SEWER DIVERSION EXCAVATION, CORONATION STREET, SOUTH SHIELDS,
TYNE AND WEAR

Assessment of Osteoarchaeological Watching Brief Results

Oxford Archaeology North

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Henry Boot Developments

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SUMMARY

As part of enabling works associated with the redevelopment of land at Coronation Street, South Shields, Tyne and Wear (NGR NZ 360 670), Henry Boot Developments (HBD) found it necessary to adjust the existing sewerage network and redirect it from the pumping station on Old Coronation Street westward along the southern edge of the thoroughfare of Coronation Street itself. The trench for the new rising main, and a number of manholes, was to be some 100m long, 2m wide and was to be excavated to a maximum depth of 2.2m below the existing road surface. The route of the rising main passes through the southern part of the former cemetery of St Hilda's Church, a site that is known from previous investigations to have been heavily utilised. Consequently, the Tyne and Wear Archaeologist advised South Shields Borough Council that, in accordance with PPG16 (DoE 1990), a planning condition of the development should be the undertaking of a programme of archaeological mitigation during any intrusive groundworks and an appropriate programme of post-excavation assessment and analysis.

In order to meet the planning condition, Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of HBD, commissioned Oxford Archaeology North (OA North) to undertake the full programme of archaeological works in accordance with a project design approved by the Tyne and Wear Archaeologist. Project Stage 1 (the watching brief and fieldwork data collection) was undertaken during June and July 2007. This draft report provides a summary of Project Stage 1 and documents the results of Project Stage 2, pertaining to a programme of post-excavation assessment of the results of the fieldwork, in order to establish their potential for further analysis.

It is concluded that the 45 well-provenanced skeletons recovered from the watching brief at Coronation Street form a significant assemblage. The funerary remains are likely to date to between 1817 and *c* 1860 and are generally well preserved, with clear potential for a range of further analyses. Their greatest potential, however, can only be met once they have been combined with the much larger and more complete assemblage of human remains recovered from the excavation undertaken in 2006 by OA North to the immediate south of Coronation Street. Such a sizeable assemblage has significant potential to document aspects of the lives of the post-medieval population of a rapidly industrialising port town, who left few other personal records of their own.

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The fieldwork was undertaken by Andrew Frudd, Mark Gibson, Joanne Hawkins and Nicholas Márquez-Grant. The osteological material was assessed and reported upon by Nicholas Márquez-Grant and Sharon Clough, who also assessed the coffin fittings. Mark Gibson compiled the stratigraphic assessment and examined the other artefacts, whilst the illustrations were produced by Marie Rowland and Alix Sperr. The report was edited by Stephen Rowland and Louise Loe, who respectively managed the fieldwork and post-excavation stages of the project.

1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Henry Boot Developments (HBD) propose to redevelop a brown field site located to the immediate south of Coronation Street, in the centre of South Shields, Tyne and Wear (NGR NZ 360 670; Fig 1). As part of enabling works associated with the redevelopment, it was necessary to adjust the existing sewerage network and redirect it from the pumping station on Old Coronation Street westward along the southern edge of the thoroughfare of Coronation Street itself, to the roundabout at the junction of Station Road. The trench for the new rising main, and a number of manholes, was to be some 100m long, 2m wide and was to be excavated to a maximum depth of 2.2m below the existing road surface.

1.1.2 Previous archaeological investigations associated with the development comprise a Tyne and Wear Museums desk-top assessment (TWM 1998), which identified that the modern route of Coronation Street lies within the bounds of St Hilda's cemetery, a trial trench evaluation (Archaeological Services, University of Durham (ASUD) 2006) and a mitigatory excavation (Oxford Archaeology forthcoming), both of which proved the presence of burials to the immediate south of Coronation Street. Consequently, the Tyne and Wear Archaeologist advised South Shields Borough Council that, in accordance with PPG16 (DoE 1990), a planning condition of the development should be the undertaking of a programme of archaeological mitigation during any intrusive groundworks associated with the sewer diversion. The Tyne and Wear Archaeologist required that preservation by record should comprise several project stages. Stage 1, the fieldwork, was to include monitoring and recording during groundworks, together with excavation, recording and lifting of all human remains encountered during this process. Stage 2 was to be an assessment of the data generated by the fieldwork, whilst Stage 3 was to encompass any appropriate detailed analysis, publication and the submission of the entire project archive.

1.1.3 In order to meet the planning condition, Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of HBD, commissioned Oxford Archaeology North (OA North) to undertake the full programme of archaeological works in accordance with a project design approved by the Tyne and Wear Archaeologist (*Appendices 1 and 2*). Project Stage 1 (the watching brief and fieldwork data collection) was undertaken during June and July 2007.

1.1.4 This report provides a summary of Project Stage 1 and documents the results of Project Stage 2, pertaining to a programme of post-excavation assessment of the results of the fieldwork, in accordance with the guidance of English Heritage's *Management of Archaeological Projects, Second Edition* (MAP2; EH 1991) and *Management of Research Projects in the Historic Environment* (MoRPHE; EH 2006). As such, this stage of the project seeks to process and assess each of the forms of raw data recovered during the fieldwork in order to

establish their potential, through detailed analysis, to address the research questions outlined in *Section 3.2*. A project design for a programme of further analysis and the final archive submission to the Tyne and Wear Record Office (TWO) (Project Stage 3) will be issued as a separate document.

1.2 Location, Topography and Geology

1.2.1 ***Location and modern topography:*** Coronation Street runs from the centre of South Shields, westward to its junction with Station Road, opposite the south-east bank of the River Tyne. To the north is St Hilda's Church, its graveyard, and the town's commercial centre, whilst to the south, the land is occupied by carparks and a disused warehouse. From these carparks, which cover largely level ground at *c* 5.1m OD, the land traversed by Coronation Street rises to the north and west, peaking at 10.5m OD at the junction of Coronation Street and Station Road (Fig 1). Evidence from the various phases of fieldwork undertaken at the site would suggest that much of this rise derives from artificial deposition, whilst the natural topography follows an expected westward dip towards the river (ASUD 2006; OA forthcoming).

1.2.2 The solid geology of the area is one of Carboniferous (280-350 million years ago) Coal Measures and Magnesian Limestone (TWM 1998), overlain by deposits of Devensian (73,000 to 10,000 BP) glacial till. With proximity to the River Tyne, the depth of boulder clay increases, and can be *c* 12m deep (*op cit*, 4). However, much of the proposed development area, possibly including that of Coronation Street, was occupied formerly by a tidal inlet and pool, the Mill Dam Creek, which has had a considerable influence on the historical development of the area (*ibid*).

1.3 Historical and Archaeological Background

1.3.1 ***Introduction:*** the following section presents a brief summary of the history and archaeology of the development site and its wider surroundings in order to contextualise the results of the present investigation. It is not intended as a comprehensive history of South Shields, various accounts of which are readily available elsewhere.

1.3.2 Although there is no contemporary evidence from the proposed development area, the earliest known human activity in the vicinity was located some *c* 1km to the north-east of Coronation Street and comprised late Iron Age settlement activity beneath the Roman fort of *Arbeia*. The fort, the easternmost defence of Hadrian's Wall, was likely to have been founded *c* AD 129 as a cavalry installation, but was rebuilt as an infantry fort during the reign of Septimus Severus in the early third century (Roman-Britain.org). There is thought to have been a contemporary settlement and port associated with the Roman fort, but their location is uncertain. The Anglian nunnery of St Hilda was built in AD 674 in the vicinity of the present development area, on the banks of the Mill Dam tidal inlet. Although the exact location of the original nunnery is not known, the area to the north of Coronation Street has remained a focus for religious activity through the medieval period and into the present. The latest

incarnation of the Church of St Hilda, some 50m to the north of Coronation Street, was rebuilt during the nineteenth century and may well occupy the site of its predecessors (TWM 1998). Little is known of the nature of secular settlement in the intervening centuries, but by 1235 South Shields was recognised as a village with 24 tennants (*ibid*), perhaps originating as a humble collection of fisherman's huts as suggested by its name *Scheles* (Middle English for huts or shelters; Roman-Britain.org). The settlement had grown further by 1256, when its 27 houses were arranged along a single north-east/south-west-aligned street straddling the Mill Dam, much like the arrangement shown on Gardner's map of 1654. As such, elements of the medieval and post-medieval settlement are likely to have lain within the present development area.

1.3.3 The Mill Dam no longer exists, but on eighteenth-century cartographic sources is shown running to the south of St Hilda's Church. By 1827 the Mill Dam had been completely infilled and had started to be built upon (TWM 1998). There is evidence from recent excavations at the Customs House (built in 1861 at what had been the confluence of the Mill Dam and the Tyne) indicating that this process of infilling had begun at least as early as the late seventeenth or early eighteenth centuries (*ibid*). South and east of Coronation Street, such deposits have been proven by recent geotechnical investigations to a depth of at least 16m below the present ground level (M Douglas *pers comm*). That such infilling may have occurred within the area of Coronation Street is hinted at by some of the older cartographic sources. Armstrong's map of 1768 depicts the Mill Dam as being very much wider (suggesting it terminated in a tidal pool) and closer to St Hilda's Church than does Richardson's map of the same year, which indicates that the extent of the churchyard, together with an associated routeway, was well-defined on what was then the northern bank of the Mill Dam. The latter source accords well with the Fryer's map of 1773 and Casson's map of 1801 and, whilst it is not possible to corroborate the accuracy of Armstrong, it may be that his map is based on an earlier survey or source showing the Mill Dam prior to infilling in the area of the church.

1.3.4 There is a possibility that detailed documentary research, particularly of the parish records and burial registers, may provide further information about the history of St Hilda's Church and the associated churchyard, but some basic information has been provided by the desk-based assessment (TWM 1998). The history of the St Hilda's would indicate that the first burials were of early medieval date; although the curtilage of the Anglian nunnery was extensive, burials are likely to have been made near the primary focus of the church. Medieval burials would, again, probably have radiated out from the church and, whilst the line of Old Coronation Street could well have fossilised a much older boundary, it is currently uncertain at which date burials extended to the formalised limit of the churchyard. Certainly by 1805 the burial ground was approaching full capacity, precipitating an attempt in 1816 to raise the level of the crowded cemetery to accommodate further burials, apparently using ballast from a nearby mound (TWM 1998). Following this raising, burial activity must have increased exponentially, matching the contemporary growth of the industrialising town. By 1856 the cemetery was closed to further burials (*ibid*), a little before a national Act of 1857 discouraged interments within urban

cemeteries, thus implying that the burial ground was again full. However, an examination of the burial register would suggest that interments, perhaps within existing family plots, took place into the 1860s.

1.3.5 The land around Coronation Street has seen considerable change over the last 150 years. The most significant of these, in terms of the present development, was the adjustment to the route of Coronation Street itself. Coronation Street originally kinked around the slightly angled southern edge of St Hilda's churchyard, an alignment preserved by Old Coronation Street. During the 1960s, this angled section of Coronation Street was straightened, so that it ran to the north through the former cemetery. The construction of a sewerage pumping station within the crook of Old Coronation Street and its redirected successor, together with associated services, must also have lain within the bounds of the cemetery.

1.3.6 ***Relevant previous investigations:*** an archaeological evaluation undertaken by ASUD in winter 2005 involved the excavation of three trial trenches to the south of Coronation Street, two of which were located within areas formerly occupied by St Hilda's cemetery (ASUD 2006). Trench 1, placed to the north-east of Old Coronation Street, revealed only disarticulated human remains and gravestone fragments. Evidence of *in situ* human remains was found within wedge-shaped Trench 3 located just to the north of the eastern arm of Old Coronation Street. This latter trench measured 18m east/west and from 2m to 4m wide at the base, following the projected southern edge of St Hilda's cemetery. Below a layer of sandy made ground and a 0.4m thick disturbed horizon containing disarticulated human bones and domestic refuse, 'natural subsoil' was encountered at 2m bgl. Fourteen 'grave cuts' were identified, four of which were investigated to reveal articulated skeletons. The associated finds were of eighteenth- to nineteenth-century date (ASUD 2006).

1.3.7 In 2006 OA North undertook the re-excavation of ASUD's Trench 3, with the aim of removing all burials down to natural deposits. During the excavation, 191 human burials were recovered from two separate burial horizons within a trench measuring approximately 17m by 4m (maximum width, reduced to 2m at depth) and up to 5.5m deep. Although natural ground was purported to have been found within the evaluation trench at a depth of 2m below ground level (ASUD 2006), the OA North excavation has proven this to be far from the case, with natural deposits encountered at a depth of approximately 5m below the modern ground level. The lower deposits, through which the earliest burial horizon had been cut, were characterised by their admixture with grey silty clay characteristic of fluvial deposits, and it is thought that these deposits relate to activity on the banks of the Mill Dam. These had been sealed by levelling dumps of clay, gravel and industrial waste through which a second burial horizon had been cut between depths of 2-4m below ground level. This material may relate to an episode of deposition, undertaken in 1816, which utilised ballast from a nearby mound in order to raise the level of the crowded cemetery to accommodate further burials (TWM 1998). If this episode is traceable within the archaeological trench excavated by OA North in 2006, then the ballast in question must have contained a high proportion of industrial and domestic refuse. In each of the burial horizons, there was evidence that

multiple interments had been made within single graves or family plots, whilst remains of coffins and their fittings were also frequent.

2 INITIAL RESEARCH AIMS AND OBJECTIVES

2.1 INTRODUCTION

2.1.1 To maximise the potential of the heritage resource, archaeological investigations are strategic in nature, with a series of clearly defined aims, often posed as research questions, and objectives, the practical means by which research questions are addressed; both are modified and developed to meet the requirements of the project and the confines of the available data. However, the impetus for the investigation is provided by a 'primary driver' (EH 2006), which, in the case of the majority of archaeological projects, is dictated by the negative impact of a development. In consideration of the fact that elements of the heritage resource were to be destroyed by the proposed development, the basic rationale, or primary driver, of the watching brief was the characterisation and preservation by record of any significant remains of archaeological interest. The various forms of data generated, together with any further research undertaken, could be analysed to provide a greater understanding of the past population of South Shields. The specific research aims and objectives for the project are outlined below; not all can be addressed at the present assessment stage, but they need to be considered when assessing the potential of each category of data for analysis (Project Stage 3).

2.1.2 ***Research background:*** archaeologically excavated post-medieval and industrial-period burials from Britain are rare. Until the 1980s the archaeological excavation of these contexts was extremely limited and cemetery clearance companies largely undertook the work without any archaeological recording. Since then, the value of such material in the understanding of the past, and to scientific enquiry in general, has been recognised, but has still not gained wide appreciation. To date, the total number of archaeologically excavated post-medieval burial contexts remains very low when compared with burial contexts from other time periods. Most examples are from London and largely comprise the middle to upper classes of Georgian and Victorian society. Few of these have been published, Christchurch, Spitalfields (Molleson *et al* 1993); St Martin's Church, Birmingham (Brickley *et al* 2006); The Royal Naval Hospital, Greenwich (Boston *et al* 2008); and All Saints, Chelsea Old Church, Kensington (Cowie *et al* 2007) being among the few that have.

2.1.3 ***Regional context:*** burial studies have always had a relatively low profile in the North East compared to other parts of the country. In particular, post-medieval and Industrial-period funerary practices and population composition are poorly understood, there having been no or limited opportunity to undertake even basic research on human populations from the region. This is largely due to the continued use of post-medieval cemeteries and the highly acidic soils which militate against the preservation of bone. The Coronation Street assemblage of human remains excavated in 2006 is the second largest to have been archaeologically excavated from the North East of England. The largest assemblage was recovered from the former Newcastle Infirmary where the remains of around 600 individuals were excavated (Louise Loe *pers*

comm). These remains comprised unclaimed hospital patients, many of whom had been dissected by early anatomists for the advancement of science, and are thus very different in nature to the assemblage from South Shields. There are no other large assemblages of post-medieval human remains from the North East of England and the nearest assemblage of comparable size is that from Barton on Humber, which includes the remains of some 400 former parishioners of St Peter's Church.

2.1.4 ***Health and demography:*** because the majority of published post-medieval assemblages comprise the middling to upper classes, Coronation Street presents a rare opportunity to explore the former lives of the industrialised working classes in terms of population composition, health and mortality. It is likely that many of those buried at St Hilda's would have been people engaged in industries connected with the local collieries, gas works, ship yards and the port. Contemporary documentary evidence indicates that industrialising populations such as this experienced poor air and water quality, overcrowding, inadequate housing, contaminated food and harsh working conditions (Roberts and Cox 2003). This impacted on health by increasing levels of infection, trauma and nutritional deficiency and resulted in increased mortality among young infants (*ibid*). The Coronation Street assemblage provides a unique opportunity to explore how this is reflected in the remains of the individuals themselves; moreover, the high number of young infants recovered from the excavation presents the rare opportunity to explore aspects of maternal health, as well as to contribute to current theories on weaning and burial practice associated with this age group (Molleson *et al* 1993).

2.1.5 ***Historical records:*** the archaeological investigation of any cemetery can yield information about those buried, but its value is enormously enhanced when studied alongside historical records. Rich historical documentation of the late eighteenth and early nineteenth century exists to complement the South Shields burial record. This includes parish records (especially burial records), Government Births, Marriages and Deaths registers (compulsory from 1837), census records, wills, trade directories and other occupational lists (eg law and the armed forces). More generally, historical accounts of funerals and of surviving coffin catalogues provide valuable historical data on the material culture of funerals and burials during this time period.

2.1.6 Historical records may also be employed to test the validity of osteological techniques, particularly those relating to age and sex estimation. Few individuals of documented age were excavated from South Shields and, therefore, this assemblage affords little, if no, opportunity to do this. However, there is scope to compare the mortality profile indicated by an analysis of the parish burial register, and that indicated by physical examination of the remains themselves.

2.2 RESEARCH AIMS

2.2.1 By considering the above themes and initiatives, it is possible to pose the following research questions (RQ) that are specific to the archaeological investigation of the rising main watching brief at Coronation Street:

RQ1 Within the defined excavation area, can human remains be recovered in such a manner that maximises the potential of the captured stratigraphic data?

RQ2 Is it possible to gain an understanding of the sequence and date of the remains?

RQ3 Using extant historical documents and the results of previous archaeological fieldwork, is it possible to understand better the excavated archaeological remains and place them within a wider historical and cultural context?

RQ4 Can a greater understanding of the use, organisation and management of the cemetery, both on a wider and more personal level, be gained?

RQ5 Can the captured data from the watching brief be integrated with that recovered during the OA North excavation to the immediate south in 2006?

RQ6 Can relevant information contained within primary and secondary historical documents be accessed and collated?

RQ7 Can a better understanding of the analytical potential of the recovered osteological assemblage be gained through:

- assessment of the potential of the human remains for the estimation of biological parameters such as sex, age and stature;
- assessment of the potential of the remains to yield palaeopathological information in order to learn about the health status of South Shield's past inhabitants;
- assessment of the potential of the remains for isotope analysis;
- examination of the requirement for additional specialist analysis, such as radiography, of the remains;
- establishment of the potential of the remains to contribute to archaeological knowledge at regional and national levels, and the most appropriate way of realising this potential;
- contributing to an updated project design for analysis of the remains, with cost and time implications specified.

RQ8 What detailed and meaningful information can analysis of the skeletal remains tell us about the lives of the inhabitants of South Shields?

RQ9 Can the results of the analysis of the skeletal remains be used to provide a comparison with documentary sources and with remains from contemporary sites?

RQ10 How can the results of the investigative programme be made available to the wider public, and all data, artefacts and remains archived or reburied appropriately?

2.3 RESEARCH OBJECTIVES

2.3.1 ***Overall Research Objectives:*** the following overarching objectives (RO) have been formulated with reference to the research questions (*Section 2.2.1*).

ROa Conduct a programme of archaeological observation, investigation and recording during the course of all groundworks within the former burial ground.

ROb Recover, process and undertake an assessment and then any appropriate analysis of the artefacts from the fieldwork, particularly those that are datable, and integrate them into the stratigraphic sequence.

ROc Undertake provisional and then any appropriate detailed analysis of the on-site stratigraphy in order to understand better the relationships between the different elements.

ROd Undertake an osteological assessment and then any appropriate analysis of the human remains excavated from the site by:

- quantification of the remains, including the number of articulated skeletons and quantity of disarticulated human bone;
- evaluation of the overall condition and completeness of the remains, with reference to the survival of indicators of age, sex and stature, metrical and non-metrical analyses, and palaeopathological examination;
- establishment of the basic demographic composition of the population, including the proportion of adults and the proportion of juveniles;
- establishment of the overall range and extent of palaeopathological conditions.

ROe Assess and then undertake any appropriate analysis of the material and manufacture of any coffins and fittings in order to establish any patterns in origin, trade and also quality, which can then be linked with the results of osteological analysis.

ROf Undertake a detailed literature search of available sources at the Tyne and Wear Record Office, the Diocesan library, local and university libraries, as well as of more general reference works and histories.

3 METHODOLOGY

3.1 PROJECT DESIGN

3.1.1 The OA North project design (*Appendices 1 and 2*) approved by the Tyne and Wear Archaeologist was followed as fully as possible throughout the investigation; all work was consistent with the relevant standards and procedures of the Institute of Field Archaeologists (IFA), and generally accepted best practice.

3.2 FIELDWORK METHODOLOGY

3.2.1 ***Extent of groundworks and contractor's methodology***: the monitored groundworks for the insertion of the diverted sewer comprised two principal elements. The first, a 2m square pit for a manhole, was excavated to a depth of 3m below ground level (bgl) to the immediate west of the Old Coronation Street pumping station. The second consisted of a 1m-wide trench for the rising main itself. This ran for some 11m north-west from the manhole before following a slightly oblique westward alignment along Coronation Street for a further 80m until the junction with Station Road was reached. Although formation level for this trench was nominally 2.2m deep, the presence of existing services beneath which the rising main had to be threaded meant that the trench was excavated to depths of 2.4m and 2.6m bgl at the eastern and western ends, respectively. On occasion, the trench was widened to a width of 1.3m to allow for the welding of pipe sections.

3.2.2 Shoring was erected in all excavations and was installed either at a depth of 2m or once archaeological remains had been revealed. In the manhole 2m by 2m box shoring was used, with 3m sheet piles at the open ends. Along the majority east/west section of the trench, 3m by 1m box shoring was used; within the north-west/south-east-aligned section, and in those locations where the trench was widened for welding the inserted sewer pipes, or where services were present, 3m sheet piles supported by hydraulic whalers were installed. Access to excavations was granted once the shoring had been adequately installed and the trench had been monitored with a gas meter for five minutes. Excavations were entered via a ladder and a gas meter was with the work party at all times.

3.2.3 ***Monitored excavation:*** removal of the uppermost levels of modern tarmac and made ground down to the top of significant archaeological horizons was undertaken by a 13 ton wheeled 360 machine, fitted with a 1m-wide toothless ditching bucket and operating under archaeological supervision. Thereafter, any archaeological features or remains were cleaned and investigated manually to define their extent, nature, form and, where possible, date. Once archaeological remains were excavated, recorded and removed, the excavation with the machine was allowed to continue under archaeological supervision. Where services limited access by the machine, such as for the easternmost 4m of the trench, the contractors excavated by hand. With the exception of obviously modern deposits associated with the construction of Coronation

Street, all excavated spoil was monitored for skeletal remains and artefacts before it was removed from the excavation area by a dumper.

3.2.4 Once funerary remains were revealed, they were hand-excavated by an experienced archaeologist or osteoarchaeologist. Each skeleton was cleaned rapidly to reveal the body position and orientation, and its relationship to underlying burials, so that it could be recorded as fully as possible. The use of shoring meant that parts of skeletons often fell outside of the excavated trench; these elements were necessarily left *in situ* and only recovered where they were revealed or displaced by deeper groundworks. Similarly, in order to avoid damage to the service network, skeletal remains within baulks beneath services could not be cleaned or recovered. Infant skeletons, along with the surrounding soil to maximise small bone recovery, were lifted in plastic sample tubs, whilst the other skeletons were bagged by side and anatomical element and placed in strong boxes. Together with any associated funerary artefacts and fittings, these were stored temporarily in a secure, locked container on site, before being removed to Oxford at the completion of the watching brief.

3.2.5 ***Recording***: a comprehensive written, drawn, and photographic record was made in accordance with the *Standard and Guidance for Archaeological Excavation* (IFA 2001). All information identified during the watching brief was recorded stratigraphically on *pro-forma* recording sheets, with a continuous unique numbering system for all features and deposits in operation. *Pro-forma* skeleton sheets recorded details of the body position, orientation, skeletal condition and completeness, presence of soft tissue and artefacts (such as shroud pins and buttons). Those for coffins (whether surviving as fragments, a stain, or as fittings), described the materials, construction, size and shape of the coffin, as well as the decorative metal fittings (including fixing nails and screws, upholstery and upholstery studs, grips, grip plates, breastplates, lid motifs and escutcheons). Any motifs on these fittings were also described.

3.2.6 A fully indexed photographic and drawn record of individual features, working shots and general views was maintained. Photography was undertaken using 35mm colour slide and monochrome print film, together with high quality digital photography for the purposes of presentation. All levels recorded on-site were tied into Ordnance Datum, with the positions of planned features being established using a total station theodolite (TST). Before lifting, skeletal remains were recorded photographically, which, where the prevailing conditions allowed, made use of geo-rectification (for example, where skeletons were not obscured by services or recovered from the trench section). A summary of the results of the fieldwork is presented in *Section 4*.

3.3 POST-EXCAVATION ASSESSMENT METHODOLOGY

3.3.1 ***Introduction***: the data recovered during the fieldwork was assessed in consideration of the project research questions and in accordance with the project objectives (*Sections 2.2.2-3*). Thus, the overarching objective of the assessment was to evaluate all classes of recovered data in order to determine the potential of the dataset for further analysis.

3.3.2 ***Material assessed***: the entire paper, digital, photographic and material archive deriving from the watching brief was examined for the purposes of this assessment. This included the stratigraphic records (context sheets, plans and sections), and the photographs, as well as the finds, funerary artefacts and the human remains.

3.3.3 ***Methodology***: the method of assessment used varied with the class of information examined, although in each case it was undertaken in accordance with guidance provided by MAP2 (EH 1991). During the assessment, the quantity, range, variety, provenance and condition of all classes of data were evaluated within the framework of the project research questions and objectives. *Section 4* summarises the raw data and results of the assessment of each data category, but full details and raw data reside within the project archive.

3.3.4 ***Stratigraphy***: the assessment of the stratigraphy was facilitated by the digitisation of the Harris matrix and the production of a provisional site plan; all of the context records completed during the excavation were entered into a specially designed Access database. The assessment of the stratigraphy comprised a quantification and qualitative appraisal of the recorded data, a brief interrogation of its complexity, and a consideration of those research questions that might be addressed, fully or in part, by the recovered stratigraphic data.

3.3.5 ***Human Remains***: the site archive and skeletal remains recovered during the rising main watching brief were examined to determine the quantity, general condition, completeness, provenance, date and nature of the material. 'Nature' refers to whether the material comprised articulated (disturbed or undisturbed) or disarticulated remains, and the proportion of adults to juveniles. The potential of the material to yield biological information, including more precise estimates of age, as well as other biological parameters, such as sex and stature, was also explored. In addition, the potential of the collection to yield information relating to pathology was assessed and, in particular, whether there were any unusual conditions present that would require detailed specialist examination and/or analytical techniques beyond standard macroscopic examination. In light of these findings, the potential of the collection for further work was evaluated. No attempt was made to estimate sex, age, stature or explore pathology in any detail since these are all factors that are beyond the requirements of an assessment. These procedures were undertaken in accordance with the national guidelines set out by Mays *et al* (2002) and with reference to standard protocols for examining human skeletal remains from archaeological sites (Brickley and McKinley 2004; Buikstra and Ubelaker 1994; Cox and Mays 2000).

3.3.6 Completeness was estimated by recording, as a percentage, how much of the skeleton had survived and assigning it to one of the following categories:

1 = <25% complete

2 = 25-50% complete

3 = >50-75% complete

4 = >75% complete

3.3.7 The condition of the bone was assessed according to the degree of erosion of the bone surface and how much of the epiphyses (the ends of the bones) and cancellous bone (the spongy bone that is beneath the outer layer) had survived. Based on these factors, skeletons were assigned to one of the following categories:

1 = Poor (cortical bone completely eroded. Very limited survival of epiphyses and cancellous bone);

2 = Fair (moderate erosion of cortical bone. Limited survival of cancellous bone and epiphyses);

3 = Good (Occasional erosion on cortical bone. Cancellous bone complete and frequent survival of epiphyses);

4 = Excellent (cortical bone undamaged, cancellous bone and epiphyses complete).

3.3.8 All anthropological and palaeopathological observations were made by rapidly scanning each skeleton. Although these observations provide adequate guidance to the potential of the material for further work they are, by their very nature, preliminary and subject to change as a result of any future high resolution examination.

3.3.9 Apart from the potential of the skeletons to yield information relating to age and sex, the skeletons were also assessed for their potential to yield metrical data such as stature, assessment of ancestry and biological variation and age estimation in sub-adults. Potential for metrical assessment was scored on a scale of 1-5, where '1' denotes skeletons that showed no potential (ie no elements could be measured owing to fragmentation/poor preservation) and '5' denotes skeletons that showed high potential (ie the full range of standard cranial and post-cranial measurements could be taken).

3.3.10 An assessment of the potential for the skeletons to yield non-metrical data was examined. Non-metric traits are morphological variations in the skeleton. They are influenced by both the environment and genetics, but to variable and unpredictable degrees (Saunders 1989). These traits were scored on a scale of 1-5, where '1' denotes skeletons that showed no potential for non-metrical analysis (ie preservation prevented the observation of all standard cranial and post-cranial sites) and '5' denotes skeletons that showed high potential for non-metrical analysis (ie all standard cranial and post-cranial sites could be scored). More readily observable traits were noted (but not formally scored) to give an indication of the level and range of traits present in the population. This will inform a data collection strategy for full analysis.

3.3.6 ***Finds***: all finds and artefacts from the watching brief were retained and were treated in accordance with the guidelines set out by the UK Institute for

Conservation (UKIC 1990) and those of the Museums and Galleries Commission (1992). All artefact fragments were examined by visual inspection and an outline computer record was created using Microsoft Access. Data were recorded in a standardised format, noting provenance, type of object, material, period, and a brief written description and all pottery was recorded by digital photograph, in the form of a single record shot per context. This database will form the basis for any further work recommended, or will comprise the archive record, as appropriate.

3.3.7 ***Archive***: several tasks facilitating both assessment and the completion of the archive, such as marking of photographs, were undertaken. The full preparation and deposition of the archive is however, a task that falls beyond the scope of the assessment, and will be treated in more detail within the updated project design for analysis, publication and archiving. A copy of all final reports will be lodged with the Tyne and Wear Historic Environment Record (HER) and the Tyne and Wear Record Office.

4 RESULTS

4.1 INTRODUCTION

4.1.1 The following section summarises and assesses the results of each category of data recovered during the watching brief fieldwork. All classes of data generated by the fieldwork were assessed in accordance with the methodology outlined in *Section 3* and statements of the significance of the results from each element of the archive are given below. These statements are based on the assessment work undertaken, related to the original academic themes expressed in *Section 2*. For the sake of brevity and clarity, individual context descriptions are summarised within *Appendix 3*, the osteological data within *Appendix 4* and a catalogue of the coffin fittings in *Appendix 5*. The location of the archaeological remains is depicted in plan on Figure 2, whilst their stratigraphic relationships are presented as a Harris matrix in *Appendix 6*. Figure 2 also shows the locations of the numbered shoring boxes, which, by the nature of the watching brief, provided spatial orientation and are occasionally mentioned in the following text as clearly visible reference points.

4.2 STRATIGRAPHY

4.2.1 ***Modern:*** the tarmac road surface and its hardcore base, ***1024***, was a uniform 0.5m thick for the eastern portion of the rising main trench. However, towards the western end, the depth of modern made ground increased to as much as 2.6m as the road rose to meet the roundabout. Services were encountered throughout the length of the trench, the highest concentration being within the easternmost 4m, where, found at depths between 0.6m to 0.8m bgl, they obscured access to the archaeology below. Along the rest of the trench the majority of the services were drainage pipes. These were mostly just below the hardcore of the road, were easily removed and later reinstated; none impacted upon the archaeology below. The construction cut for the pumping station, **891**, did impact deep enough to interfere with archaeological deposits, but did not appear to truncate directly any burials within the investigated area.

4.2.2 ***Industrial Period:*** all of the recorded archaeological features comprised funerary remains cutting into deposit ***914***, a soft dark grey sandy material. At the eastern end of the trench, where it was excavated to its greatest depth, it was in excess of 2.5m thick and at all times extended beyond the vertical limit of excavation. This deposit, containing evidence of domestic refuse, as well as glassy slag and other waste products, could not have derived from the natural clay substrate (which was never encountered during the watching brief) and had clearly been imported. Within the rising main trench, deposit ***914*** was observed running from its eastern extent to a point some 22m short of the roundabout, whereupon it was sealed completely beneath modern made ground and not impacted upon further. The nature of deposit ***914*** and the method of excavation meant that grave cuts were not readily identifiable until the skeletons were encountered at a variety of depths below ground level

between 1.2m and 2.4m bgl. Whilst these depths clearly followed the general trends within the manmade topography (for example, westernmost burial ***1023*** within Box 10 lay at 2.05m bgl, whilst ***935***, close to the eastern end, lay at only 1.2m bgl) there was a degree of variation, and it is entirely possible that further interments lie below the present depth of investigation.

4.2.3 A total of 43 graves containing 45 inhumations were identified during the watching brief. Along with these, eight charnel deposits, one clearly from a single individual, and the remains of 18 coffins, were also discovered. Two coffins are of note, ***942*** and ***961*** (Plates 3 and 4), as the breast plates were partly legible when they were uncovered. Both were fully recorded but fragmented upon lifting, due to their highly corroded state and damaged caused to them by the shoring. All of the inhumations shared an oblique east/west orientation matching that of the extant church and that of the northern boundary of the churchyard. All were laid in a supine position with their limbs extended and their hands either on the pelvic region or proximal femurs. Due to the narrow width of the trench, only half of the burials could be recovered fully, with various anatomical parts of the remaining twenty-two left *in situ* beyond the limits of the trench. This was a particular problem at the eastern end of the rising main trench, where its north-west/south-east alignment cut across the 'grain' of the burials.

4.2.4 The 43 grave cuts appear to have been distributed amongst 33 burial plots or groups. Within the limit of excavation, most of the plots contained only a single burial, but five contained two, one, towards the centre of the north-west/south-east-aligned section of trench, contained four (***898***, ***909***, ***931*** and ***932***) and another, in Box 5, contained five burials (***991***, ***995***, ***998***, ***1002***, ***1002b***). The intensity of cemetery usage was attested further by the charnel deposits, indicative of the disturbance of earlier burials by later grave-digging. Five of these were located above the burials, indicating that the bones disturbed by later grave-cutting had been collected and redeposited after the new burial had taken place. Three of the charnel deposits (***938***, ***980*** and ***989***) had been placed in a discrete pit that was then sealed by the subsequent burial (Plate 2).

4.2.5 ***Assessment of potential***: the archive of primary fieldwork data is a comprehensive and well-organised record of the recovered stratigraphic information, with significant archaeological remains recorded graphically, textually and photographically. The stratigraphic sequence is essentially rather simple and will need little further manipulation to be understood fully; it is dominated, almost exclusively, by funerary deposits and features and, as such, it provides the analytical basis for any understanding of the intensity and organisation of burial, as well as, in a number of instances, the relative sequence of interment. The recorded stratigraphic data provides a flexible framework within which the analysis of the other forms of data can take place, and is particularly valuable in the comparison of the distribution of the skeletal remains identified in the rising main trench, and those excavated to the immediate south in 2006.

4.3 HUMAN REMAINS

4.3.1 ***Introduction:*** the human remains recovered during the watching brief include 45 skeletons and a number of disarticulated bones deriving from eight different contexts, including those relating to charnel deposits and disturbed burials. Other than quantification, no further analysis of the disarticulated remains was necessary at this stage.

4.3.2 ***Completeness:*** nine skeletons were approximately more than 80% complete and were represented by skull, upper and lower extremities, thorax and pelvis (Table 1). Most of the remaining skeletons were either approximately >50-75% complete or <25% complete. Incompleteness was largely a result of later graves truncating earlier graves.

Completeness	Total
1 - <25%	15
2 - >25-50%	7
3 - >50-75%	13
4 - >75-100%	9

Table 1: Completeness of articulated skeletons

4.3.3 ***Condition of the skeletons:*** overall, the condition of the bones was good. This means that cortices and joint surfaces were well preserved. The majority of adult skulls were broken or absent, however. Approximately a quarter of skulls from the assemblage would be available for detailed metrical analysis, with a small number of these needing reconstruction. Fragmentation was low or moderate across the individuals. This means that there is good potential for metrical analysis in the assemblage (see paragraph below).

Condition	Total
1 - Poor	3
2 - Fair	8
3 - Good	33
4 - Excellent	0

Table 2: Condition of articulated skeletons

4.3.4 ***Estimation of biological sex:*** most adult skeletons had features surviving that would allow the application of standard techniques to estimate their biological sex (Brickley and McKinley 2004; Cox and Mays 2003). It will be possible to estimate the sex of 27 adult skeletons using features of either the skull and/or pelvis. There are currently no accepted methods for estimating the sex of sub-adult skeletons.

4.3.5 ***Estimation of biological age:*** there were 12 sub-adults and 33 adults. Preliminary observations suggest that all age groups are represented in the assemblage, including perinates, new borns, young children, adolescents, young, middle and mature adults. All skeletons had traits surviving that will allow ages to be estimated to within 10 years for adults and 5 years or less for

sub-adults, as described in Brickley and McKinley (2004) and Cox and Mays (2003). Further, most skeletons had a range of traits surviving for age estimation. Estimating the age of skeletons is more accurate if observations are based on a range of traits, rather than a limited number.

4.3.6 ***Potential for metrical analysis:*** a high number of skeletons show potential for metrical analysis of long bones and/ or skulls (Table 3). Metrical analysis will be possible for 11 adult skulls, which were either intact or will require some reconstruction. Skull measurements allow ancestry to be explored (i.e. whether caucasian, mongoloid or negroid) (Krogman and Iscan 1986), as well as the biological variation.

4.3.7 Metrical analysis of long bones to allow estimation of stature will be possible for 26 out of 33 adults by employing measurements of the upper long limb bones and lower long limb bones. Stature estimations based on the lengths of lower long limb bones are more accurate than those that are based on lengths of the upper long limb bones. Stature estimation involves applying the maximum length of any available major long bones to regression equations set out by Trotter and Gleser (1952) and modified by Trotter (1970). As there are different equations for males and females, it is not possible to estimate accurately the stature of those skeletons within the assemblage that are of unknown sex. Metrical data to facilitate estimation of age for the sub-adults will be possible.

Score	**Number of individuals**
1 - one or no measurements will be possible	3
2 - a few measurements will be possible	12
3 - half the number of standard measurements can be taken	9
4 - majority of long bones can be measured	16
5 - Every bone can be metrically recorded	4

Table 3: Potential for standard metrical analysis

4.3.8 ***Potential for metrical and non-metrical analysis:*** adequate cranial and post-cranial remains have survived that will allow the observation of a standard set of landmarks for scoring the presence or absence of non-metrical traits (Brothwell and Zakrzewski 2004).

Non-Metric score	**Number of individuals**
1 - 1 or no landmarks observable	3
2 - a few observable landmarks	2
3 - half of the landmarks are observable	7
4 - majority of the landmarks are observable	13
5 - Every landmark can be observed	9
N/A - subadults not scored	12

Table 4: potential for non-metrical data

4.3.9 ***Pathology:*** overall, all of the skeletons had survived in a condition that is good enough to allow future detailed macroscopic analysis and documentation of pathology. A range of conditions was noted in passing and are listed in *Appendix 4*. They include evidence of trauma, joint disease (osteoarthritis), metabolic conditions (for example, cribra orbitalia), neoplastic disease and infection. Trauma includes fractures, some of which will need radiology to confirm and gain insight into their healing status. Anomalies, for example, asymmetrical limbs, were also present and may relate to traumatic injury. Again, radiology would be required to explore this.

4.3.10 Non-specific inflammation was noted on several bones of one skeleton, suggesting systemic disease. There are numerous conditions that can cause these changes, neoplastic disease, infection, and pulmonary disease, being among them. Further analysis will be required to explore this further.

4.3.11 There was evidence for post-mortem medical intervention in the form of one craniotomy, the removal of the top of the skull in the horizontal plane in order to examine the brain. Such an intervention was usually performed to explore the cause of death, but also to further knowledge about a particular ailment or lesion.

4.3.12 The amount of dental disease in the assemblage is noteworthy, and includes caries, periodontal disease, abscesses, ante-mortem tooth loss and calculus. Heavy wear patterns were also observed on the teeth and further analysis will be required to explore if they can be attributed to any cultural habits (for example, smoking a pipe).

4.3.13 No quantification or detailed description of the above pathological conditions has been undertaken at this stage, but they certainly warrant this level of analysis. The potential of the assemblage to yield information about the health status of the population is considered to be very good.

4.3.14 ***Assessment of overall potential for analysis:*** despite the fact that a proportion of this assemblage is incomplete, the preservation of all of the remains is sufficient for age, sex and stature to be estimated in most cases. Further, sufficient landmarks survive that will allow evidence for family groups to be explored through non-metrical trait analysis. There is also some potential to evaluate ancestry by the morphological and metrical analysis of skulls. Preliminary observations suggest a group of individuals of mixed ages and sexes. A range of pathological conditions is present and, through more detailed analysis, have the potential to provide valuable insights into the overall health status of the population.

4.3.15 The 45 skeletons described here represent a small assemblage, but nevertheless an important one. To date, extremely limited study of post-medieval working class assemblages has been undertaken and there are virtually no osteological studies of populations from the industrialised north-east of England. The value of this assemblage is further increased because of the research potential that would be gained by combining it with the 191 skeletons that were excavated from other parts of the graveyard. Full,

specialist examination of the remains is likely to yield results worthy of publication.

4.3.16 Questions that might be explored at full analysis include:

- What is the demographic composition of the population?
- Is the mortality profile consistent with an industrialised working class population?
- Is there evidence for inter-personal violence in the population, or does the trauma relate to accidental injuries?
- What is the healing status of the trauma? Does this suggest adequate treatment following injury?
- The presence of cribra orbitalia indicates childhood health stress in the population, but what impact did this have on growth?
- Cribra orbitalia is believed to be caused by increased pathogen loads. Does evidence for infection support this?
- Is there evidence for scurvy and rickets?
- Do some of the skeletons share the same non-metric traits and does the distribution of non-metric traits suggest family groups?
- Do any individuals from the population have traits that suggest non-caucasoid ancestry?
- How does this population compare with others that are similar in date and type in terms of its health and physical attributes?

4.3.17 During such analysis, disarticulated bones could be examined to identify discrete individuals, whilst all discrete skeletons would be examined according to standard, recommended practice (Brickley and McKinley 2004). Skeletons would be assigned to age and sex categories and, combined with palaeopathological information, the mortality profile would be explored, taking into account the archaeological background of the site. For example, this would explore whether peaks in the mortality curve are associated with any pathological conditions, or whether statistics have been biased by cultural practice, such as the zoning of burials by age or family.

4.3.18 Wherever preservation permits the standard range of measurements could be recorded, allowing estimates of stature, an exploration of ancestry and the facilitation of other biological analyses (for example, estimation of sex for adults and age and sex for sub-adults). A range of non-metric traits could be scored as present or absent and this information would be used to explore relatedness between individuals. The status of the dentitions could be recorded to explore oral care, cultural habits (ie pipe smoking), diet and any other anomalies. Pathological conditions could be described and documented by illustrations and photographs. Differential diagnoses could be explored with reference to standard texts (for example, Ortner and Putschar 1981) and, where relevant, radiography. These objectives could be greatly complimented by the application of stable isotope analysis to explore diet and geographic origin. All

findings would be discussed in the context of contemporary funerary practices and comparable samples from Britain. A full catalogue of the skeletal remains would be provided in an appendix.

4.4 FUNERARY FIXTURES, FITTINGS AND ARTEFACTS

4.4.1 ***Introduction:*** evidence of 18 coffins was recorded during the watching brief, of which three were observed only as soil stains. The remainder comprised fragments of poorly preserved wood, a grip and breastplates, of which two of the latter retained some legible script (*Appendix 5*).

4.4.2 ***Nature of the material:*** fragments of eight breastplates were recovered, amongst which two retained partial biographical inscriptions. All were of punched tin which was painted or enamelled black with white script painted on. None were sufficiently well-preserved to discern the type/decoration. A single highly corroded iron grip was recovered, with the remainder of the assemblage comprising highly fragmented pieces of breastplate or coffin wood.

4.4.3 ***Other finds:*** seven copper alloy shroud pins were associated with two individuals, ***900*** and ***917***, a copper button was associated with ***995***, and another copper button along with the iron and leather remains of a belt were associated with ***974*** (Plate 6). Two iron-bladed knives were recovered from burial soil ***914***. The first (object 160), recovered from the north-west/south-east stretch of the trench, was a simple design with a handle made from two pieces of animal bone secured to the tang with two copper-alloy rivets. The handle had been incised with diagonal lines running in a single direction and the blade had been broken approximately 20mm from the handle. The second, a folding or lock knife (object 165) was located at the base of Box 3, below the level of the skeletons that had been recovered from there. The cross-hatched incised bone handle was slightly curved.

4.4.4 ***Potential and recommendations:*** the potential of the coffin fittings is limited because of its small size and highly corroded condition (in particular, of the breastplates). However, it will still be possible to characterise the coffins and some of the fittings in regional and chronological terms, especially if they can be contextualised through further research. Photographs of the breastplates *in situ* may enable biographic detail to be recorded for those plates that fragmented upon recovery. It is recommended that, where appropriate, fittings and artefacts are radiographed to provide a record of their size and shape. Grip and plate types should be drawn if they are identified as new styles, or catalogued if they match existing typologies.

5 CONCLUSIONS

5.1 INTRODUCTION

5.1.1 The following section presents those conclusions that can be drawn from the assessment. A separate document will provide updated project aims and objectives, and a project design for Project Stage 3, a scheme of analysis appropriate to the potential of the dataset and those requirements of the Tyne and Wear Archaeologist that are necessary to discharge the planning condition.

5.2 PROVISIONAL DISCUSSION

5.2.1 It is extremely difficult, and indeed, undesirable, to discuss the remains recovered from the present watching brief without making some consideration of the results of the excavation to the immediate south undertaken by OA North in 2006. A number of similarities were observed between the two phases of work. Of particular importance was the analogous character of the burial substrate. This clearly imported material, in excess of 2.5m thick, contained various quantities of domestic and industrial refuse, and is likely to represent an effort to raise the level of the cemetery in order to accommodate more burials. One such event, utilising material from a nearby ballast mound, was recorded as having taken place in 1817; further documentary research may reveal other such instances, but it is tempting to suggest that those skeletons revealed during the present watching brief date from 1817 to the closure of the cemetery to new interments *c* 1860. They can, therefore, be considered to fall within a relatively narrow date range.

5.2.2 As with the burials excavated by OA North to the south in 2006, the intensity of burial and the use of family plots can clearly be seen, as can hints of the manner in which the cemetery was organised. There is a suggestion that the graves of the burials recovered during the watching brief were laid-out reasonably neatly, which may have implications for the interpretation of their status. Such evidence needs to be contrasted with that from the excavation trench to the south in order to examine the wider use of space within the cemetery.

5.2.3 Although a considerable number of human remains were removed from the zone of impact associated with the sewer diversion, the nature of the findings during the archaeological excavation to the south in 2006 would suggest that many more, undisturbed, inhumations are likely to lie intact beneath the base of the diverted sewer. Such remains could be disturbed by deep excavations in the future, and this may be particularly problematic at the western end of the sewer, where the burial horizon was increasingly thickly blanketed by deposits of modern made ground and may have suffered little previous disturbance. Even within the eastern end of the sewer trench, the fact that the base of the imported burial soil was not reached, may suggest that what currently appear to be deeply buried individual interments may merely be the top of stacks.

There is also the fact that all of the revealed skeletons derive from the latest of at least two separate burial horizons and again, deeper excavations in the future are highly likely to reveal such remains in equal, if not greater, intensity.

5.3 STATEMENT OF SIGNIFICANCE AND PROPOSAL FOR FURTHER WORK

5.3.1 The research context for the present investigation, including appropriate frameworks and regional studies, has been outlined in *Section 2*, and will not be reiterated here. Suffice to note, the assemblage from the rising main watching brief at Coronation Street is an important addition to the small but growing corpus of post-medieval and Industrial-period human skeletal assemblages recovered archaeologically from the North East.

5.3.2 The assemblage, although relatively small (45), has the potential to provide a rare insight into nineteenth-century living conditions and how these impacted on the health and physical attributes of the population. This contribution is increased vastly if these remains can be considered in conjunction with the 191 individuals recovered from the excavation undertaken in 2006. Both the EH and Tyne and Wear archaeological monitors have recognised the value of the combined assemblage as one of the largest post-medieval collections from the area, particularly as it dates from a period of major expansion of the industrialising port of South Shields. Moreover, archaeologically excavated post-medieval cemeteries are highly centred around London and Birmingham and most relate to the middle-upper classes, unlike the St Hilda's assemblage, which represents a working class population from the North of England.

5.3.3 The use of the rich historical documentation of the late Georgian and early Victorian periods is an important aid in the interpretation and contextualisation of the results of the excavation and the osteological analysis. The health and demography of the assemblage could be particularly revealing, as documentary evidence suggests industrialising populations experienced high levels of stress and poor diet, crowded living conditions, rife with infectious disease. The assemblage will go some way to confirm or refute these assumptions and the findings would be set in a wider context by comparison, at a statistical level, with other British populations of a similar date (Roberts and Cox 2003).

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ILLUSTRATIONS

FIGURES

PLATES

APPENDIX 1: PROJECT DESIGN

SEWER DIVERSION EXCAVATION, CORONATION STREET, SOUTH SHIELDS,

TYNE AND WEAR

Archaeological Watching Brief:

Project Design V1.1

Oxford Archaeology North

May 2007

Henry Boot Developments Ltd and ARCUS

OA North Job No: L9706
NGR: NZ 360 670

1. INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 The following document has been prepared by Oxford Archaeology North (OA North) in response to a request from Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of Henry Boot Developments Ltd (hereafter the 'Client') for proposals for an archaeological watching brief to be undertaken during groundworks associated with a water main along the route of Coronation Street, South Shields (NGR NZ 360 670). The present document comprises a methodology for the archaeological fieldwork; the methodology for any post-excavation work to be undertaken on human remains recovered by the watching brief would be covered by *Sections 3.3* and *3.4* and *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006. The present scheme of groundworks to be subject to archaeological monitoring will involve construction of a sewer and a number of manholes along the route of Coronation Street, from the pumping station on Old Coronation Street in the east, to the roundabout at the junction of Station Road in the West. It is thought that groundworks will be enacted in a series of short sections measuring up to 2m wide by up to 2m deep.

1.1.2 Previous archaeological works in the area comprise a desk-top assessment, undertaken by Tyne and Wear Museums (1998), which identified that much of the present route of Coronation Street lay within the bounds of St Hilda's cemetery, an archaeological evaluation undertaken by Archaeological Services, University of Durham, which proved the presence of burials on the site at a depth of around 2m below ground level (ASUD 2006) and a recently-completed excavation undertaken by OA North, which took place in the small area between Coronation Street and Old Coronation Street. During the excavation, 191 human burials were removed from a trench measuring approximately 17m by 4m (maximum width, reduced to 2m at depth) and up to 5.5m deep. The concentration of these remains suggests that human remains may well be present within the areas of the proposed sewer trenches, although given the presence of made ground associated with the modern landscaping of the area, such remains could lie below the 2m depth of impact, and thus be unaffected by the development.

1.2 GEOGRAPHICAL, HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

1.2.1 The proposed development site lies in the centre of South Shields, with the River Tyne running close by, to the west. Although there is no contemporary evidence from the proposed development area, the earliest known human activity in the vicinity is located some *c* 1km to the north-east of Coronation Street and comprises settlement activity beneath the Roman fort of *Arbeia*. There is thought to have been a contemporary settlement and port associated with the fort, but it is uncertain where these lay. The Anglian nunnery of St Hilda was built in 674 AD in the vicinity of the present development area, on the banks of the Mill Dam tidal inlet. Although the exact location of the original nunnery is not known, the area to the north of Coronation Street has remained a focus for religious activity through the medieval period and into the present, with the latest incarnation of the Church of St Hilda having been rebuilt during the nineteenth century and possible occupying the same site of its predecessors.

1.2.2 Land to the south of Coronation Street, in the area of Old Coronation Street, is largely level at *c* 5.1m OD, but rises to the west, in the area of the roundabout, to 10.2m OD and to the immediate north, along Coronation Street itself, to *c* 7.3m. The natural drift geology of the area comprises thick boulder clay deposits (up to 12m thick). However, much of the proposed development area was occupied by a tidal inlet, the Mill Dam Creek, which is shown on historic maps running to the south of St Hilda's Churchyard. By 1827 the Mill Dam had been completely infilled and built upon (Tyne and Wear Museums 1998), and there is evidence from recent excavations at the Customs House (built in 1861 at the confluence of the Mill Dam and the Tyne) that this process of infilling had begun at least as early as the late seventeenth or early eighteenth centuries (*ibid*). That such activity may have occurred within the proposed development area is hinted at by some of the older cartographic sources. Armstrong's map of 1768 depicts the Mill Dam as being very much wider and closer to St

Hilda's Church than does Richardson's map of the same year. The latter source accords well with the Fryer's map of 1773 and Casson's map of 1801 and, whilst it is not possible to corroborate the accuracy of Armstrong, it is possible that his map is based on an earlier survey or source which may show the Mill Dam prior to infilling in the area of the church. South and east of the excavation trench, geotechnical investigations have proven the depth of these infill deposits to at least 16m below the present ground level (M Douglas pers com).

1.2.3 Deposits encountered within the recent excavation trench, comprising dumps of clay, gravel and industrial waste, are characterised at depth by their admixture with grey silty clay characteristic of fluvial deposits, and it is thought that these deposits relate firstly to activity on the banks of the Mill Dam, and latterly to levelling. An episode of levelling, undertaken in 1816 in order to raise the level of the crowded cemetery to accommodate further burials, is said to have utilised ballast from a nearby mound (Tyne and wear Museums 1998). If this episode is traceable within the present archaeological trench, then the ballast in question must have contained a high proportion of industrial and domestic refuse, as observed in the case of the burial matrix encountered within the upper 2m - 4m of stratigraphy. Although natural ground was purported to have been found within the evaluation trench at a depth of 2m below ground level (ASUD 2006), the OA North excavation has proven this to be far from the case, with natural deposits encountered at a depth of approximately 5.5m - 6m below the modern ground level. Moreover, there is some indication that the natural ground surface slopes down towards the Tyne, the reverse of the modern situation in the area of the Coronation Street/Station Road roundabout.

1.3 OXFORD ARCHAEOLOGY NORTH

1.3.1 OA North has considerable experience of excavation of sites of all periods, having undertaken a great number of small- and large-scale projects throughout Northern England during the past 25 years. Evaluations, desk-based assessments, watching briefs and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables. OA North has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. OA North is an **Institute of Field Archaeologists (IFA) registered organisation, registration number 17**, and all its members of staff operate subject to the IFA Code of Conduct.

2 OBJECTIVES

2.1 The following programme has been designed to identify the presence of any human remains within each of the sewer trenches, and to investigate, record and remove those remains where they would be effected by the development together with as much supporting information concerning the depth, orientation, burial furniture and dating as the circumstances within the service trenches allow.

3 METHOD STATEMENT

3.1 WATCHING BRIEF

3.1.1 ***Methodology:*** all machining undertaken on the site will be monitored by a suitably experienced archaeologist; any machining below the level of compact road services should be enacted by the use of a toothless ditching bucket. It would be desirable if machining could be undertaken in long, shallow scoops, rather than short, deep bucketfuls, in order to minimise damage to any human burials or other archaeological remains. The programme of field observation will record the location, extent, and character of any surviving archaeological features and/or deposits as accurately as possible within the area of proposed ground disturbance. Where health and safety considerations allow, any human remains revealed by the machining and lying within the zone of impact, would be screened from public view, recorded *in situ* and removed from the trench which, to allow safe access when over 1.2m deep and/or less than 2m wide, would require the use of a temporary shoring system, installed by a specialist contractor. Although it is appreciated that the limited space available to the scheme of excavation would prevent the deposition of spoil from mechanical excavation in separate spoil heaps, it would be useful if spoil deriving from initial excavation of the road

surfaces and their make-up could be kept separate from that deriving from the underlying layers in order that such material can be systematically searched for human remains and any other artefacts as soon as it is safe to do so. The rough location of such remains would be recorded as accurately as possible to allow this material to be tied in with the field observations. It is proposed that at least two archaeologists will be in attendance during the machining process, allowing the spoil to be sorted for human remains, and for any *in situ* remains to be recorded without delaying the machine, which would be able to excavate another area if archaeological remains were found at the original site of excavation. As required, additional archaeologists would be supplied to the site to deal with greater numbers of remains.

3.1.2 The investigation and excavation of human remains would be undertaken in accordance with the methodology outlined in *Appendices 1 and 2* of the OA North project design for the excavation undertaken at Coronation Street, dated April 2006. Putative non-burial archaeological features and/or deposits identified during the observation of groundworks, together with the immediate vicinity of any such features, will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions and, where appropriate, sections will be studied and drawn. Any such features will be sample excavated (ie. selected pits and postholes will normally only be half-sectioned, linear features will be subject to no more than a 10% sample, and extensive layers will, where possible, be sampled by partial rather than complete removal).

3.1.3 ***Recording:*** all recording will be undertaken in accordance with national guidelines (English Heritage Guidelines for the treatment of human remains excavated from Christian burial grounds) and OA guidelines, wherever possible, and in the case of human remains, will be undertaken in accordance with *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006. To increase the speed of recording, burials will be planned through the use of rectified photography. Such works will involve the use of survey equipment, base stations for which will need to be surveyed-in using GPS equipment prior to the commencement of groundworks, and once the location of the sewer trench has been finalised (to limit any disturbance/movement of the base stations). Recording would take the form of indexed black and white print and colour slide photography, appropriately-scaled plans and sections on permanent drafting film together with detailed written notes on *pro-forma* recording sheets.

3.1.4 ***Treatment of finds:*** all finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid For Finds*, 1998 (new edition) and the recipient museum's guidelines.

3.1.5 ***Treasure:*** any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996. Where removal cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.

3.1.6 All identified finds and artefacts will be retained, although certain classes of building material can sometimes be discarded after recording if an appropriate sample is retained on advice from the recipient museum’s archive curator.

3.1.7 ***Fleshed or partially-fleshed bodies:*** should mechanical excavation reveal the presence of fleshed or partially-fleshed burials, or coffins containing liquor or other corruption products, it would be necessary to inform the Environmental Health Officer and agree a suitable strategy for their recovery, analysis and disposal. all further works would conform to any requirements that they may set. Dependent on the state of these bodies, it may be necessary to use a specialist contractor for their removal, storage and deposition, the costs of which would be agreed with the Client and charged as a variation. Any lead coffins would not be opened, but would need to be removed, stored and deposited by a specialist contractor, the costs of which would be agreed with the Client as a variation.

3.1.9 ***Contingency plan:*** in the event of significant non-burial archaeological features being encountered during the watching brief, discussions will take place with the ARCUS, the Client

and the Tyne and Wear Archaeologist, as to the extent of further works to be carried out. All further works would be subject to a variation to this project design. In the event of environmental/organic deposits being present on site, it would be necessary to discuss and agree a programme of palaeoenvironmental sampling and or dating with the Planning Archaeologist.

3.2 **POST-EXCAVATION ASSESSMENT, ANALYSIS AND ARCHIVING**

3.2.1 The assessment and any analysis of the human remains recovered as part of the watching brief would be undertaken as part of the wider post-excavation programme, methodologies for which are provided in *Sections 3.3* and *3.4* and *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006.

4. Health and Safety

4.1 OA North provides a Health and Safety Statement for all projects and maintains a Unit Safety policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (1997). A risk assessment will be completed in advance of any on-site works and copies will be made available on request to all interested parties.

5 WORK TIMETABLE

5.1 ***Archaeological Watching Brief:*** the duration of the watching brief will be dependent upon the timetable of the groundworks; although some delay may be incurred by the discovery of *in situ* human remains, it is hoped that additional staff could be supplied to the site to investigate such remains as quickly as possible, allowing groundworks to continue at another point along the sewer trench.

6. PROJECT MONITORING

6.1 ***Access:*** liaison for site access during the evaluation will be arranged with the client unless otherwise instructed prior to commencement of the archaeological investigation.

6.2 Whilst the work is undertaken for the Client, ARCUS would ensure that the Tyne and Wear Archaeologist will be kept fully informed of the work and its results, and will be notified a week in advance of the commencement of the fieldwork. Any proposed changes to the project design will be agreed with the Tyne and Wear Archaeologist in consultation with the Client and ARCUS.

7. STAFFING PROPOSALS

7.1 The fieldwork will be under the direct management of **Stephen Rowland** (OA North project manager) to whom all correspondence should be addressed. The post-excavation programme would be managed by **Louise Loe** (OA Head of Heritage Burial Services).

7.2 The watching brief would be undertaken by an archaeological Supervisor and an Osteoarchaeologist. Additional staff would be supplied, as required, to limit disruption to the machining schedule. The initial surveying-in of base stations would be undertaken by Marc Storey, OA North Geomatics Project Officer.

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APPENDIX 2: RELEVANT SECTIONS FROM THE EXCAVATION PROJECT DESIGN

3.2 POST-EXCAVATION ASSESSMENT

3.2.1 Following completion of the fieldwork, the results will be collated and the site archive completed in accordance with English Heritage MAP2, Appendix 3. A post-excavation assessment of the archive and the resource implications of the potential further analysis will be undertaken. The stratigraphic data and the finds assemblage will be quantified and assessed, and the environmental samples processed and a brief assessment of their potential for further analysis made. The assessment will, where appropriate, comprise:

- Quantification of all site records, including drawings
- Assessment of the stratigraphic sequence, in terms of complexity and, where possible, provisional chronology
- A summary description of the results of the excavation, including an identification of formation processes
- An assessment of the significance of any deposits from which radiocarbon samples have been taken and the selection of specific samples for submission for analysis
- An assessment of any groups of articulated and disarticulated human remains, including age, gender and any pathological lesions, along with the distribution of the remains themselves, in terms of their potential for further analysis, which might include:

i. Demographic reconstruction in terms of age, gender and health

ii. Stature and bone size and shape conformation

iii. The presence of non-metric traits and genetic disorders that might indicate the use of areas of the cemetery by familial groups

iv. Indications of social status and access to resources as well as occupation-related pathological conditions

v. Groupings of disarticulated human remains likely to relate to single individuals

vi. Number of individuals and stratigraphic relationships represented by the unstratified material that may lend clues to the length of usage of the cemetery

vii. Isotope analysis for the reconstruction of past dietary practices and also for the origin of populations

- An assessment of the quantity and provisional dating of any pottery recovered from the excavation and an assessment of the further work required for the analysis of a selected assemblage from the evaluation and excavation. Such potential for analysis may include:

i. Typological and chronological analysis in order to improve an understanding of the chronological basis of the use of the site as a cemetery and of any earlier activity

- An assessment of the quantity, form and provisional dating of any coffin furniture, nails or other metal artefacts in order to establish a programme of further analysis, which might include:

i. Form, function and typological analysis, as a means of dating artefacts and interpreting their use for social display, etc.

- An assessment of the nature and quantity of any faunal remains along with the potential for further analysis, which might include:

i. Species representation, proportions, metrical conformation, pathological lesions, age and sex for the understanding of the pastoral and hunting economies and the nature of animal husbandry practices

ii. Butchery, burning, gnawing and fracturing as a means of determining the treatment and processing of meat products along with attitudes to waste disposal

iii. Analysis that might help to address research questions regarding the introduction of domesticated species during the Early Neolithic, which might include an examination of non-metric traits and body conformation that could indicate the presence of animals of primitive type, or of greater or lesser genetic diversity or of indigenous or extraneous origin

- An assessment of environmental remains recovered from the excavation, including the nature and quantity of materials such as molluscs, pollen, charcoal and carbonised plant remains along with the potential of any well-stratified assemblages for further analysis in terms of:

i. Identification of economic and subsistence practices through the identification of edible plant remains

ii. The identification of food processing strategies as indicated by the presence of various plant anatomical parts (ie, chaff), either separated from or still attached to seeds and grains. Within this context, insect remains may also be important in identifying any storage or refuse functions associated with features

iii. The nature of the environments exploited for plant foods through the identification of weed seeds, which may also indicate the nature of human manipulation of the local environment, as may insect remains

iv. The character of the local environment through the analysis of pollen, plant macrofossils and fungal spores and the potential impact of man upon this environment

v. The character of the immediate environment as indicated by any mollusc or insect remains and relict topsoil horizons

vi. The presence of faecal material and parasite eggs that may be informative of the general state of health of past populations

- An assessment of any monoliths or core samples taken from specific deposits for their potential for further analysis in terms of site formation processes

3.2.2 The assessment results will be presented within a post-excavation assessment report which will summarise the results of the excavation and any initial hypotheses that can be drawn from the assessment of the finds and environmental samples. Within the framework of these initial results, an attempt will be made to place the data from the excavation within a regional context both in terms of a chronological narrative and of significance. The assessment report will make recommendations for a schedule, timescale and programme of analysis in accordance with MAP2 Appendix 4.

3.3 ANALYSIS

3.3.1 A provisional programme of post-excavation analysis is anticipated, and guidelines are provided in *Appendix 2* of this project design. The extent of the programme, however, can only be reliably established on completion of the post-excavation-assessment report, but it is likely, considering the nature of the material from the evaluation, that each of the proposed stages for analysis of human remains will be undertaken on the more complete inhumations, while less-detailed analysis is likely to be undertaken on disarticulated remains (see *Section 3.3* above). The proposed programme anticipates both analysis of the site stratigraphy and the artefactual/ecofactual evidence leading to the production of a final report. This will be completed within two years of the fieldwork.

3.4 PUBLICATION

3.4.1 It is anticipated that the results of the excavation will be worthy of publication. If possible, the publication text will be prepared in a suitable form for inclusion in either a regional or national journal, for example, the Durham Archaeological Journal or Archaeologia Aeliana, respectively.

APPENDIX 1: THE EXCAVATION AND RECORDING OF BURIALS IN CHURCHYARDS

By A Boyle and C Boston

1 INTRODUCTION

This section details the recommended methodology for the excavation and recording of inhumations and their associated features and grave goods. Associated features include coffins, grave cuts, ditches, postholes, stakeholes and memorials.

It is fair to say that it is virtually impossible to record a burial in too much detail but this viewpoint needs to be balanced against time and money constraints BUT NOT AT THE EXPENSE OF THE DATA.

Both excavation and post-excavation treatment will directly affect the quality and quantity of information, which can be recovered by the osteoarchaeologist. An enormous amount of information can be extracted if proper procedures are followed. On any site where burials are discovered it is important to seek the advice of the osteoarchaeologist as soon as possible. Where the presence of burials is known or suspected this should happen prior to excavation. If at all possible the osteoarchaeologist should be present on site throughout excavation. This is especially important on large cemeteries and is essential both when preservation is poor and when skeletons are to be immediately reburied. Otherwise some provision should be made for regular visits. An assessment of factors such as numbers of skeletons, bone preservation, method of burial, date range and density of inhumations will aid in the definition of a suitable collection procedure. For example, in cases where the sample is small and skeletal preservation is poor, the opportunities for post-excavation will be limited. This will have implications for the recording and excavation procedures employed.

2 INHUMATION BURIALS

This section describes the recommended methodology for the excavation of inhumation burials within churchyards. The general area should be thoroughly cleaned in plan, with a view to defining grave outlines and their relationships to other graves and/or features. Clearly, intercutting graves are important in the construction of a stratigraphic sequence for the site. Where graves are intercutting it is essential that the relationships are properly investigated and interpreted on site. In these circumstances loose bones should not be removed until it is clear which context they belong to (a separate section on the excavation and recording of disarticulated bone appears below).

2.1 METHOD OF EXCAVATION

The best practice is to excavate graves and their contents in plan. Although the quadranting of graves with a view to producing longitudinal and transverse sections has been advocated it is difficult to see how such a procedure would deal adequately with eg. the recording of large numbers of finds, or the recovery of a body surviving only as a shadow. Arguments may however be presented for the excavation of particular burials in sections or quadrants.

Excavation should proceed carefully and without undue haste. A basic aim is the definition of body position in order that the more fragile bones, such as skull, pelvis, kneecaps, hands and feet, are not accidentally damaged. It is therefore poor practice to begin by digging deep exploratory holes with a view to `hitting bone'.

2.2 RECORDING THE SKELETON

Each individual skeleton will be assigned a separate context number from a continuous sequence. The skeleton has its own specialised context sheet, which must always be used. If further space is required then a standard context additional sheet should be used. **NOTE:** Once a context number has been assigned then a separate skeleton number is unnecessary. It is important to realise that the deposition of a skeleton is a stratigraphic event in *its own right* whether or not it is placed within a coffin. There are two slightly different versions of the skeleton recording sheet: one should be used for adults and the other for children and subadults as appropriate. Only those aspects of the skeleton recording sheet, which are unique, are discussed here. The remaining elements of the skeleton sheet are also present on the general context record sheet and are discussed in section 2 of the Oxford Archaeological Unit fieldwork manual.

2.2.1 ***Skeleton diagram:*** this diagram should be used to record which bones are present. If a bone is present then it should be shaded on the drawing. Where possible the osteoarchaeologist should be consulted.

2.2.2 ***Levels:*** these should be taken at three basic positions as indicated on the skeleton recording sheet (skull, pelvis and feet). A level measurement taken between the knees if legs are extended can be useful. Further readings should be taken if the position of the skeleton is in any way unusual. Great care should always be taken when placing level staff. All levels should additionally be marked on the plan.

2.2.3 ***Orientation:*** orientation should always be in relation to OS grid North or magnetic North rather than site grid North. A compass should be used.

2.2.4 ***Body position:*** body position should be indicated in the appropriate box. When describing the skeleton it should be remembered that left and right sides are those of the skeleton and not the excavator. A precise description of arms and legs should appear on the skeleton context sheet in the section for Additional Information. Factors such as displacement of skull, mandible and the disposition of hands and feet must be recorded as they may relate to taphonomic processes. Bones which have been positioned tightly together may have been wrapped in a shroud at the time of death (shrouds may additionally be indicated by pins). Animal activity or collapse and decay of grave structures may cause displacement of bones. Definitions of the relevant terminology appear below.

2.2.4.1 *Supine:* the skeleton is laid flat on its back, legs may be extended, crossed, flexed or semi-flexed, detail of arm position and the direction in which the skull is facing should also be provided. Supine is by far the most common body position found in Christian burials.

2.2.4.2 *Crouched:* the skeleton is laid on its side and crouched (often tightly) in the foetal position, detail of arm position and the direction in which the skull is facing should also be provided.

2.2.4.3 *Prone:* the skeleton is laid face down; legs may be extended, crossed, flexed or semi-flexed, detail of arm position and direction in which the skull is facing should also be provided.

2.2.4.4 *On side:* the skeleton is laid on left or right side, legs may be extended, crossed, flexed or semi-flexed, detail of arm position and the direction in which the skull is facing should also be provided.

2.2.4.5 *Irregular:* if the position of the skeleton does not fit into any of the above categories then it can fairly be described as irregular and as much detail as possible should be provided.

2.2.5 ***Preservation of skeleton:*** this category relates to the condition of those bones which are present and NOT to the completeness of the skeleton. Choose good, fair or poor as appropriate. Where preservation is variable and additional comment is required this should appear in the box marked `description'. Many factors can determine the survival of bone. These include soil pH, moisture content, air, temperature, fauna, flora, and human interference. Additionally age and sex also play a part. Pathological bones are particularly fragile and those exhibiting lesions should be photographed in situ. Water is the single most important factor of decay: the principal action of

water on bone is by leaching. Preservation is generally better in soils with a neutral or slightly alkaline pH, and is worse in acid conditions. Decomposition may be accelerated in porous light soils while dense, clay-like soils may actively retard it (Henderson 1987). The categories of preservation are defined as follows: preservation should be described as good where bones are mostly intact and in good condition and therefore unlikely to fragment during excavation, bone surfaces are smooth and unmarked; preservation should be described as fair where occasional bones are broken and further breakage is likely to occur during excavation, bone surfaces may have slightly `weathered' or roughened appearance; preservation should be described as poor where most or all of bones are broken and fragmented, bone surfaces have very `weathered' or roughened appearance.

2.2.6 ***Completeness of skeleton*****:** this is indicated pictorially on the skeleton diagram. In addition the level of completeness should appear in the appropriate box on the skeleton recording sheet using a numerical code as follows: 1 - complete/virtually complete, all or most bones of the skeleton appear to have survived; 2 - more than half the skeleton has survived; 3 - less than half the skeleton has survived.

2.2.7 ***Collection quality:*** any factors, which might have affected the standard of recording and collection, should be noted, such as if collection took place under salvage conditions or in very poor weather (eg. frost or poor light), many of the smaller bones of the hands and feet might have been missed. Any damage, which occurs during the excavation or lifting of the skeleton, should be noted. Both should appear in the section for Additional Information.

2.2.8 ***Planning and photography:*** ideally all skeletons should be planned at a scale of 1:10. This provides a realistic representation of the position of all surviving bones and any associated objects. If appropriate this plan can also incorporate grave outline, coffin evidence, any other structures and associated finds. Before planning, the grave fill and any soil around and adhering to the skeleton should be removed. Appropriate tools are described in section 2.2.9 below. It should be emphasised that the small bones of the hands and feet are easily disturbed and damaged. Consequently only the minimum amount of soil should be removed from these areas. The sparing use of sponges and fine water sprays can be useful for the removal of persistently adhering soil. However, under no circumstances should bones be continually dampened and allowed to dry out, as this will cause them to disintegrate. The use of 1:5 scale plans for infants and neonates should be considered where time allows. The points at which levels have been taken should also be indicated on the plan. Sample location can also be indicated on plan.

Increasingly, plans of skeletons are made by digital rectification of photographs taken using a digital camera. These have the advantage of greater accuracy than hand-drawn plans, and are a labour-saving device in the field. It is important to note, however, that a manual plan of the grave cut, coffin wood and fittings and small finds is still required, as these tend to show up poorly in photographs.

2.2.9 ***Excavating the skeleton:*** it must be emphasised that the quality of the skeletal information, which can be extracted by the osteoarchaeologist, is directly dependent on the completeness of the skeleton and the preservation of individual bones. A very fragmented skeleton is of limited use. Hence great care should be taken in the lifting and handling of the bones. In acid ic soil conditions, tooth enamel may be all that survives. This should be lifted in a block and kept moist.

Bones should be boxed as soon as possible after excavation. Skulls in particular should be placed in boxes immediately after lifting and UNDER NO CIRCUMSTANCES should they be transported from site in plastic bags alone as they are extremely fragile. They should never be lifted by the orbits (or eye sockets). Always lift skulls using both hands. All the appropriate packing materials should be on site prior to lifting of skeleton.

Specialised tools are essential. These are plasterer's leaves (leaf blades); dental tools and soft, and small paint brushes. Wooden tooth picks, lollipop sticks (tongue depressors) and plastic modelling tools should be employed in the final cleaning stages as they are unlikely to mark or depress bone.

The skeleton should be excavated and bagged in the manner outlined here (though not necessarily in this order). The skull and mandible should be bagged together and placed immediately in a box.

Any loose teeth should be placed in a separate small bag, which should also be placed in the box. The left scapula, clavicle, humerus, radius and ulna should be lifted and bagged together, the bones of the left hand and wrist should also be placed in this bag. Repeat for the right arm. The left pelvis, femur, patella, tibia and fibula should be lifted and bagged together; the bones of the left foot and ankle should also be placed in this bag. Repeat for the right leg. The vertebrae, ribs and sternum can be placed in one bag.

NOTE: this is the minimum number of bags, which should be used. If time allows hands and feet may be separated from arms and legs (ie right hand in one bag, left hand in another). Where the bones of the hands or feet cannot be separated ie. because they are crossed, the bones may be placed in a single bag. Whenever time allows, vertebrae and sternum can be separated from ribs, and ribs can be split into left and right sides. Additionally fourth ribs may be placed in a separate bag, if easily identifiable, as these can aid in age assessment. During lifting the ribs often break into quite small fragments, many of which may be unidentifiable as to side. It is sensible to remove the bone in a systematic fashion, ie dealing with one bag at a time in order to avoid confusion.

Every individual bag should have two labels inside. The following details should appear on both: site code, context number of skeleton, bone identification (eg. skull, right arm or left leg). Trap air in bags with bones to prevent crushing. Skeletons should be boxed as soon as possible after lifting; even before washing in order to minimise crushing.

Where possible the entire procedure should be completed in one day. If left overnight, the skeleton should be covered with polythene and packing material (eg loose soil).

2.3 THE EXCAVATION OF JUVENILES AND INFANTS

Many of the above points continue to be relevant to the excavation of young individuals, but a number of additional points are important. The epiphyses (ie the bone ends) are not fused to the bone shafts. At birth there are 450 bone forming centres which will develop into 206 in the adult. Excavators should be aware of this, preferably through demonstration of neonate, infant and juvenile skeletons. It must be borne in mind that infant epiphyses resemble small stones. Special care should be taken to recover infant vertebrae, which comprise three separate bones. Infant bones are regularly recovered from settlement contexts and often confused with small animals, such as rabbits and dogs. It is hoped that the skeleton diagrams on the recording sheets will be a help in this respect. The bones of adults and juveniles should never be bagged together as the latter are extremely fragile. Each individual infant limb bone should be placed in a separate bag.

2.4 DISARTICULATED BONE

Multiple graves, often containing disarticulated bone are quite common on archaelological sites (eg. Roman, Anglo-Saxon, medieval and post-medieval). Disarticulated bone is also known from prehistoric contexts (eg. Neolithic and early Bronze Age). Disarticulated bone from earlier periods is likely to benefit from three-dimensional plotting and identification of each individual bone, although this may not be feasible in each and every case.

Relatively little useful information may be gleaned from churchyards where successive burials have taken place intensively over a prolonged period. In these cases, the possible value of the data should be weighed up against practical considerations, such as time and money constraints. In these circumstances, it is recommended that the disarticulated bone is collected for possible reburial. Further recording and osteological analysis is not usually indicated.

2.5 BODY STAINS AND `EMPTY' GRAVES

In contexts where acid conditions prevail the skeleton may have completely decayed and be represented only by a `body stain'. Occasionally fragments such as dental enamel will survive. Body stains can generally be excavated three-dimensionally. The staining should be sampled along with all the grave fills and control samples should be provided.

Where graves are apparently empty, samples may be recovered for phosphate analysis in order to determine whether or not a burial was ever present.

2.6 GRAVE CUTS

A grave is a cut feature and therefore, a negative one. Attention should be directed to Appendix 4 of the Oxford Archaeological fieldwork manual (Wilkinson 1992). All of the general points apply equally to grave cuts. The shape of the grave cut should be described in some detail and the following terminology should be employed: sub-apsidal (grave with rounded ends), sub-rectangular, ovoid, square, circular or irregular.

The profile of the grave should be recorded in the written record. Important features to look out for are ledges, which may indicate the presence of a wooden lid and the presence of grave markers (post holes, stake holes: see associated structures below). In general, it is not necessary to draw longitudinal or cross-sectional profile of the cut. A written description, however, should be recorded on the context sheet.

The grave outline should be planned at a scale of 1:10. Levels should be taken at the top and bottom of the grave. In churchyard contexts, the precise cut of the grave may not be visible, due to lack of distinction between the graveyard soil and the grave fill. Nevertheless, it should be assumed that the cut existed, and should be accorded a context number.

2.6.1 ***Extra-mural vaults and brick shaft graves:*** in the 18th- and 19th-centuries, concern over disturbance of the remains of family members, and the increasing use of death ritual for social display led to the establishment of subterranean brick-built family vaults and shaft graves for the interment of multiple burials. A vaults traditionally has a vaulted roof, the entrance to the interior commonly is through a doorway in one of the side walls (often with a set of steps leading down to it). A brick shaft grave is essentially a rectangular or single break grave cut lined with a single or double layer of bricks and mortar. Brick shaft graves may be of single or double width. The top of the grave is covered over by horizontal ledger stones (often sandstone or limestone slabs), which could be removed for subsequent interments. Coffins were stacked vertically one above the other within the grave, sometimes resting on metal racks. Vaults and brick shaft graves were originally surmounted by an above- ground memorial. Today, many have been lost.

Recording of vaults and brick shaft graves should follow the guidelines for brick built structures laid out in the Oxford Archaeology Field Manual (Wilkinson 1992).

2.7 GRAVE FILLS

The grave fill is a positive context and attention should be directed to section 2.4.1 and Appendix 1 of the Oxford Archaeological fieldwork manual. It should never be assumed that a grave will only have a single fill- it may have several. It is important to ensure that all of the grave fill is removed and that the grave is `bottomed'. This has obvious implications for the shape and depth of the grave. More specifically, objects are often located below the skeleton, and would be otherwise missed. In churchyards, it was common practice to inter two or more burials one above the other. Care should be taken to ascertain that the lower-most burial has been revealed. The fill below the skeleton may also indicate whether or not the grave remained open for any length of time prior to burial.

Where bulk finds (eg. animal bone and pottery sherds) are recovered from grave fills, this should be recorded in the fill context sheet, along with their vertical position within the fill. Any indication that a find was confined to a particular part of the fill should be recorded. This will facilitate the distinction between residue material and grave goods deliberately placed with the corpse within the grave. On the whole, it is recommended that finds within grave fills should be treated as small finds. This is not the case, however, with coffin nails, which should be assigned the context number of the coffin. It is not necessary to give coffin fittings or fixtures small find numbers. It is important, however, to record their position within the grave on the grave plan. Most commonly, coffin fittings and fixing nails, hinges and brackets are collected for reburial

with the associated skeleton. If the skeletons are not to be reburied, they should be collected for inclusion within the archive.

2.8 COFFINS

A variety of wooden mortuary chambers and wooden coffins appear in the archaeological record dating from as far back as the earlier Neolithic. In the medieval and post-medieval periods, both wooden and lead-lined coffins are common. Simple single thickness trapezoid and rectangular wooden coffins were the most common form in the medieval period. From the 17th century, there was increasing elaboration of coffins and fittings. Single-break coffins (the modern 'coffin shape') become ubiquitous from the 1730s onwards (Litten 1991). Simple coffins comprised of a single thickness wooden case decorated with few fittings. More elaborate coffins were constructed either of a double thickness of wood; an outer wooden case and inner lead shell, a lead shell and inner wooden coffin; or a triple layer of a wood-lead-wood. Lead was the most common metal, but iron and zinc were also occasionally used for the metal shell. The outer wooden case was often upholstered in baize or velvet and decorated by elaborate patterns of upholstery studs (usually iron or brass) and metal fittings, such as escutcheons, lid motifs and *departum* plates (breastplates, footplates and headplates inscribed with the name of the deceased, their age, date of death and other particulars). A taphonomy of coffin fitting styles based on coffins found at Christ Church, Spitalfields (Reeve and Adams 1993) forms the basis for comparison of these styles. OA is currently compiling a 'master catalogue' to include new styles found on other post-medieval burials sites.

2.8.1 ***Excavation and recording:*** wooden coffins may be indicated by staining caused by the decay of the wood and/or the presence of iron nails and brackets. Where they do occur, an individual coffin context number should be assigned. Fittings should be given this number and do not require individual small finds numbers. The precise location of these objects is of vital importance for the reconstruction of mode of coffin construction. Where wood survives in contact with nails and fittings it will be possible to ascertain board thickness and the direction of the wood grain. The presence and position of nails and fittings within the grave must be marked on the grave plan. The outline of coffin stains should also be represented on the plan at a scale of 1:10. Details should be recorded on the standard OA coffin record sheet.

It is recommended that the coffin fill around the skeleton be removed whilst leaving the coffin stain and any associated fittings *in situ*. At this stage the coffin and skeleton should be planned at a scale of 1:10 and a photographic record produced.

Certain elements are common to both the standard context record sheet and the coffin record sheet. Those elements that are unique to the coffin record sheet are described below.

2.8.2 ***Shape, dimensions and distinguishing characteristics:*** draw the shape of the coffin here and include coffin furniture (for example, handles, decoration, breastplates) with their approximate locations. Make a note of dimensions in all the relevant places (head, shoulders, base, depth). If the coffin is decorated then detailed photographic recording is recommended. The style of 18th- to 19th-century coffin fittings should be compared with the detailed taxonomy of coffin fittings compiled from Christ Church, Spitalfields (Reeves and Adams 1993). Where matches cannot be found, the coffin fittings should be sketched on site. These styles will be added to the 'master catalogue' of coffin fittings currently being compiled by OA.

2.8.3 ***Description:*** describe the coffin, giving details of design and construction, materials used, and unusual features. Description of each element of the coffin fittings (eg breastplate, escutcheon, lid motif, grip and grip plate) should include material, quantity, styles (if matching Spitalfield types). Text inscribed on breastplates or directly onto the lead shell should be recorded *verbatum*.

2.8.4 ***Stratigraphic matrix:*** only enter the relevant stratigraphic relationships here (ie the grave fills and cut numbers). DO NOT enter the skeleton number (it is stratigraphically within the coffin number and in terms of chronological sequence is contemporary).

2.8.5 ***Preservation of coffin:*** tick one of these boxes to indicate how well the material of the coffin survived. If preservation is variable give details in the Description section.

2.8.6 ***Treatment:*** an entry should be made here if the coffin underwent any treatment from conservators before excavation or during lifting.

2.8.7 ***Finds:*** enter details of any coffin furniture and of any other finds closely associated with the coffin.

2.9 ASSOCIATED STRUCTURES

This applies to features such as ditches, postholes, stake holes or the foundation trench for the headstone and/or footstone of a grave memorial, which may be associated with a grave. These should be assigned a unique context number and cross-referenced on the appropriate context sheet (for grave cut or grave fill). The use of group numbers for related contexts is recommended.

2.10 ASSOCIATED OBJECTS

Grave goods may be present either within the grave fill or in direct association with the skeleton. Each object should be assigned to the appropriate context, given a unique small finds number and three-dimensionally recorded. Decayed organic objects which may only be represented by staining should also be recorded in this manner and sampled where appropriate.

Shrouds may be indicated by copper-alloy or nickel pins. These should be assigned a small finds number then accurately recorded on plan and by level. Their presence should be noted on the skeleton recording sheet. Clothing fasteners (eg buttons, toggles and garter buckles) may be present in the grave. Clothes fastenings potentially give important insights into changing patterns of grave dress over time. The location of these items should be recorded on the grave plan, and the items assigned a small find number. They should be collected for specialist analysis but may be ultimately be reburied with the coffin and human remains (depending on site specifications).

It is very important to describe the precise position of the object. Textile impressions are often preserved in the corrosion on metal objects, and can yield much information about dress and other body coverings. Where a number of objects cluster together the presence of a decayed organic container, such as a wooden box or bag, may be indicated.

All small finds should appear on the plan of the skeleton. Where a large number of grave goods are clustered together it is desirable to produce a detailed plan at a scale of 1:5, 1:2 or even 1:1 if appropriate. In cases where a number of grave goods are located below the skeleton, it is recommended that a further plan should be drawn after its removal. A photographic record should also be produced. For major cemetery sites, the use of an EDM for rapid and accurate plotting of objects is recommended. This is particularly useful in cases where objects are stratified within a grave (ie some may be lower down in the fill than others), although here measurements between stratified objects is helpful.

2.11 GRAVE MEMORIALS

Grave memorials, such as head and footstones, may be associated with specific burials. Extramural above-ground memorials became increasingly common in the post-medieval period. Recent work by Mytum (2002) and Tarlow (1999) have traced changing traditions in the shapes, iconography and text inscribed on these memorials. Headstones also offer valuable biographic information on individuals interred in the graveyard.

Head and footstones are structures and should be accorded an individual context number. They should also be included as part of the grave group, if the association with the burial is clear. It is important to note that many tombstones have been moved from their original position in recent years, and care in establishing an association with a specific burial should be made.

Descriptions of gravestones should follow guidelines set out by Mytum (2002) and include details of

- Shape
- Dimensions
- Type of stone used
- Iconography (an illustration may best describe these features)
- Inscription (*verbatum* record of inscription; font of the lettering)
- Stylistic type

3. PHOTOGRAPHY

Record photographs should be taken on colour diapositive (slide) and monochrome film using SLR cameras. A full black and white and colour (35 mm transparency) photographic record, illustrating in both detail and general context every burial. Where appropriate a digital camera may be used with features and sections that are intended to be geo-referenced. This data is in addition to the information collected above and is not intended as a substitute. The benefit of using a digital camera is the speed with which the images can be processed. However, geo-referenced digital photography may be considered as a substitute for 1:10 plans of individual graves. Site code, scale, north arrow and skeleton number should appear in every photograph. A chalk board or a number board must always be used.

4. ETHICAL AND LEGAL CONSIDERATIONS

Burials that do not fall without the aegis of the Church of England may not be excavated without receipt of a Home Office licence. Excavation of burials within churchyards of the Church of England require a Faculty to be issued by the appropriate Diocesan Advisor before work may commence. Recent burials (within the last 100 years) interred within disused burial grounds may require a Disused Burials Grounds licence from the Home Office. Heritage Burial Services will usually arrange licences on request.

It is imperative that human remains are treated at all times with the appropriate respect. They should be screened from public view at all times. Sensitivity to the emotional reactions of both other archaeologists and members of the public is paramount, and it should be anticipated that these are often more pronounced when more recent burials are being disturbed.

Following excavation human remains should be stored out of sight in a clean, dry and secure place under the aegis of an appropriate individual or group.

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APPENDIX 2: OSTEOLOGICAL METHODOLOGY

1. INTRODUCTION

1.1 The osteological methodology presented below includes only macroscopic methods. Unusual or note-worthy pathology will be recorded photographically. In rare cases, radiography and other microscopic or biochemical methods may be used, but are not outlined below.

2. GENERAL TERMINOLOGY AND EQUIPMENT USED

2.1 The anatomical terminology used in this report will be in accordance with international nomenclature. The descriptive teeth formula used will be based on the Zsigmondy system (Zsigmondy 1861 in Hillson 2003, 8-9). All bones and teeth will be analysed macroscopically.

3. RESULTS

3.1 PRESERVATION AND COMPLETENESS

3.1.1 Bone preservation and completeness of the assemblage will be rated on a four-point scale, ranging from 1 (poor) to 4 (excellent). Likewise, skeletal completeness will be scored on a scale of 1 - 4 : 1 (< 25 %); 2 (25- 50 %); 3 (50- 75 %); and 4 (> 75 %).

3.2 ESTIMATION OF AGE AT DEATH

3.2.1 Diaphyseal long bone lengths will be used as the basis for ageing foetuses and neonates using methods developed by Fazekas and Kósa (as adapted in Scheuer and Black 2000). Subadults will be aged by the stage of dental eruption (Mooreess *et al.* 1963a and b)), stage of epiphyseal fusion (Scheuer and Black 2000) and diaphyseal length of the major long bones (Maresh 1970).

3.2.2 The adult skeletons will be aged by degeneration of the auricular surface of the pelvis (Lovejoy *et al.* 1985), the sternal end of the ribs (İşcan and Loth 1986 a and b) and the pubic symphysis (Brooks and Suchey 1990; Todd 1921a and b); epiphyseal fusion of the medial clavicle (Scheuer and Black 2000); dental attrition (Miles 1962), and suture obliteration (Meindl and Lovejoy 1985).

3.2.3 All individuals will be assigned a suitable precise age group as defined in Table 1.

Age group	**Age range**
Foetus	< 0 years
Neonate	0-1 months
Infant	0-1 years
Young child	2-5 years
Older child	6-12 years
Adolescent	13-17 years
Young adult	18-25 years
Prime adult	26-35 years
Mature adult	36-45 years
Older adult	> 45 years
Child	2-12 years
Subadult	< 18 years
Adult	> 18 years

Table 1. Age groups employed in analysis

3.3 ESTIMATION OF SEX

3.3.1 Sexually dimorphic features of the pelvis and cranium will be used to diagnose osteological sex based on standards set out in Buikstra and Ubelaker (1994) and Schwartz (1995). Osteometrics will be used as secondary sexual indicators.

3.4 ESTIMATION OF STATURE

3.4.1 Calculation of body stature will be estimated from the maximum length of the major long bones will be based on the method for Caucasians developed by Trotter and Gleser (Trotter 1970). Combined measurements of the femur and tibia will be utilised wherever possible, and in the absence of one of these bones the femur and then the tibia will be used. The major bones of the upper limb will be used if no lower limb bones are present. The left side will be used preferentially in keeping with standard osteological practice.

3.4.2 For comparative studies on stature between populations, it is recommended to use the actual bone measurement rather than the calculated estimates (Brothwell and Zakrzewski 2004, 33). The raw long bone lengths will be given as an appendix to the specialist report.

3.5 NON-METRIC TRAITS

3.5.1 The descriptions given in Berry and Berry (1967) and Finnegan (1978) will be used to record non-metric traits.

3.6 METRICS

3.6.1 Measurements on the skull and postcranial elements will be taken using landmarks described by Brothwell (1981) and by Buikstra and Uberlaker (1994). These will be used in estimation of sex, and quantifying size and body proportions (such as the platymeric and platynemic indices) that may be activity related. A number of cranial indices will also be taken, and may assist in the identification of racially distinct characteristics.

3.7 SKELETAL AND DENTAL PATHOLOGIES

3.7.1 The terminology and descriptions of the skeletal pathologies used in the report will be based largely upon palaeopathology texts, such as Ortner (2003) and Aufderheide and Rodríguez-Martín (1998).

4. REPORTING

4.1 A comprehensive specialist report will be compiled on the basis of the above data, detailing the demography of the burial population, prevalence of skeletal and dental disease and non-metric traits, and detailing osteometrics. The data will be considered in its archaeological context, taking into account phasing and burial practices.

4.2 The osteological analysis from the Coronation Street assemblage will be compared with osteological work undertaken on contemporary post-medieval assemblages. The prevalence of pathologies will also be compared to rates calculated for the period by Roberts and Cox (2003).

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APPENDIX 3: SUMMARY CONTEXT LIST

Context	Interpretation	Description
884	Disturbed ground	Layer of disturbed dark bluish-grey silty clay containing brick and disarticulated human bone within manhole trench
885	Burial soil	Mid-brown silty clay layer within manhole trench
886	Construction cut backfill	Yellowish-brown gravel backfill extending 1.5m from pumping station
887	Coffin	Coffin containing sk ***888***
888	Skeleton	Adult skeleton. Only the left leg was removed, the rest is preserved *in situ*
889	Charnel	Charnel deposit
890	Coffin	No skeletal remains recovered from within
891	Construction cut	Construction cut for pumping station
892	Gave cut	Cut for sk ***888***
893	Grave fill	Dark bluish-grey silty clay backfill of ***892***
894	Grave cut	Cut for coffin ***890***
895	Grave fill	Dark bluish-grey silty clay backfill of ***894***
896	Grave cut	Cut for sk ***898***
897	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***896***
898	Skeleton	Adult skeleton
899	Coffin	Coffin containing sk ***898***
900	Charnel	Charnel with grave ***901***
901	Grave cut	Cut for sk ***902***
902	Skeleton	Adult skeleton, abdomen, lower arms and legs outside of trench
903	Coffin	Coffin containing sk ***902***
904	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***902***
905	Grave cut	Cut for sk ***906***
906	Skeleton	Adult skeleton, the skull, right arm and the majority of the chest and spine remain *in situ* outside of the trench
907	Coffin	Coffin containing sk ***906***
908	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***905***
909	Skeleton	Highly disturbed skeleton mixed with ***910***, ***931***, ***932***, ***933***
910	Skeleton	Highly disturbed skeleton mixed with ***909***, ***931***, ***932***, ***933***
911	Grave cut	Cut for sk ***913***
910	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***911***
913	Skeleton	Adult, only left forearm, left leg and right lower leg were within the trench
914	Made ground/ burial soil	Layer of imported dark grey sand with glass slag inclusions used as a burial soil.
915	Grave cut	Cut for sk ***917***
916	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***915***
917	Skeleton	Sub-adult, only the skull, right arm and right pelvis were within the trench
918	Coffin	Coffin containing sk ***917***
919	Grave cut	Cut for sk ***920***
920	Skeleton	Adult, only the left leg was within the trench
921	Coffin	Coffin containing sk ***920***
922	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***919***
923	Grave cut	Cut for sk ***925***
924	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***923***
925	Skeleton	Adult, only the legs were within the trench
926	Skeleton	Adult, only the skull and right shoulder were recovered from the trench section
927	Grave cut	Cut for sk ***928***
928	Skeleton	Adult, left forearm and leg were outside the trench
929	Coffin	Coffin containing sk ***928***
930	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***927***
931	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***932***, ***933***
932	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***931***, ***933***

Context	Interpretation	Description
933	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***931***, ***932***
934	Gave cut	Cut for sk ***935***
935	Skeleton	Adult, only skull and right upper arm were located within the trench
936	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***934***
937	Grave cut	Cut containing charnel ***938***
938	Charnel	Charnel of a single sub-adult,
939	Grave fill	Dark grey sand with glass slag inclusions,;backfill of grave cut ***937***
940	Grave cut	Cut for sk ***941***
941	Skeleton	Adult, right upper arm outside of trench
942	Coffin	Coffin containing sk ***941***. Breast plate was partly legible
943	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***940***
944	Skeleton	Adult, left side of skull and left proximal humerus visible in the trench section before shoring was lowered. Remains *in situ*
945	Skeleton	Adult, badly disturbed and truncated, only the skull, left humerus, some vertebrae and ribs survived.
946	Grave cut	Cut for sk ***947***
947	Skeleton	Adult, fully recovered
948	Coffin	Coffin containing sk ***947***
949	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***946***
950	Grave cut	Cut for sk ***952***
951	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***950***
952	Skeleton	Adult, left arm, the skull and part of the chest were outside the trench, however the skull, left distal humerus and left radius were recovered after a section collapse
953	Coffin	Coffin containing sk ***952***
954	Skeleton	Adult, right humerus, right and left tibia recovered after a section collapse
955	Grave cut	Cut for sk ***956***
956	Skeleton	Adult, fully recovered
957	Coffin	Coffin containing sk ***956***
958	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***955***
959	Grave cut	Cut for sk ***960***
960	Skeleton	Sub-adult. Right side outside of the trench, left *in situ*
961	Coffin	Coffin containing sk ***960***. Breast plate was partly legible
962	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***959***
963	Charnel	Charnel above sk ***965***
964	Grave cut	Cut for sk ***965***
965	Skeleton	Adult, fully recovered
966	Coffin	Coffin containing sk ***965***
967	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***964***
968	Grave cut	Cut for sk ***970***
969	Charnel	Charnel above sk ***970***
970	Skeleton	Adult, truncated from the thorax down
971	Coffin	Coffin containing sk ***970***
972	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***968***
973	Grave cut	Cut for sk ***974***
974	Skeleton	Adult, fully recovered
975	Coffin	Coffin containing sk ***974***
976	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***973***
977	Grave cut	Cut for sk ***978***
978	Skeleton	Sub-adult, fully recovered
979	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***977***
980	Charnel	Charnel below sk ***974***
981	Skeleton	Sub-adult, partly recovered from section
982	Skeleton	Sub-adult, none left *in situ*
983	Grave cut	Cut for sk ***984***
984	Skeleton	Sub-adult
985	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***983***

Context	Interpretation	Description
986	Grave cut	Cut for sk ***987***
987	Skeleton	Adult, lower legs and left hand outside of trench and remain *in situ*
988	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***986***
989	Charnel	Charnel below sk ***987***
990	Grave cut	Cut for sk ***991***
991	Skeleton	Adult, fully recovered
992	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***990***
993	Coffin	Coffin containing sk ***991***
994	Grave cut	Cut for sk ***995***
995	Skeleton	Adult, fully recovered, truncated by grave ***990***
996	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***994***
997	Grave cut	Cut for sk ***998***
998	Skeleton	Adult, fully recovered
999	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***997***
1000	Charnel	Charnel above sk ***1002***
1001	Grave cut	Cut for sk ***1002***, ***1002b***
1002	Skeleton	Adult
1002b	Skeleton	Sub-adult recovered alongside sk ***1002***
1003	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1001***
1004	Grave cut	Cut for sk ***1005***
1005	Skeleton	Adult, fully recovered
1006	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1004***
1007	Skeleton	Adult, fully recovered from section
1007b	Skeleton	Sub-adult recovered alongside sk ***1007***
1008	Skeleton	Adult, skull only, recovered from section
1009	Grave cut	Cut for sk ***1010***
1010	Skeleton	Adult, right arm and leg outside of trench, left *in situ*
1011	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1009***
1012	Grave cut	Cut for sk ***1013***
1013	Skeleton	Sub-adult
1014	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1012***
1015	Skeleton	Adult, only skull and cervical vertebrae within trench
1016	Grave cut	Cut for sk ***1017***
1017	Skeleton	Sub-adult, skull fragments only
1018	Coffin	Coffin containing sk ***1017***
1019	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1016***
1020	Grave cut	Cut for sk ***1021***
1021	Skeleton	Sub-adult, fully recovered
1022	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1020***
1023	Skeleton	Sub-adult, left arm, left pelvis and chest outside of trench, left *in situ*
1024	Tarmac and hardcore	Tarmac road surface laid on top of a hardcore base.
1025	Grave cut	Cut for sk ***1023***
1026	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1025***
1027	Grave cut	Cut for sk ***1015***
1028	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1027***
1029	Grave cut	Cut for sk ***1008***
1030	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1029***
1031	Grave cut	Cut for sk ***1007*** and ***1007b***
1032	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1031***
1033	Grave cut	Cut for sk ***982***
1034	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1033***
1035	Grave cut	Cut for sk ***981***
1036	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1035***
1037	Grave cut	Cut for sk ***954***
1038	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1037***
1039	Grave cut	Cut for sk ***944***

Context	**Interpretation**	**Description**
1040	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1039***
1041	Grave cut	Cut for sk ***909***, ***910***, ***931***, ***932***, ***933***
1042	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1041***
1043	Grave cut	Cut for sk ***945***
1044	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1043***
1045	Grave cut	Cut for sk ***926***
1045	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1045***

APPENDIX 4: OSTEOLOGICAL ASSESSMENT DATA

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
888	n	n	1	3	n	3	3	N/a	N/a	N/a	-
898	y	y	3	2	y	3	3	y-with recon	19	ca, p, c, a, amtl , eh	Craniotomy. Cribra orblitalia, asymmetrical femora. OP on fem head. OA left hip, secondary to trauma?
900 (charnel)	n	y	2	2	y	3	3	n	0	amtl	OP prox tib & L dist fem. Marked enthesophytes. 'hole' R parietal.
902	y	y	1	3	y	2	3	n	4	P,c,amtl	
906	y	y	3	3	y	4	4	N/a	N/a	-	-
909	y	y	2	3	y	2	2	N/a	N/a	-	-
913	n	n	1	3	y	4	4	N/a	N/a	-	-
917	y	n	1	3	n	1	1	N/a	29	C, eh	Premature synotosis ?
920	n	n	1	3	y	5	5	N/a	N/a	-	Left OA hip joint and knee. Ankle DJD.
925	y	y	2	3	y	4	4	N/a	N/a	-	-
926	y	y	1	3	n	2	3	n	2	P, amtl	-
928	y	y	3	3	y	4	5	y	16	Ca,p,c,eh,amtl	SNs. Active periostitis left hum, ribs, R tib. OP talus.

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
935	y	y	1	3	y	4	4	y- with recon	14	Ca,p,c,a,amtl,eh	Cribra orbitalia.
938 (charnel)	y	N/a	2	2	N/a	N/a	N/a	N/a	N/a	-	-
941	y	y	3	2	y	4	4	y	22	Ca, p, c, a, amtl, eh	Cribra orbitalia
945	y	y	1	3	y	3	4	n	14	Ca, eh	Button osteoma, 3rd molars not fully erupted
947	y	y	4	3	y	4	4	n	1	Amtl, p, c, eh	Cribra orbitalia. Button osteoma? Slight OP left femur & R knee & R distal radius,ulna & ribs. OA R femoral head and distal left radius. Vert OP, Schmorl's Nodes. Fused R rib to TV. Considerable amtl.
952	y	y	3	3	y	4	4	y	0	All lost am	OA both knees. OA right 2nd metacarpal.
954	n	n	1	3	n	1	1	N/a	N/a	-	Non-specific infection. Osteomyelitis? affecting tibia, humerus, femur and fibula. Slight OP joint surfaces.
956	y	y	4	3	y	5	5	y	15	Ca, p, c, amtl, eh	OP fem head. Lytic lesion dist fib.
960	y	N/a	3	3	N/a	2	N/a	N/a	20	deciduous	Active periostitis ribs. Cribra orb.
965	y	y	3	3	y	3	4	n	21	Ca,p,c, a, amtl,eh	SNs. Endocranial lesions. Hair on left temporal. Periostitis clavicles. OA R proximal phalanx. Healed fracture? L 1st rib. Notched incisors (culturally induced)
969 (charnel)	n	n	1	2	y	2	1	N/a	N/a	-	Systemic infection - affecting femur.
970	n	y	2	1	n	2	2	n	10	Ca, c	Hair present

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
974	y	y	4	3	y	5	5	y	27	Ca,p,c,a,amtl	Lumbarisation of S1. Schmorl's nodes. Ossified cartilage
978	y	N/a	4	3	N/a	4	N/a	N/a	8	deciduous	Neonate.
981	y	N/a	1	2	N/a	1	N/a	N/a	3	deciduous	-
982	y	N/a	2	3	N/a	2	N/a	N/a	3	deciduous	perinate
984	y	N/a	3	3	N/a	3	N/a	N/a	22	Perm & deciduous	Hair preserved.
987	y	y	4	3	y	3	3	y	17	Ca,p,c,a,amtl,eh	Capitate fused to base of 3rd metacarpal left hand. Vertebral OP. Hair on skull.
991	y	y	4	3	y	4	4	n	17	P,c	Lumbarisation of S1
995	y	y	4	3	y	4	4	n	9	Ca, p, c	-
998	y	y	4	3	y	4	5	y	4	C, amtl	OA L distal femora. OP dist L humerus & dist L radius. Ossified cartilage.
1002	n	y	3	2	y	4	4	n	0	amtl	OP R glenoid and proximal hand phalanx. Hyperostosis frontalis interna?
1002b	y	N/a	3	3	N/a	4	N/a	N/a	-	-	neonate
1005	n	y	3	2	y	3	5	n	6	Ca,p, amtl,eh	Ankylosis TV.
1007	y	y	4	3	y	4	4	n	0	amtl	All teeth lost AM. OP head L femur. Ankylosis axis & C3.

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
1007b	y	N/a	4	3	N/a	3	N/a	N/a	-	-	neonate
1008	n	y	1	3	n	2	5	y	15	Ca, p, c	Hair present. Skull only
1010	y	y	3	3	y	5	5	y	29	Ca, p, c, a , eh	OP 1st metatarsal. Schmorl's nodes. Vertebral OP.
1013	n	N/a	1	1	N/a	2	N/a	N/a	0	-	Subadult
1015	y	y	1	3	n	2	3	n	0	amtl	OP vertebrae. Button osteoma. DJD TMJ. Hair present.
1017	n	N/a	1	3	N/a	2	N/a	N/a	0	-	Subadult. Skull only
1021	y	N/a	4	1	N/a	3	N/a	N/a	30	caries	Cribra orbitalia
1023	y	N/a	2	3	N/a	2	N/a	N/a	2	Deciduous	

Key: Ca - caries, C - calculus, P - periodontitis, A - periapical cavities, EH - enamel hypoplasia, amtl = *ante-mortem* tooth loss; OP= ostephyte; DJD= degenerative joint disease; L=left; R=right

APPENDIX 5: CATALOGUE OF COFFIN FITTINGS

Coffin number	**Fittings**	**condition**
887	Wood	Small damp fragments
890	Left in situ - wood, iron grip	N/A
899	Iron grip and breastplate	Corroded and fragmented
903	Wood	Small fragments
907	Breastplate	Corroded fragments
918	Fragments of wood	Small damp fragments
921	Damp fragments of wood	Small damp fragments
929	Fragments of breastplate	Corroded and fragmented
942	Fragmented breastplate with inscription: [I]sabella --a--- / Died June 23 / Aged 27 / -----	Corroded and fragmented
948	Dried wood and 2 nails	corroded
953	Fragmented breastplate	Corroded and fragmented
957	Fragmented plate and coffin stain	Corroded and fragmented
961	Fragmented breastplate with inscription: ------ / died 15th ---- / aged 4 years	Corroded and fragmented
966	Fragments of breastplate	Corroded and fragmented
971	Fragments of breastplate	Corroded and fragmented
975	Fragments of breastplate	Corroded and fragmented
993	Fragments of breastplate	Corroded and fragmented
1018	Stain	N/A

APPENDIX 6: HARRIS MATRIX

CONTENTS

SUMMARY

As part of enabling works associated with the redevelopment of land at Coronation Street, South Shields, Tyne and Wear (NGR NZ 360 670), Henry Boot Developments (HBD) found it necessary to adjust the existing sewerage network and redirect it from the pumping station on Old Coronation Street westward along the southern edge of the thoroughfare of Coronation Street itself. The trench for the new rising main, and a number of manholes, was to be some 100m long, 2m wide and was to be excavated to a maximum depth of 2.2m below the existing road surface. The route of the rising main passes through the southern part of the former cemetery of St Hilda's Church, a site that is known from previous investigations to have been heavily utilised. Consequently, the Tyne and Wear Archaeologist advised South Shields Borough Council that, in accordance with PPG16 (DoE 1990), a planning condition of the development should be the undertaking of a programme of archaeological mitigation during any intrusive groundworks and an appropriate programme of post-excavation assessment and analysis.

In order to meet the planning condition, Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of HBD, commissioned Oxford Archaeology North (OA North) to undertake the full programme of archaeological works in accordance with a project design approved by the Tyne and Wear Archaeologist. Project Stage 1 (the watching brief and fieldwork data collection) was undertaken during June and July 2007. This draft report provides a summary of Project Stage 1 and documents the results of Project Stage 2, pertaining to a programme of post-excavation assessment of the results of the fieldwork, in order to establish their potential for further analysis.

It is concluded that the 45 well-provenanced skeletons recovered from the watching brief at Coronation Street form a significant assemblage. The funerary remains are likely to date to between 1817 and *c* 1860 and are generally well preserved, with clear potential for a range of further analyses. Their greatest potential, however, can only be met once they have been combined with the much larger and more complete assemblage of human remains recovered from the excavation undertaken in 2006 by OA North to the immediate south of Coronation Street. Such a sizeable assemblage has significant potential to document aspects of the lives of the post-medieval population of a rapidly industrialising port town, who left few other personal records of their own.

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The fieldwork was undertaken by Andrew Frudd, Mark Gibson, Joanne Hawkins and Nicholas Márquez-Grant. The osteological material was assessed and reported upon by Nicholas Márquez-Grant and Sharon Clough, who also assessed the coffin fittings. Mark Gibson compiled the stratigraphic assessment and examined the other artefacts, whilst the illustrations were produced by Marie Rowland and Alix Sperr. The report was edited by Stephen Rowland and Louise Loe, who respectively managed the fieldwork and post-excavation stages of the project.

1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Henry Boot Developments (HBD) propose to redevelop a brown field site located to the immediate south of Coronation Street, in the centre of South Shields, Tyne and Wear (NGR NZ 360 670; Fig 1). As part of enabling works associated with the redevelopment, it was necessary to adjust the existing sewerage network and redirect it from the pumping station on Old Coronation Street westward along the southern edge of the thoroughfare of Coronation Street itself, to the roundabout at the junction of Station Road. The trench for the new rising main, and a number of manholes, was to be some 100m long, 2m wide and was to be excavated to a maximum depth of 2.2m below the existing road surface.

1.1.2 Previous archaeological investigations associated with the development comprise a Tyne and Wear Museums desk-top assessment (TWM 1998), which identified that the modern route of Coronation Street lies within the bounds of St Hilda's cemetery, a trial trench evaluation (Archaeological Services, University of Durham (ASUD) 2006) and a mitigatory excavation (Oxford Archaeology forthcoming), both of which proved the presence of burials to the immediate south of Coronation Street. Consequently, the Tyne and Wear Archaeologist advised South Shields Borough Council that, in accordance with PPG16 (DoE 1990), a planning condition of the development should be the undertaking of a programme of archaeological mitigation during any intrusive groundworks associated with the sewer diversion. The Tyne and Wear Archaeologist required that preservation by record should comprise several project stages. Stage 1, the fieldwork, was to include monitoring and recording during groundworks, together with excavation, recording and lifting of all human remains encountered during this process. Stage 2 was to be an assessment of the data generated by the fieldwork, whilst Stage 3 was to encompass any appropriate detailed analysis, publication and the submission of the entire project archive.

1.1.3 In order to meet the planning condition, Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of HBD, commissioned Oxford Archaeology North (OA North) to undertake the full programme of archaeological works in accordance with a project design approved by the Tyne and Wear Archaeologist (*Appendices 1 and 2*). Project Stage 1 (the watching brief and fieldwork data collection) was undertaken during June and July 2007.

1.1.4 This report provides a summary of Project Stage 1 and documents the results of Project Stage 2, pertaining to a programme of post-excavation assessment of the results of the fieldwork, in accordance with the guidance of English Heritage's *Management of Archaeological Projects, Second Edition* (MAP2; EH 1991) and *Management of Research Projects in the Historic Environment* (MoRPHE; EH 2006). As such, this stage of the project seeks to process and assess each of the forms of raw data recovered during the fieldwork in order to

establish their potential, through detailed analysis, to address the research questions outlined in *Section 3.2*. A project design for a programme of further analysis and the final archive submission to the Tyne and Wear Record Office (TWO) (Project Stage 3) will be issued as a separate document.

1.2 Location, Topography and Geology

1.2.1 ***Location and modern topography:*** Coronation Street runs from the centre of South Shields, westward to its junction with Station Road, opposite the south-east bank of the River Tyne. To the north is St Hilda's Church, its graveyard, and the town's commercial centre, whilst to the south, the land is occupied by carparks and a disused warehouse. From these carparks, which cover largely level ground at *c* 5.1m OD, the land traversed by Coronation Street rises to the north and west, peaking at 10.5m OD at the junction of Coronation Street and Station Road (Fig 1). Evidence from the various phases of fieldwork undertaken at the site would suggest that much of this rise derives from artificial deposition, whilst the natural topography follows an expected westward dip towards the river (ASUD 2006; OA forthcoming).

1.2.2 The solid geology of the area is one of Carboniferous (280-350 million years ago) Coal Measures and Magnesian Limestone (TWM 1998), overlain by deposits of Devensian (73,000 to 10,000 BP) glacial till. With proximity to the River Tyne, the depth of boulder clay increases, and can be *c* 12m deep (*op cit*, 4). However, much of the proposed development area, possibly including that of Coronation Street, was occupied formerly by a tidal inlet and pool, the Mill Dam Creek, which has had a considerable influence on the historical development of the area (*ibid*).

1.3 Historical and Archaeological Background

1.3.1 ***Introduction:*** the following section presents a brief summary of the history and archaeology of the development site and its wider surroundings in order to contextualise the results of the present investigation. It is not intended as a comprehensive history of South Shields, various accounts of which are readily available elsewhere.

1.3.2 Although there is no contemporary evidence from the proposed development area, the earliest known human activity in the vicinity was located some *c* 1km to the north-east of Coronation Street and comprised late Iron Age settlement activity beneath the Roman fort of *Arbeia*. The fort, the easternmost defence of Hadrian's Wall, was likely to have been founded *c* AD 129 as a cavalry installation, but was rebuilt as an infantry fort during the reign of Septimus Severus in the early third century (Roman-Britain.org). There is thought to have been a contemporary settlement and port associated with the Roman fort, but their location is uncertain. The Anglian nunnery of St Hilda was built in AD 674 in the vicinity of the present development area, on the banks of the Mill Dam tidal inlet. Although the exact location of the original nunnery is not known, the area to the north of Coronation Street has remained a focus for religious activity through the medieval period and into the present. The latest

incarnation of the Church of St Hilda, some 50m to the north of Coronation Street, was rebuilt during the nineteenth century and may well occupy the site of its predecessors (TWM 1998). Little is known of the nature of secular settlement in the intervening centuries, but by 1235 South Shields was recognised as a village with 24 tennants (*ibid*), perhaps originating as a humble collection of fisherman's huts as suggested by its name *Scheles* (Middle English for huts or shelters; Roman-Britain.org). The settlement had grown further by 1256, when its 27 houses were arranged along a single north-east/south-west-aligned street straddling the Mill Dam, much like the arrangement shown on Gardner's map of 1654. As such, elements of the medieval and post-medieval settlement are likely to have lain within the present development area.

1.3.3 The Mill Dam no longer exists, but on eighteenth-century cartographic sources is shown running to the south of St Hilda's Church. By 1827 the Mill Dam had been completely infilled and had started to be built upon (TWM 1998). There is evidence from recent excavations at the Customs House (built in 1861 at what had been the confluence of the Mill Dam and the Tyne) indicating that this process of infilling had begun at least as early as the late seventeenth or early eighteenth centuries (*ibid*). South and east of Coronation Street, such deposits have been proven by recent geotechnical investigations to a depth of at least 16m below the present ground level (M Douglas *pers comm*). That such infilling may have occurred within the area of Coronation Street is hinted at by some of the older cartographic sources. Armstrong's map of 1768 depicts the Mill Dam as being very much wider (suggesting it terminated in a tidal pool) and closer to St Hilda's Church than does Richardson's map of the same year, which indicates that the extent of the churchyard, together with an associated routeway, was well-defined on what was then the northern bank of the Mill Dam. The latter source accords well with the Fryer's map of 1773 and Casson's map of 1801 and, whilst it is not possible to corroborate the accuracy of Armstrong, it may be that his map is based on an earlier survey or source showing the Mill Dam prior to infilling in the area of the church.

1.3.4 There is a possibility that detailed documentary research, particularly of the parish records and burial registers, may provide further information about the history of St Hilda's Church and the associated churchyard, but some basic information has been provided by the desk-based assessment (TWM 1998). The history of the St Hilda's would indicate that the first burials were of early medieval date; although the curtilage of the Anglian nunnery was extensive, burials are likely to have been made near the primary focus of the church. Medieval burials would, again, probably have radiated out from the church and, whilst the line of Old Coronation Street could well have fossilised a much older boundary, it is currently uncertain at which date burials extended to the formalised limit of the churchyard. Certainly by 1805 the burial ground was approaching full capacity, precipitating an attempt in 1816 to raise the level of the crowded cemetery to accommodate further burials, apparently using ballast from a nearby mound (TWM 1998). Following this raising, burial activity must have increased exponentially, matching the contemporary growth of the industrialising town. By 1856 the cemetery was closed to further burials (*ibid*), a little before a national Act of 1857 discouraged interments within urban

cemeteries, thus implying that the burial ground was again full. However, an examination of the burial register would suggest that interments, perhaps within existing family plots, took place into the 1860s.

1.3.5 The land around Coronation Street has seen considerable change over the last 150 years. The most significant of these, in terms of the present development, was the adjustment to the route of Coronation Street itself. Coronation Street originally kinked around the slightly angled southern edge of St Hilda's churchyard, an alignment preserved by Old Coronation Street. During the 1960s, this angled section of Coronation Street was straightened, so that it ran to the north through the former cemetery. The construction of a sewerage pumping station within the crook of Old Coronation Street and its redirected successor, together with associated services, must also have lain within the bounds of the cemetery.

1.3.6 ***Relevant previous investigations:*** an archaeological evaluation undertaken by ASUD in winter 2005 involved the excavation of three trial trenches to the south of Coronation Street, two of which were located within areas formerly occupied by St Hilda's cemetery (ASUD 2006). Trench 1, placed to the north-east of Old Coronation Street, revealed only disarticulated human remains and gravestone fragments. Evidence of *in situ* human remains was found within wedge-shaped Trench 3 located just to the north of the eastern arm of Old Coronation Street. This latter trench measured 18m east/west and from 2m to 4m wide at the base, following the projected southern edge of St Hilda's cemetery. Below a layer of sandy made ground and a 0.4m thick disturbed horizon containing disarticulated human bones and domestic refuse, 'natural subsoil' was encountered at 2m bgl. Fourteen 'grave cuts' were identified, four of which were investigated to reveal articulated skeletons. The associated finds were of eighteenth- to nineteenth-century date (ASUD 2006).

1.3.7 In 2006 OA North undertook the re-excavation of ASUD's Trench 3, with the aim of removing all burials down to natural deposits. During the excavation, 191 human burials were recovered from two separate burial horizons within a trench measuring approximately 17m by 4m (maximum width, reduced to 2m at depth) and up to 5.5m deep. Although natural ground was purported to have been found within the evaluation trench at a depth of 2m below ground level (ASUD 2006), the OA North excavation has proven this to be far from the case, with natural deposits encountered at a depth of approximately 5m below the modern ground level. The lower deposits, through which the earliest burial horizon had been cut, were characterised by their admixture with grey silty clay characteristic of fluvial deposits, and it is thought that these deposits relate to activity on the banks of the Mill Dam. These had been sealed by levelling dumps of clay, gravel and industrial waste through which a second burial horizon had been cut between depths of 2-4m below ground level. This material may relate to an episode of deposition, undertaken in 1816, which utilised ballast from a nearby mound in order to raise the level of the crowded cemetery to accommodate further burials (TWM 1998). If this episode is traceable within the archaeological trench excavated by OA North in 2006, then the ballast in question must have contained a high proportion of industrial and domestic refuse. In each of the burial horizons, there was evidence that

multiple interments had been made within single graves or family plots, whilst remains of coffins and their fittings were also frequent.

2 INITIAL RESEARCH AIMS AND OBJECTIVES

2.1 INTRODUCTION

2.1.1 To maximise the potential of the heritage resource, archaeological investigations are strategic in nature, with a series of clearly defined aims, often posed as research questions, and objectives, the practical means by which research questions are addressed; both are modified and developed to meet the requirements of the project and the confines of the available data. However, the impetus for the investigation is provided by a 'primary driver' (EH 2006), which, in the case of the majority of archaeological projects, is dictated by the negative impact of a development. In consideration of the fact that elements of the heritage resource were to be destroyed by the proposed development, the basic rationale, or primary driver, of the watching brief was the characterisation and preservation by record of any significant remains of archaeological interest. The various forms of data generated, together with any further research undertaken, could be analysed to provide a greater understanding of the past population of South Shields. The specific research aims and objectives for the project are outlined below; not all can be addressed at the present assessment stage, but they need to be considered when assessing the potential of each category of data for analysis (Project Stage 3).

2.1.2 ***Research background:*** archaeologically excavated post-medieval and industrial-period burials from Britain are rare. Until the 1980s the archaeological excavation of these contexts was extremely limited and cemetery clearance companies largely undertook the work without any archaeological recording. Since then, the value of such material in the understanding of the past, and to scientific enquiry in general, has been recognised, but has still not gained wide appreciation. To date, the total number of archaeologically excavated post-medieval burial contexts remains very low when compared with burial contexts from other time periods. Most examples are from London and largely comprise the middle to upper classes of Georgian and Victorian society. Few of these have been published, Christchurch, Spitalfields (Molleson *et al* 1993); St Martin's Church, Birmingham (Brickley *et al* 2006); The Royal Naval Hospital, Greenwich (Boston *et al* 2008); and All Saints, Chelsea Old Church, Kensington (Cowie *et al* 2007) being among the few that have.

2.1.3 ***Regional context:*** burial studies have always had a relatively low profile in the North East compared to other parts of the country. In particular, post-medieval and Industrial-period funerary practices and population composition are poorly understood, there having been no or limited opportunity to undertake even basic research on human populations from the region. This is largely due to the continued use of post-medieval cemeteries and the highly acidic soils which militate against the preservation of bone. The Coronation Street assemblage of human remains excavated in 2006 is the second largest to have been archaeologically excavated from the North East of England. The largest assemblage was recovered from the former Newcastle Infirmary where the remains of around 600 individuals were excavated (Louise Loe *pers*

comm). These remains comprised unclaimed hospital patients, many of whom had been dissected by early anatomists for the advancement of science, and are thus very different in nature to the assemblage from South Shields. There are no other large assemblages of post-medieval human remains from the North East of England and the nearest assemblage of comparable size is that from Barton on Humber, which includes the remains of some 400 former parishioners of St Peter's Church.

2.1.4 ***Health and demography:*** because the majority of published post-medieval assemblages comprise the middling to upper classes, Coronation Street presents a rare opportunity to explore the former lives of the industrialised working classes in terms of population composition, health and mortality. It is likely that many of those buried at St Hilda's would have been people engaged in industries connected with the local collieries, gas works, ship yards and the port. Contemporary documentary evidence indicates that industrialising populations such as this experienced poor air and water quality, overcrowding, inadequate housing, contaminated food and harsh working conditions (Roberts and Cox 2003). This impacted on health by increasing levels of infection, trauma and nutritional deficiency and resulted in increased mortality among young infants (*ibid*). The Coronation Street assemblage provides a unique opportunity to explore how this is reflected in the remains of the individuals themselves; moreover, the high number of young infants recovered from the excavation presents the rare opportunity to explore aspects of maternal health, as well as to contribute to current theories on weaning and burial practice associated with this age group (Molleson *et al* 1993).

2.1.5 ***Historical records:*** the archaeological investigation of any cemetery can yield information about those buried, but its value is enormously enhanced when studied alongside historical records. Rich historical documentation of the late eighteenth and early nineteenth century exists to complement the South Shields burial record. This includes parish records (especially burial records), Government Births, Marriages and Deaths registers (compulsory from 1837), census records, wills, trade directories and other occupational lists (eg law and the armed forces). More generally, historical accounts of funerals and of surviving coffin catalogues provide valuable historical data on the material culture of funerals and burials during this time period.

2.1.6 Historical records may also be employed to test the validity of osteological techniques, particularly those relating to age and sex estimation. Few individuals of documented age were excavated from South Shields and, therefore, this assemblage affords little, if no, opportunity to do this. However, there is scope to compare the mortality profile indicated by an analysis of the parish burial register, and that indicated by physical examination of the remains themselves.

2.2 RESEARCH AIMS

2.2.1 By considering the above themes and initiatives, it is possible to pose the following research questions (RQ) that are specific to the archaeological investigation of the rising main watching brief at Coronation Street:

RQ1 Within the defined excavation area, can human remains be recovered in such a manner that maximises the potential of the captured stratigraphic data?

RQ2 Is it possible to gain an understanding of the sequence and date of the remains?

RQ3 Using extant historical documents and the results of previous archaeological fieldwork, is it possible to understand better the excavated archaeological remains and place them within a wider historical and cultural context?

RQ4 Can a greater understanding of the use, organisation and management of the cemetery, both on a wider and more personal level, be gained?

RQ5 Can the captured data from the watching brief be integrated with that recovered during the OA North excavation to the immediate south in 2006?

RQ6 Can relevant information contained within primary and secondary historical documents be accessed and collated?

RQ7 Can a better understanding of the analytical potential of the recovered osteological assemblage be gained through:

- assessment of the potential of the human remains for the estimation of biological parameters such as sex, age and stature;
- assessment of the potential of the remains to yield palaeopathological information in order to learn about the health status of South Shield's past inhabitants;
- assessment of the potential of the remains for isotope analysis;
- examination of the requirement for additional specialist analysis, such as radiography, of the remains;
- establishment of the potential of the remains to contribute to archaeological knowledge at regional and national levels, and the most appropriate way of realising this potential;
- contributing to an updated project design for analysis of the remains, with cost and time implications specified.

RQ8 What detailed and meaningful information can analysis of the skeletal remains tell us about the lives of the inhabitants of South Shields?

RQ9 Can the results of the analysis of the skeletal remains be used to provide a comparison with documentary sources and with remains from contemporary sites?

RQ10 How can the results of the investigative programme be made available to the wider public, and all data, artefacts and remains archived or reburied appropriately?

2.3 Research Objectives

2.3.1 ***Overall Research Objectives:*** the following overarching objectives (RO) have been formulated with reference to the research questions (*Section 2.2.1*).

ROa Conduct a programme of archaeological observation, investigation and recording during the course of all groundworks within the former burial ground.

ROb Recover, process and undertake an assessment and then any appropriate analysis of the artefacts from the fieldwork, particularly those that are datable, and integrate them into the stratigraphic sequence.

ROc Undertake provisional and then any appropriate detailed analysis of the on-site stratigraphy in order to understand better the relationships between the different elements.

ROd Undertake an osteological assessment and then any appropriate analysis of the human remains excavated from the site by:

- quantification of the remains, including the number of articulated skeletons and quantity of disarticulated human bone;
- evaluation of the overall condition and completeness of the remains, with reference to the survival of indicators of age, sex and stature, metrical and non-metrical analyses, and palaeopathological examination;
- establishment of the basic demographic composition of the population, including the proportion of adults and the proportion of juveniles;
- establishment of the overall range and extent of palaeopathological conditions.

ROe Assess and then undertake any appropriate analysis of the material and manufacture of any coffins and fittings in order to establish any patterns in origin, trade and also quality, which can then be linked with the results of osteological analysis.

ROf Undertake a detailed literature search of available sources at the Tyne and Wear Record Office, the Diocesan library, local and university libraries, as well as of more general reference works and histories.

3 METHODOLOGY

3.1 PROJECT DESIGN

3.1.1 The OA North project design (*Appendices 1 and 2*) approved by the Tyne and Wear Archaeologist was followed as fully as possible throughout the investigation; all work was consistent with the relevant standards and procedures of the Institute of Field Archaeologists (IFA), and generally accepted best practice.

3.2 FIELDWORK METHODOLOGY

3.2.1 ***Extent of groundworks and contractor's methodology***: the monitored groundworks for the insertion of the diverted sewer comprised two principal elements. The first, a 2m square pit for a manhole, was excavated to a depth of 3m below ground level (bgl) to the immediate west of the Old Coronation Street pumping station. The second consisted of a 1m-wide trench for the rising main itself. This ran for some 11m north-west from the manhole before following a slightly oblique westward alignment along Coronation Street for a further 80m until the junction with Station Road was reached. Although formation level for this trench was nominally 2.2m deep, the presence of existing services beneath which the rising main had to be threaded meant that the trench was excavated to depths of 2.4m and 2.6m bgl at the eastern and western ends, respectively. On occasion, the trench was widened to a width of 1.3m to allow for the welding of pipe sections.

3.2.2 Shoring was erected in all excavations and was installed either at a depth of 2m or once archaeological remains had been revealed. In the manhole 2m by 2m box shoring was used, with 3m sheet piles at the open ends. Along the majority east/west section of the trench, 3m by 1m box shoring was used; within the north-west/south-east-aligned section, and in those locations where the trench was widened for welding the inserted sewer pipes, or where services were present, 3m sheet piles supported by hydraulic whalers were installed. Access to excavations was granted once the shoring had been adequately installed and the trench had been monitored with a gas meter for five minutes. Excavations were entered via a ladder and a gas meter was with the work party at all times.

3.2.3 ***Monitored excavation:*** removal of the uppermost levels of modern tarmac and made ground down to the top of significant archaeological horizons was undertaken by a 13 ton wheeled 360 machine, fitted with a 1m-wide toothless ditching bucket and operating under archaeological supervision. Thereafter, any archaeological features or remains were cleaned and investigated manually to define their extent, nature, form and, where possible, date. Once archaeological remains were excavated, recorded and removed, the excavation with the machine was allowed to continue under archaeological supervision. Where services limited access by the machine, such as for the easternmost 4m of the trench, the contractors excavated by hand. With the exception of obviously modern deposits associated with the construction of Coronation

Street, all excavated spoil was monitored for skeletal remains and artefacts before it was removed from the excavation area by a dumper.

3.2.4 Once funerary remains were revealed, they were hand-excavated by an experienced archaeologist or osteoarchaeologist. Each skeleton was cleaned rapidly to reveal the body position and orientation, and its relationship to underlying burials, so that it could be recorded as fully as possible. The use of shoring meant that parts of skeletons often fell outside of the excavated trench; these elements were necessarily left *in situ* and only recovered where they were revealed or displaced by deeper groundworks. Similarly, in order to avoid damage to the service network, skeletal remains within baulks beneath services could not be cleaned or recovered. Infant skeletons, along with the surrounding soil to maximise small bone recovery, were lifted in plastic sample tubs, whilst the other skeletons were bagged by side and anatomical element and placed in strong boxes. Together with any associated funerary artefacts and fittings, these were stored temporarily in a secure, locked container on site, before being removed to Oxford at the completion of the watching brief.

3.2.5 ***Recording***: a comprehensive written, drawn, and photographic record was made in accordance with the *Standard and Guidance for Archaeological Excavation* (IFA 2001). All information identified during the watching brief was recorded stratigraphically on *pro-forma* recording sheets, with a continuous unique numbering system for all features and deposits in operation. *Pro-forma* skeleton sheets recorded details of the body position, orientation, skeletal condition and completeness, presence of soft tissue and artefacts (such as shroud pins and buttons). Those for coffins (whether surviving as fragments, a stain, or as fittings), described the materials, construction, size and shape of the coffin, as well as the decorative metal fittings (including fixing nails and screws, upholstery and upholstery studs, grips, grip plates, breastplates, lid motifs and escutcheons). Any motifs on these fittings were also described.

3.2.6 A fully indexed photographic and drawn record of individual features, working shots and general views was maintained. Photography was undertaken using 35mm colour slide and monochrome print film, together with high quality digital photography for the purposes of presentation. All levels recorded on-site were tied into Ordnance Datum, with the positions of planned features being established using a total station theodolite (TST). Before lifting, skeletal remains were recorded photographically, which, where the prevailing conditions allowed, made use of geo-rectification (for example, where skeletons were not obscured by services or recovered from the trench section). A summary of the results of the fieldwork is presented in *Section 4*.

3.3 Post-Excavation Assessment Methodology

3.3.1 ***Introduction***: the data recovered during the fieldwork was assessed in consideration of the project research questions and in accordance with the project objectives (*Sections 2.2.2-3*). Thus, the overarching objective of the assessment was to evaluate all classes of recovered data in order to determine the potential of the dataset for further analysis.

3.3.2 ***Material assessed***: the entire paper, digital, photographic and material archive deriving from the watching brief was examined for the purposes of this assessment. This included the stratigraphic records (context sheets, plans and sections), and the photographs, as well as the finds, funerary artefacts and the human remains.

3.3.3 ***Methodology***: the method of assessment used varied with the class of information examined, although in each case it was undertaken in accordance with guidance provided by MAP2 (EH 1991). During the assessment, the quantity, range, variety, provenance and condition of all classes of data were evaluated within the framework of the project research questions and objectives. *Section 4* summarises the raw data and results of the assessment of each data category, but full details and raw data reside within the project archive.

3.3.4 ***Stratigraphy***: the assessment of the stratigraphy was facilitated by the digitisation of the Harris matrix and the production of a provisional site plan; all of the context records completed during the excavation were entered into a specially designed Access database. The assessment of the stratigraphy comprised a quantification and qualitative appraisal of the recorded data, a brief interrogation of its complexity, and a consideration of those research questions that might be addressed, fully or in part, by the recovered stratigraphic data.

3.3.5 ***Human Remains***: the site archive and skeletal remains recovered during the rising main watching brief were examined to determine the quantity, general condition, completeness, provenance, date and nature of the material. 'Nature' refers to whether the material comprised articulated (disturbed or undisturbed) or disarticulated remains, and the proportion of adults to juveniles. The potential of the material to yield biological information, including more precise estimates of age, as well as other biological parameters, such as sex and stature, was also explored. In addition, the potential of the collection to yield information relating to pathology was assessed and, in particular, whether there were any unusual conditions present that would require detailed specialist examination and/or analytical techniques beyond standard macroscopic examination. In light of these findings, the potential of the collection for further work was evaluated. No attempt was made to estimate sex, age, stature or explore pathology in any detail since these are all factors that are beyond the requirements of an assessment. These procedures were undertaken in accordance with the national guidelines set out by Mays *et al* (2002) and with reference to standard protocols for examining human skeletal remains from archaeological sites (Brickley and McKinley 2004; Buikstra and Ubelaker 1994; Cox and Mays 2000).

3.3.6 Completeness was estimated by recording, as a percentage, how much of the skeleton had survived and assigning it to one of the following categories:

1 = <25% complete

2 = 25-50% complete

3 = >50-75% complete

4 = >75% complete

3.3.7 The condition of the bone was assessed according to the degree of erosion of the bone surface and how much of the epiphyses (the ends of the bones) and cancellous bone (the spongy bone that is beneath the outer layer) had survived. Based on these factors, skeletons were assigned to one of the following categories:

1 = Poor (cortical bone completely eroded. Very limited survival of epiphyses and cancellous bone);

2 = Fair (moderate erosion of cortical bone. Limited survival of cancellous bone and epiphyses);

3 = Good (Occasional erosion on cortical bone. Cancellous bone complete and frequent survival of epiphyses);

4 = Excellent (cortical bone undamaged, cancellous bone and epiphyses complete).

3.3.8 All anthropological and palaeopathological observations were made by rapidly scanning each skeleton. Although these observations provide adequate guidance to the potential of the material for further work they are, by their very nature, preliminary and subject to change as a result of any future high resolution examination.

3.3.9 Apart from the potential of the skeletons to yield information relating to age and sex, the skeletons were also assessed for their potential to yield metrical data such as stature, assessment of ancestry and biological variation and age estimation in sub-adults. Potential for metrical assessment was scored on a scale of 1-5, where '1' denotes skeletons that showed no potential (ie no elements could be measured owing to fragmentation/poor preservation) and '5' denotes skeletons that showed high potential (ie the full range of standard cranial and post-cranial measurements could be taken).

3.3.10 An assessment of the potential for the skeletons to yield non-metrical data was examined. Non-metric traits are morphological variations in the skeleton. They are influenced by both the environment and genetics, but to variable and unpredictable degrees (Saunders 1989). These traits were scored on a scale of 1-5, where '1' denotes skeletons that showed no potential for non-metrical analysis (ie preservation prevented the observation of all standard cranial and post-cranial sites) and '5' denotes skeletons that showed high potential for non-metrical analysis (ie all standard cranial and post-cranial sites could be scored). More readily observable traits were noted (but not formally scored) to give an indication of the level and range of traits present in the population. This will inform a data collection strategy for full analysis.

3.3.6 ***Finds***: all finds and artefacts from the watching brief were retained and were treated in accordance with the guidelines set out by the UK Institute for

Conservation (UKIC 1990) and those of the Museums and Galleries Commission (1992). All artefact fragments were examined by visual inspection and an outline computer record was created using Microsoft Access. Data were recorded in a standardised format, noting provenance, type of object, material, period, and a brief written description and all pottery was recorded by digital photograph, in the form of a single record shot per context. This database will form the basis for any further work recommended, or will comprise the archive record, as appropriate.

3.3.7 ***Archive***: several tasks facilitating both assessment and the completion of the archive, such as marking of photographs, were undertaken. The full preparation and deposition of the archive is however, a task that falls beyond the scope of the assessment, and will be treated in more detail within the updated project design for analysis, publication and archiving. A copy of all final reports will be lodged with the Tyne and Wear Historic Environment Record (HER) and the Tyne and Wear Record Office.

4 RESULTS

4.1 Introduction

4.1.1 The following section summarises and assesses the results of each category of data recovered during the watching brief fieldwork. All classes of data generated by the fieldwork were assessed in accordance with the methodology outlined in *Section 3* and statements of the significance of the results from each element of the archive are given below. These statements are based on the assessment work undertaken, related to the original academic themes expressed in *Section 2*. For the sake of brevity and clarity, individual context descriptions are summarised within *Appendix 3*, the osteological data within *Appendix 4* and a catalogue of the coffin fittings in *Appendix 5*. The location of the archaeological remains is depicted in plan on Figure 2, whilst their stratigraphic relationships are presented as a Harris matrix in *Appendix 6*. Figure 2 also shows the locations of the numbered shoring boxes, which, by the nature of the watching brief, provided spatial orientation and are occasionally mentioned in the following text as clearly visible reference points.

4.2 Stratigraphy

4.2.1 ***Modern:*** the tarmac road surface and its hardcore base, ***1024***, was a uniform 0.5m thick for the eastern portion of the rising main trench. However, towards the western end, the depth of modern made ground increased to as much as 2.6m as the road rose to meet the roundabout. Services were encountered throughout the length of the trench, the highest concentration being within the easternmost 4m, where, found at depths between 0.6m to 0.8m bgl, they obscured access to the archaeology below. Along the rest of the trench the majority of the services were drainage pipes. These were mostly just below the hardcore of the road, were easily removed and later reinstated; none impacted upon the archaeology below. The construction cut for the pumping station, **891**, did impact deep enough to interfere with archaeological deposits, but did not appear to truncate directly any burials within the investigated area.

4.2.2 ***Industrial Period:*** all of the recorded archaeological features comprised funerary remains cutting into deposit ***914***, a soft dark grey sandy material. At the eastern end of the trench, where it was excavated to its greatest depth, it was in excess of 2.5m thick and at all times extended beyond the vertical limit of excavation. This deposit, containing evidence of domestic refuse, as well as glassy slag and other waste products, could not have derived from the natural clay substrate (which was never encountered during the watching brief) and had clearly been imported. Within the rising main trench, deposit ***914*** was observed running from its eastern extent to a point some 22m short of the roundabout, whereupon it was sealed completely beneath modern made ground and not impacted upon further. The nature of deposit ***914*** and the method of excavation meant that grave cuts were not readily identifiable until the skeletons were encountered at a variety of depths below ground level

between 1.2m and 2.4m bgl. Whilst these depths clearly followed the general trends within the manmade topography (for example, westernmost burial ***1023*** within Box 10 lay at 2.05m bgl, whilst ***935***, close to the eastern end, lay at only 1.2m bgl) there was a degree of variation, and it is entirely possible that further interments lie below the present depth of investigation.

4.2.3 A total of 43 graves containing 45 inhumations were identified during the watching brief. Along with these, eight charnel deposits, one clearly from a single individual, and the remains of 18 coffins, were also discovered. Two coffins are of note, ***942*** and ***961*** (Plates 3 and 4), as the breast plates were partly legible when they were uncovered. Both were fully recorded but fragmented upon lifting, due to their highly corroded state and damaged caused to them by the shoring. All of the inhumations shared an oblique east/west orientation matching that of the extant church and that of the northern boundary of the churchyard. All were laid in a supine position with their limbs extended and their hands either on the pelvic region or proximal femurs. Due to the narrow width of the trench, only half of the burials could be recovered fully, with various anatomical parts of the remaining twenty-two left *in situ* beyond the limits of the trench. This was a particular problem at the eastern end of the rising main trench, where its north-west/south-east alignment cut across the 'grain' of the burials.

4.2.4 The 43 grave cuts appear to have been distributed amongst 33 burial plots or groups. Within the limit of excavation, most of the plots contained only a single burial, but five contained two, one, towards the centre of the north-west/south-east-aligned section of trench, contained four (***898***, ***909***, ***931*** and ***932***) and another, in Box 5, contained five burials (***991***, ***995***, ***998***, ***1002***, ***1002b***). The intensity of cemetery usage was attested further by the charnel deposits, indicative of the disturbance of earlier burials by later grave-digging. Five of these were located above the burials, indicating that the bones disturbed by later grave-cutting had been collected and redeposited after the new burial had taken place. Three of the charnel deposits (***938***, ***980*** and ***989***) had been placed in a discrete pit that was then sealed by the subsequent burial (Plate 2).

4.2.5 ***Assessment of potential***: the archive of primary fieldwork data is a comprehensive and well-organised record of the recovered stratigraphic information, with significant archaeological remains recorded graphically, textually and photographically. The stratigraphic sequence is essentially rather simple and will need little further manipulation to be understood fully; it is dominated, almost exclusively, by funerary deposits and features and, as such, it provides the analytical basis for any understanding of the intensity and organisation of burial, as well as, in a number of instances, the relative sequence of interment. The recorded stratigraphic data provides a flexible framework within which the analysis of the other forms of data can take place, and is particularly valuable in the comparison of the distribution of the skeletal remains identified in the rising main trench, and those excavated to the immediate south in 2006.

4.3 HUMAN REMAINS

4.3.1 ***Introduction:*** the human remains recovered during the watching brief include 45 skeletons and a number of disarticulated bones deriving from eight different contexts, including those relating to charnel deposits and disturbed burials. Other than quantification, no further analysis of the disarticulated remains was necessary at this stage.

4.3.2 ***Completeness:*** nine skeletons were approximately more than 80% complete and were represented by skull, upper and lower extremities, thorax and pelvis (Table 1). Most of the remaining skeletons were either approximately >50-75% complete or <25% complete. Incompleteness was largely a result of later graves truncating earlier graves.

Completeness	**Total**
1 - <25%	15
2 - >25-50%	7
3 - >50-75%	13
4 - >75-100%	9

Table 1: Completeness of articulated skeletons

4.3.3 ***Condition of the skeletons:*** overall, the condition of the bones was good. This means that cortices and joint surfaces were well preserved. The majority of adult skulls were broken or absent, however. Approximately a quarter of skulls from the assemblage would be available for detailed metrical analysis, with a small number of these needing reconstruction. Fragmentation was low or moderate across the individuals. This means that there is good potential for metrical analysis in the assemblage (see paragraph below).

Condition	**Total**
1 - Poor	3
2 - Fair	8
3 - Good	33
4 - Excellent	0

Table 2: Condition of articulated skeletons

4.3.4 ***Estimation of biological sex:*** most adult skeletons had features surviving that would allow the application of standard techniques to estimate their biological sex (Brickley and McKinley 2004; Cox and Mays 2003). It will be possible to estimate the sex of 27 adult skeletons using features of either the skull and/or pelvis. There are currently no accepted methods for estimating the sex of sub-adult skeletons.

4.3.5 ***Estimation of biological age:*** there were 12 sub-adults and 33 adults. Preliminary observations suggest that all age groups are represented in the assemblage, including perinates, new borns, young children, adolescents, young, middle and mature adults. All skeletons had traits surviving that will allow ages to be estimated to within 10 years for adults and 5 years or less for

sub-adults, as described in Brickley and McKinley (2004) and Cox and Mays (2003). Further, most skeletons had a range of traits surviving for age estimation. Estimating the age of skeletons is more accurate if observations are based on a range of traits, rather than a limited number.

4.3.6 ***Potential for metrical analysis:*** a high number of skeletons show potential for metrical analysis of long bones and/ or skulls (Table 3). Metrical analysis will be possible for 11 adult skulls, which were either intact or will require some reconstruction. Skull measurements allow ancestry to be explored (i.e. whether caucasian, mongoloid or negroid) (Krogman and Iscan 1986), as well as the biological variation.

4.3.7 Metrical analysis of long bones to allow estimation of stature will be possible for 26 out of 33 adults by employing measurements of the upper long limb bones and lower long limb bones. Stature estimations based on the lengths of lower long limb bones are more accurate than those that are based on lengths of the upper long limb bones. Stature estimation involves applying the maximum length of any available major long bones to regression equations set out by Trotter and Gleser (1952) and modified by Trotter (1970). As there are different equations for males and females, it is not possible to estimate accurately the stature of those skeletons within the assemblage that are of unknown sex. Metrical data to facilitate estimation of age for the sub-adults will be possible.

Score	**Number of individuals**
1 - one or no measurements will be possible	3
2 - a few measurements will be possible	12
3 - half the number of standard measurements can be taken	9
4 - majority of long bones can be measured	16
5 - Every bone can be metrically recorded	4

Table 3: Potential for standard metrical analysis

4.3.8 ***Potential for metrical and non-metrical analysis:*** adequate cranial and post-cranial remains have survived that will allow the observation of a standard set of landmarks for scoring the presence or absence of non-metrical traits (Brothwell and Zakrzewski 2004).

Non-Metric score	**Number of individuals**
1 - 1 or no landmarks observable	3
2 - a few observable landmarks	2
3 - half of the landmarks are observable	7
4 - majority of the landmarks are observable	13
5 - Every landmark can be observed	9
N/A - subadults not scored	12

Table 4: potential for non-metrical data

4.3.9 ***Pathology:*** overall, all of the skeletons had survived in a condition that is good enough to allow future detailed macroscopic analysis and documentation of pathology. A range of conditions was noted in passing and are listed in *Appendix 4*. They include evidence of trauma, joint disease (osteoarthritis), metabolic conditions (for example, cribra orbitalia), neoplastic disease and infection. Trauma includes fractures, some of which will need radiology to confirm and gain insight into their healing status. Anomalies, for example, asymmetrical limbs, were also present and may relate to traumatic injury. Again, radiology would be required to explore this.

4.3.10 Non-specific inflammation was noted on several bones of one skeleton, suggesting systemic disease. There are numerous conditions that can cause these changes, neoplastic disease, infection, and pulmonary disease, being among them. Further analysis will be required to explore this further.

4.3.11 There was evidence for post-mortem medical intervention in the form of one craniotomy, the removal of the top of the skull in the horizontal plane in order to examine the brain. Such an intervention was usually performed to explore the cause of death, but also to further knowledge about a particular ailment or lesion.

4.3.12 The amount of dental disease in the assemblage is noteworthy, and includes caries, periodontal disease, abscesses, ante-mortem tooth loss and calculus. Heavy wear patterns were also observed on the teeth and further analysis will be required to explore if they can be attributed to any cultural habits (for example, smoking a pipe).

4.3.13 No quantification or detailed description of the above pathological conditions has been undertaken at this stage, but they certainly warrant this level of analysis. The potential of the assemblage to yield information about the health status of the population is considered to be very good.

4.3.14 ***Assessment of overall potential for analysis:*** despite the fact that a proportion of this assemblage is incomplete, the preservation of all of the remains is sufficient for age, sex and stature to be estimated in most cases. Further, sufficient landmarks survive that will allow evidence for family groups to be explored through non-metrical trait analysis. There is also some potential to evaluate ancestry by the morphological and metrical analysis of skulls. Preliminary observations suggest a group of individuals of mixed ages and sexes. A range of pathological conditions is present and, through more detailed analysis, have the potential to provide valuable insights into the overall health status of the population.

4.3.15 The 45 skeletons described here represent a small assemblage, but nevertheless an important one. To date, extremely limited study of post-medieval working class assemblages has been undertaken and there are virtually no osteological studies of populations from the industrialised north-east of England. The value of this assemblage is further increased because of the research potential that would be gained by combining it with the 191 skeletons that were excavated from other parts of the graveyard. Full,

specialist examination of the remains is likely to yield results worthy of publication.

4.3.16 Questions that might be explored at full analysis include:

- What is the demographic composition of the population?
- Is the mortality profile consistent with an industrialised working class population?
- Is there evidence for inter-personal violence in the population, or does the trauma relate to accidental injuries?
- What is the healing status of the trauma? Does this suggest adequate treatment following injury?
- The presence of cribra orbitalia indicates childhood health stress in the population, but what impact did this have on growth?
- Cribra orbitalia is believed to be caused by increased pathogen loads. Does evidence for infection support this?
- Is there evidence for scurvy and rickets?
- Do some of the skeletons share the same non-metric traits and does the distribution of non-metric traits suggest family groups?
- Do any individuals from the population have traits that suggest non-caucasoid ancestry?
- How does this population compare with others that are similar in date and type in terms of its health and physical attributes?

4.3.17 During such analysis, disarticulated bones could be examined to identify discrete individuals, whilst all discrete skeletons would be examined according to standard, recommended practice (Brickley and McKinley 2004). Skeletons would be assigned to age and sex categories and, combined with palaeopathological information, the mortality profile would be explored, taking into account the archaeological background of the site. For example, this would explore whether peaks in the mortality curve are associated with any pathological conditions, or whether statistics have been biased by cultural practice, such as the zoning of burials by age or family.

4.3.18 Wherever preservation permits the standard range of measurements could be recorded, allowing estimates of stature, an exploration of ancestry and the facilitation of other biological analyses (for example, estimation of sex for adults and age and sex for sub-adults). A range of non-metric traits could be scored as present or absent and this information would be used to explore relatedness between individuals. The status of the dentitions could be recorded to explore oral care, cultural habits (ie pipe smoking), diet and any other anomalies. Pathological conditions could be described and documented by illustrations and photographs. Differential diagnoses could be explored with reference to standard texts (for example, Ortner and Putschar 1981) and, where relevant, radiography. These objectives could be greatly complimented by the application of stable isotope analysis to explore diet and geographic origin. All

findings would be discussed in the context of contemporary funerary practices and comparable samples from Britain. A full catalogue of the skeletal remains would be provided in an appendix.

4.4 FUNERARY FIXTURES, FITTINGS AND ARTEFACTS

4.4.1 ***Introduction:*** evidence of 18 coffins was recorded during the watching brief, of which three were observed only as soil stains. The remainder comprised fragments of poorly preserved wood, a grip and breastplates, of which two of the latter retained some legible script (*Appendix 5*).

4.4.2 ***Nature of the material:*** fragments of eight breastplates were recovered, amongst which two retained partial biographical inscriptions. All were of punched tin which was painted or enamelled black with white script painted on. None were sufficiently well-preserved to discern the type/decoration. A single highly corroded iron grip was recovered, with the remainder of the assemblage comprising highly fragmented pieces of breastplate or coffin wood.

4.4.3 ***Other finds:*** seven copper alloy shroud pins were associated with two individuals, ***900*** and ***917***, a copper button was associated with ***995***, and another copper button along with the iron and leather remains of a belt were associated with ***974*** (Plate 6). Two iron-bladed knives were recovered from burial soil ***914***. The first (object 160), recovered from the north-west/south-east stretch of the trench, was a simple design with a handle made from two pieces of animal bone secured to the tang with two copper-alloy rivets. The handle had been incised with diagonal lines running in a single direction and the blade had been broken approximately 20mm from the handle. The second, a folding or lock knife (object 165) was located at the base of Box 3, below the level of the skeletons that had been recovered from there. The cross-hatched incised bone handle was slightly curved.

4.4.4 ***Potential and recommendations:*** the potential of the coffin fittings is limited because of its small size and highly corroded condition (in particular, of the breastplates). However, it will still be possible to characterise the coffins and some of the fittings in regional and chronological terms, especially if they can be contextualised through further research. Photographs of the breastplates *in situ* may enable biographic detail to be recorded for those plates that fragmented upon recovery. It is recommended that, where appropriate, fittings and artefacts are radiographed to provide a record of their size and shape. Grip and plate types should be drawn if they are identified as new styles, or catalogued if they match existing typologies.

5 CONCLUSIONS

5.1 Introduction

5.1.1 The following section presents those conclusions that can be drawn from the assessment. A separate document will provide updated project aims and objectives, and a project design for Project Stage 3, a scheme of analysis appropriate to the potential of the dataset and those requirements of the Tyne and Wear Archaeologist that are necessary to discharge the planning condition.

5.2 Provisional Discussion

5.2.1 It is extremely difficult, and indeed, undesirable, to discuss the remains recovered from the present watching brief without making some consideration of the results of the excavation to the immediate south undertaken by OA North in 2006. A number of similarities were observed between the two phases of work. Of particular importance was the analogous character of the burial substrate. This clearly imported material, in excess of 2.5m thick, contained various quantities of domestic and industrial refuse, and is likely to represent an effort to raise the level of the cemetery in order to accommodate more burials. One such event, utilising material from a nearby ballast mound, was recorded as having taken place in 1817; further documentary research may reveal other such instances, but it is tempting to suggest that those skeletons revealed during the present watching brief date from 1817 to the closure of the cemetery to new interments *c* 1860. They can, therefore, be considered to fall within a relatively narrow date range.

5.2.2 As with the burials excavated by OA North to the south in 2006, the intensity of burial and the use of family plots can clearly be seen, as can hints of the manner in which the cemetery was organised. There is a suggestion that the graves of the burials recovered during the watching brief were laid-out reasonably neatly, which may have implications for the interpretation of their status. Such evidence needs to be contrasted with that from the excavation trench to the south in order to examine the wider use of space within the cemetery.

5.2.3 Although a considerable number of human remains were removed from the zone of impact associated with the sewer diversion, the nature of the findings during the archaeological excavation to the south in 2006 would suggest that many more, undisturbed, inhumations are likely to lie intact beneath the base of the diverted sewer. Such remains could be disturbed by deep excavations in the future, and this may be particularly problematic at the western end of the sewer, where the burial horizon was increasingly thickly blanketed by deposits of modern made ground and may have suffered little previous disturbance. Even within the eastern end of the sewer trench, the fact that the base of the imported burial soil was not reached, may suggest that what currently appear to be deeply buried individual interments may merely be the top of stacks.

There is also the fact that all of the revealed skeletons derive from the latest of at least two separate burial horizons and again, deeper excavations in the future are highly likely to reveal such remains in equal, if not greater, intensity.

5.3 Statement of Significance and Proposal for Further Work

5.3.1 The research context for the present investigation, including appropriate frameworks and regional studies, has been outlined in *Section 2*, and will not be reiterated here. Suffice to note, the assemblage from the rising main watching brief at Coronation Street is an important addition to the small but growing corpus of post-medieval and Industrial-period human skeletal assemblages recovered archaeologically from the North East.

5.3.2 The assemblage, although relatively small (45), has the potential to provide a rare insight into nineteenth-century living conditions and how these impacted on the health and physical attributes of the population. This contribution is increased vastly if these remains can be considered in conjunction with the 191 individuals recovered from the excavation undertaken in 2006. Both the EH and Tyne and Wear archaeological monitors have recognised the value of the combined assemblage as one of the largest post-medieval collections from the area, particularly as it dates from a period of major expansion of the industrialising port of South Shields. Moreover, archaeologically excavated post-medieval cemeteries are highly centred around London and Birmingham and most relate to the middle-upper classes, unlike the St Hilda's assemblage, which represents a working class population from the North of England.

5.3.3 The use of the rich historical documentation of the late Georgian and early Victorian periods is an important aid in the interpretation and contextualisation of the results of the excavation and the osteological analysis. The health and demography of the assemblage could be particularly revealing, as documentary evidence suggests industrialising populations experienced high levels of stress and poor diet, crowded living conditions, rife with infectious disease. The assemblage will go some way to confirm or refute these assumptions and the findings would be set in a wider context by comparison, at a statistical level, with other British populations of a similar date (Roberts and Cox 2003).

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ILLUSTRATIONS

FIGURES

PLATES

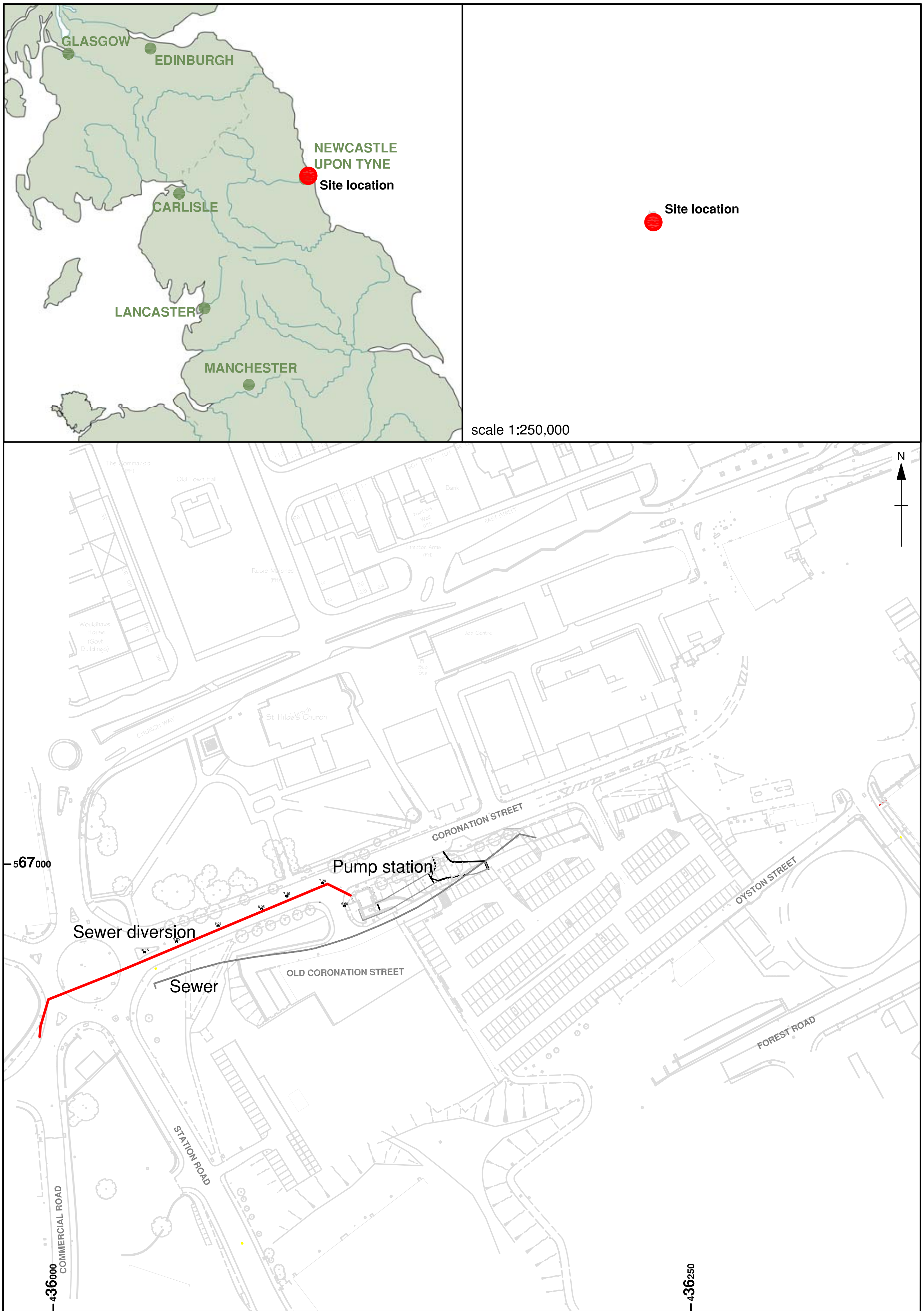

Figure 1: Site location

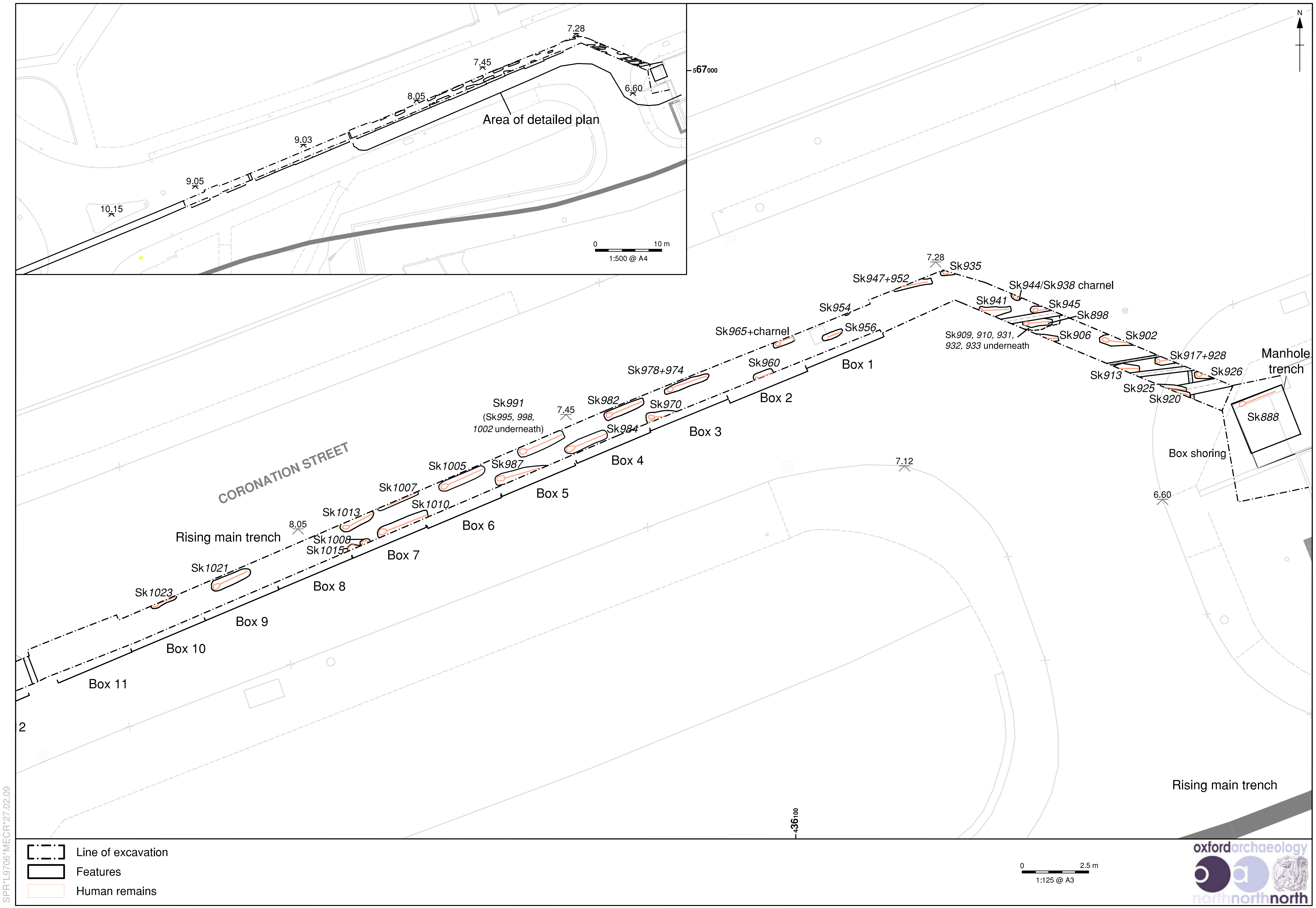

Figure 2: Location plan of human remains recovered during the rising main watching brief on Coronation Street

Plate 1: East facing view of the pipe trench

Plate 2: Charnel 980 in pit

Plate 3: Painted breast plate on coffin 942 reads: [I]sabella ?A?? Died June 23 18??, Aged, 27 years

Plate 4: Skeleton 941 with breast plate 942

Plate 5: Skeleton 928

Plate 6: Skeletons 974 and 978 with button and belt buckle

APPENDIX 1: PROJECT DESIGN

SEWER DIVERSION EXCAVATION, CORONATION STREET, SOUTH SHIELDS,

TYNE AND WEAR

Archaeological Watching Brief:

Project Design V1.1

Oxford Archaeology North

May 2007

Henry Boot Developments Ltd and ARCUS

OA North Job No: L9706
NGR: NZ 360 670

1. INTRODUCTION

1.1 Project Background

1.1.1 The following document has been prepared by Oxford Archaeology North (OA North) in response to a request from Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of Henry Boot Developments Ltd (hereafter the 'Client') for proposals for an archaeological watching brief to be undertaken during groundworks associated with a water main along the route of Coronation Street, South Shields (NGR NZ 360 670). The present document comprises a methodology for the archaeological fieldwork; the methodology for any post-excavation work to be undertaken on human remains recovered by the watching brief would be covered by *Sections 3.3* and *3.4* and *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006. The present scheme of groundworks to be subject to archaeological monitoring will involve construction of a sewer and a number of manholes along the route of Coronation Street, from the pumping station on Old Coronation Street in the east, to the roundabout at the junction of Station Road in the West. It is thought that groundworks will be enacted in a series of short sections measuring up to 2m wide by up to 2m deep.

1.1.2 Previous archaeological works in the area comprise a desk-top assessment, undertaken by Tyne and Wear Museums (1998), which identified that much of the present route of Coronation Street lay within the bounds of St Hilda's cemetery, an archaeological evaluation undertaken by Archaeological Services, University of Durham, which proved the presence of burials on the site at a depth of around 2m below ground level (ASUD 2006) and a recently-completed excavation undertaken by OA North, which took place in the small area between Coronation Street and Old Coronation Street. During the excavation, 191 human burials were removed from a trench measuring approximately 17m by 4m (maximum width, reduced to 2m at depth) and up to 5.5m deep. The concentration of these remains suggests that human remains may well be present within the areas of the proposed sewer trenches, although given the presence of made ground associated with the modern landscaping of the area, such remains could lie below the 2m depth of impact, and thus be unaffected by the development.

1.2 Geographical, Historical and Archaeological Background

1.2.1 The proposed development site lies in the centre of South Shields, with the River Tyne running close by, to the west. Although there is no contemporary evidence from the proposed development area, the earliest known human activity in the vicinity is located some *c* 1km to the north-east of Coronation Street and comprises settlement activity beneath the Roman fort of *Arbeia*. There is thought to have been a contemporary settlement and port associated with the fort, but it is uncertain where these lay. The Anglian nunnery of St Hilda was built in 674 AD in the vicinity of the present development area, on the banks of the Mill Dam tidal inlet. Although the exact location of the original nunnery is not known, the area to the north of Coronation Street has remained a focus for religious activity through the medieval period and into the present, with the latest incarnation of the Church of St Hilda having been rebuilt during the nineteenth century and possible occupying the same site of its predecessors.

1.2.2 Land to the south of Coronation Street, in the area of Old Coronation Street, is largely level at *c* 5.1m OD, but rises to the west, in the area of the roundabout, to 10.2m OD and to the immediate north, along Coronation Street itself, to *c* 7.3m. The natural drift geology of the area comprises thick boulder clay deposits (up to 12m thick). However, much of the proposed development area was occupied by a tidal inlet, the Mill Dam Creek, which is shown on historic maps running to the south of St Hilda's Churchyard. By 1827 the Mill Dam had been completely infilled and built upon (Tyne and Wear Museums 1998), and there is evidence from recent excavations at the Customs House (built in 1861 at the confluence of the Mill Dam and the Tyne) that this process of infilling had begun at least as early as the late seventeenth or early eighteenth centuries (*ibid*). That such activity may have occurred within the proposed development area is hinted at by some of the older cartographic sources. Armstrong's map of 1768 depicts the Mill Dam as being very much wider and closer to St

Hilda's Church than does Richardson's map of the same year. The latter source accords well with the Fryer's map of 1773 and Casson's map of 1801 and, whilst it is not possible to corroborate the accuracy of Armstrong, it is possible that his map is based on an earlier survey or source which may show the Mill Dam prior to infilling in the area of the church. South and east of the excavation trench, geotechnical investigations have proven the depth of these infill deposits to at least 16m below the present ground level (M Douglas pers com).

1.2.3 Deposits encountered within the recent excavation trench, comprising dumps of clay, gravel and industrial waste, are characterised at depth by their admixture with grey silty clay characteristic of fluvial deposits, and it is thought that these deposits relate firstly to activity on the banks of the Mill Dam, and latterly to levelling. An episode of levelling, undertaken in 1816 in order to raise the level of the crowded cemetery to accommodate further burials, is said to have utilised ballast from a nearby mound (Tyne and wear Museums 1998). If this episode is traceable within the present archaeological trench, then the ballast in question must have contained a high proportion of industrial and domestic refuse, as observed in the case of the burial matrix encountered within the upper 2m - 4m of stratigraphy. Although natural ground was purported to have been found within the evaluation trench at a depth of 2m below ground level (ASUD 2006), the OA North excavation has proven this to be far from the case, with natural deposits encountered at a depth of approximately 5.5m - 6m below the modern ground level. Moreover, there is some indication that the natural ground surface slopes down towards the Tyne, the reverse of the modern situation in the area of the Coronation Street/Station Road roundabout.

1.3 OXFORD ARCHAEOLOGY NORTH

1.3.1 OA North has considerable experience of excavation of sites of all periods, having undertaken a great number of small- and large-scale projects throughout Northern England during the past 25 years. Evaluations, desk-based assessments, watching briefs and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables. OA North has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. OA North is an **Institute of Field Archaeologists (IFA) registered organisation, registration number 17**, and all its members of staff operate subject to the IFA Code of Conduct.

2 OBJECTIVES

2.1 The following programme has been designed to identify the presence of any human remains within each of the sewer trenches, and to investigate, record and remove those remains where they would be effected by the development together with as much supporting information concerning the depth, orientation, burial furniture and dating as the circumstances within the service trenches allow.

3 METHOD STATEMENT

3.1 WATCHING BRIEF

3.1.1 ***Methodology:*** all machining undertaken on the site will be monitored by a suitably experienced archaeologist; any machining below the level of compact road services should be enacted by the use of a toothless ditching bucket. It would be desirable if machining could be undertaken in long, shallow scoops, rather than short, deep bucketfuls, in order to minimise damage to any human burials or other archaeological remains. The programme of field observation will record the location, extent, and character of any surviving archaeological features and/or deposits as accurately as possible within the area of proposed ground disturbance. Where health and safety considerations allow, any human remains revealed by the machining and lying within the zone of impact, would be screened from public view, recorded *in situ* and removed from the trench which, to allow safe access when over 1.2m deep and/or less than 2m wide, would require the use of a temporary shoring system, installed by a specialist contractor. Although it is appreciated that the limited space available to the scheme of excavation would prevent the deposition of spoil from mechanical excavation in separate spoil heaps, it would be useful if spoil deriving from initial excavation of the road

surfaces and their make-up could be kept separate from that deriving from the underlying layers in order that such material can be systematically searched for human remains and any other artefacts as soon as it is safe to do so. The rough location of such remains would be recorded as accurately as possible to allow this material to be tied in with the field observations. It is proposed that at least two archaeologists will be in attendance during the machining process, allowing the spoil to be sorted for human remains, and for any *in situ* remains to be recorded without delaying the machine, which would be able to excavate another area if archaeological remains were found at the original site of excavation. As required, additional archaeologists would be supplied to the site to deal with greater numbers of remains.

3.1.2 The investigation and excavation of human remains would be undertaken in accordance with the methodology outlined in *Appendices 1 and 2* of the OA North project design for the excavation undertaken at Coronation Street, dated April 2006. Putative non-burial archaeological features and/or deposits identified during the observation of groundworks, together with the immediate vicinity of any such features, will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions and, where appropriate, sections will be studied and drawn. Any such features will be sample excavated (ie. selected pits and postholes will normally only be half-sectioned, linear features will be subject to no more than a 10% sample, and extensive layers will, where possible, be sampled by partial rather than complete removal).

3.1.3 ***Recording:*** all recording will be undertaken in accordance with national guidelines (English Heritage Guidelines for the treatment of human remains excavated from Christian burial grounds) and OA guidelines, wherever possible, and in the case of human remains, will be undertaken in accordance with *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006. To increase the speed of recording, burials will be planned through the use of rectified photography. Such works will involve the use of survey equipment, base stations for which will need to be surveyed-in using GPS equipment prior to the commencement of groundworks, and once the location of the sewer trench has been finalised (to limit any disturbance/movement of the base stations). Recording would take the form of indexed black and white print and colour slide photography, appropriately-scaled plans and sections on permanent drafting film together with detailed written notes on *pro-forma* recording sheets.

3.1.4 ***Treatment of finds:*** all finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid For Finds*, 1998 (new edition) and the recipient museum's guidelines.

3.1.5 ***Treasure:*** any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996. Where removal cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.

3.1.6 All identified finds and artefacts will be retained, although certain classes of building material can sometimes be discarded after recording if an appropriate sample is retained on advice from the recipient museum's archive curator.

3.1.7 ***Fleshed or partially-fleshed bodies:*** should mechanical excavation reveal the presence of fleshed or partially-fleshed burials, or coffins containing liquor or other corruption products, it would be necessary to inform the Environmental Health Officer and agree a suitable strategy for their recovery, analysis and disposal. all further works would conform to any requirements that they may set. Dependent on the state of these bodies, it may be necessary to use a specialist contractor for their removal, storage and deposition, the costs of which would be agreed with the Client and charged as a variation. Any lead coffins would not be opened, but would need to be removed, stored and deposited by a specialist contractor, the costs of which would be agreed with the Client as a variation.

3.1.9 ***Contingency plan:*** in the event of significant non-burial archaeological features being encountered during the watching brief, discussions will take place with the ARCUS, the Client

and the Tyne and Wear Archaeologist, as to the extent of further works to be carried out. All further works would be subject to a variation to this project design. In the event of environmental/organic deposits being present on site, it would be necessary to discuss and agree a programme of palaeoenvironmental sampling and or dating with the Planning Archaeologist.

3.2 POST-EXCAVATION ASSESSMENT, ANALYSIS AND ARCHIVING

3.2.1 The assessment and any analysis of the human remains recovered as part of the watching brief would be undertaken as part of the wider post-excavation programme, methodologies for which are provided in *Sections 3.3* and *3.4* and *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006.

4. Health and Safety

4.1 OA North provides a Health and Safety Statement for all projects and maintains a Unit Safety policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (1997). A risk assessment will be completed in advance of any on-site works and copies will be made available on request to all interested parties.

5 WORK TIMETABLE

5.1 ***Archaeological Watching Brief:*** the duration of the watching brief will be dependent upon the timetable of the groundworks; although some delay may be incurred by the discovery of *in situ* human remains, it is hoped that additional staff could be supplied to the site to investigate such remains as quickly as possible, allowing groundworks to continue at another point along the sewer trench.

6. PROJECT MONITORING

6.1 ***Access:*** liaison for site access during the evaluation will be arranged with the client unless otherwise instructed prior to commencement of the archaeological investigation.

6.2 Whilst the work is undertaken for the Client, ARCUS would ensure that the Tyne and Wear Archaeologist will be kept fully informed of the work and its results, and will be notified a week in advance of the commencement of the fieldwork. Any proposed changes to the project design will be agreed with the Tyne and Wear Archaeologist in consultation with the Client and ARCUS.

7. STAFFING PROPOSALS

7.1 The fieldwork will be under the direct management of **Stephen Rowland** (OA North project manager) to whom all correspondence should be addressed. The post-excavation programme would be managed by **Louise Loe** (OA Head of Heritage Burial Services).

7.2 The watching brief would be undertaken by an archaeological Supervisor and an Osteoarchaeologist. Additional staff would be supplied, as required, to limit disruption to the machining schedule. The initial surveying-in of base stations would be undertaken by Marc Storey, OA North Geomatics Project Officer.

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APPENDIX 2: RELEVANT SECTIONS FROM THE EXCAVATION PROJECT DESIGN

3.2 POST-EXCAVATION ASSESSMENT

3.2.1 Following completion of the fieldwork, the results will be collated and the site archive completed in accordance with English Heritage MAP2, Appendix 3. A post-excavation assessment of the archive and the resource implications of the potential further analysis will be undertaken. The stratigraphic data and the finds assemblage will be quantified and assessed, and the environmental samples processed and a brief assessment of their potential for further analysis made. The assessment will, where appropriate, comprise:

- Quantification of all site records, including drawings
- Assessment of the stratigraphic sequence, in terms of complexity and, where possible, provisional chronology
- A summary description of the results of the excavation, including an identification of formation processes
- An assessment of the significance of any deposits from which radiocarbon samples have been taken and the selection of specific samples for submission for analysis
- An assessment of any groups of articulated and disarticulated human remains, including age, gender and any pathological lesions, along with the distribution of the remains themselves, in terms of their potential for further analysis, which might include:

i. Demographic reconstruction in terms of age, gender and health

ii. Stature and bone size and shape conformation

iii. The presence of non-metric traits and genetic disorders that might indicate the use of areas of the cemetery by familial groups

iv. Indications of social status and access to resources as well as occupation-related pathological conditions

v. Groupings of disarticulated human remains likely to relate to single individuals

vi. Number of individuals and stratigraphic relationships represented by the unstratified material that may lend clues to the length of usage of the cemetery

vii. Isotope analysis for the reconstruction of past dietary practices and also for the origin of populations

- An assessment of the quantity and provisional dating of any pottery recovered from the excavation and an assessment of the further work required for the analysis of a selected assemblage from the evaluation and excavation. Such potential for analysis may include:

i. Typological and chronological analysis in order to improve an understanding of the chronological basis of the use of the site as a cemetery and of any earlier activity

- An assessment of the quantity, form and provisional dating of any coffin furniture, nails or other metal artefacts in order to establish a programme of further analysis, which might include:

i. Form, function and typological analysis, as a means of dating artefacts and interpreting their use for social display, etc.

- An assessment of the nature and quantity of any faunal remains along with the potential for further analysis, which might include:

i. Species representation, proportions, metrical conformation, pathological lesions, age and sex for the understanding of the pastoral and hunting economies and the nature of animal husbandry practices

ii. Butchery, burning, gnawing and fracturing as a means of determining the treatment and processing of meat products along with attitudes to waste disposal

iii. Analysis that might help to address research questions regarding the introduction of domesticated species during the Early Neolithic, which might include an examination of non-metric traits and body conformation that could indicate the presence of animals of primitive type, or of greater or lesser genetic diversity or of indigenous or extraneous origin

- An assessment of environmental remains recovered from the excavation, including the nature and quantity of materials such as molluscs, pollen, charcoal and carbonised plant remains along with the potential of any well-stratified assemblages for further analysis in terms of:

i. Identification of economic and subsistence practices through the identification of edible plant remains

ii. The identification of food processing strategies as indicated by the presence of various plant anatomical parts (ie, chaff), either separated from or still attached to seeds and grains. Within this context, insect remains may also be important in identifying any storage or refuse functions associated with features

iii. The nature of the environments exploited for plant foods through the identification of weed seeds, which may also indicate the nature of human manipulation of the local environment, as may insect remains

iv. The character of the local environment through the analysis of pollen, plant macrofossils and fungal spores and the potential impact of man upon this environment

v. The character of the immediate environment as indicated by any mollusc or insect remains and relict topsoil horizons

vi. The presence of faecal material and parasite eggs that may be informative of the general state of health of past populations

- An assessment of any monoliths or core samples taken from specific deposits for their potential for further analysis in terms of site formation processes

3.2.2 The assessment results will be presented within a post-excavation assessment report which will summarise the results of the excavation and any initial hypotheses that can be drawn from the assessment of the finds and environmental samples. Within the framework of these initial results, an attempt will be made to place the data from the excavation within a regional context both in terms of a chronological narrative and of significance. The assessment report will make recommendations for a schedule, timescale and programme of analysis in accordance with MAP2 Appendix 4.

3.3 ANALYSIS

3.3.1 A provisional programme of post-excavation analysis is anticipated, and guidelines are provided in *Appendix 2* of this project design. The extent of the programme, however, can only be reliably established on completion of the post-excavation-assessment report, but it is likely, considering the nature of the material from the evaluation, that each of the proposed stages for analysis of human remains will be undertaken on the more complete inhumations, while less-detailed analysis is likely to be undertaken on disarticulated remains (see *Section 3.3* above). The proposed programme anticipates both analysis of the site stratigraphy and the artefactual/ecofactual evidence leading to the production of a final report. This will be completed within two years of the fieldwork.

3.4 PUBLICATION

3.4.1 It is anticipated that the results of the excavation will be worthy of publication. If possible, the publication text will be prepared in a suitable form for inclusion in either a regional or national journal, for example, the Durham Archaeological Journal or Archaeologia Aeliana, respectively.

APPENDIX 1: THE EXCAVATION AND RECORDING OF BURIALS IN CHURCHYARDS

By A Boyle and C Boston

1 INTRODUCTION

This section details the recommended methodology for the excavation and recording of inhumations and their associated features and grave goods. Associated features include coffins, grave cuts, ditches, postholes, stakeholes and memorials.

It is fair to say that it is virtually impossible to record a burial in too much detail but this viewpoint needs to be balanced against time and money constraints BUT NOT AT THE EXPENSE OF THE DATA.

Both excavation and post-excavation treatment will directly affect the quality and quantity of information, which can be recovered by the osteoarchaeologist. An enormous amount of information can be extracted if proper procedures are followed. On any site where burials are discovered it is important to seek the advice of the osteoarchaeologist as soon as possible. Where the presence of burials is known or suspected this should happen prior to excavation. If at all possible the osteoarchaeologist should be present on site throughout excavation. This is especially important on large cemeteries and is essential both when preservation is poor and when skeletons are to be immediately reburied. Otherwise some provision should be made for regular visits. An assessment of factors such as numbers of skeletons, bone preservation, method of burial, date range and density of inhumations will aid in the definition of a suitable collection procedure. For example, in cases where the sample is small and skeletal preservation is poor, the opportunities for post-excavation will be limited. This will have implications for the recording and excavation procedures employed.

2 INHUMATION BURIALS

This section describes the recommended methodology for the excavation of inhumation burials within churchyards. The general area should be thoroughly cleaned in plan, with a view to defining grave outlines and their relationships to other graves and/or features. Clearly, intercutting graves are important in the construction of a stratigraphic sequence for the site. Where graves are intercutting it is essential that the relationships are properly investigated and interpreted on site. In these circumstances loose bones should not be removed until it is clear which context they belong to (a separate section on the excavation and recording of disarticulated bone appears below).

2.1 METHOD OF EXCAVATION

The best practice is to excavate graves and their contents in plan. Although the quadranting of graves with a view to producing longitudinal and transverse sections has been advocated it is difficult to see how such a procedure would deal adequately with eg. the recording of large numbers of finds, or the recovery of a body surviving only as a shadow. Arguments may however be presented for the excavation of particular burials in sections or quadrants.

Excavation should proceed carefully and without undue haste. A basic aim is the definition of body position in order that the more fragile bones, such as skull, pelvis, kneecaps, hands and feet, are not accidentally damaged. It is therefore poor practice to begin by digging deep exploratory holes with a view to `hitting bone'.

2.2 RECORDING THE SKELETON

Each individual skeleton will be assigned a separate context number from a continuous sequence. The skeleton has its own specialised context sheet, which must always be used. If further space is required then a standard context additional sheet should be used. **NOTE:** Once a context number has been assigned then a separate skeleton number is unnecessary. It is important to realise that the deposition of a skeleton is a stratigraphic event in *its own right* whether or not it is placed within a coffin. There are two slightly different versions of the skeleton recording sheet: one should be used for adults and the other for children and subadults as appropriate. Only those aspects of the skeleton recording sheet, which are unique, are discussed here. The remaining elements of the skeleton sheet are also present on the general context record sheet and are discussed in section 2 of the Oxford Archaeological Unit fieldwork manual.

2.2.1 ***Skeleton diagram:*** this diagram should be used to record which bones are present. If a bone is present then it should be shaded on the drawing. Where possible the osteoarchaeologist should be consulted.

2.2.2 ***Levels:*** these should be taken at three basic positions as indicated on the skeleton recording sheet (skull, pelvis and feet). A level measurement taken between the knees if legs are extended can be useful. Further readings should be taken if the position of the skeleton is in any way unusual. Great care should always be taken when placing level staff. All levels should additionally be marked on the plan.

2.2.3 ***Orientation:*** orientation should always be in relation to OS grid North or magnetic North rather than site grid North. A compass should be used.

2.2.4 ***Body position:*** body position should be indicated in the appropriate box. When describing the skeleton it should be remembered that left and right sides are those of the skeleton and not the excavator. A precise description of arms and legs should appear on the skeleton context sheet in the section for Additional Information. Factors such as displacement of skull, mandible and the disposition of hands and feet must be recorded as they may relate to taphonomic processes. Bones which have been positioned tightly together may have been wrapped in a shroud at the time of death (shrouds may additionally be indicated by pins). Animal activity or collapse and decay of grave structures may cause displacement of bones. Definitions of the relevant terminology appear below.

2.2.4.1 *Supine:* the skeleton is laid flat on its back, legs may be extended, crossed, flexed or semi-flexed, detail of arm position and the direction in which the skull is facing should also be provided. Supine is by far the most common body position found in Christian burials.

2.2.4.2 *Crouched:* the skeleton is laid on its side and crouched (often tightly) in the foetal position, detail of arm position and the direction in which the skull is facing should also be provided.

2.2.4.3 *Prone:* the skeleton is laid face down; legs may be extended, crossed, flexed or semi-flexed, detail of arm position and direction in which the skull is facing should also be provided.

2.2.4.4 *On side:* the skeleton is laid on left or right side, legs may be extended, crossed, flexed or semi-flexed, detail of arm position and the direction in which the skull is facing should also be provided.

2.2.4.5 *Irregular:* if the position of the skeleton does not fit into any of the above categories then it can fairly be described as irregular and as much detail as possible should be provided.

2.2.5 ***Preservation of skeleton:*** this category relates to the condition of those bones which are present and NOT to the completeness of the skeleton. Choose good, fair or poor as appropriate. Where preservation is variable and additional comment is required this should appear in the box marked `description'. Many factors can determine the survival of bone. These include soil pH, moisture content, air, temperature, fauna, flora, and human interference. Additionally age and sex also play a part. Pathological bones are particularly fragile and those exhibiting lesions should be photographed in situ. Water is the single most important factor of decay: the principal action of

water on bone is by leaching. Preservation is generally better in soils with a neutral or slightly alkaline pH, and is worse in acid conditions. Decomposition may be accelerated in porous light soils while dense, clay-like soils may actively retard it (Henderson 1987). The categories of preservation are defined as follows: preservation should be described as good where bones are mostly intact and in good condition and therefore unlikely to fragment during excavation, bone surfaces are smooth and unmarked; preservation should be described as fair where occasional bones are broken and further breakage is likely to occur during excavation, bone surfaces may have slightly `weathered' or roughened appearance; preservation should be described as poor where most or all of bones are broken and fragmented, bone surfaces have very `weathered' or roughened appearance.

2.2.6 ***Completeness of skeleton*****:** this is indicated pictorially on the skeleton diagram. In addition the level of completeness should appear in the appropriate box on the skeleton recording sheet using a numerical code as follows: 1 - complete/virtually complete, all or most bones of the skeleton appear to have survived; 2 - more than half the skeleton has survived; 3 - less than half the skeleton has survived.

2.2.7 ***Collection quality:*** any factors, which might have affected the standard of recording and collection, should be noted, such as if collection took place under salvage conditions or in very poor weather (eg. frost or poor light), many of the smaller bones of the hands and feet might have been missed. Any damage, which occurs during the excavation or lifting of the skeleton, should be noted. Both should appear in the section for Additional Information.

2.2.8 ***Planning and photography:*** ideally all skeletons should be planned at a scale of 1:10. This provides a realistic representation of the position of all surviving bones and any associated objects. If appropriate this plan can also incorporate grave outline, coffin evidence, any other structures and associated finds. Before planning, the grave fill and any soil around and adhering to the skeleton should be removed. Appropriate tools are described in section 2.2.9 below. It should be emphasised that the small bones of the hands and feet are easily disturbed and damaged. Consequently only the minimum amount of soil should be removed from these areas. The sparing use of sponges and fine water sprays can be useful for the removal of persistently adhering soil. However, under no circumstances should bones be continually dampened and allowed to dry out, as this will cause them to disintegrate. The use of 1:5 scale plans for infants and neonates should be considered where time allows. The points at which levels have been taken should also be indicated on the plan. Sample location can also be indicated on plan.

Increasingly, plans of skeletons are made by digital rectification of photographs taken using a digital camera. These have the advantage of greater accuracy than hand-drawn plans, and are a labour-saving device in the field. It is important to note, however, that a manual plan of the grave cut, coffin wood and fittings and small finds is still required, as these tend to show up poorly in photographs.

2.2.9 ***Excavating the skeleton:*** it must be emphasised that the quality of the skeletal information, which can be extracted by the osteoarchaeologist, is directly dependent on the completeness of the skeleton and the preservation of individual bones. A very fragmented skeleton is of limited use. Hence great care should be taken in the lifting and handling of the bones. In acid ic soil conditions, tooth enamel may be all that survives. This should be lifted in a block and kept moist.

Bones should be boxed as soon as possible after excavation. Skulls in particular should be placed in boxes immediately after lifting and UNDER NO CIRCUMSTANCES should they be transported from site in plastic bags alone as they are extremely fragile. They should never be lifted by the orbits (or eye sockets). Always lift skulls using both hands. All the appropriate packing materials should be on site prior to lifting of skeleton.

Specialised tools are essential. These are plasterer's leaves (leaf blades); dental tools and soft, and small paint brushes. Wooden tooth picks, lollipop sticks (tongue depressors) and plastic modelling tools should be employed in the final cleaning stages as they are unlikely to mark or depress bone.

The skeleton should be excavated and bagged in the manner outlined here (though not necessarily in this order). The skull and mandible should be bagged together and placed immediately in a box.

Any loose teeth should be placed in a separate small bag, which should also be placed in the box. The left scapula, clavicle, humerus, radius and ulna should be lifted and bagged together, the bones of the left hand and wrist should also be placed in this bag. Repeat for the right arm. The left pelvis, femur, patella, tibia and fibula should be lifted and bagged together; the bones of the left foot and ankle should also be placed in this bag. Repeat for the right leg. The vertebrae, ribs and sternum can be placed in one bag.

NOTE: this is the minimum number of bags, which should be used. If time allows hands and feet may be separated from arms and legs (ie right hand in one bag, left hand in another). Where the bones of the hands or feet cannot be separated ie. because they are crossed, the bones may be placed in a single bag. Whenever time allows, vertebrae and sternum can be separated from ribs, and ribs can be split into left and right sides. Additionally fourth ribs may be placed in a separate bag, if easily identifiable, as these can aid in age assessment. During lifting the ribs often break into quite small fragments, many of which may be unidentifiable as to side. It is sensible to remove the bone in a systematic fashion, ie dealing with one bag at a time in order to avoid confusion.

Every individual bag should have two labels inside. The following details should appear on both: site code, context number of skeleton, bone identification (eg. skull, right arm or left leg). Trap air in bags with bones to prevent crushing. Skeletons should be boxed as soon as possible after lifting; even before washing in order to minimise crushing.

Where possible the entire procedure should be completed in one day. If left overnight, the skeleton should be covered with polythene and packing material (eg loose soil).

2.3 THE EXCAVATION OF JUVENILES AND INFANTS

Many of the above points continue to be relevant to the excavation of young individuals, but a number of additional points are important. The epiphyses (ie the bone ends) are not fused to the bone shafts. At birth there are 450 bone forming centres which will develop into 206 in the adult. Excavators should be aware of this, preferably through demonstration of neonate, infant and juvenile skeletons. It must be borne in mind that infant epiphyses resemble small stones. Special care should be taken to recover infant vertebrae, which comprise three separate bones. Infant bones are regularly recovered from settlement contexts and often confused with small animals, such as rabbits and dogs. It is hoped that the skeleton diagrams on the recording sheets will be a help in this respect. The bones of adults and juveniles should never be bagged together as the latter are extremely fragile. Each individual infant limb bone should be placed in a separate bag.

2.4 DISARTICULATED BONE

Multiple graves, often containing disarticulated bone are quite common on archaelological sites (eg. Roman, Anglo-Saxon, medieval and post-medieval). Disarticulated bone is also known from prehistoric contexts (eg. Neolithic and early Bronze Age). Disarticulated bone from earlier periods is likely to benefit from three-dimensional plotting and identification of each individual bone, although this may not be feasible in each and every case.

Relatively little useful information may be gleaned from churchyards where successive burials have taken place intensively over a prolonged period. In these cases, the possible value of the data should be weighed up against practical considerations, such as time and money constraints. In these circumstances, it is recommended that the disarticulated bone is collected for possible reburial. Further recording and osteological analysis is not usually indicated.

2.5 BODY STAINS AND `EMPTY' GRAVES

In contexts where acid conditions prevail the skeleton may have completely decayed and be represented only by a `body stain'. Occasionally fragments such as dental enamel will survive. Body stains can generally be excavated three-dimensionally. The staining should be sampled along with all the grave fills and control samples should be provided.

Where graves are apparently empty, samples may be recovered for phosphate analysis in order to determine whether or not a burial was ever present.

2.6 GRAVE CUTS

A grave is a cut feature and therefore, a negative one. Attention should be directed to Appendix 4 of the Oxford Archaeological fieldwork manual (Wilkinson 1992). All of the general points apply equally to grave cuts. The shape of the grave cut should be described in some detail and the following terminology should be employed: sub-apsidal (grave with rounded ends), sub-rectangular, ovoid, square, circular or irregular.

The profile of the grave should be recorded in the written record. Important features to look out for are ledges, which may indicate the presence of a wooden lid and the presence of grave markers (post holes, stake holes: see associated structures below). In general, it is not necessary to draw longitudinal or cross-sectional profile of the cut. A written description, however, should be recorded on the context sheet.

The grave outline should be planned at a scale of 1:10. Levels should be taken at the top and bottom of the grave. In churchyard contexts, the precise cut of the grave may not be visible, due to lack of distinction between the graveyard soil and the grave fill. Nevertheless, it should be assumed that the cut existed, and should be accorded a context number.

2.6.1 ***Extra-mural vaults and brick shaft graves:*** in the 18th- and 19th-centuries, concern over disturbance of the remains of family members, and the increasing use of death ritual for social display led to the establishment of subterranean brick-built family vaults and shaft graves for the interment of multiple burials. A vaults traditionally has a vaulted roof, the entrance to the interior commonly is through a doorway in one of the side walls (often with a set of steps leading down to it). A brick shaft grave is essentially a rectangular or single break grave cut lined with a single or double layer of bricks and mortar. Brick shaft graves may be of single or double width. The top of the grave is covered over by horizontal ledger stones (often sandstone or limestone slabs), which could be removed for subsequent interments. Coffins were stacked vertically one above the other within the grave, sometimes resting on metal racks. Vaults and brick shaft graves were originally surmounted by an above- ground memorial. Today, many have been lost.

Recording of vaults and brick shaft graves should follow the guidelines for brick built structures laid out in the Oxford Archaeology Field Manual (Wilkinson 1992).

2.7 GRAVE FILLS

The grave fill is a positive context and attention should be directed to section 2.4.1 and Appendix 1 of the Oxford Archaeological fieldwork manual. It should never be assumed that a grave will only have a single fill- it may have several. It is important to ensure that all of the grave fill is removed and that the grave is `bottomed'. This has obvious implications for the shape and depth of the grave. More specifically, objects are often located below the skeleton, and would be otherwise missed. In churchyards, it was common practice to inter two or more burials one above the other. Care should be taken to ascertain that the lower-most burial has been revealed. The fill below the skeleton may also indicate whether or not the grave remained open for any length of time prior to burial.

Where bulk finds (eg. animal bone and pottery sherds) are recovered from grave fills, this should be recorded in the fill context sheet, along with their vertical position within the fill. Any indication that a find was confined to a particular part of the fill should be recorded. This will facilitate the distinction between residue material and grave goods deliberately placed with the corpse within the grave. On the whole, it is recommended that finds within grave fills should be treated as small finds. This is not the case, however, with coffin nails, which should be assigned the context number of the coffin. It is not necessary to give coffin fittings or fixtures small find numbers. It is important, however, to record their position within the grave on the grave plan. Most commonly, coffin fittings and fixing nails, hinges and brackets are collected for reburial

with the associated skeleton. If the skeletons are not to be reburied, they should be collected for inclusion within the archive.

2.8 COFFINS

A variety of wooden mortuary chambers and wooden coffins appear in the archaeological record dating from as far back as the earlier Neolithic. In the medieval and post-medieval periods, both wooden and lead-lined coffins are common. Simple single thickness trapezoid and rectangular wooden coffins were the most common form in the medieval period. From the 17th century, there was increasing elaboration of coffins and fittings. Single-break coffins (the modern 'coffin shape') become ubiquitous from the 1730s onwards (Litten 1991). Simple coffins comprised of a single thickness wooden case decorated with few fittings. More elaborate coffins were constructed either of a double thickness of wood; an outer wooden case and inner lead shell, a lead shell and inner wooden coffin; or a triple layer of a wood-lead-wood. Lead was the most common metal, but iron and zinc were also occasionally used for the metal shell. The outer wooden case was often upholstered in baize or velvet and decorated by elaborate patterns of upholstery studs (usually iron or brass) and metal fittings, such as escutcheons, lid motifs and *departum* plates (breastplates, footplates and headplates inscribed with the name of the deceased, their age, date of death and other particulars). A taphonomy of coffin fitting styles based on coffins found at Christ Church, Spitalfields (Reeve and Adams 1993) forms the basis for comparison of these styles. OA is currently compiling a 'master catalogue' to include new styles found on other post-medieval burials sites.

2.8.1 ***Excavation and recording:*** wooden coffins may be indicated by staining caused by the decay of the wood and/or the presence of iron nails and brackets. Where they do occur, an individual coffin context number should be assigned. Fittings should be given this number and do not require individual small finds numbers. The precise location of these objects is of vital importance for the reconstruction of mode of coffin construction. Where wood survives in contact with nails and fittings it will be possible to ascertain board thickness and the direction of the wood grain. The presence and position of nails and fittings within the grave must be marked on the grave plan. The outline of coffin stains should also be represented on the plan at a scale of 1:10. Details should be recorded on the standard OA coffin record sheet.

It is recommended that the coffin fill around the skeleton be removed whilst leaving the coffin stain and any associated fittings *in situ*. At this stage the coffin and skeleton should be planned at a scale of 1:10 and a photographic record produced.

Certain elements are common to both the standard context record sheet and the coffin record sheet. Those elements that are unique to the coffin record sheet are described below.

2.8.2 ***Shape, dimensions and distinguishing characteristics:*** draw the shape of the coffin here and include coffin furniture (for example, handles, decoration, breastplates) with their approximate locations. Make a note of dimensions in all the relevant places (head, shoulders, base, depth). If the coffin is decorated then detailed photographic recording is recommended. The style of 18th- to 19th-century coffin fittings should be compared with the detailed taxonomy of coffin fittings compiled from Christ Church, Spitalfields (Reeves and Adams 1993). Where matches cannot be found, the coffin fittings should be sketched on site. These styles will be added to the 'master catalogue' of coffin fittings currently being compiled by OA.

2.8.3 ***Description:*** describe the coffin, giving details of design and construction, materials used, and unusual features. Description of each element of the coffin fittings (eg breastplate, escutcheon, lid motif, grip and grip plate) should include material, quantity, styles (if matching Spitalfield types). Text inscribed on breastplates or directly onto the lead shell should be recorded *verbatum*.

2.8.4 ***Stratigraphic matrix:*** only enter the relevant stratigraphic relationships here (ie the grave fills and cut numbers). DO NOT enter the skeleton number (it is stratigraphically within the coffin number and in terms of chronological sequence is contemporary).

2.8.5 ***Preservation of coffin:*** tick one of these boxes to indicate how well the material of the coffin survived. If preservation is variable give details in the Description section.

2.8.6 ***Treatment:*** an entry should be made here if the coffin underwent any treatment from conservators before excavation or during lifting.

2.8.7 ***Finds:*** enter details of any coffin furniture and of any other finds closely associated with the coffin.

2.9 ASSOCIATED STRUCTURES

This applies to features such as ditches, postholes, stake holes or the foundation trench for the headstone and/or footstone of a grave memorial, which may be associated with a grave. These should be assigned a unique context number and cross-referenced on the appropriate context sheet (for grave cut or grave fill). The use of group numbers for related contexts is recommended.

2.10 ASSOCIATED OBJECTS

Grave goods may be present either within the grave fill or in direct association with the skeleton. Each object should be assigned to the appropriate context, given a unique small finds number and three-dimensionally recorded. Decayed organic objects which may only be represented by staining should also be recorded in this manner and sampled where appropriate.

Shrouds may be indicated by copper-alloy or nickel pins. These should be assigned a small finds number then accurately recorded on plan and by level. Their presence should be noted on the skeleton recording sheet. Clothing fasteners (eg buttons, toggles and garter buckles) may be present in the grave. Clothes fastenings potentially give important insights into changing patterns of grave dress over time. The location of these items should be recorded on the grave plan, and the items assigned a small find number. They should be collected for specialist analysis but may be ultimately be reburied with the coffin and human remains (depending on site specifications).

It is very important to describe the precise position of the object. Textile impressions are often preserved in the corrosion on metal objects, and can yield much information about dress and other body coverings. Where a number of objects cluster together the presence of a decayed organic container, such as a wooden box or bag, may be indicated.

All small finds should appear on the plan of the skeleton. Where a large number of grave goods are clustered together it is desirable to produce a detailed plan at a scale of 1:5, 1:2 or even 1:1 if appropriate. In cases where a number of grave goods are located below the skeleton, it is recommended that a further plan should be drawn after its removal. A photographic record should also be produced. For major cemetery sites, the use of an EDM for rapid and accurate plotting of objects is recommended. This is particularly useful in cases where objects are stratified within a grave (ie some may be lower down in the fill than others), although here measurements between stratified objects is helpful.

2.11 GRAVE MEMORIALS

Grave memorials, such as head and footstones, may be associated with specific burials. Extramural above-ground memorials became increasingly common in the post-medieval period. Recent work by Mytum (2002) and Tarlow (1999) have traced changing traditions in the shapes, iconography and text inscribed on these memorials. Headstones also offer valuable biographic information on individuals interred in the graveyard.

Head and footstones are structures and should be accorded an individual context number. They should also be included as part of the grave group, if the association with the burial is clear. It is important to note that many tombstones have been moved from their original position in recent years, and care in establishing an association with a specific burial should be made.

Descriptions of gravestones should follow guidelines set out by Mytum (2002) and include details of

- Shape
- Dimensions
- Type of stone used
- Iconography (an illustration may best describe these features)
- Inscription (*verbatum* record of inscription; font of the lettering)
- Stylistic type

3. PHOTOGRAPHY

Record photographs should be taken on colour diapositive (slide) and monochrome film using SLR cameras. A full black and white and colour (35 mm transparency) photographic record, illustrating in both detail and general context every burial. Where appropriate a digital camera may be used with features and sections that are intended to be geo-referenced. This data is in addition to the information collected above and is not intended as a substitute. The benefit of using a digital camera is the speed with which the images can be processed. However, geo-referenced digital photography may be considered as a substitute for 1:10 plans of individual graves. Site code, scale, north arrow and skeleton number should appear in every photograph. A chalk board or a number board must always be used.

4. ETHICAL AND LEGAL CONSIDERATIONS

Burials that do not fall without the aegis of the Church of England may not be excavated without receipt of a Home Office licence. Excavation of burials within churchyards of the Church of England require a Faculty to be issued by the appropriate Diocesan Advisor before work may commence. Recent burials (within the last 100 years) interred within disused burial grounds may require a Disused Burials Grounds licence from the Home Office. Heritage Burial Services will usually arrange licences on request.

It is imperative that human remains are treated at all times with the appropriate respect. They should be screened from public view at all times. Sensitivity to the emotional reactions of both other archaeologists and members of the public is paramount, and it should be anticipated that these are often more pronounced when more recent burials are being disturbed.

Following excavation human remains should be stored out of sight in a clean, dry and secure place under the aegis of an appropriate individual or group.

5. Bibliography

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APPENDIX 2: OSTEOLOGICAL METHODOLOGY

1. INTRODUCTION

1.1 The osteological methodology presented below includes only macroscopic methods. Unusual or note-worthy pathology will be recorded photographically. In rare cases, radiography and other microscopic or biochemical methods may be used, but are not outlined below.

2. GENERAL TERMINOLOGY AND EQUIPMENT USED

2.1 The anatomical terminology used in this report will be in accordance with international nomenclature. The descriptive teeth formula used will be based on the Zsigmondy system (Zsigmondy 1861 in Hillson 2003, 8-9). All bones and teeth will be analysed macroscopically.

3. RESULTS

3.1 PRESERVATION AND COMPLETENESS

3.1.1 Bone preservation and completeness of the assemblage will be rated on a four-point scale, ranging from 1 (poor) to 4 (excellent). Likewise, skeletal completeness will be scored on a scale of 1 - 4 : 1 (< 25 %); 2 (25- 50 %); 3 (50- 75 %); and 4 (> 75 %).

3.2 ESTIMATION OF AGE AT DEATH

3.2.1 Diaphyseal long bone lengths will be used as the basis for ageing foetuses and neonates using methods developed by Fazekas and Kósa (as adapted in Scheuer and Black 2000). Subadults will be aged by the stage of dental eruption (Mooreess *et al.* 1963a and b)), stage of epiphyseal fusion (Scheuer and Black 2000) and diaphyseal length of the major long bones (Maresh 1970).

3.2.2 The adult skeletons will be aged by degeneration of the auricular surface of the pelvis (Lovejoy *et al.* 1985), the sternal end of the ribs (İşcan and Loth 1986 a and b) and the pubic symphysis (Brooks and Suchey 1990; Todd 1921a and b); epiphyseal fusion of the medial clavicle (Scheuer and Black 2000); dental attrition (Miles 1962), and suture obliteration (Meindl and Lovejoy 1985).

3.2.3 All individuals will be assigned a suitable precise age group as defined in Table 1.

Age group	Age range
Foetus	< 0 years
Neonate	0-1 months
Infant	0-1 years
Young child	2-5 years
Older child	6-12 years
Adolescent	13-17 years
Young adult	18-25 years
Prime adult	26-35 years
Mature adult	36-45 years
Older adult	> 45 years
Child	2-12 years
Subadult	< 18 years
Adult	> 18 years

Table 1. Age groups employed in analysis

3.3 ESTIMATION OF SEX

3.3.1 Sexually dimorphic features of the pelvis and cranium will be used to diagnose osteological sex based on standards set out in Buikstra and Ubelaker (1994) and Schwartz (1995). Osteometrics will be used as secondary sexual indicators.

3.4 ESTIMATION OF STATURE

3.4.1 Calculation of body stature will be estimated from the maximum length of the major long bones will be based on the method for Caucasians developed by Trotter and Gleser (Trotter 1970). Combined measurements of the femur and tibia will be utilised wherever possible, and in the absence of one of these bones the femur and then the tibia will be used. The major bones of the upper limb will be used if no lower limb bones are present. The left side will be used preferentially in keeping with standard osteological practice.

3.4.2 For comparative studies on stature between populations, it is recommended to use the actual bone measurement rather than the calculated estimates (Brothwell and Zakrzewski 2004, 33). The raw long bone lengths will be given as an appendix to the specialist report.

3.5 NON-METRIC TRAITS

3.5.1 The descriptions given in Berry and Berry (1967) and Finnegan (1978) will be used to record non-metric traits.

3.6 METRICS

3.6.1 Measurements on the skull and postcranial elements will be taken using landmarks described by Brothwell (1981) and by Buikstra and Uberlaker (1994). These will be used in estimation of sex, and quantifying size and body proportions (such as the platymeric and platynemic indices) that may be activity related. A number of cranial indices will also be taken, and may assist in the identification of racially distinct characteristics.

3.7 SKELETAL AND DENTAL PATHOLOGIES

3.7.1 The terminology and descriptions of the skeletal pathologies used in the report will be based largely upon palaeopathology texts, such as Ortner (2003) and Aufderheide and Rodríguez-Martín (1998).

4. REPORTING

4.1 A comprehensive specialist report will be compiled on the basis of the above data, detailing the demography of the burial population, prevalence of skeletal and dental disease and non-metric traits, and detailing osteometrics. The data will be considered in its archaeological context, taking into account phasing and burial practices.

4.2 The osteological analysis from the Coronation Street assemblage will be compared with osteological work undertaken on contemporary post-medieval assemblages. The prevalence of pathologies will also be compared to rates calculated for the period by Roberts and Cox (2003).

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APPENDIX 3: SUMMARY CONTEXT LIST

Context	Interpretation	Description
884	Disturbed ground	Layer of disturbed dark bluish-grey silty clay containing brick and disarticulated human bone within manhole trench
885	Burial soil	Mid-brown silty clay layer within manhole trench
886	Construction cut backfill	Yellowish-brown gravel backfill extending 1.5m from pumping station
887	Coffin	Coffin containing sk ***888***
888	Skeleton	Adult skeleton. Only the left leg was removed, the rest is preserved *in situ*
889	Charnel	Charnel deposit
890	Coffin	No skeletal remains recovered from within
891	Construction cut	Construction cut for pumping station
892	Gave cut	Cut for sk ***888***
893	Grave fill	Dark bluish-grey silty clay backfill of ***892***
894	Grave cut	Cut for coffin ***890***
895	Grave fill	Dark bluish-grey silty clay backfill of ***894***
896	Grave cut	Cut for sk ***898***
897	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***896***
898	Skeleton	Adult skeleton
899	Coffin	Coffin containing sk ***898***
900	Charnel	Charnel with grave ***901***
901	Grave cut	Cut for sk ***902***
902	Skeleton	Adult skeleton, abdomen, lower arms and legs outside of trench
903	Coffin	Coffin containing sk ***902***
904	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***902***
905	Grave cut	Cut for sk ***906***
906	Skeleton	Adult skeleton, the skull, right arm and the majority of the chest and spine remain *in situ* outside of the trench
907	Coffin	Coffin containing sk ***906***
908	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***905***
909	Skeleton	Highly disturbed skeleton mixed with ***910***, ***931***, ***932***, ***933***
910	Skeleton	Highly disturbed skeleton mixed with ***909***, ***931***, ***932***, ***933***
911	Grave cut	Cut for sk ***913***
910	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***911***
913	Skeleton	Adult, only left forearm, left leg and right lower leg were within the trench
914	Made ground/ burial soil	Layer of imported dark grey sand with glass slag inclusions used as a burial soil.
915	Grave cut	Cut for sk ***917***
916	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***915***
917	Skeleton	Sub-adult, only the skull, right arm and right pelvis were within the trench
918	Coffin	Coffin containing sk ***917***
919	Grave cut	Cut for sk ***920***
920	Skeleton	Adult, only the left leg was within the trench
921	Coffin	Coffin containing sk ***920***
922	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***919***
923	Grave cut	Cut for sk ***925***
924	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***923***
925	Skeleton	Adult, only the legs were within the trench
926	Skeleton	Adult, only the skull and right shoulder were recovered from the trench section
927	Grave cut	Cut for sk ***928***
928	Skeleton	Adult, left forearm and leg were outside the trench
929	Coffin	Coffin containing sk ***928***
930	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***927***
931	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***932***, ***933***
932	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***931***, ***933***

Context	Interpretation	Description
933	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***931***, ***932***
934	Gave cut	Cut for sk ***935***
935	Skeleton	Adult, only skull and right upper arm were located within the trench
936	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***934***
937	Grave cut	Cut containing charnel ***938***
938	Charnel	Charnel of a single sub-adult,
939	Grave fill	Dark grey sand with glass slag inclusions,;backfill of grave cut ***937***
940	Grave cut	Cut for sk ***941***
941	Skeleton	Adult, right upper arm outside of trench
942	Coffin	Coffin containing sk ***941***. Breast plate was partly legible
943	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***940***
944	Skeleton	Adult, left side of skull and left proximal humerus visible in the trench section before shoring was lowered. Remains *in situ*
945	Skeleton	Adult, badly disturbed and truncated, only the skull, left humerus, some vertebrae and ribs survived.
946	Grave cut	Cut for sk ***947***
947	Skeleton	Adult, fully recovered
948	Coffin	Coffin containing sk ***947***
949	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***946***
950	Grave cut	Cut for sk ***952***
951	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***950***
952	Skeleton	Adult, left arm, the skull and part of the chest were outside the trench, however the skull, left distal humerus and left radius were recovered after a section collapse
953	Coffin	Coffin containing sk ***952***
954	Skeleton	Adult, right humerus, right and left tibia recovered after a section collapse
955	Grave cut	Cut for sk ***956***
956	Skeleton	Adult, fully recovered
957	Coffin	Coffin containing sk ***956***
958	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***955***
959	Grave cut	Cut for sk ***960***
960	Skeleton	Sub-adult. Right side outside of the trench, left *in situ*
961	Coffin	Coffin containing sk ***960***. Breast plate was partly legible
962	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***959***
963	Charnel	Charnel above sk ***965***
964	Grave cut	Cut for sk ***965***
965	Skeleton	Adult, fully recovered
966	Coffin	Coffin containing sk ***965***
967	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***964***
968	Grave cut	Cut for sk ***970***
969	Charnel	Charnel above sk ***970***
970	Skeleton	Adult, truncated from the thorax down
971	Coffin	Coffin containing sk ***970***
972	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***968***
973	Grave cut	Cut for sk ***974***
974	Skeleton	Adult, fully recovered
975	Coffin	Coffin containing sk ***974***
976	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***973***
977	Grave cut	Cut for sk ***978***
978	Skeleton	Sub-adult, fully recovered
979	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***977***
980	Charnel	Charnel below sk ***974***
981	Skeleton	Sub-adult, partly recovered from section
982	Skeleton	Sub-adult, none left *in situ*
983	Grave cut	Cut for sk ***984***
984	Skeleton	Sub-adult
985	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***983***

Context	**Interpretation**	**Description**
986	Grave cut	Cut for sk ***987***
987	Skeleton	Adult, lower legs and left hand outside of trench and remain *in situ*
988	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***986***
989	Charnel	Charnel below sk ***987***
990	Grave cut	Cut for sk ***991***
991	Skeleton	Adult, fully recovered
992	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***990***
993	Coffin	Coffin containing sk ***991***
994	Grave cut	Cut for sk ***995***
995	Skeleton	Adult, fully recovered, truncated by grave ***990***
996	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***994***
997	Grave cut	Cut for sk ***998***
998	Skeleton	Adult, fully recovered
999	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***997***
1000	Charnel	Charnel above sk ***1002***
1001	Grave cut	Cut for sk ***1002***, ***1002b***
1002	Skeleton	Adult
1002b	Skeleton	Sub-adult recovered alongside sk ***1002***
1003	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1001***
1004	Grave cut	Cut for sk ***1005***
1005	Skeleton	Adult, fully recovered
1006	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1004***
1007	Skeleton	Adult, fully recovered from section
1007b	Skeleton	Sub-adult recovered alongside sk ***1007***
1008	Skeleton	Adult, skull only, recovered from section
1009	Grave cut	Cut for sk ***1010***
1010	Skeleton	Adult, right arm and leg outside of trench, left *in situ*
1011	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1009***
1012	Grave cut	Cut for sk ***1013***
1013	Skeleton	Sub-adult
1014	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1012***
1015	Skeleton	Adult, only skull and cervical vertebrae within trench
1016	Grave cut	Cut for sk ***1017***
1017	Skeleton	Sub-adult, skull fragments only
1018	Coffin	Coffin containing sk ***1017***
1019	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1016***
1020	Grave cut	Cut for sk ***1021***
1021	Skeleton	Sub-adult, fully recovered
1022	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1020***
1023	Skeleton	Sub-adult, left arm, left pelvis and chest outside of trench, left *in situ*
1024	Tarmac and hardcore	Tarmac road surface laid on top of a hardcore base.
1025	Grave cut	Cut for sk ***1023***
1026	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1025***
1027	Grave cut	Cut for sk ***1015***
1028	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1027***
1029	Grave cut	Cut for sk ***1008***
1030	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1029***
1031	Grave cut	Cut for sk ***1007*** and ***1007b***
1032	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1031***
1033	Grave cut	Cut for sk ***982***
1034	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1033***
1035	Grave cut	Cut for sk ***981***
1036	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1035***
1037	Grave cut	Cut for sk ***954***
1038	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1037***
1039	Grave cut	Cut for sk ***944***

Context	Interpretation	Description
1040	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1039***
1041	Grave cut	Cut for sk ***909***, ***910***, ***931***, ***932***, ***933***
1042	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1041***
1043	Grave cut	Cut for sk ***945***
1044	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1043***
1045	Grave cut	Cut for sk ***926***
1045	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1045***

APPENDIX 4: OSTEOLOGICAL ASSESSMENT DATA

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
888	n	n	1	3	n	3	3	N/a	N/a	N/a	-
898	y	y	3	2	y	3	3	y-with recon	19	ca, p, c, a, amtl , eh	Craniotomy. Cribra orblitalia, asymmetrical femora. OP on fem head. OA left hip, secondary to trauma?
900 (charnel)	n	y	2	2	y	3	3	n	0	amtl	OP prox tib & L dist fem. Marked enthesophytes. 'hole' R parietal.
902	y	y	1	3	y	2	3	n	4	P,c,amtl	
906	y	y	3	3	y	4	4	N/a	N/a	-	-
909	y	y	2	3	y	2	2	N/a	N/a	-	-
913	n	n	1	3	y	4	4	N/a	N/a	-	-
917	y	n	1	3	n	1	1	N/a	29	C, eh	Premature synotosis ?
920	n	n	1	3	y	5	5	N/a	N/a	-	Left OA hip joint and knee. Ankle DJD.
925	y	y	2	3	y	4	4	N/a	N/a	-	-
926	y	y	1	3	n	2	3	n	2	P, amtl	-
928	y	y	3	3	y	4	5	y	16	Ca,p,c,eh,amtl	SNs. Active periostitis left hum, ribs, R tib. OP talus.

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
935	y	y	1	3	y	4	4	y- with recon	14	Ca,p,c,a,amtl,eh	Cribra orbitalia.
938 (charnel)	y	N/a	2	2	N/a	N/a	N/a	N/a	N/a	-	-
941	y	y	3	2	y	4	4	y	22	Ca, p, c, a, amtl, eh	Cribra orbitalia
945	y	y	1	3	y	3	4	n	14	Ca, eh	Button osteoma, 3rd molars not fully erupted
947	y	y	4	3	y	4	4	n	1	Amtl, p, c, eh	Cribra orbitalia. Button osteoma? Slight OP left femur & R knee & R distal radius,ulna & ribs. OA R femoral head and distal left radius. Vert OP, Schmorl's Nodes. Fused R rib to TV. Considerable amtl.
952	y	y	3	3	y	4	4	y	0	All lost am	OA both knees. OA right 2nd metacarpal.
954	n	n	1	3	n	1	1	N/a	N/a	-	Non-specific infection. Osteomyelitis? affecting tibia, humerus, femur and fibula. Slight OP joint surfaces.
956	y	y	4	3	y	5	5	y	15	Ca, p, c, amtl, eh	OP fem head. Lytic lesion dist fib.
960	y	N/a	3	3	N/a	2	N/a	N/a	20	deciduous	Active periostitis ribs. Cribra orb.
965	y	y	3	3	y	3	4	n	21	Ca,p,c, a, amtl,eh	SNs. Endocranial lesions. Hair on left temporal. Periostitis clavicles. OA R proximal phalanx. Healed fracture? L 1st rib. Notched incisors (culturally induced)
969 (charnel)	n	n	1	2	y	2	1	N/a	N/a	-	Systemic infection - affecting femur.
970	n	y	2	1	n	2	2	n	10	Ca, c	Hair present

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
974	y	y	4	3	y	5	5	y	27	Ca,p,c,a,amtl	Lumbarisation of S1. Schmorl's nodes. Ossified cartilage
978	y	N/a	4	3	N/a	4	N/a	N/a	8	deciduous	Neonate.
981	y	N/a	1	2	N/a	1	N/a	N/a	3	deciduous	-
982	y	N/a	2	3	N/a	2	N/a	N/a	3	deciduous	perinate
984	y	N/a	3	3	N/a	3	N/a	N/a	22	Perm & deciduous	Hair preserved.
987	y	y	4	3	y	3	3	y	17	Ca,p,c,a,amtl,eh	Capitate fused to base of 3rd metacarpal left hand. Vertebral OP. Hair on skull.
991	y	y	4	3	y	4	4	n	17	P,c	Lumbarisation of S1
995	y	y	4	3	y	4	4	n	9	Ca, p, c	-
998	y	y	4	3	y	4	5	y	4	C, amtl	OA L distal femora. OP dist L humerus & dist L radius. Ossified cartilage.
1002	n	y	3	2	y	4	4	n	0	amtl	OP R glenoid and proximal hand phalanx. Hyperostosis frontalis interna?
1002b	y	N/a	3	3	N/a	4	N/a	N/a	-	-	neonate
1005	n	y	3	2	y	3	5	n	6	Ca,p, amtl,eh	Ankylosis TV.
1007	y	y	4	3	y	4	4	n	0	amtl	All teeth lost AM. OP head L femur. Ankylosis axis & C3.

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
1007b	y	N/a	4	3	N/a	3	N/a	N/a	-	-	neonate
1008	n	y	1	3	n	2	5	y	15	Ca, p, c	Hair present. Skull only
1010	y	y	3	3	y	5	5	y	29	Ca, p, c, a , eh	OP 1st metatarsal. Schmorl's nodes. Vertebral OP.
1013	n	N/a	1	1	N/a	2	N/a	N/a	0	-	Subadult
1015	y	y	1	3	n	2	3	n	0	amtl	OP vertebrae. Button osteoma. DJD TMJ. Hair present.
1017	n	N/a	1	3	N/a	2	N/a	N/a	0	-	Subadult. Skull only
1021	y	N/a	4	1	N/a	3	N/a	N/a	30	caries	Cribra orbitalia
1023	y	N/a	2	3	N/a	2	N/a	N/a	2	Deciduous	

Key: Ca - caries, C - calculus, P - periodontitis, A - periapical cavities, EH - enamel hypoplasia, amtl = *ante-mortem* tooth loss; OP= ostephyte; DJD= degenerative joint disease; L=left; R=right

APPENDIX 5: CATALOGUE OF COFFIN FITTINGS

Coffin number	Fittings	condition
887	Wood	Small damp fragments
890	Left in situ - wood, iron grip	N/A
899	Iron grip and breastplate	Corroded and fragmented
903	Wood	Small fragments
907	Breastplate	Corroded fragments
918	Fragments of wood	Small damp fragments
921	Damp fragments of wood	Small damp fragments
929	Fragments of breastplate	Corroded and fragmented
942	Fragmented breastplate with inscription: [I]sabella --a--- / Died June 23 / Aged 27 / -----	Corroded and fragmented
948	Dried wood and 2 nails	corroded
953	Fragmented breastplate	Corroded and fragmented
957	Fragmented plate and coffin stain	Corroded and fragmented
961	Fragmented breastplate with inscription: ------ / died 15th ---- / aged 4 years	Corroded and fragmented
966	Fragments of breastplate	Corroded and fragmented
971	Fragments of breastplate	Corroded and fragmented
975	Fragments of breastplate	Corroded and fragmented
993	Fragments of breastplate	Corroded and fragmented
1018	Stain	N/A

APPENDIX 6: HARRIS MATRIX

CONTENTS

SUMMARY

As part of enabling works associated with the redevelopment of land at Coronation Street, South Shields, Tyne and Wear (NGR NZ 360 670), Henry Boot Developments (HBD) found it necessary to adjust the existing sewerage network and redirect it from the pumping station on Old Coronation Street westward along the southern edge of the thoroughfare of Coronation Street itself. The trench for the new rising main, and a number of manholes, was to be some 100m long, 2m wide and was to be excavated to a maximum depth of 2.2m below the existing road surface. The route of the rising main passes through the southern part of the former cemetery of St Hilda's Church, a site that is known from previous investigations to have been heavily utilised. Consequently, the Tyne and Wear Archaeologist advised South Shields Borough Council that, in accordance with PPG16 (DoE 1990), a planning condition of the development should be the undertaking of a programme of archaeological mitigation during any intrusive groundworks and an appropriate programme of post-excavation assessment and analysis.

In order to meet the planning condition, Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of HBD, commissioned Oxford Archaeology North (OA North) to undertake the full programme of archaeological works in accordance with a project design approved by the Tyne and Wear Archaeologist. Project Stage 1 (the watching brief and fieldwork data collection) was undertaken during June and July 2007. This draft report provides a summary of Project Stage 1 and documents the results of Project Stage 2, pertaining to a programme of post-excavation assessment of the results of the fieldwork, in order to establish their potential for further analysis.

It is concluded that the 45 well-provenanced skeletons recovered from the watching brief at Coronation Street form a significant assemblage. The funerary remains are likely to date to between 1817 and *c* 1860 and are generally well preserved, with clear potential for a range of further analyses. Their greatest potential, however, can only be met once they have been combined with the much larger and more complete assemblage of human remains recovered from the excavation undertaken in 2006 by OA North to the immediate south of Coronation Street. Such a sizeable assemblage has significant potential to document aspects of the lives of the post-medieval population of a rapidly industrialising port town, who left few other personal records of their own.

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The fieldwork was undertaken by Andrew Frudd, Mark Gibson, Joanne Hawkins and Nicholas Márquez-Grant. The osteological material was assessed and reported upon by Nicholas Márquez-Grant and Sharon Clough, who also assessed the coffin fittings. Mark Gibson compiled the stratigraphic assessment and examined the other artefacts, whilst the illustrations were produced by Marie Rowland and Alix Sperr. The report was edited by Stephen Rowland and Louise Loe, who respectively managed the fieldwork and post-excavation stages of the project.

1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Henry Boot Developments (HBD) propose to redevelop a brown field site located to the immediate south of Coronation Street, in the centre of South Shields, Tyne and Wear (NGR NZ 360 670; Fig 1). As part of enabling works associated with the redevelopment, it was necessary to adjust the existing sewerage network and redirect it from the pumping station on Old Coronation Street westward along the southern edge of the thoroughfare of Coronation Street itself, to the roundabout at the junction of Station Road. The trench for the new rising main, and a number of manholes, was to be some 100m long, 2m wide and was to be excavated to a maximum depth of 2.2m below the existing road surface.

1.1.2 Previous archaeological investigations associated with the development comprise a Tyne and Wear Museums desk-top assessment (TWM 1998), which identified that the modern route of Coronation Street lies within the bounds of St Hilda's cemetery, a trial trench evaluation (Archaeological Services, University of Durham (ASUD) 2006) and a mitigatory excavation (Oxford Archaeology forthcoming), both of which proved the presence of burials to the immediate south of Coronation Street. Consequently, the Tyne and Wear Archaeologist advised South Shields Borough Council that, in accordance with PPG16 (DoE 1990), a planning condition of the development should be the undertaking of a programme of archaeological mitigation during any intrusive groundworks associated with the sewer diversion. The Tyne and Wear Archaeologist required that preservation by record should comprise several project stages. Stage 1, the fieldwork, was to include monitoring and recording during groundworks, together with excavation, recording and lifting of all human remains encountered during this process. Stage 2 was to be an assessment of the data generated by the fieldwork, whilst Stage 3 was to encompass any appropriate detailed analysis, publication and the submission of the entire project archive.

1.1.3 In order to meet the planning condition, Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of HBD, commissioned Oxford Archaeology North (OA North) to undertake the full programme of archaeological works in accordance with a project design approved by the Tyne and Wear Archaeologist (*Appendices 1 and 2*). Project Stage 1 (the watching brief and fieldwork data collection) was undertaken during June and July 2007.

1.1.4 This report provides a summary of Project Stage 1 and documents the results of Project Stage 2, pertaining to a programme of post-excavation assessment of the results of the fieldwork, in accordance with the guidance of English Heritage's *Management of Archaeological Projects, Second Edition* (MAP2; EH 1991) and *Management of Research Projects in the Historic Environment* (MoRPHE; EH 2006). As such, this stage of the project seeks to process and assess each of the forms of raw data recovered during the fieldwork in order to

establish their potential, through detailed analysis, to address the research questions outlined in *Section 3.2*. A project design for a programme of further analysis and the final archive submission to the Tyne and Wear Record Office (TWO) (Project Stage 3) will be issued as a separate document.

1.2 LOCATION, TOPOGRAPHY AND GEOLOGY

1.2.1 ***Location and modern topography:*** Coronation Street runs from the centre of South Shields, westward to its junction with Station Road, opposite the south-east bank of the River Tyne. To the north is St Hilda's Church, its graveyard, and the town's commercial centre, whilst to the south, the land is occupied by carparks and a disused warehouse. From these carparks, which cover largely level ground at *c* 5.1m OD, the land traversed by Coronation Street rises to the north and west, peaking at 10.5m OD at the junction of Coronation Street and Station Road (Fig 1). Evidence from the various phases of fieldwork undertaken at the site would suggest that much of this rise derives from artificial deposition, whilst the natural topography follows an expected westward dip towards the river (ASUD 2006; OA forthcoming).

1.2.2 The solid geology of the area is one of Carboniferous (280-350 million years ago) Coal Measures and Magnesian Limestone (TWM 1998), overlain by deposits of Devensian (73,000 to 10,000 BP) glacial till. With proximity to the River Tyne, the depth of boulder clay increases, and can be *c* 12m deep (*op cit*, 4). However, much of the proposed development area, possibly including that of Coronation Street, was occupied formerly by a tidal inlet and pool, the Mill Dam Creek, which has had a considerable influence on the historical development of the area (*ibid*).

1.3 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

1.3.1 ***Introduction:*** the following section presents a brief summary of the history and archaeology of the development site and its wider surroundings in order to contextualise the results of the present investigation. It is not intended as a comprehensive history of South Shields, various accounts of which are readily available elsewhere.

1.3.2 Although there is no contemporary evidence from the proposed development area, the earliest known human activity in the vicinity was located some *c* 1km to the north-east of Coronation Street and comprised late Iron Age settlement activity beneath the Roman fort of *Arbeia*. The fort, the easternmost defence of Hadrian's Wall, was likely to have been founded *c* AD 129 as a cavalry installation, but was rebuilt as an infantry fort during the reign of Septimus Severus in the early third century (Roman-Britain.org). There is thought to have been a contemporary settlement and port associated with the Roman fort, but their location is uncertain. The Anglian nunnery of St Hilda was built in AD 674 in the vicinity of the present development area, on the banks of the Mill Dam tidal inlet. Although the exact location of the original nunnery is not known, the area to the north of Coronation Street has remained a focus for religious activity through the medieval period and into the present. The latest

incarnation of the Church of St Hilda, some 50m to the north of Coronation Street, was rebuilt during the nineteenth century and may well occupy the site of its predecessors (TWM 1998). Little is known of the nature of secular settlement in the intervening centuries, but by 1235 South Shields was recognised as a village with 24 tennants (*ibid*), perhaps originating as a humble collection of fisherman's huts as suggested by its name *Scheles* (Middle English for huts or shelters; Roman-Britain.org). The settlement had grown further by 1256, when its 27 houses were arranged along a single north-east/south-west-aligned street straddling the Mill Dam, much like the arrangement shown on Gardner's map of 1654. As such, elements of the medieval and post-medieval settlement are likely to have lain within the present development area.

1.3.3 The Mill Dam no longer exists, but on eighteenth-century cartographic sources is shown running to the south of St Hilda's Church. By 1827 the Mill Dam had been completely infilled and had started to be built upon (TWM 1998). There is evidence from recent excavations at the Customs House (built in 1861 at what had been the confluence of the Mill Dam and the Tyne) indicating that this process of infilling had begun at least as early as the late seventeenth or early eighteenth centuries (*ibid*). South and east of Coronation Street, such deposits have been proven by recent geotechnical investigations to a depth of at least 16m below the present ground level (M Douglas *pers comm*). That such infilling may have occurred within the area of Coronation Street is hinted at by some of the older cartographic sources. Armstrong's map of 1768 depicts the Mill Dam as being very much wider (suggesting it terminated in a tidal pool) and closer to St Hilda's Church than does Richardson's map of the same year, which indicates that the extent of the churchyard, together with an associated routeway, was well-defined on what was then the northern bank of the Mill Dam. The latter source accords well with the Fryer's map of 1773 and Casson's map of 1801 and, whilst it is not possible to corroborate the accuracy of Armstrong, it may be that his map is based on an earlier survey or source showing the Mill Dam prior to infilling in the area of the church.

1.3.4 There is a possibility that detailed documentary research, particularly of the parish records and burial registers, may provide further information about the history of St Hilda's Church and the associated churchyard, but some basic information has been provided by the desk-based assessment (TWM 1998). The history of the St Hilda's would indicate that the first burials were of early medieval date; although the curtilage of the Anglian nunnery was extensive, burials are likely to have been made near the primary focus of the church. Medieval burials would, again, probably have radiated out from the church and, whilst the line of Old Coronation Street could well have fossilised a much older boundary, it is currently uncertain at which date burials extended to the formalised limit of the churchyard. Certainly by 1805 the burial ground was approaching full capacity, precipitating an attempt in 1816 to raise the level of the crowded cemetery to accommodate further burials, apparently using ballast from a nearby mound (TWM 1998). Following this raising, burial activity must have increased exponentially, matching the contemporary growth of the industrialising town. By 1856 the cemetery was closed to further burials (*ibid*), a little before a national Act of 1857 discouraged interments within urban

cemeteries, thus implying that the burial ground was again full. However, an examination of the burial register would suggest that interments, perhaps within existing family plots, took place into the 1860s.

1.3.5 The land around Coronation Street has seen considerable change over the last 150 years. The most significant of these, in terms of the present development, was the adjustment to the route of Coronation Street itself. Coronation Street originally kinked around the slightly angled southern edge of St Hilda's churchyard, an alignment preserved by Old Coronation Street. During the 1960s, this angled section of Coronation Street was straightened, so that it ran to the north through the former cemetery. The construction of a sewerage pumping station within the crook of Old Coronation Street and its redirected successor, together with associated services, must also have lain within the bounds of the cemetery.

1.3.6 ***Relevant previous investigations:*** an archaeological evaluation undertaken by ASUD in winter 2005 involved the excavation of three trial trenches to the south of Coronation Street, two of which were located within areas formerly occupied by St Hilda's cemetery (ASUD 2006). Trench 1, placed to the north-east of Old Coronation Street, revealed only disarticulated human remains and gravestone fragments. Evidence of *in situ* human remains was found within wedge-shaped Trench 3 located just to the north of the eastern arm of Old Coronation Street. This latter trench measured 18m east/west and from 2m to 4m wide at the base, following the projected southern edge of St Hilda's cemetery. Below a layer of sandy made ground and a 0.4m thick disturbed horizon containing disarticulated human bones and domestic refuse, 'natural subsoil' was encountered at 2m bgl. Fourteen 'grave cuts' were identified, four of which were investigated to reveal articulated skeletons. The associated finds were of eighteenth- to nineteenth-century date (ASUD 2006).

1.3.7 In 2006 OA North undertook the re-excavation of ASUD's Trench 3, with the aim of removing all burials down to natural deposits. During the excavation, 191 human burials were recovered from two separate burial horizons within a trench measuring approximately 17m by 4m (maximum width, reduced to 2m at depth) and up to 5.5m deep. Although natural ground was purported to have been found within the evaluation trench at a depth of 2m below ground level (ASUD 2006), the OA North excavation has proven this to be far from the case, with natural deposits encountered at a depth of approximately 5m below the modern ground level. The lower deposits, through which the earliest burial horizon had been cut, were characterised by their admixture with grey silty clay characteristic of fluvial deposits, and it is thought that these deposits relate to activity on the banks of the Mill Dam. These had been sealed by levelling dumps of clay, gravel and industrial waste through which a second burial horizon had been cut between depths of 2-4m below ground level. This material may relate to an episode of deposition, undertaken in 1816, which utilised ballast from a nearby mound in order to raise the level of the crowded cemetery to accommodate further burials (TWM 1998). If this episode is traceable within the archaeological trench excavated by OA North in 2006, then the ballast in question must have contained a high proportion of industrial and domestic refuse. In each of the burial horizons, there was evidence that

multiple interments had been made within single graves or family plots, whilst remains of coffins and their fittings were also frequent.

2 INITIAL RESEARCH AIMS AND OBJECTIVES

2.1 INTRODUCTION

2.1.1 To maximise the potential of the heritage resource, archaeological investigations are strategic in nature, with a series of clearly defined aims, often posed as research questions, and objectives, the practical means by which research questions are addressed; both are modified and developed to meet the requirements of the project and the confines of the available data. However, the impetus for the investigation is provided by a 'primary driver' (EH 2006), which, in the case of the majority of archaeological projects, is dictated by the negative impact of a development. In consideration of the fact that elements of the heritage resource were to be destroyed by the proposed development, the basic rationale, or primary driver, of the watching brief was the characterisation and preservation by record of any significant remains of archaeological interest. The various forms of data generated, together with any further research undertaken, could be analysed to provide a greater understanding of the past population of South Shields. The specific research aims and objectives for the project are outlined below; not all can be addressed at the present assessment stage, but they need to be considered when assessing the potential of each category of data for analysis (Project Stage 3).

2.1.2 ***Research background:*** archaeologically excavated post-medieval and industrial-period burials from Britain are rare. Until the 1980s the archaeological excavation of these contexts was extremely limited and cemetery clearance companies largely undertook the work without any archaeological recording. Since then, the value of such material in the understanding of the past, and to scientific enquiry in general, has been recognised, but has still not gained wide appreciation. To date, the total number of archaeologically excavated post-medieval burial contexts remains very low when compared with burial contexts from other time periods. Most examples are from London and largely comprise the middle to upper classes of Georgian and Victorian society. Few of these have been published, Christchurch, Spitalfields (Molleson *et al* 1993); St Martin's Church, Birmingham (Brickley *et al* 2006); The Royal Naval Hospital, Greenwich (Boston *et al* 2008); and All Saints, Chelsea Old Church, Kensington (Cowie *et al* 2007) being among the few that have.

2.1.3 ***Regional context:*** burial studies have always had a relatively low profile in the North East compared to other parts of the country. In particular, post-medieval and Industrial-period funerary practices and population composition are poorly understood, there having been no or limited opportunity to undertake even basic research on human populations from the region. This is largely due to the continued use of post-medieval cemeteries and the highly acidic soils which militate against the preservation of bone. The Coronation Street assemblage of human remains excavated in 2006 is the second largest to have been archaeologically excavated from the North East of England. The largest assemblage was recovered from the former Newcastle Infirmary where the remains of around 600 individuals were excavated (Louise Loe *pers*

comm). These remains comprised unclaimed hospital patients, many of whom had been dissected by early anatomists for the advancement of science, and are thus very different in nature to the assemblage from South Shields. There are no other large assemblages of post-medieval human remains from the North East of England and the nearest assemblage of comparable size is that from Barton on Humber, which includes the remains of some 400 former parishioners of St Peter's Church.

2.1.4 ***Health and demography:*** because the majority of published post-medieval assemblages comprise the middling to upper classes, Coronation Street presents a rare opportunity to explore the former lives of the industrialised working classes in terms of population composition, health and mortality. It is likely that many of those buried at St Hilda's would have been people engaged in industries connected with the local collieries, gas works, ship yards and the port. Contemporary documentary evidence indicates that industrialising populations such as this experienced poor air and water quality, overcrowding, inadequate housing, contaminated food and harsh working conditions (Roberts and Cox 2003). This impacted on health by increasing levels of infection, trauma and nutritional deficiency and resulted in increased mortality among young infants (*ibid*). The Coronation Street assemblage provides a unique opportunity to explore how this is reflected in the remains of the individuals themselves; moreover, the high number of young infants recovered from the excavation presents the rare opportunity to explore aspects of maternal health, as well as to contribute to current theories on weaning and burial practice associated with this age group (Molleson *et al* 1993).

2.1.5 ***Historical records:*** the archaeological investigation of any cemetery can yield information about those buried, but its value is enormously enhanced when studied alongside historical records. Rich historical documentation of the late eighteenth and early nineteenth century exists to complement the South Shields burial record. This includes parish records (especially burial records), Government Births, Marriages and Deaths registers (compulsory from 1837), census records, wills, trade directories and other occupational lists (eg law and the armed forces). More generally, historical accounts of funerals and of surviving coffin catalogues provide valuable historical data on the material culture of funerals and burials during this time period.

2.1.6 Historical records may also be employed to test the validity of osteological techniques, particularly those relating to age and sex estimation. Few individuals of documented age were excavated from South Shields and, therefore, this assemblage affords little, if no, opportunity to do this. However, there is scope to compare the mortality profile indicated by an analysis of the parish burial register, and that indicated by physical examination of the remains themselves.

2.2 Research Aims

2.2.1 By considering the above themes and initiatives, it is possible to pose the following research questions (RQ) that are specific to the archaeological investigation of the rising main watching brief at Coronation Street:

RQ1 Within the defined excavation area, can human remains be recovered in such a manner that maximises the potential of the captured stratigraphic data?

RQ2 Is it possible to gain an understanding of the sequence and date of the remains?

RQ3 Using extant historical documents and the results of previous archaeological fieldwork, is it possible to understand better the excavated archaeological remains and place them within a wider historical and cultural context?

RQ4 Can a greater understanding of the use, organisation and management of the cemetery, both on a wider and more personal level, be gained?

RQ5 Can the captured data from the watching brief be integrated with that recovered during the OA North excavation to the immediate south in 2006?

RQ6 Can relevant information contained within primary and secondary historical documents be accessed and collated?

RQ7 Can a better understanding of the analytical potential of the recovered osteological assemblage be gained through:

- assessment of the potential of the human remains for the estimation of biological parameters such as sex, age and stature;
- assessment of the potential of the remains to yield palaeopathological information in order to learn about the health status of South Shield's past inhabitants;
- assessment of the potential of the remains for isotope analysis;
- examination of the requirement for additional specialist analysis, such as radiography, of the remains;
- establishment of the potential of the remains to contribute to archaeological knowledge at regional and national levels, and the most appropriate way of realising this potential;
- contributing to an updated project design for analysis of the remains, with cost and time implications specified.

RQ8 What detailed and meaningful information can analysis of the skeletal remains tell us about the lives of the inhabitants of South Shields?

RQ9 Can the results of the analysis of the skeletal remains be used to provide a comparison with documentary sources and with remains from contemporary sites?

RQ10 How can the results of the investigative programme be made available to the wider public, and all data, artefacts and remains archived or reburied appropriately?

2.3 RESEARCH OBJECTIVES

2.3.1 ***Overall Research Objectives:*** the following overarching objectives (RO) have been formulated with reference to the research questions (*Section 2.2.1*).

ROa Conduct a programme of archaeological observation, investigation and recording during the course of all groundworks within the former burial ground.

ROb Recover, process and undertake an assessment and then any appropriate analysis of the artefacts from the fieldwork, particularly those that are datable, and integrate them into the stratigraphic sequence.

ROc Undertake provisional and then any appropriate detailed analysis of the on-site stratigraphy in order to understand better the relationships between the different elements.

ROd Undertake an osteological assessment and then any appropriate analysis of the human remains excavated from the site by:

- quantification of the remains, including the number of articulated skeletons and quantity of disarticulated human bone;
- evaluation of the overall condition and completeness of the remains, with reference to the survival of indicators of age, sex and stature, metrical and non-metrical analyses, and palaeopathological examination;
- establishment of the basic demographic composition of the population, including the proportion of adults and the proportion of juveniles;
- establishment of the overall range and extent of palaeopathological conditions.

ROe Assess and then undertake any appropriate analysis of the material and manufacture of any coffins and fittings in order to establish any patterns in origin, trade and also quality, which can then be linked with the results of osteological analysis.

ROf Undertake a detailed literature search of available sources at the Tyne and Wear Record Office, the Diocesan library, local and university libraries, as well as of more general reference works and histories.

3 METHODOLOGY

3.1 PROJECT DESIGN

3.1.1 The OA North project design (*Appendices 1 and 2*) approved by the Tyne and Wear Archaeologist was followed as fully as possible throughout the investigation; all work was consistent with the relevant standards and procedures of the Institute of Field Archaeologists (IFA), and generally accepted best practice.

3.2 FIELDWORK METHODOLOGY

3.2.1 ***Extent of groundworks and contractor's methodology***: the monitored groundworks for the insertion of the diverted sewer comprised two principal elements. The first, a 2m square pit for a manhole, was excavated to a depth of 3m below ground level (bgl) to the immediate west of the Old Coronation Street pumping station. The second consisted of a 1m-wide trench for the rising main itself. This ran for some 11m north-west from the manhole before following a slightly oblique westward alignment along Coronation Street for a further 80m until the junction with Station Road was reached. Although formation level for this trench was nominally 2.2m deep, the presence of existing services beneath which the rising main had to be threaded meant that the trench was excavated to depths of 2.4m and 2.6m bgl at the eastern and western ends, respectively. On occasion, the trench was widened to a width of 1.3m to allow for the welding of pipe sections.

3.2.2 Shoring was erected in all excavations and was installed either at a depth of 2m or once archaeological remains had been revealed. In the manhole 2m by 2m box shoring was used, with 3m sheet piles at the open ends. Along the majority east/west section of the trench, 3m by 1m box shoring was used; within the north-west/south-east-aligned section, and in those locations where the trench was widened for welding the inserted sewer pipes, or where services were present, 3m sheet piles supported by hydraulic whalers were installed. Access to excavations was granted once the shoring had been adequately installed and the trench had been monitored with a gas meter for five minutes. Excavations were entered via a ladder and a gas meter was with the work party at all times.

3.2.3 ***Monitored excavation:*** removal of the uppermost levels of modern tarmac and made ground down to the top of significant archaeological horizons was undertaken by a 13 ton wheeled 360 machine, fitted with a 1m-wide toothless ditching bucket and operating under archaeological supervision. Thereafter, any archaeological features or remains were cleaned and investigated manually to define their extent, nature, form and, where possible, date. Once archaeological remains were excavated, recorded and removed, the excavation with the machine was allowed to continue under archaeological supervision. Where services limited access by the machine, such as for the easternmost 4m of the trench, the contractors excavated by hand. With the exception of obviously modern deposits associated with the construction of Coronation

Street, all excavated spoil was monitored for skeletal remains and artefacts before it was removed from the excavation area by a dumper.

3.2.4 Once funerary remains were revealed, they were hand-excavated by an experienced archaeologist or osteoarchaeologist. Each skeleton was cleaned rapidly to reveal the body position and orientation, and its relationship to underlying burials, so that it could be recorded as fully as possible. The use of shoring meant that parts of skeletons often fell outside of the excavated trench; these elements were necessarily left *in situ* and only recovered where they were revealed or displaced by deeper groundworks. Similarly, in order to avoid damage to the service network, skeletal remains within baulks beneath services could not be cleaned or recovered. Infant skeletons, along with the surrounding soil to maximise small bone recovery, were lifted in plastic sample tubs, whilst the other skeletons were bagged by side and anatomical element and placed in strong boxes. Together with any associated funerary artefacts and fittings, these were stored temporarily in a secure, locked container on site, before being removed to Oxford at the completion of the watching brief.

3.2.5 ***Recording***: a comprehensive written, drawn, and photographic record was made in accordance with the *Standard and Guidance for Archaeological Excavation* (IFA 2001). All information identified during the watching brief was recorded stratigraphically on *pro-forma* recording sheets, with a continuous unique numbering system for all features and deposits in operation. *Pro-forma* skeleton sheets recorded details of the body position, orientation, skeletal condition and completeness, presence of soft tissue and artefacts (such as shroud pins and buttons). Those for coffins (whether surviving as fragments, a stain, or as fittings), described the materials, construction, size and shape of the coffin, as well as the decorative metal fittings (including fixing nails and screws, upholstery and upholstery studs, grips, grip plates, breastplates, lid motifs and escutcheons). Any motifs on these fittings were also described.

3.2.6 A fully indexed photographic and drawn record of individual features, working shots and general views was maintained. Photography was undertaken using 35mm colour slide and monochrome print film, together with high quality digital photography for the purposes of presentation. All levels recorded on-site were tied into Ordnance Datum, with the positions of planned features being established using a total station theodolite (TST). Before lifting, skeletal remains were recorded photographically, which, where the prevailing conditions allowed, made use of geo-rectification (for example, where skeletons were not obscured by services or recovered from the trench section). A summary of the results of the fieldwork is presented in *Section 4*.

3.3 POST-EXCAVATION ASSESSMENT METHODOLOGY

3.3.1 ***Introduction***: the data recovered during the fieldwork was assessed in consideration of the project research questions and in accordance with the project objectives (*Sections 2.2.2-3*). Thus, the overarching objective of the assessment was to evaluate all classes of recovered data in order to determine the potential of the dataset for further analysis.

3.3.2 ***Material assessed***: the entire paper, digital, photographic and material archive deriving from the watching brief was examined for the purposes of this assessment. This included the stratigraphic records (context sheets, plans and sections), and the photographs, as well as the finds, funerary artefacts and the human remains.

3.3.3 ***Methodology***: the method of assessment used varied with the class of information examined, although in each case it was undertaken in accordance with guidance provided by MAP2 (EH 1991). During the assessment, the quantity, range, variety, provenance and condition of all classes of data were evaluated within the framework of the project research questions and objectives. *Section 4* summarises the raw data and results of the assessment of each data category, but full details and raw data reside within the project archive.

3.3.4 ***Stratigraphy***: the assessment of the stratigraphy was facilitated by the digitisation of the Harris matrix and the production of a provisional site plan; all of the context records completed during the excavation were entered into a specially designed Access database. The assessment of the stratigraphy comprised a quantification and qualitative appraisal of the recorded data, a brief interrogation of its complexity, and a consideration of those research questions that might be addressed, fully or in part, by the recovered stratigraphic data.

3.3.5 ***Human Remains***: the site archive and skeletal remains recovered during the rising main watching brief were examined to determine the quantity, general condition, completeness, provenance, date and nature of the material. 'Nature' refers to whether the material comprised articulated (disturbed or undisturbed) or disarticulated remains, and the proportion of adults to juveniles. The potential of the material to yield biological information, including more precise estimates of age, as well as other biological parameters, such as sex and stature, was also explored. In addition, the potential of the collection to yield information relating to pathology was assessed and, in particular, whether there were any unusual conditions present that would require detailed specialist examination and/or analytical techniques beyond standard macroscopic examination. In light of these findings, the potential of the collection for further work was evaluated. No attempt was made to estimate sex, age, stature or explore pathology in any detail since these are all factors that are beyond the requirements of an assessment. These procedures were undertaken in accordance with the national guidelines set out by Mays *et al* (2002) and with reference to standard protocols for examining human skeletal remains from archaeological sites (Brickley and McKinley 2004; Buikstra and Ubelaker 1994; Cox and Mays 2000).

3.3.6 Completeness was estimated by recording, as a percentage, how much of the skeleton had survived and assigning it to one of the following categories:

1 = <25% complete

2 = 25-50% complete

3 = >50-75% complete

4 = >75% complete

3.3.7 The condition of the bone was assessed according to the degree of erosion of the bone surface and how much of the epiphyses (the ends of the bones) and cancellous bone (the spongy bone that is beneath the outer layer) had survived. Based on these factors, skeletons were assigned to one of the following categories:

1 = Poor (cortical bone completely eroded. Very limited survival of epiphyses and cancellous bone);

2 = Fair (moderate erosion of cortical bone. Limited survival of cancellous bone and epiphyses);

3 = Good (Occasional erosion on cortical bone. Cancellous bone complete and frequent survival of epiphyses);

4 = Excellent (cortical bone undamaged, cancellous bone and epiphyses complete).

3.3.8 All anthropological and palaeopathological observations were made by rapidly scanning each skeleton. Although these observations provide adequate guidance to the potential of the material for further work they are, by their very nature, preliminary and subject to change as a result of any future high resolution examination.

3.3.9 Apart from the potential of the skeletons to yield information relating to age and sex, the skeletons were also assessed for their potential to yield metrical data such as stature, assessment of ancestry and biological variation and age estimation in sub-adults. Potential for metrical assessment was scored on a scale of 1-5, where ‘1’ denotes skeletons that showed no potential (ie no elements could be measured owing to fragmentation/poor preservation) and ‘5’ denotes skeletons that showed high potential (ie the full range of standard cranial and post-cranial measurements could be taken).

3.3.10 An assessment of the potential for the skeletons to yield non-metrical data was examined. Non-metric traits are morphological variations in the skeleton. They are influenced by both the environment and genetics, but to variable and unpredictable degrees (Saunders 1989). These traits were scored on a scale of 1-5, where ‘1’ denotes skeletons that showed no potential for non-metrical analysis (ie preservation prevented the observation of all standard cranial and post-cranial sites) and ‘5’ denotes skeletons that showed high potential for non-metrical analysis (ie all standard cranial and post-cranial sites could be scored). More readily observable traits were noted (but not formally scored) to give an indication of the level and range of traits present in the population. This will inform a data collection strategy for full analysis.

3.3.6 ***Finds***: all finds and artefacts from the watching brief were retained and were treated in accordance with the guidelines set out by the UK Institute for

Conservation (UKIC 1990) and those of the Museums and Galleries Commission (1992). All artefact fragments were examined by visual inspection and an outline computer record was created using Microsoft Access. Data were recorded in a standardised format, noting provenance, type of object, material, period, and a brief written description and all pottery was recorded by digital photograph, in the form of a single record shot per context. This database will form the basis for any further work recommended, or will comprise the archive record, as appropriate.

3.3.7 ***Archive***: several tasks facilitating both assessment and the completion of the archive, such as marking of photographs, were undertaken. The full preparation and deposition of the archive is however, a task that falls beyond the scope of the assessment, and will be treated in more detail within the updated project design for analysis, publication and archiving. A copy of all final reports will be lodged with the Tyne and Wear Historic Environment Record (HER) and the Tyne and Wear Record Office.

4 RESULTS

4.1 INTRODUCTION

4.1.1 The following section summarises and assesses the results of each category of data recovered during the watching brief fieldwork. All classes of data generated by the fieldwork were assessed in accordance with the methodology outlined in *Section 3* and statements of the significance of the results from each element of the archive are given below. These statements are based on the assessment work undertaken, related to the original academic themes expressed in *Section 2*. For the sake of brevity and clarity, individual context descriptions are summarised within *Appendix 3*, the osteological data within *Appendix 4* and a catalogue of the coffin fittings in *Appendix 5*. The location of the archaeological remains is depicted in plan on Figure 2, whilst their stratigraphic relationships are presented as a Harris matrix in *Appendix 6*. Figure 2 also shows the locations of the numbered shoring boxes, which, by the nature of the watching brief, provided spatial orientation and are occasionally mentioned in the following text as clearly visible reference points.

4.2 STRATIGRAPHY

4.2.1 ***Modern:*** the tarmac road surface and its hardcore base, ***1024***, was a uniform 0.5m thick for the eastern portion of the rising main trench. However, towards the western end, the depth of modern made ground increased to as much as 2.6m as the road rose to meet the roundabout. Services were encountered throughout the length of the trench, the highest concentration being within the easternmost 4m, where, found at depths between 0.6m to 0.8m bgl, they obscured access to the archaeology below. Along the rest of the trench the majority of the services were drainage pipes. These were mostly just below the hardcore of the road, were easily removed and later reinstated; none impacted upon the archaeology below. The construction cut for the pumping station, **891**, did impact deep enough to interfere with archaeological deposits, but did not appear to truncate directly any burials within the investigated area.

4.2.2 ***Industrial Period:*** all of the recorded archaeological features comprised funerary remains cutting into deposit ***914***, a soft dark grey sandy material. At the eastern end of the trench, where it was excavated to its greatest depth, it was in excess of 2.5m thick and at all times extended beyond the vertical limit of excavation. This deposit, containing evidence of domestic refuse, as well as glassy slag and other waste products, could not have derived from the natural clay substrate (which was never encountered during the watching brief) and had clearly been imported. Within the rising main trench, deposit ***914*** was observed running from its eastern extent to a point some 22m short of the roundabout, whereupon it was sealed completely beneath modern made ground and not impacted upon further. The nature of deposit ***914*** and the method of excavation meant that grave cuts were not readily identifiable until the skeletons were encountered at a variety of depths below ground level

between 1.2m and 2.4m bgl. Whilst these depths clearly followed the general trends within the manmade topography (for example, westernmost burial ***1023*** within Box 10 lay at 2.05m bgl, whilst ***935***, close to the eastern end, lay at only 1.2m bgl) there was a degree of variation, and it is entirely possible that further interments lie below the present depth of investigation.

4.2.3 A total of 43 graves containing 45 inhumations were identified during the watching brief. Along with these, eight charnel deposits, one clearly from a single individual, and the remains of 18 coffins, were also discovered. Two coffins are of note, ***942*** and ***961*** (Plates 3 and 4), as the breast plates were partly legible when they were uncovered. Both were fully recorded but fragmented upon lifting, due to their highly corroded state and damaged caused to them by the shoring. All of the inhumations shared an oblique east/west orientation matching that of the extant church and that of the northern boundary of the churchyard. All were laid in a supine position with their limbs extended and their hands either on the pelvic region or proximal femurs. Due to the narrow width of the trench, only half of the burials could be recovered fully, with various anatomical parts of the remaining twenty-two left *in situ* beyond the limits of the trench. This was a particular problem at the eastern end of the rising main trench, where its north-west/south-east alignment cut across the 'grain' of the burials.

4.2.4 The 43 grave cuts appear to have been distributed amongst 33 burial plots or groups. Within the limit of excavation, most of the plots contained only a single burial, but five contained two, one, towards the centre of the north-west/south-east-aligned section of trench, contained four (***898***, ***909***, ***931*** and ***932***) and another, in Box 5, contained five burials (***991***, ***995***, ***998***, ***1002***, ***1002b***). The intensity of cemetery usage was attested further by the charnel deposits, indicative of the disturbance of earlier burials by later grave-digging. Five of these were located above the burials, indicating that the bones disturbed by later grave-cutting had been collected and redeposited after the new burial had taken place. Three of the charnel deposits (***938***, ***980*** and ***989***) had been placed in a discrete pit that was then sealed by the subsequent burial (Plate 2).

4.2.5 ***Assessment of potential***: the archive of primary fieldwork data is a comprehensive and well-organised record of the recovered stratigraphic information, with significant archaeological remains recorded graphically, textually and photographically. The stratigraphic sequence is essentially rather simple and will need little further manipulation to be understood fully; it is dominated, almost exclusively, by funerary deposits and features and, as such, it provides the analytical basis for any understanding of the intensity and organisation of burial, as well as, in a number of instances, the relative sequence of interment. The recorded stratigraphic data provides a flexible framework within which the analysis of the other forms of data can take place, and is particularly valuable in the comparison of the distribution of the skeletal remains identified in the rising main trench, and those excavated to the immediate south in 2006.

4.3 Human Remains

4.3.1 ***Introduction:*** the human remains recovered during the watching brief include 45 skeletons and a number of disarticulated bones deriving from eight different contexts, including those relating to charnel deposits and disturbed burials. Other than quantification, no further analysis of the disarticulated remains was necessary at this stage.

4.3.2 ***Completeness:*** nine skeletons were approximately more than 80% complete and were represented by skull, upper and lower extremities, thorax and pelvis (Table 1). Most of the remaining skeletons were either approximately >50-75% complete or <25% complete. Incompleteness was largely a result of later graves truncating earlier graves.

Completeness	Total
1 - <25%	15
2 - >25-50%	7
3 - >50-75%	13
4 - >75-100%	9

Table 1: Completeness of articulated skeletons

4.3.3 ***Condition of the skeletons:*** overall, the condition of the bones was good. This means that cortices and joint surfaces were well preserved. The majority of adult skulls were broken or absent, however. Approximately a quarter of skulls from the assemblage would be available for detailed metrical analysis, with a small number of these needing reconstruction. Fragmentation was low or moderate across the individuals. This means that there is good potential for metrical analysis in the assemblage (see paragraph below).

Condition	Total
1 - Poor	3
2 - Fair	8
3 - Good	33
4 - Excellent	0

Table 2: Condition of articulated skeletons

4.3.4 ***Estimation of biological sex:*** most adult skeletons had features surviving that would allow the application of standard techniques to estimate their biological sex (Brickley and McKinley 2004; Cox and Mays 2003). It will be possible to estimate the sex of 27 adult skeletons using features of either the skull and/or pelvis. There are currently no accepted methods for estimating the sex of sub-adult skeletons.

4.3.5 ***Estimation of biological age:*** there were 12 sub-adults and 33 adults. Preliminary observations suggest that all age groups are represented in the assemblage, including perinates, new borns, young children, adolescents, young, middle and mature adults. All skeletons had traits surviving that will allow ages to be estimated to within 10 years for adults and 5 years or less for

sub-adults, as described in Brickley and McKinley (2004) and Cox and Mays (2003). Further, most skeletons had a range of traits surviving for age estimation. Estimating the age of skeletons is more accurate if observations are based on a range of traits, rather than a limited number.

4.3.6 ***Potential for metrical analysis:*** a high number of skeletons show potential for metrical analysis of long bones and/ or skulls (Table 3). Metrical analysis will be possible for 11 adult skulls, which were either intact or will require some reconstruction. Skull measurements allow ancestry to be explored (i.e. whether caucasian, mongoloid or negroid) (Krogman and Iscan 1986), as well as the biological variation.

4.3.7 Metrical analysis of long bones to allow estimation of stature will be possible for 26 out of 33 adults by employing measurements of the upper long limb bones and lower long limb bones. Stature estimations based on the lengths of lower long limb bones are more accurate than those that are based on lengths of the upper long limb bones. Stature estimation involves applying the maximum length of any available major long bones to regression equations set out by Trotter and Gleser (1952) and modified by Trotter (1970). As there are different equations for males and females, it is not possible to estimate accurately the stature of those skeletons within the assemblage that are of unknown sex. Metrical data to facilitate estimation of age for the sub-adults will be possible.

Score	**Number of individuals**
1 - one or no measurements will be possible	3
2 - a few measurements will be possible	12
3 - half the number of standard measurements can be taken	9
4 - majority of long bones can be measured	16
5 - Every bone can be metrically recorded	4

Table 3: Potential for standard metrical analysis

4.3.8 ***Potential for metrical and non-metrical analysis:*** adequate cranial and post-cranial remains have survived that will allow the observation of a standard set of landmarks for scoring the presence or absence of non-metrical traits (Brothwell and Zakrzewski 2004).

Non-Metric score	**Number of individuals**
1 - 1 or no landmarks observable	3
2 - a few observable landmarks	2
3 - half of the landmarks are observable	7
4 - majority of the landmarks are observable	13
5 - Every landmark can be observed	9
N/A - subadults not scored	12

Table 4: potential for non-metrical data

4.3.9 ***Pathology:*** overall, all of the skeletons had survived in a condition that is good enough to allow future detailed macroscopic analysis and documentation of pathology. A range of conditions was noted in passing and are listed in *Appendix 4*. They include evidence of trauma, joint disease (osteoarthritis), metabolic conditions (for example, cribra orbitalia), neoplastic disease and infection. Trauma includes fractures, some of which will need radiology to confirm and gain insight into their healing status. Anomalies, for example, asymmetrical limbs, were also present and may relate to traumatic injury. Again, radiology would be required to explore this.

4.3.10 Non-specific inflammation was noted on several bones of one skeleton, suggesting systemic disease. There are numerous conditions that can cause these changes, neoplastic disease, infection, and pulmonary disease, being among them. Further analysis will be required to explore this further.

4.3.11 There was evidence for post-mortem medical intervention in the form of one craniotomy, the removal of the top of the skull in the horizontal plane in order to examine the brain. Such an intervention was usually performed to explore the cause of death, but also to further knowledge about a particular ailment or lesion.

4.3.12 The amount of dental disease in the assemblage is noteworthy, and includes caries, periodontal disease, abscesses, ante-mortem tooth loss and calculus. Heavy wear patterns were also observed on the teeth and further analysis will be required to explore if they can be attributed to any cultural habits (for example, smoking a pipe).

4.3.13 No quantification or detailed description of the above pathological conditions has been undertaken at this stage, but they certainly warrant this level of analysis. The potential of the assemblage to yield information about the health status of the population is considered to be very good.

4.3.14 ***Assessment of overall potential for analysis:*** despite the fact that a proportion of this assemblage is incomplete, the preservation of all of the remains is sufficient for age, sex and stature to be estimated in most cases. Further, sufficient landmarks survive that will allow evidence for family groups to be explored through non-metrical trait analysis. There is also some potential to evaluate ancestry by the morphological and metrical analysis of skulls. Preliminary observations suggest a group of individuals of mixed ages and sexes. A range of pathological conditions is present and, through more detailed analysis, have the potential to provide valuable insights into the overall health status of the population.

4.3.15 The 45 skeletons described here represent a small assemblage, but nevertheless an important one. To date, extremely limited study of post-medieval working class assemblages has been undertaken and there are virtually no osteological studies of populations from the industrialised north-east of England. The value of this assemblage is further increased because of the research potential that would be gained by combining it with the 191 skeletons that were excavated from other parts of the graveyard. Full,

specialist examination of the remains is likely to yield results worthy of publication.

4.3.16 Questions that might be explored at full analysis include:

- What is the demographic composition of the population?
- Is the mortality profile consistent with an industrialised working class population?
- Is there evidence for inter-personal violence in the population, or does the trauma relate to accidental injuries?
- What is the healing status of the trauma? Does this suggest adequate treatment following injury?
- The presence of cribra orbitalia indicates childhood health stress in the population, but what impact did this have on growth?
- Cribra orbitalia is believed to be caused by increased pathogen loads. Does evidence for infection support this?
- Is there evidence for scurvy and rickets?
- Do some of the skeletons share the same non-metric traits and does the distribution of non-metric traits suggest family groups?
- Do any individuals from the population have traits that suggest non-caucasoid ancestry?
- How does this population compare with others that are similar in date and type in terms of its health and physical attributes?

4.3.17 During such analysis, disarticulated bones could be examined to identify discrete individuals, whilst all discrete skeletons would be examined according to standard, recommended practice (Brickley and McKinley 2004). Skeletons would be assigned to age and sex categories and, combined with palaeopathological information, the mortality profile would be explored, taking into account the archaeological background of the site. For example, this would explore whether peaks in the mortality curve are associated with any pathological conditions, or whether statistics have been biased by cultural practice, such as the zoning of burials by age or family.

4.3.18 Wherever preservation permits the standard range of measurements could be recorded, allowing estimates of stature, an exploration of ancestry and the facilitation of other biological analyses (for example, estimation of sex for adults and age and sex for sub-adults). A range of non-metric traits could be scored as present or absent and this information would be used to explore relatedness between individuals. The status of the dentitions could be recorded to explore oral care, cultural habits (ie pipe smoking), diet and any other anomalies. Pathological conditions could be described and documented by illustrations and photographs. Differential diagnoses could be explored with reference to standard texts (for example, Ortner and Putschar 1981) and, where relevant, radiography. These objectives could be greatly complimented by the application of stable isotope analysis to explore diet and geographic origin. All

findings would be discussed in the context of contemporary funerary practices and comparable samples from Britain. A full catalogue of the skeletal remains would be provided in an appendix.

4.4 FUNERARY FIXTURES, FITTINGS AND ARTEFACTS

4.4.1 ***Introduction:*** evidence of 18 coffins was recorded during the watching brief, of which three were observed only as soil stains. The remainder comprised fragments of poorly preserved wood, a grip and breastplates, of which two of the latter retained some legible script (*Appendix 5*).

4.4.2 ***Nature of the material:*** fragments of eight breastplates were recovered, amongst which two retained partial biographical inscriptions. All were of punched tin which was painted or enamelled black with white script painted on. None were sufficiently well-preserved to discern the type/decoration. A single highly corroded iron grip was recovered, with the remainder of the assemblage comprising highly fragmented pieces of breastplate or coffin wood.

4.4.3 ***Other finds:*** seven copper alloy shroud pins were associated with two individuals, ***900*** and ***917***, a copper button was associated with ***995***, and another copper button along with the iron and leather remains of a belt were associated with ***974*** (Plate 6). Two iron-bladed knives were recovered from burial soil ***914***. The first (object 160), recovered from the north-west/south-east stretch of the trench, was a simple design with a handle made from two pieces of animal bone secured to the tang with two copper-alloy rivets. The handle had been incised with diagonal lines running in a single direction and the blade had been broken approximately 20mm from the handle. The second, a folding or lock knife (object 165) was located at the base of Box 3, below the level of the skeletons that had been recovered from there. The cross-hatched incised bone handle was slightly curved.

4.4.4 ***Potential and recommendations:*** the potential of the coffin fittings is limited because of its small size and highly corroded condition (in particular, of the breastplates). However, it will still be possible to characterise the coffins and some of the fittings in regional and chronological terms, especially if they can be contextualised through further research. Photographs of the breastplates *in situ* may enable biographic detail to be recorded for those plates that fragmented upon recovery. It is recommended that, where appropriate, fittings and artefacts are radiographed to provide a record of their size and shape. Grip and plate types should be drawn if they are identified as new styles, or catalogued if they match existing typologies.

5 CONCLUSIONS

5.1 INTRODUCTION

5.1.1 The following section presents those conclusions that can be drawn from the assessment. A separate document will provide updated project aims and objectives, and a project design for Project Stage 3, a scheme of analysis appropriate to the potential of the dataset and those requirements of the Tyne and Wear Archaeologist that are necessary to discharge the planning condition.

5.2 PROVISIONAL DISCUSSION

5.2.1 It is extremely difficult, and indeed, undesirable, to discuss the remains recovered from the present watching brief without making some consideration of the results of the excavation to the immediate south undertaken by OA North in 2006. A number of similarities were observed between the two phases of work. Of particular importance was the analogous character of the burial substrate. This clearly imported material, in excess of 2.5m thick, contained various quantities of domestic and industrial refuse, and is likely to represent an effort to raise the level of the cemetery in order to accommodate more burials. One such event, utilising material from a nearby ballast mound, was recorded as having taken place in 1817; further documentary research may reveal other such instances, but it is tempting to suggest that those skeletons revealed during the present watching brief date from 1817 to the closure of the cemetery to new interments *c* 1860. They can, therefore, be considered to fall within a relatively narrow date range.

5.2.2 As with the burials excavated by OA North to the south in 2006, the intensity of burial and the use of family plots can clearly be seen, as can hints of the manner in which the cemetery was organised. There is a suggestion that the graves of the burials recovered during the watching brief were laid-out reasonably neatly, which may have implications for the interpretation of their status. Such evidence needs to be contrasted with that from the excavation trench to the south in order to examine the wider use of space within the cemetery.

5.2.3 Although a considerable number of human remains were removed from the zone of impact associated with the sewer diversion, the nature of the findings during the archaeological excavation to the south in 2006 would suggest that many more, undisturbed, inhumations are likely to lie intact beneath the base of the diverted sewer. Such remains could be disturbed by deep excavations in the future, and this may be particularly problematic at the western end of the sewer, where the burial horizon was increasingly thickly blanketed by deposits of modern made ground and may have suffered little previous disturbance. Even within the eastern end of the sewer trench, the fact that the base of the imported burial soil was not reached, may suggest that what currently appear to be deeply buried individual interments may merely be the top of stacks.

There is also the fact that all of the revealed skeletons derive from the latest of at least two separate burial horizons and again, deeper excavations in the future are highly likely to reveal such remains in equal, if not greater, intensity.

5.3 STATEMENT OF SIGNIFICANCE AND PROPOSAL FOR FURTHER WORK

5.3.1 The research context for the present investigation, including appropriate frameworks and regional studies, has been outlined in *Section 2*, and will not be reiterated here. Suffice to note, the assemblage from the rising main watching brief at Coronation Street is an important addition to the small but growing corpus of post-medieval and Industrial-period human skeletal assemblages recovered archaeologically from the North East.

5.3.2 The assemblage, although relatively small (45), has the potential to provide a rare insight into nineteenth-century living conditions and how these impacted on the health and physical attributes of the population. This contribution is increased vastly if these remains can be considered in conjunction with the 191 individuals recovered from the excavation undertaken in 2006. Both the EH and Tyne and Wear archaeological monitors have recognised the value of the combined assemblage as one of the largest post-medieval collections from the area, particularly as it dates from a period of major expansion of the industrialising port of South Shields. Moreover, archaeologically excavated post-medieval cemeteries are highly centred around London and Birmingham and most relate to the middle-upper classes, unlike the St Hilda's assemblage, which represents a working class population from the North of England.

5.3.3 The use of the rich historical documentation of the late Georgian and early Victorian periods is an important aid in the interpretation and contextualisation of the results of the excavation and the osteological analysis. The health and demography of the assemblage could be particularly revealing, as documentary evidence suggests industrialising populations experienced high levels of stress and poor diet, crowded living conditions, rife with infectious disease. The assemblage will go some way to confirm or refute these assumptions and the findings would be set in a wider context by comparison, at a statistical level, with other British populations of a similar date (Roberts and Cox 2003).

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ILLUSTRATIONS

FIGURES

Figure 1: Location plan

Figure 2: Location plan of the human remains recovered during the rising main watching brief on Coronation Street

PLATES

Plate 1: East-facing view of the pipe trench

Plate 2: Charnel ***980*** in pit

Plate 3: Painted breast plate on coffin ***942*** reads: [I]sabella ?A?? Died June 23 18??, Aged, 27 years

Plate 4: Skeleton ***941*** with breast plate ***942***

Plate 5: Skeleton ***928***

Plate 6: Skeletons ***974*** and ***978*** with button and belt buckle

APPENDIX 1: PROJECT DESIGN

SEWER DIVERSION EXCAVATION, CORONATION STREET, SOUTH SHIELDS,

TYNE AND WEAR

Archaeological Watching Brief:

Project Design V1.1

Oxford Archaeology North

May 2007

Henry Boot Developments Ltd and ARCUS

OA North Job No: L9706
NGR: NZ 360 670

1. INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 The following document has been prepared by Oxford Archaeology North (OA North) in response to a request from Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of Henry Boot Developments Ltd (hereafter the 'Client') for proposals for an archaeological watching brief to be undertaken during groundworks associated with a water main along the route of Coronation Street, South Shields (NGR NZ 360 670). The present document comprises a methodology for the archaeological fieldwork; the methodology for any post-excavation work to be undertaken on human remains recovered by the watching brief would be covered by *Sections 3.3* and *3.4* and *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006. The present scheme of groundworks to be subject to archaeological monitoring will involve construction of a sewer and a number of manholes along the route of Coronation Street, from the pumping station on Old Coronation Street in the east, to the roundabout at the junction of Station Road in the West. It is thought that groundworks will be enacted in a series of short sections measuring up to 2m wide by up to 2m deep.

1.1.2 Previous archaeological works in the area comprise a desk-top assessment, undertaken by Tyne and Wear Museums (1998), which identified that much of the present route of Coronation Street lay within the bounds of St Hilda's cemetery, an archaeological evaluation undertaken by Archaeological Services, University of Durham, which proved the presence of burials on the site at a depth of around 2m below ground level (ASUD 2006) and a recently-completed excavation undertaken by OA North, which took place in the small area between Coronation Street and Old Coronation Street. During the excavation, 191 human burials were removed from a trench measuring approximately 17m by 4m (maximum width, reduced to 2m at depth) and up to 5.5m deep. The concentration of these remains suggests that human remains may well be present within the areas of the proposed sewer trenches, although given the presence of made ground associated with the modern landscaping of the area, such remains could lie below the 2m depth of impact, and thus be unaffected by the development.

1.2 GEOGRAPHICAL, HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

1.2.1 The proposed development site lies in the centre of South Shields, with the River Tyne running close by, to the west. Although there is no contemporary evidence from the proposed development area, the earliest known human activity in the vicinity is located some *c* 1km to the north-east of Coronation Street and comprises settlement activity beneath the Roman fort of *Arbeia*. There is thought to have been a contemporary settlement and port associated with the fort, but it is uncertain where these lay. The Anglian nunnery of St Hilda was built in 674 AD in the vicinity of the present development area, on the banks of the Mill Dam tidal inlet. Although the exact location of the original nunnery is not known, the area to the north of Coronation Street has remained a focus for religious activity through the medieval period and into the present, with the latest incarnation of the Church of St Hilda having been rebuilt during the nineteenth century and possible occupying the same site of its predecessors.

1.2.2 Land to the south of Coronation Street, in the area of Old Coronation Street, is largely level at *c* 5.1m OD, but rises to the west, in the area of the roundabout, to 10.2m OD and to the immediate north, along Coronation Street itself, to *c* 7.3m. The natural drift geology of the area comprises thick boulder clay deposits (up to 12m thick). However, much of the proposed development area was occupied by a tidal inlet, the Mill Dam Creek, which is shown on historic maps running to the south of St Hilda's Churchyard. By 1827 the Mill Dam had been completely infilled and built upon (Tyne and Wear Museums 1998), and there is evidence from recent excavations at the Customs House (built in 1861 at the confluence of the Mill Dam and the Tyne) that this process of infilling had begun at least as early as the late seventeenth or early eighteenth centuries (*ibid*). That such activity may have occurred within the proposed development area is hinted at by some of the older cartographic sources. Armstrong's map of 1768 depicts the Mill Dam as being very much wider and closer to St

Hilda's Church than does Richardson's map of the same year. The latter source accords well with the Fryer's map of 1773 and Casson's map of 1801 and, whilst it is not possible to corroborate the accuracy of Armstrong, it is possible that his map is based on an earlier survey or source which may show the Mill Dam prior to infilling in the area of the church. South and east of the excavation trench, geotechnical investigations have proven the depth of these infill deposits to at least 16m below the present ground level (M Douglas pers com).

1.2.3 Deposits encountered within the recent excavation trench, comprising dumps of clay, gravel and industrial waste, are characterised at depth by their admixture with grey silty clay characteristic of fluvial deposits, and it is thought that these deposits relate firstly to activity on the banks of the Mill Dam, and latterly to levelling. An episode of levelling, undertaken in 1816 in order to raise the level of the crowded cemetery to accommodate further burials, is said to have utilised ballast from a nearby mound (Tyne and wear Museums 1998). If this episode is traceable within the present archaeological trench, then the ballast in question must have contained a high proportion of industrial and domestic refuse, as observed in the case of the burial matrix encountered within the upper 2m - 4m of stratigraphy. Although natural ground was purported to have been found within the evaluation trench at a depth of 2m below ground level (ASUD 2006), the OA North excavation has proven this to be far from the case, with natural deposits encountered at a depth of approximately 5.5m - 6m below the modern ground level. Moreover, there is some indication that the natural ground surface slopes down towards the Tyne, the reverse of the modern situation in the area of the Coronation Street/Station Road roundabout.

1.3 OXFORD ARCHAEOLOGY NORTH

1.3.1 OA North has considerable experience of excavation of sites of all periods, having undertaken a great number of small- and large-scale projects throughout Northern England during the past 25 years. Evaluations, desk-based assessments, watching briefs and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables. OA North has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. OA North is an **Institute of Field Archaeologists (IFA) registered organisation, registration number 17**, and all its members of staff operate subject to the IFA Code of Conduct.

2 OBJECTIVES

2.1 The following programme has been designed to identify the presence of any human remains within each of the sewer trenches, and to investigate, record and remove those remains where they would be effected by the development together with as much supporting information concerning the depth, orientation, burial furniture and dating as the circumstances within the service trenches allow.

3 METHOD STATEMENT

3.1 WATCHING BRIEF

3.1.1 ***Methodology:*** all machining undertaken on the site will be monitored by a suitably experienced archaeologist; any machining below the level of compact road services should be enacted by the use of a toothless ditching bucket. It would be desirable if machining could be undertaken in long, shallow scoops, rather than short, deep bucketfuls, in order to minimise damage to any human burials or other archaeological remains. The programme of field observation will record the location, extent, and character of any surviving archaeological features and/or deposits as accurately as possible within the area of proposed ground disturbance. Where health and safety considerations allow, any human remains revealed by the machining and lying within the zone of impact, would be screened from public view, recorded *in situ* and removed from the trench which, to allow safe access when over 1.2m deep and/or less than 2m wide, would require the use of a temporary shoring system, installed by a specialist contractor. Although it is appreciated that the limited space available to the scheme of excavation would prevent the deposition of spoil from mechanical excavation in separate spoil heaps, it would be useful if spoil deriving from initial excavation of the road

surfaces and their make-up could be kept separate from that deriving from the underlying layers in order that such material can be systematically searched for human remains and any other artefacts as soon as it is safe to do so. The rough location of such remains would be recorded as accurately as possible to allow this material to be tied in with the field observations. It is proposed that at least two archaeologists will be in attendance during the machining process, allowing the spoil to be sorted for human remains, and for any *in situ* remains to be recorded without delaying the machine, which would be able to excavate another area if archaeological remains were found at the original site of excavation. As required, additional archaeologists would be supplied to the site to deal with greater numbers of remains.

3.1.2 The investigation and excavation of human remains would be undertaken in accordance with the methodology outlined in *Appendices 1 and 2* of the OA North project design for the excavation undertaken at Coronation Street, dated April 2006. Putative non-burial archaeological features and/or deposits identified during the observation of groundworks, together with the immediate vicinity of any such features, will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions and, where appropriate, sections will be studied and drawn. Any such features will be sample excavated (ie. selected pits and postholes will normally only be half-sectioned, linear features will be subject to no more than a 10% sample, and extensive layers will, where possible, be sampled by partial rather than complete removal).

3.1.3 ***Recording:*** all recording will be undertaken in accordance with national guidelines (English Heritage Guidelines for the treatment of human remains excavated from Christian burial grounds) and OA guidelines, wherever possible, and in the case of human remains, will be undertaken in accordance with *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006. To increase the speed of recording, burials will be planned through the use of rectified photography. Such works will involve the use of survey equipment, base stations for which will need to be surveyed-in using GPS equipment prior to the commencement of groundworks, and once the location of the sewer trench has been finalised (to limit any disturbance/movement of the base stations). Recording would take the form of indexed black and white print and colour slide photography, appropriately-scaled plans and sections on permanent drafting film together with detailed written notes on *pro-forma* recording sheets.

3.1.4 ***Treatment of finds:*** all finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid For Finds*, 1998 (new edition) and the recipient museum's guidelines.

3.1.5 ***Treasure:*** any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996. Where removal cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.

3.1.6 All identified finds and artefacts will be retained, although certain classes of building material can sometimes be discarded after recording if an appropriate sample is retained on advice from the recipient museum’s archive curator.

3.1.7 ***Fleshed or partially-fleshed bodies:*** should mechanical excavation reveal the presence of fleshed or partially-fleshed burials, or coffins containing liquor or other corruption products, it would be necessary to inform the Environmental Health Officer and agree a suitable strategy for their recovery, analysis and disposal. all further works would conform to any requirements that they may set. Dependent on the state of these bodies, it may be necessary to use a specialist contractor for their removal, storage and deposition, the costs of which would be agreed with the Client and charged as a variation. Any lead coffins would not be opened, but would need to be removed, stored and deposited by a specialist contractor, the costs of which would be agreed with the Client as a variation.

3.1.9 ***Contingency plan:*** in the event of significant non-burial archaeological features being encountered during the watching brief, discussions will take place with the ARCUS, the Client

and the Tyne and Wear Archaeologist, as to the extent of further works to be carried out. All further works would be subject to a variation to this project design. In the event of environmental/organic deposits being present on site, it would be necessary to discuss and agree a programme of palaeoenvironmental sampling and or dating with the Planning Archaeologist.

3.2 **POST-EXCAVATION ASSESSMENT, ANALYSIS AND ARCHIVING**

3.2.1 The assessment and any analysis of the human remains recovered as part of the watching brief would be undertaken as part of the wider post-excavation programme, methodologies for which are provided in *Sections 3.3* and *3.4* and *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006.

4. Health and Safety

4.1 OA North provides a Health and Safety Statement for all projects and maintains a Unit Safety policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (1997). A risk assessment will be completed in advance of any on-site works and copies will be made available on request to all interested parties.

5 WORK TIMETABLE

5.1 ***Archaeological Watching Brief:*** the duration of the watching brief will be dependent upon the timetable of the groundworks; although some delay may be incurred by the discovery of *in situ* human remains, it is hoped that additional staff could be supplied to the site to investigate such remains as quickly as possible, allowing groundworks to continue at another point along the sewer trench.

6. PROJECT MONITORING

6.1 ***Access:*** liaison for site access during the evaluation will be arranged with the client unless otherwise instructed prior to commencement of the archaeological investigation.

6.2 Whilst the work is undertaken for the Client, ARCUS would ensure that the Tyne and Wear Archaeologist will be kept fully informed of the work and its results, and will be notified a week in advance of the commencement of the fieldwork. Any proposed changes to the project design will be agreed with the Tyne and Wear Archaeologist in consultation with the Client and ARCUS.

7. STAFFING PROPOSALS

7.1 The fieldwork will be under the direct management of **Stephen Rowland** (OA North project manager) to whom all correspondence should be addressed. The post-excavation programme would be managed by **Louise Loe** (OA Head of Heritage Burial Services).

7.2 The watching brief would be undertaken by an archaeological Supervisor and an Osteoarchaeologist. Additional staff would be supplied, as required, to limit disruption to the machining schedule. The initial surveying-in of base stations would be undertaken by Marc Storey, OA North Geomatics Project Officer.

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APPENDIX 2: RELEVANT SECTIONS FROM THE EXCAVATION PROJECT DESIGN

3.2 POST-EXCAVATION ASSESSMENT

3.2.1 Following completion of the fieldwork, the results will be collated and the site archive completed in accordance with English Heritage MAP2, Appendix 3. A post-excavation assessment of the archive and the resource implications of the potential further analysis will be undertaken. The stratigraphic data and the finds assemblage will be quantified and assessed, and the environmental samples processed and a brief assessment of their potential for further analysis made. The assessment will, where appropriate, comprise:

- Quantification of all site records, including drawings

- Assessment of the stratigraphic sequence, in terms of complexity and, where possible, provisional chronology

- A summary description of the results of the excavation, including an identification of formation processes

- An assessment of the significance of any deposits from which radiocarbon samples have been taken and the selection of specific samples for submission for analysis

- An assessment of any groups of articulated and disarticulated human remains, including age, gender and any pathological lesions, along with the distribution of the remains themselves, in terms of their potential for further analysis, which might include:

  i. Demographic reconstruction in terms of age, gender and health
  ii. Stature and bone size and shape conformation
  iii. The presence of non-metric traits and genetic disorders that might indicate the use of areas of the cemetery by familial groups
  iv. Indications of social status and access to resources as well as occupation-related pathological conditions
  v. Groupings of disarticulated human remains likely to relate to single individuals
  vi. Number of individuals and stratigraphic relationships represented by the unstratified material that may lend clues to the length of usage of the cemetery
  vii. Isotope analysis for the reconstruction of past dietary practices and also for the origin of populations

- An assessment of the quantity and provisional dating of any pottery recovered from the excavation and an assessment of the further work required for the analysis of a selected assemblage from the evaluation and excavation. Such potential for analysis may include:

  i. Typological and chronological analysis in order to improve an understanding of the chronological basis of the use of the site as a cemetery and of any earlier activity

- An assessment of the quantity, form and provisional dating of any coffin furniture, nails or other metal artefacts in order to establish a programme of further analysis, which might include:

  i. Form, function and typological analysis, as a means of dating artefacts and interpreting their use for social display, etc.

- An assessment of the nature and quantity of any faunal remains along with the potential for further analysis, which might include:

i. Species representation, proportions, metrical conformation, pathological lesions, age and sex for the understanding of the pastoral and hunting economies and the nature of animal husbandry practices

ii. Butchery, burning, gnawing and fracturing as a means of determining the treatment and processing of meat products along with attitudes to waste disposal

iii. Analysis that might help to address research questions regarding the introduction of domesticated species during the Early Neolithic, which might include an examination of non-metric traits and body conformation that could indicate the presence of animals of primitive type, or of greater or lesser genetic diversity or of indigenous or extraneous origin

- An assessment of environmental remains recovered from the excavation, including the nature and quantity of materials such as molluscs, pollen, charcoal and carbonised plant remains along with the potential of any well-stratified assemblages for further analysis in terms of:

i. Identification of economic and subsistence practices through the identification of edible plant remains

ii. The identification of food processing strategies as indicated by the presence of various plant anatomical parts (ie, chaff), either separated from or still attached to seeds and grains. Within this context, insect remains may also be important in identifying any storage or refuse functions associated with features

iii. The nature of the environments exploited for plant foods through the identification of weed seeds, which may also indicate the nature of human manipulation of the local environment, as may insect remains

iv. The character of the local environment through the analysis of pollen, plant macrofossils and fungal spores and the potential impact of man upon this environment

v. The character of the immediate environment as indicated by any mollusc or insect remains and relict topsoil horizons

vi. The presence of faecal material and parasite eggs that may be informative of the general state of health of past populations

- An assessment of any monoliths or core samples taken from specific deposits for their potential for further analysis in terms of site formation processes

3.2.2 The assessment results will be presented within a post-excavation assessment report which will summarise the results of the excavation and any initial hypotheses that can be drawn from the assessment of the finds and environmental samples. Within the framework of these initial results, an attempt will be made to place the data from the excavation within a regional context both in terms of a chronological narrative and of significance. The assessment report will make recommendations for a schedule, timescale and programme of analysis in accordance with MAP2 Appendix 4.

3.3 ANALYSIS

3.3.1 A provisional programme of post-excavation analysis is anticipated, and guidelines are provided in *Appendix 2* of this project design. The extent of the programme, however, can only be reliably established on completion of the post-excavation-assessment report, but it is likely, considering the nature of the material from the evaluation, that each of the proposed stages for analysis of human remains will be undertaken on the more complete inhumations, while less-detailed analysis is likely to be undertaken on disarticulated remains (see *Section 3.3* above). The proposed programme anticipates both analysis of the site stratigraphy and the artefactual/ecofactual evidence leading to the production of a final report. This will be completed within two years of the fieldwork.

3.4 PUBLICATION

3.4.1 It is anticipated that the results of the excavation will be worthy of publication. If possible, the publication text will be prepared in a suitable form for inclusion in either a regional or national journal, for example, the Durham Archaeological Journal or Archaeologia Aeliana, respectively.

APPENDIX 1: THE EXCAVATION AND RECORDING OF BURIALS IN CHURCHYARDS

By A Boyle and C Boston

1 INTRODUCTION

This section details the recommended methodology for the excavation and recording of inhumations and their associated features and grave goods. Associated features include coffins, grave cuts, ditches, postholes, stakeholes and memorials.

It is fair to say that it is virtually impossible to record a burial in too much detail but this viewpoint needs to be balanced against time and money constraints BUT NOT AT THE EXPENSE OF THE DATA.

Both excavation and post-excavation treatment will directly affect the quality and quantity of information, which can be recovered by the osteoarchaeologist. An enormous amount of information can be extracted if proper procedures are followed. On any site where burials are discovered it is important to seek the advice of the osteoarchaeologist as soon as possible. Where the presence of burials is known or suspected this should happen prior to excavation. If at all possible the osteoarchaeologist should be present on site throughout excavation. This is especially important on large cemeteries and is essential both when preservation is poor and when skeletons are to be immediately reburied. Otherwise some provision should be made for regular visits. An assessment of factors such as numbers of skeletons, bone preservation, method of burial, date range and density of inhumations will aid in the definition of a suitable collection procedure. For example, in cases where the sample is small and skeletal preservation is poor, the opportunities for post-excavation will be limited. This will have implications for the recording and excavation procedures employed.

2 INHUMATION BURIALS

This section describes the recommended methodology for the excavation of inhumation burials within churchyards. The general area should be thoroughly cleaned in plan, with a view to defining grave outlines and their relationships to other graves and/or features. Clearly, intercutting graves are important in the construction of a stratigraphic sequence for the site. Where graves are intercutting it is essential that the relationships are properly investigated and interpreted on site. In these circumstances loose bones should not be removed until it is clear which context they belong to (a separate section on the excavation and recording of disarticulated bone appears below).

2.1 METHOD OF EXCAVATION

The best practice is to excavate graves and their contents in plan. Although the quadranting of graves with a view to producing longitudinal and transverse sections has been advocated it is difficult to see how such a procedure would deal adequately with eg. the recording of large numbers of finds, or the recovery of a body surviving only as a shadow. Arguments may however be presented for the excavation of particular burials in sections or quadrants.

Excavation should proceed carefully and without undue haste. A basic aim is the definition of body position in order that the more fragile bones, such as skull, pelvis, kneecaps, hands and feet, are not accidentally damaged. It is therefore poor practice to begin by digging deep exploratory holes with a view to `hitting bone'.

2.2 RECORDING THE SKELETON

Each individual skeleton will be assigned a separate context number from a continuous sequence. The skeleton has its own specialised context sheet, which must always be used. If further space is required then a standard context additional sheet should be used. **NOTE:** Once a context number has been assigned then a separate skeleton number is unnecessary. It is important to realise that the deposition of a skeleton is a stratigraphic event in *its own right* whether or not it is placed within a coffin. There are two slightly different versions of the skeleton recording sheet: one should be used for adults and the other for children and subadults as appropriate. Only those aspects of the skeleton recording sheet, which are unique, are discussed here. The remaining elements of the skeleton sheet are also present on the general context record sheet and are discussed in section 2 of the Oxford Archaeological Unit fieldwork manual.

2.2.1 ***Skeleton diagram:*** this diagram should be used to record which bones are present. If a bone is present then it should be shaded on the drawing. Where possible the osteoarchaeologist should be consulted.

2.2.2 ***Levels:*** these should be taken at three basic positions as indicated on the skeleton recording sheet (skull, pelvis and feet). A level measurement taken between the knees if legs are extended can be useful. Further readings should be taken if the position of the skeleton is in any way unusual. Great care should always be taken when placing level staff. All levels should additionally be marked on the plan.

2.2.3 ***Orientation:*** orientation should always be in relation to OS grid North or magnetic North rather than site grid North. A compass should be used.

2.2.4 ***Body position:*** body position should be indicated in the appropriate box. When describing the skeleton it should be remembered that left and right sides are those of the skeleton and not the excavator. A precise description of arms and legs should appear on the skeleton context sheet in the section for Additional Information. Factors such as displacement of skull, mandible and the disposition of hands and feet must be recorded as they may relate to taphonomic processes. Bones which have been positioned tightly together may have been wrapped in a shroud at the time of death (shrouds may additionally be indicated by pins). Animal activity or collapse and decay of grave structures may cause displacement of bones. Definitions of the relevant terminology appear below.

2.2.4.1 *Supine:* the skeleton is laid flat on its back, legs may be extended, crossed, flexed or semi-flexed, detail of arm position and the direction in which the skull is facing should also be provided. Supine is by far the most common body position found in Christian burials.

2.2.4.2 *Crouched:* the skeleton is laid on its side and crouched (often tightly) in the foetal position, detail of arm position and the direction in which the skull is facing should also be provided.

2.2.4.3 *Prone:* the skeleton is laid face down; legs may be extended, crossed, flexed or semi-flexed, detail of arm position and direction in which the skull is facing should also be provided.

2.2.4.4 *On side:* the skeleton is laid on left or right side, legs may be extended, crossed, flexed or semi-flexed, detail of arm position and the direction in which the skull is facing should also be provided.

2.2.4.5 *Irregular:* if the position of the skeleton does not fit into any of the above categories then it can fairly be described as irregular and as much detail as possible should be provided.

2.2.5 ***Preservation of skeleton:*** this category relates to the condition of those bones which are present and NOT to the completeness of the skeleton. Choose good, fair or poor as appropriate. Where preservation is variable and additional comment is required this should appear in the box marked `description'. Many factors can determine the survival of bone. These include soil pH, moisture content, air, temperature, fauna, flora, and human interference. Additionally age and sex also play a part. Pathological bones are particularly fragile and those exhibiting lesions should be photographed in situ. Water is the single most important factor of decay: the principal action of

water on bone is by leaching. Preservation is generally better in soils with a neutral or slightly alkaline pH, and is worse in acid conditions. Decomposition may be accelerated in porous light soils while dense, clay-like soils may actively retard it (Henderson 1987). The categories of preservation are defined as follows: preservation should be described as good where bones are mostly intact and in good condition and therefore unlikely to fragment during excavation, bone surfaces are smooth and unmarked; preservation should be described as fair where occasional bones are broken and further breakage is likely to occur during excavation, bone surfaces may have slightly `weathered' or roughened appearance; preservation should be described as poor where most or all of bones are broken and fragmented, bone surfaces have very `weathered' or roughened appearance.

2.2.6 ***Completeness of skeleton*****:** this is indicated pictorially on the skeleton diagram. In addition the level of completeness should appear in the appropriate box on the skeleton recording sheet using a numerical code as follows: 1 - complete/virtually complete, all or most bones of the skeleton appear to have survived; 2 - more than half the skeleton has survived; 3 - less than half the skeleton has survived.

2.2.7 ***Collection quality:*** any factors, which might have affected the standard of recording and collection, should be noted, such as if collection took place under salvage conditions or in very poor weather (eg. frost or poor light), many of the smaller bones of the hands and feet might have been missed. Any damage, which occurs during the excavation or lifting of the skeleton, should be noted. Both should appear in the section for Additional Information.

2.2.8 ***Planning and photography:*** ideally all skeletons should be planned at a scale of 1:10. This provides a realistic representation of the position of all surviving bones and any associated objects. If appropriate this plan can also incorporate grave outline, coffin evidence, any other structures and associated finds. Before planning, the grave fill and any soil around and adhering to the skeleton should be removed. Appropriate tools are described in section 2.2.9 below. It should be emphasised that the small bones of the hands and feet are easily disturbed and damaged. Consequently only the minimum amount of soil should be removed from these areas. The sparing use of sponges and fine water sprays can be useful for the removal of persistently adhering soil. However, under no circumstances should bones be continually dampened and allowed to dry out, as this will cause them to disintegrate. The use of 1:5 scale plans for infants and neonates should be considered where time allows. The points at which levels have been taken should also be indicated on the plan. Sample location can also be indicated on plan.

Increasingly, plans of skeletons are made by digital rectification of photographs taken using a digital camera. These have the advantage of greater accuracy than hand-drawn plans, and are a labour-saving device in the field. It is important to note, however, that a manual plan of the grave cut, coffin wood and fittings and small finds is still required, as these tend to show up poorly in photographs.

2.2.9 ***Excavating the skeleton:*** it must be emphasised that the quality of the skeletal information, which can be extracted by the osteoarchaeologist, is directly dependent on the completeness of the skeleton and the preservation of individual bones. A very fragmented skeleton is of limited use. Hence great care should be taken in the lifting and handling of the bones. In acid ic soil conditions, tooth enamel may be all that survives. This should be lifted in a block and kept moist.

Bones should be boxed as soon as possible after excavation. Skulls in particular should be placed in boxes immediately after lifting and UNDER NO CIRCUMSTANCES should they be transported from site in plastic bags alone as they are extremely fragile. They should never be lifted by the orbits (or eye sockets). Always lift skulls using both hands. All the appropriate packing materials should be on site prior to lifting of skeleton.

Specialised tools are essential. These are plasterer's leaves (leaf blades); dental tools and soft, and small paint brushes. Wooden tooth picks, lollipop sticks (tongue depressors) and plastic modelling tools should be employed in the final cleaning stages as they are unlikely to mark or depress bone.

The skeleton should be excavated and bagged in the manner outlined here (though not necessarily in this order). The skull and mandible should be bagged together and placed immediately in a box.

Any loose teeth should be placed in a separate small bag, which should also be placed in the box. The left scapula, clavicle, humerus, radius and ulna should be lifted and bagged together, the bones of the left hand and wrist should also be placed in this bag. Repeat for the right arm. The left pelvis, femur, patella, tibia and fibula should be lifted and bagged together; the bones of the left foot and ankle should also be placed in this bag. Repeat for the right leg. The vertebrae, ribs and sternum can be placed in one bag.

NOTE: this is the minimum number of bags, which should be used. If time allows hands and feet may be separated from arms and legs (ie right hand in one bag, left hand in another). Where the bones of the hands or feet cannot be separated ie. because they are crossed, the bones may be placed in a single bag. Whenever time allows, vertebrae and sternum can be separated from ribs, and ribs can be split into left and right sides. Additionally fourth ribs may be placed in a separate bag, if easily identifiable, as these can aid in age assessment. During lifting the ribs often break into quite small fragments, many of which may be unidentifiable as to side. It is sensible to remove the bone in a systematic fashion, ie dealing with one bag at a time in order to avoid confusion.

Every individual bag should have two labels inside. The following details should appear on both: site code, context number of skeleton, bone identification (eg. skull, right arm or left leg). Trap air in bags with bones to prevent crushing. Skeletons should be boxed as soon as possible after lifting; even before washing in order to minimise crushing.

Where possible the entire procedure should be completed in one day. If left overnight, the skeleton should be covered with polythene and packing material (eg loose soil).

2.3 THE EXCAVATION OF JUVENILES AND INFANTS

Many of the above points continue to be relevant to the excavation of young individuals, but a number of additional points are important. The epiphyses (ie the bone ends) are not fused to the bone shafts. At birth there are 450 bone forming centres which will develop into 206 in the adult. Excavators should be aware of this, preferably through demonstration of neonate, infant and juvenile skeletons. It must be borne in mind that infant epiphyses resemble small stones. Special care should be taken to recover infant vertebrae, which comprise three separate bones. Infant bones are regularly recovered from settlement contexts and often confused with small animals, such as rabbits and dogs. It is hoped that the skeleton diagrams on the recording sheets will be a help in this respect. The bones of adults and juveniles should never be bagged together as the latter are extremely fragile. Each individual infant limb bone should be placed in a separate bag.

2.4 DISARTICULATED BONE

Multiple graves, often containing disarticulated bone are quite common on archaelological sites (eg. Roman, Anglo-Saxon, medieval and post-medieval). Disarticulated bone is also known from prehistoric contexts (eg. Neolithic and early Bronze Age). Disarticulated bone from earlier periods is likely to benefit from three-dimensional plotting and identification of each individual bone, although this may not be feasible in each and every case.

Relatively little useful information may be gleaned from churchyards where successive burials have taken place intensively over a prolonged period. In these cases, the possible value of the data should be weighed up against practical considerations, such as time and money constraints. In these circumstances, it is recommended that the disarticulated bone is collected for possible reburial. Further recording and osteological analysis is not usually indicated.

2.5 BODY STAINS AND `EMPTY' GRAVES

In contexts where acid conditions prevail the skeleton may have completely decayed and be represented only by a `body stain'. Occasionally fragments such as dental enamel will survive. Body stains can generally be excavated three-dimensionally. The staining should be sampled along with all the grave fills and control samples should be provided.

Where graves are apparently empty, samples may be recovered for phosphate analysis in order to determine whether or not a burial was ever present.

2.6 GRAVE CUTS

A grave is a cut feature and therefore, a negative one. Attention should be directed to Appendix 4 of the Oxford Archaeological fieldwork manual (Wilkinson 1992). All of the general points apply equally to grave cuts. The shape of the grave cut should be described in some detail and the following terminology should be employed: sub-apsidal (grave with rounded ends), sub-rectangular, ovoid, square, circular or irregular.

The profile of the grave should be recorded in the written record. Important features to look out for are ledges, which may indicate the presence of a wooden lid and the presence of grave markers (post holes, stake holes: see associated structures below). In general, it is not necessary to draw longitudinal or cross-sectional profile of the cut. A written description, however, should be recorded on the context sheet.

The grave outline should be planned at a scale of 1:10. Levels should be taken at the top and bottom of the grave. In churchyard contexts, the precise cut of the grave may not be visible, due to lack of distinction between the graveyard soil and the grave fill. Nevertheless, it should be assumed that the cut existed, and should be accorded a context number.

2.6.1 ***Extra-mural vaults and brick shaft graves:*** in the 18th- and 19th-centuries, concern over disturbance of the remains of family members, and the increasing use of death ritual for social display led to the establishment of subterranean brick-built family vaults and shaft graves for the interment of multiple burials. A vaults traditionally has a vaulted roof, the entrance to the interior commonly is through a doorway in one of the side walls (often with a set of steps leading down to it). A brick shaft grave is essentially a rectangular or single break grave cut lined with a single or double layer of bricks and mortar. Brick shaft graves may be of single or double width. The top of the grave is covered over by horizontal ledger stones (often sandstone or limestone slabs), which could be removed for subsequent interments. Coffins were stacked vertically one above the other within the grave, sometimes resting on metal racks. Vaults and brick shaft graves were originally surmounted by an above- ground memorial. Today, many have been lost.

Recording of vaults and brick shaft graves should follow the guidelines for brick built structures laid out in the Oxford Archaeology Field Manual (Wilkinson 1992).

2.7 GRAVE FILLS

The grave fill is a positive context and attention should be directed to section 2.4.1 and Appendix 1 of the Oxford Archaeological fieldwork manual. It should never be assumed that a grave will only have a single fill- it may have several. It is important to ensure that all of the grave fill is removed and that the grave is `bottomed'. This has obvious implications for the shape and depth of the grave. More specifically, objects are often located below the skeleton, and would be otherwise missed. In churchyards, it was common practice to inter two or more burials one above the other. Care should be taken to ascertain that the lower-most burial has been revealed. The fill below the skeleton may also indicate whether or not the grave remained open for any length of time prior to burial.

Where bulk finds (eg. animal bone and pottery sherds) are recovered from grave fills, this should be recorded in the fill context sheet, along with their vertical position within the fill. Any indication that a find was confined to a particular part of the fill should be recorded. This will facilitate the distinction between residue material and grave goods deliberately placed with the corpse within the grave. On the whole, it is recommended that finds within grave fills should be treated as small finds. This is not the case, however, with coffin nails, which should be assigned the context number of the coffin. It is not necessary to give coffin fittings or fixtures small find numbers. It is important, however, to record their position within the grave on the grave plan. Most commonly, coffin fittings and fixing nails, hinges and brackets are collected for reburial

with the associated skeleton. If the skeletons are not to be reburied, they should be collected for inclusion within the archive.

2.8 COFFINS

A variety of wooden mortuary chambers and wooden coffins appear in the archaeological record dating from as far back as the earlier Neolithic. In the medieval and post-medieval periods, both wooden and lead-lined coffins are common. Simple single thickness trapezoid and rectangular wooden coffins were the most common form in the medieval period. From the 17th century, there was increasing elaboration of coffins and fittings. Single-break coffins (the modern 'coffin shape') become ubiquitous from the 1730s onwards (Litten 1991). Simple coffins comprised of a single thickness wooden case decorated with few fittings. More elaborate coffins were constructed either of a double thickness of wood; an outer wooden case and inner lead shell, a lead shell and inner wooden coffin; or a triple layer of a wood-lead-wood. Lead was the most common metal, but iron and zinc were also occasionally used for the metal shell. The outer wooden case was often upholstered in baize or velvet and decorated by elaborate patterns of upholstery studs (usually iron or brass) and metal fittings, such as escutcheons, lid motifs and *departum* plates (breastplates, footplates and headplates inscribed with the name of the deceased, their age, date of death and other particulars). A taphonomy of coffin fitting styles based on coffins found at Christ Church, Spitalfields (Reeve and Adams 1993) forms the basis for comparison of these styles. OA is currently compiling a 'master catalogue' to include new styles found on other post-medieval burials sites.

2.8.1 ***Excavation and recording:*** wooden coffins may be indicated by staining caused by the decay of the wood and/or the presence of iron nails and brackets. Where they do occur, an individual coffin context number should be assigned. Fittings should be given this number and do not require individual small finds numbers. The precise location of these objects is of vital importance for the reconstruction of mode of coffin construction. Where wood survives in contact with nails and fittings it will be possible to ascertain board thickness and the direction of the wood grain. The presence and position of nails and fittings within the grave must be marked on the grave plan. The outline of coffin stains should also be represented on the plan at a scale of 1:10. Details should be recorded on the standard OA coffin record sheet.

It is recommended that the coffin fill around the skeleton be removed whilst leaving the coffin stain and any associated fittings *in situ*. At this stage the coffin and skeleton should be planned at a scale of 1:10 and a photographic record produced.

Certain elements are common to both the standard context record sheet and the coffin record sheet. Those elements that are unique to the coffin record sheet are described below.

2.8.2 ***Shape, dimensions and distinguishing characteristics:*** draw the shape of the coffin here and include coffin furniture (for example, handles, decoration, breastplates) with their approximate locations. Make a note of dimensions in all the relevant places (head, shoulders, base, depth). If the coffin is decorated then detailed photographic recording is recommended. The style of 18th- to 19th-century coffin fittings should be compared with the detailed taxonomy of coffin fittings compiled from Christ Church, Spitalfields (Reeves and Adams 1993). Where matches cannot be found, the coffin fittings should be sketched on site. These styles will be added to the 'master catalogue' of coffin fittings currently being compiled by OA.

2.8.3 ***Description:*** describe the coffin, giving details of design and construction, materials used, and unusual features. Description of each element of the coffin fittings (eg breastplate, escutcheon, lid motif, grip and grip plate) should include material, quantity, styles (if matching Spitalfield types). Text inscribed on breastplates or directly onto the lead shell should be recorded *verbatum*.

2.8.4 ***Stratigraphic matrix:*** only enter the relevant stratigraphic relationships here (ie the grave fills and cut numbers). DO NOT enter the skeleton number (it is stratigraphically within the coffin number and in terms of chronological sequence is contemporary).

2.8.5 ***Preservation of coffin:*** tick one of these boxes to indicate how well the material of the coffin survived. If preservation is variable give details in the Description section.

2.8.6 ***Treatment:*** an entry should be made here if the coffin underwent any treatment from conservators before excavation or during lifting.

2.8.7 ***Finds:*** enter details of any coffin furniture and of any other finds closely associated with the coffin.

2.9 ASSOCIATED STRUCTURES

This applies to features such as ditches, postholes, stake holes or the foundation trench for the headstone and/or footstone of a grave memorial, which may be associated with a grave. These should be assigned a unique context number and cross-referenced on the appropriate context sheet (for grave cut or grave fill). The use of group numbers for related contexts is recommended.

2.10 ASSOCIATED OBJECTS

Grave goods may be present either within the grave fill or in direct association with the skeleton. Each object should be assigned to the appropriate context, given a unique small finds number and three-dimensionally recorded. Decayed organic objects which may only be represented by staining should also be recorded in this manner and sampled where appropriate.

Shrouds may be indicated by copper-alloy or nickel pins. These should be assigned a small finds number then accurately recorded on plan and by level. Their presence should be noted on the skeleton recording sheet. Clothing fasteners (eg buttons, toggles and garter buckles) may be present in the grave. Clothes fastenings potentially give important insights into changing patterns of grave dress over time. The location of these items should be recorded on the grave plan, and the items assigned a small find number. They should be collected for specialist analysis but may be ultimately be reburied with the coffin and human remains (depending on site specifications).

It is very important to describe the precise position of the object. Textile impressions are often preserved in the corrosion on metal objects, and can yield much information about dress and other body coverings. Where a number of objects cluster together the presence of a decayed organic container, such as a wooden box or bag, may be indicated.

All small finds should appear on the plan of the skeleton. Where a large number of grave goods are clustered together it is desirable to produce a detailed plan at a scale of 1:5, 1:2 or even 1:1 if appropriate. In cases where a number of grave goods are located below the skeleton, it is recommended that a further plan should be drawn after its removal. A photographic record should also be produced. For major cemetery sites, the use of an EDM for rapid and accurate plotting of objects is recommended. This is particularly useful in cases where objects are stratified within a grave (ie some may be lower down in the fill than others), although here measurements between stratified objects is helpful.

2.11 GRAVE MEMORIALS

Grave memorials, such as head and footstones, may be associated with specific burials. Extramural above-ground memorials became increasingly common in the post-medieval period. Recent work by Mytum (2002) and Tarlow (1999) have traced changing traditions in the shapes, iconography and text inscribed on these memorials. Headstones also offer valuable biographic information on individuals interred in the graveyard.

Head and footstones are structures and should be accorded an individual context number. They should also be included as part of the grave group, if the association with the burial is clear. It is important to note that many tombstones have been moved from their original position in recent years, and care in establishing an association with a specific burial should be made.

Descriptions of gravestones should follow guidelines set out by Mytum (2002) and include details of

- Shape
- Dimensions
- Type of stone used
- Iconography (an illustration may best describe these features)
- Inscription (*verbatum* record of inscription; font of the lettering)
- Stylistic type

3. PHOTOGRAPHY

Record photographs should be taken on colour diapositive (slide) and monochrome film using SLR cameras. A full black and white and colour (35 mm transparency) photographic record, illustrating in both detail and general context every burial. Where appropriate a digital camera may be used with features and sections that are intended to be geo-referenced. This data is in addition to the information collected above and is not intended as a substitute. The benefit of using a digital camera is the speed with which the images can be processed. However, geo-referenced digital photography may be considered as a substitute for 1:10 plans of individual graves. Site code, scale, north arrow and skeleton number should appear in every photograph. A chalk board or a number board must always be used.

4. ETHICAL AND LEGAL CONSIDERATIONS

Burials that do not fall without the aegis of the Church of England may not be excavated without receipt of a Home Office licence. Excavation of burials within churchyards of the Church of England require a Faculty to be issued by the appropriate Diocesan Advisor before work may commence. Recent burials (within the last 100 years) interred within disused burial grounds may require a Disused Burials Grounds licence from the Home Office. Heritage Burial Services will usually arrange licences on request.

It is imperative that human remains are treated at all times with the appropriate respect. They should be screened from public view at all times. Sensitivity to the emotional reactions of both other archaeologists and members of the public is paramount, and it should be anticipated that these are often more pronounced when more recent burials are being disturbed.

Following excavation human remains should be stored out of sight in a clean, dry and secure place under the aegis of an appropriate individual or group.

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APPENDIX 2: OSTEOLOGICAL METHODOLOGY

1. INTRODUCTION

1.1 The osteological methodology presented below includes only macroscopic methods. Unusual or note-worthy pathology will be recorded photographically. In rare cases, radiography and other microscopic or biochemical methods may be used, but are not outlined below.

2. GENERAL TERMINOLOGY AND EQUIPMENT USED

2.1 The anatomical terminology used in this report will be in accordance with international nomenclature. The descriptive teeth formula used will be based on the Zsigmondy system (Zsigmondy 1861 in Hillson 2003, 8-9). All bones and teeth will be analysed macroscopically.

3. RESULTS

3.1 Preservation and completeness

3.1.1 Bone preservation and completeness of the assemblage will be rated on a four-point scale, ranging from 1 (poor) to 4 (excellent). Likewise, skeletal completeness will be scored on a scale of 1 - 4 : 1 (< 25 %); 2 (25- 50 %); 3 (50- 75 %); and 4 (> 75 %).

3.2 Estimation of age at death

3.2.1 Diaphyseal long bone lengths will be used as the basis for ageing foetuses and neonates using methods developed by Fazekas and Kósa (as adapted in Scheuer and Black 2000). Subadults will be aged by the stage of dental eruption (Mooreess *et al.* 1963a and b)), stage of epiphyseal fusion (Scheuer and Black 2000) and diaphyseal length of the major long bones (Maresh 1970).

3.2.2 The adult skeletons will be aged by degeneration of the auricular surface of the pelvis (Lovejoy *et al.* 1985), the sternal end of the ribs (İşcan and Loth 1986 a and b) and the pubic symphysis (Brooks and Suchey 1990; Todd 1921a and b); epiphyseal fusion of the medial clavicle (Scheuer and Black 2000); dental attrition (Miles 1962), and suture obliteration (Meindl and Lovejoy 1985).

3.2.3 All individuals will be assigned a suitable precise age group as defined in Table 1.

Age group	Age range
Foetus	< 0 years
Neonate	0-1 months
Infant	0-1 years
Young child	2-5 years
Older child	6-12 years
Adolescent	13-17 years
Young adult	18-25 years
Prime adult	26-35 years
Mature adult	36-45 years
Older adult	> 45 years
Child	2-12 years
Subadult	< 18 years
Adult	> 18 years

Table 1. Age groups employed in analysis

3.3 Estimation of sex

3.3.1 Sexually dimorphic features of the pelvis and cranium will be used to diagnose osteological sex based on standards set out in Buikstra and Ubelaker (1994) and Schwartz (1995). Osteometrics will be used as secondary sexual indicators.

3.4 Estimation of stature

3.4.1 Calculation of body stature will be estimated from the maximum length of the major long bones will be based on the method for Caucasians developed by Trotter and Gleser (Trotter 1970). Combined measurements of the femur and tibia will be utilised wherever possible, and in the absence of one of these bones the femur and then the tibia will be used. The major bones of the upper limb will be used if no lower limb bones are present. The left side will be used preferentially in keeping with standard osteological practice.

3.4.2 For comparative studies on stature between populations, it is recommended to use the actual bone measurement rather than the calculated estimates (Brothwell and Zakrzewski 2004, 33). The raw long bone lengths will be given as an appendix to the specialist report.

3.5 Non-metric traits

3.5.1 The descriptions given in Berry and Berry (1967) and Finnegan (1978) will be used to record non-metric traits.

3.6 Metrics

3.6.1 Measurements on the skull and postcranial elements will be taken using landmarks described by Brothwell (1981) and by Buikstra and Uberlaker (1994). These will be used in estimation of sex, and quantifying size and body proportions (such as the platymeric and platynemic indices) that may be activity related. A number of cranial indices will also be taken, and may assist in the identification of racially distinct characteristics.

3.7 Skeletal and dental pathologies

3.7.1 The terminology and descriptions of the skeletal pathologies used in the report will be based largely upon palaeopathology texts, such as Ortner (2003) and Aufderheide and Rodríguez-Martín (1998).

4. REPORTING

4.1 A comprehensive specialist report will be compiled on the basis of the above data, detailing the demography of the burial population, prevalence of skeletal and dental disease and non-metric traits, and detailing osteometrics. The data will be considered in its archaeological context, taking into account phasing and burial practices.

4.2 The osteological analysis from the Coronation Street assemblage will be compared with osteological work undertaken on contemporary post-medieval assemblages. The prevalence of pathologies will also be compared to rates calculated for the period by Roberts and Cox (2003).

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APPENDIX 3: SUMMARY CONTEXT LIST

Context	Interpretation	Description
884	Disturbed ground	Layer of disturbed dark bluish-grey silty clay containing brick and disarticulated human bone within manhole trench
885	Burial soil	Mid-brown silty clay layer within manhole trench
886	Construction cut backfill	Yellowish-brown gravel backfill extending 1.5m from pumping station
887	Coffin	Coffin containing sk ***888***
888	Skeleton	Adult skeleton. Only the left leg was removed, the rest is preserved *in situ*
889	Charnel	Charnel deposit
890	Coffin	No skeletal remains recovered from within
891	Construction cut	Construction cut for pumping station
892	Gave cut	Cut for sk ***888***
893	Grave fill	Dark bluish-grey silty clay backfill of ***892***
894	Grave cut	Cut for coffin ***890***
895	Grave fill	Dark bluish-grey silty clay backfill of ***894***
896	Grave cut	Cut for sk ***898***
897	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***896***
898	Skeleton	Adult skeleton
899	Coffin	Coffin containing sk ***898***
900	Charnel	Charnel with grave ***901***
901	Grave cut	Cut for sk ***902***
902	Skeleton	Adult skeleton, abdomen, lower arms and legs outside of trench
903	Coffin	Coffin containing sk ***902***
904	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***902***
905	Grave cut	Cut for sk ***906***
906	Skeleton	Adult skeleton, the skull, right arm and the majority of the chest and spine remain *in situ* outside of the trench
907	Coffin	Coffin containing sk ***906***
908	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***905***
909	Skeleton	Highly disturbed skeleton mixed with ***910***, ***931***, ***932***, ***933***
910	Skeleton	Highly disturbed skeleton mixed with ***909***, ***931***, ***932***, ***933***
911	Grave cut	Cut for sk ***913***
910	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***911***
913	Skeleton	Adult, only left forearm, left leg and right lower leg were within the trench
914	Made ground/ burial soil	Layer of imported dark grey sand with glass slag inclusions used as a burial soil.
915	Grave cut	Cut for sk ***917***
916	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***915***
917	Skeleton	Sub-adult, only the skull, right arm and right pelvis were within the trench
918	Coffin	Coffin containing sk ***917***
919	Grave cut	Cut for sk ***920***
920	Skeleton	Adult, only the left leg was within the trench
921	Coffin	Coffin containing sk ***920***
922	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***919***
923	Grave cut	Cut for sk ***925***
924	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***923***
925	Skeleton	Adult, only the legs were within the trench
926	Skeleton	Adult, only the skull and right shoulder were recovered from the trench section
927	Grave cut	Cut for sk ***928***
928	Skeleton	Adult, left forearm and leg were outside the trench
929	Coffin	Coffin containing sk ***928***
930	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***927***
931	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***932***, ***933***
932	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***931***, ***933***

Context	Interpretation	Description
933	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***931***, ***932***
934	Gave cut	Cut for sk ***935***
935	Skeleton	Adult, only skull and right upper arm were located within the trench
936	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***934***
937	Grave cut	Cut containing charnel ***938***
938	Charnel	Charnel of a single sub-adult,
939	Grave fill	Dark grey sand with glass slag inclusions,;backfill of grave cut ***937***
940	Grave cut	Cut for sk ***941***
941	Skeleton	Adult, right upper arm outside of trench
942	Coffin	Coffin containing sk ***941***. Breast plate was partly legible
943	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***940***
944	Skeleton	Adult, left side of skull and left proximal humerus visible in the trench section before shoring was lowered. Remains *in situ*
945	Skeleton	Adult, badly disturbed and truncated, only the skull, left humerus, some vertebrae and ribs survived.
946	Grave cut	Cut for sk ***947***
947	Skeleton	Adult, fully recovered
948	Coffin	Coffin containing sk ***947***
949	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***946***
950	Grave cut	Cut for sk ***952***
951	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***950***
952	Skeleton	Adult, left arm, the skull and part of the chest were outside the trench, however the skull, left distal humerus and left radius were recovered after a section collapse
953	Coffin	Coffin containing sk ***952***
954	Skeleton	Adult, right humerus, right and left tibia recovered after a section collapse
955	Grave cut	Cut for sk ***956***
956	Skeleton	Adult, fully recovered
957	Coffin	Coffin containing sk ***956***
958	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***955***
959	Grave cut	Cut for sk ***960***
960	Skeleton	Sub-adult. Right side outside of the trench, left *in situ*
961	Coffin	Coffin containing sk ***960***. Breast plate was partly legible
962	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***959***
963	Charnel	Charnel above sk ***965***
964	Grave cut	Cut for sk ***965***
965	Skeleton	Adult, fully recovered
966	Coffin	Coffin containing sk ***965***
967	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***964***
968	Grave cut	Cut for sk ***970***
969	Charnel	Charnel above sk ***970***
970	Skeleton	Adult, truncated from the thorax down
971	Coffin	Coffin containing sk ***970***
972	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***968***
973	Grave cut	Cut for sk ***974***
974	Skeleton	Adult, fully recovered
975	Coffin	Coffin containing sk ***974***
976	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***973***
977	Grave cut	Cut for sk ***978***
978	Skeleton	Sub-adult, fully recovered
979	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***977***
980	Charnel	Charnel below sk ***974***
981	Skeleton	Sub-adult, partly recovered from section
982	Skeleton	Sub-adult, none left *in situ*
983	Grave cut	Cut for sk ***984***
984	Skeleton	Sub-adult
985	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***983***

Context	Interpretation	Description
986	Grave cut	Cut for sk ***987***
987	Skeleton	Adult, lower legs and left hand outside of trench and remain *in situ*
988	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***986***
989	Charnel	Charnel below sk ***987***
990	Grave cut	Cut for sk ***991***
991	Skeleton	Adult, fully recovered
992	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***990***
993	Coffin	Coffin containing sk ***991***
994	Grave cut	Cut for sk ***995***
995	Skeleton	Adult, fully recovered, truncated by grave ***990***
996	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***994***
997	Grave cut	Cut for sk ***998***
998	Skeleton	Adult, fully recovered
999	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***997***
1000	Charnel	Charnel above sk ***1002***
1001	Grave cut	Cut for sk ***1002***, ***1002b***
1002	Skeleton	Adult
1002b	Skeleton	Sub-adult recovered alongside sk ***1002***
1003	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1001***
1004	Grave cut	Cut for sk ***1005***
1005	Skeleton	Adult, fully recovered
1006	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1004***
1007	Skeleton	Adult, fully recovered from section
1007b	Skeleton	Sub-adult recovered alongside sk ***1007***
1008	Skeleton	Adult, skull only, recovered from section
1009	Grave cut	Cut for sk ***1010***
1010	Skeleton	Adult, right arm and leg outside of trench, left *in situ*
1011	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1009***
1012	Grave cut	Cut for sk ***1013***
1013	Skeleton	Sub-adult
1014	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1012***
1015	Skeleton	Adult, only skull and cervical vertebrae within trench
1016	Grave cut	Cut for sk ***1017***
1017	Skeleton	Sub-adult, skull fragments only
1018	Coffin	Coffin containing sk ***1017***
1019	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1016***
1020	Grave cut	Cut for sk ***1021***
1021	Skeleton	Sub-adult, fully recovered
1022	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1020***
1023	Skeleton	Sub-adult, left arm, left pelvis and chest outside of trench, left *in situ*
1024	Tarmac and hardcore	Tarmac road surface laid on top of a hardcore base.
1025	Grave cut	Cut for sk ***1023***
1026	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1025***
1027	Grave cut	Cut for sk ***1015***
1028	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1027***
1029	Grave cut	Cut for sk ***1008***
1030	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1029***
1031	Grave cut	Cut for sk ***1007*** and ***1007b***
1032	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1031***
1033	Grave cut	Cut for sk ***982***
1034	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1033***
1035	Grave cut	Cut for sk ***981***
1036	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1035***
1037	Grave cut	Cut for sk ***954***
1038	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1037***
1039	Grave cut	Cut for sk ***944***

Context	Interpretation	Description
1040	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1039***
1041	Grave cut	Cut for sk ***909***, ***910***, ***931***, ***932***, ***933***
1042	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1041***
1043	Grave cut	Cut for sk ***945***
1044	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1043***
1045	Grave cut	Cut for sk ***926***
1045	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1045***

APPENDIX 4: OSTEOLOGICAL ASSESSMENT DATA

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
888	n	n	1	3	n	3	3	N/a	N/a	N/a	-
898	y	y	3	2	y	3	3	y-with recon	19	ca, p, c, a, amtl , eh	Craniotomy. Cribra orblitalia, asymmetrical femora. OP on fem head. OA left hip, secondary to trauma?
900 (charnel)	n	y	2	2	y	3	3	n	0	amtl	OP prox tib & L dist fem. Marked enthesophytes. 'hole' R parietal.
902	y	y	1	3	y	2	3	n	4	P,c,amtl	
906	y	y	3	3	y	4	4	N/a	N/a	-	-
909	y	y	2	3	y	2	2	N/a	N/a	-	-
913	n	n	1	3	y	4	4	N/a	N/a	-	-
917	y	n	1	3	n	1	1	N/a	29	C, eh	Premature synotosis ?
920	n	n	1	3	y	5	5	N/a	N/a	-	Left OA hip joint and knee. Ankle DJD.
925	y	y	2	3	y	4	4	N/a	N/a	-	-
926	y	y	1	3	n	2	3	n	2	P, amtl	-
928	y	y	3	3	y	4	5	y	16	Ca,p,c,eh,amtl	SNs. Active periostitis left hum, ribs, R tib. OP talus.

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
935	y	y	1	3	y	4	4	y- with recon	14	Ca,p,c,a,amtl,eh	Cribra orbitalia.
938 (charnel)	y	N/a	2	2	N/a	N/a	N/a	N/a	N/a	-	-
941	y	y	3	2	y	4	4	y	22	Ca, p, c, a, amtl, eh	Cribra orbitalia
945	y	y	1	3	y	3	4	n	14	Ca, eh	Button osteoma, 3rd molars not fully erupted
947	y	y	4	3	y	4	4	n	1	Amtl, p, c, eh	Cribra orbitalia. Button osteoma? Slight OP left femur & R knee & R distal radius,ulna & ribs. OA R femoral head and distal left radius. Vert OP, Schmorl's Nodes. Fused R rib to TV. Considerable amtl.
952	y	y	3	3	y	4	4	y	0	All lost am	OA both knees. OA right 2nd metacarpal.
954	n	n	1	3	n	1	1	N/a	N/a	-	Non-specific infection. Osteomyelitis? affecting tibia, humerus, femur and fibula. Slight OP joint surfaces.
956	y	y	4	3	y	5	5	y	15	Ca, p, c, amtl, eh	OP fem head. Lytic lesion dist fib.
960	y	N/a	3	3	N/a	2	N/a	N/a	20	deciduous	Active periostitis ribs. Cribra orb.
965	y	y	3	3	y	3	4	n	21	Ca,p,c, a, amtl,eh	SNs. Endocranial lesions. Hair on left temporal. Periostitis clavicles. OA R proximal phalanx. Healed fracture? L 1st rib. Notched incisors (culturally induced)
969 (charnel)	n	n	1	2	y	2	1	N/a	N/a	-	Systemic infection - affecting femur.
970	n	y	2	1	n	2	2	n	10	Ca, c	Hair present

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
974	y	y	4	3	y	5	5	y	27	Ca,p,c,a,amtl	Lumbarisation of S1. Schmorl's nodes. Ossified cartilage
978	y	N/a	4	3	N/a	4	N/a	N/a	8	deciduous	Neonate.
981	y	N/a	1	2	N/a	1	N/a	N/a	3	deciduous	-
982	y	N/a	2	3	N/a	2	N/a	N/a	3	deciduous	perinate
984	y	N/a	3	3	N/a	3	N/a	N/a	22	Perm & deciduous	Hair preserved.
987	y	y	4	3	y	3	3	y	17	Ca,p,c,a,amtl,eh	Capitate fused to base of 3rd metacarpal left hand. Vertebral OP. Hair on skull.
991	y	y	4	3	y	4	4	n	17	P,c	Lumbarisation of S1
995	y	y	4	3	y	4	4	n	9	Ca, p, c	-
998	y	y	4	3	y	4	5	y	4	C, amtl	OA L distal femora. OP dist L humerus & dist L radius. Ossified cartilage.
1002	n	y	3	2	y	4	4	n	0	amtl	OP R glenoid and proximal hand phalanx. Hyperostosis frontalis interna?
1002b	y	N/a	3	3	N/a	4	N/a	N/a	-	-	neonate
1005	n	y	3	2	y	3	5	n	6	Ca,p, amtl,eh	Ankylosis TV.
1007	y	y	4	3	y	4	4	n	0	amtl	All teeth lost AM. OP head L femur. Ankylosis axis & C3.

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
1007b	y	N/a	4	3	N/a	3	N/a	N/a	-	-	neonate
1008	n	y	1	3	n	2	5	y	15	Ca, p, c	Hair present. Skull only
1010	y	y	3	3	y	5	5	y	29	Ca, p, c, a , eh	OP 1st metatarsal. Schmorl's nodes. Vertebral OP.
1013	n	N/a	1	1	N/a	2	N/a	N/a	0	-	Subadult
1015	y	y	1	3	n	2	3	n	0	amtl	OP vertebrae. Button osteoma. DJD TMJ. Hair present.
1017	n	N/a	1	3	N/a	2	N/a	N/a	0	-	Subadult. Skull only
1021	y	N/a	4	1	N/a	3	N/a	N/a	30	caries	Cribra orbitalia
1023	y	N/a	2	3	N/a	2	N/a	N/a	2	Deciduous	

Key: Ca - caries, C - calculus, P - periodontitis, A - periapical cavities, EH - enamel hypoplasia, amtl = *ante-mortem* tooth loss; OP= ostephyte; DJD= degenerative joint disease; L=left; R=right

APPENDIX 5: CATALOGUE OF COFFIN FITTINGS

Coffin number	**Fittings**	**condition**
887	Wood	Small damp fragments
890	Left in situ - wood, iron grip	N/A
899	Iron grip and breastplate	Corroded and fragmented
903	Wood	Small fragments
907	Breastplate	Corroded fragments
918	Fragments of wood	Small damp fragments
921	Damp fragments of wood	Small damp fragments
929	Fragments of breastplate	Corroded and fragmented
942	Fragmented breastplate with inscription: [I]sabella --a--- / Died June 23 / Aged 27 / -----	Corroded and fragmented
948	Dried wood and 2 nails	corroded
953	Fragmented breastplate	Corroded and fragmented
957	Fragmented plate and coffin stain	Corroded and fragmented
961	Fragmented breastplate with inscription: ------ / died 15th ---- / aged 4 years	Corroded and fragmented
966	Fragments of breastplate	Corroded and fragmented
971	Fragments of breastplate	Corroded and fragmented
975	Fragments of breastplate	Corroded and fragmented
993	Fragments of breastplate	Corroded and fragmented
1018	Stain	N/A

APPENDIX 6: HARRIS MATRIX

CONTENTS

SUMMARY

As part of enabling works associated with the redevelopment of land at Coronation Street, South Shields, Tyne and Wear (NGR NZ 360 670), Henry Boot Developments (HBD) found it necessary to adjust the existing sewerage network and redirect it from the pumping station on Old Coronation Street westward along the southern edge of the thoroughfare of Coronation Street itself. The trench for the new rising main, and a number of manholes, was to be some 100m long, 2m wide and was to be excavated to a maximum depth of 2.2m below the existing road surface. The route of the rising main passes through the southern part of the former cemetery of St Hilda's Church, a site that is known from previous investigations to have been heavily utilised. Consequently, the Tyne and Wear Archaeologist advised South Shields Borough Council that, in accordance with PPG16 (DoE 1990), a planning condition of the development should be the undertaking of a programme of archaeological mitigation during any intrusive groundworks and an appropriate programme of post-excavation assessment and analysis.

In order to meet the planning condition, Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of HBD, commissioned Oxford Archaeology North (OA North) to undertake the full programme of archaeological works in accordance with a project design approved by the Tyne and Wear Archaeologist. Project Stage 1 (the watching brief and fieldwork data collection) was undertaken during June and July 2007. This draft report provides a summary of Project Stage 1 and documents the results of Project Stage 2, pertaining to a programme of post-excavation assessment of the results of the fieldwork, in order to establish their potential for further analysis.

It is concluded that the 45 well-provenanced skeletons recovered from the watching brief at Coronation Street form a significant assemblage. The funerary remains are likely to date to between 1817 and *c* 1860 and are generally well preserved, with clear potential for a range of further analyses. Their greatest potential, however, can only be met once they have been combined with the much larger and more complete assemblage of human remains recovered from the excavation undertaken in 2006 by OA North to the immediate south of Coronation Street. Such a sizeable assemblage has significant potential to document aspects of the lives of the post-medieval population of a rapidly industrialising port town, who left few other personal records of their own.

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The fieldwork was undertaken by Andrew Frudd, Mark Gibson, Joanne Hawkins and Nicholas Márquez-Grant. The osteological material was assessed and reported upon by Nicholas Márquez-Grant and Sharon Clough, who also assessed the coffin fittings. Mark Gibson compiled the stratigraphic assessment and examined the other artefacts, whilst the illustrations were produced by Marie Rowland and Alix Sperr. The report was edited by Stephen Rowland and Louise Loe, who respectively managed the fieldwork and post-excavation stages of the project.

1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Henry Boot Developments (HBD) propose to redevelop a brown field site located to the immediate south of Coronation Street, in the centre of South Shields, Tyne and Wear (NGR NZ 360 670; Fig 1). As part of enabling works associated with the redevelopment, it was necessary to adjust the existing sewerage network and redirect it from the pumping station on Old Coronation Street westward along the southern edge of the thoroughfare of Coronation Street itself, to the roundabout at the junction of Station Road. The trench for the new rising main, and a number of manholes, was to be some 100m long, 2m wide and was to be excavated to a maximum depth of 2.2m below the existing road surface.

1.1.2 Previous archaeological investigations associated with the development comprise a Tyne and Wear Museums desk-top assessment (TWM 1998), which identified that the modern route of Coronation Street lies within the bounds of St Hilda's cemetery, a trial trench evaluation (Archaeological Services, University of Durham (ASUD) 2006) and a mitigatory excavation (Oxford Archaeology forthcoming), both of which proved the presence of burials to the immediate south of Coronation Street. Consequently, the Tyne and Wear Archaeologist advised South Shields Borough Council that, in accordance with PPG16 (DoE 1990), a planning condition of the development should be the undertaking of a programme of archaeological mitigation during any intrusive groundworks associated with the sewer diversion. The Tyne and Wear Archaeologist required that preservation by record should comprise several project stages. Stage 1, the fieldwork, was to include monitoring and recording during groundworks, together with excavation, recording and lifting of all human remains encountered during this process. Stage 2 was to be an assessment of the data generated by the fieldwork, whilst Stage 3 was to encompass any appropriate detailed analysis, publication and the submission of the entire project archive.

1.1.3 In order to meet the planning condition, Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of HBD, commissioned Oxford Archaeology North (OA North) to undertake the full programme of archaeological works in accordance with a project design approved by the Tyne and Wear Archaeologist (*Appendices 1 and 2*). Project Stage 1 (the watching brief and fieldwork data collection) was undertaken during June and July 2007.

1.1.4 This report provides a summary of Project Stage 1 and documents the results of Project Stage 2, pertaining to a programme of post-excavation assessment of the results of the fieldwork, in accordance with the guidance of English Heritage's *Management of Archaeological Projects, Second Edition* (MAP2; EH 1991) and *Management of Research Projects in the Historic Environment* (MoRPHE; EH 2006). As such, this stage of the project seeks to process and assess each of the forms of raw data recovered during the fieldwork in order to

establish their potential, through detailed analysis, to address the research questions outlined in *Section 3.2*. A project design for a programme of further analysis and the final archive submission to the Tyne and Wear Record Office (TWO) (Project Stage 3) will be issued as a separate document.

1.2 Location, Topography and Geology

1.2.1 ***Location and modern topography:*** Coronation Street runs from the centre of South Shields, westward to its junction with Station Road, opposite the south-east bank of the River Tyne. To the north is St Hilda's Church, its graveyard, and the town's commercial centre, whilst to the south, the land is occupied by carparks and a disused warehouse. From these carparks, which cover largely level ground at *c* 5.1m OD, the land traversed by Coronation Street rises to the north and west, peaking at 10.5m OD at the junction of Coronation Street and Station Road (Fig 1). Evidence from the various phases of fieldwork undertaken at the site would suggest that much of this rise derives from artificial deposition, whilst the natural topography follows an expected westward dip towards the river (ASUD 2006; OA forthcoming).

1.2.2 The solid geology of the area is one of Carboniferous (280-350 million years ago) Coal Measures and Magnesian Limestone (TWM 1998), overlain by deposits of Devensian (73,000 to 10,000 BP) glacial till. With proximity to the River Tyne, the depth of boulder clay increases, and can be *c* 12m deep (*op cit*, 4). However, much of the proposed development area, possibly including that of Coronation Street, was occupied formerly by a tidal inlet and pool, the Mill Dam Creek, which has had a considerable influence on the historical development of the area (*ibid*).

1.3 Historical and Archaeological Background

1.3.1 ***Introduction:*** the following section presents a brief summary of the history and archaeology of the development site and its wider surroundings in order to contextualise the results of the present investigation. It is not intended as a comprehensive history of South Shields, various accounts of which are readily available elsewhere.

1.3.2 Although there is no contemporary evidence from the proposed development area, the earliest known human activity in the vicinity was located some *c* 1km to the north-east of Coronation Street and comprised late Iron Age settlement activity beneath the Roman fort of *Arbeia*. The fort, the easternmost defence of Hadrian's Wall, was likely to have been founded *c* AD 129 as a cavalry installation, but was rebuilt as an infantry fort during the reign of Septimus Severus in the early third century (Roman-Britain.org). There is thought to have been a contemporary settlement and port associated with the Roman fort, but their location is uncertain. The Anglian nunnery of St Hilda was built in AD 674 in the vicinity of the present development area, on the banks of the Mill Dam tidal inlet. Although the exact location of the original nunnery is not known, the area to the north of Coronation Street has remained a focus for religious activity through the medieval period and into the present. The latest

incarnation of the Church of St Hilda, some 50m to the north of Coronation Street, was rebuilt during the nineteenth century and may well occupy the site of its predecessors (TWM 1998). Little is known of the nature of secular settlement in the intervening centuries, but by 1235 South Shields was recognised as a village with 24 tennants (*ibid*), perhaps originating as a humble collection of fisherman's huts as suggested by its name *Scheles* (Middle English for huts or shelters; Roman-Britain.org). The settlement had grown further by 1256, when its 27 houses were arranged along a single north-east/south-west-aligned street straddling the Mill Dam, much like the arrangement shown on Gardner's map of 1654. As such, elements of the medieval and post-medieval settlement are likely to have lain within the present development area.

1.3.3 The Mill Dam no longer exists, but on eighteenth-century cartographic sources is shown running to the south of St Hilda's Church. By 1827 the Mill Dam had been completely infilled and had started to be built upon (TWM 1998). There is evidence from recent excavations at the Customs House (built in 1861 at what had been the confluence of the Mill Dam and the Tyne) indicating that this process of infilling had begun at least as early as the late seventeenth or early eighteenth centuries (*ibid*). South and east of Coronation Street, such deposits have been proven by recent geotechnical investigations to a depth of at least 16m below the present ground level (M Douglas *pers comm*). That such infilling may have occurred within the area of Coronation Street is hinted at by some of the older cartographic sources. Armstrong's map of 1768 depicts the Mill Dam as being very much wider (suggesting it terminated in a tidal pool) and closer to St Hilda's Church than does Richardson's map of the same year, which indicates that the extent of the churchyard, together with an associated routeway, was well-defined on what was then the northern bank of the Mill Dam. The latter source accords well with the Fryer's map of 1773 and Casson's map of 1801 and, whilst it is not possible to corroborate the accuracy of Armstrong, it may be that his map is based on an earlier survey or source showing the Mill Dam prior to infilling in the area of the church.

1.3.4 There is a possibility that detailed documentary research, particularly of the parish records and burial registers, may provide further information about the history of St Hilda's Church and the associated churchyard, but some basic information has been provided by the desk-based assessment (TWM 1998). The history of the St Hilda's would indicate that the first burials were of early medieval date; although the curtilage of the Anglian nunnery was extensive, burials are likely to have been made near the primary focus of the church. Medieval burials would, again, probably have radiated out from the church and, whilst the line of Old Coronation Street could well have fossilised a much older boundary, it is currently uncertain at which date burials extended to the formalised limit of the churchyard. Certainly by 1805 the burial ground was approaching full capacity, precipitating an attempt in 1816 to raise the level of the crowded cemetery to accommodate further burials, apparently using ballast from a nearby mound (TWM 1998). Following this raising, burial activity must have increased exponentially, matching the contemporary growth of the industrialising town. By 1856 the cemetery was closed to further burials (*ibid*), a little before a national Act of 1857 discouraged interments within urban

cemeteries, thus implying that the burial ground was again full. However, an examination of the burial register would suggest that interments, perhaps within existing family plots, took place into the 1860s.

1.3.5 The land around Coronation Street has seen considerable change over the last 150 years. The most significant of these, in terms of the present development, was the adjustment to the route of Coronation Street itself. Coronation Street originally kinked around the slightly angled southern edge of St Hilda's churchyard, an alignment preserved by Old Coronation Street. During the 1960s, this angled section of Coronation Street was straightened, so that it ran to the north through the former cemetery. The construction of a sewerage pumping station within the crook of Old Coronation Street and its redirected successor, together with associated services, must also have lain within the bounds of the cemetery.

1.3.6 ***Relevant previous investigations:*** an archaeological evaluation undertaken by ASUD in winter 2005 involved the excavation of three trial trenches to the south of Coronation Street, two of which were located within areas formerly occupied by St Hilda's cemetery (ASUD 2006). Trench 1, placed to the north-east of Old Coronation Street, revealed only disarticulated human remains and gravestone fragments. Evidence of *in situ* human remains was found within wedge-shaped Trench 3 located just to the north of the eastern arm of Old Coronation Street. This latter trench measured 18m east/west and from 2m to 4m wide at the base, following the projected southern edge of St Hilda's cemetery. Below a layer of sandy made ground and a 0.4m thick disturbed horizon containing disarticulated human bones and domestic refuse, 'natural subsoil' was encountered at 2m bgl. Fourteen 'grave cuts' were identified, four of which were investigated to reveal articulated skeletons. The associated finds were of eighteenth- to nineteenth-century date (ASUD 2006).

1.3.7 In 2006 OA North undertook the re-excavation of ASUD's Trench 3, with the aim of removing all burials down to natural deposits. During the excavation, 191 human burials were recovered from two separate burial horizons within a trench measuring approximately 17m by 4m (maximum width, reduced to 2m at depth) and up to 5.5m deep. Although natural ground was purported to have been found within the evaluation trench at a depth of 2m below ground level (ASUD 2006), the OA North excavation has proven this to be far from the case, with natural deposits encountered at a depth of approximately 5m below the modern ground level. The lower deposits, through which the earliest burial horizon had been cut, were characterised by their admixture with grey silty clay characteristic of fluvial deposits, and it is thought that these deposits relate to activity on the banks of the Mill Dam. These had been sealed by levelling dumps of clay, gravel and industrial waste through which a second burial horizon had been cut between depths of 2-4m below ground level. This material may relate to an episode of deposition, undertaken in 1816, which utilised ballast from a nearby mound in order to raise the level of the crowded cemetery to accommodate further burials (TWM 1998). If this episode is traceable within the archaeological trench excavated by OA North in 2006, then the ballast in question must have contained a high proportion of industrial and domestic refuse. In each of the burial horizons, there was evidence that

multiple interments had been made within single graves or family plots, whilst remains of coffins and their fittings were also frequent.

2 INITIAL RESEARCH AIMS AND OBJECTIVES

2.1 INTRODUCTION

2.1.1 To maximise the potential of the heritage resource, archaeological investigations are strategic in nature, with a series of clearly defined aims, often posed as research questions, and objectives, the practical means by which research questions are addressed; both are modified and developed to meet the requirements of the project and the confines of the available data. However, the impetus for the investigation is provided by a 'primary driver' (EH 2006), which, in the case of the majority of archaeological projects, is dictated by the negative impact of a development. In consideration of the fact that elements of the heritage resource were to be destroyed by the proposed development, the basic rationale, or primary driver, of the watching brief was the characterisation and preservation by record of any significant remains of archaeological interest. The various forms of data generated, together with any further research undertaken, could be analysed to provide a greater understanding of the past population of South Shields. The specific research aims and objectives for the project are outlined below; not all can be addressed at the present assessment stage, but they need to be considered when assessing the potential of each category of data for analysis (Project Stage 3).

2.1.2 ***Research background:*** archaeologically excavated post-medieval and industrial-period burials from Britain are rare. Until the 1980s the archaeological excavation of these contexts was extremely limited and cemetery clearance companies largely undertook the work without any archaeological recording. Since then, the value of such material in the understanding of the past, and to scientific enquiry in general, has been recognised, but has still not gained wide appreciation. To date, the total number of archaeologically excavated post-medieval burial contexts remains very low when compared with burial contexts from other time periods. Most examples are from London and largely comprise the middle to upper classes of Georgian and Victorian society. Few of these have been published, Christchurch, Spitalfields (Molleson *et al* 1993); St Martin's Church, Birmingham (Brickley *et al* 2006); The Royal Naval Hospital, Greenwich (Boston *et al* 2008); and All Saints, Chelsea Old Church, Kensington (Cowie *et al* 2007) being among the few that have.

2.1.3 ***Regional context:*** burial studies have always had a relatively low profile in the North East compared to other parts of the country. In particular, post-medieval and Industrial-period funerary practices and population composition are poorly understood, there having been no or limited opportunity to undertake even basic research on human populations from the region. This is largely due to the continued use of post-medieval cemeteries and the highly acidic soils which militate against the preservation of bone. The Coronation Street assemblage of human remains excavated in 2006 is the second largest to have been archaeologically excavated from the North East of England. The largest assemblage was recovered from the former Newcastle Infirmary where the remains of around 600 individuals were excavated (Louise Loe *pers*

comm). These remains comprised unclaimed hospital patients, many of whom had been dissected by early anatomists for the advancement of science, and are thus very different in nature to the assemblage from South Shields. There are no other large assemblages of post-medieval human remains from the North East of England and the nearest assemblage of comparable size is that from Barton on Humber, which includes the remains of some 400 former parishioners of St Peter's Church.

2.1.4 ***Health and demography:*** because the majority of published post-medieval assemblages comprise the middling to upper classes, Coronation Street presents a rare opportunity to explore the former lives of the industrialised working classes in terms of population composition, health and mortality. It is likely that many of those buried at St Hilda's would have been people engaged in industries connected with the local collieries, gas works, ship yards and the port. Contemporary documentary evidence indicates that industrialising populations such as this experienced poor air and water quality, overcrowding, inadequate housing, contaminated food and harsh working conditions (Roberts and Cox 2003). This impacted on health by increasing levels of infection, trauma and nutritional deficiency and resulted in increased mortality among young infants (*ibid*). The Coronation Street assemblage provides a unique opportunity to explore how this is reflected in the remains of the individuals themselves; moreover, the high number of young infants recovered from the excavation presents the rare opportunity to explore aspects of maternal health, as well as to contribute to current theories on weaning and burial practice associated with this age group (Molleson *et al* 1993).

2.1.5 ***Historical records:*** the archaeological investigation of any cemetery can yield information about those buried, but its value is enormously enhanced when studied alongside historical records. Rich historical documentation of the late eighteenth and early nineteenth century exists to complement the South Shields burial record. This includes parish records (especially burial records), Government Births, Marriages and Deaths registers (compulsory from 1837), census records, wills, trade directories and other occupational lists (eg law and the armed forces). More generally, historical accounts of funerals and of surviving coffin catalogues provide valuable historical data on the material culture of funerals and burials during this time period.

2.1.6 Historical records may also be employed to test the validity of osteological techniques, particularly those relating to age and sex estimation. Few individuals of documented age were excavated from South Shields and, therefore, this assemblage affords little, if no, opportunity to do this. However, there is scope to compare the mortality profile indicated by an analysis of the parish burial register, and that indicated by physical examination of the remains themselves.

2.2 RESEARCH AIMS

2.2.1 By considering the above themes and initiatives, it is possible to pose the following research questions (RQ) that are specific to the archaeological investigation of the rising main watching brief at Coronation Street:

RQ1 Within the defined excavation area, can human remains be recovered in such a manner that maximises the potential of the captured stratigraphic data?

RQ2 Is it possible to gain an understanding of the sequence and date of the remains?

RQ3 Using extant historical documents and the results of previous archaeological fieldwork, is it possible to understand better the excavated archaeological remains and place them within a wider historical and cultural context?

RQ4 Can a greater understanding of the use, organisation and management of the cemetery, both on a wider and more personal level, be gained?

RQ5 Can the captured data from the watching brief be integrated with that recovered during the OA North excavation to the immediate south in 2006?

RQ6 Can relevant information contained within primary and secondary historical documents be accessed and collated?

RQ7 Can a better understanding of the analytical potential of the recovered osteological assemblage be gained through:

- assessment of the potential of the human remains for the estimation of biological parameters such as sex, age and stature;
- assessment of the potential of the remains to yield palaeopathological information in order to learn about the health status of South Shield's past inhabitants;
- assessment of the potential of the remains for isotope analysis;
- examination of the requirement for additional specialist analysis, such as radiography, of the remains;
- establishment of the potential of the remains to contribute to archaeological knowledge at regional and national levels, and the most appropriate way of realising this potential;
- contributing to an updated project design for analysis of the remains, with cost and time implications specified.

RQ8 What detailed and meaningful information can analysis of the skeletal remains tell us about the lives of the inhabitants of South Shields?

RQ9 Can the results of the analysis of the skeletal remains be used to provide a comparison with documentary sources and with remains from contemporary sites?

RQ10 How can the results of the investigative programme be made available to the wider public, and all data, artefacts and remains archived or reburied appropriately?

2.3 RESEARCH OBJECTIVES

2.3.1 ***Overall Research Objectives:*** the following overarching objectives (RO) have been formulated with reference to the research questions (*Section 2.2.1*).

ROa Conduct a programme of archaeological observation, investigation and recording during the course of all groundworks within the former burial ground.

ROb Recover, process and undertake an assessment and then any appropriate analysis of the artefacts from the fieldwork, particularly those that are datable, and integrate them into the stratigraphic sequence.

ROc Undertake provisional and then any appropriate detailed analysis of the on-site stratigraphy in order to understand better the relationships between the different elements.

ROd Undertake an osteological assessment and then any appropriate analysis of the human remains excavated from the site by:

- quantification of the remains, including the number of articulated skeletons and quantity of disarticulated human bone;
- evaluation of the overall condition and completeness of the remains, with reference to the survival of indicators of age, sex and stature, metrical and non-metrical analyses, and palaeopathological examination;
- establishment of the basic demographic composition of the population, including the proportion of adults and the proportion of juveniles;
- establishment of the overall range and extent of palaeopathological conditions.

ROe Assess and then undertake any appropriate analysis of the material and manufacture of any coffins and fittings in order to establish any patterns in origin, trade and also quality, which can then be linked with the results of osteological analysis.

ROf Undertake a detailed literature search of available sources at the Tyne and Wear Record Office, the Diocesan library, local and university libraries, as well as of more general reference works and histories.

3 METHODOLOGY

3.1 PROJECT DESIGN

3.1.1 The OA North project design (*Appendices 1 and 2*) approved by the Tyne and Wear Archaeologist was followed as fully as possible throughout the investigation; all work was consistent with the relevant standards and procedures of the Institute of Field Archaeologists (IFA), and generally accepted best practice.

3.2 FIELDWORK METHODOLOGY

3.2.1 ***Extent of groundworks and contractor's methodology***: the monitored groundworks for the insertion of the diverted sewer comprised two principal elements. The first, a 2m square pit for a manhole, was excavated to a depth of 3m below ground level (bgl) to the immediate west of the Old Coronation Street pumping station. The second consisted of a 1m-wide trench for the rising main itself. This ran for some 11m north-west from the manhole before following a slightly oblique westward alignment along Coronation Street for a further 80m until the junction with Station Road was reached. Although formation level for this trench was nominally 2.2m deep, the presence of existing services beneath which the rising main had to be threaded meant that the trench was excavated to depths of 2.4m and 2.6m bgl at the eastern and western ends, respectively. On occasion, the trench was widened to a width of 1.3m to allow for the welding of pipe sections.

3.2.2 Shoring was erected in all excavations and was installed either at a depth of 2m or once archaeological remains had been revealed. In the manhole 2m by 2m box shoring was used, with 3m sheet piles at the open ends. Along the majority east/west section of the trench, 3m by 1m box shoring was used; within the north-west/south-east-aligned section, and in those locations where the trench was widened for welding the inserted sewer pipes, or where services were present, 3m sheet piles supported by hydraulic whalers were installed. Access to excavations was granted once the shoring had been adequately installed and the trench had been monitored with a gas meter for five minutes. Excavations were entered via a ladder and a gas meter was with the work party at all times.

3.2.3 ***Monitored excavation:*** removal of the uppermost levels of modern tarmac and made ground down to the top of significant archaeological horizons was undertaken by a 13 ton wheeled 360 machine, fitted with a 1m-wide toothless ditching bucket and operating under archaeological supervision. Thereafter, any archaeological features or remains were cleaned and investigated manually to define their extent, nature, form and, where possible, date. Once archaeological remains were excavated, recorded and removed, the excavation with the machine was allowed to continue under archaeological supervision. Where services limited access by the machine, such as for the easternmost 4m of the trench, the contractors excavated by hand. With the exception of obviously modern deposits associated with the construction of Coronation

Street, all excavated spoil was monitored for skeletal remains and artefacts before it was removed from the excavation area by a dumper.

3.2.4 Once funerary remains were revealed, they were hand-excavated by an experienced archaeologist or osteoarchaeologist. Each skeleton was cleaned rapidly to reveal the body position and orientation, and its relationship to underlying burials, so that it could be recorded as fully as possible. The use of shoring meant that parts of skeletons often fell outside of the excavated trench; these elements were necessarily left *in situ* and only recovered where they were revealed or displaced by deeper groundworks. Similarly, in order to avoid damage to the service network, skeletal remains within baulks beneath services could not be cleaned or recovered. Infant skeletons, along with the surrounding soil to maximise small bone recovery, were lifted in plastic sample tubs, whilst the other skeletons were bagged by side and anatomical element and placed in strong boxes. Together with any associated funerary artefacts and fittings, these were stored temporarily in a secure, locked container on site, before being removed to Oxford at the completion of the watching brief.

3.2.5 ***Recording***: a comprehensive written, drawn, and photographic record was made in accordance with the *Standard and Guidance for Archaeological Excavation* (IFA 2001). All information identified during the watching brief was recorded stratigraphically on *pro-forma* recording sheets, with a continuous unique numbering system for all features and deposits in operation. *Pro-forma* skeleton sheets recorded details of the body position, orientation, skeletal condition and completeness, presence of soft tissue and artefacts (such as shroud pins and buttons). Those for coffins (whether surviving as fragments, a stain, or as fittings), described the materials, construction, size and shape of the coffin, as well as the decorative metal fittings (including fixing nails and screws, upholstery and upholstery studs, grips, grip plates, breastplates, lid motifs and escutcheons). Any motifs on these fittings were also described.

3.2.6 A fully indexed photographic and drawn record of individual features, working shots and general views was maintained. Photography was undertaken using 35mm colour slide and monochrome print film, together with high quality digital photography for the purposes of presentation. All levels recorded on-site were tied into Ordnance Datum, with the positions of planned features being established using a total station theodolite (TST). Before lifting, skeletal remains were recorded photographically, which, where the prevailing conditions allowed, made use of geo-rectification (for example, where skeletons were not obscured by services or recovered from the trench section). A summary of the results of the fieldwork is presented in *Section 4*.

3.3 Post-Excavation Assessment Methodology

3.3.1 ***Introduction***: the data recovered during the fieldwork was assessed in consideration of the project research questions and in accordance with the project objectives (*Sections 2.2.2-3*). Thus, the overarching objective of the assessment was to evaluate all classes of recovered data in order to determine the potential of the dataset for further analysis.

3.3.2 ***Material assessed***: the entire paper, digital, photographic and material archive deriving from the watching brief was examined for the purposes of this assessment. This included the stratigraphic records (context sheets, plans and sections), and the photographs, as well as the finds, funerary artefacts and the human remains.

3.3.3 ***Methodology***: the method of assessment used varied with the class of information examined, although in each case it was undertaken in accordance with guidance provided by MAP2 (EH 1991). During the assessment, the quantity, range, variety, provenance and condition of all classes of data were evaluated within the framework of the project research questions and objectives. *Section 4* summarises the raw data and results of the assessment of each data category, but full details and raw data reside within the project archive.

3.3.4 ***Stratigraphy***: the assessment of the stratigraphy was facilitated by the digitisation of the Harris matrix and the production of a provisional site plan; all of the context records completed during the excavation were entered into a specially designed Access database. The assessment of the stratigraphy comprised a quantification and qualitative appraisal of the recorded data, a brief interrogation of its complexity, and a consideration of those research questions that might be addressed, fully or in part, by the recovered stratigraphic data.

3.3.5 ***Human Remains***: the site archive and skeletal remains recovered during the rising main watching brief were examined to determine the quantity, general condition, completeness, provenance, date and nature of the material. 'Nature' refers to whether the material comprised articulated (disturbed or undisturbed) or disarticulated remains, and the proportion of adults to juveniles. The potential of the material to yield biological information, including more precise estimates of age, as well as other biological parameters, such as sex and stature, was also explored. In addition, the potential of the collection to yield information relating to pathology was assessed and, in particular, whether there were any unusual conditions present that would require detailed specialist examination and/or analytical techniques beyond standard macroscopic examination. In light of these findings, the potential of the collection for further work was evaluated. No attempt was made to estimate sex, age, stature or explore pathology in any detail since these are all factors that are beyond the requirements of an assessment. These procedures were undertaken in accordance with the national guidelines set out by Mays *et al* (2002) and with reference to standard protocols for examining human skeletal remains from archaeological sites (Brickley and McKinley 2004; Buikstra and Ubelaker 1994; Cox and Mays 2000).

3.3.6 Completeness was estimated by recording, as a percentage, how much of the skeleton had survived and assigning it to one of the following categories:

1 = <25% complete

2 = 25-50% complete

3 = >50-75% complete

4 = >75% complete

3.3.7 The condition of the bone was assessed according to the degree of erosion of the bone surface and how much of the epiphyses (the ends of the bones) and cancellous bone (the spongy bone that is beneath the outer layer) had survived. Based on these factors, skeletons were assigned to one of the following categories:

1 = Poor (cortical bone completely eroded. Very limited survival of epiphyses and cancellous bone);

2 = Fair (moderate erosion of cortical bone. Limited survival of cancellous bone and epiphyses);

3 = Good (Occasional erosion on cortical bone. Cancellous bone complete and frequent survival of epiphyses);

4 = Excellent (cortical bone undamaged, cancellous bone and epiphyses complete).

3.3.8 All anthropological and palaeopathological observations were made by rapidly scanning each skeleton. Although these observations provide adequate guidance to the potential of the material for further work they are, by their very nature, preliminary and subject to change as a result of any future high resolution examination.

3.3.9 Apart from the potential of the skeletons to yield information relating to age and sex, the skeletons were also assessed for their potential to yield metrical data such as stature, assessment of ancestry and biological variation and age estimation in sub-adults. Potential for metrical assessment was scored on a scale of 1-5, where '1' denotes skeletons that showed no potential (ie no elements could be measured owing to fragmentation/poor preservation) and '5' denotes skeletons that showed high potential (ie the full range of standard cranial and post-cranial measurements could be taken).

3.3.10 An assessment of the potential for the skeletons to yield non-metrical data was examined. Non-metric traits are morphological variations in the skeleton. They are influenced by both the environment and genetics, but to variable and unpredictable degrees (Saunders 1989). These traits were scored on a scale of 1-5, where '1' denotes skeletons that showed no potential for non-metrical analysis (ie preservation prevented the observation of all standard cranial and post-cranial sites) and '5' denotes skeletons that showed high potential for non-metrical analysis (ie all standard cranial and post-cranial sites could be scored). More readily observable traits were noted (but not formally scored) to give an indication of the level and range of traits present in the population. This will inform a data collection strategy for full analysis.

3.3.6 ***Finds***: all finds and artefacts from the watching brief were retained and were treated in accordance with the guidelines set out by the UK Institute for

Conservation (UKIC 1990) and those of the Museums and Galleries Commission (1992). All artefact fragments were examined by visual inspection and an outline computer record was created using Microsoft Access. Data were recorded in a standardised format, noting provenance, type of object, material, period, and a brief written description and all pottery was recorded by digital photograph, in the form of a single record shot per context. This database will form the basis for any further work recommended, or will comprise the archive record, as appropriate.

3.3.7 ***Archive***: several tasks facilitating both assessment and the completion of the archive, such as marking of photographs, were undertaken. The full preparation and deposition of the archive is however, a task that falls beyond the scope of the assessment, and will be treated in more detail within the updated project design for analysis, publication and archiving. A copy of all final reports will be lodged with the Tyne and Wear Historic Environment Record (HER) and the Tyne and Wear Record Office.

4 RESULTS

4.1 INTRODUCTION

4.1.1 The following section summarises and assesses the results of each category of data recovered during the watching brief fieldwork. All classes of data generated by the fieldwork were assessed in accordance with the methodology outlined in *Section 3* and statements of the significance of the results from each element of the archive are given below. These statements are based on the assessment work undertaken, related to the original academic themes expressed in *Section 2*. For the sake of brevity and clarity, individual context descriptions are summarised within *Appendix 3*, the osteological data within *Appendix 4* and a catalogue of the coffin fittings in *Appendix 5*. The location of the archaeological remains is depicted in plan on Figure 2, whilst their stratigraphic relationships are presented as a Harris matrix in *Appendix 6*. Figure 2 also shows the locations of the numbered shoring boxes, which, by the nature of the watching brief, provided spatial orientation and are occasionally mentioned in the following text as clearly visible reference points.

4.2 STRATIGRAPHY

4.2.1 ***Modern:*** the tarmac road surface and its hardcore base, ***1024***, was a uniform 0.5m thick for the eastern portion of the rising main trench. However, towards the western end, the depth of modern made ground increased to as much as 2.6m as the road rose to meet the roundabout. Services were encountered throughout the length of the trench, the highest concentration being within the easternmost 4m, where, found at depths between 0.6m to 0.8m bgl, they obscured access to the archaeology below. Along the rest of the trench the majority of the services were drainage pipes. These were mostly just below the hardcore of the road, were easily removed and later reinstated; none impacted upon the archaeology below. The construction cut for the pumping station, **891**, did impact deep enough to interfere with archaeological deposits, but did not appear to truncate directly any burials within the investigated area.

4.2.2 ***Industrial Period:*** all of the recorded archaeological features comprised funerary remains cutting into deposit ***914***, a soft dark grey sandy material. At the eastern end of the trench, where it was excavated to its greatest depth, it was in excess of 2.5m thick and at all times extended beyond the vertical limit of excavation. This deposit, containing evidence of domestic refuse, as well as glassy slag and other waste products, could not have derived from the natural clay substrate (which was never encountered during the watching brief) and had clearly been imported. Within the rising main trench, deposit ***914*** was observed running from its eastern extent to a point some 22m short of the roundabout, whereupon it was sealed completely beneath modern made ground and not impacted upon further. The nature of deposit ***914*** and the method of excavation meant that grave cuts were not readily identifiable until the skeletons were encountered at a variety of depths below ground level

between 1.2m and 2.4m bgl. Whilst these depths clearly followed the general trends within the manmade topography (for example, westernmost burial ***1023*** within Box 10 lay at 2.05m bgl, whilst ***935***, close to the eastern end, lay at only 1.2m bgl) there was a degree of variation, and it is entirely possible that further interments lie below the present depth of investigation.

4.2.3 A total of 43 graves containing 45 inhumations were identified during the watching brief. Along with these, eight charnel deposits, one clearly from a single individual, and the remains of 18 coffins, were also discovered. Two coffins are of note, ***942*** and ***961*** (Plates 3 and 4), as the breast plates were partly legible when they were uncovered. Both were fully recorded but fragmented upon lifting, due to their highly corroded state and damaged caused to them by the shoring. All of the inhumations shared an oblique east/west orientation matching that of the extant church and that of the northern boundary of the churchyard. All were laid in a supine position with their limbs extended and their hands either on the pelvic region or proximal femurs. Due to the narrow width of the trench, only half of the burials could be recovered fully, with various anatomical parts of the remaining twenty-two left *in situ* beyond the limits of the trench. This was a particular problem at the eastern end of the rising main trench, where its north-west/south-east alignment cut across the ‘grain’ of the burials.

4.2.4 The 43 grave cuts appear to have been distributed amongst 33 burial plots or groups. Within the limit of excavation, most of the plots contained only a single burial, but five contained two, one, towards the centre of the north-west/south-east-aligned section of trench, contained four (***898***, ***909***, ***931*** and ***932***) and another, in Box 5, contained five burials (***991***, ***995***, ***998***, ***1002***, ***1002b***). The intensity of cemetery usage was attested further by the charnel deposits, indicative of the disturbance of earlier burials by later grave-digging. Five of these were located above the burials, indicating that the bones disturbed by later grave-cutting had been collected and redeposited after the new burial had taken place. Three of the charnel deposits (***938***, ***980*** and ***989***) had been placed in a discrete pit that was then sealed by the subsequent burial (Plate 2).

4.2.5 ***Assessment of potential***: the archive of primary fieldwork data is a comprehensive and well-organised record of the recovered stratigraphic information, with significant archaeological remains recorded graphically, textually and photographically. The stratigraphic sequence is essentially rather simple and will need little further manipulation to be understood fully; it is dominated, almost exclusively, by funerary deposits and features and, as such, it provides the analytical basis for any understanding of the intensity and organisation of burial, as well as, in a number of instances, the relative sequence of interment. The recorded stratigraphic data provides a flexible framework within which the analysis of the other forms of data can take place, and is particularly valuable in the comparison of the distribution of the skeletal remains identified in the rising main trench, and those excavated to the immediate south in 2006.

4.3 HUMAN REMAINS

4.3.1 ***Introduction:*** the human remains recovered during the watching brief include 45 skeletons and a number of disarticulated bones deriving from eight different contexts, including those relating to charnel deposits and disturbed burials. Other than quantification, no further analysis of the disarticulated remains was necessary at this stage.

4.3.2 ***Completeness:*** nine skeletons were approximately more than 80% complete and were represented by skull, upper and lower extremities, thorax and pelvis (Table 1). Most of the remaining skeletons were either approximately >50-75% complete or <25% complete. Incompleteness was largely a result of later graves truncating earlier graves.

Completeness	Total
1 - <25%	15
2 - >25-50%	7
3 - >50-75%	13
4 - >75-100%	9

Table 1: Completeness of articulated skeletons

4.3.3 ***Condition of the skeletons:*** overall, the condition of the bones was good. This means that cortices and joint surfaces were well preserved. The majority of adult skulls were broken or absent, however. Approximately a quarter of skulls from the assemblage would be available for detailed metrical analysis, with a small number of these needing reconstruction. Fragmentation was low or moderate across the individuals. This means that there is good potential for metrical analysis in the assemblage (see paragraph below).

Condition	Total
1 - Poor	3
2 - Fair	8
3 - Good	33
4 - Excellent	0

Table 2: Condition of articulated skeletons

4.3.4 ***Estimation of biological sex:*** most adult skeletons had features surviving that would allow the application of standard techniques to estimate their biological sex (Brickley and McKinley 2004; Cox and Mays 2003). It will be possible to estimate the sex of 27 adult skeletons using features of either the skull and/or pelvis. There are currently no accepted methods for estimating the sex of sub-adult skeletons.

4.3.5 ***Estimation of biological age:*** there were 12 sub-adults and 33 adults. Preliminary observations suggest that all age groups are represented in the assemblage, including perinates, new borns, young children, adolescents, young, middle and mature adults. All skeletons had traits surviving that will allow ages to be estimated to within 10 years for adults and 5 years or less for

sub-adults, as described in Brickley and McKinley (2004) and Cox and Mays (2003). Further, most skeletons had a range of traits surviving for age estimation. Estimating the age of skeletons is more accurate if observations are based on a range of traits, rather than a limited number.

4.3.6 ***Potential for metrical analysis:*** a high number of skeletons show potential for metrical analysis of long bones and/ or skulls (Table 3). Metrical analysis will be possible for 11 adult skulls, which were either intact or will require some reconstruction. Skull measurements allow ancestry to be explored (i.e. whether caucasian, mongoloid or negroid) (Krogman and Iscan 1986), as well as the biological variation.

4.3.7 Metrical analysis of long bones to allow estimation of stature will be possible for 26 out of 33 adults by employing measurements of the upper long limb bones and lower long limb bones. Stature estimations based on the lengths of lower long limb bones are more accurate than those that are based on lengths of the upper long limb bones. Stature estimation involves applying the maximum length of any available major long bones to regression equations set out by Trotter and Gleser (1952) and modified by Trotter (1970). As there are different equations for males and females, it is not possible to estimate accurately the stature of those skeletons within the assemblage that are of unknown sex. Metrical data to facilitate estimation of age for the sub-adults will be possible.

Score	**Number of individuals**
1 - one or no measurements will be possible	3
2 - a few measurements will be possible	12
3 - half the number of standard measurements can be taken	9
4 - majority of long bones can be measured	16
5 - Every bone can be metrically recorded	4

Table 3: Potential for standard metrical analysis

4.3.8 ***Potential for metrical and non-metrical analysis:*** adequate cranial and post-cranial remains have survived that will allow the observation of a standard set of landmarks for scoring the presence or absence of non-metrical traits (Brothwell and Zakrzewski 2004).

Non-Metric score	**Number of individuals**
1 - 1 or no landmarks observable	3
2 - a few observable landmarks	2
3 - half of the landmarks are observable	7
4 - majority of the landmarks are observable	13
5 - Every landmark can be observed	9
N/A - subadults not scored	12

Table 4: potential for non-metrical data

4.3.9 ***Pathology:*** overall, all of the skeletons had survived in a condition that is good enough to allow future detailed macroscopic analysis and documentation of pathology. A range of conditions was noted in passing and are listed in *Appendix 4*. They include evidence of trauma, joint disease (osteoarthritis), metabolic conditions (for example, cribra orbitalia), neoplastic disease and infection. Trauma includes fractures, some of which will need radiology to confirm and gain insight into their healing status. Anomalies, for example, asymmetrical limbs, were also present and may relate to traumatic injury. Again, radiology would be required to explore this.

4.3.10 Non-specific inflammation was noted on several bones of one skeleton, suggesting systemic disease. There are numerous conditions that can cause these changes, neoplastic disease, infection, and pulmonary disease, being among them. Further analysis will be required to explore this further.

4.3.11 There was evidence for post-mortem medical intervention in the form of one craniotomy, the removal of the top of the skull in the horizontal plane in order to examine the brain. Such an intervention was usually performed to explore the cause of death, but also to further knowledge about a particular ailment or lesion.

4.3.12 The amount of dental disease in the assemblage is noteworthy, and includes caries, periodontal disease, abscesses, ante-mortem tooth loss and calculus. Heavy wear patterns were also observed on the teeth and further analysis will be required to explore if they can be attributed to any cultural habits (for example, smoking a pipe).

4.3.13 No quantification or detailed description of the above pathological conditions has been undertaken at this stage, but they certainly warrant this level of analysis. The potential of the assemblage to yield information about the health status of the population is considered to be very good.

4.3.14 ***Assessment of overall potential for analysis:*** despite the fact that a proportion of this assemblage is incomplete, the preservation of all of the remains is sufficient for age, sex and stature to be estimated in most cases. Further, sufficient landmarks survive that will allow evidence for family groups to be explored through non-metrical trait analysis. There is also some potential to evaluate ancestry by the morphological and metrical analysis of skulls. Preliminary observations suggest a group of individuals of mixed ages and sexes. A range of pathological conditions is present and, through more detailed analysis, have the potential to provide valuable insights into the overall health status of the population.

4.3.15 The 45 skeletons described here represent a small assemblage, but nevertheless an important one. To date, extremely limited study of post-medieval working class assemblages has been undertaken and there are virtually no osteological studies of populations from the industrialised north-east of England. The value of this assemblage is further increased because of the research potential that would be gained by combining it with the 191 skeletons that were excavated from other parts of the graveyard. Full,

specialist examination of the remains is likely to yield results worthy of publication.

4.3.16 Questions that might be explored at full analysis include:

- What is the demographic composition of the population?
- Is the mortality profile consistent with an industrialised working class population?
- Is there evidence for inter-personal violence in the population, or does the trauma relate to accidental injuries?
- What is the healing status of the trauma? Does this suggest adequate treatment following injury?
- The presence of cribra orbitalia indicates childhood health stress in the population, but what impact did this have on growth?
- Cribra orbitalia is believed to be caused by increased pathogen loads. Does evidence for infection support this?
- Is there evidence for scurvy and rickets?
- Do some of the skeletons share the same non-metric traits and does the distribution of non-metric traits suggest family groups?
- Do any individuals from the population have traits that suggest non-caucasoid ancestry?
- How does this population compare with others that are similar in date and type in terms of its health and physical attributes?

4.3.17 During such analysis, disarticulated bones could be examined to identify discrete individuals, whilst all discrete skeletons would be examined according to standard, recommended practice (Brickley and McKinley 2004). Skeletons would be assigned to age and sex categories and, combined with palaeopathological information, the mortality profile would be explored, taking into account the archaeological background of the site. For example, this would explore whether peaks in the mortality curve are associated with any pathological conditions, or whether statistics have been biased by cultural practice, such as the zoning of burials by age or family.

4.3.18 Wherever preservation permits the standard range of measurements could be recorded, allowing estimates of stature, an exploration of ancestry and the facilitation of other biological analyses (for example, estimation of sex for adults and age and sex for sub-adults). A range of non-metric traits could be scored as present or absent and this information would be used to explore relatedness between individuals. The status of the dentitions could be recorded to explore oral care, cultural habits (ie pipe smoking), diet and any other anomalies. Pathological conditions could be described and documented by illustrations and photographs. Differential diagnoses could be explored with reference to standard texts (for example, Ortner and Putschar 1981) and, where relevant, radiography. These objectives could be greatly complimented by the application of stable isotope analysis to explore diet and geographic origin. All

findings would be discussed in the context of contemporary funerary practices and comparable samples from Britain. A full catalogue of the skeletal remains would be provided in an appendix.

4.4 FUNERARY FIXTURES, FITTINGS AND ARTEFACTS

4.4.1 ***Introduction:*** evidence of 18 coffins was recorded during the watching brief, of which three were observed only as soil stains. The remainder comprised fragments of poorly preserved wood, a grip and breastplates, of which two of the latter retained some legible script (*Appendix 5*).

4.4.2 ***Nature of the material:*** fragments of eight breastplates were recovered, amongst which two retained partial biographical inscriptions. All were of punched tin which was painted or enamelled black with white script painted on. None were sufficiently well-preserved to discern the type/decoration. A single highly corroded iron grip was recovered, with the remainder of the assemblage comprising highly fragmented pieces of breastplate or coffin wood.

4.4.3 ***Other finds:*** seven copper alloy shroud pins were associated with two individuals, ***900*** and ***917***, a copper button was associated with ***995***, and another copper button along with the iron and leather remains of a belt were associated with ***974*** (Plate 6). Two iron-bladed knives were recovered from burial soil ***914***. The first (object 160), recovered from the north-west/south-east stretch of the trench, was a simple design with a handle made from two pieces of animal bone secured to the tang with two copper-alloy rivets. The handle had been incised with diagonal lines running in a single direction and the blade had been broken approximately 20mm from the handle. The second, a folding or lock knife (object 165) was located at the base of Box 3, below the level of the skeletons that had been recovered from there. The cross-hatched incised bone handle was slightly curved.

4.4.4 ***Potential and recommendations:*** the potential of the coffin fittings is limited because of its small size and highly corroded condition (in particular, of the breastplates). However, it will still be possible to characterise the coffins and some of the fittings in regional and chronological terms, especially if they can be contextualised through further research. Photographs of the breastplates *in situ* may enable biographic detail to be recorded for those plates that fragmented upon recovery. It is recommended that, where appropriate, fittings and artefacts are radiographed to provide a record of their size and shape. Grip and plate types should be drawn if they are identified as new styles, or catalogued if they match existing typologies.

5 CONCLUSIONS

5.1 INTRODUCTION

5.1.1 The following section presents those conclusions that can be drawn from the assessment. A separate document will provide updated project aims and objectives, and a project design for Project Stage 3, a scheme of analysis appropriate to the potential of the dataset and those requirements of the Tyne and Wear Archaeologist that are necessary to discharge the planning condition.

5.2 PROVISIONAL DISCUSSION

5.2.1 It is extremely difficult, and indeed, undesirable, to discuss the remains recovered from the present watching brief without making some consideration of the results of the excavation to the immediate south undertaken by OA North in 2006. A number of similarities were observed between the two phases of work. Of particular importance was the analogous character of the burial substrate. This clearly imported material, in excess of 2.5m thick, contained various quantities of domestic and industrial refuse, and is likely to represent an effort to raise the level of the cemetery in order to accommodate more burials. One such event, utilising material from a nearby ballast mound, was recorded as having taken place in 1817; further documentary research may reveal other such instances, but it is tempting to suggest that those skeletons revealed during the present watching brief date from 1817 to the closure of the cemetery to new interments *c* 1860. They can, therefore, be considered to fall within a relatively narrow date range.

5.2.2 As with the burials excavated by OA North to the south in 2006, the intensity of burial and the use of family plots can clearly be seen, as can hints of the manner in which the cemetery was organised. There is a suggestion that the graves of the burials recovered during the watching brief were laid-out reasonably neatly, which may have implications for the interpretation of their status. Such evidence needs to be contrasted with that from the excavation trench to the south in order to examine the wider use of space within the cemetery.

5.2.3 Although a considerable number of human remains were removed from the zone of impact associated with the sewer diversion, the nature of the findings during the archaeological excavation to the south in 2006 would suggest that many more, undisturbed, inhumations are likely to lie intact beneath the base of the diverted sewer. Such remains could be disturbed by deep excavations in the future, and this may be particularly problematic at the western end of the sewer, where the burial horizon was increasingly thickly blanketed by deposits of modern made ground and may have suffered little previous disturbance. Even within the eastern end of the sewer trench, the fact that the base of the imported burial soil was not reached, may suggest that what currently appear to be deeply buried individual interments may merely be the top of stacks.

There is also the fact that all of the revealed skeletons derive from the latest of at least two separate burial horizons and again, deeper excavations in the future are highly likely to reveal such remains in equal, if not greater, intensity.

5.3 STATEMENT OF SIGNIFICANCE AND PROPOSAL FOR FURTHER WORK

5.3.1 The research context for the present investigation, including appropriate frameworks and regional studies, has been outlined in *Section 2*, and will not be reiterated here. Suffice to note, the assemblage from the rising main watching brief at Coronation Street is an important addition to the small but growing corpus of post-medieval and Industrial-period human skeletal assemblages recovered archaeologically from the North East.

5.3.2 The assemblage, although relatively small (45), has the potential to provide a rare insight into nineteenth-century living conditions and how these impacted on the health and physical attributes of the population. This contribution is increased vastly if these remains can be considered in conjunction with the 191 individuals recovered from the excavation undertaken in 2006. Both the EH and Tyne and Wear archaeological monitors have recognised the value of the combined assemblage as one of the largest post-medieval collections from the area, particularly as it dates from a period of major expansion of the industrialising port of South Shields. Moreover, archaeologically excavated post-medieval cemeteries are highly centred around London and Birmingham and most relate to the middle-upper classes, unlike the St Hilda's assemblage, which represents a working class population from the North of England.

5.3.3 The use of the rich historical documentation of the late Georgian and early Victorian periods is an important aid in the interpretation and contextualisation of the results of the excavation and the osteological analysis. The health and demography of the assemblage could be particularly revealing, as documentary evidence suggests industrialising populations experienced high levels of stress and poor diet, crowded living conditions, rife with infectious disease. The assemblage will go some way to confirm or refute these assumptions and the findings would be set in a wider context by comparison, at a statistical level, with other British populations of a similar date (Roberts and Cox 2003).

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ILLUSTRATIONS

FIGURES

Figure 1: Location plan

Figure 2: Location plan of the human remains recovered during the rising main watching brief on Coronation Street

PLATES

Plate 1: East-facing view of the pipe trench

Plate 2: Charnel ***980*** in pit

Plate 3: Painted breast plate on coffin ***942*** reads: [I]sabella ?A?? Died June 23 18??, Aged, 27 years

Plate 4: Skeleton ***941*** with breast plate ***942***

Plate 5: Skeleton ***928***

Plate 6: Skeletons ***974*** and ***978*** with button and belt buckle

APPENDIX 1: PROJECT DESIGN

SEWER DIVERSION EXCAVATION, CORONATION STREET, SOUTH SHIELDS,

TYNE AND WEAR

Archaeological Watching Brief:

Project Design V1.1

Oxford Archaeology North

May 2007

Henry Boot Developments Ltd and ARCUS

OA North Job No: L9706
NGR: NZ 360 670

1. INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 The following document has been prepared by Oxford Archaeology North (OA North) in response to a request from Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of Henry Boot Developments Ltd (hereafter the 'Client') for proposals for an archaeological watching brief to be undertaken during groundworks associated with a water main along the route of Coronation Street, South Shields (NGR NZ 360 670). The present document comprises a methodology for the archaeological fieldwork; the methodology for any post-excavation work to be undertaken on human remains recovered by the watching brief would be covered by *Sections 3.3* and *3.4* and *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006. The present scheme of groundworks to be subject to archaeological monitoring will involve construction of a sewer and a number of manholes along the route of Coronation Street, from the pumping station on Old Coronation Street in the east, to the roundabout at the junction of Station Road in the West. It is thought that groundworks will be enacted in a series of short sections measuring up to 2m wide by up to 2m deep.

1.1.2 Previous archaeological works in the area comprise a desk-top assessment, undertaken by Tyne and Wear Museums (1998), which identified that much of the present route of Coronation Street lay within the bounds of St Hilda's cemetery, an archaeological evaluation undertaken by Archaeological Services, University of Durham, which proved the presence of burials on the site at a depth of around 2m below ground level (ASUD 2006) and a recently-completed excavation undertaken by OA North, which took place in the small area between Coronation Street and Old Coronation Street. During the excavation, 191 human burials were removed from a trench measuring approximately 17m by 4m (maximum width, reduced to 2m at depth) and up to 5.5m deep. The concentration of these remains suggests that human remains may well be present within the areas of the proposed sewer trenches, although given the presence of made ground associated with the modern landscaping of the area, such remains could lie below the 2m depth of impact, and thus be unaffected by the development.

1.2 GEOGRAPHICAL, HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

1.2.1 The proposed development site lies in the centre of South Shields, with the River Tyne running close by, to the west. Although there is no contemporary evidence from the proposed development area, the earliest known human activity in the vicinity is located some *c* 1km to the north-east of Coronation Street and comprises settlement activity beneath the Roman fort of *Arbeia*. There is thought to have been a contemporary settlement and port associated with the fort, but it is uncertain where these lay. The Anglian nunnery of St Hilda was built in 674 AD in the vicinity of the present development area, on the banks of the Mill Dam tidal inlet. Although the exact location of the original nunnery is not known, the area to the north of Coronation Street has remained a focus for religious activity through the medieval period and into the present, with the latest incarnation of the Church of St Hilda having been rebuilt during the nineteenth century and possible occupying the same site of its predecessors.

1.2.2 Land to the south of Coronation Street, in the area of Old Coronation Street, is largely level at *c* 5.1m OD, but rises to the west, in the area of the roundabout, to 10.2m OD and to the immediate north, along Coronation Street itself, to *c* 7.3m. The natural drift geology of the area comprises thick boulder clay deposits (up to 12m thick). However, much of the proposed development area was occupied by a tidal inlet, the Mill Dam Creek, which is shown on historic maps running to the south of St Hilda's Churchyard. By 1827 the Mill Dam had been completely infilled and built upon (Tyne and Wear Museums 1998), and there is evidence from recent excavations at the Customs House (built in 1861 at the confluence of the Mill Dam and the Tyne) that this process of infilling had begun at least as early as the late seventeenth or early eighteenth centuries (*ibid*). That such activity may have occurred within the proposed development area is hinted at by some of the older cartographic sources. Armstrong's map of 1768 depicts the Mill Dam as being very much wider and closer to St

Hilda's Church than does Richardson's map of the same year. The latter source accords well with the Fryer's map of 1773 and Casson's map of 1801 and, whilst it is not possible to corroborate the accuracy of Armstrong, it is possible that his map is based on an earlier survey or source which may show the Mill Dam prior to infilling in the area of the church. South and east of the excavation trench, geotechnical investigations have proven the depth of these infill deposits to at least 16m below the present ground level (M Douglas pers com).

1.2.3 Deposits encountered within the recent excavation trench, comprising dumps of clay, gravel and industrial waste, are characterised at depth by their admixture with grey silty clay characteristic of fluvial deposits, and it is thought that these deposits relate firstly to activity on the banks of the Mill Dam, and latterly to levelling. An episode of levelling, undertaken in 1816 in order to raise the level of the crowded cemetery to accommodate further burials, is said to have utilised ballast from a nearby mound (Tyne and wear Museums 1998). If this episode is traceable within the present archaeological trench, then the ballast in question must have contained a high proportion of industrial and domestic refuse, as observed in the case of the burial matrix encountered within the upper 2m - 4m of stratigraphy. Although natural ground was purported to have been found within the evaluation trench at a depth of 2m below ground level (ASUD 2006), the OA North excavation has proven this to be far from the case, with natural deposits encountered at a depth of approximately 5.5m - 6m below the modern ground level. Moreover, there is some indication that the natural ground surface slopes down towards the Tyne, the reverse of the modern situation in the area of the Coronation Street/Station Road roundabout.

1.3 Oxford Archaeology North

1.3.1 OA North has considerable experience of excavation of sites of all periods, having undertaken a great number of small- and large-scale projects throughout Northern England during the past 25 years. Evaluations, desk-based assessments, watching briefs and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables. OA North has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. OA North is an **Institute of Field Archaeologists (IFA) registered organisation, registration number 17**, and all its members of staff operate subject to the IFA Code of Conduct.

2 OBJECTIVES

2.1 The following programme has been designed to identify the presence of any human remains within each of the sewer trenches, and to investigate, record and remove those remains where they would be effected by the development together with as much supporting information concerning the depth, orientation, burial furniture and dating as the circumstances within the service trenches allow.

3 METHOD STATEMENT

3.1 Watching Brief

3.1.1 ***Methodology:*** all machining undertaken on the site will be monitored by a suitably experienced archaeologist; any machining below the level of compact road services should be enacted by the use of a toothless ditching bucket. It would be desirable if machining could be undertaken in long, shallow scoops, rather than short, deep bucketfuls, in order to minimise damage to any human burials or other archaeological remains. The programme of field observation will record the location, extent, and character of any surviving archaeological features and/or deposits as accurately as possible within the area of proposed ground disturbance. Where health and safety considerations allow, any human remains revealed by the machining and lying within the zone of impact, would be screened from public view, recorded *in situ* and removed from the trench which, to allow safe access when over 1.2m deep and/or less than 2m wide, would require the use of a temporary shoring system, installed by a specialist contractor. Although it is appreciated that the limited space available to the scheme of excavation would prevent the deposition of spoil from mechanical excavation in separate spoil heaps, it would be useful if spoil deriving from initial excavation of the road

surfaces and their make-up could be kept separate from that deriving from the underlying layers in order that such material can be systematically searched for human remains and any other artefacts as soon as it is safe to do so. The rough location of such remains would be recorded as accurately as possible to allow this material to be tied in with the field observations. It is proposed that at least two archaeologists will be in attendance during the machining process, allowing the spoil to be sorted for human remains, and for any *in situ* remains to be recorded without delaying the machine, which would be able to excavate another area if archaeological remains were found at the original site of excavation. As required, additional archaeologists would be supplied to the site to deal with greater numbers of remains.

3.1.2 The investigation and excavation of human remains would be undertaken in accordance with the methodology outlined in *Appendices 1 and 2* of the OA North project design for the excavation undertaken at Coronation Street, dated April 2006. Putative non-burial archaeological features and/or deposits identified during the observation of groundworks, together with the immediate vicinity of any such features, will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions and, where appropriate, sections will be studied and drawn. Any such features will be sample excavated (ie. selected pits and postholes will normally only be half-sectioned, linear features will be subject to no more than a 10% sample, and extensive layers will, where possible, be sampled by partial rather than complete removal).

3.1.3 ***Recording:*** all recording will be undertaken in accordance with national guidelines (English Heritage Guidelines for the treatment of human remains excavated from Christian burial grounds) and OA guidelines, wherever possible, and in the case of human remains, will be undertaken in accordance with *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006. To increase the speed of recording, burials will be planned through the use of rectified photography. Such works will involve the use of survey equipment, base stations for which will need to be surveyed-in using GPS equipment prior to the commencement of groundworks, and once the location of the sewer trench has been finalised (to limit any disturbance/movement of the base stations). Recording would take the form of indexed black and white print and colour slide photography, appropriately-scaled plans and sections on permanent drafting film together with detailed written notes on *pro-forma* recording sheets.

3.1.4 ***Treatment of finds:*** all finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid For Finds*, 1998 (new edition) and the recipient museum's guidelines.

3.1.5 ***Treasure:*** any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996. Where removal cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.

3.1.6 All identified finds and artefacts will be retained, although certain classes of building material can sometimes be discarded after recording if an appropriate sample is retained on advice from the recipient museum's archive curator.

3.1.7 ***Fleshed or partially-fleshed bodies:*** should mechanical excavation reveal the presence of fleshed or partially-fleshed burials, or coffins containing liquor or other corruption products, it would be necessary to inform the Environmental Health Officer and agree a suitable strategy for their recovery, analysis and disposal. all further works would conform to any requirements that they may set. Dependent on the state of these bodies, it may be necessary to use a specialist contractor for their removal, storage and deposition, the costs of which would be agreed with the Client and charged as a variation. Any lead coffins would not be opened, but would need to be removed, stored and deposited by a specialist contractor, the costs of which would be agreed with the Client as a variation.

3.1.9 ***Contingency plan:*** in the event of significant non-burial archaeological features being encountered during the watching brief, discussions will take place with the ARCUS, the Client

and the Tyne and Wear Archaeologist, as to the extent of further works to be carried out. All further works would be subject to a variation to this project design. In the event of environmental/organic deposits being present on site, it would be necessary to discuss and agree a programme of palaeoenvironmental sampling and or dating with the Planning Archaeologist.

3.2 POST-EXCAVATION ASSESSMENT, ANALYSIS AND ARCHIVING

3.2.1 The assessment and any analysis of the human remains recovered as part of the watching brief would be undertaken as part of the wider post-excavation programme, methodologies for which are provided in *Sections 3.3* and *3.4* and *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006.

4. Health and Safety

4.1 OA North provides a Health and Safety Statement for all projects and maintains a Unit Safety policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (1997). A risk assessment will be completed in advance of any on-site works and copies will be made available on request to all interested parties.

5 WORK TIMETABLE

5.1 ***Archaeological Watching Brief:*** the duration of the watching brief will be dependent upon the timetable of the groundworks; although some delay may be incurred by the discovery of *in situ* human remains, it is hoped that additional staff could be supplied to the site to investigate such remains as quickly as possible, allowing groundworks to continue at another point along the sewer trench.

6. PROJECT MONITORING

6.1 ***Access:*** liaison for site access during the evaluation will be arranged with the client unless otherwise instructed prior to commencement of the archaeological investigation.

6.2 Whilst the work is undertaken for the Client, ARCUS would ensure that the Tyne and Wear Archaeologist will be kept fully informed of the work and its results, and will be notified a week in advance of the commencement of the fieldwork. Any proposed changes to the project design will be agreed with the Tyne and Wear Archaeologist in consultation with the Client and ARCUS.

7. STAFFING PROPOSALS

7.1 The fieldwork will be under the direct management of **Stephen Rowland** (OA North project manager) to whom all correspondence should be addressed. The post-excavation programme would be managed by **Louise Loe** (OA Head of Heritage Burial Services).

7.2 The watching brief would be undertaken by an archaeological Supervisor and an Osteoarchaeologist. Additional staff would be supplied, as required, to limit disruption to the machining schedule. The initial surveying-in of base stations would be undertaken by Marc Storey, OA North Geomatics Project Officer.

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APPENDIX 2: RELEVANT SECTIONS FROM THE EXCAVATION PROJECT DESIGN

3.2 POST-EXCAVATION ASSESSMENT

3.2.1 Following completion of the fieldwork, the results will be collated and the site archive completed in accordance with English Heritage MAP2, Appendix 3. A post-excavation assessment of the archive and the resource implications of the potential further analysis will be undertaken. The stratigraphic data and the finds assemblage will be quantified and assessed, and the environmental samples processed and a brief assessment of their potential for further analysis made. The assessment will, where appropriate, comprise:

- Quantification of all site records, including drawings
- Assessment of the stratigraphic sequence, in terms of complexity and, where possible, provisional chronology
- A summary description of the results of the excavation, including an identification of formation processes
- An assessment of the significance of any deposits from which radiocarbon samples have been taken and the selection of specific samples for submission for analysis
- An assessment of any groups of articulated and disarticulated human remains, including age, gender and any pathological lesions, along with the distribution of the remains themselves, in terms of their potential for further analysis, which might include:

i. Demographic reconstruction in terms of age, gender and health

ii. Stature and bone size and shape conformation

iii. The presence of non-metric traits and genetic disorders that might indicate the use of areas of the cemetery by familial groups

iv. Indications of social status and access to resources as well as occupation-related pathological conditions

v. Groupings of disarticulated human remains likely to relate to single individuals

vi. Number of individuals and stratigraphic relationships represented by the unstratified material that may lend clues to the length of usage of the cemetery

vii. Isotope analysis for the reconstruction of past dietary practices and also for the origin of populations

- An assessment of the quantity and provisional dating of any pottery recovered from the excavation and an assessment of the further work required for the analysis of a selected assemblage from the evaluation and excavation. Such potential for analysis may include:

i. Typological and chronological analysis in order to improve an understanding of the chronological basis of the use of the site as a cemetery and of any earlier activity

- An assessment of the quantity, form and provisional dating of any coffin furniture, nails or other metal artefacts in order to establish a programme of further analysis, which might include:

i. Form, function and typological analysis, as a means of dating artefacts and interpreting their use for social display, etc.

- An assessment of the nature and quantity of any faunal remains along with the potential for further analysis, which might include:

i. Species representation, proportions, metrical conformation, pathological lesions, age and sex for the understanding of the pastoral and hunting economies and the nature of animal husbandry practices

ii. Butchery, burning, gnawing and fracturing as a means of determining the treatment and processing of meat products along with attitudes to waste disposal

iii. Analysis that might help to address research questions regarding the introduction of domesticated species during the Early Neolithic, which might include an examination of non-metric traits and body conformation that could indicate the presence of animals of primitive type, or of greater or lesser genetic diversity or of indigenous or extraneous origin

- An assessment of environmental remains recovered from the excavation, including the nature and quantity of materials such as molluscs, pollen, charcoal and carbonised plant remains along with the potential of any well-stratified assemblages for further analysis in terms of:

i. Identification of economic and subsistence practices through the identification of edible plant remains

ii. The identification of food processing strategies as indicated by the presence of various plant anatomical parts (ie, chaff), either separated from or still attached to seeds and grains. Within this context, insect remains may also be important in identifying any storage or refuse functions associated with features

iii. The nature of the environments exploited for plant foods through the identification of weed seeds, which may also indicate the nature of human manipulation of the local environment, as may insect remains

iv. The character of the local environment through the analysis of pollen, plant macrofossils and fungal spores and the potential impact of man upon this environment

v. The character of the immediate environment as indicated by any mollusc or insect remains and relict topsoil horizons

vi. The presence of faecal material and parasite eggs that may be informative of the general state of health of past populations

- An assessment of any monoliths or core samples taken from specific deposits for their potential for further analysis in terms of site formation processes

3.2.2 The assessment results will be presented within a post-excavation assessment report which will summarise the results of the excavation and any initial hypotheses that can be drawn from the assessment of the finds and environmental samples. Within the framework of these initial results, an attempt will be made to place the data from the excavation within a regional context both in terms of a chronological narrative and of significance. The assessment report will make recommendations for a schedule, timescale and programme of analysis in accordance with MAP2 Appendix 4.

3.3 ANALYSIS

3.3.1 A provisional programme of post-excavation analysis is anticipated, and guidelines are provided in *Appendix 2* of this project design. The extent of the programme, however, can only be reliably established on completion of the post-excavation-assessment report, but it is likely, considering the nature of the material from the evaluation, that each of the proposed stages for analysis of human remains will be undertaken on the more complete inhumations, while less-detailed analysis is likely to be undertaken on disarticulated remains (see *Section 3.3* above). The proposed programme anticipates both analysis of the site stratigraphy and the artefactual/ecofactual evidence leading to the production of a final report. This will be completed within two years of the fieldwork.

3.4 PUBLICATION

3.4.1 It is anticipated that the results of the excavation will be worthy of publication. If possible, the publication text will be prepared in a suitable form for inclusion in either a regional or national journal, for example, the Durham Archaeological Journal or Archaeologia Aeliana, respectively.

APPENDIX 1: THE EXCAVATION AND RECORDING OF BURIALS IN CHURCHYARDS

By A Boyle and C Boston

1 INTRODUCTION

This section details the recommended methodology for the excavation and recording of inhumations and their associated features and grave goods. Associated features include coffins, grave cuts, ditches, postholes, stakeholes and memorials.

It is fair to say that it is virtually impossible to record a burial in too much detail but this viewpoint needs to be balanced against time and money constraints BUT NOT AT THE EXPENSE OF THE DATA.

Both excavation and post-excavation treatment will directly affect the quality and quantity of information, which can be recovered by the osteoarchaeologist. An enormous amount of information can be extracted if proper procedures are followed. On any site where burials are discovered it is important to seek the advice of the osteoarchaeologist as soon as possible. Where the presence of burials is known or suspected this should happen prior to excavation. If at all possible the osteoarchaeologist should be present on site throughout excavation. This is especially important on large cemeteries and is essential both when preservation is poor and when skeletons are to be immediately reburied. Otherwise some provision should be made for regular visits. An assessment of factors such as numbers of skeletons, bone preservation, method of burial, date range and density of inhumations will aid in the definition of a suitable collection procedure. For example, in cases where the sample is small and skeletal preservation is poor, the opportunities for post-excavation will be limited. This will have implications for the recording and excavation procedures employed.

2 INHUMATION BURIALS

This section describes the recommended methodology for the excavation of inhumation burials within churchyards. The general area should be thoroughly cleaned in plan, with a view to defining grave outlines and their relationships to other graves and/or features. Clearly, intercutting graves are important in the construction of a stratigraphic sequence for the site. Where graves are intercutting it is essential that the relationships are properly investigated and interpreted on site. In these circumstances loose bones should not be removed until it is clear which context they belong to (a separate section on the excavation and recording of disarticulated bone appears below).

2.1 METHOD OF EXCAVATION

The best practice is to excavate graves and their contents in plan. Although the quadranting of graves with a view to producing longitudinal and transverse sections has been advocated it is difficult to see how such a procedure would deal adequately with eg. the recording of large numbers of finds, or the recovery of a body surviving only as a shadow. Arguments may however be presented for the excavation of particular burials in sections or quadrants.

Excavation should proceed carefully and without undue haste. A basic aim is the definition of body position in order that the more fragile bones, such as skull, pelvis, kneecaps, hands and feet, are not accidentally damaged. It is therefore poor practice to begin by digging deep exploratory holes with a view to `hitting bone'.

2.2 RECORDING THE SKELETON

Each individual skeleton will be assigned a separate context number from a continuous sequence. The skeleton has its own specialised context sheet, which must always be used. If further space is required then a standard context additional sheet should be used. **NOTE:** Once a context number has been assigned then a separate skeleton number is unnecessary. It is important to realise that the deposition of a skeleton is a stratigraphic event in *its own right* whether or not it is placed within a coffin. There are two slightly different versions of the skeleton recording sheet: one should be used for adults and the other for children and subadults as appropriate. Only those aspects of the skeleton recording sheet, which are unique, are discussed here. The remaining elements of the skeleton sheet are also present on the general context record sheet and are discussed in section 2 of the Oxford Archaeological Unit fieldwork manual.

2.2.1 ***Skeleton diagram:*** this diagram should be used to record which bones are present. If a bone is present then it should be shaded on the drawing. Where possible the osteoarchaeologist should be consulted.

2.2.2 ***Levels:*** these should be taken at three basic positions as indicated on the skeleton recording sheet (skull, pelvis and feet). A level measurement taken between the knees if legs are extended can be useful. Further readings should be taken if the position of the skeleton is in any way unusual. Great care should always be taken when placing level staff. All levels should additionally be marked on the plan.

2.2.3 ***Orientation:*** orientation should always be in relation to OS grid North or magnetic North rather than site grid North. A compass should be used.

2.2.4 ***Body position:*** body position should be indicated in the appropriate box. When describing the skeleton it should be remembered that left and right sides are those of the skeleton and not the excavator. A precise description of arms and legs should appear on the skeleton context sheet in the section for Additional Information. Factors such as displacement of skull, mandible and the disposition of hands and feet must be recorded as they may relate to taphonomic processes. Bones which have been positioned tightly together may have been wrapped in a shroud at the time of death (shrouds may additionally be indicated by pins). Animal activity or collapse and decay of grave structures may cause displacement of bones. Definitions of the relevant terminology appear below.

2.2.4.1 *Supine:* the skeleton is laid flat on its back, legs may be extended, crossed, flexed or semi-flexed, detail of arm position and the direction in which the skull is facing should also be provided. Supine is by far the most common body position found in Christian burials.

2.2.4.2 *Crouched:* the skeleton is laid on its side and crouched (often tightly) in the foetal position, detail of arm position and the direction in which the skull is facing should also be provided.

2.2.4.3 *Prone:* the skeleton is laid face down; legs may be extended, crossed, flexed or semi-flexed, detail of arm position and direction in which the skull is facing should also be provided.

2.2.4.4 *On side:* the skeleton is laid on left or right side, legs may be extended, crossed, flexed or semi-flexed, detail of arm position and the direction in which the skull is facing should also be provided.

2.2.4.5 *Irregular:* if the position of the skeleton does not fit into any of the above categories then it can fairly be described as irregular and as much detail as possible should be provided.

2.2.5 ***Preservation of skeleton:*** this category relates to the condition of those bones which are present and NOT to the completeness of the skeleton. Choose good, fair or poor as appropriate. Where preservation is variable and additional comment is required this should appear in the box marked `description'. Many factors can determine the survival of bone. These include soil pH, moisture content, air, temperature, fauna, flora, and human interference. Additionally age and sex also play a part. Pathological bones are particularly fragile and those exhibiting lesions should be photographed in situ. Water is the single most important factor of decay: the principal action of

water on bone is by leaching. Preservation is generally better in soils with a neutral or slightly alkaline pH, and is worse in acid conditions. Decomposition may be accelerated in porous light soils while dense, clay-like soils may actively retard it (Henderson 1987). The categories of preservation are defined as follows: preservation should be described as good where bones are mostly intact and in good condition and therefore unlikely to fragment during excavation, bone surfaces are smooth and unmarked; preservation should be described as fair where occasional bones are broken and further breakage is likely to occur during excavation, bone surfaces may have slightly `weathered' or roughened appearance; preservation should be described as poor where most or all of bones are broken and fragmented, bone surfaces have very `weathered' or roughened appearance.

2.2.6 ***Completeness of skeleton*:** this is indicated pictorially on the skeleton diagram. In addition the level of completeness should appear in the appropriate box on the skeleton recording sheet using a numerical code as follows: 1 - complete/virtually complete, all or most bones of the skeleton appear to have survived; 2 - more than half the skeleton has survived; 3 - less than half the skeleton has survived.

2.2.7 ***Collection quality:*** any factors, which might have affected the standard of recording and collection, should be noted, such as if collection took place under salvage conditions or in very poor weather (eg. frost or poor light), many of the smaller bones of the hands and feet might have been missed. Any damage, which occurs during the excavation or lifting of the skeleton, should be noted. Both should appear in the section for Additional Information.

2.2.8 ***Planning and photography:*** ideally all skeletons should be planned at a scale of 1:10. This provides a realistic representation of the position of all surviving bones and any associated objects. If appropriate this plan can also incorporate grave outline, coffin evidence, any other structures and associated finds. Before planning, the grave fill and any soil around and adhering to the skeleton should be removed. Appropriate tools are described in section 2.2.9 below. It should be emphasised that the small bones of the hands and feet are easily disturbed and damaged. Consequently only the minimum amount of soil should be removed from these areas. The sparing use of sponges and fine water sprays can be useful for the removal of persistently adhering soil. However, under no circumstances should bones be continually dampened and allowed to dry out, as this will cause them to disintegrate. The use of 1:5 scale plans for infants and neonates should be considered where time allows. The points at which levels have been taken should also be indicated on the plan. Sample location can also be indicated on plan.

Increasingly, plans of skeletons are made by digital rectification of photographs taken using a digital camera. These have the advantage of greater accuracy than hand-drawn plans, and are a labour-saving device in the field. It is important to note, however, that a manual plan of the grave cut, coffin wood and fittings and small finds is still required, as these tend to show up poorly in photographs.

2.2.9 ***Excavating the skeleton:*** it must be emphasised that the quality of the skeletal information, which can be extracted by the osteoarchaeologist, is directly dependent on the completeness of the skeleton and the preservation of individual bones. A very fragmented skeleton is of limited use. Hence great care should be taken in the lifting and handling of the bones. In acid ic soil conditions, tooth enamel may be all that survives. This should be lifted in a block and kept moist.

Bones should be boxed as soon as possible after excavation. Skulls in particular should be placed in boxes immediately after lifting and UNDER NO CIRCUMSTANCES should they be transported from site in plastic bags alone as they are extremely fragile. They should never be lifted by the orbits (or eye sockets). Always lift skulls using both hands. All the appropriate packing materials should be on site prior to lifting of skeleton.

Specialised tools are essential. These are plasterer's leaves (leaf blades); dental tools and soft, and small paint brushes. Wooden tooth picks, lollipop sticks (tongue depressors) and plastic modelling tools should be employed in the final cleaning stages as they are unlikely to mark or depress bone.

The skeleton should be excavated and bagged in the manner outlined here (though not necessarily in this order). The skull and mandible should be bagged together and placed immediately in a box.

Any loose teeth should be placed in a separate small bag, which should also be placed in the box. The left scapula, clavicle, humerus, radius and ulna should be lifted and bagged together, the bones of the left hand and wrist should also be placed in this bag. Repeat for the right arm. The left pelvis, femur, patella, tibia and fibula should be lifted and bagged together; the bones of the left foot and ankle should also be placed in this bag. Repeat for the right leg. The vertebrae, ribs and sternum can be placed in one bag.

NOTE: this is the minimum number of bags, which should be used. If time allows hands and feet may be separated from arms and legs (ie right hand in one bag, left hand in another). Where the bones of the hands or feet cannot be separated ie. because they are crossed, the bones may be placed in a single bag. Whenever time allows, vertebrae and sternum can be separated from ribs, and ribs can be split into left and right sides. Additionally fourth ribs may be placed in a separate bag, if easily identifiable, as these can aid in age assessment. During lifting the ribs often break into quite small fragments, many of which may be unidentifiable as to side. It is sensible to remove the bone in a systematic fashion, ie dealing with one bag at a time in order to avoid confusion.

Every individual bag should have two labels inside. The following details should appear on both: site code, context number of skeleton, bone identification (eg. skull, right arm or left leg). Trap air in bags with bones to prevent crushing. Skeletons should be boxed as soon as possible after lifting; even before washing in order to minimise crushing.

Where possible the entire procedure should be completed in one day. If left overnight, the skeleton should be covered with polythene and packing material (eg loose soil).

2.3 THE EXCAVATION OF JUVENILES AND INFANTS

Many of the above points continue to be relevant to the excavation of young individuals, but a number of additional points are important. The epiphyses (ie the bone ends) are not fused to the bone shafts. At birth there are 450 bone forming centres which will develop into 206 in the adult. Excavators should be aware of this, preferably through demonstration of neonate, infant and juvenile skeletons. It must be borne in mind that infant epiphyses resemble small stones. Special care should be taken to recover infant vertebrae, which comprise three separate bones. Infant bones are regularly recovered from settlement contexts and often confused with small animals, such as rabbits and dogs. It is hoped that the skeleton diagrams on the recording sheets will be a help in this respect. The bones of adults and juveniles should never be bagged together as the latter are extremely fragile. Each individual infant limb bone should be placed in a separate bag.

2.4 DISARTICULATED BONE

Multiple graves, often containing disarticulated bone are quite common on archaelological sites (eg. Roman, Anglo-Saxon, medieval and post-medieval). Disarticulated bone is also known from prehistoric contexts (eg. Neolithic and early Bronze Age). Disarticulated bone from earlier periods is likely to benefit from three-dimensional plotting and identification of each individual bone, although this may not be feasible in each and every case.

Relatively little useful information may be gleaned from churchyards where successive burials have taken place intensively over a prolonged period. In these cases, the possible value of the data should be weighed up against practical considerations, such as time and money constraints. In these circumstances, it is recommended that the disarticulated bone is collected for possible reburial. Further recording and osteological analysis is not usually indicated.

2.5 BODY STAINS AND `EMPTY' GRAVES

In contexts where acid conditions prevail the skeleton may have completely decayed and be represented only by a `body stain'. Occasionally fragments such as dental enamel will survive. Body stains can generally be excavated three-dimensionally. The staining should be sampled along with all the grave fills and control samples should be provided.

Where graves are apparently empty, samples may be recovered for phosphate analysis in order to determine whether or not a burial was ever present.

2.6 GRAVE CUTS

A grave is a cut feature and therefore, a negative one. Attention should be directed to Appendix 4 of the Oxford Archaeological fieldwork manual (Wilkinson 1992). All of the general points apply equally to grave cuts. The shape of the grave cut should be described in some detail and the following terminology should be employed: sub-apsidal (grave with rounded ends), sub-rectangular, ovoid, square, circular or irregular.

The profile of the grave should be recorded in the written record. Important features to look out for are ledges, which may indicate the presence of a wooden lid and the presence of grave markers (post holes, stake holes: see associated structures below). In general, it is not necessary to draw longitudinal or cross-sectional profile of the cut. A written description, however, should be recorded on the context sheet.

The grave outline should be planned at a scale of 1:10. Levels should be taken at the top and bottom of the grave. In churchyard contexts, the precise cut of the grave may not be visible, due to lack of distinction between the graveyard soil and the grave fill. Nevertheless, it should be assumed that the cut existed, and should be accorded a context number.

2.6.1 ***Extra-mural vaults and brick shaft graves:*** in the 18th- and 19th-centuries, concern over disturbance of the remains of family members, and the increasing use of death ritual for social display led to the establishment of subterranean brick-built family vaults and shaft graves for the interment of multiple burials. A vaults traditionally has a vaulted roof, the entrance to the interior commonly is through a doorway in one of the side walls (often with a set of steps leading down to it). A brick shaft grave is essentially a rectangular or single break grave cut lined with a single or double layer of bricks and mortar. Brick shaft graves may be of single or double width. The top of the grave is covered over by horizontal ledger stones (often sandstone or limestone slabs), which could be removed for subsequent interments. Coffins were stacked vertically one above the other within the grave, sometimes resting on metal racks. Vaults and brick shaft graves were originally surmounted by an above- ground memorial. Today, many have been lost.

Recording of vaults and brick shaft graves should follow the guidelines for brick built structures laid out in the Oxford Archaeology Field Manual (Wilkinson 1992).

2.7 GRAVE FILLS

The grave fill is a positive context and attention should be directed to section 2.4.1 and Appendix 1 of the Oxford Archaeological fieldwork manual. It should never be assumed that a grave will only have a single fill- it may have several. It is important to ensure that all of the grave fill is removed and that the grave is `bottomed'. This has obvious implications for the shape and depth of the grave. More specifically, objects are often located below the skeleton, and would be otherwise missed. In churchyards, it was common practice to inter two or more burials one above the other. Care should be taken to ascertain that the lower-most burial has been revealed. The fill below the skeleton may also indicate whether or not the grave remained open for any length of time prior to burial.

Where bulk finds (eg. animal bone and pottery sherds) are recovered from grave fills, this should be recorded in the fill context sheet, along with their vertical position within the fill. Any indication that a find was confined to a particular part of the fill should be recorded. This will facilitate the distinction between residue material and grave goods deliberately placed with the corpse within the grave. On the whole, it is recommended that finds within grave fills should be treated as small finds. This is not the case, however, with coffin nails, which should be assigned the context number of the coffin. It is not necessary to give coffin fittings or fixtures small find numbers. It is important, however, to record their position within the grave on the grave plan. Most commonly, coffin fittings and fixing nails, hinges and brackets are collected for reburial

with the associated skeleton. If the skeletons are not to be reburied, they should be collected for inclusion within the archive.

2.8 COFFINS

A variety of wooden mortuary chambers and wooden coffins appear in the archaeological record dating from as far back as the earlier Neolithic. In the medieval and post-medieval periods, both wooden and lead-lined coffins are common. Simple single thickness trapezoid and rectangular wooden coffins were the most common form in the medieval period. From the 17th century, there was increasing elaboration of coffins and fittings. Single-break coffins (the modern 'coffin shape') become ubiquitous from the 1730s onwards (Litten 1991). Simple coffins comprised of a single thickness wooden case decorated with few fittings. More elaborate coffins were constructed either of a double thickness of wood; an outer wooden case and inner lead shell, a lead shell and inner wooden coffin; or a triple layer of a wood-lead-wood. Lead was the most common metal, but iron and zinc were also occasionally used for the metal shell. The outer wooden case was often upholstered in baize or velvet and decorated by elaborate patterns of upholstery studs (usually iron or brass) and metal fittings, such as escutcheons, lid motifs and *departum* plates (breastplates, footplates and headplates inscribed with the name of the deceased, their age, date of death and other particulars). A taphonomy of coffin fitting styles based on coffins found at Christ Church, Spitalfields (Reeve and Adams 1993) forms the basis for comparison of these styles. OA is currently compiling a 'master catalogue' to include new styles found on other post-medieval burials sites.

2.8.1 ***Excavation and recording:*** wooden coffins may be indicated by staining caused by the decay of the wood and/or the presence of iron nails and brackets. Where they do occur, an individual coffin context number should be assigned. Fittings should be given this number and do not require individual small finds numbers. The precise location of these objects is of vital importance for the reconstruction of mode of coffin construction. Where wood survives in contact with nails and fittings it will be possible to ascertain board thickness and the direction of the wood grain. The presence and position of nails and fittings within the grave must be marked on the grave plan. The outline of coffin stains should also be represented on the plan at a scale of 1:10. Details should be recorded on the standard OA coffin record sheet.

It is recommended that the coffin fill around the skeleton be removed whilst leaving the coffin stain and any associated fittings *in situ*. At this stage the coffin and skeleton should be planned at a scale of 1:10 and a photographic record produced.

Certain elements are common to both the standard context record sheet and the coffin record sheet. Those elements that are unique to the coffin record sheet are described below.

2.8.2 ***Shape, dimensions and distinguishing characteristics:*** draw the shape of the coffin here and include coffin furniture (for example, handles, decoration, breastplates) with their approximate locations. Make a note of dimensions in all the relevant places (head, shoulders, base, depth). If the coffin is decorated then detailed photographic recording is recommended. The style of 18th- to 19th-century coffin fittings should be compared with the detailed taxonomy of coffin fittings compiled from Christ Church, Spitalfields (Reeves and Adams 1993). Where matches cannot be found, the coffin fittings should be sketched on site. These styles will be added to the 'master catalogue' of coffin fittings currently being compiled by OA.

2.8.3 ***Description:*** describe the coffin, giving details of design and construction, materials used, and unusual features. Description of each element of the coffin fittings (eg breastplate, escutcheon, lid motif, grip and grip plate) should include material, quantity, styles (if matching Spitalfield types). Text inscribed on breastplates or directly onto the lead shell should be recorded *verbatum*.

2.8.4 ***Stratigraphic matrix:*** only enter the relevant stratigraphic relationships here (ie the grave fills and cut numbers). DO NOT enter the skeleton number (it is stratigraphically within the coffin number and in terms of chronological sequence is contemporary).

2.8.5 ***Preservation of coffin:*** tick one of these boxes to indicate how well the material of the coffin survived. If preservation is variable give details in the Description section.

2.8.6 ***Treatment:*** an entry should be made here if the coffin underwent any treatment from conservators before excavation or during lifting.

2.8.7 ***Finds:*** enter details of any coffin furniture and of any other finds closely associated with the coffin.

2.9 ASSOCIATED STRUCTURES

This applies to features such as ditches, postholes, stake holes or the foundation trench for the headstone and/or footstone of a grave memorial, which may be associated with a grave. These should be assigned a unique context number and cross-referenced on the appropriate context sheet (for grave cut or grave fill). The use of group numbers for related contexts is recommended.

2.10 ASSOCIATED OBJECTS

Grave goods may be present either within the grave fill or in direct association with the skeleton. Each object should be assigned to the appropriate context, given a unique small finds number and three-dimensionally recorded. Decayed organic objects which may only be represented by staining should also be recorded in this manner and sampled where appropriate.

Shrouds may be indicated by copper-alloy or nickel pins. These should be assigned a small finds number then accurately recorded on plan and by level. Their presence should be noted on the skeleton recording sheet. Clothing fasteners (eg buttons, toggles and garter buckles) may be present in the grave. Clothes fastenings potentially give important insights into changing patterns of grave dress over time. The location of these items should be recorded on the grave plan, and the items assigned a small find number. They should be collected for specialist analysis but may be ultimately be reburied with the coffin and human remains (depending on site specifications).

It is very important to describe the precise position of the object. Textile impressions are often preserved in the corrosion on metal objects, and can yield much information about dress and other body coverings. Where a number of objects cluster together the presence of a decayed organic container, such as a wooden box or bag, may be indicated.

All small finds should appear on the plan of the skeleton. Where a large number of grave goods are clustered together it is desirable to produce a detailed plan at a scale of 1:5, 1:2 or even 1:1 if appropriate. In cases where a number of grave goods are located below the skeleton, it is recommended that a further plan should be drawn after its removal. A photographic record should also be produced. For major cemetery sites, the use of an EDM for rapid and accurate plotting of objects is recommended. This is particularly useful in cases where objects are stratified within a grave (ie some may be lower down in the fill than others), although here measurements between stratified objects is helpful.

2.11 GRAVE MEMORIALS

Grave memorials, such as head and footstones, may be associated with specific burials. Extramural above-ground memorials became increasingly common in the post-medieval period. Recent work by Mytum (2002) and Tarlow (1999) have traced changing traditions in the shapes, iconography and text inscribed on these memorials. Headstones also offer valuable biographic information on individuals interred in the graveyard.

Head and footstones are structures and should be accorded an individual context number. They should also be included as part of the grave group, if the association with the burial is clear. It is important to note that many tombstones have been moved from their original position in recent years, and care in establishing an association with a specific burial should be made.

Descriptions of gravestones should follow guidelines set out by Mytum (2002) and include details of

- Shape
- Dimensions
- Type of stone used
- Iconography (an illustration may best describe these features)
- Inscription (*verbatum* record of inscription; font of the lettering)
- Stylistic type

3. PHOTOGRAPHY

Record photographs should be taken on colour diapositive (slide) and monochrome film using SLR cameras. A full black and white and colour (35 mm transparency) photographic record, illustrating in both detail and general context every burial. Where appropriate a digital camera may be used with features and sections that are intended to be geo-referenced. This data is in addition to the information collected above and is not intended as a substitute. The benefit of using a digital camera is the speed with which the images can be processed. However, geo-referenced digital photography may be considered as a substitute for 1:10 plans of individual graves. Site code, scale, north arrow and skeleton number should appear in every photograph. A chalk board or a number board must always be used.

4. ETHICAL AND LEGAL CONSIDERATIONS

Burials that do not fall without the aegis of the Church of England may not be excavated without receipt of a Home Office licence. Excavation of burials within churchyards of the Church of England require a Faculty to be issued by the appropriate Diocesan Advisor before work may commence. Recent burials (within the last 100 years) interred within disused burial grounds may require a Disused Burials Grounds licence from the Home Office. Heritage Burial Services will usually arrange licences on request.

It is imperative that human remains are treated at all times with the appropriate respect. They should be screened from public view at all times. Sensitivity to the emotional reactions of both other archaeologists and members of the public is paramount, and it should be anticipated that these are often more pronounced when more recent burials are being disturbed.

Following excavation human remains should be stored out of sight in a clean, dry and secure place under the aegis of an appropriate individual or group.

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APPENDIX 2: OSTEOLOGICAL METHODOLOGY

1. INTRODUCTION

1.1 The osteological methodology presented below includes only macroscopic methods. Unusual or note-worthy pathology will be recorded photographically. In rare cases, radiography and other microscopic or biochemical methods may be used, but are not outlined below.

2. GENERAL TERMINOLOGY AND EQUIPMENT USED

2.1 The anatomical terminology used in this report will be in accordance with international nomenclature. The descriptive teeth formula used will be based on the Zsigmondy system (Zsigmondy 1861 in Hillson 2003, 8-9). All bones and teeth will be analysed macroscopically.

3. RESULTS

3.1 PRESERVATION AND COMPLETENESS

3.1.1 Bone preservation and completeness of the assemblage will be rated on a four-point scale, ranging from 1 (poor) to 4 (excellent). Likewise, skeletal completeness will be scored on a scale of 1 - 4 : 1 (< 25 %); 2 (25- 50 %); 3 (50- 75 %); and 4 (> 75 %).

3.2 ESTIMATION OF AGE AT DEATH

3.2.1 Diaphyseal long bone lengths will be used as the basis for ageing foetuses and neonates using methods developed by Fazekas and Kósa (as adapted in Scheuer and Black 2000). Subadults will be aged by the stage of dental eruption (Mooreess *et al.* 1963a and b)), stage of epiphyseal fusion (Scheuer and Black 2000) and diaphyseal length of the major long bones (Maresh 1970).

3.2.2 The adult skeletons will be aged by degeneration of the auricular surface of the pelvis (Lovejoy *et al.* 1985), the sternal end of the ribs (İşcan and Loth 1986 a and b) and the pubic symphysis (Brooks and Suchey 1990; Todd 1921a and b); epiphyseal fusion of the medial clavicle (Scheuer and Black 2000); dental attrition (Miles 1962), and suture obliteration (Meindl and Lovejoy 1985).

3.2.3 All individuals will be assigned a suitable precise age group as defined in Table 1.

Age group	Age range
Foetus	< 0 years
Neonate	0-1 months
Infant	0-1 years
Young child	2-5 years
Older child	6-12 years
Adolescent	13-17 years
Young adult	18-25 years
Prime adult	26-35 years
Mature adult	36-45 years
Older adult	> 45 years
Child	2-12 years
Subadult	< 18 years
Adult	> 18 years

Table 1. Age groups employed in analysis

3.3 ESTIMATION OF SEX

3.3.1 Sexually dimorphic features of the pelvis and cranium will be used to diagnose osteological sex based on standards set out in Buikstra and Ubelaker (1994) and Schwartz (1995). Osteometrics will be used as secondary sexual indicators.

3.4 ESTIMATION OF STATURE

3.4.1 Calculation of body stature will be estimated from the maximum length of the major long bones will be based on the method for Caucasians developed by Trotter and Gleser (Trotter 1970). Combined measurements of the femur and tibia will be utilised wherever possible, and in the absence of one of these bones the femur and then the tibia will be used. The major bones of the upper limb will be used if no lower limb bones are present. The left side will be used preferentially in keeping with standard osteological practice.

3.4.2 For comparative studies on stature between populations, it is recommended to use the actual bone measurement rather than the calculated estimates (Brothwell and Zakrzewski 2004, 33). The raw long bone lengths will be given as an appendix to the specialist report.

3.5 NON-METRIC TRAITS

3.5.1 The descriptions given in Berry and Berry (1967) and Finnegan (1978) will be used to record non-metric traits.

3.6 METRICS

3.6.1 Measurements on the skull and postcranial elements will be taken using landmarks described by Brothwell (1981) and by Buikstra and Uberlaker (1994). These will be used in estimation of sex, and quantifying size and body proportions (such as the platymeric and platynemic indices) that may be activity related. A number of cranial indices will also be taken, and may assist in the identification of racially distinct characteristics.

3.7 SKELETAL AND DENTAL PATHOLOGIES

3.7.1 The terminology and descriptions of the skeletal pathologies used in the report will be based largely upon palaeopathology texts, such as Ortner (2003) and Aufderheide and Rodríguez-Martín (1998).

4. REPORTING

4.1 A comprehensive specialist report will be compiled on the basis of the above data, detailing the demography of the burial population, prevalence of skeletal and dental disease and non-metric traits, and detailing osteometrics. The data will be considered in its archaeological context, taking into account phasing and burial practices.

4.2 The osteological analysis from the Coronation Street assemblage will be compared with osteological work undertaken on contemporary post-medieval assemblages. The prevalence of pathologies will also be compared to rates calculated for the period by Roberts and Cox (2003).

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APPENDIX 3: SUMMARY CONTEXT LIST

Context	Interpretation	Description
884	Disturbed ground	Layer of disturbed dark bluish-grey silty clay containing brick and disarticulated human bone within manhole trench
885	Burial soil	Mid-brown silty clay layer within manhole trench
886	Construction cut backfill	Yellowish-brown gravel backfill extending 1.5m from pumping station
887	Coffin	Coffin containing sk ***888***
888	Skeleton	Adult skeleton. Only the left leg was removed, the rest is preserved *in situ*
889	Charnel	Charnel deposit
890	Coffin	No skeletal remains recovered from within
891	Construction cut	Construction cut for pumping station
892	Gave cut	Cut for sk ***888***
893	Grave fill	Dark bluish-grey silty clay backfill of ***892***
894	Grave cut	Cut for coffin ***890***
895	Grave fill	Dark bluish-grey silty clay backfill of ***894***
896	Grave cut	Cut for sk ***898***
897	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***896***
898	Skeleton	Adult skeleton
899	Coffin	Coffin containing sk ***898***
900	Charnel	Charnel with grave ***901***
901	Grave cut	Cut for sk ***902***
902	Skeleton	Adult skeleton, abdomen, lower arms and legs outside of trench
903	Coffin	Coffin containing sk ***902***
904	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***902***
905	Grave cut	Cut for sk ***906***
906	Skeleton	Adult skeleton, the skull, right arm and the majority of the chest and spine remain *in situ* outside of the trench
907	Coffin	Coffin containing sk ***906***
908	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***905***
909	Skeleton	Highly disturbed skeleton mixed with ***910***, ***931***, ***932***, ***933***
910	Skeleton	Highly disturbed skeleton mixed with ***909***, ***931***, ***932***, ***933***
911	Grave cut	Cut for sk ***913***
910	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***911***
913	Skeleton	Adult, only left forearm, left leg and right lower leg were within the trench
914	Made ground/ burial soil	Layer of imported dark grey sand with glass slag inclusions used as a burial soil.
915	Grave cut	Cut for sk ***917***
916	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***915***
917	Skeleton	Sub-adult, only the skull, right arm and right pelvis were within the trench
918	Coffin	Coffin containing sk ***917***
919	Grave cut	Cut for sk ***920***
920	Skeleton	Adult, only the left leg was within the trench
921	Coffin	Coffin containing sk ***920***
922	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***919***
923	Grave cut	Cut for sk ***925***
924	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***923***
925	Skeleton	Adult, only the legs were within the trench
926	Skeleton	Adult, only the skull and right shoulder were recovered from the trench section
927	Grave cut	Cut for sk ***928***
928	Skeleton	Adult, left forearm and leg were outside the trench
929	Coffin	Coffin containing sk ***928***
930	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***927***
931	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***932***, ***933***
932	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***931***, ***933***

Context	Interpretation	Description
933	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***931***, ***932***
934	Gave cut	Cut for sk ***935***
935	Skeleton	Adult, only skull and right upper arm were located within the trench
936	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***934***
937	Grave cut	Cut containing charnel ***938***
938	Charnel	Charnel of a single sub-adult,
939	Grave fill	Dark grey sand with glass slag inclusions,;backfill of grave cut ***937***
940	Grave cut	Cut for sk ***941***
941	Skeleton	Adult, right upper arm outside of trench
942	Coffin	Coffin containing sk ***941***. Breast plate was partly legible
943	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***940***
944	Skeleton	Adult, left side of skull and left proximal humerus visible in the trench section before shoring was lowered. Remains *in situ*
945	Skeleton	Adult, badly disturbed and truncated, only the skull, left humerus, some vertebrae and ribs survived.
946	Grave cut	Cut for sk ***947***
947	Skeleton	Adult, fully recovered
948	Coffin	Coffin containing sk ***947***
949	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***946***
950	Grave cut	Cut for sk ***952***
951	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***950***
952	Skeleton	Adult, left arm, the skull and part of the chest were outside the trench, however the skull, left distal humerus and left radius were recovered after a section collapse
953	Coffin	Coffin containing sk ***952***
954	Skeleton	Adult, right humerus, right and left tibia recovered after a section collapse
955	Grave cut	Cut for sk ***956***
956	Skeleton	Adult, fully recovered
957	Coffin	Coffin containing sk ***956***
958	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***955***
959	Grave cut	Cut for sk ***960***
960	Skeleton	Sub-adult. Right side outside of the trench, left *in situ*
961	Coffin	Coffin containing sk ***960***. Breast plate was partly legible
962	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***959***
963	Charnel	Charnel above sk ***965***
964	Grave cut	Cut for sk ***965***
965	Skeleton	Adult, fully recovered
966	Coffin	Coffin containing sk ***965***
967	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***964***
968	Grave cut	Cut for sk ***970***
969	Charnel	Charnel above sk ***970***
970	Skeleton	Adult, truncated from the thorax down
971	Coffin	Coffin containing sk ***970***
972	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***968***
973	Grave cut	Cut for sk ***974***
974	Skeleton	Adult, fully recovered
975	Coffin	Coffin containing sk ***974***
976	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***973***
977	Grave cut	Cut for sk ***978***
978	Skeleton	Sub-adult, fully recovered
979	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***977***
980	Charnel	Charnel below sk ***974***
981	Skeleton	Sub-adult, partly recovered from section
982	Skeleton	Sub-adult, none left *in situ*
983	Grave cut	Cut for sk ***984***
984	Skeleton	Sub-adult
985	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***983***

Context	Interpretation	Description
986	Grave cut	Cut for sk ***987***
987	Skeleton	Adult, lower legs and left hand outside of trench and remain *in situ*
988	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***986***
989	Charnel	Charnel below sk ***987***
990	Grave cut	Cut for sk ***991***
991	Skeleton	Adult, fully recovered
992	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***990***
993	Coffin	Coffin containing sk ***991***
994	Grave cut	Cut for sk ***995***
995	Skeleton	Adult, fully recovered, truncated by grave ***990***
996	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***994***
997	Grave cut	Cut for sk ***998***
998	Skeleton	Adult, fully recovered
999	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***997***
1000	Charnel	Charnel above sk ***1002***
1001	Grave cut	Cut for sk ***1002***, ***1002b***
1002	Skeleton	Adult
1002b	Skeleton	Sub-adult recovered alongside sk ***1002***
1003	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1001***
1004	Grave cut	Cut for sk ***1005***
1005	Skeleton	Adult, fully recovered
1006	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1004***
1007	Skeleton	Adult, fully recovered from section
1007b	Skeleton	Sub-adult recovered alongside sk ***1007***
1008	Skeleton	Adult, skull only, recovered from section
1009	Grave cut	Cut for sk ***1010***
1010	Skeleton	Adult, right arm and leg outside of trench, left *in situ*
1011	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1009***
1012	Grave cut	Cut for sk ***1013***
1013	Skeleton	Sub-adult
1014	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1012***
1015	Skeleton	Adult, only skull and cervical vertebrae within trench
1016	Grave cut	Cut for sk ***1017***
1017	Skeleton	Sub-adult, skull fragments only
1018	Coffin	Coffin containing sk ***1017***
1019	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1016***
1020	Grave cut	Cut for sk ***1021***
1021	Skeleton	Sub-adult, fully recovered
1022	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1020***
1023	Skeleton	Sub-adult, left arm, left pelvis and chest outside of trench, left *in situ*
1024	Tarmac and hardcore	Tarmac road surface laid on top of a hardcore base.
1025	Grave cut	Cut for sk ***1023***
1026	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1025***
1027	Grave cut	Cut for sk ***1015***
1028	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1027***
1029	Grave cut	Cut for sk ***1008***
1030	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1029***
1031	Grave cut	Cut for sk ***1007*** and ***1007b***
1032	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1031***
1033	Grave cut	Cut for sk ***982***
1034	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1033***
1035	Grave cut	Cut for sk ***981***
1036	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1035***
1037	Grave cut	Cut for sk ***954***
1038	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1037***
1039	Grave cut	Cut for sk ***944***

Context	**Interpretation**	**Description**
1040	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1039***
1041	Grave cut	Cut for sk ***909***, ***910***, ***931***, ***932***, ***933***
1042	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1041***
1043	Grave cut	Cut for sk ***945***
1044	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1043***
1045	Grave cut	Cut for sk ***926***
1045	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1045***

APPENDIX 4: OSTEOLOGICAL ASSESSMENT DATA

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
888	n	n	1	3	n	3	3	N/a	N/a	N/a	-
898	y	y	3	2	y	3	3	y-with recon	19	ca, p, c, a, amtl , eh	Craniotomy. Cribra orblitalia, asymmetrical femora. OP on fem head. OA left hip, secondary to trauma?
900 (charnel)	n	y	2	2	y	3	3	n	0	amtl	OP prox tib & L dist fem. Marked enthesophytes. 'hole' R parietal.
902	y	y	1	3	y	2	3	n	4	P,c,amtl	
906	y	y	3	3	y	4	4	N/a	N/a	-	-
909	y	y	2	3	y	2	2	N/a	N/a	-	-
913	n	n	1	3	y	4	4	N/a	N/a	-	-
917	y	n	1	3	n	1	1	N/a	29	C, eh	Premature synotosis ?
920	n	n	1	3	y	5	5	N/a	N/a	-	Left OA hip joint and knee. Ankle DJD.
925	y	y	2	3	y	4	4	N/a	N/a	-	-
926	y	y	1	3	n	2	3	n	2	P, amtl	-
928	y	y	3	3	y	4	5	y	16	Ca,p,c,eh,amtl	SNs. Active periostitis left hum, ribs, R tib. OP talus.

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
935	y	y	1	3	y	4	4	y- with recon	14	Ca,p,c,a,amtl,eh	Cribra orbitalia.
938 (charnel)	y	N/a	2	2	N/a	N/a	N/a	N/a	N/a	-	-
941	y	y	3	2	y	4	4	y	22	Ca, p, c, a, amtl, eh	Cribra orbitalia
945	y	y	1	3	y	3	4	n	14	Ca, eh	Button osteoma, 3rd molars not fully erupted
947	y	y	4	3	y	4	4	n	1	Amtl, p, c, eh	Cribra orbitalia. Button osteoma? Slight OP left femur & R knee & R distal radius,ulna & ribs. OA R femoral head and distal left radius. Vert OP, Schmorl's Nodes. Fused R rib to TV. Considerable amtl.
952	y	y	3	3	y	4	4	y	0	All lost am	OA both knees. OA right 2nd metacarpal.
954	n	n	1	3	n	1	1	N/a	N/a	-	Non-specific infection. Osteomyelitis? affecting tibia, humerus, femur and fibula. Slight OP joint surfaces.
956	y	y	4	3	y	5	5	y	15	Ca, p, c, amtl, eh	OP fem head. Lytic lesion dist fib.
960	y	N/a	3	3	N/a	2	N/a	N/a	20	deciduous	Active periostitis ribs. Cribra orb.
965	y	y	3	3	y	3	4	n	21	Ca,p,c, a, amtl,eh	SNs. Endocranial lesions. Hair on left temporal. Periostitis clavicles. OA R proximal phalanx. Healed fracture? L 1st rib. Notched incisors (culturally induced)
969 (charnel)	n	n	1	2	y	2	1	N/a	N/a	-	Systemic infection - affecting femur.
970	n	y	2	1	n	2	2	n	10	Ca, c	Hair present

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
974	y	y	4	3	y	5	5	y	27	Ca,p,c,a,amtl	Lumbarisation of S1. Schmorl's nodes. Ossified cartilage
978	y	N/a	4	3	N/a	4	N/a	N/a	8	deciduous	Neonate.
981	y	N/a	1	2	N/a	1	N/a	N/a	3	deciduous	-
982	y	N/a	2	3	N/a	2	N/a	N/a	3	deciduous	perinate
984	y	N/a	3	3	N/a	3	N/a	N/a	22	Perm & deciduous	Hair preserved.
987	y	y	4	3	y	3	3	y	17	Ca,p,c,a,amtl,eh	Capitate fused to base of 3rd metacarpal left hand. Vertebral OP. Hair on skull.
991	y	y	4	3	y	4	4	n	17	P,c	Lumbarisation of S1
995	y	y	4	3	y	4	4	n	9	Ca, p, c	-
998	y	y	4	3	y	4	5	y	4	C, amtl	OA L distal femora. OP dist L humerus & dist L radius. Ossified cartilage.
1002	n	y	3	2	y	4	4	n	0	amtl	OP R glenoid and proximal hand phalanx. Hyperostosis frontalis interna?
1002b	y	N/a	3	3	N/a	4	N/a	N/a	-	-	neonate
1005	n	y	3	2	y	3	5	n	6	Ca,p, amtl,eh	Ankylosis TV.
1007	y	y	4	3	y	4	4	n	0	amtl	All teeth lost AM. OP head L femur. Ankylosis axis & C3.

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
1007b	y	N/a	4	3	N/a	3	N/a	N/a	-	-	neonate
1008	n	y	1	3	n	2	5	y	15	Ca, p, c	Hair present. Skull only
1010	y	y	3	3	y	5	5	y	29	Ca, p, c, a , eh	OP 1st metatarsal. Schmorl's nodes. Vertebral OP.
1013	n	N/a	1	1	N/a	2	N/a	N/a	0	-	Subadult
1015	y	y	1	3	n	2	3	n	0	amtl	OP vertebrae. Button osteoma. DJD TMJ. Hair present.
1017	n	N/a	1	3	N/a	2	N/a	N/a	0	-	Subadult. Skull only
1021	y	N/a	4	1	N/a	3	N/a	N/a	30	caries	Cribra orbitalia
1023	y	N/a	2	3	N/a	2	N/a	N/a	2	Deciduous	

Key: Ca - caries, C - calculus, P - periodontitis, A - periapical cavities, EH - enamel hypoplasia, amtl = *ante-mortem* tooth loss; OP= ostephyte; DJD= degenerative joint disease; L=left; R=right

APPENDIX 5: CATALOGUE OF COFFIN FITTINGS

Coffin number	**Fittings**	**condition**
887	Wood	Small damp fragments
890	Left in situ - wood, iron grip	N/A
899	Iron grip and breastplate	Corroded and fragmented
903	Wood	Small fragments
907	Breastplate	Corroded fragments
918	Fragments of wood	Small damp fragments
921	Damp fragments of wood	Small damp fragments
929	Fragments of breastplate	Corroded and fragmented
942	Fragmented breastplate with inscription: [I]sabella --a--- / Died June 23 / Aged 27 / -----	Corroded and fragmented
948	Dried wood and 2 nails	corroded
953	Fragmented breastplate	Corroded and fragmented
957	Fragmented plate and coffin stain	Corroded and fragmented
961	Fragmented breastplate with inscription: ------ / died 15th ---- / aged 4 years	Corroded and fragmented
966	Fragments of breastplate	Corroded and fragmented
971	Fragments of breastplate	Corroded and fragmented
975	Fragments of breastplate	Corroded and fragmented
993	Fragments of breastplate	Corroded and fragmented
1018	Stain	N/A

APPENDIX 6: HARRIS MATRIX

CONTENTS

SUMMARY

As part of enabling works associated with the redevelopment of land at Coronation Street, South Shields, Tyne and Wear (NGR NZ 360 670), Henry Boot Developments (HBD) found it necessary to adjust the existing sewerage network and redirect it from the pumping station on Old Coronation Street westward along the southern edge of the thoroughfare of Coronation Street itself. The trench for the new rising main, and a number of manholes, was to be some 100m long, 2m wide and was to be excavated to a maximum depth of 2.2m below the existing road surface. The route of the rising main passes through the southern part of the former cemetery of St Hilda's Church, a site that is known from previous investigations to have been heavily utilised. Consequently, the Tyne and Wear Archaeologist advised South Shields Borough Council that, in accordance with PPG16 (DoE 1990), a planning condition of the development should be the undertaking of a programme of archaeological mitigation during any intrusive groundworks and an appropriate programme of post-excavation assessment and analysis.

In order to meet the planning condition, Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of HBD, commissioned Oxford Archaeology North (OA North) to undertake the full programme of archaeological works in accordance with a project design approved by the Tyne and Wear Archaeologist. Project Stage 1 (the watching brief and fieldwork data collection) was undertaken during June and July 2007. This draft report provides a summary of Project Stage 1 and documents the results of Project Stage 2, pertaining to a programme of post-excavation assessment of the results of the fieldwork, in order to establish their potential for further analysis.

It is concluded that the 45 well-provenanced skeletons recovered from the watching brief at Coronation Street form a significant assemblage. The funerary remains are likely to date to between 1817 and *c* 1860 and are generally well preserved, with clear potential for a range of further analyses. Their greatest potential, however, can only be met once they have been combined with the much larger and more complete assemblage of human remains recovered from the excavation undertaken in 2006 by OA North to the immediate south of Coronation Street. Such a sizeable assemblage has significant potential to document aspects of the lives of the post-medieval population of a rapidly industrialising port town, who left few other personal records of their own.

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The fieldwork was undertaken by Andrew Frudd, Mark Gibson, Joanne Hawkins and Nicholas Márquez-Grant. The osteological material was assessed and reported upon by Nicholas Márquez-Grant and Sharon Clough, who also assessed the coffin fittings. Mark Gibson compiled the stratigraphic assessment and examined the other artefacts, whilst the illustrations were produced by Marie Rowland and Alix Sperr. The report was edited by Stephen Rowland and Louise Loe, who respectively managed the fieldwork and post-excavation stages of the project.

1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Henry Boot Developments (HBD) propose to redevelop a brown field site located to the immediate south of Coronation Street, in the centre of South Shields, Tyne and Wear (NGR NZ 360 670; Fig 1). As part of enabling works associated with the redevelopment, it was necessary to adjust the existing sewerage network and redirect it from the pumping station on Old Coronation Street westward along the southern edge of the thoroughfare of Coronation Street itself, to the roundabout at the junction of Station Road. The trench for the new rising main, and a number of manholes, was to be some 100m long, 2m wide and was to be excavated to a maximum depth of 2.2m below the existing road surface.

1.1.2 Previous archaeological investigations associated with the development comprise a Tyne and Wear Museums desk-top assessment (TWM 1998), which identified that the modern route of Coronation Street lies within the bounds of St Hilda's cemetery, a trial trench evaluation (Archaeological Services, University of Durham (ASUD) 2006) and a mitigatory excavation (Oxford Archaeology forthcoming), both of which proved the presence of burials to the immediate south of Coronation Street. Consequently, the Tyne and Wear Archaeologist advised South Shields Borough Council that, in accordance with PPG16 (DoE 1990), a planning condition of the development should be the undertaking of a programme of archaeological mitigation during any intrusive groundworks associated with the sewer diversion. The Tyne and Wear Archaeologist required that preservation by record should comprise several project stages. Stage 1, the fieldwork, was to include monitoring and recording during groundworks, together with excavation, recording and lifting of all human remains encountered during this process. Stage 2 was to be an assessment of the data generated by the fieldwork, whilst Stage 3 was to encompass any appropriate detailed analysis, publication and the submission of the entire project archive.

1.1.3 In order to meet the planning condition, Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of HBD, commissioned Oxford Archaeology North (OA North) to undertake the full programme of archaeological works in accordance with a project design approved by the Tyne and Wear Archaeologist (*Appendices 1 and 2*). Project Stage 1 (the watching brief and fieldwork data collection) was undertaken during June and July 2007.

1.1.4 This report provides a summary of Project Stage 1 and documents the results of Project Stage 2, pertaining to a programme of post-excavation assessment of the results of the fieldwork, in accordance with the guidance of English Heritage's *Management of Archaeological Projects, Second Edition* (MAP2; EH 1991) and *Management of Research Projects in the Historic Environment* (MoRPHE; EH 2006). As such, this stage of the project seeks to process and assess each of the forms of raw data recovered during the fieldwork in order to

establish their potential, through detailed analysis, to address the research questions outlined in *Section 3.2*. A project design for a programme of further analysis and the final archive submission to the Tyne and Wear Record Office (TWO) (Project Stage 3) will be issued as a separate document.

1.2 LOCATION, TOPOGRAPHY AND GEOLOGY

1.2.1 ***Location and modern topography:*** Coronation Street runs from the centre of South Shields, westward to its junction with Station Road, opposite the south-east bank of the River Tyne. To the north is St Hilda's Church, its graveyard, and the town's commercial centre, whilst to the south, the land is occupied by carparks and a disused warehouse. From these carparks, which cover largely level ground at *c* 5.1m OD, the land traversed by Coronation Street rises to the north and west, peaking at 10.5m OD at the junction of Coronation Street and Station Road (Fig 1). Evidence from the various phases of fieldwork undertaken at the site would suggest that much of this rise derives from artificial deposition, whilst the natural topography follows an expected westward dip towards the river (ASUD 2006; OA forthcoming).

1.2.2 The solid geology of the area is one of Carboniferous (280-350 million years ago) Coal Measures and Magnesian Limestone (TWM 1998), overlain by deposits of Devensian (73,000 to 10,000 BP) glacial till. With proximity to the River Tyne, the depth of boulder clay increases, and can be *c* 12m deep (*op cit*, 4). However, much of the proposed development area, possibly including that of Coronation Street, was occupied formerly by a tidal inlet and pool, the Mill Dam Creek, which has had a considerable influence on the historical development of the area (*ibid*).

1.3 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

1.3.1 ***Introduction:*** the following section presents a brief summary of the history and archaeology of the development site and its wider surroundings in order to contextualise the results of the present investigation. It is not intended as a comprehensive history of South Shields, various accounts of which are readily available elsewhere.

1.3.2 Although there is no contemporary evidence from the proposed development area, the earliest known human activity in the vicinity was located some *c* 1km to the north-east of Coronation Street and comprised late Iron Age settlement activity beneath the Roman fort of *Arbeia*. The fort, the easternmost defence of Hadrian's Wall, was likely to have been founded *c* AD 129 as a cavalry installation, but was rebuilt as an infantry fort during the reign of Septimus Severus in the early third century (Roman-Britain.org). There is thought to have been a contemporary settlement and port associated with the Roman fort, but their location is uncertain. The Anglian nunnery of St Hilda was built in AD 674 in the vicinity of the present development area, on the banks of the Mill Dam tidal inlet. Although the exact location of the original nunnery is not known, the area to the north of Coronation Street has remained a focus for religious activity through the medieval period and into the present. The latest

incarnation of the Church of St Hilda, some 50m to the north of Coronation Street, was rebuilt during the nineteenth century and may well occupy the site of its predecessors (TWM 1998). Little is known of the nature of secular settlement in the intervening centuries, but by 1235 South Shields was recognised as a village with 24 tennants (*ibid*), perhaps originating as a humble collection of fisherman's huts as suggested by its name *Scheles* (Middle English for huts or shelters; Roman-Britain.org). The settlement had grown further by 1256, when its 27 houses were arranged along a single north-east/south-west-aligned street straddling the Mill Dam, much like the arrangement shown on Gardner's map of 1654. As such, elements of the medieval and post-medieval settlement are likely to have lain within the present development area.

1.3.3 The Mill Dam no longer exists, but on eighteenth-century cartographic sources is shown running to the south of St Hilda's Church. By 1827 the Mill Dam had been completely infilled and had started to be built upon (TWM 1998). There is evidence from recent excavations at the Customs House (built in 1861 at what had been the confluence of the Mill Dam and the Tyne) indicating that this process of infilling had begun at least as early as the late seventeenth or early eighteenth centuries (*ibid*). South and east of Coronation Street, such deposits have been proven by recent geotechnical investigations to a depth of at least 16m below the present ground level (M Douglas *pers comm*). That such infilling may have occurred within the area of Coronation Street is hinted at by some of the older cartographic sources. Armstrong's map of 1768 depicts the Mill Dam as being very much wider (suggesting it terminated in a tidal pool) and closer to St Hilda's Church than does Richardson's map of the same year, which indicates that the extent of the churchyard, together with an associated routeway, was well-defined on what was then the northern bank of the Mill Dam. The latter source accords well with the Fryer's map of 1773 and Casson's map of 1801 and, whilst it is not possible to corroborate the accuracy of Armstrong, it may be that his map is based on an earlier survey or source showing the Mill Dam prior to infilling in the area of the church.

1.3.4 There is a possibility that detailed documentary research, particularly of the parish records and burial registers, may provide further information about the history of St Hilda's Church and the associated churchyard, but some basic information has been provided by the desk-based assessment (TWM 1998). The history of the St Hilda's would indicate that the first burials were of early medieval date; although the curtilage of the Anglian nunnery was extensive, burials are likely to have been made near the primary focus of the church. Medieval burials would, again, probably have radiated out from the church and, whilst the line of Old Coronation Street could well have fossilised a much older boundary, it is currently uncertain at which date burials extended to the formalised limit of the churchyard. Certainly by 1805 the burial ground was approaching full capacity, precipitating an attempt in 1816 to raise the level of the crowded cemetery to accommodate further burials, apparently using ballast from a nearby mound (TWM 1998). Following this raising, burial activity must have increased exponentially, matching the contemporary growth of the industrialising town. By 1856 the cemetery was closed to further burials (*ibid*), a little before a national Act of 1857 discouraged interments within urban

cemeteries, thus implying that the burial ground was again full. However, an examination of the burial register would suggest that interments, perhaps within existing family plots, took place into the 1860s.

1.3.5 The land around Coronation Street has seen considerable change over the last 150 years. The most significant of these, in terms of the present development, was the adjustment to the route of Coronation Street itself. Coronation Street originally kinked around the slightly angled southern edge of St Hilda's churchyard, an alignment preserved by Old Coronation Street. During the 1960s, this angled section of Coronation Street was straightened, so that it ran to the north through the former cemetery. The construction of a sewerage pumping station within the crook of Old Coronation Street and its redirected successor, together with associated services, must also have lain within the bounds of the cemetery.

1.3.6 ***Relevant previous investigations:*** an archaeological evaluation undertaken by ASUD in winter 2005 involved the excavation of three trial trenches to the south of Coronation Street, two of which were located within areas formerly occupied by St Hilda's cemetery (ASUD 2006). Trench 1, placed to the north-east of Old Coronation Street, revealed only disarticulated human remains and gravestone fragments. Evidence of *in situ* human remains was found within wedge-shaped Trench 3 located just to the north of the eastern arm of Old Coronation Street. This latter trench measured 18m east/west and from 2m to 4m wide at the base, following the projected southern edge of St Hilda's cemetery. Below a layer of sandy made ground and a 0.4m thick disturbed horizon containing disarticulated human bones and domestic refuse, 'natural subsoil' was encountered at 2m bgl. Fourteen 'grave cuts' were identified, four of which were investigated to reveal articulated skeletons. The associated finds were of eighteenth- to nineteenth-century date (ASUD 2006).

1.3.7 In 2006 OA North undertook the re-excavation of ASUD's Trench 3, with the aim of removing all burials down to natural deposits. During the excavation, 191 human burials were recovered from two separate burial horizons within a trench measuring approximately 17m by 4m (maximum width, reduced to 2m at depth) and up to 5.5m deep. Although natural ground was purported to have been found within the evaluation trench at a depth of 2m below ground level (ASUD 2006), the OA North excavation has proven this to be far from the case, with natural deposits encountered at a depth of approximately 5m below the modern ground level. The lower deposits, through which the earliest burial horizon had been cut, were characterised by their admixture with grey silty clay characteristic of fluvial deposits, and it is thought that these deposits relate to activity on the banks of the Mill Dam. These had been sealed by levelling dumps of clay, gravel and industrial waste through which a second burial horizon had been cut between depths of 2-4m below ground level. This material may relate to an episode of deposition, undertaken in 1816, which utilised ballast from a nearby mound in order to raise the level of the crowded cemetery to accommodate further burials (TWM 1998). If this episode is traceable within the archaeological trench excavated by OA North in 2006, then the ballast in question must have contained a high proportion of industrial and domestic refuse. In each of the burial horizons, there was evidence that

multiple interments had been made within single graves or family plots, whilst remains of coffins and their fittings were also frequent.

2 INITIAL RESEARCH AIMS AND OBJECTIVES

2.1 INTRODUCTION

2.1.1 To maximise the potential of the heritage resource, archaeological investigations are strategic in nature, with a series of clearly defined aims, often posed as research questions, and objectives, the practical means by which research questions are addressed; both are modified and developed to meet the requirements of the project and the confines of the available data. However, the impetus for the investigation is provided by a 'primary driver' (EH 2006), which, in the case of the majority of archaeological projects, is dictated by the negative impact of a development. In consideration of the fact that elements of the heritage resource were to be destroyed by the proposed development, the basic rationale, or primary driver, of the watching brief was the characterisation and preservation by record of any significant remains of archaeological interest. The various forms of data generated, together with any further research undertaken, could be analysed to provide a greater understanding of the past population of South Shields. The specific research aims and objectives for the project are outlined below; not all can be addressed at the present assessment stage, but they need to be considered when assessing the potential of each category of data for analysis (Project Stage 3).

2.1.2 ***Research background:*** archaeologically excavated post-medieval and industrial-period burials from Britain are rare. Until the 1980s the archaeological excavation of these contexts was extremely limited and cemetery clearance companies largely undertook the work without any archaeological recording. Since then, the value of such material in the understanding of the past, and to scientific enquiry in general, has been recognised, but has still not gained wide appreciation. To date, the total number of archaeologically excavated post-medieval burial contexts remains very low when compared with burial contexts from other time periods. Most examples are from London and largely comprise the middle to upper classes of Georgian and Victorian society. Few of these have been published, Christchurch, Spitalfields (Molleson *et al* 1993); St Martin's Church, Birmingham (Brickley *et al* 2006); The Royal Naval Hospital, Greenwich (Boston *et al* 2008); and All Saints, Chelsea Old Church, Kensington (Cowie *et al* 2007) being among the few that have.

2.1.3 ***Regional context:*** burial studies have always had a relatively low profile in the North East compared to other parts of the country. In particular, post-medieval and Industrial-period funerary practices and population composition are poorly understood, there having been no or limited opportunity to undertake even basic research on human populations from the region. This is largely due to the continued use of post-medieval cemeteries and the highly acidic soils which militate against the preservation of bone. The Coronation Street assemblage of human remains excavated in 2006 is the second largest to have been archaeologically excavated from the North East of England. The largest assemblage was recovered from the former Newcastle Infirmary where the remains of around 600 individuals were excavated (Louise Loe *pers*

comm). These remains comprised unclaimed hospital patients, many of whom had been dissected by early anatomists for the advancement of science, and are thus very different in nature to the assemblage from South Shields. There are no other large assemblages of post-medieval human remains from the North East of England and the nearest assemblage of comparable size is that from Barton on Humber, which includes the remains of some 400 former parishioners of St Peter's Church.

2.1.4 ***Health and demography:*** because the majority of published post-medieval assemblages comprise the middling to upper classes, Coronation Street presents a rare opportunity to explore the former lives of the industrialised working classes in terms of population composition, health and mortality. It is likely that many of those buried at St Hilda's would have been people engaged in industries connected with the local collieries, gas works, ship yards and the port. Contemporary documentary evidence indicates that industrialising populations such as this experienced poor air and water quality, overcrowding, inadequate housing, contaminated food and harsh working conditions (Roberts and Cox 2003). This impacted on health by increasing levels of infection, trauma and nutritional deficiency and resulted in increased mortality among young infants (*ibid*). The Coronation Street assemblage provides a unique opportunity to explore how this is reflected in the remains of the individuals themselves; moreover, the high number of young infants recovered from the excavation presents the rare opportunity to explore aspects of maternal health, as well as to contribute to current theories on weaning and burial practice associated with this age group (Molleson *et al* 1993).

2.1.5 ***Historical records:*** the archaeological investigation of any cemetery can yield information about those buried, but its value is enormously enhanced when studied alongside historical records. Rich historical documentation of the late eighteenth and early nineteenth century exists to complement the South Shields burial record. This includes parish records (especially burial records), Government Births, Marriages and Deaths registers (compulsory from 1837), census records, wills, trade directories and other occupational lists (eg law and the armed forces). More generally, historical accounts of funerals and of surviving coffin catalogues provide valuable historical data on the material culture of funerals and burials during this time period.

2.1.6 Historical records may also be employed to test the validity of osteological techniques, particularly those relating to age and sex estimation. Few individuals of documented age were excavated from South Shields and, therefore, this assemblage affords little, if no, opportunity to do this. However, there is scope to compare the mortality profile indicated by an analysis of the parish burial register, and that indicated by physical examination of the remains themselves.

2.2 RESEARCH AIMS

2.2.1 By considering the above themes and initiatives, it is possible to pose the following research questions (RQ) that are specific to the archaeological investigation of the rising main watching brief at Coronation Street:

RQ1 Within the defined excavation area, can human remains be recovered in such a manner that maximises the potential of the captured stratigraphic data?

RQ2 Is it possible to gain an understanding of the sequence and date of the remains?

RQ3 Using extant historical documents and the results of previous archaeological fieldwork, is it possible to understand better the excavated archaeological remains and place them within a wider historical and cultural context?

RQ4 Can a greater understanding of the use, organisation and management of the cemetery, both on a wider and more personal level, be gained?

RQ5 Can the captured data from the watching brief be integrated with that recovered during the OA North excavation to the immediate south in 2006?

RQ6 Can relevant information contained within primary and secondary historical documents be accessed and collated?

RQ7 Can a better understanding of the analytical potential of the recovered osteological assemblage be gained through:

- assessment of the potential of the human remains for the estimation of biological parameters such as sex, age and stature;
- assessment of the potential of the remains to yield palaeopathological information in order to learn about the health status of South Shield's past inhabitants;
- assessment of the potential of the remains for isotope analysis;
- examination of the requirement for additional specialist analysis, such as radiography, of the remains;
- establishment of the potential of the remains to contribute to archaeological knowledge at regional and national levels, and the most appropriate way of realising this potential;
- contributing to an updated project design for analysis of the remains, with cost and time implications specified.

RQ8 What detailed and meaningful information can analysis of the skeletal remains tell us about the lives of the inhabitants of South Shields?

RQ9 Can the results of the analysis of the skeletal remains be used to provide a comparison with documentary sources and with remains from contemporary sites?

RQ10 How can the results of the investigative programme be made available to the wider public, and all data, artefacts and remains archived or reburied appropriately?

2.3 RESEARCH OBJECTIVES

2.3.1 ***Overall Research Objectives:*** the following overarching objectives (RO) have been formulated with reference to the research questions (*Section 2.2.1*).

ROa Conduct a programme of archaeological observation, investigation and recording during the course of all groundworks within the former burial ground.

ROb Recover, process and undertake an assessment and then any appropriate analysis of the artefacts from the fieldwork, particularly those that are datable, and integrate them into the stratigraphic sequence.

ROc Undertake provisional and then any appropriate detailed analysis of the on-site stratigraphy in order to understand better the relationships between the different elements.

ROd Undertake an osteological assessment and then any appropriate analysis of the human remains excavated from the site by:

- quantification of the remains, including the number of articulated skeletons and quantity of disarticulated human bone;
- evaluation of the overall condition and completeness of the remains, with reference to the survival of indicators of age, sex and stature, metrical and non-metrical analyses, and palaeopathological examination;
- establishment of the basic demographic composition of the population, including the proportion of adults and the proportion of juveniles;
- establishment of the overall range and extent of palaeopathological conditions.

ROe Assess and then undertake any appropriate analysis of the material and manufacture of any coffins and fittings in order to establish any patterns in origin, trade and also quality, which can then be linked with the results of osteological analysis.

ROf Undertake a detailed literature search of available sources at the Tyne and Wear Record Office, the Diocesan library, local and university libraries, as well as of more general reference works and histories.

3 METHODOLOGY

3.1 PROJECT DESIGN

3.1.1 The OA North project design (*Appendices 1 and 2*) approved by the Tyne and Wear Archaeologist was followed as fully as possible throughout the investigation; all work was consistent with the relevant standards and procedures of the Institute of Field Archaeologists (IFA), and generally accepted best practice.

3.2 FIELDWORK METHODOLOGY

3.2.1 ***Extent of groundworks and contractor's methodology***: the monitored groundworks for the insertion of the diverted sewer comprised two principal elements. The first, a 2m square pit for a manhole, was excavated to a depth of 3m below ground level (bgl) to the immediate west of the Old Coronation Street pumping station. The second consisted of a 1m-wide trench for the rising main itself. This ran for some 11m north-west from the manhole before following a slightly oblique westward alignment along Coronation Street for a further 80m until the junction with Station Road was reached. Although formation level for this trench was nominally 2.2m deep, the presence of existing services beneath which the rising main had to be threaded meant that the trench was excavated to depths of 2.4m and 2.6m bgl at the eastern and western ends, respectively. On occasion, the trench was widened to a width of 1.3m to allow for the welding of pipe sections.

3.2.2 Shoring was erected in all excavations and was installed either at a depth of 2m or once archaeological remains had been revealed. In the manhole 2m by 2m box shoring was used, with 3m sheet piles at the open ends. Along the majority east/west section of the trench, 3m by 1m box shoring was used; within the north-west/south-east-aligned section, and in those locations where the trench was widened for welding the inserted sewer pipes, or where services were present, 3m sheet piles supported by hydraulic whalers were installed. Access to excavations was granted once the shoring had been adequately installed and the trench had been monitored with a gas meter for five minutes. Excavations were entered via a ladder and a gas meter was with the work party at all times.

3.2.3 ***Monitored excavation:*** removal of the uppermost levels of modern tarmac and made ground down to the top of significant archaeological horizons was undertaken by a 13 ton wheeled 360 machine, fitted with a 1m-wide toothless ditching bucket and operating under archaeological supervision. Thereafter, any archaeological features or remains were cleaned and investigated manually to define their extent, nature, form and, where possible, date. Once archaeological remains were excavated, recorded and removed, the excavation with the machine was allowed to continue under archaeological supervision. Where services limited access by the machine, such as for the easternmost 4m of the trench, the contractors excavated by hand. With the exception of obviously modern deposits associated with the construction of Coronation

Street, all excavated spoil was monitored for skeletal remains and artefacts before it was removed from the excavation area by a dumper.

3.2.4 Once funerary remains were revealed, they were hand-excavated by an experienced archaeologist or osteoarchaeologist. Each skeleton was cleaned rapidly to reveal the body position and orientation, and its relationship to underlying burials, so that it could be recorded as fully as possible. The use of shoring meant that parts of skeletons often fell outside of the excavated trench; these elements were necessarily left *in situ* and only recovered where they were revealed or displaced by deeper groundworks. Similarly, in order to avoid damage to the service network, skeletal remains within baulks beneath services could not be cleaned or recovered. Infant skeletons, along with the surrounding soil to maximise small bone recovery, were lifted in plastic sample tubs, whilst the other skeletons were bagged by side and anatomical element and placed in strong boxes. Together with any associated funerary artefacts and fittings, these were stored temporarily in a secure, locked container on site, before being removed to Oxford at the completion of the watching brief.

3.2.5 ***Recording***: a comprehensive written, drawn, and photographic record was made in accordance with the *Standard and Guidance for Archaeological Excavation* (IFA 2001). All information identified during the watching brief was recorded stratigraphically on *pro-forma* recording sheets, with a continuous unique numbering system for all features and deposits in operation. *Pro-forma* skeleton sheets recorded details of the body position, orientation, skeletal condition and completeness, presence of soft tissue and artefacts (such as shroud pins and buttons). Those for coffins (whether surviving as fragments, a stain, or as fittings), described the materials, construction, size and shape of the coffin, as well as the decorative metal fittings (including fixing nails and screws, upholstery and upholstery studs, grips, grip plates, breastplates, lid motifs and escutcheons). Any motifs on these fittings were also described.

3.2.6 A fully indexed photographic and drawn record of individual features, working shots and general views was maintained. Photography was undertaken using 35mm colour slide and monochrome print film, together with high quality digital photography for the purposes of presentation. All levels recorded on-site were tied into Ordnance Datum, with the positions of planned features being established using a total station theodolite (TST). Before lifting, skeletal remains were recorded photographically, which, where the prevailing conditions allowed, made use of geo-rectification (for example, where skeletons were not obscured by services or recovered from the trench section). A summary of the results of the fieldwork is presented in *Section 4*.

3.3 POST-EXCAVATION ASSESSMENT METHODOLOGY

3.3.1 ***Introduction***: the data recovered during the fieldwork was assessed in consideration of the project research questions and in accordance with the project objectives (*Sections 2.2.2-3*). Thus, the overarching objective of the assessment was to evaluate all classes of recovered data in order to determine the potential of the dataset for further analysis.

3.3.2 ***Material assessed***: the entire paper, digital, photographic and material archive deriving from the watching brief was examined for the purposes of this assessment. This included the stratigraphic records (context sheets, plans and sections), and the photographs, as well as the finds, funerary artefacts and the human remains.

3.3.3 ***Methodology***: the method of assessment used varied with the class of information examined, although in each case it was undertaken in accordance with guidance provided by MAP2 (EH 1991). During the assessment, the quantity, range, variety, provenance and condition of all classes of data were evaluated within the framework of the project research questions and objectives. *Section 4* summarises the raw data and results of the assessment of each data category, but full details and raw data reside within the project archive.

3.3.4 ***Stratigraphy***: the assessment of the stratigraphy was facilitated by the digitisation of the Harris matrix and the production of a provisional site plan; all of the context records completed during the excavation were entered into a specially designed Access database. The assessment of the stratigraphy comprised a quantification and qualitative appraisal of the recorded data, a brief interrogation of its complexity, and a consideration of those research questions that might be addressed, fully or in part, by the recovered stratigraphic data.

3.3.5 ***Human Remains***: the site archive and skeletal remains recovered during the rising main watching brief were examined to determine the quantity, general condition, completeness, provenance, date and nature of the material. 'Nature' refers to whether the material comprised articulated (disturbed or undisturbed) or disarticulated remains, and the proportion of adults to juveniles. The potential of the material to yield biological information, including more precise estimates of age, as well as other biological parameters, such as sex and stature, was also explored. In addition, the potential of the collection to yield information relating to pathology was assessed and, in particular, whether there were any unusual conditions present that would require detailed specialist examination and/or analytical techniques beyond standard macroscopic examination. In light of these findings, the potential of the collection for further work was evaluated. No attempt was made to estimate sex, age, stature or explore pathology in any detail since these are all factors that are beyond the requirements of an assessment. These procedures were undertaken in accordance with the national guidelines set out by Mays *et al* (2002) and with reference to standard protocols for examining human skeletal remains from archaeological sites (Brickley and McKinley 2004; Buikstra and Ubelaker 1994; Cox and Mays 2000).

3.3.6 Completeness was estimated by recording, as a percentage, how much of the skeleton had survived and assigning it to one of the following categories:

1 = <25% complete

2 = 25-50% complete

3 = >50-75% complete

4 = >75% complete

3.3.7 The condition of the bone was assessed according to the degree of erosion of the bone surface and how much of the epiphyses (the ends of the bones) and cancellous bone (the spongy bone that is beneath the outer layer) had survived. Based on these factors, skeletons were assigned to one of the following categories:

1 = Poor (cortical bone completely eroded. Very limited survival of epiphyses and cancellous bone);

2 = Fair (moderate erosion of cortical bone. Limited survival of cancellous bone and epiphyses);

3 = Good (Occasional erosion on cortical bone. Cancellous bone complete and frequent survival of epiphyses);

4 = Excellent (cortical bone undamaged, cancellous bone and epiphyses complete).

3.3.8 All anthropological and palaeopathological observations were made by rapidly scanning each skeleton. Although these observations provide adequate guidance to the potential of the material for further work they are, by their very nature, preliminary and subject to change as a result of any future high resolution examination.

3.3.9 Apart from the potential of the skeletons to yield information relating to age and sex, the skeletons were also assessed for their potential to yield metrical data such as stature, assessment of ancestry and biological variation and age estimation in sub-adults. Potential for metrical assessment was scored on a scale of 1-5, where ‘1’ denotes skeletons that showed no potential (ie no elements could be measured owing to fragmentation/poor preservation) and ‘5’ denotes skeletons that showed high potential (ie the full range of standard cranial and post-cranial measurements could be taken).

3.3.10 An assessment of the potential for the skeletons to yield non-metrical data was examined. Non-metric traits are morphological variations in the skeleton. They are influenced by both the environment and genetics, but to variable and unpredictable degrees (Saunders 1989). These traits were scored on a scale of 1-5, where ‘1’ denotes skeletons that showed no potential for non-metrical analysis (ie preservation prevented the observation of all standard cranial and post-cranial sites) and ‘5’ denotes skeletons that showed high potential for non-metrical analysis (ie all standard cranial and post-cranial sites could be scored). More readily observable traits were noted (but not formally scored) to give an indication of the level and range of traits present in the population. This will inform a data collection strategy for full analysis.

3.3.6 ***Finds***: all finds and artefacts from the watching brief were retained and were treated in accordance with the guidelines set out by the UK Institute for

Conservation (UKIC 1990) and those of the Museums and Galleries Commission (1992). All artefact fragments were examined by visual inspection and an outline computer record was created using Microsoft Access. Data were recorded in a standardised format, noting provenance, type of object, material, period, and a brief written description and all pottery was recorded by digital photograph, in the form of a single record shot per context. This database will form the basis for any further work recommended, or will comprise the archive record, as appropriate.

3.3.7 ***Archive***: several tasks facilitating both assessment and the completion of the archive, such as marking of photographs, were undertaken. The full preparation and deposition of the archive is however, a task that falls beyond the scope of the assessment, and will be treated in more detail within the updated project design for analysis, publication and archiving. A copy of all final reports will be lodged with the Tyne and Wear Historic Environment Record (HER) and the Tyne and Wear Record Office.

4 RESULTS

4.1 INTRODUCTION

4.1.1 The following section summarises and assesses the results of each category of data recovered during the watching brief fieldwork. All classes of data generated by the fieldwork were assessed in accordance with the methodology outlined in *Section 3* and statements of the significance of the results from each element of the archive are given below. These statements are based on the assessment work undertaken, related to the original academic themes expressed in *Section 2*. For the sake of brevity and clarity, individual context descriptions are summarised within *Appendix 3*, the osteological data within *Appendix 4* and a catalogue of the coffin fittings in *Appendix 5*. The location of the archaeological remains is depicted in plan on Figure 2, whilst their stratigraphic relationships are presented as a Harris matrix in *Appendix 6*. Figure 2 also shows the locations of the numbered shoring boxes, which, by the nature of the watching brief, provided spatial orientation and are occasionally mentioned in the following text as clearly visible reference points.

4.2 STRATIGRAPHY

4.2.1 ***Modern:*** the tarmac road surface and its hardcore base, ***1024***, was a uniform 0.5m thick for the eastern portion of the rising main trench. However, towards the western end, the depth of modern made ground increased to as much as 2.6m as the road rose to meet the roundabout. Services were encountered throughout the length of the trench, the highest concentration being within the easternmost 4m, where, found at depths between 0.6m to 0.8m bgl, they obscured access to the archaeology below. Along the rest of the trench the majority of the services were drainage pipes. These were mostly just below the hardcore of the road, were easily removed and later reinstated; none impacted upon the archaeology below. The construction cut for the pumping station, **891**, did impact deep enough to interfere with archaeological deposits, but did not appear to truncate directly any burials within the investigated area.

4.2.2 ***Industrial Period:*** all of the recorded archaeological features comprised funerary remains cutting into deposit ***914***, a soft dark grey sandy material. At the eastern end of the trench, where it was excavated to its greatest depth, it was in excess of 2.5m thick and at all times extended beyond the vertical limit of excavation. This deposit, containing evidence of domestic refuse, as well as glassy slag and other waste products, could not have derived from the natural clay substrate (which was never encountered during the watching brief) and had clearly been imported. Within the rising main trench, deposit ***914*** was observed running from its eastern extent to a point some 22m short of the roundabout, whereupon it was sealed completely beneath modern made ground and not impacted upon further. The nature of deposit ***914*** and the method of excavation meant that grave cuts were not readily identifiable until the skeletons were encountered at a variety of depths below ground level

between 1.2m and 2.4m bgl. Whilst these depths clearly followed the general trends within the manmade topography (for example, westernmost burial ***1023*** within Box 10 lay at 2.05m bgl, whilst ***935***, close to the eastern end, lay at only 1.2m bgl) there was a degree of variation, and it is entirely possible that further interments lie below the present depth of investigation.

4.2.3 A total of 43 graves containing 45 inhumations were identified during the watching brief. Along with these, eight charnel deposits, one clearly from a single individual, and the remains of 18 coffins, were also discovered. Two coffins are of note, ***942*** and ***961*** (Plates 3 and 4), as the breast plates were partly legible when they were uncovered. Both were fully recorded but fragmented upon lifting, due to their highly corroded state and damaged caused to them by the shoring. All of the inhumations shared an oblique east/west orientation matching that of the extant church and that of the northern boundary of the churchyard. All were laid in a supine position with their limbs extended and their hands either on the pelvic region or proximal femurs. Due to the narrow width of the trench, only half of the burials could be recovered fully, with various anatomical parts of the remaining twenty-two left *in situ* beyond the limits of the trench. This was a particular problem at the eastern end of the rising main trench, where its north-west/south-east alignment cut across the 'grain' of the burials.

4.2.4 The 43 grave cuts appear to have been distributed amongst 33 burial plots or groups. Within the limit of excavation, most of the plots contained only a single burial, but five contained two, one, towards the centre of the north-west/south-east-aligned section of trench, contained four (***898***, ***909***, ***931*** and ***932***) and another, in Box 5, contained five burials (***991***, ***995***, ***998***, ***1002***, ***1002b***). The intensity of cemetery usage was attested further by the charnel deposits, indicative of the disturbance of earlier burials by later grave-digging. Five of these were located above the burials, indicating that the bones disturbed by later grave-cutting had been collected and redeposited after the new burial had taken place. Three of the charnel deposits (***938***, ***980*** and ***989***) had been placed in a discrete pit that was then sealed by the subsequent burial (Plate 2).

4.2.5 ***Assessment of potential***: the archive of primary fieldwork data is a comprehensive and well-organised record of the recovered stratigraphic information, with significant archaeological remains recorded graphically, textually and photographically. The stratigraphic sequence is essentially rather simple and will need little further manipulation to be understood fully; it is dominated, almost exclusively, by funerary deposits and features and, as such, it provides the analytical basis for any understanding of the intensity and organisation of burial, as well as, in a number of instances, the relative sequence of interment. The recorded stratigraphic data provides a flexible framework within which the analysis of the other forms of data can take place, and is particularly valuable in the comparison of the distribution of the skeletal remains identified in the rising main trench, and those excavated to the immediate south in 2006.

4.3 Human Remains

4.3.1 ***Introduction:*** the human remains recovered during the watching brief include 45 skeletons and a number of disarticulated bones deriving from eight different contexts, including those relating to charnel deposits and disturbed burials. Other than quantification, no further analysis of the disarticulated remains was necessary at this stage.

4.3.2 ***Completeness:*** nine skeletons were approximately more than 80% complete and were represented by skull, upper and lower extremities, thorax and pelvis (Table 1). Most of the remaining skeletons were either approximately >50-75% complete or <25% complete. Incompleteness was largely a result of later graves truncating earlier graves.

Completeness	Total
1 - <25%	15
2 - >25-50%	7
3 - >50-75%	13
4 - >75-100%	9

Table 1: Completeness of articulated skeletons

4.3.3 ***Condition of the skeletons:*** overall, the condition of the bones was good. This means that cortices and joint surfaces were well preserved. The majority of adult skulls were broken or absent, however. Approximately a quarter of skulls from the assemblage would be available for detailed metrical analysis, with a small number of these needing reconstruction. Fragmentation was low or moderate across the individuals. This means that there is good potential for metrical analysis in the assemblage (see paragraph below).

Condition	Total
1 - Poor	3
2 - Fair	8
3 - Good	33
4 - Excellent	0

Table 2: Condition of articulated skeletons

4.3.4 ***Estimation of biological sex:*** most adult skeletons had features surviving that would allow the application of standard techniques to estimate their biological sex (Brickley and McKinley 2004; Cox and Mays 2003). It will be possible to estimate the sex of 27 adult skeletons using features of either the skull and/or pelvis. There are currently no accepted methods for estimating the sex of sub-adult skeletons.

4.3.5 ***Estimation of biological age:*** there were 12 sub-adults and 33 adults. Preliminary observations suggest that all age groups are represented in the assemblage, including perinates, new borns, young children, adolescents, young, middle and mature adults. All skeletons had traits surviving that will allow ages to be estimated to within 10 years for adults and 5 years or less for

sub-adults, as described in Brickley and McKinley (2004) and Cox and Mays (2003). Further, most skeletons had a range of traits surviving for age estimation. Estimating the age of skeletons is more accurate if observations are based on a range of traits, rather than a limited number.

4.3.6 ***Potential for metrical analysis:*** a high number of skeletons show potential for metrical analysis of long bones and/ or skulls (Table 3). Metrical analysis will be possible for 11 adult skulls, which were either intact or will require some reconstruction. Skull measurements allow ancestry to be explored (i.e. whether caucasian, mongoloid or negroid) (Krogman and Iscan 1986), as well as the biological variation.

4.3.7 Metrical analysis of long bones to allow estimation of stature will be possible for 26 out of 33 adults by employing measurements of the upper long limb bones and lower long limb bones. Stature estimations based on the lengths of lower long limb bones are more accurate than those that are based on lengths of the upper long limb bones. Stature estimation involves applying the maximum length of any available major long bones to regression equations set out by Trotter and Gleser (1952) and modified by Trotter (1970). As there are different equations for males and females, it is not possible to estimate accurately the stature of those skeletons within the assemblage that are of unknown sex. Metrical data to facilitate estimation of age for the sub-adults will be possible.

Score	**Number of individuals**
1 - one or no measurements will be possible	3
2 - a few measurements will be possible	12
3 - half the number of standard measurements can be taken	9
4 - majority of long bones can be measured	16
5 - Every bone can be metrically recorded	4

Table 3: Potential for standard metrical analysis

4.3.8 ***Potential for metrical and non-metrical analysis:*** adequate cranial and post-cranial remains have survived that will allow the observation of a standard set of landmarks for scoring the presence or absence of non-metrical traits (Brothwell and Zakrzewski 2004).

Non-Metric score	**Number of individuals**
1 - 1 or no landmarks observable	3
2 - a few observable landmarks	2
3 - half of the landmarks are observable	7
4 - majority of the landmarks are observable	13
5 - Every landmark can be observed	9
N/A - subadults not scored	12

Table 4: potential for non-metrical data

4.3.9 ***Pathology:*** overall, all of the skeletons had survived in a condition that is good enough to allow future detailed macroscopic analysis and documentation of pathology. A range of conditions was noted in passing and are listed in *Appendix 4*. They include evidence of trauma, joint disease (osteoarthritis), metabolic conditions (for example, cribra orbitalia), neoplastic disease and infection. Trauma includes fractures, some of which will need radiology to confirm and gain insight into their healing status. Anomalies, for example, asymmetrical limbs, were also present and may relate to traumatic injury. Again, radiology would be required to explore this.

4.3.10 Non-specific inflammation was noted on several bones of one skeleton, suggesting systemic disease. There are numerous conditions that can cause these changes, neoplastic disease, infection, and pulmonary disease, being among them. Further analysis will be required to explore this further.

4.3.11 There was evidence for post-mortem medical intervention in the form of one craniotomy, the removal of the top of the skull in the horizontal plane in order to examine the brain. Such an intervention was usually performed to explore the cause of death, but also to further knowledge about a particular ailment or lesion.

4.3.12 The amount of dental disease in the assemblage is noteworthy, and includes caries, periodontal disease, abscesses, ante-mortem tooth loss and calculus. Heavy wear patterns were also observed on the teeth and further analysis will be required to explore if they can be attributed to any cultural habits (for example, smoking a pipe).

4.3.13 No quantification or detailed description of the above pathological conditions has been undertaken at this stage, but they certainly warrant this level of analysis. The potential of the assemblage to yield information about the health status of the population is considered to be very good.

4.3.14 ***Assessment of overall potential for analysis:*** despite the fact that a proportion of this assemblage is incomplete, the preservation of all of the remains is sufficient for age, sex and stature to be estimated in most cases. Further, sufficient landmarks survive that will allow evidence for family groups to be explored through non-metrical trait analysis. There is also some potential to evaluate ancestry by the morphological and metrical analysis of skulls. Preliminary observations suggest a group of individuals of mixed ages and sexes. A range of pathological conditions is present and, through more detailed analysis, have the potential to provide valuable insights into the overall health status of the population.

4.3.15 The 45 skeletons described here represent a small assemblage, but nevertheless an important one. To date, extremely limited study of post-medieval working class assemblages has been undertaken and there are virtually no osteological studies of populations from the industrialised north-east of England. The value of this assemblage is further increased because of the research potential that would be gained by combining it with the 191 skeletons that were excavated from other parts of the graveyard. Full,

specialist examination of the remains is likely to yield results worthy of publication.

4.3.16 Questions that might be explored at full analysis include:

- What is the demographic composition of the population?
- Is the mortality profile consistent with an industrialised working class population?
- Is there evidence for inter-personal violence in the population, or does the trauma relate to accidental injuries?
- What is the healing status of the trauma? Does this suggest adequate treatment following injury?
- The presence of cribra orbitalia indicates childhood health stress in the population, but what impact did this have on growth?
- Cribra orbitalia is believed to be caused by increased pathogen loads. Does evidence for infection support this?
- Is there evidence for scurvy and rickets?
- Do some of the skeletons share the same non-metric traits and does the distribution of non-metric traits suggest family groups?
- Do any individuals from the population have traits that suggest non-caucasoid ancestry?
- How does this population compare with others that are similar in date and type in terms of its health and physical attributes?

4.3.17 During such analysis, disarticulated bones could be examined to identify discrete individuals, whilst all discrete skeletons would be examined according to standard, recommended practice (Brickley and McKinley 2004). Skeletons would be assigned to age and sex categories and, combined with palaeopathological information, the mortality profile would be explored, taking into account the archaeological background of the site. For example, this would explore whether peaks in the mortality curve are associated with any pathological conditions, or whether statistics have been biased by cultural practice, such as the zoning of burials by age or family.

4.3.18 Wherever preservation permits the standard range of measurements could be recorded, allowing estimates of stature, an exploration of ancestry and the facilitation of other biological analyses (for example, estimation of sex for adults and age and sex for sub-adults). A range of non-metric traits could be scored as present or absent and this information would be used to explore relatedness between individuals. The status of the dentitions could be recorded to explore oral care, cultural habits (ie pipe smoking), diet and any other anomalies. Pathological conditions could be described and documented by illustrations and photographs. Differential diagnoses could be explored with reference to standard texts (for example, Ortner and Putschar 1981) and, where relevant, radiography. These objectives could be greatly complimented by the application of stable isotope analysis to explore diet and geographic origin. All

findings would be discussed in the context of contemporary funerary practices and comparable samples from Britain. A full catalogue of the skeletal remains would be provided in an appendix.

4.4 Funerary Fixtures, Fittings and Artefacts

4.4.1 ***Introduction:*** evidence of 18 coffins was recorded during the watching brief, of which three were observed only as soil stains. The remainder comprised fragments of poorly preserved wood, a grip and breastplates, of which two of the latter retained some legible script (*Appendix 5*).

4.4.2 ***Nature of the material:*** fragments of eight breastplates were recovered, amongst which two retained partial biographical inscriptions. All were of punched tin which was painted or enamelled black with white script painted on. None were sufficiently well-preserved to discern the type/decoration. A single highly corroded iron grip was recovered, with the remainder of the assemblage comprising highly fragmented pieces of breastplate or coffin wood.

4.4.3 ***Other finds:*** seven copper alloy shroud pins were associated with two individuals, ***900*** and ***917***, a copper button was associated with ***995***, and another copper button along with the iron and leather remains of a belt were associated with ***974*** (Plate 6). Two iron-bladed knives were recovered from burial soil ***914***. The first (object 160), recovered from the north-west/south-east stretch of the trench, was a simple design with a handle made from two pieces of animal bone secured to the tang with two copper-alloy rivets. The handle had been incised with diagonal lines running in a single direction and the blade had been broken approximately 20mm from the handle. The second, a folding or lock knife (object 165) was located at the base of Box 3, below the level of the skeletons that had been recovered from there. The cross-hatched incised bone handle was slightly curved.

4.4.4 ***Potential and recommendations:*** the potential of the coffin fittings is limited because of its small size and highly corroded condition (in particular, of the breastplates). However, it will still be possible to characterise the coffins and some of the fittings in regional and chronological terms, especially if they can be contextualised through further research. Photographs of the breastplates *in situ* may enable biographic detail to be recorded for those plates that fragmented upon recovery. It is recommended that, where appropriate, fittings and artefacts are radiographed to provide a record of their size and shape. Grip and plate types should be drawn if they are identified as new styles, or catalogued if they match existing typologies.

5 CONCLUSIONS

5.1 INTRODUCTION

5.1.1 The following section presents those conclusions that can be drawn from the assessment. A separate document will provide updated project aims and objectives, and a project design for Project Stage 3, a scheme of analysis appropriate to the potential of the dataset and those requirements of the Tyne and Wear Archaeologist that are necessary to discharge the planning condition.

5.2 PROVISIONAL DISCUSSION

5.2.1 It is extremely difficult, and indeed, undesirable, to discuss the remains recovered from the present watching brief without making some consideration of the results of the excavation to the immediate south undertaken by OA North in 2006. A number of similarities were observed between the two phases of work. Of particular importance was the analogous character of the burial substrate. This clearly imported material, in excess of 2.5m thick, contained various quantities of domestic and industrial refuse, and is likely to represent an effort to raise the level of the cemetery in order to accommodate more burials. One such event, utilising material from a nearby ballast mound, was recorded as having taken place in 1817; further documentary research may reveal other such instances, but it is tempting to suggest that those skeletons revealed during the present watching brief date from 1817 to the closure of the cemetery to new interments *c* 1860. They can, therefore, be considered to fall within a relatively narrow date range.

5.2.2 As with the burials excavated by OA North to the south in 2006, the intensity of burial and the use of family plots can clearly be seen, as can hints of the manner in which the cemetery was organised. There is a suggestion that the graves of the burials recovered during the watching brief were laid-out reasonably neatly, which may have implications for the interpretation of their status. Such evidence needs to be contrasted with that from the excavation trench to the south in order to examine the wider use of space within the cemetery.

5.2.3 Although a considerable number of human remains were removed from the zone of impact associated with the sewer diversion, the nature of the findings during the archaeological excavation to the south in 2006 would suggest that many more, undisturbed, inhumations are likely to lie intact beneath the base of the diverted sewer. Such remains could be disturbed by deep excavations in the future, and this may be particularly problematic at the western end of the sewer, where the burial horizon was increasingly thickly blanketed by deposits of modern made ground and may have suffered little previous disturbance. Even within the eastern end of the sewer trench, the fact that the base of the imported burial soil was not reached, may suggest that what currently appear to be deeply buried individual interments may merely be the top of stacks.

There is also the fact that all of the revealed skeletons derive from the latest of at least two separate burial horizons and again, deeper excavations in the future are highly likely to reveal such remains in equal, if not greater, intensity.

5.3 STATEMENT OF SIGNIFICANCE AND PROPOSAL FOR FURTHER WORK

5.3.1 The research context for the present investigation, including appropriate frameworks and regional studies, has been outlined in *Section 2*, and will not be reiterated here. Suffice to note, the assemblage from the rising main watching brief at Coronation Street is an important addition to the small but growing corpus of post-medieval and Industrial-period human skeletal assemblages recovered archaeologically from the North East.

5.3.2 The assemblage, although relatively small (45), has the potential to provide a rare insight into nineteenth-century living conditions and how these impacted on the health and physical attributes of the population. This contribution is increased vastly if these remains can be considered in conjunction with the 191 individuals recovered from the excavation undertaken in 2006. Both the EH and Tyne and Wear archaeological monitors have recognised the value of the combined assemblage as one of the largest post-medieval collections from the area, particularly as it dates from a period of major expansion of the industrialising port of South Shields. Moreover, archaeologically excavated post-medieval cemeteries are highly centred around London and Birmingham and most relate to the middle-upper classes, unlike the St Hilda's assemblage, which represents a working class population from the North of England.

5.3.3 The use of the rich historical documentation of the late Georgian and early Victorian periods is an important aid in the interpretation and contextualisation of the results of the excavation and the osteological analysis. The health and demography of the assemblage could be particularly revealing, as documentary evidence suggests industrialising populations experienced high levels of stress and poor diet, crowded living conditions, rife with infectious disease. The assemblage will go some way to confirm or refute these assumptions and the findings would be set in a wider context by comparison, at a statistical level, with other British populations of a similar date (Roberts and Cox 2003).

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APPENDIX 1: PROJECT DESIGN

SEWER DIVERSION EXCAVATION, CORONATION STREET, SOUTH SHIELDS,

TYNE AND WEAR

Archaeological Watching Brief:

Project Design V1.1

Oxford Archaeology North

May 2007

Henry Boot Developments Ltd and ARCUS

OA North Job No: L9706
NGR: NZ 360 670

1. INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 The following document has been prepared by Oxford Archaeology North (OA North) in response to a request from Archaeological Research and Consultancy, University of Sheffield (ARCUS), on behalf of Henry Boot Developments Ltd (hereafter the 'Client') for proposals for an archaeological watching brief to be undertaken during groundworks associated with a water main along the route of Coronation Street, South Shields (NGR NZ 360 670). The present document comprises a methodology for the archaeological fieldwork; the methodology for any post-excavation work to be undertaken on human remains recovered by the watching brief would be covered by *Sections 3.3* and *3.4* and *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006. The present scheme of groundworks to be subject to archaeological monitoring will involve construction of a sewer and a number of manholes along the route of Coronation Street, from the pumping station on Old Coronation Street in the east, to the roundabout at the junction of Station Road in the West. It is thought that groundworks will be enacted in a series of short sections measuring up to 2m wide by up to 2m deep.

1.1.2 Previous archaeological works in the area comprise a desk-top assessment, undertaken by Tyne and Wear Museums (1998), which identified that much of the present route of Coronation Street lay within the bounds of St Hilda's cemetery, an archaeological evaluation undertaken by Archaeological Services, University of Durham, which proved the presence of burials on the site at a depth of around 2m below ground level (ASUD 2006) and a recently-completed excavation undertaken by OA North, which took place in the small area between Coronation Street and Old Coronation Street. During the excavation, 191 human burials were removed from a trench measuring approximately 17m by 4m (maximum width, reduced to 2m at depth) and up to 5.5m deep. The concentration of these remains suggests that human remains may well be present within the areas of the proposed sewer trenches, although given the presence of made ground associated with the modern landscaping of the area, such remains could lie below the 2m depth of impact, and thus be unaffected by the development.

1.2 GEOGRAPHICAL, HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

1.2.1 The proposed development site lies in the centre of South Shields, with the River Tyne running close by, to the west. Although there is no contemporary evidence from the proposed development area, the earliest known human activity in the vicinity is located some *c* 1km to the north-east of Coronation Street and comprises settlement activity beneath the Roman fort of *Arbeia*. There is thought to have been a contemporary settlement and port associated with the fort, but it is uncertain where these lay. The Anglian nunnery of St Hilda was built in 674 AD in the vicinity of the present development area, on the banks of the Mill Dam tidal inlet. Although the exact location of the original nunnery is not known, the area to the north of Coronation Street has remained a focus for religious activity through the medieval period and into the present, with the latest incarnation of the Church of St Hilda having been rebuilt during the nineteenth century and possible occupying the same site of its predecessors.

1.2.2 Land to the south of Coronation Street, in the area of Old Coronation Street, is largely level at *c* 5.1m OD, but rises to the west, in the area of the roundabout, to 10.2m OD and to the immediate north, along Coronation Street itself, to *c* 7.3m. The natural drift geology of the area comprises thick boulder clay deposits (up to 12m thick). However, much of the proposed development area was occupied by a tidal inlet, the Mill Dam Creek, which is shown on historic maps running to the south of St Hilda's Churchyard. By 1827 the Mill Dam had been completely infilled and built upon (Tyne and Wear Museums 1998), and there is evidence from recent excavations at the Customs House (built in 1861 at the confluence of the Mill Dam and the Tyne) that this process of infilling had begun at least as early as the late seventeenth or early eighteenth centuries (*ibid*). That such activity may have occurred within the proposed development area is hinted at by some of the older cartographic sources. Armstrong's map of 1768 depicts the Mill Dam as being very much wider and closer to St

Hilda's Church than does Richardson's map of the same year. The latter source accords well with the Fryer's map of 1773 and Casson's map of 1801 and, whilst it is not possible to corroborate the accuracy of Armstrong, it is possible that his map is based on an earlier survey or source which may show the Mill Dam prior to infilling in the area of the church. South and east of the excavation trench, geotechnical investigations have proven the depth of these infill deposits to at least 16m below the present ground level (M Douglas pers com).

1.2.3 Deposits encountered within the recent excavation trench, comprising dumps of clay, gravel and industrial waste, are characterised at depth by their admixture with grey silty clay characteristic of fluvial deposits, and it is thought that these deposits relate firstly to activity on the banks of the Mill Dam, and latterly to levelling. An episode of levelling, undertaken in 1816 in order to raise the level of the crowded cemetery to accommodate further burials, is said to have utilised ballast from a nearby mound (Tyne and wear Museums 1998). If this episode is traceable within the present archaeological trench, then the ballast in question must have contained a high proportion of industrial and domestic refuse, as observed in the case of the burial matrix encountered within the upper 2m - 4m of stratigraphy. Although natural ground was purported to have been found within the evaluation trench at a depth of 2m below ground level (ASUD 2006), the OA North excavation has proven this to be far from the case, with natural deposits encountered at a depth of approximately 5.5m - 6m below the modern ground level. Moreover, there is some indication that the natural ground surface slopes down towards the Tyne, the reverse of the modern situation in the area of the Coronation Street/Station Road roundabout.

1.3 OXFORD ARCHAEOLOGY NORTH

1.3.1 OA North has considerable experience of excavation of sites of all periods, having undertaken a great number of small- and large-scale projects throughout Northern England during the past 25 years. Evaluations, desk-based assessments, watching briefs and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables. OA North has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. OA North is an **Institute of Field Archaeologists (IFA) registered organisation, registration number 17**, and all its members of staff operate subject to the IFA Code of Conduct.

2 OBJECTIVES

2.1 The following programme has been designed to identify the presence of any human remains within each of the sewer trenches, and to investigate, record and remove those remains where they would be effected by the development together with as much supporting information concerning the depth, orientation, burial furniture and dating as the circumstances within the service trenches allow.

3 METHOD STATEMENT

3.1 WATCHING BRIEF

3.1.1 ***Methodology:*** all machining undertaken on the site will be monitored by a suitably experienced archaeologist; any machining below the level of compact road services should be enacted by the use of a toothless ditching bucket. It would be desirable if machining could be undertaken in long, shallow scoops, rather than short, deep bucketfuls, in order to minimise damage to any human burials or other archaeological remains. The programme of field observation will record the location, extent, and character of any surviving archaeological features and/or deposits as accurately as possible within the area of proposed ground disturbance. Where health and safety considerations allow, any human remains revealed by the machining and lying within the zone of impact, would be screened from public view, recorded *in situ* and removed from the trench which, to allow safe access when over 1.2m deep and/or less than 2m wide, would require the use of a temporary shoring system, installed by a specialist contractor. Although it is appreciated that the limited space available to the scheme of excavation would prevent the deposition of spoil from mechanical excavation in separate spoil heaps, it would be useful if spoil deriving from initial excavation of the road

surfaces and their make-up could be kept separate from that deriving from the underlying layers in order that such material can be systematically searched for human remains and any other artefacts as soon as it is safe to do so. The rough location of such remains would be recorded as accurately as possible to allow this material to be tied in with the field observations. It is proposed that at least two archaeologists will be in attendance during the machining process, allowing the spoil to be sorted for human remains, and for any *in situ* remains to be recorded without delaying the machine, which would be able to excavate another area if archaeological remains were found at the original site of excavation. As required, additional archaeologists would be supplied to the site to deal with greater numbers of remains.

3.1.2 The investigation and excavation of human remains would be undertaken in accordance with the methodology outlined in *Appendices 1 and 2* of the OA North project design for the excavation undertaken at Coronation Street, dated April 2006. Putative non-burial archaeological features and/or deposits identified during the observation of groundworks, together with the immediate vicinity of any such features, will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions and, where appropriate, sections will be studied and drawn. Any such features will be sample excavated (ie. selected pits and postholes will normally only be half-sectioned, linear features will be subject to no more than a 10% sample, and extensive layers will, where possible, be sampled by partial rather than complete removal).

3.1.3 ***Recording:*** all recording will be undertaken in accordance with national guidelines (English Heritage Guidelines for the treatment of human remains excavated from Christian burial grounds) and OA guidelines, wherever possible, and in the case of human remains, will be undertaken in accordance with *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006. To increase the speed of recording, burials will be planned through the use of rectified photography. Such works will involve the use of survey equipment, base stations for which will need to be surveyed-in using GPS equipment prior to the commencement of groundworks, and once the location of the sewer trench has been finalised (to limit any disturbance/movement of the base stations). Recording would take the form of indexed black and white print and colour slide photography, appropriately-scaled plans and sections on permanent drafting film together with detailed written notes on *pro-forma* recording sheets.

3.1.4 ***Treatment of finds:*** all finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid For Finds*, 1998 (new edition) and the recipient museum's guidelines.

3.1.5 ***Treasure:*** any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996. Where removal cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.

3.1.6 All identified finds and artefacts will be retained, although certain classes of building material can sometimes be discarded after recording if an appropriate sample is retained on advice from the recipient museum’s archive curator.

3.1.7 ***Fleshed or partially-fleshed bodies:*** should mechanical excavation reveal the presence of fleshed or partially-fleshed burials, or coffins containing liquor or other corruption products, it would be necessary to inform the Environmental Health Officer and agree a suitable strategy for their recovery, analysis and disposal. all further works would conform to any requirements that they may set. Dependent on the state of these bodies, it may be necessary to use a specialist contractor for their removal, storage and deposition, the costs of which would be agreed with the Client and charged as a variation. Any lead coffins would not be opened, but would need to be removed, stored and deposited by a specialist contractor, the costs of which would be agreed with the Client as a variation.

3.1.9 ***Contingency plan:*** in the event of significant non-burial archaeological features being encountered during the watching brief, discussions will take place with the ARCUS, the Client

and the Tyne and Wear Archaeologist, as to the extent of further works to be carried out. All further works would be subject to a variation to this project design. In the event of environmental/organic deposits being present on site, it would be necessary to discuss and agree a programme of palaeoenvironmental sampling and or dating with the Planning Archaeologist.

3.2 POST-EXCAVATION ASSESSMENT, ANALYSIS AND ARCHIVING

3.2.1 The assessment and any analysis of the human remains recovered as part of the watching brief would be undertaken as part of the wider post-excavation programme, methodologies for which are provided in *Sections 3.3* and *3.4* and *Appendix 1* of *Coronation Street, South Shields, Tyne and Wear: Archaeological Excavation Project Design* submitted to the Client and to ARCUS in April 2006.

4. Health and Safety

4.1 OA North provides a Health and Safety Statement for all projects and maintains a Unit Safety policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (1997). A risk assessment will be completed in advance of any on-site works and copies will be made available on request to all interested parties.

5 WORK TIMETABLE

5.1 ***Archaeological Watching Brief:*** the duration of the watching brief will be dependent upon the timetable of the groundworks; although some delay may be incurred by the discovery of *in situ* human remains, it is hoped that additional staff could be supplied to the site to investigate such remains as quickly as possible, allowing groundworks to continue at another point along the sewer trench.

6. PROJECT MONITORING

6.1 ***Access:*** liaison for site access during the evaluation will be arranged with the client unless otherwise instructed prior to commencement of the archaeological investigation.

6.2 Whilst the work is undertaken for the Client, ARCUS would ensure that the Tyne and Wear Archaeologist will be kept fully informed of the work and its results, and will be notified a week in advance of the commencement of the fieldwork. Any proposed changes to the project design will be agreed with the Tyne and Wear Archaeologist in consultation with the Client and ARCUS.

7. STAFFING PROPOSALS

7.1 The fieldwork will be under the direct management of **Stephen Rowland** (OA North project manager) to whom all correspondence should be addressed. The post-excavation programme would be managed by **Louise Loe** (OA Head of Heritage Burial Services).

7.2 The watching brief would be undertaken by an archaeological Supervisor and an Osteoarchaeologist. Additional staff would be supplied, as required, to limit disruption to the machining schedule. The initial surveying-in of base stations would be undertaken by Marc Storey, OA North Geomatics Project Officer.

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APPENDIX 2: RELEVANT SECTIONS FROM THE EXCAVATION PROJECT DESIGN

3.2 POST-EXCAVATION ASSESSMENT

3.2.1 Following completion of the fieldwork, the results will be collated and the site archive completed in accordance with English Heritage MAP2, Appendix 3. A post-excavation assessment of the archive and the resource implications of the potential further analysis will be undertaken. The stratigraphic data and the finds assemblage will be quantified and assessed, and the environmental samples processed and a brief assessment of their potential for further analysis made. The assessment will, where appropriate, comprise:

- Quantification of all site records, including drawings
- Assessment of the stratigraphic sequence, in terms of complexity and, where possible, provisional chronology
- A summary description of the results of the excavation, including an identification of formation processes
- An assessment of the significance of any deposits from which radiocarbon samples have been taken and the selection of specific samples for submission for analysis
- An assessment of any groups of articulated and disarticulated human remains, including age, gender and any pathological lesions, along with the distribution of the remains themselves, in terms of their potential for further analysis, which might include:

i. Demographic reconstruction in terms of age, gender and health

ii. Stature and bone size and shape conformation

iii. The presence of non-metric traits and genetic disorders that might indicate the use of areas of the cemetery by familial groups

iv. Indications of social status and access to resources as well as occupation-related pathological conditions

v. Groupings of disarticulated human remains likely to relate to single individuals

vi. Number of individuals and stratigraphic relationships represented by the unstratified material that may lend clues to the length of usage of the cemetery

vii. Isotope analysis for the reconstruction of past dietary practices and also for the origin of populations

- An assessment of the quantity and provisional dating of any pottery recovered from the excavation and an assessment of the further work required for the analysis of a selected assemblage from the evaluation and excavation. Such potential for analysis may include:

i. Typological and chronological analysis in order to improve an understanding of the chronological basis of the use of the site as a cemetery and of any earlier activity

- An assessment of the quantity, form and provisional dating of any coffin furniture, nails or other metal artefacts in order to establish a programme of further analysis, which might include:

i. Form, function and typological analysis, as a means of dating artefacts and interpreting their use for social display, etc.

- An assessment of the nature and quantity of any faunal remains along with the potential for further analysis, which might include:

i. Species representation, proportions, metrical conformation, pathological lesions, age and sex for the understanding of the pastoral and hunting economies and the nature of animal husbandry practices

ii. Butchery, burning, gnawing and fracturing as a means of determining the treatment and processing of meat products along with attitudes to waste disposal

iii. Analysis that might help to address research questions regarding the introduction of domesticated species during the Early Neolithic, which might include an examination of non-metric traits and body conformation that could indicate the presence of animals of primitive type, or of greater or lesser genetic diversity or of indigenous or extraneous origin

- An assessment of environmental remains recovered from the excavation, including the nature and quantity of materials such as molluscs, pollen, charcoal and carbonised plant remains along with the potential of any well-stratified assemblages for further analysis in terms of:

i. Identification of economic and subsistence practices through the identification of edible plant remains

ii. The identification of food processing strategies as indicated by the presence of various plant anatomical parts (ie, chaff), either separated from or still attached to seeds and grains. Within this context, insect remains may also be important in identifying any storage or refuse functions associated with features

iii. The nature of the environments exploited for plant foods through the identification of weed seeds, which may also indicate the nature of human manipulation of the local environment, as may insect remains

iv. The character of the local environment through the analysis of pollen, plant macrofossils and fungal spores and the potential impact of man upon this environment

v. The character of the immediate environment as indicated by any mollusc or insect remains and relict topsoil horizons

vi. The presence of faecal material and parasite eggs that may be informative of the general state of health of past populations

- An assessment of any monoliths or core samples taken from specific deposits for their potential for further analysis in terms of site formation processes

3.2.2 The assessment results will be presented within a post-excavation assessment report which will summarise the results of the excavation and any initial hypotheses that can be drawn from the assessment of the finds and environmental samples. Within the framework of these initial results, an attempt will be made to place the data from the excavation within a regional context both in terms of a chronological narrative and of significance. The assessment report will make recommendations for a schedule, timescale and programme of analysis in accordance with MAP2 Appendix 4.

3.3 ANALYSIS

3.3.1 A provisional programme of post-excavation analysis is anticipated, and guidelines are provided in *Appendix 2* of this project design. The extent of the programme, however, can only be reliably established on completion of the post-excavation-assessment report, but it is likely, considering the nature of the material from the evaluation, that each of the proposed stages for analysis of human remains will be undertaken on the more complete inhumations, while less-detailed analysis is likely to be undertaken on disarticulated remains (see *Section 3.3* above). The proposed programme anticipates both analysis of the site stratigraphy and the artefactual/ecofactual evidence leading to the production of a final report. This will be completed within two years of the fieldwork.

3.4 PUBLICATION

3.4.1 It is anticipated that the results of the excavation will be worthy of publication. If possible, the publication text will be prepared in a suitable form for inclusion in either a regional or national journal, for example, the Durham Archaeological Journal or Archaeologia Aeliana, respectively.

APPENDIX 1: THE EXCAVATION AND RECORDING OF BURIALS IN CHURCHYARDS

By A Boyle and C Boston

1 INTRODUCTION

This section details the recommended methodology for the excavation and recording of inhumations and their associated features and grave goods. Associated features include coffins, grave cuts, ditches, postholes, stakeholes and memorials.

It is fair to say that it is virtually impossible to record a burial in too much detail but this viewpoint needs to be balanced against time and money constraints BUT NOT AT THE EXPENSE OF THE DATA.

Both excavation and post-excavation treatment will directly affect the quality and quantity of information, which can be recovered by the osteoarchaeologist. An enormous amount of information can be extracted if proper procedures are followed. On any site where burials are discovered it is important to seek the advice of the osteoarchaeologist as soon as possible. Where the presence of burials is known or suspected this should happen prior to excavation. If at all possible the osteoarchaeologist should be present on site throughout excavation. This is especially important on large cemeteries and is essential both when preservation is poor and when skeletons are to be immediately reburied. Otherwise some provision should be made for regular visits. An assessment of factors such as numbers of skeletons, bone preservation, method of burial, date range and density of inhumations will aid in the definition of a suitable collection procedure. For example, in cases where the sample is small and skeletal preservation is poor, the opportunities for post-excavation will be limited. This will have implications for the recording and excavation procedures employed.

2 INHUMATION BURIALS

This section describes the recommended methodology for the excavation of inhumation burials within churchyards. The general area should be thoroughly cleaned in plan, with a view to defining grave outlines and their relationships to other graves and/or features. Clearly, intercutting graves are important in the construction of a stratigraphic sequence for the site. Where graves are intercutting it is essential that the relationships are properly investigated and interpreted on site. In these circumstances loose bones should not be removed until it is clear which context they belong to (a separate section on the excavation and recording of disarticulated bone appears below).

2.1 METHOD OF EXCAVATION

The best practice is to excavate graves and their contents in plan. Although the quadranting of graves with a view to producing longitudinal and transverse sections has been advocated it is difficult to see how such a procedure would deal adequately with eg. the recording of large numbers of finds, or the recovery of a body surviving only as a shadow. Arguments may however be presented for the excavation of particular burials in sections or quadrants.

Excavation should proceed carefully and without undue haste. A basic aim is the definition of body position in order that the more fragile bones, such as skull, pelvis, kneecaps, hands and feet, are not accidentally damaged. It is therefore poor practice to begin by digging deep exploratory holes with a view to `hitting bone'.

2.2 RECORDING THE SKELETON

Each individual skeleton will be assigned a separate context number from a continuous sequence. The skeleton has its own specialised context sheet, which must always be used. If further space is required then a standard context additional sheet should be used. **NOTE:** Once a context number has been assigned then a separate skeleton number is unnecessary. It is important to realise that the deposition of a skeleton is a stratigraphic event in *its own right* whether or not it is placed within a coffin. There are two slightly different versions of the skeleton recording sheet: one should be used for adults and the other for children and subadults as appropriate. Only those aspects of the skeleton recording sheet, which are unique, are discussed here. The remaining elements of the skeleton sheet are also present on the general context record sheet and are discussed in section 2 of the Oxford Archaeological Unit fieldwork manual.

2.2.1 ***Skeleton diagram:*** this diagram should be used to record which bones are present. If a bone is present then it should be shaded on the drawing. Where possible the osteoarchaeologist should be consulted.

2.2.2 ***Levels:*** these should be taken at three basic positions as indicated on the skeleton recording sheet (skull, pelvis and feet). A level measurement taken between the knees if legs are extended can be useful. Further readings should be taken if the position of the skeleton is in any way unusual. Great care should always be taken when placing level staff. All levels should additionally be marked on the plan.

2.2.3 ***Orientation:*** orientation should always be in relation to OS grid North or magnetic North rather than site grid North. A compass should be used.

2.2.4 ***Body position:*** body position should be indicated in the appropriate box. When describing the skeleton it should be remembered that left and right sides are those of the skeleton and not the excavator. A precise description of arms and legs should appear on the skeleton context sheet in the section for Additional Information. Factors such as displacement of skull, mandible and the disposition of hands and feet must be recorded as they may relate to taphonomic processes. Bones which have been positioned tightly together may have been wrapped in a shroud at the time of death (shrouds may additionally be indicated by pins). Animal activity or collapse and decay of grave structures may cause displacement of bones. Definitions of the relevant terminology appear below.

2.2.4.1 *Supine:* the skeleton is laid flat on its back, legs may be extended, crossed, flexed or semi-flexed, detail of arm position and the direction in which the skull is facing should also be provided. Supine is by far the most common body position found in Christian burials.

2.2.4.2 *Crouched:* the skeleton is laid on its side and crouched (often tightly) in the foetal position, detail of arm position and the direction in which the skull is facing should also be provided.

2.2.4.3 *Prone:* the skeleton is laid face down; legs may be extended, crossed, flexed or semi-flexed, detail of arm position and direction in which the skull is facing should also be provided.

2.2.4.4 *On side:* the skeleton is laid on left or right side, legs may be extended, crossed, flexed or semi-flexed, detail of arm position and the direction in which the skull is facing should also be provided.

2.2.4.5 *Irregular:* if the position of the skeleton does not fit into any of the above categories then it can fairly be described as irregular and as much detail as possible should be provided.

2.2.5 ***Preservation of skeleton:*** this category relates to the condition of those bones which are present and NOT to the completeness of the skeleton. Choose good, fair or poor as appropriate. Where preservation is variable and additional comment is required this should appear in the box marked `description'. Many factors can determine the survival of bone. These include soil pH, moisture content, air, temperature, fauna, flora, and human interference. Additionally age and sex also play a part. Pathological bones are particularly fragile and those exhibiting lesions should be photographed in situ. Water is the single most important factor of decay: the principal action of

water on bone is by leaching. Preservation is generally better in soils with a neutral or slightly alkaline pH, and is worse in acid conditions. Decomposition may be accelerated in porous light soils while dense, clay-like soils may actively retard it (Henderson 1987). The categories of preservation are defined as follows: preservation should be described as good where bones are mostly intact and in good condition and therefore unlikely to fragment during excavation, bone surfaces are smooth and unmarked; preservation should be described as fair where occasional bones are broken and further breakage is likely to occur during excavation, bone surfaces may have slightly `weathered' or roughened appearance; preservation should be described as poor where most or all of bones are broken and fragmented, bone surfaces have very `weathered' or roughened appearance.

2.2.6 ***Completeness of skeleton*:** this is indicated pictorially on the skeleton diagram. In addition the level of completeness should appear in the appropriate box on the skeleton recording sheet using a numerical code as follows: 1 - complete/virtually complete, all or most bones of the skeleton appear to have survived; 2 - more than half the skeleton has survived; 3 - less than half the skeleton has survived.

2.2.7 ***Collection quality:*** any factors, which might have affected the standard of recording and collection, should be noted, such as if collection took place under salvage conditions or in very poor weather (eg. frost or poor light), many of the smaller bones of the hands and feet might have been missed. Any damage, which occurs during the excavation or lifting of the skeleton, should be noted. Both should appear in the section for Additional Information.

2.2.8 ***Planning and photography:*** ideally all skeletons should be planned at a scale of 1:10. This provides a realistic representation of the position of all surviving bones and any associated objects. If appropriate this plan can also incorporate grave outline, coffin evidence, any other structures and associated finds. Before planning, the grave fill and any soil around and adhering to the skeleton should be removed. Appropriate tools are described in section 2.2.9 below. It should be emphasised that the small bones of the hands and feet are easily disturbed and damaged. Consequently only the minimum amount of soil should be removed from these areas. The sparing use of sponges and fine water sprays can be useful for the removal of persistently adhering soil. However, under no circumstances should bones be continually dampened and allowed to dry out, as this will cause them to disintegrate. The use of 1:5 scale plans for infants and neonates should be considered where time allows. The points at which levels have been taken should also be indicated on the plan. Sample location can also be indicated on plan.

Increasingly, plans of skeletons are made by digital rectification of photographs taken using a digital camera. These have the advantage of greater accuracy than hand-drawn plans, and are a labour-saving device in the field. It is important to note, however, that a manual plan of the grave cut, coffin wood and fittings and small finds is still required, as these tend to show up poorly in photographs.

2.2.9 ***Excavating the skeleton:*** it must be emphasised that the quality of the skeletal information, which can be extracted by the osteoarchaeologist, is directly dependent on the completeness of the skeleton and the preservation of individual bones. A very fragmented skeleton is of limited use. Hence great care should be taken in the lifting and handling of the bones. In acid ic soil conditions, tooth enamel may be all that survives. This should be lifted in a block and kept moist.

Bones should be boxed as soon as possible after excavation. Skulls in particular should be placed in boxes immediately after lifting and UNDER NO CIRCUMSTANCES should they be transported from site in plastic bags alone as they are extremely fragile. They should never be lifted by the orbits (or eye sockets). Always lift skulls using both hands. All the appropriate packing materials should be on site prior to lifting of skeleton.

Specialised tools are essential. These are plasterer's leaves (leaf blades); dental tools and soft, and small paint brushes. Wooden tooth picks, lollipop sticks (tongue depressors) and plastic modelling tools should be employed in the final cleaning stages as they are unlikely to mark or depress bone.

The skeleton should be excavated and bagged in the manner outlined here (though not necessarily in this order). The skull and mandible should be bagged together and placed immediately in a box.

Any loose teeth should be placed in a separate small bag, which should also be placed in the box. The left scapula, clavicle, humerus, radius and ulna should be lifted and bagged together, the bones of the left hand and wrist should also be placed in this bag. Repeat for the right arm. The left pelvis, femur, patella, tibia and fibula should be lifted and bagged together; the bones of the left foot and ankle should also be placed in this bag. Repeat for the right leg. The vertebrae, ribs and sternum can be placed in one bag.

NOTE: this is the minimum number of bags, which should be used. If time allows hands and feet may be separated from arms and legs (ie right hand in one bag, left hand in another). Where the bones of the hands or feet cannot be separated ie. because they are crossed, the bones may be placed in a single bag. Whenever time allows, vertebrae and sternum can be separated from ribs, and ribs can be split into left and right sides. Additionally fourth ribs may be placed in a separate bag, if easily identifiable, as these can aid in age assessment. During lifting the ribs often break into quite small fragments, many of which may be unidentifiable as to side. It is sensible to remove the bone in a systematic fashion, ie dealing with one bag at a time in order to avoid confusion.

Every individual bag should have two labels inside. The following details should appear on both: site code, context number of skeleton, bone identification (eg. skull, right arm or left leg). Trap air in bags with bones to prevent crushing. Skeletons should be boxed as soon as possible after lifting; even before washing in order to minimise crushing.

Where possible the entire procedure should be completed in one day. If left overnight, the skeleton should be covered with polythene and packing material (eg loose soil).

2.3 THE EXCAVATION OF JUVENILES AND INFANTS

Many of the above points continue to be relevant to the excavation of young individuals, but a number of additional points are important. The epiphyses (ie the bone ends) are not fused to the bone shafts. At birth there are 450 bone forming centres which will develop into 206 in the adult. Excavators should be aware of this, preferably through demonstration of neonate, infant and juvenile skeletons. It must be borne in mind that infant epiphyses resemble small stones. Special care should be taken to recover infant vertebrae, which comprise three separate bones. Infant bones are regularly recovered from settlement contexts and often confused with small animals, such as rabbits and dogs. It is hoped that the skeleton diagrams on the recording sheets will be a help in this respect. The bones of adults and juveniles should never be bagged together as the latter are extremely fragile. Each individual infant limb bone should be placed in a separate bag.

2.4 DISARTICULATED BONE

Multiple graves, often containing disarticulated bone are quite common on archaelological sites (eg. Roman, Anglo-Saxon, medieval and post-medieval). Disarticulated bone is also known from prehistoric contexts (eg. Neolithic and early Bronze Age). Disarticulated bone from earlier periods is likely to benefit from three-dimensional plotting and identification of each individual bone, although this may not be feasible in each and every case.

Relatively little useful information may be gleaned from churchyards where successive burials have taken place intensively over a prolonged period. In these cases, the possible value of the data should be weighed up against practical considerations, such as time and money constraints. In these circumstances, it is recommended that the disarticulated bone is collected for possible reburial. Further recording and osteological analysis is not usually indicated.

2.5 BODY STAINS AND `EMPTY' GRAVES

In contexts where acid conditions prevail the skeleton may have completely decayed and be represented only by a `body stain'. Occasionally fragments such as dental enamel will survive. Body stains can generally be excavated three-dimensionally. The staining should be sampled along with all the grave fills and control samples should be provided.

Where graves are apparently empty, samples may be recovered for phosphate analysis in order to determine whether or not a burial was ever present.

2.6 GRAVE CUTS

A grave is a cut feature and therefore, a negative one. Attention should be directed to Appendix 4 of the Oxford Archaeological fieldwork manual (Wilkinson 1992). All of the general points apply equally to grave cuts. The shape of the grave cut should be described in some detail and the following terminology should be employed: sub-apsidal (grave with rounded ends), sub-rectangular, ovoid, square, circular or irregular.

The profile of the grave should be recorded in the written record. Important features to look out for are ledges, which may indicate the presence of a wooden lid and the presence of grave markers (post holes, stake holes: see associated structures below). In general, it is not necessary to draw longitudinal or cross-sectional profile of the cut. A written description, however, should be recorded on the context sheet.

The grave outline should be planned at a scale of 1:10. Levels should be taken at the top and bottom of the grave. In churchyard contexts, the precise cut of the grave may not be visible, due to lack of distinction between the graveyard soil and the grave fill. Nevertheless, it should be assumed that the cut existed, and should be accorded a context number.

2.6.1 ***Extra-mural vaults and brick shaft graves:*** in the 18th- and 19th-centuries, concern over disturbance of the remains of family members, and the increasing use of death ritual for social display led to the establishment of subterranean brick-built family vaults and shaft graves for the interment of multiple burials. A vaults traditionally has a vaulted roof, the entrance to the interior commonly is through a doorway in one of the side walls (often with a set of steps leading down to it). A brick shaft grave is essentially a rectangular or single break grave cut lined with a single or double layer of bricks and mortar. Brick shaft graves may be of single or double width. The top of the grave is covered over by horizontal ledger stones (often sandstone or limestone slabs), which could be removed for subsequent interments. Coffins were stacked vertically one above the other within the grave, sometimes resting on metal racks. Vaults and brick shaft graves were originally surmounted by an above- ground memorial. Today, many have been lost.

Recording of vaults and brick shaft graves should follow the guidelines for brick built structures laid out in the Oxford Archaeology Field Manual (Wilkinson 1992).

2.7 GRAVE FILLS

The grave fill is a positive context and attention should be directed to section 2.4.1 and Appendix 1 of the Oxford Archaeological fieldwork manual. It should never be assumed that a grave will only have a single fill- it may have several. It is important to ensure that all of the grave fill is removed and that the grave is `bottomed'. This has obvious implications for the shape and depth of the grave. More specifically, objects are often located below the skeleton, and would be otherwise missed. In churchyards, it was common practice to inter two or more burials one above the other. Care should be taken to ascertain that the lower-most burial has been revealed. The fill below the skeleton may also indicate whether or not the grave remained open for any length of time prior to burial.

Where bulk finds (eg. animal bone and pottery sherds) are recovered from grave fills, this should be recorded in the fill context sheet, along with their vertical position within the fill. Any indication that a find was confined to a particular part of the fill should be recorded. This will facilitate the distinction between residue material and grave goods deliberately placed with the corpse within the grave. On the whole, it is recommended that finds within grave fills should be treated as small finds. This is not the case, however, with coffin nails, which should be assigned the context number of the coffin. It is not necessary to give coffin fittings or fixtures small find numbers. It is important, however, to record their position within the grave on the grave plan. Most commonly, coffin fittings and fixing nails, hinges and brackets are collected for reburial

with the associated skeleton. If the skeletons are not to be reburied, they should be collected for inclusion within the archive.

2.8 Coffins

A variety of wooden mortuary chambers and wooden coffins appear in the archaeological record dating from as far back as the earlier Neolithic. In the medieval and post-medieval periods, both wooden and lead-lined coffins are common. Simple single thickness trapezoid and rectangular wooden coffins were the most common form in the medieval period. From the 17th century, there was increasing elaboration of coffins and fittings. Single-break coffins (the modern 'coffin shape') become ubiquitous from the 1730s onwards (Litten 1991). Simple coffins comprised of a single thickness wooden case decorated with few fittings. More elaborate coffins were constructed either of a double thickness of wood; an outer wooden case and inner lead shell, a lead shell and inner wooden coffin; or a triple layer of a wood-lead-wood. Lead was the most common metal, but iron and zinc were also occasionally used for the metal shell. The outer wooden case was often upholstered in baize or velvet and decorated by elaborate patterns of upholstery studs (usually iron or brass) and metal fittings, such as escutcheons, lid motifs and *departum* plates (breastplates, footplates and headplates inscribed with the name of the deceased, their age, date of death and other particulars). A taphonomy of coffin fitting styles based on coffins found at Christ Church, Spitalfields (Reeve and Adams 1993) forms the basis for comparison of these styles. OA is currently compiling a 'master catalogue' to include new styles found on other post-medieval burials sites.

2.8.1 ***Excavation and recording:*** wooden coffins may be indicated by staining caused by the decay of the wood and/or the presence of iron nails and brackets. Where they do occur, an individual coffin context number should be assigned. Fittings should be given this number and do not require individual small finds numbers. The precise location of these objects is of vital importance for the reconstruction of mode of coffin construction. Where wood survives in contact with nails and fittings it will be possible to ascertain board thickness and the direction of the wood grain. The presence and position of nails and fittings within the grave must be marked on the grave plan. The outline of coffin stains should also be represented on the plan at a scale of 1:10. Details should be recorded on the standard OA coffin record sheet.

It is recommended that the coffin fill around the skeleton be removed whilst leaving the coffin stain and any associated fittings *in situ*. At this stage the coffin and skeleton should be planned at a scale of 1:10 and a photographic record produced.

Certain elements are common to both the standard context record sheet and the coffin record sheet. Those elements that are unique to the coffin record sheet are described below.

2.8.2 ***Shape, dimensions and distinguishing characteristics:*** draw the shape of the coffin here and include coffin furniture (for example, handles, decoration, breastplates) with their approximate locations. Make a note of dimensions in all the relevant places (head, shoulders, base, depth). If the coffin is decorated then detailed photographic recording is recommended. The style of 18th- to 19th-century coffin fittings should be compared with the detailed taxonomy of coffin fittings compiled from Christ Church, Spitalfields (Reeves and Adams 1993). Where matches cannot be found, the coffin fittings should be sketched on site. These styles will be added to the 'master catalogue' of coffin fittings currently being compiled by OA.

2.8.3 ***Description:*** describe the coffin, giving details of design and construction, materials used, and unusual features. Description of each element of the coffin fittings (eg breastplate, escutcheon, lid motif, grip and grip plate) should include material, quantity, styles (if matching Spitalfield types). Text inscribed on breastplates or directly onto the lead shell should be recorded *verbatum*.

2.8.4 ***Stratigraphic matrix:*** only enter the relevant stratigraphic relationships here (ie the grave fills and cut numbers). DO NOT enter the skeleton number (it is stratigraphically within the coffin number and in terms of chronological sequence is contemporary).

2.8.5 ***Preservation of coffin:*** tick one of these boxes to indicate how well the material of the coffin survived. If preservation is variable give details in the Description section.

2.8.6 ***Treatment:*** an entry should be made here if the coffin underwent any treatment from conservators before excavation or during lifting.

2.8.7 ***Finds:*** enter details of any coffin furniture and of any other finds closely associated with the coffin.

2.9 ASSOCIATED STRUCTURES

This applies to features such as ditches, postholes, stake holes or the foundation trench for the headstone and/or footstone of a grave memorial, which may be associated with a grave. These should be assigned a unique context number and cross-referenced on the appropriate context sheet (for grave cut or grave fill). The use of group numbers for related contexts is recommended.

2.10 ASSOCIATED OBJECTS

Grave goods may be present either within the grave fill or in direct association with the skeleton. Each object should be assigned to the appropriate context, given a unique small finds number and three-dimensionally recorded. Decayed organic objects which may only be represented by staining should also be recorded in this manner and sampled where appropriate.

Shrouds may be indicated by copper-alloy or nickel pins. These should be assigned a small finds number then accurately recorded on plan and by level. Their presence should be noted on the skeleton recording sheet. Clothing fasteners (eg buttons, toggles and garter buckles) may be present in the grave. Clothes fastenings potentially give important insights into changing patterns of grave dress over time. The location of these items should be recorded on the grave plan, and the items assigned a small find number. They should be collected for specialist analysis but may be ultimately be reburied with the coffin and human remains (depending on site specifications).

It is very important to describe the precise position of the object. Textile impressions are often preserved in the corrosion on metal objects, and can yield much information about dress and other body coverings. Where a number of objects cluster together the presence of a decayed organic container, such as a wooden box or bag, may be indicated.

All small finds should appear on the plan of the skeleton. Where a large number of grave goods are clustered together it is desirable to produce a detailed plan at a scale of 1:5, 1:2 or even 1:1 if appropriate. In cases where a number of grave goods are located below the skeleton, it is recommended that a further plan should be drawn after its removal. A photographic record should also be produced. For major cemetery sites, the use of an EDM for rapid and accurate plotting of objects is recommended. This is particularly useful in cases where objects are stratified within a grave (ie some may be lower down in the fill than others), although here measurements between stratified objects is helpful.

2.11 GRAVE MEMORIALS

Grave memorials, such as head and footstones, may be associated with specific burials. Extramural above-ground memorials became increasingly common in the post-medieval period. Recent work by Mytum (2002) and Tarlow (1999) have traced changing traditions in the shapes, iconography and text inscribed on these memorials. Headstones also offer valuable biographic information on individuals interred in the graveyard.

Head and footstones are structures and should be accorded an individual context number. They should also be included as part of the grave group, if the association with the burial is clear. It is important to note that many tombstones have been moved from their original position in recent years, and care in establishing an association with a specific burial should be made.

Descriptions of gravestones should follow guidelines set out by Mytum (2002) and include details of

- Shape
- Dimensions
- Type of stone used
- Iconography (an illustration may best describe these features)
- Inscription (*verbatum* record of inscription; font of the lettering)
- Stylistic type

3. PHOTOGRAPHY

Record photographs should be taken on colour diapositive (slide) and monochrome film using SLR cameras. A full black and white and colour (35 mm transparency) photographic record, illustrating in both detail and general context every burial. Where appropriate a digital camera may be used with features and sections that are intended to be geo-referenced. This data is in addition to the information collected above and is not intended as a substitute. The benefit of using a digital camera is the speed with which the images can be processed. However, geo-referenced digital photography may be considered as a substitute for 1:10 plans of individual graves. Site code, scale, north arrow and skeleton number should appear in every photograph. A chalk board or a number board must always be used.

4. ETHICAL AND LEGAL CONSIDERATIONS

Burials that do not fall without the aegis of the Church of England may not be excavated without receipt of a Home Office licence. Excavation of burials within churchyards of the Church of England require a Faculty to be issued by the appropriate Diocesan Advisor before work may commence. Recent burials (within the last 100 years) interred within disused burial grounds may require a Disused Burials Grounds licence from the Home Office. Heritage Burial Services will usually arrange licences on request.

It is imperative that human remains are treated at all times with the appropriate respect. They should be screened from public view at all times. Sensitivity to the emotional reactions of both other archaeologists and members of the public is paramount, and it should be anticipated that these are often more pronounced when more recent burials are being disturbed.

Following excavation human remains should be stored out of sight in a clean, dry and secure place under the aegis of an appropriate individual or group.

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APPENDIX 2: OSTEOLOGICAL METHODOLOGY

1. INTRODUCTION

1.1 The osteological methodology presented below includes only macroscopic methods. Unusual or note-worthy pathology will be recorded photographically. In rare cases, radiography and other microscopic or biochemical methods may be used, but are not outlined below.

2. GENERAL TERMINOLOGY AND EQUIPMENT USED

2.1 The anatomical terminology used in this report will be in accordance with international nomenclature. The descriptive teeth formula used will be based on the Zsigmondy system (Zsigmondy 1861 in Hillson 2003, 8-9). All bones and teeth will be analysed macroscopically.

3. RESULTS

3.1 Preservation and completeness

3.1.1 Bone preservation and completeness of the assemblage will be rated on a four-point scale, ranging from 1 (poor) to 4 (excellent). Likewise, skeletal completeness will be scored on a scale of 1 - 4 : 1 (< 25 %); 2 (25- 50 %); 3 (50- 75 %); and 4 (> 75 %).

3.2 Estimation of age at death

3.2.1 Diaphyseal long bone lengths will be used as the basis for ageing foetuses and neonates using methods developed by Fazekas and Kósa (as adapted in Scheuer and Black 2000). Subadults will be aged by the stage of dental eruption (Mooreess *et al.* 1963a and b)), stage of epiphyseal fusion (Scheuer and Black 2000) and diaphyseal length of the major long bones (Maresh 1970).

3.2.2 The adult skeletons will be aged by degeneration of the auricular surface of the pelvis (Lovejoy *et al.* 1985), the sternal end of the ribs (İşcan and Loth 1986 a and b) and the pubic symphysis (Brooks and Suchey 1990; Todd 1921a and b); epiphyseal fusion of the medial clavicle (Scheuer and Black 2000); dental attrition (Miles 1962), and suture obliteration (Meindl and Lovejoy 1985).

3.2.3 All individuals will be assigned a suitable precise age group as defined in Table 1.

Age group	Age range
Foetus	< 0 years
Neonate	0-1 months
Infant	0-1 years
Young child	2-5 years
Older child	6-12 years
Adolescent	13-17 years
Young adult	18-25 years
Prime adult	26-35 years
Mature adult	36-45 years
Older adult	> 45 years
Child	2-12 years
Subadult	< 18 years
Adult	> 18 years

Table 1. Age groups employed in analysis

3.3 ESTIMATION OF SEX

3.3.1 Sexually dimorphic features of the pelvis and cranium will be used to diagnose osteological sex based on standards set out in Buikstra and Ubelaker (1994) and Schwartz (1995). Osteometrics will be used as secondary sexual indicators.

3.4 ESTIMATION OF STATURE

3.4.1 Calculation of body stature will be estimated from the maximum length of the major long bones will be based on the method for Caucasians developed by Trotter and Gleser (Trotter 1970). Combined measurements of the femur and tibia will be utilised wherever possible, and in the absence of one of these bones the femur and then the tibia will be used. The major bones of the upper limb will be used if no lower limb bones are present. The left side will be used preferentially in keeping with standard osteological practice.

3.4.2 For comparative studies on stature between populations, it is recommended to use the actual bone measurement rather than the calculated estimates (Brothwell and Zakrzewski 2004, 33). The raw long bone lengths will be given as an appendix to the specialist report.

3.5 NON-METRIC TRAITS

3.5.1 The descriptions given in Berry and Berry (1967) and Finnegan (1978) will be used to record non-metric traits.

3.6 METRICS

3.6.1 Measurements on the skull and postcranial elements will be taken using landmarks described by Brothwell (1981) and by Buikstra and Uberlaker (1994). These will be used in estimation of sex, and quantifying size and body proportions (such as the platymeric and platynemic indices) that may be activity related. A number of cranial indices will also be taken, and may assist in the identification of racially distinct characteristics.

3.7 SKELETAL AND DENTAL PATHOLOGIES

3.7.1 The terminology and descriptions of the skeletal pathologies used in the report will be based largely upon palaeopathology texts, such as Ortner (2003) and Aufderheide and Rodríguez-Martín (1998).

4. REPORTING

4.1 A comprehensive specialist report will be compiled on the basis of the above data, detailing the demography of the burial population, prevalence of skeletal and dental disease and non-metric traits, and detailing osteometrics. The data will be considered in its archaeological context, taking into account phasing and burial practices.

4.2 The osteological analysis from the Coronation Street assemblage will be compared with osteological work undertaken on contemporary post-medieval assemblages. The prevalence of pathologies will also be compared to rates calculated for the period by Roberts and Cox (2003).

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APPENDIX 3: SUMMARY CONTEXT LIST

Context	Interpretation	Description
884	Disturbed ground	Layer of disturbed dark bluish-grey silty clay containing brick and disarticulated human bone within manhole trench
885	Burial soil	Mid-brown silty clay layer within manhole trench
886	Construction cut backfill	Yellowish-brown gravel backfill extending 1.5m from pumping station
887	Coffin	Coffin containing sk ***888***
888	Skeleton	Adult skeleton. Only the left leg was removed, the rest is preserved *in situ*
889	Charnel	Charnel deposit
890	Coffin	No skeletal remains recovered from within
891	Construction cut	Construction cut for pumping station
892	Gave cut	Cut for sk ***888***
893	Grave fill	Dark bluish-grey silty clay backfill of ***892***
894	Grave cut	Cut for coffin ***890***
895	Grave fill	Dark bluish-grey silty clay backfill of ***894***
896	Grave cut	Cut for sk ***898***
897	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***896***
898	Skeleton	Adult skeleton
899	Coffin	Coffin containing sk ***898***
900	Charnel	Charnel with grave ***901***
901	Grave cut	Cut for sk ***902***
902	Skeleton	Adult skeleton, abdomen, lower arms and legs outside of trench
903	Coffin	Coffin containing sk ***902***
904	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***902***
905	Grave cut	Cut for sk ***906***
906	Skeleton	Adult skeleton, the skull, right arm and the majority of the chest and spine remain *in situ* outside of the trench
907	Coffin	Coffin containing sk ***906***
908	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***905***
909	Skeleton	Highly disturbed skeleton mixed with ***910***, ***931***, ***932***, ***933***
910	Skeleton	Highly disturbed skeleton mixed with ***909***, ***931***, ***932***, ***933***
911	Grave cut	Cut for sk ***913***
910	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***911***
913	Skeleton	Adult, only left forearm, left leg and right lower leg were within the trench
914	Made ground/ burial soil	Layer of imported dark grey sand with glass slag inclusions used as a burial soil.
915	Grave cut	Cut for sk ***917***
916	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***915***
917	Skeleton	Sub-adult, only the skull, right arm and right pelvis were within the trench
918	Coffin	Coffin containing sk ***917***
919	Grave cut	Cut for sk ***920***
920	Skeleton	Adult, only the left leg was within the trench
921	Coffin	Coffin containing sk ***920***
922	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***919***
923	Grave cut	Cut for sk ***925***
924	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***923***
925	Skeleton	Adult, only the legs were within the trench
926	Skeleton	Adult, only the skull and right shoulder were recovered from the trench section
927	Grave cut	Cut for sk ***928***
928	Skeleton	Adult, left forearm and leg were outside the trench
929	Coffin	Coffin containing sk ***928***
930	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***927***
931	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***932***, ***933***
932	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***931***, ***933***

Context	Interpretation	Description
933	Skeleton	Highly disturbed skeleton mixed with ***910***, ***909***, ***931***, ***932***
934	Gave cut	Cut for sk ***935***
935	Skeleton	Adult, only skull and right upper arm were located within the trench
936	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***934***
937	Grave cut	Cut containing charnel ***938***
938	Charnel	Charnel of a single sub-adult,
939	Grave fill	Dark grey sand with glass slag inclusions,;backfill of grave cut ***937***
940	Grave cut	Cut for sk ***941***
941	Skeleton	Adult, right upper arm outside of trench
942	Coffin	Coffin containing sk ***941***. Breast plate was partly legible
943	Grave fill	Dark grey sand with glass slag inclusions, backfill of grave cut ***940***
944	Skeleton	Adult, left side of skull and left proximal humerus visible in the trench section before shoring was lowered. Remains *in situ*
945	Skeleton	Adult, badly disturbed and truncated, only the skull, left humerus, some vertebrae and ribs survived.
946	Grave cut	Cut for sk ***947***
947	Skeleton	Adult, fully recovered
948	Coffin	Coffin containing sk ***947***
949	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***946***
950	Grave cut	Cut for sk ***952***
951	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***950***
952	Skeleton	Adult, left arm, the skull and part of the chest were outside the trench, however the skull, left distal humerus and left radius were recovered after a section collapse
953	Coffin	Coffin containing sk ***952***
954	Skeleton	Adult, right humerus, right and left tibia recovered after a section collapse
955	Grave cut	Cut for sk ***956***
956	Skeleton	Adult, fully recovered
957	Coffin	Coffin containing sk ***956***
958	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***955***
959	Grave cut	Cut for sk ***960***
960	Skeleton	Sub-adult. Right side outside of the trench, left *in situ*
961	Coffin	Coffin containing sk ***960***. Breast plate was partly legible
962	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***959***
963	Charnel	Charnel above sk ***965***
964	Grave cut	Cut for sk ***965***
965	Skeleton	Adult, fully recovered
966	Coffin	Coffin containing sk ***965***
967	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***964***
968	Grave cut	Cut for sk ***970***
969	Charnel	Charnel above sk ***970***
970	Skeleton	Adult, truncated from the thorax down
971	Coffin	Coffin containing sk ***970***
972	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***968***
973	Grave cut	Cut for sk ***974***
974	Skeleton	Adult, fully recovered
975	Coffin	Coffin containing sk ***974***
976	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***973***
977	Grave cut	Cut for sk ***978***
978	Skeleton	Sub-adult, fully recovered
979	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***977***
980	Charnel	Charnel below sk ***974***
981	Skeleton	Sub-adult, partly recovered from section
982	Skeleton	Sub-adult, none left *in situ*
983	Grave cut	Cut for sk ***984***
984	Skeleton	Sub-adult
985	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***983***

Context	Interpretation	Description
986	Grave cut	Cut for sk ***987***
987	Skeleton	Adult, lower legs and left hand outside of trench and remain *in situ*
988	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***986***
989	Charnel	Charnel below sk ***987***
990	Grave cut	Cut for sk ***991***
991	Skeleton	Adult, fully recovered
992	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***990***
993	Coffin	Coffin containing sk ***991***
994	Grave cut	Cut for sk ***995***
995	Skeleton	Adult, fully recovered, truncated by grave ***990***
996	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***994***
997	Grave cut	Cut for sk ***998***
998	Skeleton	Adult, fully recovered
999	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***997***
1000	Charnel	Charnel above sk ***1002***
1001	Grave cut	Cut for sk ***1002***, ***1002b***
1002	Skeleton	Adult
1002b	Skeleton	Sub-adult recovered alongside sk ***1002***
1003	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1001***
1004	Grave cut	Cut for sk ***1005***
1005	Skeleton	Adult, fully recovered
1006	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1004***
1007	Skeleton	Adult, fully recovered from section
1007b	Skeleton	Sub-adult recovered alongside sk ***1007***
1008	Skeleton	Adult, skull only, recovered from section
1009	Grave cut	Cut for sk ***1010***
1010	Skeleton	Adult, right arm and leg outside of trench, left *in situ*
1011	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1009***
1012	Grave cut	Cut for sk ***1013***
1013	Skeleton	Sub-adult
1014	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1012***
1015	Skeleton	Adult, only skull and cervical vertebrae within trench
1016	Grave cut	Cut for sk ***1017***
1017	Skeleton	Sub-adult, skull fragments only
1018	Coffin	Coffin containing sk ***1017***
1019	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1016***
1020	Grave cut	Cut for sk ***1021***
1021	Skeleton	Sub-adult, fully recovered
1022	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1020***
1023	Skeleton	Sub-adult, left arm, left pelvis and chest outside of trench, left *in situ*
1024	Tarmac and hardcore	Tarmac road surface laid on top of a hardcore base.
1025	Grave cut	Cut for sk ***1023***
1026	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1025***
1027	Grave cut	Cut for sk ***1015***
1028	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1027***
1029	Grave cut	Cut for sk ***1008***
1030	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1029***
1031	Grave cut	Cut for sk ***1007*** and ***1007b***
1032	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1031***
1033	Grave cut	Cut for sk ***982***
1034	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1033***
1035	Grave cut	Cut for sk ***981***
1036	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1035***
1037	Grave cut	Cut for sk ***954***
1038	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1037***
1039	Grave cut	Cut for sk ***944***

Context	Interpretation	Description
1040	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1039***
1041	Grave cut	Cut for sk ***909***, ***910***, ***931***, ***932***, ***933***
1042	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1041***
1043	Grave cut	Cut for sk ***945***
1044	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1043***
1045	Grave cut	Cut for sk ***926***
1045	Grave fill	Dark grey sand with glass slag inclusions; backfill of grave cut ***1045***

APPENDIX 4: OSTEOLOGICAL ASSESSMENT DATA

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
888	n	n	1	3	n	3	3	N/a	N/a	N/a	-
898	y	y	3	2	y	3	3	y-with recon	19	ca, p, c, a, amtl , eh	Craniotomy. Cribra orblitalia, asymmetrical femora. OP on fem head. OA left hip, secondary to trauma?
900 (charnel)	n	y	2	2	y	3	3	n	0	amtl	OP prox tib & L dist fem. Marked enthesophytes. 'hole' R parietal.
902	y	y	1	3	y	2	3	n	4	P,c,amtl	
906	y	y	3	3	y	4	4	N/a	N/a	-	-
909	y	y	2	3	y	2	2	N/a	N/a	-	-
913	n	n	1	3	y	4	4	N/a	N/a	-	-
917	y	n	1	3	n	1	1	N/a	29	C, eh	Premature synotosis ?
920	n	n	1	3	y	5	5	N/a	N/a	-	Left OA hip joint and knee. Ankle DJD.
925	y	y	2	3	y	4	4	N/a	N/a	-	-
926	y	y	1	3	n	2	3	n	2	P, amtl	-
928	y	y	3	3	y	4	5	y	16	Ca,p,c,eh,amtl	SNs. Active periostitis left hum, ribs, R tib. OP talus.

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
935	y	y	1	3	y	4	4	y- with recon	14	Ca,p,c,a,amtl,eh	Cribra orbitalia.
938 (charnel)	y	N/a	2	2	N/a	N/a	N/a	N/a	N/a	-	-
941	y	y	3	2	y	4	4	y	22	Ca, p, c, a, amtl, eh	Cribra orbitalia
945	y	y	1	3	y	3	4	n	14	Ca, eh	Button osteoma, 3rd molars not fully erupted
947	y	y	4	3	y	4	4	n	1	Amtl, p, c, eh	Cribra orbitalia. Button osteoma? Slight OP left femur & R knee & R distal radius,ulna & ribs. OA R femoral head and distal left radius. Vert OP, Schmorl's Nodes. Fused R rib to TV. Considerable amtl.
952	y	y	3	3	y	4	4	y	0	All lost am	OA both knees. OA right 2nd metacarpal.
954	n	n	1	3	n	1	1	N/a	N/a	-	Non-specific infection. Osteomyelitis? affecting tibia, humerus, femur and fibula. Slight OP joint surfaces.
956	y	y	4	3	y	5	5	y	15	Ca, p, c, amtl, eh	OP fem head. Lytic lesion dist fib.
960	y	N/a	3	3	N/a	2	N/a	N/a	20	deciduous	Active periostitis ribs. Cribra orb.
965	y	y	3	3	y	3	4	n	21	Ca,p,c, a, amtl,eh	SNs. Endocranial lesions. Hair on left temporal. Periostitis clavicles. OA R proximal phalanx. Healed fracture? L 1st rib. Notched incisors (culturally induced)
969 (charnel)	n	n	1	2	y	2	1	N/a	N/a	-	Systemic infection - affecting femur.
970	n	y	2	1	n	2	2	n	10	Ca, c	Hair present

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
974	y	y	4	3	y	5	5	y	27	Ca,p,c,a,amtl	Lumbarisation of S1. Schmorl's nodes. Ossified cartilage
978	y	N/a	4	3	N/a	4	N/a	N/a	8	deciduous	Neonate.
981	y	N/a	1	2	N/a	1	N/a	N/a	3	deciduous	-
982	y	N/a	2	3	N/a	2	N/a	N/a	3	deciduous	perinate
984	y	N/a	3	3	N/a	3	N/a	N/a	22	Perm & deciduous	Hair preserved.
987	y	y	4	3	y	3	3	y	17	Ca,p,c,a,amtl,eh	Capitate fused to base of 3rd metacarpal left hand. Vertebral OP. Hair on skull.
991	y	y	4	3	y	4	4	n	17	P,c	Lumbarisation of S1
995	y	y	4	3	y	4	4	n	9	Ca, p, c	-
998	y	y	4	3	y	4	5	y	4	C, amtl	OA L distal femora. OP dist L humerus & dist L radius. Ossified cartilage.
1002	n	y	3	2	y	4	4	n	0	amtl	OP R glenoid and proximal hand phalanx. Hyperostosis frontalis interna?
1002b	y	N/a	3	3	N/a	4	N/a	N/a	-	-	neonate
1005	n	y	3	2	y	3	5	n	6	Ca,p, amtl,eh	Ankylosis TV.
1007	y	y	4	3	y	4	4	n	0	amtl	All teeth lost AM. OP head L femur. Ankylosis axis & C3.

Sk Number	Age estimation possible? Y/N	Sex estimation possible? Y/N	Completeness 1-4	Condition 1-4	Stature Y/N	Metric 1-5	Non-metric 1-5	Skull complete?	No. teeth	Dental pathology	Skeletal pathology and other notes (preliminary observations)
1007b	y	N/a	4	3	N/a	3	N/a	N/a	-	-	neonate
1008	n	y	1	3	n	2	5	y	15	Ca, p, c	Hair present. Skull only
1010	y	y	3	3	y	5	5	y	29	Ca, p, c, a , eh	OP 1st metatarsal. Schmorl's nodes. Vertebral OP.
1013	n	N/a	1	1	N/a	2	N/a	N/a	0	-	Subadult
1015	y	y	1	3	n	2	3	n	0	amtl	OP vertebrae. Button osteoma. DJD TMJ. Hair present.
1017	n	N/a	1	3	N/a	2	N/a	N/a	0	-	Subadult. Skull only
1021	y	N/a	4	1	N/a	3	N/a	N/a	30	caries	Cribra orbitalia
1023	y	N/a	2	3	N/a	2	N/a	N/a	2	Deciduous	

Key: Ca - caries, C - calculus, P - periodontitis, A - periapical cavities, EH - enamel hypoplasia, amtl = *ante-mortem* tooth loss; OP= ostephyte; DJD= degenerative joint disease; L=left; R=right

APPENDIX 5: CATALOGUE OF COFFIN FITTINGS

Coffin number	**Fittings**	**condition**
887	Wood	Small damp fragments
890	Left in situ - wood, iron grip	N/A
899	Iron grip and breastplate	Corroded and fragmented
903	Wood	Small fragments
907	Breastplate	Corroded fragments
918	Fragments of wood	Small damp fragments
921	Damp fragments of wood	Small damp fragments
929	Fragments of breastplate	Corroded and fragmented
942	Fragmented breastplate with inscription: [I]sabella --a--- / Died June 23 / Aged 27 / -----	Corroded and fragmented
948	Dried wood and 2 nails	corroded
953	Fragmented breastplate	Corroded and fragmented
957	Fragmented plate and coffin stain	Corroded and fragmented
961	Fragmented breastplate with inscription: ------ / died 15th ---- / aged 4 years	Corroded and fragmented
966	Fragments of breastplate	Corroded and fragmented
971	Fragments of breastplate	Corroded and fragmented
975	Fragments of breastplate	Corroded and fragmented
993	Fragments of breastplate	Corroded and fragmented
1018	Stain	N/A

APPENDIX 6: HARRIS MATRIX

Rising Main Watching Brief, Coronation Street, South Shields: Harris Matrix

Western end **Eastern end**

Box/Trench segment

10	9	8	7	6	5	4	3	2	1	East/west segment	North-west/south-east segment	Man hole