AN ARCHAEOLOGICAL WATCHING BRIEF AT HOLY TRINITY CHURCH, SUNDERLAND, TYNE AND WEAR

WATCHING BRIEF AND OSTEOLOGICAL ANALYSIS REPORT

February 2020

PRE-CONSTRUCT ARCHAEOLOGY

An Archaeological Watching Brief at Holy Trinity Church, Sunderland, Tyne and Wear

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1. NON-TECHNICAL SUMMARY

1.1 Pre-Construct Archaeology Limited were commissioned by the Churches Conservation Trust to undertake an archaeological watching brief at Holy Trinity Church, Sunderland, Tyne and Wear (central National Grid Reference NZ 40594 57192).

1.2 Built in 1718–1719, Holy Trinity served the growing merchant classes around the port area (known as Old Sunderland). In its heyday Holy Trinity had a dual role for worship and civic administration; the vestry was used as the town hall/magistrates court and the town's first library was in the room above. The church was vested into the care of the Churches Conservation Trust in June 1988 following mounting repair bills and a dwindling congregation. The churchyard, however, still belongs to the Parochial Church Council and is maintained by Sunderland City Council. The Statement of Need for Holy Trinity Church noted numerous areas for urgent repair including the need for new external drainage.

1.3 A desk-based assessment undertaken by PCA in 2016 was commissioned by Mosedale Gillatt Architects, ahead of a submission for a Stage 2 Heritage Lottery Fund bid for the renovation of the Holy Trinity Church to establish the 'Canny Space' as a new heritage attraction, community centre and commercial venue for the city of Sunderland and thereby repair, conserve and transform the church for future generations. The desk-based assessment concluded that there was high potential for the drainage work to disturb unmarked graves. A 19th-century burial plan shows densely packed burials to the east and south of the church, within the area bounded by iron railings. The proposed redevelopment (including the installation of upgraded services and a new disabled toilet facility) has the potential to impact on graves and disarticulated human remains.

1.4 A watching brief was undertaken in October 2016 during the investigation of test pits excavated around the southern elevation and eastern apse of the church. Two brick structures encountered in Trial Pits 1 and 4 may have represented walled burials and disarticulated human bone was also recovered.

1.5 Planning permission for change of use from a church to new community venue and heritage attraction with various external works and installation of new drainage facilities was granted in 2017. A specification for archaeological monitoring work was prepared by the Tyne and Wear Archaeology Officer to mitigate the risks associated with the installation of new drainage and services as such work had the potential to impact upon graves or disarticulated human remains. Faculty to carry out the drainage works was granted by the Diocese of Durham on 23rd February 2018.

1.6 The archaeological work involved the monitoring and recording of a new drainage trench that extended around the southern and eastern perimeter of the church. Internally the work comprised the monitoring of a test pit located within the choir area, the excavation of the dais/chancel, and an area within the apse to assess the condition of the underlying burial vault.

1.7 Five burials were encountered within the drainage trench as well as four additional vaults/burial slabs that were either within the trench section, so not excavated, or were not *in situ*. Other structural remains uncovered included walls that may have related to a former cemetery wall to the south of the church entrance and part of the demolished boiler house to the north of the apse.

1.8 Internally the support foundations of the pulpit were uncovered. The condition of the burial vault below the apse that housed the remains of the former rectors was assessed during removal of the apse floorboards. Previous works in this area had caused damage to the structure and it was necessary to determine what condition the vault was in and if human remains were still present. The brickwork had been damaged in places to allow for joists to be laid across the structure and an opening had been made in the roof of the burial vault during installation of a heating system. This made it possible to view inside the structure; human remains were visible however these had been disturbed at some point as they were scattered around the burial vault. All photographs of the vault were taken through the hole in the roof as it was not possible to access the structure; the skeletal remains were not removed.

2. INTRODUCTION

2.1 Project Background

2.1.1 This report details the results of an archaeological watching brief carried out by Pre-Construct Archaeology Limited (PCA) within the grounds of the churchyard of Holy Trinity Church, Church Street East, Sunderland, Tyne and Wear, SR1 2BB. The church is located within the area known as 'Old Sunderland' or 'East End' at Ordnance Survey National Grid Reference NZ 40594 57192 (Figures 1 & 2). The watching brief, commissioned by the Churches Conservation Trust, was carried out intermittently during September and November 2019. The work was associated with the renovation of the building as the 'Canny Space', a new heritage attraction, community centre and commercial venue for the city of Sunderland which will repair, conserve and transform the church for future generations.

2.1.2 A phased scheme of archaeological investigation was required by the Tyne and Wear Archaeology Officer to mitigate the risks associated with the installation of new drainage and services associated with the renovation of the structure; such groundworks had the potential to impact upon graves or disarticulated human remains. A desk-based assessment (PCA 2016a) was followed by a watching brief in October 2016 (PCA 2016b) during the investigation of test pits excavated around the southern elevation and eastern apse of the church. Two brick structures encountered in Trial Pits 1 and 4 may have represented walled burials and disarticulated human bone was also recovered.

2.1.3 Planning permission for change of use from a church to new community venue and heritage attraction with various external works and installation of new drainage facilities was granted in 2017. A specification for the archaeological monitoring work was prepared by the Tyne and Wear Archaeology Officer (NCC 2017). Faculty to carry out the drainage works was granted by the Diocese of Durham 23rd February 2018, on condition that an archaeological watching brief was carried out in accordance with the specification.

2.1.4 Externally, the watching brief comprised archaeological monitoring of the excavation of a 600-900mm deep drainage trench along the southern and eastern perimeter of the church (Figure 2). All human remains within the trench were recorded and exhumed by an osteologist prior to drainage being laid.

2.1.5 Internally the condition of the burial vault below the church apse that housed the remains of the former rectors was assessed during removal of floorboards. Human remains were visible inside the vault, although these have been disturbed at some point as they were scattered around the chamber. It was not possible to enter the chamber and photographs of the vault were taken through an opening made in the roof during installation of a heating system.

2.1.6 The Online Access to the Index of Archaeological Investigations (OASIS) reference number for the project is: preconst-383795.

2.2 Site Location and Description

2.2.1 The site is located on the south side of the River Wear and lies at the eastern most extent of Sunderland (NGR NZ 40594 57192; Figure 1). Situated in the east end of Sunderland, an area known as 'Old Sunderland' the church is *c.* 0.8km east of the City Centre. The surrounding area is mainly modern housing and the remains of heavy industry,although the large green open space of the Town Moor lies immediately to the east.

2.2.2 Holy Trinity Church occupies the north-western corner of a much larger plot of land that was once the parish churchyard from 1719 to 1854 and potentially accommodated over 100,000 burials. It is bounded by the former Donnison School to the east, parkland that was previously part of the church burial ground to the south, residential properties to the west and Hendon Young People's Project to the north. The areas monitored during these works are shown in Figure 2.

2.3 Geology and Topography

2.3.1 The church is located *c.* 1km south of the mouth of the River Wear and *c.* 0.8km east of Sunderland City Centre.

2.3.2 Dolostone of Roker Formation from the Permian period forms the solid geology of the area of the site (*British Geological Survey* website). In the vicinity of the study site the bedrock is covered by Devensian glaciolacustrine deposits composed of clay and silt formed in the Quaternary Period.

2.3.3 Land in the vicinity of the study site lies at approximately 15.5m above Ordnance Datum (AOD).

2.4 Planning Background

2.4.1 The requirement to undertake the archaeological investigation is in line with planning policy at a national level, as set out in the *National Planning Policy Framework* (NPPF) (Department for Communities and Local Government 2012 (revised 2019)). The NPPF came into effect in 2012, replacing *Planning Policy Statement 5: 'Planning for the Historic Environment'* (PPS5) (DCLG 2010), to provide updated guidance for LPAs, property owners, developers and others on the conservation and investigation of the historic environment. Heritage assets – those parts of the historic environment that have significance because of their historic, archaeological, architectural or artistic interest – remain a key concept of the NPPF, retained from PPS5. Despite the deletion of PPS5, the *PPS5: Planning for the Historic Environment – Practice Guide* (English Heritage, DCMS and DCLG (revised) 2012), remains a valid, UK Government-endorsed, document.

2.4.2 Chapter 16 of the NPPF 'Conserving and enhancing the historic environment' describes, in paragraph 185, how LPAs should '…set out in their Local Plan a positive strategy for the conservation and enjoyment of the historic environment' and details, in paragraph 189, that '*In determining applications, LPAs should require an applicant to describe the significance of*

any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum, the relevant [Historic Environment Record] HER should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed included or has the potential to include heritage assets with archaeological interest, LPAs should require developers to submit an appropriate desk-based assessment and where necessary [the results of] a field evaluation'.

2.4.3 Planning permission (17/00674/FU4) for change of use from Church to new community venue and heritage attraction with various external works and installation of new drainage facilities was granted in 2017. A new drainage run is to be installed around the perimeter of the church. Permission was granted subject to several conditions; No. 7 and 8 relate to archaeological mitigation and require an archaeologist to be present during undertaking of groundworks within the churchyard.

2.4.4 The Specification for the archaeological watching brief was prepared by the Tyne and Wear Archaeology Officer (NCC 2017). Faculty to carry out the drainage works was granted by the Diocese of Durham on 23rd February 2018, on condition that an archaeological watching brief was carried out in accordance with the specification.

2.5 Archaeological and Historical Background

2.5.1 A detailed history of this area is described in the 2016 desk-based assessment carried out by PCA. A summary of the relevant details from those sources is described below.

2.5.2 Holy Trinity Church (HER 4421) is the focus of the Canny Space development and is located on Church Street East. The structure is Grade I listed and lies within a conservation area.

2.5.3 As the port of Sunderland grew, its expanding population far outstripped the number of seats in the parish church of St Michael, Bishopwearmouth, which also cared for a rural area of more than 9000 acres that included Ryhope, Silksworth, Tunstall and Burdon. By the early 1700s, St Michaels could not accommodate even a quarter of the inhabitants and most of the pews had passed down through generations of long-established families, which excluded any newcomers.

2.5.4 In 1712 merchants and ship builder launched an appeal to raise funds to build a church of their own (Holy Trinity), separating the parish of Sunderland from the densely populated east end of Bishopwearmouth. This increased the number of parishes in the city to three and local government was divided between the churches of Holy Trinity, Sunderland, St Michaels, Bishopwearmouth and St Peters, Monkwearmouth.

2.5.5 There is no recorded designer of the church and although unsubstantiated suggestion have been made linking the structure to Vanbrugh or Hawksmoor, it is more likely to have been designed by an informed amateur perhaps guided by pattern books, or by a craftsmen like

William Etty of York. On the front of the church a blue plaque attributes the design to Etty but this claim has not been substantiated. Etty did carve the font and it has been suggested that he may have provided further designs to be carried out by local craftsmen. The church, however, bears little comparison except in general plan to the only church known to be designed by Etty; Holy Trinity at Boar Lane, Leeds.

2.5.6 The church is Baroque in style and built of brick laid in Flemish bond. It has sandstone dressings, a low-pitched slate roof and basically forms a seven-bay rectangle with west tower and apsidal east end. Completed in 1719, the overall plan has been relatively unaltered apart from the addition of an almost circular apse and the removal of a later boiler house. The roof was originally covered in lead but was raised in 1803 by Thomas Wilson, a local engineer who designed the iron bridge across the River Wear (1793-6). The nave and aisles are of six bays and the tower, lobbies and vestry take up the seventh. Each bay has a large round-headed window with stone surround, moulded imposts and triple keystone. At the east end there was originally a shallow chancel recess to which was added the unique almost circular sanctuary some 15 years after the church was built and under which is a burial vault. Onn the western elevation are three entrances each with their original doors. The main entrance was through central double six-panelled doors. The main entrance was through central double six-panelled doors. Above the entrance way is a tower with three clock faces and two sundials; the tall west facing window has the only original glass left after damage in World War II.

2.5.7 Local and regional craftsmen are recorded as being involved in some aspects of the church. The elaborate font was by William Etty of York; the Venetian stained-glass east window depicting the Ascension was designed by Wailes of Newcastle and made at James Hartley's glassworks in Sunderland; the roof structure was altered by Thomas Wilson and the organ was built by Nelson and Co. of Durham.

2.5.8 Holy Trinity was inaugurated with a sermon by Thomas Mangey D.D., on 'The Holiness of Christian Churches'. The first baptisms and marriage took place in May 1719. The church and its churchyard, taken from the town moor to the south, were not consecrated until 5th September, when the first internment also took place. Parishioners of Sunderland continued to be buried at Bishopwearmouth for a time afterwards.

2.5.9 Daniel Newcombe, formerly vicar of Hunmanby was inducted in the rectory of Sunderland in July 1719, remaining in office until his death in 1738. It was rumoured that he spent the greatest part of his income in beautifying and adorning the church (Meikle & Newman 2007, 174). The work was completed over many years, with the elaborate chancel being added as late as 1735, and a burial vault was constructed below the apse for the rectors of the church (CCT 2010, 6 & 8).

2.5.10 Daniel Newcombe would have been the first to be interred in the vaults in 1738. A source from 1834 (Mackenzie & Ross 1834, 280) contains a reference to a vault under the chancel known as *Rector's Vault*: *"within this vault were interred the remains of some of the rectors*

of Sunderland, with branches of their families". It is highly unlikely, however, the families were buried within the vault at Holy Trinity as Sunderland Antiquarian Society (1902, 6) notes that no burials were allowed in the church except those of the deceased rectors.

2.5.11 Reverend Robert Gray died in 1838 and was buried within the parish churchyard ("to be with his beloved people…") so it is likely that the rectors from Newcombe up to Gray are all buried in the Rector's Vault. A poster held in Sunderland Local Studies Library, produced by Friends of Sunderland Old Parish Church, reads:

> *Below this apse lie five of the early rectors of Sunderland Parish*
>
> *Daniel Newcombe inducted 25 July 1719, died 1738*
>
> *Richard Swainston 1739-1758*
>
> *George Bramwell 1758-1962*
>
> *John Coxon 1762-1788*
>
> *James Smyth 1788-1793*
>
> *John Hampson 1795-1819*

2.5.12 No documentary evidence has been discovered to suggest that the burial vault has been emptied and it is therefore considered likely that the bodies of the rectors remain in the church beneath the apse.

2.5.13 Mackenzie and Ross (1834, 280) observe that burial is with great propriety prohibited in every other part of the church. The church yard itself is recorded as one of the largest in England and has, at different times, been improved and raised by ballast (Mackenzie & Ross 1834, 280). On July 28, 1819, part of the adjoining moor, which had been added to the cemetery, was consecrated by the bishop of Oxford. The whole space is recorded being already covered with tombs and headstones and in the centre stood a small watch-house, from which the approach of resurrectionists could be observed (resurrectionist were employed by anatomists to exhume the bodies of the recently deceased).

2.5.14 In 1842 side galleries were added to the church providing an additional 320 seats. In 1856 the tower clock was installed and the raised platform at the east end of the nave was constructed *c.* 1887 with communion rails set up along its step and in line with the easternmost piers of the nave arcade. The present choir stalls probably date from this period and are likely to have been constructed from former pews.

2.5.15 In 1935 there was a major restoration within the structure; side galleries were removed, the west gallery refashioned, box pews in the nave replaced with the present seating, a new solid floor laid in the nave, panelling introduced around the present seating, a new solid floor laid in the nave, panelling introduced around the pier bases, the chancel area extended westwards beyond its 1887 limit and communion rails put in their current position and the

nave roof restored. In the following year the organ was also substantially rebuilt and in the 1940s the existing ceiling was installed after being damaged during World War II.

2.5.16 In 1988, because of a dwindling congregation and the need for expensive repairs the church was closed and is now in the care of the Churches Conservation Trust.

2.5.17 The Assessment of Significance (CCT 2010) notes that although the architect is unconfirmed, the major changes to the church, in particular the re-ordering, have been well documented. Whilst the exterior and plan form remain essentially unaltered so are of high significance; the seating has been subject to various changes up to the late 19th/early 20th century so in in itself has less significance. The exterior remains little altered with the exception of the north and south windows which have been replaced in recent years with poorly designed versions of the original vertical sliding sashes. The Assessment of Significance notes that the replicas detract from the overall aesthetic value and add to the church's forlorn appearance. Fortunately, the window openings with their stone dressings remain unaltered and the untouched west elevation provide an imposing focal point that is considered to have high aesthetic value.

2.5.18 Holy Trinity Church was a centre for worship and civic administration; until 1835 the vestry which is at the west end was used as the town hall/magistrates court and the town's first public library was in the room directly above (the front lobby originally held the town's fire engine and stocks). The original council meeting table and library bookshelves with their reading and writing desks still remain in situ. Below the gallery were special seats for the church wardens and men who ran the parish.

2.5.19 Old Sunderland continued to thrive until around the 1840s when the shipbuilding industry went into decline and the town's centre of gravity moved westwards to form the core of the present city centre. Despite this decline the population continued to expand due to demand for other import and export products and merchants houses around the church began to be turned into tenements.

2.5.20 The historical value of Holy Trinity Church lies mainly in its date which makes it one of the earliest remaining buildings to survive in Sunderland and in its subsequent re-orderings as the economy and population changed. Additional significance is observed in the additional roles of the church played in the civic functions, and its impact on social change in the area relating to shipbuilding and trade around the port. The importance of the church is reflected in its Grade I listing. It is of interest not only for its considerable architectural quality but also because of its key role in the political and social history of Old Sunderland. The newly built church as well as being a great achievement for the shipbuilders and merchants of the area also became their centre of civic administration for over 100 years.

2.5.21 Two other listed structures relating to the church are situated within the development area. Holy Trinity Church forecourt wall with gate piers (HER 4771) are Grade II listed and are found at the westernmost extent of the church. The wall is constructed of brick with stone

copings and ashlar piers and dates from 1719. The railings are likely to have been renewed as in the southern section they are of 19th-century. The wall to the east of the church is also Grade II listed (HER 4753) and is also constructed of brick with ashlar copings. The wall has been rendered and probably dates from the early 18th century.

3. Aims and Objectives

3.1 Project Aims

3.1.1 The broad aim of the project was to ensure that archaeological remains were not destroyed without first being adequately recorded. The main objectives of the watching brief was to recover any fragments of human bone disturbed during the process of groundworks. Any in-situ inhumations were to be recorded and excavated in single context order. Additional aims of the project were:

- Safeguard any human remains (in-situ or disarticulated) from unnecessary damage and ensure they are recorded thoroughly;
- identify and record any archaeological features that are likely to be affected by the works;
- Ensure that disturbance of in-situ material is kept to a minimum to allow for preservation where possible;
- To compile a Site Archive consisting of all site and project documentary and photographic records, as well as all artefactual and paleoenvironmental material recovered;
- To compile a report that contains an assessment of the nature and significance of all data categories, stratigraphic, artefactual, *etc.*

3.2 Research Agenda

3.2.1 The project was undertaken with reference to the research framework set out in *Shared Visions: The North-East Regional Research Framework for the Historic Environment* (NERRF) (Petts and Gerrard 2006), which highlights the importance of research as a vital element of development-led archaeological work. By setting out key research priorities for all periods of the past, NERRF allows archaeological projects to be related to wider regional and national priorities for the study of archaeology and the historic environment.

4. ARCHAEOLOGICAL METHODOLOGY

4.1 Fieldwork

4.1.1 The archaeological watching brief was carried out intermittently during September and November 2019. All fieldwork was undertaken in compliance with the codes and practice of the Chartered Institute for Archaeologists and the relevant CIfA standard and guidance document (CIfA 2014 a, b & c). PCA is a CIFA Registered Organisation. Guidance within a CIfA technical paper covering excavation of inhumed human remains was also followed (CIfA 2017). All fieldwork and post-excavation were carried out in accordance with the Yorkshire, the Humber & The North East: Regional Statement of Good Practice (SYAS 2011).

4.1.2 A Specification for Archaeological Watching Brief at Holy Trinity Church was provided by Tyne and Wear Archaeology Service (MON15062; Morrison 2017). All archaeological fieldwork was undertaken in accordance with the brief.

4.1.3 Continuous archaeological monitoring and observation was carried out during all invasive groundworks within the proposed development. The drainage trench and other groundworks were excavated under archaeological supervision, using a mini excavator fitted with a toothless bucket or by hand by the client's appointed contractors (Historic Property Restoration). The works comprised monitoring a trench for new drainage excavated around the perimeter of the southern and eastern elevations of the church and internally monitoring a test pit, the excavation of the dais and an inspection of ground material under the apse.

4.1.4 The external drainage run was excavated to a depth of between 600-900mm. Where only pipe was being installed the trench measured 300mm wide however this widened to 600mm where additional pipes had to be installed to accommodate water from the down pipes of the church. Where burial slabs were encountered the trench was widened to safely remove and record these remains.

4.1.5 Any work taking place on the apse floor was also monitored as a large burial vault was located beneath it. A small test pit in the church floor was also monitored. This test pit was approximately 1000mm long and 500mm wide. The excavation of the dais measured approximately 4.5m by 7.5m and taken to *c.* 1m below ground level.

4.1.6 All osteological analysis was carried out in the church vestry on site as no human remains were to be removed from site. All finds and human remains recovered were stored on site in the church safe located in the vestry. Additionally, no photographs of the human remains or their burial sites were permitted to be taken by anyone but the qualified osteoarchaeologist. The human remains are to be reburied on site.

4.1.7 All ground-breaking tasks were carried out by the groundworks team. Any archaeological features or human remains were recorded and exhumed by the onsite osteologist. Only skeletal remains lying within the trench were excavated; any parts of burials lying beyond

the trench were left in situ. Investigations within the trench followed the normal principles of stratigraphic excavation and were conducted in accordance with the methodology set out in the field manual of PCA (PCA 2009) and the Museum of London Site Manual (Museum of London 1994).

4.1.8 Throughout the exhumation/excavation the 'single context recording' method was employed, with the PCA pro forma 'Context Recording Sheet' used for deposits and 'cuts', while skeletons and coffins were individually recorded on the PCA pro-forma 'Skeleton Recording Sheet' and 'Coffin Recording Sheet', respectively. Structural remains were recorded using the PCA pro-forma 'Masonry Recording Sheet'. Each skeleton was removed from the ground according to the methodologies set out in the aforementioned technical paper and field manuals. All site records were marked with the unique Site Code HTC19. All archaeological features were excavated by hand tools and were recorded using standard single context recording methods. The height of all principle strata and features was calculated in metres above Ordnance Datum (m AOD) and indicated on appropriate plans and sections.

4.1.9 A detailed photographic record of the watching brief was produced using digital photography. All detailed photographs included a legible graduated metric scale. The photographic record illustrated both in detail and general context archaeological exposures and specific features in all trenches.

4.2 Post-excavation

4.2.1 The stratigraphic data for the project comprises written and photographic records. A total of 58 archaeological contexts were defined (Appendix 2). Post-excavation work involved checking and collating site records, grouping contexts and phasing the stratigraphic data (Appendix 3). A written summary of the archaeological sequence was then compiled, as described in Section 5.

4.2.2 All human bone was washed and dried on site before full analysis of all complete skeletons was undertaken by an osteologist (Appendix 5). All disarticulated human bone was identified and catalogued by the osteologist. Infant bones recovered from the eastern drainage trench were analysed as a group regardless of whether they were disarticulated or associated with a burial. This was to allow for a minimum number of individuals to be accurately calculated and for age data to be collated easily.

4.2.3 The complete Site Archive, in this case comprising the written, drawn and photographic records (including all material generated electronically during post-excavation) will be retained for long term curation. In preparing the Site Archive for deposition, all relevant standards and guidelines documents referenced in the Archaeological Archives Forum guidelines document (Brown 2007) will be adhered to, in particular a well-established United Kingdom Institute for Conservation (UKIC) document (Walker, UKIC 1990) and the most recent CIfA publication relating to arching (CIfA 2014c).

4.2.4 The retained element of the site archive will be deposited with the relevant museum, under the site code HTC19. The depositional requirements of the relevant museum which the Site Archive will be ultimately transferred will be met in full. All human remains will be reburied at Holy Trinity Church, Sunderland, Tyne and Wear. The Online Access to the Index of Archaeological Investigations (OASIS) reference number for the project is: preconst-383795.

5. RESULTS: THE ARCHAEOLOGICAL SEQUENCE

During the archaeological investigation, separate stratigraphic entities were assigned unique and individual context numbers, which are indicated in the following text as, for example [123]. The archaeological sequence is described by placing stratigraphic sequences within broad phases, assigned on a site-wide basis in this case. An attempt has been made to add interpretation to the data and correlate these phases with recognised historical and geological periods. The figures can be found in Appendix 1 with the context index and stratigraphic matrix located in Appendix 2 and 3 respectively. A selection of plates can be found within Appendix 4. Post-excavation specialist assessment of the human remains can be found within Appendix 5.

5.1 Phase 1: Eighteenth to Nineteenth Century

5.1.1 The earliest deposits encountered at the site represent post-medieval levelling activity that was encountered along the full length of the drainage run (Figure 4, Sections 1 & 2; Plate 1). The earliest levelling deposit comprised stiff mid grey clay [107] that was partially exposed within the central part of the southern drainage run for a distance of 5.7m ENE-WSW and was at least 0.14m thick, encountered at a maximum height of 15.98m AOD. This in turn was overlain by a further levelling deposit that comprised *c*. 0.39m thick friable mid brown silty clay [101] that was recorded extending across the length of the drainage run and was encountered at maximum and minimum heights of 15.29m AOD and 15.05m AOD, respectively. Disarticulated human bones were recovered from [101] (Appendix 5).

5.1.2 The burial soil at the site, that formed one of the more substantial levelling deposits, was comprised of friable dark brownish grey clayey silt [100] (Plate 1). It was exposed for the length of the drainage run with a maximum thickness of 0.49m. The maximum recorded height of the deposit was 15.58m AOD. Sixty-three fragments of disarticulated human bone were recovered from the deposit (Appendix 5) as well as two small finds. The small finds comprised a copper alloy button (SF. 1) and a fragment of a coffin (SF. 2).

5.1.3 A further levelling deposit was partially exposed within the eastern drainage run that comprised *c*. 0.46m thick firm mid grey silty sand [133] and contained frequent inclusions of light grey lime mortar (Figure 6, Section 6).

5.1.4 Cut into these levelling deposits were five inhumations. One of these was uncovered to the south of the church with the other four lying to the east. An inhumation of a young adult male [128] within grave cut [130] was partially located within the eastern drainage trench. The grave cut [130] was >0.72m east/west by 0.52m wide and *c.* 0.84m deep. Its highest and lowest levels were 15.45m and 14.63m AOD respectively.

5.1.5 Skeleton [128] was recorded at a height of 14.77m AOD and approximately 35-45% of the bones were recovered (the rest had either not survived or lay outside the limits of excavation) (Figure 6). The remains showed signs of ante-mortem tooth loss and minor osteophytes of the thoracic vertebrae. The cranium was absent and the mandible had a post mortem circular puncture wound perhaps caused by a fence pin or similar object or the later internment of skeleton [127]. Although no coffin was visible, finds of coffin nails show that a

coffin would have been present. The grave fill was comprised of friable dark brownish grey clayey silt [132] *c.* 0.84m thick.

5.1.6 Disturbing burial [130]/[128] was grave cut [139] for infant/neonatal burial [127]. The grave cut [139] was 0.44m east/west by 0.20m wide and *c.* 0.59m deep (Figure 6) with the highest and lowest levels 15.47m and 14.88m AOD respectively. Skeleton [127] was observed at 14.78m AOD. The grave was backfilled with soft dark brownish grey clayey silt [151]. Approximately 0.45m to the west was an infant/neonatal burial [126] within grave cut [138] The grave cut was 0.40m east/west by 0.20m wide and *c*. 0.60m deep with highest and lowest levels of 15.50m and 14.81m AOD respectively. The neonatal remains were observed at 14.91m AOD and the grave was backfilled by soft dark brownish grey clayey silt [150].

5.1.7 When these infant/neonatal burials were analysed, it was found that the remains of multiple individuals had been recovered in both cases. The minimum number of individuals recovered for infants in just this area was five. Based on age estimation by long bone length, all the individuals were likely either premature or newborn (Appendix 5).

5.1.8 An inhumation of a juvenile (4-6 years) of indeterminate biological sex [129] was found partially within the drainage trench adjacent to the church apse (Figure 2 & 7). The remains were within grave cut [137] that was exposed for 0.19m north-east/south-west by 0.32m wide and 0.57m deep. The highest and lowest level within the cut were 15.59m and 15.01m AOD respectively. Approximately 20-30% of skeleton [129] was recovered and was first observed at a height of 15.11m AOD (Appendix 5). The skeleton displayed no notable pathology. Although no coffin was visible, finds of coffin nails show that a coffin had been present. The grave was backfilled with friable dark greyish brown clayey silt [135].

5.1.9 To the south of the church was an intact burial vault [106] aligned east-west within grave cut [110]. The cut measured > 2.27m east/west by >0.62m north/south and >0.58m deep. The burial vault was comprised of a brick structure [106] and stone sealing slab [105] (Plate 3 and 4). The stone slab was recorded at a height of 15.72m AOD and the brick vault at a height of 15.50m AOD. The vault was constructed using common bricks a single brick thick (Figure 5). The structure in its entirety measured 2.27m east/west by 0.98m wide and 0.58m high with the internal section being 2.02m east/west and 0.72m wide. The western end of the vault had been damaged and the body badly disturbed by burrowing animals. This led to a mixed infilling deposit [109] accumulating within the vault.

5.1.10 The remains of a young adult female [111] were scattered throughout the burial vault. Approximately 30-40% of the skeleton was recovered that would have likely been laid supine within a coffin, no remains of the which survived. The skeleton showed evidence of a dental abscess of the upper left first premolar and benign neoplastic osteomas on the internal surface of the frontal bone.

5.1.11 On top of the stone slab [105], a small portion of an inscription survived (Plate 5). This was barely legible but appears to refer to *January 17??.* It is not known whether this was a birth date or the date the person died.

5.1.12 An additional two burial vaults were also exposed within the edge of the southern drainage trench (Plate 6). Vault [113], within grave cut [148] was recorded at a height of 15.46m AOD and was covered by stone slab [112] at a height of 15.64m AOD. The burial was only partially within section of the trench so exact dimensions could not be ascertained (Figure 5). Although [113] was not excavated, there was damage to the brickwork, and it did appear to have been infilled similar to [106]. It is likely that this vault has also been disturbed by burrowing animals.

5.1.13 To the north of grave cut [148] was demolished vault [114] within grave cut [147]. On top of the vault was stone slab [104] that was encountered just below the topsoil and measured 1.83m by 0.92m and 0.13m thick (Plate 7). A faint inscription was noted on top of the slab however it was too badly worn to be legible. The burial vault below had already been truncated with only a short stretch of vault [114] surviving for 1.4m by 0.11m wide and 0.15m high (Plate 6). As no skeleton was observed within the grave it is conceivable that the vault would have stood above ground level originally but was demolished when the cemetery was cleared of grave monuments. The stone slab would have been reburied below ground level.

5.1.14 Two more redeposited stone slabs were also noted during the works without associated burial vaults or human remains. These comprised [103] (Plate 8) and [108] (Figure 4).

5.1.15 The remains of four walls, not associated with burial vaults, were also uncovered within the drainage trench. A brick wall [136] was located in the far northern end of the drainage trench (Plate 10). It was recorded at a height of 15.36m AOD and was exposed for >0.33m long by 0.22m wide and over 0.34m high. Its purpose is unknown, but it may be associated with the demolished boiler house that used to occupy the area. The wall did not continue in the drainage trench located 3m to the east (Figure 8).

5.1.16 Walls [115], [116] and [118] were all located at the western end of the drainage trench to the south of the church (Figure 2). Wall [115] was aligned north-south within construction cut [117] and was recorded at a height of 15.24m AOD (Plate 2). It was exposed 0.30m north/south by 0.47m wide and 0.25m high. It was aligned perfectly with the front elevation of the church and is likely the original cemetery wall. At some point in the 18th or 19th century the upper courses of this wall were truncated by demolition cut [146] when the limits of the graveyard were extended outwards. It was backfilled with demolition material [145] comprising dark brownish grey sandy clay with frequent inclusions of ceramic building material (Figure 2 & 3: Section 5).

5.1.17 Brick wall [116] within construction cut [149] was aligned southeast/northwest for >0.4m and was >0.21m wide and 0.19m high (Plate 2; Figure 2 & 3). It was recorded at a height of 15.08m AOD. Only a small portion of the wall was visible within the trench so its purpose is

not clear although it may be associated with the construction of the modern-day cemetery entrance.

5.1.18 Wall [118] was aligned east/west and recorded at a height of 15.47m AOD (Figure 3). Very little of this wall was exposed (0.28m by 0.24m and only the top course) and its purpose is therefore not known.

Church Interior

5.1.19 The condition of the rector's burial vault [119] below the eastern apse was monitored during removal of the floorboards (Plates 12-15). The roof of the vault was covered in a sandy deposit [120] with occasional stones used to support the floor joists. A service trench [125] for heating pipes had been installed that truncated the upper courses of the burial vault (Plate 16). Through this hole, it was possible to observe the inside of the vault (Plates 17-19). Human bones, presumably the skeletal remains of the rectors known to have been interred within the vault, were observed however, it was clear that some disturbance had occurred as the bones were scattered. It was not possible to ascertain when this had occurred, but anecdotal evidence suggests that the vault floods to such an extent during heavy rain that the bones would be disturbed. There was also what appeared to be a brick ossuary box which likely contained the remains of at least one individual (Plate 19). The vault was not entered, and no human remains were removed from it.

5.1.20 A test pit located in the choir area of Holy Trinity Church was monitored, this measured *c.* 1m by 0.5m (Figure 2; Plate 11). The earliest deposit encountered comprised a friable mid brownish grey silty clay [123] that represented post-medieval levelling activity to raise the floor level within the church.

5.1.21 Work within the dais and chancel was also monitored during the installation of underground heating within the eastern end of the church (Figure 2). The area monitored measured *c.* 7.5m north/south by 4.56m east/west; this area was reduced to 1.04m below ground level. The earliest deposit encountered comprised loose black coarse sand [143] and rubble *c.* 1.04m thick. This represented a ground raising dump/infill below the former floor level of the church and is equivalent to deposit [123] noted in the test pit (Plate 20).

5.1.22 Cut into the ground raising dumps was a square construction cut [142] *c.* 0.91m by 0.90m and >0.64m deep. It was located along the western limit of the dais at the north-west corner and contained a circular cast-iron support beam [140] *c.* 0.14m in diameter and concrete foundation [141]. The structure perhaps represents the foundations of a pulpit with the metal support continuing above floor level into the base of a wooden pulpit (Plate 21). Historic photographs of the interior of the church show a pulpit within this location.

5.2 Phase 2: Twentieth Century

5.2.1 The construction of the raised dais and chancel has been placed within this phase of activity (thought to have been undertaken in the restoration of 1935) but may have been built earlier during the alteration to the church in 1887. Church records note that the raised platform was

constructed in the eastern-most bay of the nave and the communion rails set up at the entrance to the raised area in line with the eastern-most piers of the nave arcade in 1887 (CCT 2010, 23). Several bricks, however, were noted within the construction of both the dais walls and heating ducts that appear to be early 20th-century in date.

5.2.2 The construction cut [206] for the dais was rectangular in shape and cut earlier ground raising deposit [143]. The construction cut was 7.5m north/south by 4.56m east/west and 1m deep. Several brick heating ducts [203] *c.* 0.50m wide and 0.75m high were observed below the dais which contained cast iron pipes that would have led to the now demolished boiler house on the northern side of the apse. Each heating duct was sealed with a sandstone slab *c.* 500mm by 600mm and 40mm thick (Plate 22).

5.2.3 The outer limits of the dais (northern, western and southern) were comprised of brick walls [205] in stretcher bond that measured 4.56m east/west, 7.5m north/south, 0.36m wide and 0.88m high. The outer wall was capped with sandstone edging stones [202] that measured *c.* 6.03m north/south by 3.82m east/west, 0.12m wide and 0.25m thick. The ground level within the dais area was raised by loose black coarse sand and rubble [204] *c.* 0.42m thick and loose black coarse sand and rubble [201] *c.* 0.46m thick. The floor level comprised concrete and black and red floor tiles (Plate 23).

5.2.4 Above the rector's burial vault within the apse was mid greyish brown silty sand [120] that contained occasional stone inclusions that were used to support the floor joists. A service trench [125] for heating pipes had also been installed that would have fed from the boiler house on the northern side of the apse into the heating ducts of the church (the heating ducts were exposed below the dais). These pipes truncated the upper courses of the burial vault (Plate 16) and were sealed with a concrete slab [124].

5.2.5 Twentieth century remains within the test pit were comprised of mid brown gravelling levelling deposit (122) *c.* 0.33m thick for concrete floor [121] *c.* 0.10m thick.

5.2.6 Outside of the church the modern ground level within the former cemetery was comprised of friable dark brownish grey clayey silt topsoil [144] *c.* 0.28m thick.

6. DISCUSSION AND RECOMMENDATIONS

6.1 The archaeological investigation undertaken at Holy Trinity Church, Sunderland comprised the monitoring of four areas; the drainage trench within the former cemetery; a test pit within the church; the dais/chancel area and the apse. The activity uncovered within these phases was attributed to two phases of activity:

- Phase 1: Post-medieval remains relating to the construction of the church in 1719, the burial vault and apse constructed in 1735 and burial vaults/human remains uncovered within the former graveyard;
- Phase 2: 20th-century remains included floor levels, installation of a heating systems and the construction of the dais. Externally this phase was represented by a topsoil deposit within the former cemetery that had been laid down once the grave markers had been removed in the early to mid-20th century.

6.2 The construction date for the dais has been placed within Phase 2 due to 20th-century bricks being used in some areas however it may have been installed earlier during the 1887 works. The modern bricks could represent spot repairs to the masonry. Further research into the installation of the boiler house and therefore the heating ducts may elucidate when it was constructed.

6.3 The stone wall foundation [115] aligned with the western elevation of the church likely represents the original cemetery wall. It was probably a stone foundation but with red brick upper course. This is the style of construction used throughout the church. The purpose of the other walls is unclear, but it is possible that [116] may have been associated with the introduction of the modern-day cemetery gate. Wall [136] was conceivably associated with the old boiler house.

6.4 It was not expected that burials would be found within the main body of the church and that has proven to be the case in the areas monitored. The only internal structure known to hold human remains is the burial vault [119] located below the church apse. The burial vault was constructed below the apse for the rectors of the church (CCT 2010, 6 & 8). This archaeological monitoring work has confirmed that the vault still contains the remains of an unknown number of individuals. Although it was not possible to access the vault, a hole on the roof allowed the interior to be viewed and human skeletal remains were visible scattered around the chamber along with a brick structure which probably represents an ossuary box. It is not clear if this occurred during the heating works which created the hole in the roof or during the interment of later burials. Anecdotal evidence also suggests that the vault floods to such an extent during heavy rain that the bones would be disturbed. There was also what appeared to be a brick ossuary box which likely contained the remains of at least one individual (Plate 19). The vault was not entered, and no human remains were removed.

6.5 Daniel Newcombe would have been the first to be interred in the vaults in 1738. A source from 1834 (Mackenzie & Ross 1834, 280) contains a reference to a vault under the chancel

known as Rector's Vault: "within this vault were interred the remains of some of the rectors of Sunderland, with branches of their families". It is highly unlikely, however, the families were buried within the vault at Holy Trinity as Sunderland Antiquarian Society (1902, 6) notes that no burials were allowed in the church except those of the deceased rectors. Reverend Robert Gray died in 1838 and was buried within the parish churchyard ("to be with his beloved people…") so it is likely that the rectors from Newcombe up to Gray are all buried in the Rector's Vault. A poster held in Sunderland Local Studies Library, produced by Friends of Sunderland Old Parish Church, reads:

> Below this apse lie five of the early rectors of Sunderland Parish
>
> Daniel Newcombe inducted 25 July 1719, died 1738
>
> Richard Swainston 1739-1758
>
> George Bramwell 1758-1962
>
> John Coxon 1762-1788
>
> James Smyth 1788-1793
>
> John Hampson 1795-1819

6.6 The monitoring work has demonstrated that despite the demolition of the cemetery monuments, burials do remain within the churchyard. This includes at least two intact burial vaults discovered during these works. It is also clear that some inhumations have been removed from their original locations. Wall [114] almost certainly represents the remains of a demolished vault that previously stood above ground level. It is likely that all such monuments were demolished in this manner, but it is not known if the human remains were reburied on site.

6.7 In the event that the cemetery (including the wider area which was formerly part of the cemetery) was to undergo further ground disturbance work, this would require archaeological monitoring as the presence of human remains is almost certain. It is recommended that any structural work on the apse be assessed thoroughly in terms of the impact it may have on the human remains contained within. If there is deemed to be any danger of significant disturbance and/or damage, then it would be recommended that the bones be removed and relocated at least temporarily. If no significant risk of disturbance is noted, then there would likely be no need to remove any human remains. There are no recommendations for further study of the individuals exhumed during these works.

6.8 No further work is required on the information recovered during the watching brief, with the Site Archive (including this report) forming the permanent record of the strata encountered.

7. REFERENCES

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7.2 Online Sources

The British Geological Survey website: www.bgs.ac.uk. This was consulted for information regarding the geology of the study area.

8. ACKNOWLEDGEMENTS AND CREDITS

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PCA Credits

Fieldwork: John Kemp (Osteoarchaeologist)

Report: John Kemp

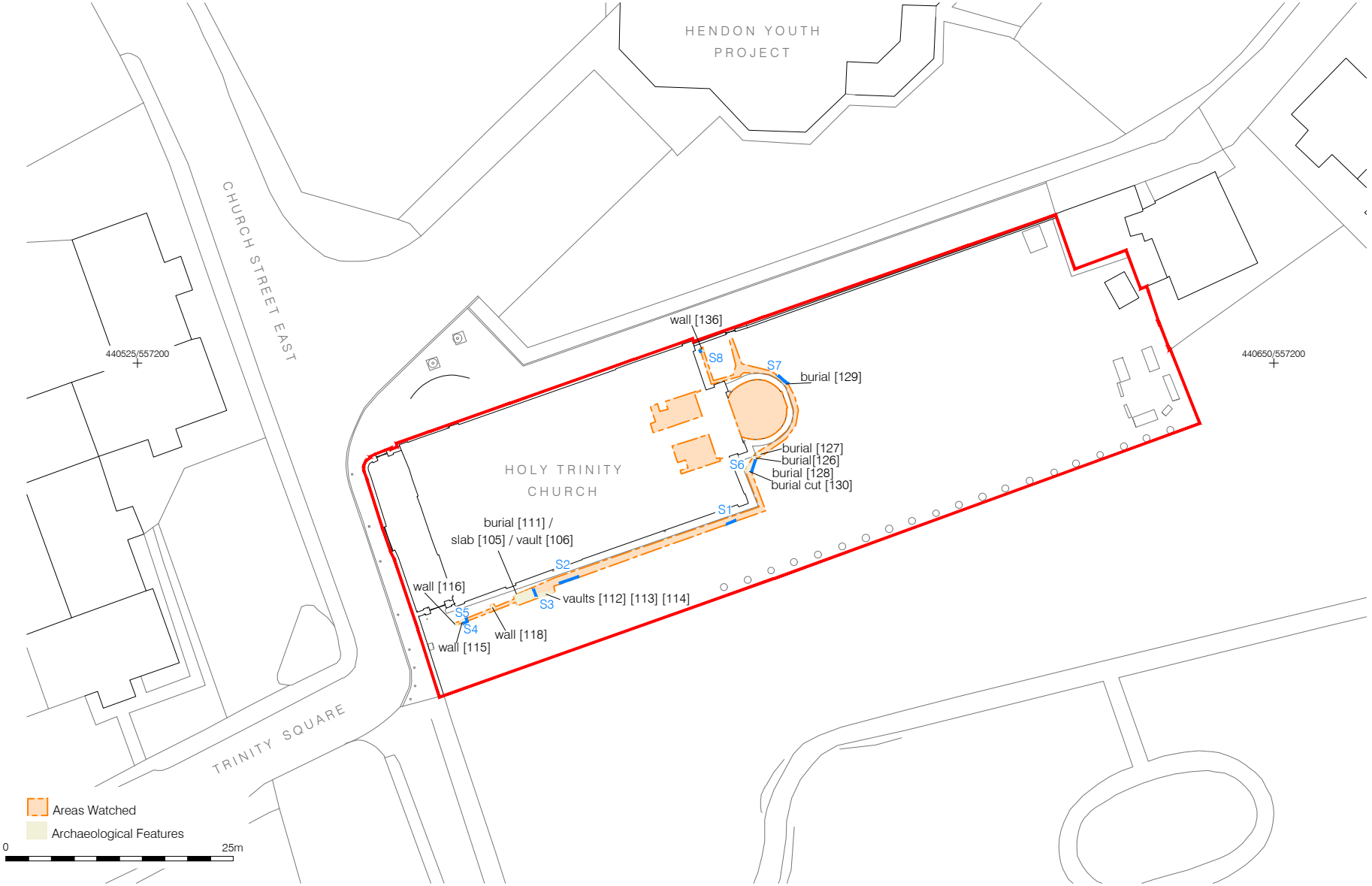
Project Manager: Jennifer Proctor

CAD: Diana Valk

APPENDIX 1: FIGURES

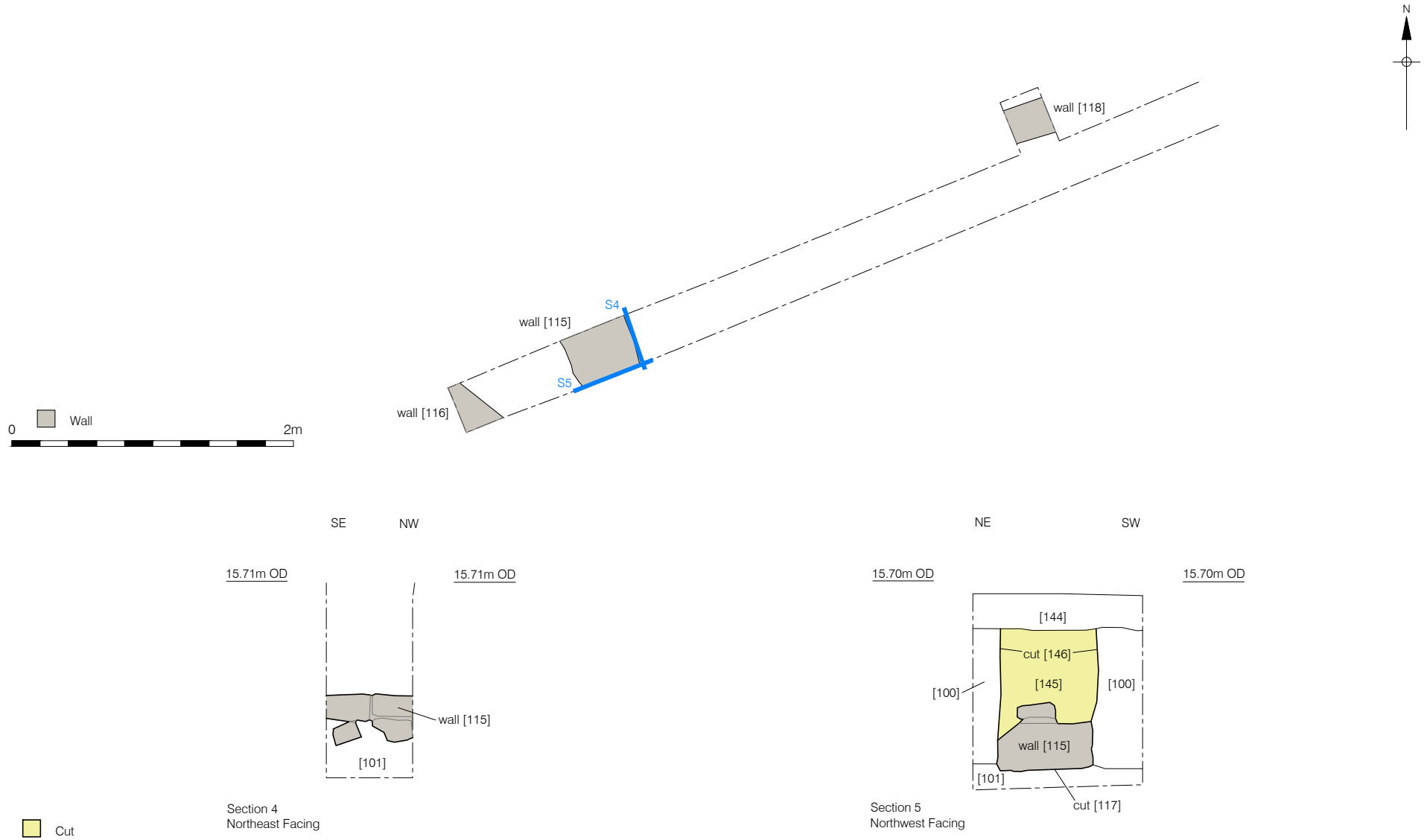
10/02/20 DV

Figure 1
Site Location
1:2,000,000, 1:250,000, 1:20,000 at A4



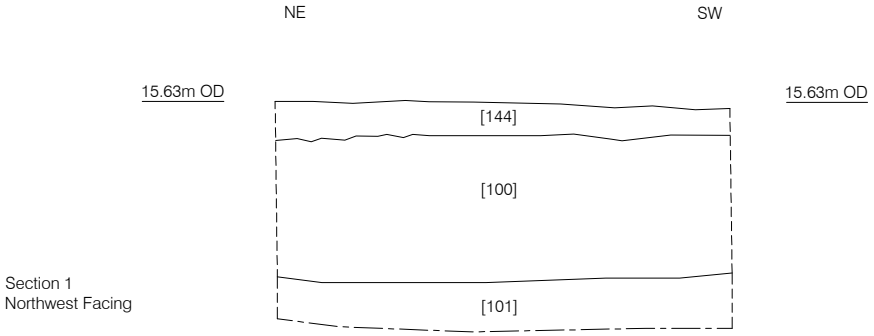
10/02/20 DV

Figure 2
Detailed Site Location
1:625 at A4

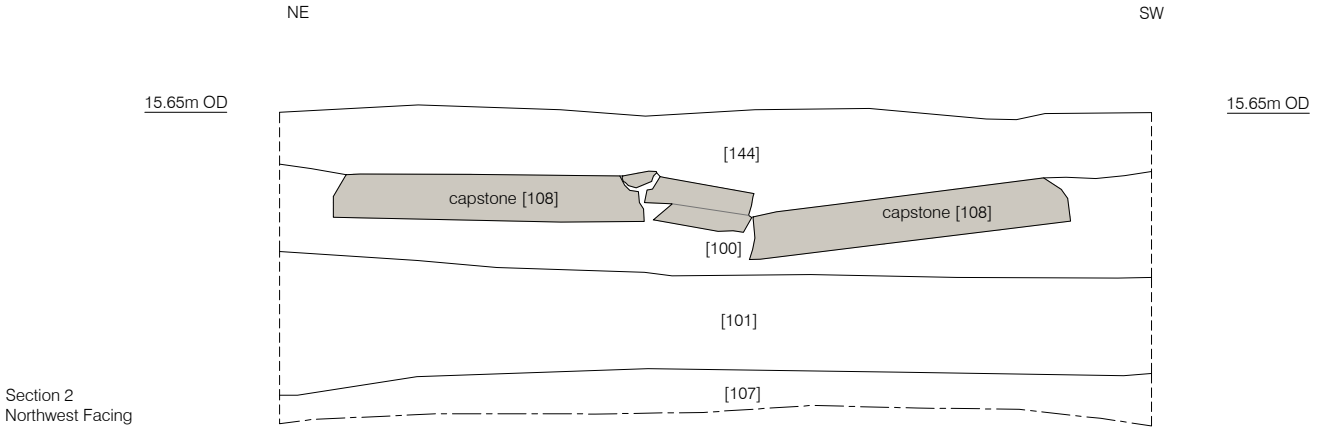


10/02/20 DV

Figure 3
Plan and Sections from West End of South Trench
Plan at 1:40 and Sections at 1:20 at A4



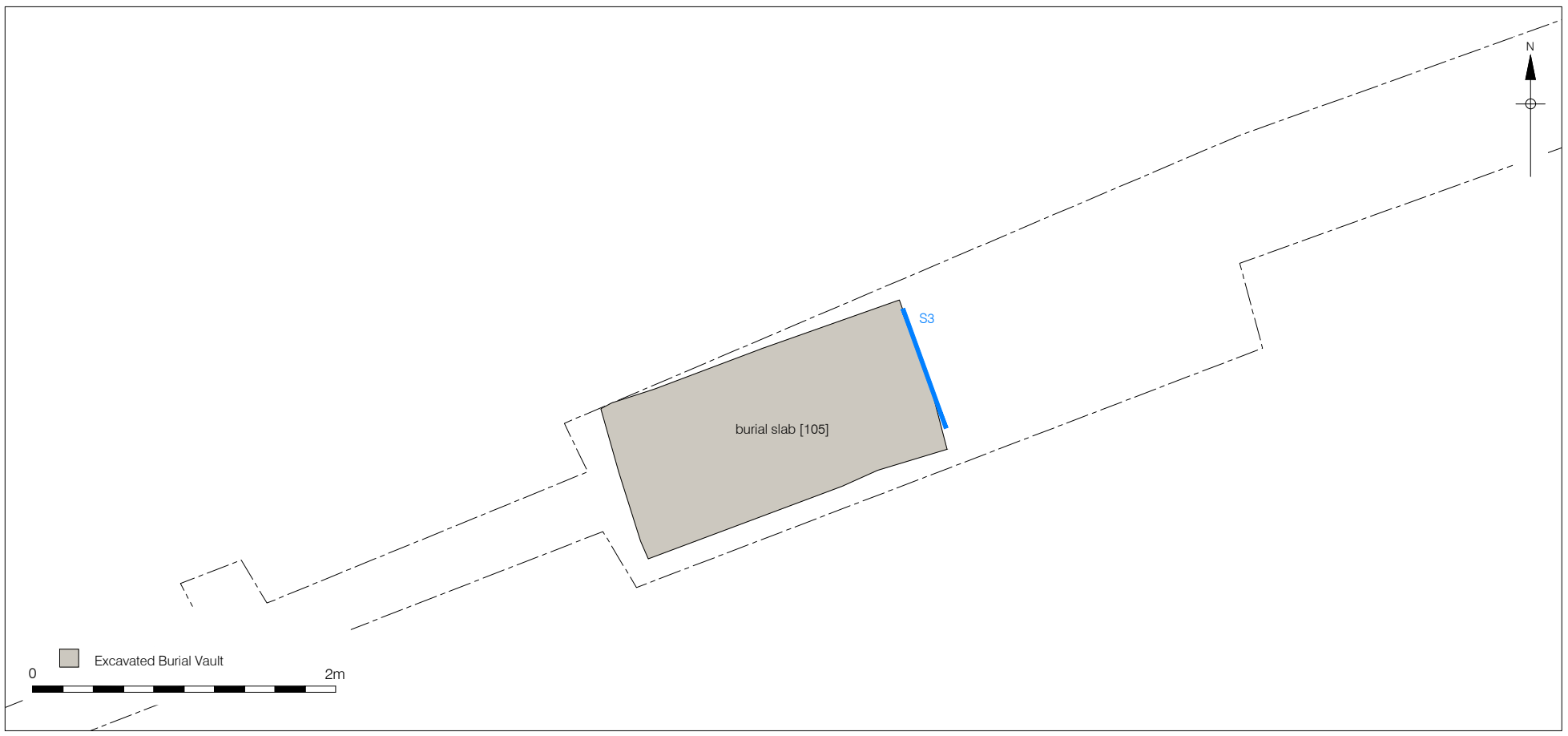
Section 1
Northwest Facing

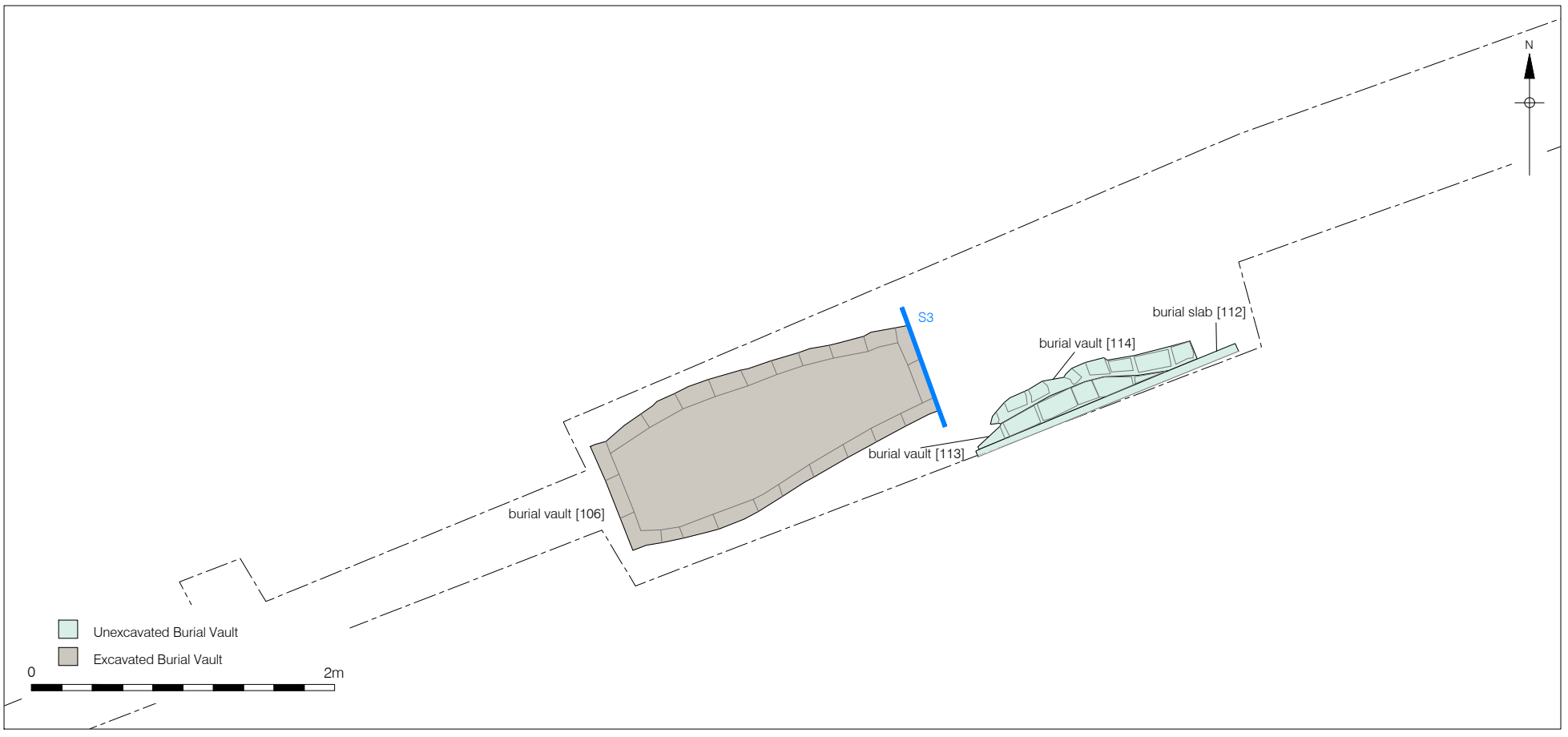


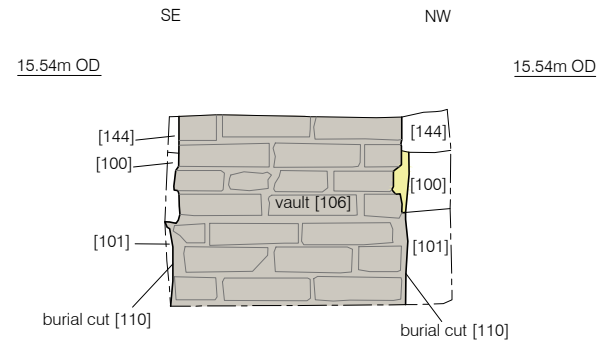
Section 2
Northwest Facing

10/02/20 DV

Figure 4
Representative Sections
1:20 at A4





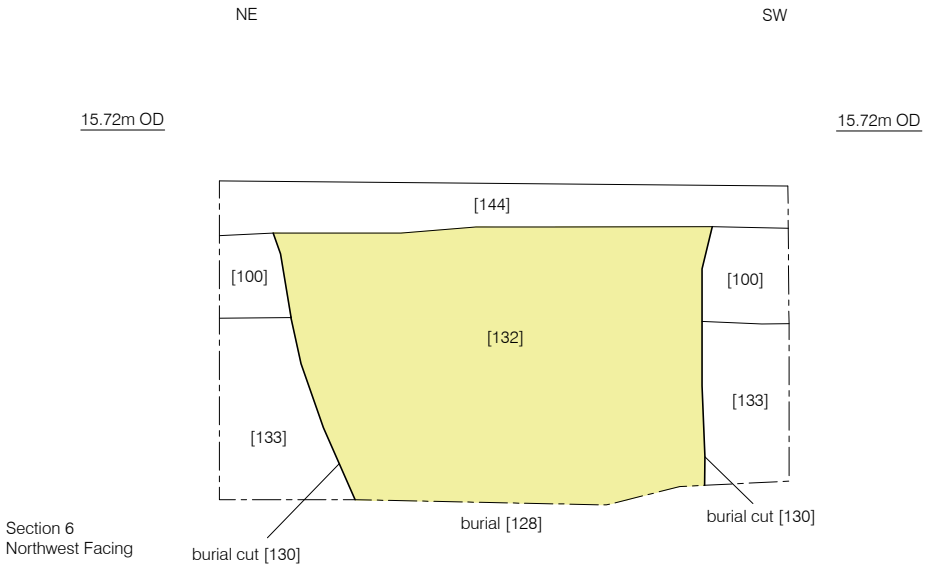


Section 3
Northeast Facing

Burial cut
Excavated burial vault
0
1m

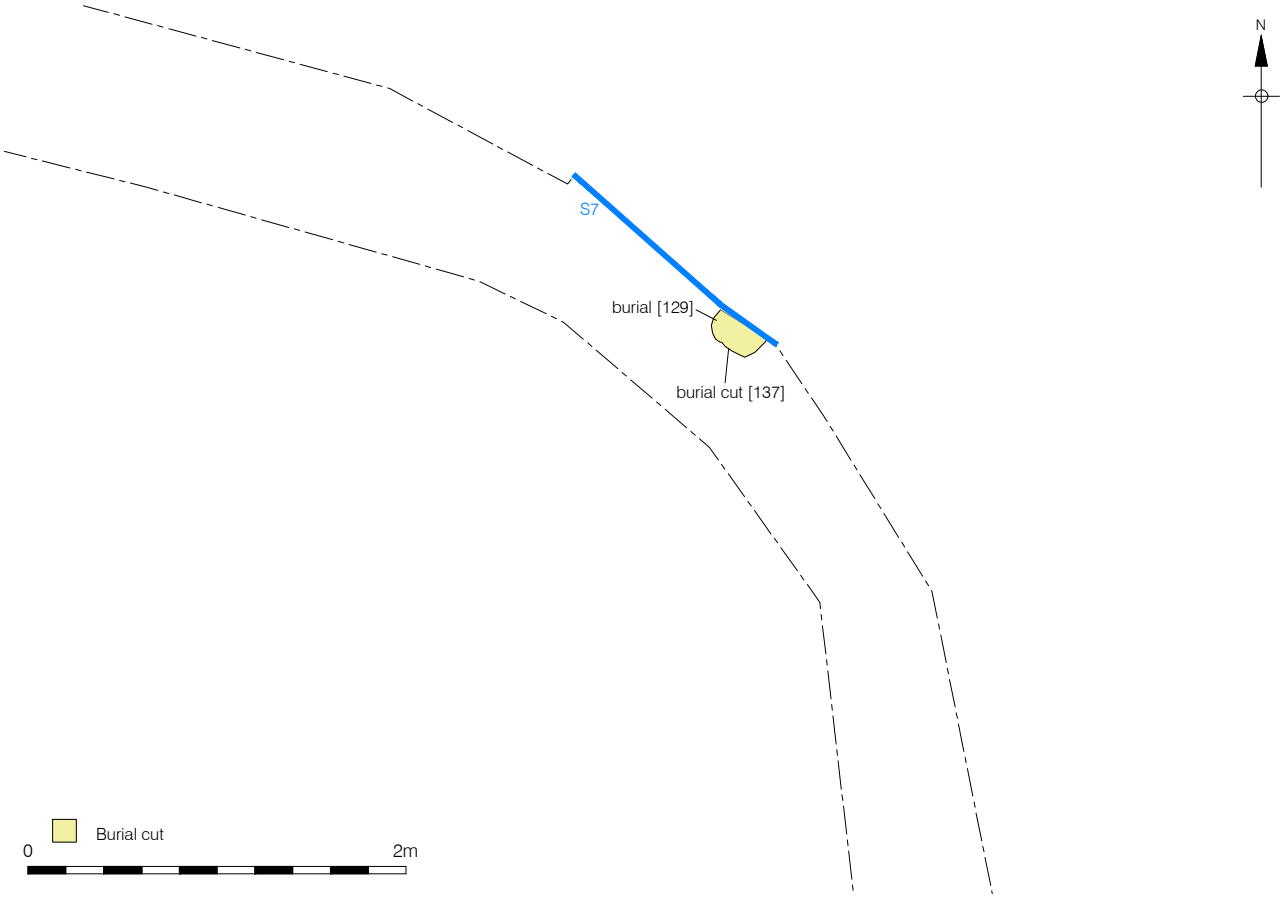
10/02/20 DV

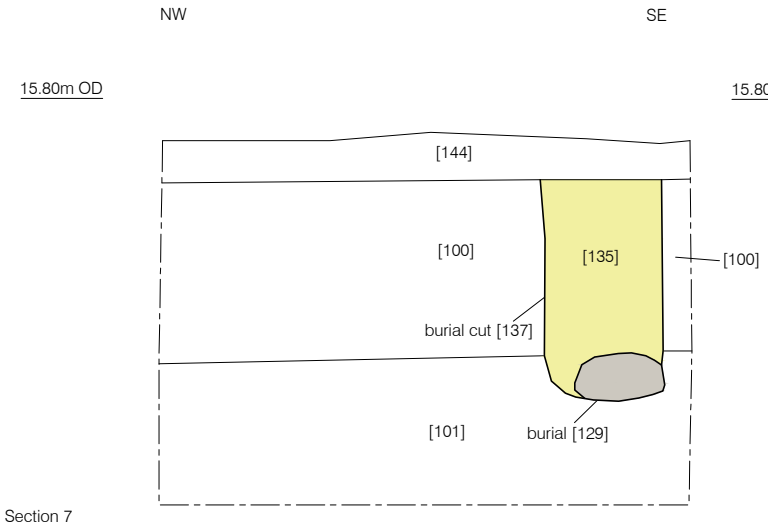
Figure 5
Excavated and Unexcavated Burial Vaults
Plans at 1:40 and Section at 1:20 at A3



10/02/DV DV

Figure 6
Plan and Section of Inhumations
Plan at 1:40 and Section at 1:20 at A4

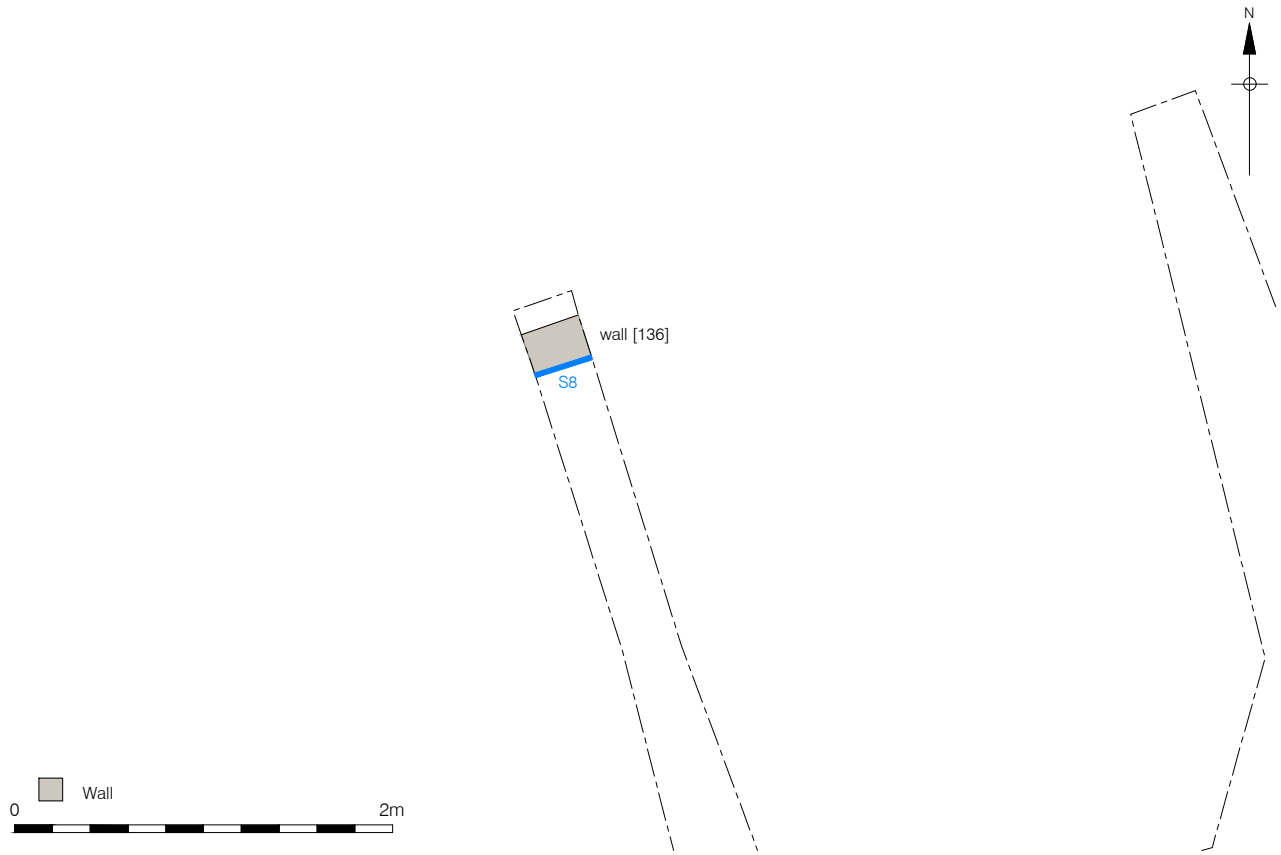


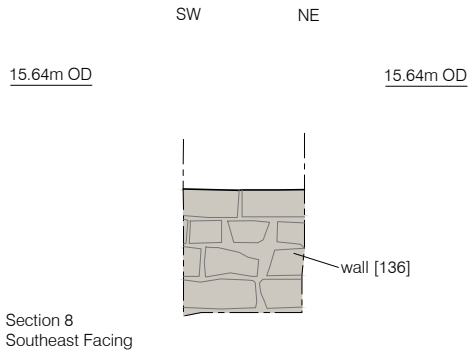


Section 7
Southwest Facing

Figure 7
Plan and Section of Juvenile Inhumation
Plan at 1:40 and Section at 1:20 at A4

10/02/20 DV





Section 8
Southeast Facing

10/02/20 DV

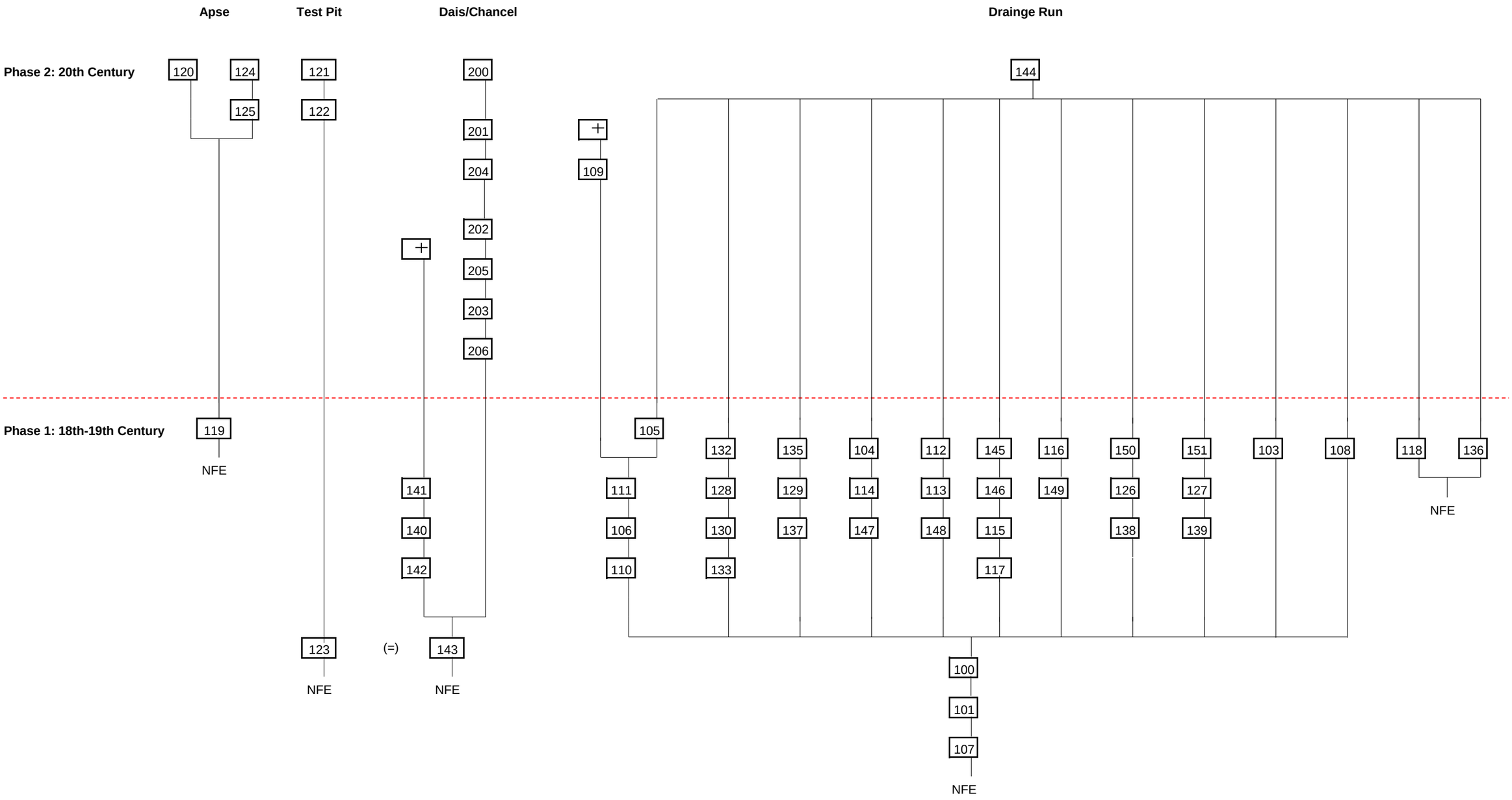
Figure 8
Plan and Section of North End of East Trench
Plan at 1:40 and Section at 1:20 at A4

APPENDIX 2: CONTEXT INDEX

Context	*Phase*	*Type 1*	*Type 2*	*Fill of*	*Interpretation*
100	1	Deposit	Layer	-	Burial soil
101	1	Deposit	Layer	-	Made ground surface
102	-	-	-	-	VOID
103	1	Masonry	Stone slab	-	Vault cover slab
104	1	Masonry	Stone slab	-	Vault cover slab
105	1	Masonry	Stone slab	-	In situ vault cover slab
106	1	Masonry	Burial vault	-	Brick wall forming burial vault and supporting 105
107	1	Deposit	Layer	-	Made ground surface
108	1	Masonry	Stone slab	-	Redeposited, broken vault cover slab [108] visible in section 2
109	2	Deposit	Fill	106	Backfill of burial vault 106 caused by animal disturbance
110	1	Cut	Discrete	-	Construction cut for burial vault 106
111	1	Skeleton	Inhumation	-	Adult female inhumation within 105/106
112	1	Masonry	Stone slab	-	In situ vault cover slab adjacent to 104. Located just outside trench limits.
113	1	Masonry	Burial vault	148	Brick wall forming burial vault and supporting 112
114	1	Masonry	Burial vault	147	Remains of a demolished vault underneath 104
115	1	Masonry	Wall	-	Stone foundations of a wall
116	1	Masonry	Wall	-	Brick wall
117	1	Cut	Construction	-	Cut for wall 115
118	1	Masonry	Wall	-	Brick wall located just outside trench
119	1	Masonry	Burial vault	-	Large burial vault located below church apse.
120	2	Deposit	Layer	-	Deposit covering the top of vault 119
121	2	Deposit	Layer	-	Concrete floor of church
122	2	Deposit	Layer	-	Hardcore layer
123	1	Deposit	Layer	-	Infill deposit under interior church flooring
124	2	Masonry	Surface	-	Modern concrete flagstone covering a hole in burial vault [119]
125	2	Cut	Linear	-	Service trench for installation of heating pipe. Truncates burial vault 119.
126	1	Skeleton	Inhumation	-	Infant burial
127	1	Skeleton	Inhumation	-	Infant burial
128	1	Skeleton	Inhumation	-	Adult male inhumation
129	1	Skeleton	Inhumation	137	Juvenile burial
130	1	Cut	Grave	-	Cut of grave for skeleton 128
131	-	-	-	-	VOID
132	1	Deposit	Fill	130	Fill of grave for skeleton 128
133	1	Deposit	Layer	-	White coloured deposit in east trench
134	-	-	-	-	VOID
135	1	Deposit	Fill	137	Fill of grave for skeleton 129
136	1	Masonry	Wall	-	Brick wall (boiler house?)
137	1	Cut	Grave	-	Cut of grave for skeleton 129
138	1	Cut	Grave	-	Cut of grave for skeleton 126

139	1	Cut	Grave	-	Cut of grave for skeleton 127
140	1	Other	Support	-	Metal support for pulpit
141	1	Deposit	Structure	142	Concrete foundation for metal support [140] used to support pulpit.
142	1	Cut	Discrete		Construction cut for pulpit support [140] and [141]
143	1	Deposit	Layer		Ground raising dump/infill interior of church below floor level. Same as [123]
144	2	Deposit	Layer		Topsoil
145	1	Deposit	Fill	146	Fill of demolition cut [146]
146	1	Cut	Linear		Demolition cut removing wall [115]
147	1	Cut	Discrete		Construction cut for vault [114]
148	1	Cut	Discrete		Construction cut for vault [113]
149	1	Cut	Linear		Construction cut for wall [116]
150	1	Deposit	Fill		Fill of grave cut [138]
151	1	Deposit	Fill		Fill of grave cut [139]
200	2	Masonry	Surface		Tile and concrete floor surface within dais and Chancel.
201	2	Deposit	Layer	206	Infill deposit within 20th century dais construction
202	2	Masonry	Structure	206	Sandstone edging for dais
203	2	Masonry	Structure	206	Brick heating duct
204	2	Deposit	Fill	206	Infill of construction cut [206] for brick ducts [203] and dais
205	2	Masonry	Structure	206	Outer brick wall of dais, below capping stones [202]
206	2	Cut	Discrete		Construction cut for dais/chancel during the installation of heating ducts [203].

APPENDIX 3: STRATIGRAPHIC MATRIX


Apse
Test Pit
Dais/Chancel
Drainge Run
Phase 2: 20th Century
Phase 1: 18th-19th Century
120
124
125
121
122
200
201
204
202
205
203
206
144
109
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NFE
141
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136
NFE
100
101
107
NFE

APPENDIX 4: PHOTOGRAPHIC PLATES

Plate 1: Section 1 representative section, view south, scale: 1m

Plate 2: Walls [116] (right) and [115] (left) in drainage trench west end, view south, scale: 1m

Plate 3: Vault slab [105], view north, scale: 2m and 0.5m

Plate 4: Burial vault [106], view north, scale: 2m and 0.5m

Plate 5: Surviving inscription on [105], scale: 0.5m

Plate 6: Burial slab [112] with vaults [113] in section with partially demolished vault [114] and burial vault [106] (right), view southwest, scale: 2m

Plate 7: Vault slab [104] above [114], view north, scale: 2m and 0.5m

Plate 8: Burial slab [103]: view north scale: 2m & 0.5m

Plate 9: Burial (128), view northwest, scale: 0.5m

Plate 10: Boiler house [136] in drainage trench north end: view north, scale: 0.1m

Plate 11: Church floor test pit, view south, scale: 1m

Plate 12: Burial vault [119] below apse, view east, scale: 1m

Plate 13: Burial vault [119] below apse, view east, scale: 1m

Plate 14: Burial vault [119], view east, scale: 2m

Plate 15: Arched roof of burial vault [119], view northeast, scale: 1m and 0.5m

Plate 16: Heating pipe with service trench in apse, view west, scale: 0.5m

Plate 17: Rector's vault [119] below apse, view northeast

Plate 18: Rector's vault [119] below apse with disturbed human remains, view northeast

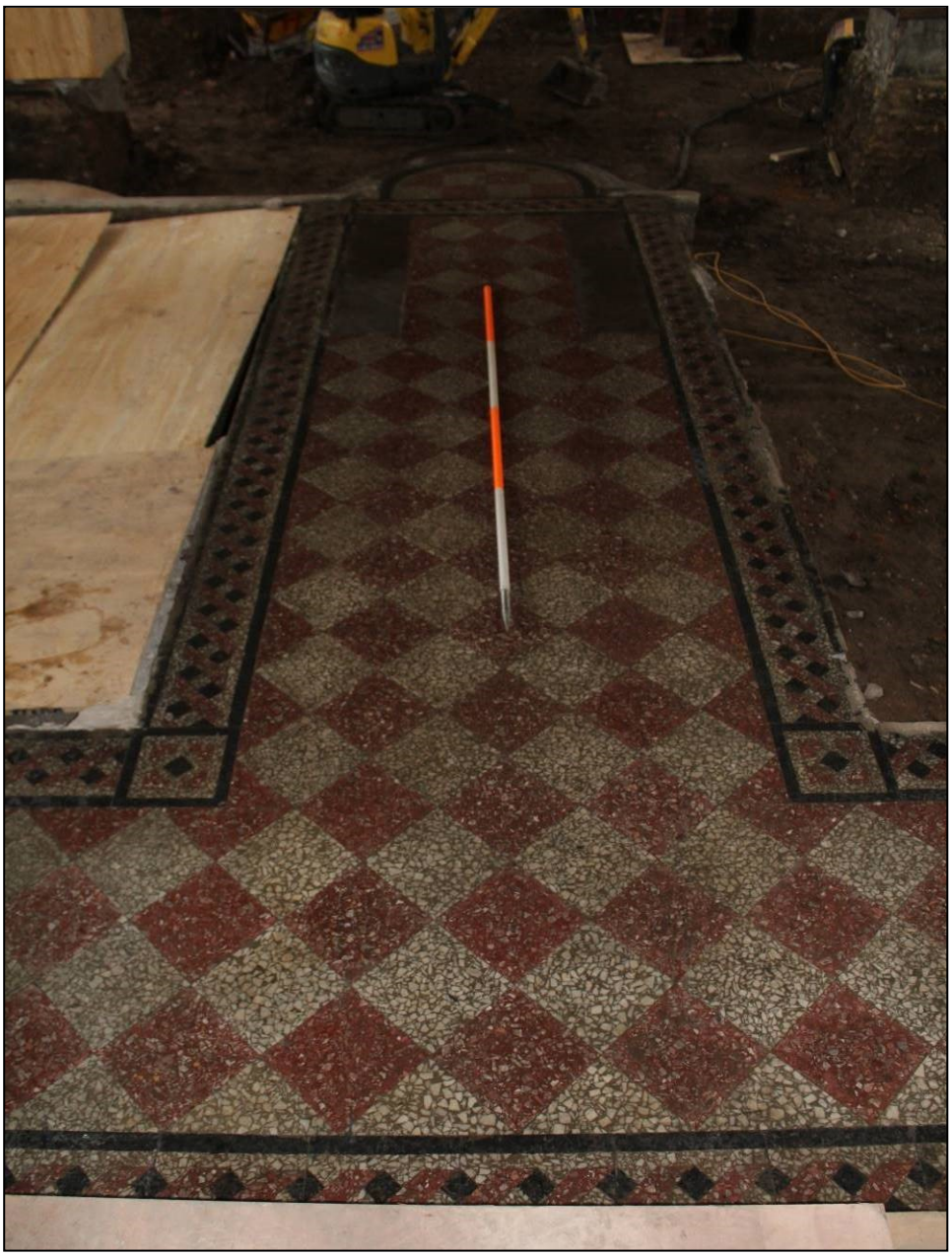
Plate 19: Ossuary box within Rector's vault and scattered human remains, view northeast

Plate 20: Nave after ground reduction: view southwest, scale: 1m

Plate 21: Pulpit foundations [140] and [141] in cut [141]: view northeast, scale: 0.5m

Plate 22: Heating duct [203] below dais: view northeast, scale: 1m

Plate 23: Tiled floor surface [200] within dais/chancel: view southwest, scale: 2m



APPENDIX 5: OSTEOLOGY REPORT

John Kemp

Introduction

A watching brief at Holy Trinity Church Sunderland revealed a small number of in-situ burials and disarticulated bone during excavation works. There were five in-situ burials, one of which was in a brick vault with a stone cover slab and two were neonates/infants. The eastern trench at the rear of the church also contained the remains of at least three additional neonates/infants. The three adult burials had all originally likely been interred in coffins, but coffin furniture was only found associated with two burials. An earlier watching brief carried out by PCA in 2016 also encountered disarticulated human bone in test pits located around the perimeter on the church. Osteological analysis of the recovered individuals was carried out to provide demographic information and to describe pathological changes to the skeletons.

Methodology

Articulated human bone

Each articulated skeleton was assessed for completeness, preservation, pathological lesions, age and sex where possible. Preservation level was assessed using the grading system in McKinley (2004) described below. Completeness was estimated visually as a percentage. The dentition was recorded using the FDI system as illustrated in Hillson (1996) and labelled based on the system proposed by Brothwell (1981).

Grade 0 – Very good
Surface morphology clearly visible with fresh appearance to the bone and no modifications.
Grade 1 – Good
Slight erosion and patchy surface.
Grade 2 – Good-moderate
More extensive surface erosion than grade 1 with deeper surface penetration.
Grade 3 – Moderate
Most of bone surface affected by some degree of erosion; general morphology maintained but details of parts of surface masked by erosive activity.
Grade 4 – Moderate-poor
All of bone surface affected by erosive action; general profile maintained, and depth of modification not uniform across whole surface.
Grade 5 – Poor
Heavy erosion across whole surface, completely masking normal surface morphology, with some modification of profile.
Grade 5+ - Very poor
As grade 5 but with extensive penetrating erosion resulting in modification of profile.

Age assessment

Due to the fragmentary nature of the remains recovered, useable age estimation methods were limited. It was possible to assess 1 individual using the Buckberry & Chamberlain (200) method using the auricular surface. Other individuals were assessed as closely as possible using the AlQhatani *et al* (2010) dental atlas and developmental data from Schaefer *et al* (2009). The individuals were then placed into categories based on guidelines in Buikstra & Ubelaker (1994). The categories used are shown in table 1.

Category	**Age range**
Neonate	Birth
Infant	Birth-1 year
Juvenile	1-11 years
Adolescent	12-20 years
Young Adult	20-34 years
Middle Adult	35-49 years
Old Adult	50+ years
Unspecified adult	20+ years

Table 1: Age categories for skeletal remains. Adapted from Buikstra & Ubelaker (1994)

Sex assessment

Morphology of the cranium and pelvis were used to assess biological sex. The guidelines in Brothwell (1981) and Ubelaker (1989) were used to assess these traits. Although the pelvis is usually favoured for this as it is the most reliably sexually dimorphic area of the human skeleton, a lack of pelvic bones recovered meant that the cranium was favoured in most cases (Brothwell 1981).

Biometrics, Stature Estimation and Non-Metric analysis

Where possible, measurements of the bones from undisturbed contexts were measured according to the standards in Buikstra & Ubelaker (1994). Estimates of stature were made using the formulae developed by Trotter (1970). In this instance the method could only be applied to one individual. All skeletons were assessed for non-metric traits listed in Brothwell (1981) and Buikstra & Ubelaker (1994).

Recording of Pathology

Pathological changes identified on the skeletons were split into separate sections for ease of reading. A description of the type and location of the changes is given for each individual exhibiting that particular pathology. This is followed by a differential diagnosis and archaeological interpretation

where possible. Descriptions and classifications were based largely on Roberts & Manchester (2010). Other relevant sources were consulted when necessary. Photographs of notable pathology are presented in appendix A and the plates are referred to throughout the text.

Disarticulated Human Bone

Disarticulated bone from the redeposited soil above the in-situ burials was sorted roughly according to where in the trench it was found. Each element recovered was identified and sided where possible. A minimum number of individuals (MNI) was established based on the most commonly reoccurring element and any pathological changes were recorded. The infant bones recovered from the eastern trench have been combined with those recorded as articulated burials in order to provide a more accurate picture of the overall population.

Results

Disarticulated MNI

The minimum number of individuals from the disarticulated bone was calculated as one adult plus the two articulated burials. In addition to this, there was one juvenile burial and an MNI of five neonatal/infant remains based on the reoccurrence of the left humerus and the left tibia. This is inclusive of bones from burials [127] and [128]. This results in an MNI of nine for the excavated areas.

Completeness & Condition

The completeness and preservation of the skeletal remains is shown in table 2.

Skeleton	Completeness	Preservation
111	30-40%	Grade 1
126	25-35%	Grade 1
127	20-30%	Grade 1
128	35-45%	Grade 1
129	20-30%	Grade 1

Table 2: Estimated completeness and grade of preservation (McKinley 2004) for the excavated individuals.

Age assessment

Most individuals were too fragmented to carry out multiple methods of age assessment. However, in all cases, it was possible to establish an age range based on the remains recovered. Table 4 shows the collated age estimation information for all the neonatal/infant bones. This includes bones associated with burials 126 and 127.

Skeleton	Long bone measurements	Dental eruption	Fusion analysis	Auricular Surface
111	N/A	23.5+ years	N/A	N/A
126	28-38 weeks	N/A	<1 year	N/A
127	24-32 weeks	N/A	<1 year	N/A
128	N/A	23.5+ years	N/A	21-38 years
129	N/A	4-6 years	>3 years	N/A

Table 3: Age analysis for the excavated individuals.

Context	Element	Measurement	Age estimate
(100)	Femur	65mm	34-38 weeks
(100)	Femur	54mm	30-32 weeks
(100)	Tibia	53mm	34-36 weeks
(100)	Tibia	61mm	38-40+ weeks
(100)	Tibia	52mm	32-36 weeks
(100)	Fibula	56mm	36-38 weeks
(100)	Fibula	51mm	32-36 weeks
(100)	Fibula	51mm	32-36 weeks
(100)	Ulna	40mm	26-30 weeks
(100)	Ulna	47mm	30-34 weeks
(100)	Humerus	51mm	32-34 weeks
(126)	Humerus	50mm	30-34 weeks
(126)	Humerus	52mm	32-34 weeks
(126)	Humerus	55mm	34-38 weeks
(126)	Femur	57mm	32-34 weeks
(126)	Femur	57mm	32-34 weeks
(126)	Tibia	48mm	30-32 weeks
(126)	Tibia	48mm	30-32 weeks
(126)	Fibula	45mm	30-32 weeks
(126)	Fibula	45mm	30-32 weeks
(126)	Clavicle	32mm	28-30 weeks
(127)	Humerus	45mm	26-30 weeks
(127)	Humerus	44mm	26-28 weeks
(127)	Humerus	43mm	24-30 weeks
(127)	Radius	36mm	26-30 weeks
(127)	Radius	57mm	40+weeks
(127)	Ulna	41mm	28-32 weeks
(127)	Femur	48mm	28-30 weeks
(127)	Tibia	42mm	28-30 weeks
(127)	Fibula	40mm	24-30 weeks
(127)	Clavicle	24mm	20-22 weeks

Table 4: Long bone measurements and age estimates for neonatal/infant bones

Sex assessment

Skeletons [126], [127] and [129] could not be assessed as the biological sex of infant and juvenile skeletons is difficult to accurately establish as their skeletal traits are far more ambiguous. For all other in situ skeletons, biological sex was assessed with a high degree of certainty based on morphological traits. The results of the assessment are shown in table 5.

Skeleton	**Biological sex**
111	Female
128	Male

Table 5: Sex assessment of excavated individuals.

Biometrics and non-metrics

Stature was calculated for skeleton [128] using the Trotter (1970) equations. The results are shown in table 6. Stature could not be calculated for skeleton [111] due to damage to the required bones. Skeletons [126], [127] and [129] could not be assessed for stature as the equations can only be applied to adults. Table 7 shows the non-metric trait assessment for the excavated individuals.

Skeleton	**Bone used**	**Stature (cm)**
128	Humerus	173.63 ±4.05
128	Radius	176.91 ±4.32

Table 6: Stature estimation for excavated individuals.

Trait	Skeleton 111	Skeleton 128	Skeleton 129
Cranial			
Metopic Suture	0	UO	0
Supraorbital notch	UO/UO	UO/UO	1/UO
Supraorbital foramen	UO/UO	UO/UO	0/UO
Infraorbital suture	UO/UO	UO/UO	0/UO
Multiple infraorbital foramina	UO/UO	UO/UO	0/UO
Zygomatico-facial foramina	UO/UO	UO/UO	1/UO
Parietal Foramen	UO/UO	UO/UO	1/1
Epipteric bone	UO/UO	UO/UO	UO/UO
Coronal ossicle	UO/UO	UO/UO	UO/UO
Bregmatic bone	UO	UO	UO

Saggittal Ossicle	UO	UO	UO
Apical bone	UO	UO	UO
Lamboid ossicle	UO	UO	UO
Asterionic bone	UO	UO	UO
Ossicle in Occipito-mastoid suture	UO/UO	UO/UO	0/UO
Parietal notch bone	UO/UO	UO/UO	UO/UO
Inca bone	UO	UO	UO
Condylar canal	UO/UO	UO/UO	1/UO
Divided hypoglossal canal	0/UO	UO/UO	UO/UO
Flexure of superior saggittal sulcus	UO	UO	UO
Foramen ovale incomplete	UO/UO	UO/UO	UO/UO
Foramen spinosum incomplete	UO/UO	UO/UO	UO/UO
Pterygo-spinous bridge	UO/UO	UO/UO	UO/UO
Pterygo-alar bridge	UO/UO	UO/UO	UO/UO
Tympanic dehiscence	0/UO	UO/UO	UO/UO
Auditory exostosis	0/UO	UO/UO	0/0
Mastoid foramen	1/UO	UO/UO	0/UO
Multiple mental foramen	UO/UO	UO/UO	0/0
Mandibular torus	UO/UO	UO/UO	0/0
Mylohyoid bridge	UO/UO	UO/UO	0/0
Bridging of jugular foramen	UO/UO	UO/UO	0/UO
Double occipital condylar facet	UO/0	UO/UO	0/0
Frontal grooves	0/0	UO/UO	0/UO
Ethmoidal foramina	UO/UO	UO/UO	UO/UO
Paracondylar process	UO/UO	UO/UO	UO/UO
Maxillary torus	UO	UO/UO	UO
Pharyngeal tubercle	1	UO	0
Clinoid bridge or spurs	UO/UO	UO/UO	UO/UO
Accessory lesser palatine foramina	UO/UO	UO/UO	0/0
Palatine torus	UO	UO	UO
Suprameatal pit or spine	0/UO	UO/UO	0/UO
Divided parietal bone	UO/UO	UO/UO	0/0
Os japonicum	UO/UO	UO/UO	0/UO
Marginal tubercle	UO/UO	UO/UO	0/UO
Trochlear spine	UO/UO	UO/UO	0/UO
Supratrochlear notch/foramen	UO/UO	UO/UO	UO/UO
Trochlear notch form	UO/UO	UO/UO	UO/UO
Supratrochlear spur	UO/UO	UO/UO	UO/UO
Retroauricular bridge	0/UO	UO/UO	0/UO
Rocker mandible	UO	UO	UO
Postcranial			
Atlas double facets	UO/UO	UO/UO	UO/UO
Atlas bridging	UO	UO	UO
Accessory transverse foramen (atlas)	UO/UO	UO/UO	UO/UO

Accessory transverse foramen in cervical vertebrae	UO/UO	0/0	0/0
sternal foramen	UO	UO	UO
Preauricular sulcus	UO/UO	0/UO	UO/UO
Accessory sacroilliac articulation	UO/UO	UO/UO	UO/UO
Acetabular crease	UO/UO	UO/UO	UO/UO
Upper limbs			
Suprascapular foramen or notch	UO/UO	0/0	UO/UO
Accessory acromial articular facet	UO/UO	0/0	UO/UO
unfused acromial epiphysis	UO/UO	0/0	0/0
Glenoid fossa extension	UO/UO	0/UO	UO/UO
Circumflex sulcus	UO/Uo	0/0	0/0
Supracondylid process	0/0	0/UO	UO/UO
Septal aperture	UO/UO	0/UO	UO/UO
Lower limbs			
Exostosis in trochanteric fossa	UO/UO	0/UO	UO/UO
Allen's fossa	UO/UO	0/UO	UO/UO
Poirer's facet or extension	UO/UO	0/UO	UO/UO
Femoral head plaque formation	UO/UO	0/UO	UO/UO
Third trochanter	UO/UO	UO/UO	UO/UO
Vastus notch	UO/UO	UO/UO	UO/UO
Emarginate patells	UO/UO	UO/UO	UO/UO
Tibial squatting facets	UO/UO	UO/UO	UO/UO
Talus squatting facets	UO/UO	UO/UO	UO/UO
Lateral talar extension	UO/UO	UO/UO	UO/UO
Inferior articular surface extension	UO/UO	UO/UO	UO/UO
Anterior calcaneal facet double	UO/UO	UO/UO	UO/UO
Anterior calcaneal facet absent	UO/UO	UO/UO	UO/UO
Peroneal tubercle	UO/UO	UO/UO	UO/UO
Dental			
Shovel shaped incisors	UO/UO	UO/UO	0/0
Carabelli's cusp (upper molars)	0/0	UO/UO	0/0
Parastyle mandible (upper molars)	0/0	UO/UO	0/0
Tuberculum dentale (lower incisors)	UO/UO	0/0	0/0
Interruption groove (Lower molars)	UO/UO	0/UO	0/0
Peg shape (Upper lateral incisors)	UO/UO	UO/UO	0/0
Bushman canine (upper canines)	UO/UO	UO/UO	0/0
Paracone ridge (upper molars)	1/1	UO/UO	1/1
Enamel extension (upper molars)	0	0	0
Protoconid (Lower molars)	UO/UO	0/UO	1/1
Hypocone (upper molars)	1/1	UO/UO	1/1
Protostylid (Lower molars)	UO/UO	0/UO	0/0

Table 7: Assessment of non-metric traits for the excavated individuals.

Skeletal Pathology

Dental Pathology

Table 8 shows a summary of the major dental conditions and notes their locations within the dentition using the FDI system.

Skeleton	Caries	Tooth loss	Periodontitis	Dental abscess
111	No	No	No	24
126	No	No	No	No
127	No	No	No	No
128	No	48	No	No
129	No	No	No	No

Table 8: Dental pathology for excavated individuals using the FDI notation system.

Dental caries/abscesses

Caries is a destructive lesion affecting the teeth. It is caused by the fermentation of sugars by bacteria present in dental plaque (Roberts & Manchester 2010). No caries lesions were noted on any of the teeth recovered. However, a dental abscess was noted in the maxilla of skeleton [111] (plate 1). Although the associated tooth was not recovered, it is likely that it would have been affected by caries. Endodontic lesions have been shown to increase the risk of heart disease (Liljestrand *et al* 2016).

Ante mortem tooth loss

Due to the fragmentary nature of the human remains, the assessment of ante mortem tooth loss was difficult to assess. There was only one certain instance of ante mortem tooth loss. The lower left third molar of skeleton [128] was absent and the empty socket had mostly infilled with bone (plate 2).

Calculus

Calculus build up was noted on the teeth of skeletons [111] and [128] (plates 3, 4, 5 and 6). Using the scoring system in Hillson (1996), the deposits for skeleton [111] were noted as slight and those of skeleton [128] were noted as moderate. Untreated calculus deposition can lead to periodontal disease and tooth loss (Roberts & Manchester 2010). Periodontal disease is the loss of alveolar bone resulting in exposure of tooth roots (Hillson 1996). Periodontal disease can be difficult to identify in archaeological remains due to taphonomic damage (Roberts & Manchester 2010). However, in this instance, there does not appear to be any evidence of periodontal disease in any of the individuals recovered.

Cranial Pathology

Neoplasms

Skeleton [111] had a small cluster of small neoplastic osteomas on the internal surface of the frontal bone (plate 7). These would likely have been symptomless and there is no evidence to suggest they had any negative effect on the individual (Roberts & Manchester 2010).

Post Cranial Pathology

Osteophytes

Osteophytes are bony outgrowths occurring in the margins of a joint surface or on the joint surface itself (Roberts & Manchester 2010). They form as a reaction to stress or trauma placed upon the joint and become increasingly common as an individual ages (Roberts & Manchester 2010). In extreme cases, osteophytes on the vertebral bodies can overlap and fuse together. This is known as osteophytosis (Roberts & Manchester 2010).

Only skeleton [128] showed any evidence of osteophytes (plate 8). These occurred on the vertebral bodies of some of the thoracic vertebrae. However, they were very infrequent and small. The absence of advanced osteophytes in the adult skeletons suggest the individuals were fairly young and this supports the earlier age estimates well.

Non-pathological alterations

Skeleton [111] had been badly disturbed by burrowing animals entering the burial vault. This has resulted in claw marks on several of the recovered bones (plate 9). Skeleton [128] was missing their cranium and the mandible had a circular, post-mortem puncture wound (plates 10 & 11). This was likely caused by a spiked object such as a fencing pin. It is likely that ground disturbing works have taken place in this area previously and disturbed the burial.

Recommendations for further work

The burial assemblage recovered represents a very small portion of the cemetery population. There are most certainly other burials remaining in the cemetery, but they are not under threat and are unlikely to require excavation in the future. The individuals recovered are to be reinterred, but the information gathered in this report should be more than sufficient to inform the reader. Therefore, no further work is recommended.

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Pathology photographs

Plate 1: Dental abscess in the maxilla of skeleton [111]

Plate 2: Ante mortem tooth loss in the mandible of skeleton [128]

Plate 3: Calculus deposits on the dentition of skeleton [128]

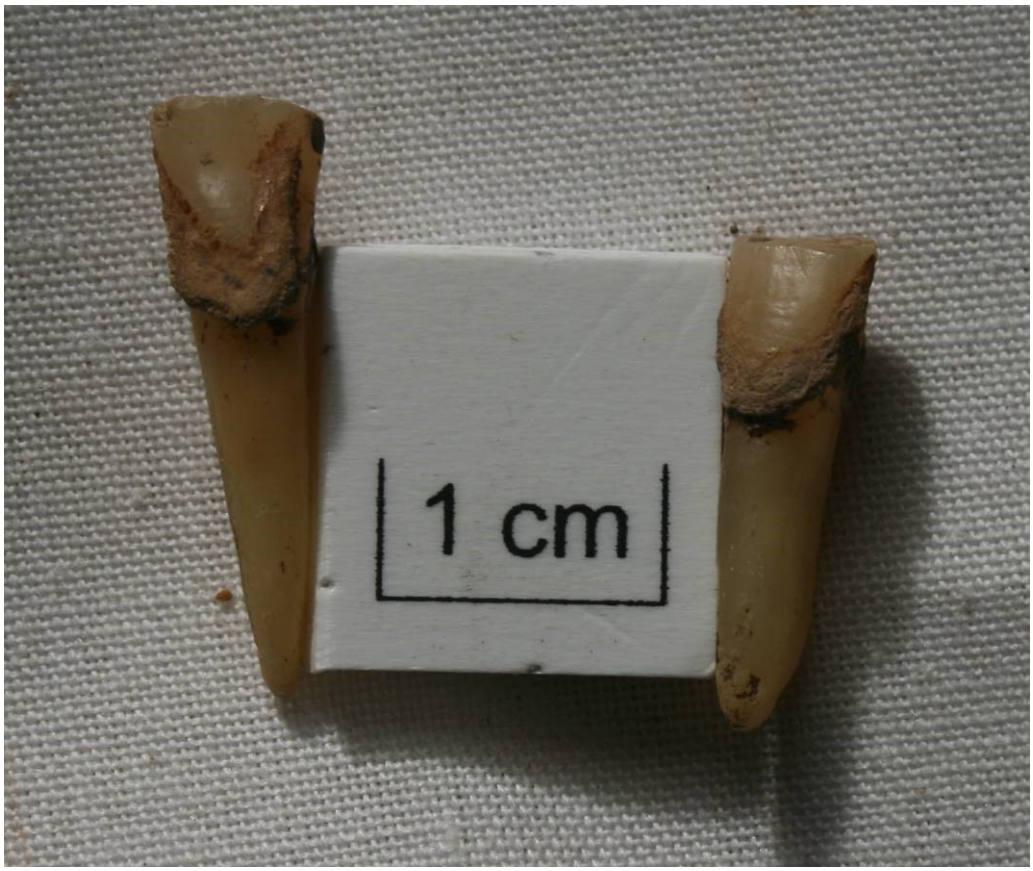


Plate 4: Further calculus deposits on the dentition of skeleton [128]

Plate 5: Calculus deposits on the dentition of skeleton [111]

Plate 6: Further calculus deposits on the dentition of skeleton [111]

Plate 7: Neoplastic osteomas on the internal surface of the frontal bone of skeleton [111]

Plate 8: Small ostephytes formed around the borders of the thoracic vertebrae of skeleton [128]

Plate 9: Animal claw marks on a humerus from skeleton [111]

Plate 10: Post-mortem puncture wound to mandible of skeleton [128], lingual side

Plate 11: post-mortem puncture wound to mandible of skeleton [128], buccal side

Burial catalogue

Skeleton 111
Age: Young adult
Sex: Female
Stature: N/A due to taphonomic damage
Preservation: Good (McKinley 2004)
Completeness: 30-40%
Pathology: Slight calculus deposits on all recovered teeth. Dental abscess associated with tooth 24

Skeleton 126
Age: Neonate/infant
Sex: Indeterminate
Stature: N/A due to unsuitable age
Preservation: Good (McKinley 2004)
Completeness: 25-35%
Pathology: None noted

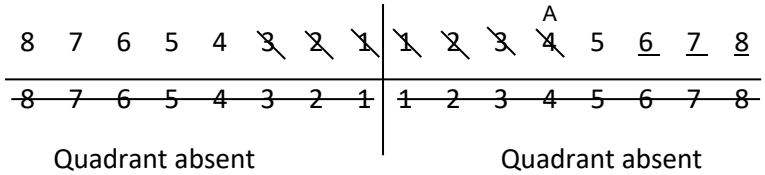
Skeleton 127
Age: Neonate/infant
Sex: Indeterminate
Stature: N/A due to unsuitable age
Preservation: Good (McKinley 2004)
Completeness: 20-30%
Pathology: None noted

Skeleton 128
Age: Young adult
Sex: Male
Stature: Humerus – 173.63 ±4.05 (Trotter 1970)
Radius – 176.91 ±4.32 (Trotter 1970)
Preservation: Good (McKinley 2004)
Completeness: 35-45%
Pathology: Moderate calculus deposits on all teeth recovered. Minor osteophytic lipping on thoracic vertebrae.

Skeleton 129
Age: Juvenile
Sex: Indeterminate
Stature: N/A due to unsuitable age
Preservation: Good (McKinley 2004)
Completeness: 20-30%
Pathology: None noted.

HTC 19 dental recording forms

SK111



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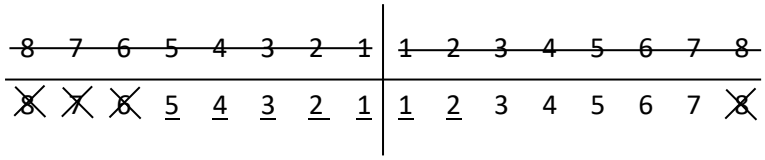
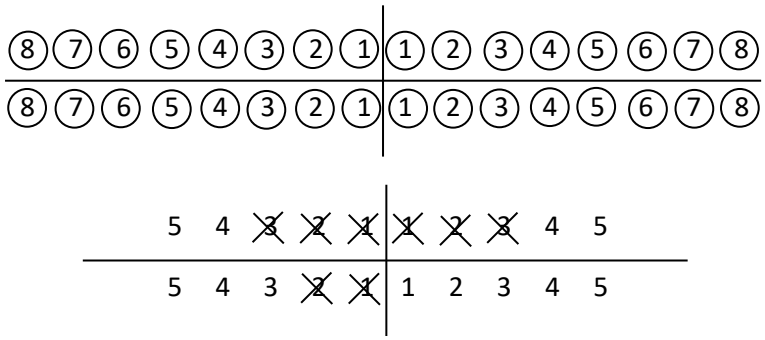


SK129



KEY

1 = Present

1 = Absent

1 = Tooth absent, socket present

1 = Tooth present, socket absent

1 = Tooth erupting

1 = Tooth not yet erupted

1 = Caries lesion present

C

1 = Dental abscess present

A

Disarticulated bone catalogue

Context	Element	Side	Age	Sex	Notes
(100) south	Femur	Left	Adult	UO	Proximal shaft
(100) south	Humerus	Right	Adult	UO	Distal fragment
(100) south	Rib	UO	Adult	UO	3 fragments
(100) south	Unidetified	UO	UO	UO	4 unidientified fragments
(100) south	Femur	UO	Adult	UO	midshaft fragment
(100) east	Rib	UO	Adult	UO	1 fragment
(100) east	Cranium	UO	Neonate/Infant	UO	17 fragments. Likely multiple individuals
(100) east	Rib	UO	Neonate/Infant	UO	14 fragments.
(100) east	Fibula	UO	Neonate/Infant	UO	Broken in 2 pieces
(100) east	Fibula	UO	Neonate/Infant	UO	
(100) east	Fibula	UO	Neonate/Infant	UO	
(100) east	Fibula	UO	Neonate/Infant	UO	
(100) east	Mandible	Right	Neonate/Infant	UO	Left side absent
(100) east	Pars lateralis	Left	Neonate/Infant	UO	
(100) east	Femur	Right	Neonate/Infant	UO	
(100) east	Femur	Left	Neonate/Infant	UO	
(100) east	Humerus	Right	Neonate/Infant	UO	Proximal end broken
(100) east	Humerus	Right	Neonate/Infant	UO	Broken mid shaft
(100) east	Ulna	Right	Neonate/Infant	UO	
(100) east	Ulna	Right	Neonate/Infant	UO	
(100) east	Tibia	Left	Neonate/Infant	UO	
(100) east	Tibia	Right	Neonate/Infant	UO	
(100) east	Tibia	Right	Neonate/Infant	UO	Distal end broken
(100) east	Tibia	Left	Neonate/Infant	UO	Distal end broken
(100) east	Tibia	Left	Neonate/Infant	UO	
(100) east	Scapula	Left	Neonate/Infant	UO	
(100) east	Metatarsal	UO	Juvenile?	UO	Unidentified metatarsal. Likely juvenile

P C A

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