; Trench 1 was located on a paved area, directly to the north of the Holy Jesus Hospital building and was orientated north to south, extending from the northern wall of the building. The original trench measured approximately 1.04m in width  $\times$  1.82m in length and had a maximum depth of 1.01m.*

*During the monitoring of drain repairs in Trench 1, a partially articulated human skeleton was observed in a truncated grave cut. The grave was orientated east to west, and the remains were inhumed with the head (which was missing) at the western end. The individual, whose sex was indeterminate, was aged between 35 and 50 years and presented a stature of between five feet four inches and five feet eight inches in height. The skeletal remains appeared to continue beyond the original western limit of excavation, and therefore Trench 1 was extended. Only fragmentary human remains were recovered in the extension, and it was likely that the upper portion of the skeleton had been destroyed or removed during the installation of the adjacent manhole.*

*Radiocarbon determination of the remains provided a calibrated date range of 1265 – 1395 cal AD at 95.4% probability. However, it was noted that there was a likely marine influence affecting the dates, and therefore the dates were recalibrated taking the marine reservoir effect into account. This recalibration provided a date range of 1295 – 1435 cal AD at 95.4% probability. These recalibrated dates sit firmly within the known chronology of the Augustinian Friary, and therefore it is more than likely that the individual was an inhabitant of the Friary, or a lay patron.*

*The individual appears to have consumed a diet comprising almost one third of marine derived food. The location of the friary close to the River Tyne, and approximately 8.5 miles from the North Sea, would have facilitated access to this food source. It is probable that the ecclesiastical inhabitants of the friary shared a similar, if not the same, diet as the secular inhabitants of the city.*

*Trench 2 was located in the female toilets inside Holy Jesus Hospital and was dug against the northern wall of the building, immediately to the south of Trench 1. Trench 2 measured 0.45m in width  $\times$  0.59m in length  $\times$  0.47m in depth and contained no finds or features of an archaeological nature.*

## 1. Introduction

1.1 In October 2013 Archaeological Research Services Ltd was commissioned by The National Trust to undertake an archaeological watching brief for the purposes of monitoring ongoing maintenance of the drainage system in the grounds of Holy Jesus Hospital in Newcastle Upon Tyne. It was deemed necessary to relay a section of failed sewer and install an inspection chamber. This scheme of works involved removal of an existing sewer pipe and installation of a replacement with a manhole chamber, carried out by Seymours. The works took place within the grounds of Holy Jesus Hospital, which is a Grade II\* listed building and is listed as the John George Joicey Museum (1116207). The interventions involved excavation to a maximum drainage depth of 0.46m and a manhole depth of 0.6m

1.2 Previous archaeological works were carried out in 2002 by Bernicia Archaeology when sandstone foundations, brick walls and fragments of pantiles were discovered. Therefore, the planned works were perceived to have the potential to impact on significant archaeological remains.

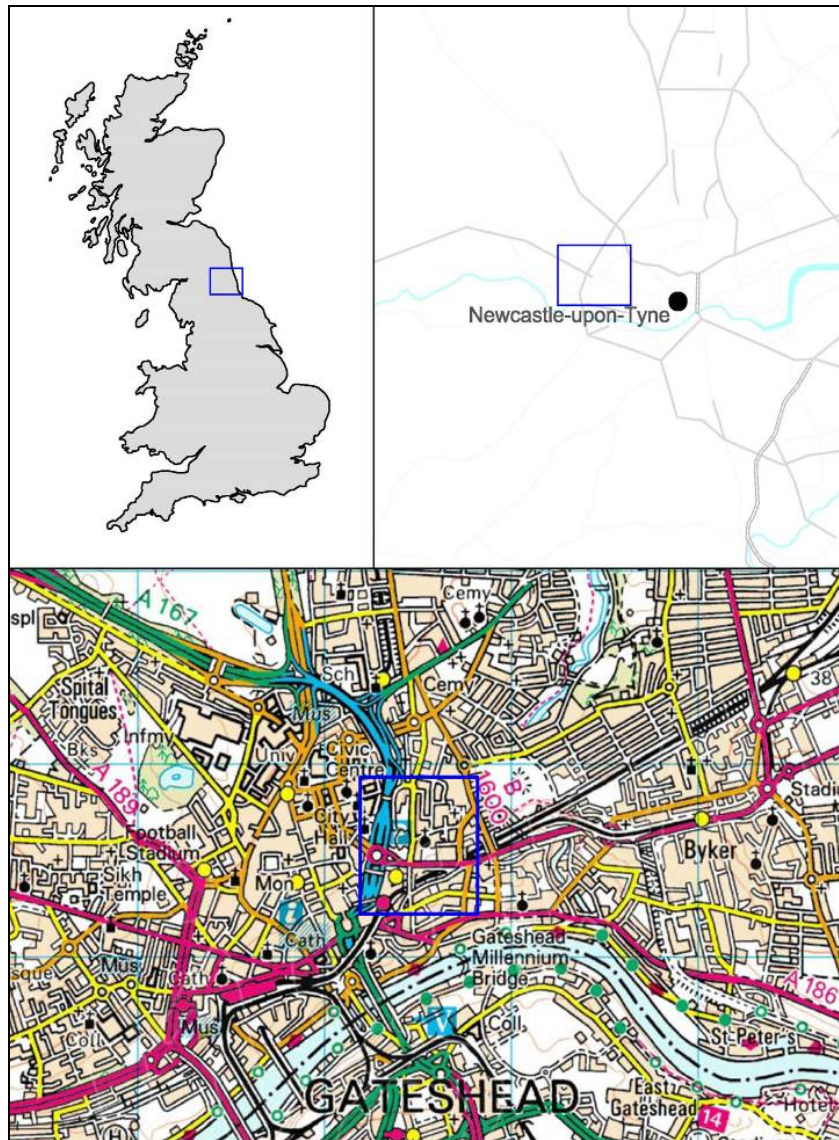


Figure 1. Site location.

Ordnance Survey data copyright OS, reproduced by permission, Licence no. 100045420

## **2. Location and Geology**

2.1 The site is located at NGR NZ 25369 64183. The underlying geology is composed of the Pennine Middle Coal Measures Formation – Mudstone, Siltstone and Sandstone (BGS 2013).

## **3. Historical and Archaeological Background**

3.1 Austin Friary (HER 1436) was first recorded on the site in 1291 and by the late 14<sup>th</sup> century a small friary precinct existed. The friary was suppressed and dissolved in 1539 and the land passed to the mayor and burgesses of Newcastle. Burials were found both in the church (i.e. under the Holy Jesus Hospital) and in the area of the cloister (HER 1437)

3.2 Austin Friars Tower (HER 4826) is attached to the north side of Holy Jesus Hospital and is Grade II\* listed (listed in 1954 – 304463). The tower was built in the latter half of the 16<sup>th</sup> century and consists of four walls, standing three storeys high.

3.3 A fine medieval effigy of a knight (HER 13538) was found during excavations in 1970 and was identified as Sir Henry Staunton, with a date of after 1320 given.

3.4 A late 17<sup>th</sup> century ‘pant’ is situated at the entrance to Holy Jesus Hospital and is Grade II\* listed ( Listed in 1987 304464). The pant is of a sandstone construction and is octagonal in shape.

3.5 Holy Jesus Hospital (also listed as the John George Joicey museum) (HER 4825) is a Grade II\* Listed building (1116207) and was founded in 1681 on the site of the former Austin Priory. The Mayor and Burgesses of Newcastle upon Tyne founded the hospital for the relief of Freemen, their widows and unmarried children. The building was built on a parcel of land called the Manors, a freehold which belonged to the town, and it housed a master and 39 poor freemen. The Holy Jesus Hospital Act of 1847 regulated the hospital. Under this Act the Corporation had to pay out of the Walker Estate £800 per annum for the support and maintenance of the hospital. By 1926 they were authorised to provide £500 per annum from the rates. By 1937 the institution had re-sited to Spital Tongues because the original building was declared unfit. Thanks to a bequest from John George Joicey in 1968, the building became a local history museum. The museum closed in 1995. The hospital building is three storeys high with an open arcade of brick arches on square pillars at ground floor level. It is one of only two complete C17 brick buildings to survive in Newcastle.

3.6 City Road, which was built in 1882-3, passes over the site of a lawn which formerly fronted the hospital.

## **4. Aims and Objectives**

4.1 The purpose of the work was to gain information about the archaeological resource, including its presence or absence, character, extent, date, integrity, state of preservation and quality, in order to formulate an appropriate mitigation strategy to ensure an appropriate recording, preservation or management of the resource. In particular:

- i) the presence or absence of archaeological features their quality, depth and preservation.
- ii) an assessment of their significance and importance in line with NPPF (CLG 2012)
- iii) the likely impact of the proposed works upon any such features
- iv) the appropriate mitigation of the development's impact upon those remains.

## 5. Methodology

5.1 The proposal involved the replacing of a damaged foul water pipe and the creation of a new inspection chamber (see Figure 2). There was potential for encountering archaeological deposits beyond those seen previously in 2002, mainly within the scope of the slight enlargement of excavation for the inspection chamber.

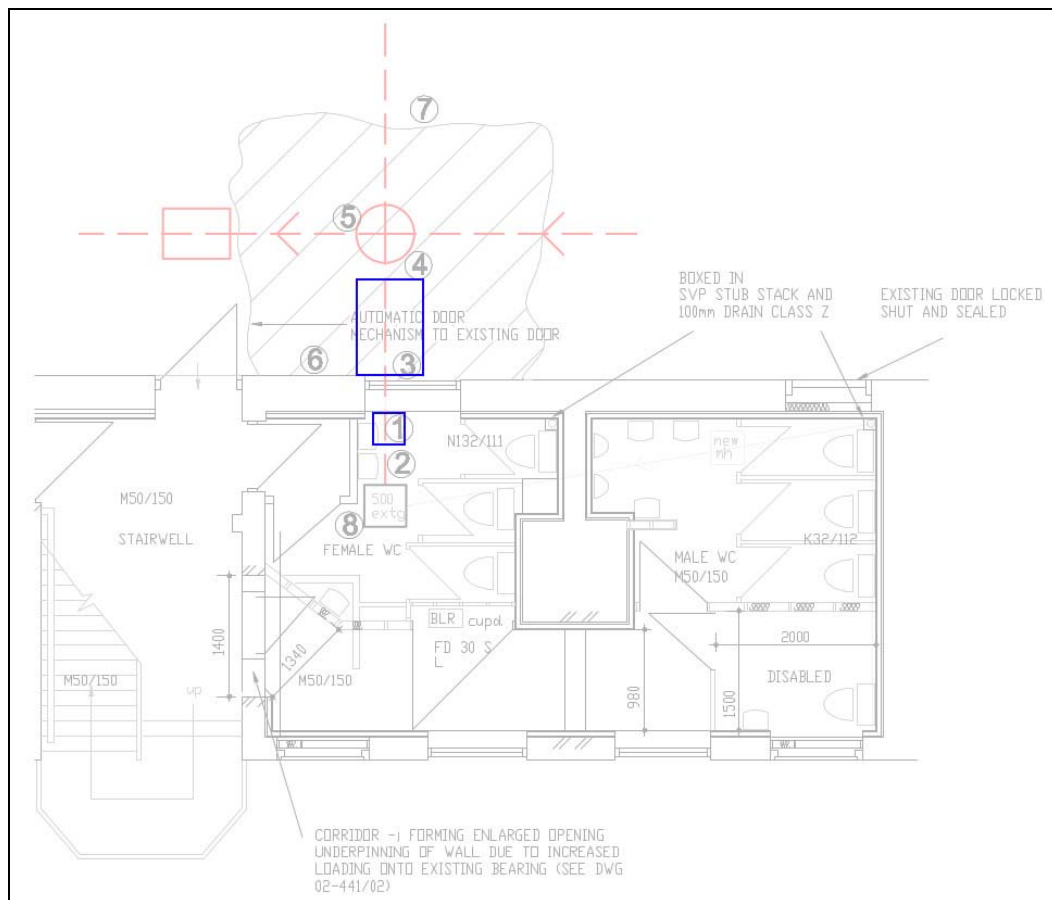


Figure 2. Approximate location of works, shown in blue

5.2 The works were determined not to require planning permission or listed buildings consent; although on an undertaking that full archaeological overview would be maintained.

5.3 All archaeological fieldwork, recording of archaeological features and deposits and post-excavation analysis was carried out to acceptable standards as set out in the Institute for Archaeologists' *Code of Conduct* (2012) and *Standard and Guidance for Field Evaluation* (2009).

5.4 The evaluation trench was hand dug by operatives supplied by Seymours under the direct and continuous management and direction of a suitably qualified member of staff

from ARS Ltd.

5.5 The deposits were recorded according to the normal principles of stratigraphic excavation. Each context (see Appendix 1) was recorded on pro-forma records which included the following: character and contextual relationships; detailed description (dimensions and shape; soil components, colour, texture and consistency); interpretation and phasing as well as cross-references to the drawn, photographic and finds registers.

5.6 The trench was planned at 1:20. Trench sides were also drawn in section at a scale of 1:10. All deposits and the base of each trench were levelled and heights are expressed in metres above Ordnance Datum.

5.7 A photographic record was maintained (see Appendix 2) including photographs of all significant features and overall photographs of each area or trench. All images were taken in black and white and colour print, and digital format, and contained a graduated photographic scale. The main photographic archive will comprise 35mm b/w and colour SLR print film, supplemented by digital SLR (minimum 12 megapixels).

## 6. Evaluation results

### 6.1. Trench 1

6.1.1 Trench 1, which was orientated in a north to south direction, was located within a paved area extending from the northern wall directly to the north of the Holy Jesus Hospital building (Figures 2 and 3). The original trench measured approximately 1.04m in width x 1.82m in length (Figure 2).



Figure 3. East facing view of opening of Trench 1.



6.1.2 A paved surface, Context (001), was removed and a light yellow fine sand (002) was encountered. (002) had a maximum depth of 0.09m and was a bedding layer for (001). Directly below (002) was a loose tarmac layer (003), which had a maximum depth of 0.11m and continued across the full width of the trench. This deposit represented an earlier surface in this area. Beneath (003) was a re-deposited back fill layer (004) which had a maximum depth of 0.68m and extended the full width of the trench. (004) comprised mid-orangey brown silty sand and contained frequent broken bricks and small to medium sub angular stones. A corroded metal object was found within (004) which appeared to be a wall hook. A cast iron pipe (009) 0.13m in circumference was encountered at a depth of 0.47m and was (Figure 4), and was found to be a relatively horizontal pipe, which extended along the full length of the trench. This was the pipe that required replacement.



Figure 4. South facing view of Trench 1, showing exposed cast iron pipe. Scale = 1m

6.1.3 A disused ceramic pipe (005) was encountered at a depth of 0.39m on an east-west orientation, located approximately 0.37m from the northern wall of the building (Figure 5). (005) was approximately 0.20m in circumference and had largely been removed to facilitate the installation of (009). (005) was sat directly on top of a small rectangular stone slab (006) measuring approximately 0.33m in width by 0.05m in thickness, which appears to have been used to provide stability to the ceramic drain above. At a depth of 0.68m and approximately 0.26m from the northern limit of Trench 1, a concrete deposit (010) was encountered (Figure 6), which was approximately 0.36m in width. The measured depth of the deposit was 0.16m, although it appeared to continue below the limit of the excavation, so wasn't possible to ascertain its true depth. It was assumed that (010) encased a sewer pipe and needed to be removed to facilitate the installation of a new manhole chamber.



Figure 5. East facing view of Trench 1. Scale = 1m.



Figure 6. West facing view of Trench 1. Burial 1 apparent to right of shot. Scale = 1m.

6.1.4 While attempting to ascertain the limit of (010), a human burial (Burial 1) was encountered which was aligned east to west along the northern side of the trench (Figure 7). The left leg and foot, and right leg, were found in an articulated position (Figures 8 and 9). The burial appeared to be in a relatively undisturbed grave fill (008), which was a mid-orangey brown clay, with infrequent small sub-rounded pebbles. A probable grave cut [007] was visible in the eastern trench wall and was 0.44m in width and 0.33m in depth. The upper portion of [007] and (008) had been truncated during the installation of (009) and the laying down of (010). The burial appeared to continue beyond the original western extent of the trench, subsequently the trench was extended to the west by 0.80m in length and 0.43m in width.

6.1.5 The trench extension necessitated the removal of a section of decorative bricks (013) within the existing modern surface. These bricks were 0.10m in width, 0.22m in length and 0.05m thick. Below (013) was (002), which had a maximum thickness of 0.09m and (003), which had a maximum thickness of 0.10m. Directly beneath (003) was (016) which had a maximum depth of 0.26m, and was a re-deposited backfill layer which comprised a mid-yellowish brown sandy silt, with frequent broken bricks. Immediately beneath (016) was a continuation of (010), which extended the full width and length of the extended trench (Figure 6). Context (010) was 0.05m in thickness and appeared to be associated with the adjacent brick lined manhole chamber (012). (012) was exposed to a depth of 0.76m and was 9 brick courses high. (010) was removed in the trench extension area and directly underneath it was (011), a mid-orangey brown clay which appeared to be a similar fill to (008). However, it became apparent that (011) had been heavily truncated and the truncation was probably associated with the installation of (012). (011) contained frequent occurrences of small pieces of broken concrete and also contained a piece of modern silver foil from a cigarette packet. Burial 1 did not continue to the west as was first assumed and several pieces of disarticulated bone (partial pelvis, arm bones, ribs and a portion of vertebrae) were found within (011). It is probable that the remainder of the burial was removed during the works associated with (012). Also present in (011) was a fragment of mortar, 1 piece of shell and a small, partially worked piece of flint. In the northern trench side it was possible to see the cut [014] for the installation of (009); also visible was [015], which appeared to be a cut for the associated works for the installation of (012).



Figure 7. North facing view of Trench 1. Burial apparent in foreground. Scale = 1m.



Figure 8. Showing position of burial 1a at northern end of Trench 1. Scale = 1m.



Figure 9. Burial 1. Scale = 1m.

## 6.2 Trench 2

6.2.1 Trench 2 was located within the female toilets, immediately south of the northern wall of Holy Jesus Hospital and immediately to the south of Trench 1 (Figure 10). Trench 2 was 0.45m in width x 0.59m in length x 0.47m in depth.

6.2.3 A concrete floor surface (017) was broken through and was found to have a thickness of 0.23m and continued for the full length and width of the trench. Directly below (017) was a re-deposited demolition layer (018). This layer was a slightly silty, sandy soil with frequent modern bricks, broken roof tiles and broken concrete. (018) had a visible depth of 0.42m. Contained within (018) was the cast iron waste pipe (009). This pipe extended north into Trench 1 and south into an adjacent manhole. 0.44m of (009) was visible in Trench 2 (Figure 11). No finds or features of archaeological significance were present in Trench 2.

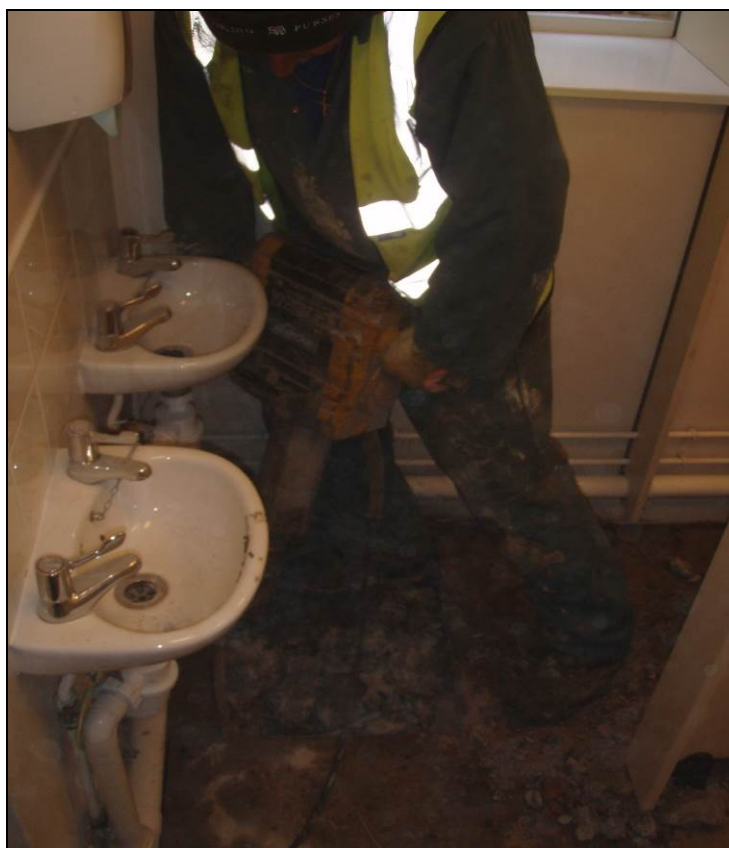
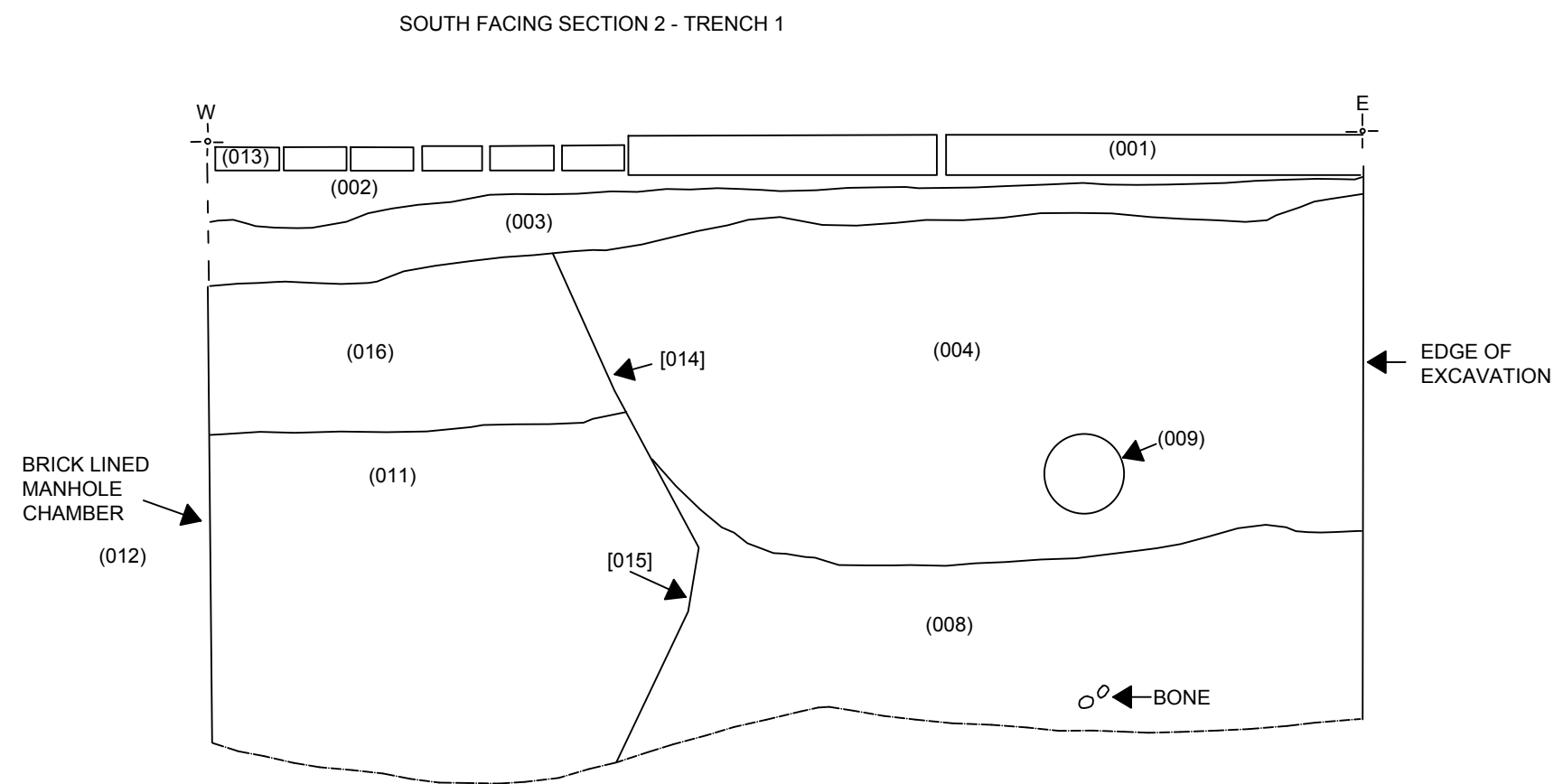
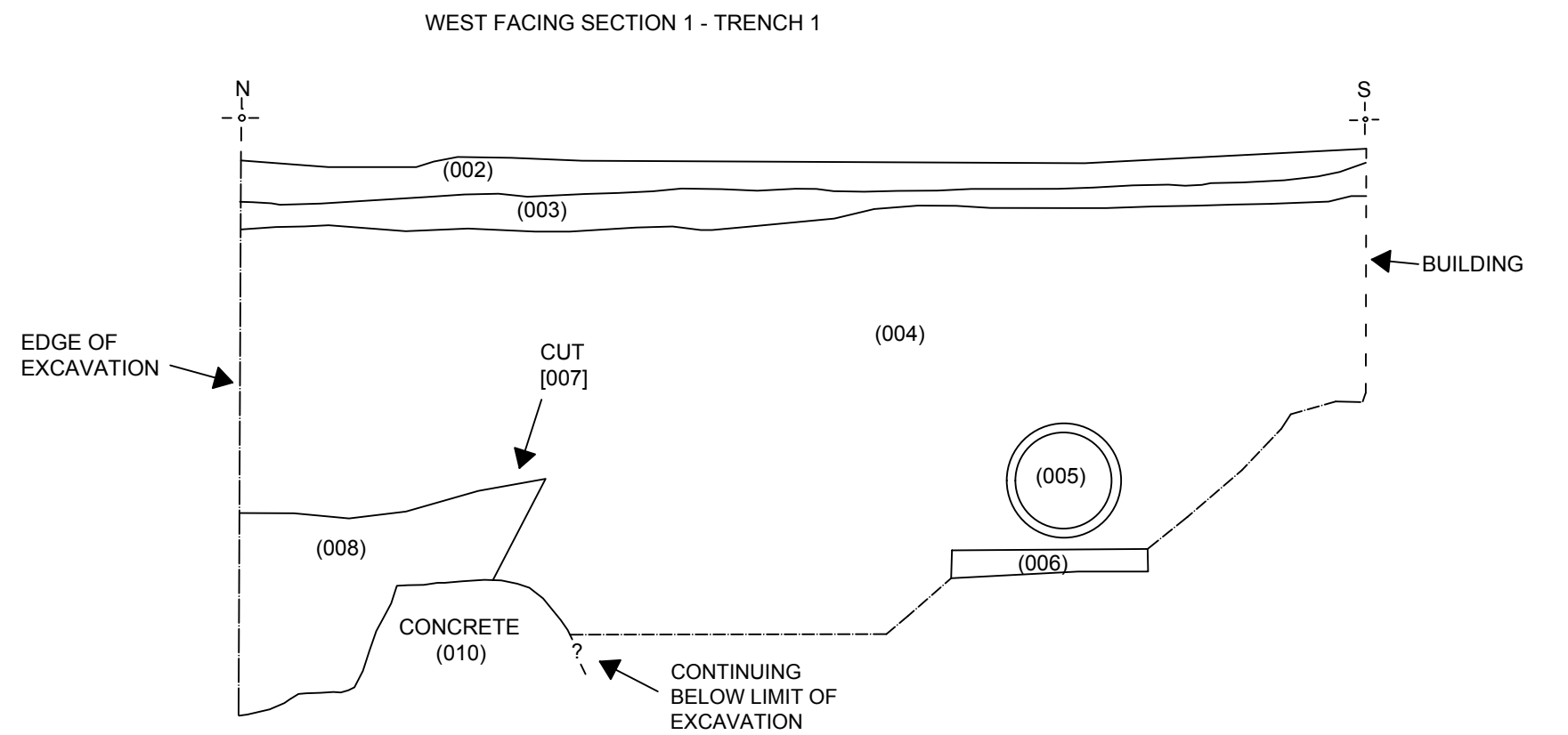


Figure 10. Opening of Trench 2.



Figure 11. North facing view of Trench 2, showing exposed waste pipe (009).

Figure 12. Trench 1 sections  
Scale: 1:16 at A4

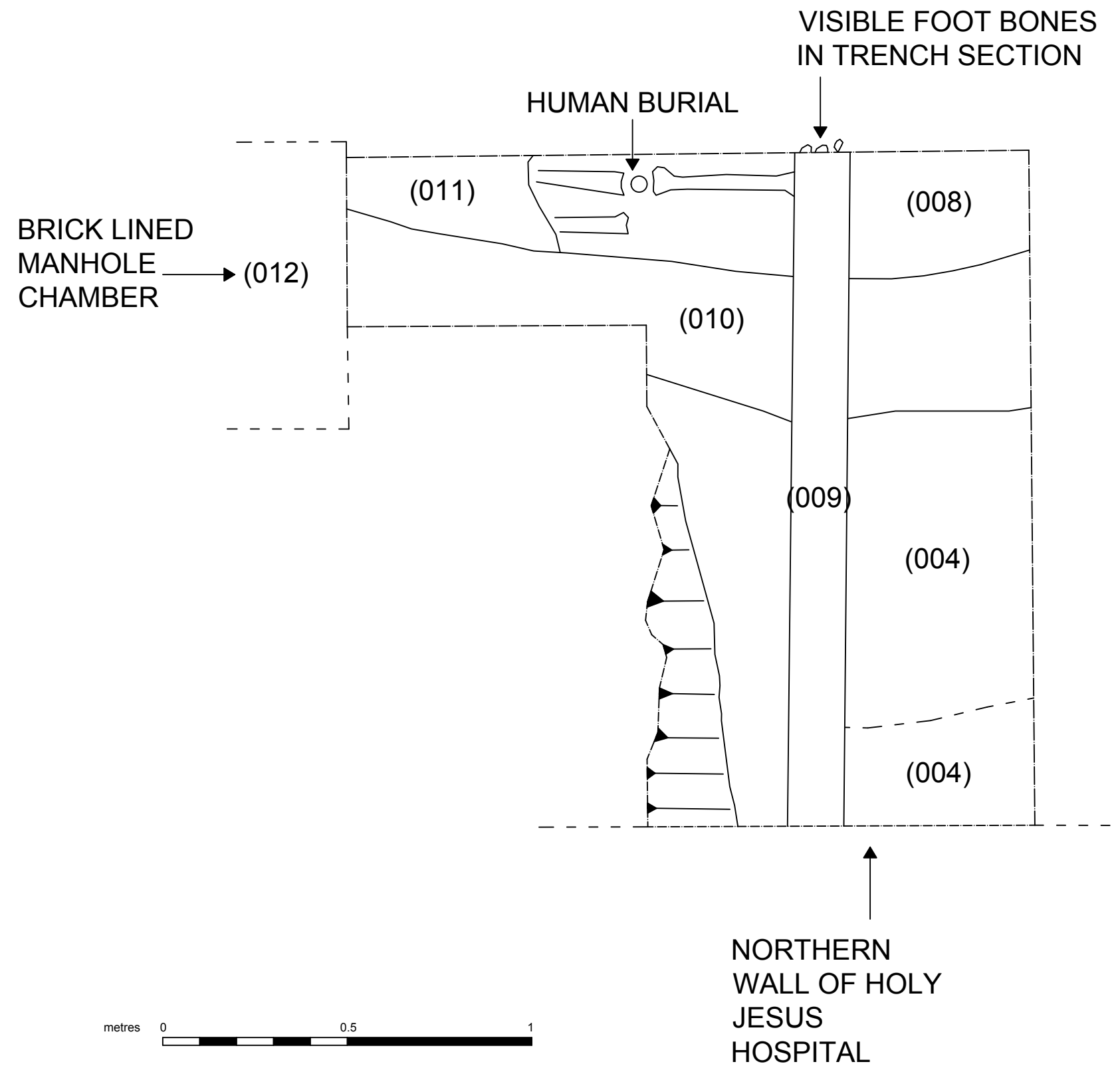


Key:

Copyright/ Licencing  
This Drawing  
© A.R.S. Ltd

Ordnance Survey data if applicable  
© Crown Copyright, all rights reserved  
reproduction with permission.  
Licence No. 100045420

Figure 13. Trench 1 plan  
Scale: 1:20 at A4



Key:

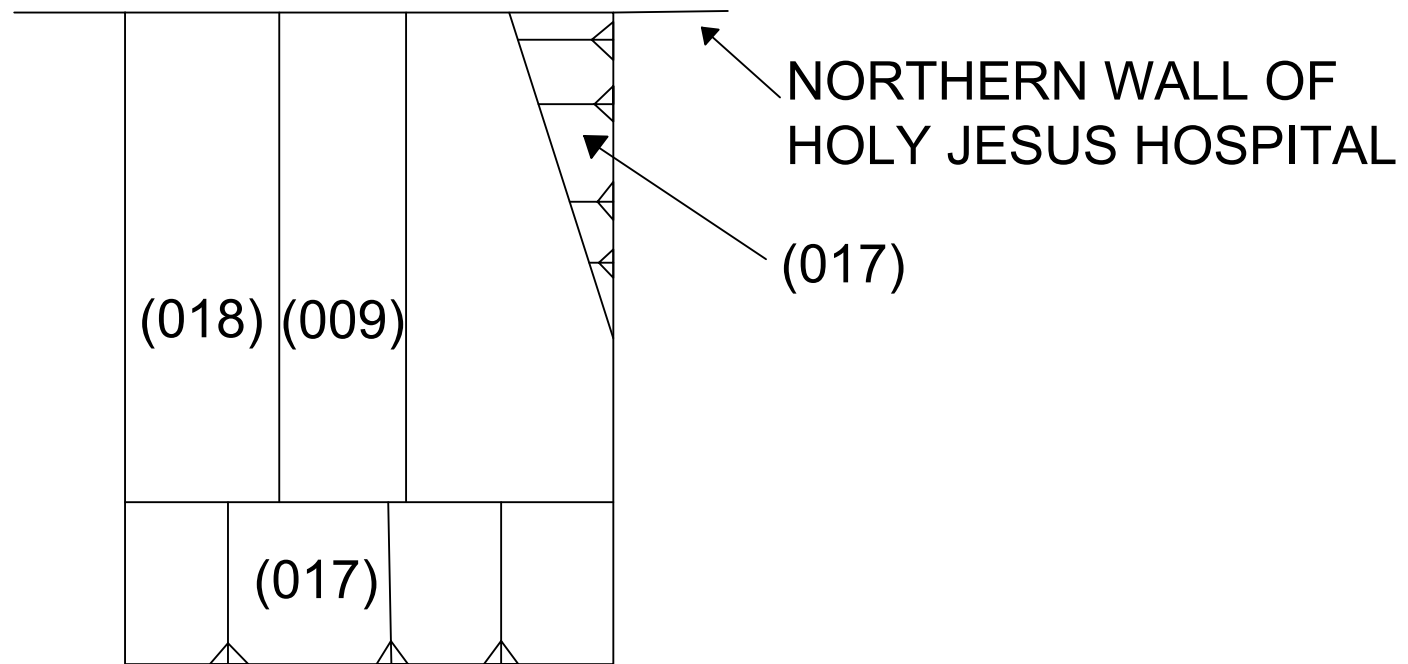
Copyright/ Licencing  
This Drawing  
© A.R.S. Ltd

Ordnance Survey data if applicable  
© Crown Copyright, all rights reserved  
reproduction with permission.  
Licence No. 100045420



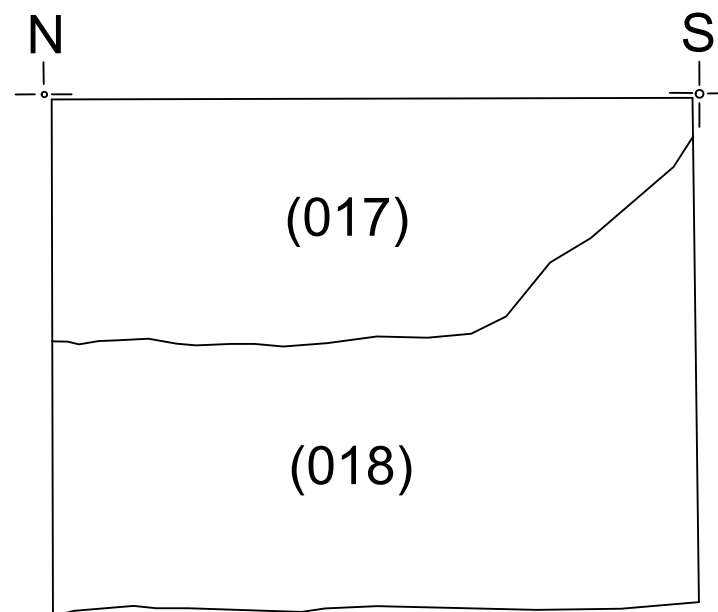
Figure 14. Trench 2 plan and section  
Scale: 1:10 at A4

### PLAN TRENCH 2



Key:

### WEST FACING SECTION - TRENCH 2



Copyright/ Licencing  
This Drawing  
© A.R.S. Ltd

Ordnance Survey data if applicable  
© Crown Copyright, all rights reserved  
reproduction with permission.  
Licence No. 100045420

## **7. Human bone assessment**

### **Kate Mapplethorpe**

#### *7.1. Introduction*

7.1.1. These remains were recovered during an archaeological watching brief at Holy Jesus Hospital, Newcastle upon Tyne. Articulated human remains were recovered from a single context, context (008), but were found to be missing most of the pelvis and upper body due to the previous construction of a manhole over this area.

7.1.2. The remains were carefully excavated using a leaf trowel and were removed to the Archaeological Research Services Ltd office in Tyneside for analysis.

#### *7.2. Methodology*

7.2.1. The remains were carefully washed with a soft brush and allowed to air dry. The remains were then laid out in anatomical position and each bone examined for completeness, non-metric traits and pathological lesions. Age and sex was determined where possible.

7.2.2. The methods used in the analysis of the remains are based on the recommendations of Brickley and McKinley (2004). Age estimation was based on the Lovejoy et al. (1985) auricular surface method (1989), while sex estimation of the remains was undertaken using the sexually dimorphic traits of the os coxae (pelvis) where possible. The stature of the remains was assessed using equations set out in Brothwell and Zakrzewski (2004).

#### *7.3. Preservation*

7.3.1. The surface preservation of the remains was assessed using standards set out by Brickley and McKinley (2004). The system scores bone preservation between 0 and 5+, where 0 is equivalent to “surface morphology clearly visible with fresh appearance to bone and no modifications” and 5+ is equivalent to “Heavy erosion...across the whole surface, completely masking normal surface morphology...with extensive penetrating erosion resulting in modification of profile”.

7.3.2. These remains showed two different degrees of surface preservation. Areas of the bone surface had flaked away revealing the bone beneath (Grade 5) while other areas were very well preserved (Grade 1).

#### *7.4. Age Estimation*

7.4.1. Age estimation is usually carried out using a combination of methods. In this case, due to the fact that a large part of the pelvis was missing from the assemblage, the only method that was able to be used was assessment of the auricular surface (Meindl and Lovejoy 1985). The right auricular surface was partially present, although much of it was missing. For this reason the assessment should be used as a guideline rather than a statement of fact.

7.4.2. The auricular surface was smooth and slightly granular, indicating an age of between 35 and 50 years of age at death.

#### *7.5. Sex Estimation*

7.5.1. Sex estimation of human remains is usually carried out using the sexually dimorphic traits of the skull and pelvis. The skull of this individual was not included within the

assemblage and most of the pelvis was damaged or missing. The greater sciatic notch of the right pelvis was present, and therefore this could be used. It is, however, unfortunate that the greater sciatic notch was scored as a '3', as this is an indeterminate score whereby the individual could be either a gracile male or a robust female.

#### 7.6. *Stature*

7.6.1. Both the left tibia and fibula of the individual had been recovered complete and therefore these could be used to estimate stature. The equations for stature estimation are based upon known values for white and black American males and females, and are separated as such. We know that this individual is most likely to have been a Caucasian, however we do not know if the individual is male or female. Therefore, the stature was calculated for both.

7.6.2. The length of the tibia suggests a stature of 170.14cm for a male ( $\pm 3.29$ cm) and 167.14cm for a female ( $\pm 3.57$ cm), and the fibula suggests a stature of 169.59cm for a male ( $\pm 3.37$ cm) and 166.22cm for a female ( $\pm 3.66$ cm). Therefore it can be said that the stature of this individual during life was between approximately 163 and 173cm (5 feet 4 inches to 5 feet 8 inches)

#### 7.7. *Pathology*

7.7.1. No pathological lesions were found on the remains from this assemblage. This does not necessarily mean that the individual was completely healthy, however. The poor surface preservation on areas of the bones may have masked any lesions that were originally present upon the bone surface when the individual was buried. Also, any illness that affected the soft tissues without affecting the bones would not be detected. This can often be the case with many lethal, fast-acting illnesses such as smallpox, cholera, typhoid and diphtheria as the sufferer often does not live long enough for the bones to be touched, but can also be the case with many longer lasting, degenerative illnesses such as Parkinson's Disease, diabetes, heart disease and some cancers.

#### 7.8. *Discussion*

7.8.1. The remains recovered from the watching brief at Holy Jesus Hospital were found to be an individual between 35 and 50 years of age and of indeterminate sex, with a stature of between five feet four inches and five feet eight inches. No pathological lesions were found.

#### 7.9. *Recommendations*

7.9.1. No further analysis is recommended for the recovered bones. If additional work is undertaken at the site the results of this assessment should be added to any further relevant assessment produced. If radiocarbon dating is to be undertaken it is recommended that a portion of the right tibia should be used.

7.9.2. If the remains are to be retained for museum deposition they should be packaged within acid-free tissue paper inside archival quality cardboard boxes. Any plastic bags used should be punctured to prevent the build-up of harmful microclimates and silica gel should be included within the boxes.

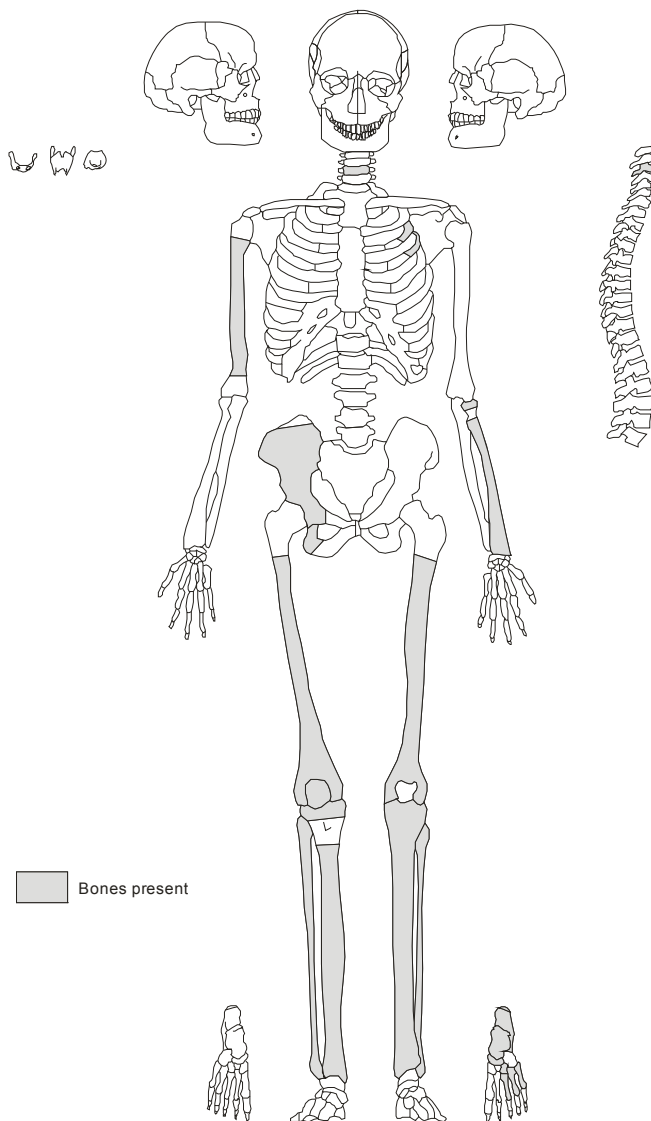


Figure 15. Skeletal Inventory Diagram

## 8. Radiocarbon dating

### Professor Gordon Cook and Scott Williams

8.1 A single sample was submitted for radiocarbon determination to the Scottish Universities Environmental Research Centre (SUERC), being a portion of the right tibia. The sample was measured by AMS as described by Zondervan and Sparks (1997). The laboratory maintains a continual programme of quality assurance procedures and takes part in all international inter-calibration studies. The calibrated age ranges were determined using the Oxford University Radiocarbon Accelerator Unit calibration program OxCal4.1.

### 8.2 Objectives

8.2.1 The scientific dating programme aimed to establish the date of the human remains within the burial context in order to determine the chronological period to which the individual belonged.

### 8.3 Results

8.3.1 The radiocarbon results are given in Table 1, and are quoted in accordance with the international standard known as the Trondheim convention (Stuiver and Kra 1986). They are conventional radiocarbon ages (Stuiver and Polach 1977).

Table 1. Radiocarbon dating results, prior to recalibration

Context	Material	Lab code	$\delta^{13}\text{C}$ (0/00)	RC Age (BP)	Calibrated date range (95.4% confidence)	Calibrated date range (68.2% confidence)
008	Bone: Human	SUERC-50144	-19	674 ± 42	1265 – 1395 cal AD	1277 – 1387 cal AD

### 8.4 Calibration

8.4.1 The calibrations of the results, relating the radiocarbon measurements directly to calendar dates, are given in Table 1 and in Figure 16. This has been calculated using the calibration curve of Reimer et al.(2013) and the computer program OxCal v4.1 (Bronk Ramsey 1995; 1998; 2001; 2010; 2013). Terrestrial samples are calibrated using the IntCal13 curve. The calibrated date ranges are quoted in the form recommended by Mook (1986), with the end points rounded outwards to 10 years.

### 8.5 Discussion

8.5.1 The pronounced double peak in the calibrated date range was a result of the calibration curve, as can be seen in Figure 16 below. It was noted that the  $\delta^{13}\text{C}$  value of -19‰ probably indicated a slight marine influence, and therefore Professor Cook kindly recalibrated the dates as follows.

8.5.2 Using C-13 end points of -12.5 per mil for a totally terrestrial diet and -21.5 for a totally marine diet, -19 per mil would represent 28% marine diet. An error of 10% was used as a best estimate of the potential error. A delta-R value of -51 +/- 54 was used for the surface ocean C-14 offset for this area of the global surface ocean. This was based on a number of studies carried out by Professor Cook at SUERC (pers. comm.). The recalibration has made the age slightly younger and removed the pronounced double peak in the calibrated range (Figure 17), giving a date range of 1295 to 1435 cal AD at 95.4% probability.

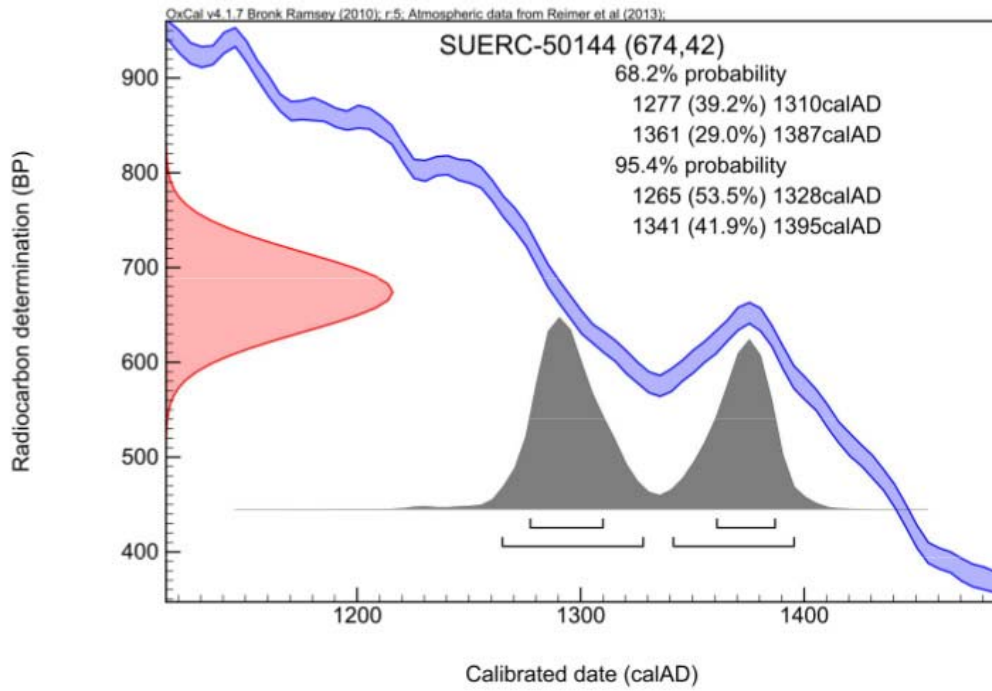


Figure 16. Calibration graph for the Burial 1 sample.

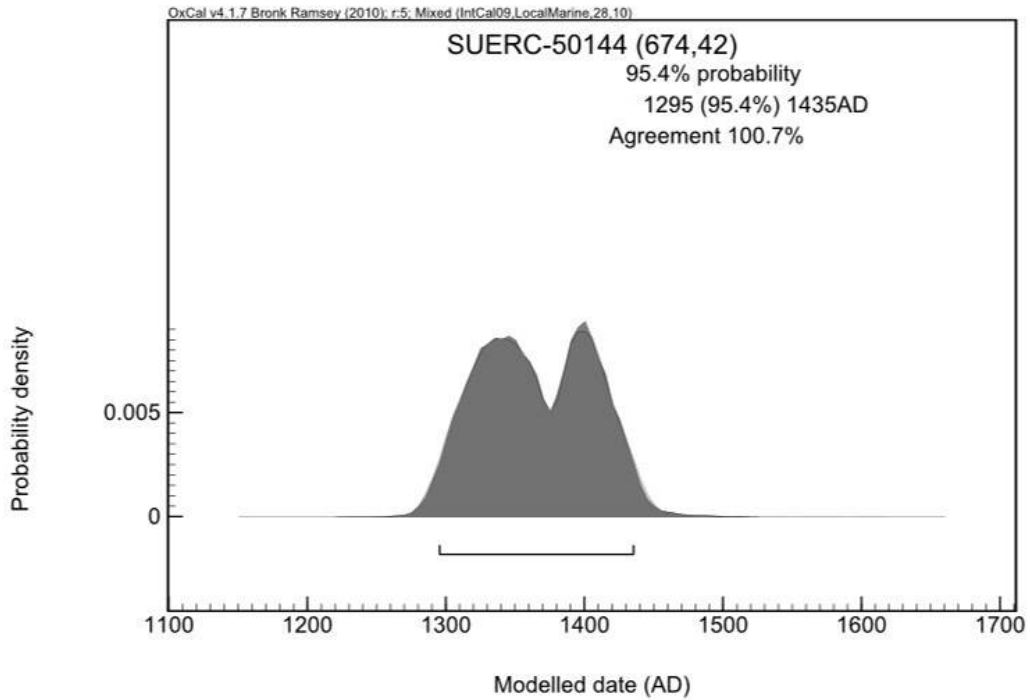


Figure 17. Recalibrated date range taking into account the marine influence.

## **9. Discussion**

9.1 During the monitoring of drain repairs in Trench 1, a partially articulated human skeleton was observed in a truncated grave cut at a depth of 0.87m against the northern trench wall. The grave was orientated east to west, and the remains were inhumed with the head (which was missing) at the western end. The individual, whose sex was indeterminate, was aged between 35 and 50 years and presented a stature of between five feet four inches and five feet eight inches in height. The possible grave cut was observed in the eastern trench wall, although the upper grave fill was heavily truncated by the installation of a cast iron pipe. It appeared that the skeletal remains continued beyond the western limit of excavation, and therefore Trench 1 was extended by a length of 0.80m and a width of 0.46m. Fragmentary human remains were recovered in the extension, and it was likely that the upper portion of the skeleton had been destroyed or removed during the installation of the adjacent manhole. The previous recovery of burials is known from the site but very little information is available, and any inference that can be made from the recovery of the remains will add to the archaeological record of the site.

9.2 Radiocarbon determination of the remains provided a calibrated date range of 1265 – 1395 cal AD at 95.4% probability. However, it was noted that there was a likely marine influence affecting the dates, and therefore the dates were recalibrated taking the marine reservoir effect into account, which provided a date range of 1295 – 1435 cal AD at 95.4% probability. These recalibrated dates sit within the known chronology of the Augustinian Friary, and therefore it is likely that the individual was an inhabitant of the Friary, or a person of higher status who had wealth enough to be buried there.

9.3 The individual appears to have consumed a diet comprising almost one third of marine derived food. The location of the friary close to the River Tyne, and approximately 8.5 miles from the North Sea, would have facilitated access to this food source for the city's population. It is probable that the ecclesiastical inhabitants of the friary shared a similar, if not the same, diet.

9.4 The second phase of monitoring took place in the female toilets. A small trench, Trench 2, was dug against the northern wall of Holy Jesus Hospital, and a cast iron pipe was exposed. This trench contained no finds or features of an archaeological nature.

## **10. Publicity, Confidentiality and Copyright**

10.1 Any publicity will be handled by the client.

10.2 The National Trust will retain full copyright over any and all report materials arising from this project. ARS Ltd shall surrender such copyright on receipt of final payment.

## **11. Statement of Indemnity**

11.1 All statements and opinions contained within this report arising from the works undertaken are offered in good faith and compiled according to professional standards. No responsibility can be accepted by the author/s of the report for any errors of fact or opinion resulting from data supplied by any third party, or for loss or other consequence

arising from decisions or actions made upon the basis of facts or opinions expressed in any such report(s), howsoever such facts and opinions may have been derived.

## 12. Acknowledgements

12.1 Archaeological Research Services Ltd would like to thank all those involved with this work, in particular Mark Newman and Brian Rochester from The National Trust and Jennifer Morrison, Archaeological Officer at Tyne and Wear Specialist Conservation Team.

## 13. References

Brickley, M. and McKinley, J. I. 2004. *Guidelines to the Standards for Recording Human Remains*. British Association for Biological Anthropology and Osteoarchaeology with the Institute of Field Archaeologists; Southampton/Reading.

Bronk Ramsey, C. 1995. Radiocarbon Calibration and Analysis of Stratigraphy: The OxCal Program. *Radiocarbon* 37: 425–30.

Bronk Ramsey, C. 1998. Probability and dating. *Radiocarbon* 40: 461–74.

Bronk Ramsey, C. 2001. Development of the radiocarbon calibration program OxCal, *Radiocarbon* 43: 355–63.

Bronk Ramsey, C., Dee, M., Lee, S., Nakagawa, T., & Staff, R. (2010). Developments in the calibration and modelling of radiocarbon dates. *Radiocarbon* 52(3): 953-961.

Bronk Ramsey, C., & Lee, S. (2013). Recent and Planned Developments of the Program OxCal. *Radiocarbon* 55(2-3): 720-730.

Brothwell, D. and Zakrzewski, S. 2004. 'Metric and non-metric studies of archaeological human bone'. In M. Brickley and J. McKinley: *Guidelines to the Standards for Recording Human Remains*. British Association for Biological Anthropology and Osteoarchaeology with the Institute of Field Archaeologists; Southampton/Reading

Communities and Local Government (CLG). 2012. *National Planning Policy Framework*. London, Department for Communities and Local Government

Institute for Archaeologists. 2009. *Standard and Guidance for field evaluation*. Reading, Institute for Archaeologists.

Institute of Field Archaeologists. 2012. *Code of Conduct*. Reading, Institute for Archaeologists.

Lovejoy, C. O., Meindl, R. S., Pryzbeck, T. R. and Mensforth, R. P. 1985. 'Chronological Metamorphosis of the Auricular Surface of the Ilium: A new method for the determination of adult skeletal age at death'. *American Journal of Physical Anthropology* 68: 15-28.

Mook, W.G. 1986. Business Meeting: recommendations/resolutions adopted by the twelfth international radiocarbon conference. *Radiocarbon* 28: 799.



Reimer, P. J., Bard, E., Bayliss, A., Beck, J. W., Blackwell, P. G., Bronk Ramsey, C., Grootes, P. M., Guilderson, T. P., Hafliðason, H., Hajdas, I., HattĹ, C., Heaton, T. J., Hoffmann, D. L., Hogg, A. G., Hughen, K. A., Kaiser, K. F., Kromer, B., Manning, S. W., Niu, M., Reimer, R. W., Richards, D. A., Scott, E. M., Southon, J. R., Staff, R. A., Turney, C. S. M., & van der Plicht, J. (2013). IntCal13 and Marine13 Radiocarbon Age Calibration Curves 0-50,000 Years cal BP. *Radiocarbon* 55(4).

Stuiver, M. and Kra, R.S. 1986. Editorial comment. *Radiocarbon* 28(2B): ii.

Stuiver, M. and Polach, H.A. 1977. Reporting of <sup>14</sup>C data. *Radiocarbon* 19: 355–63.

Zondervan, A. and Sparks, R.J. 1997. Development plans for the AMS facility at the Institute of Geological and Nuclear Sciences, New Zealand. *Nuclear Instruments and Methods in Physics Research B* 123: 79–83.

### **Websites**

British Geological Survey <http://www.bgs.ac.uk/>

Keys to the Past <http://www.keystothepast.info>

Tyne and Wear Sitelines <http://www.twsitelines.info>

## **Appendix I: Context register**

<b>Context No.</b>	<b>Description</b>
001	Concrete paving slabs
002	Fine yellow building sand
003	Loose tarmac
004	Backfill layer
005	Ceramic drainage pipe
006	Stone slabs – (Base layer for 005)
007	Probable grave cut
008	Grave fill
009	Cast iron pipe
010	Modern concrete
011	Truncated grave fill
012	Brick lined manhole chamber
013	Decorative bricks
014	Cut for cast iron drain
015	Cut for modern intrusion
016	Backfill – associated with (012)
017	Concrete floor surface
018	Re-deposited demolition layer

## Appendix II: Photographic Register

Shot No.	Direction	Scale	Context No.	Description
1	E	-	001	Removal of concrete paving slabs (001)
2	E	-	002	Removal of fine yellow sand (002)
3	S	-	002	Removal of fine yellow sand (002)
4	E	-	004	Opening of Trench 1 and removal of re-deposited layer (004)
5	E	-	009	Cast iron pipe (009) exposed
6	W	1m	-	Trench 1 with westerly trench extension
7	W	1m	-	Trench 1 with westerly trench extension
8	W	1m	-	Trench 1 with westerly trench extension
9	N	-	-	Exposed human burial
10	S	1m	004	Trench 1 showing exposed cast iron pipe and re-deposited material
11	S	1m	004	Trench 1 showing exposed cast iron pipe and re-deposited material
12	E	1m	004	West facing section of Trench 1
13	E	1m	004	West facing section of Trench 1
14	W	1m	004	East facing section of Trench 1
15	W	1m	004	East facing section of Trench 1
16	N	1m	009	South facing section of Trench 1 showing exposed human burial
17	N	1m	009	South facing section of Trench 1 showing exposed human burial
18	-	1m	-	Plan view of exposed human remains
19	N	-	-	Opening of Trench 2
20	N	-	-	Plan view of Trench 2
21	N	-	-	Plan view of Trench 2
22	N	-	-	South Facing section of Trench 2