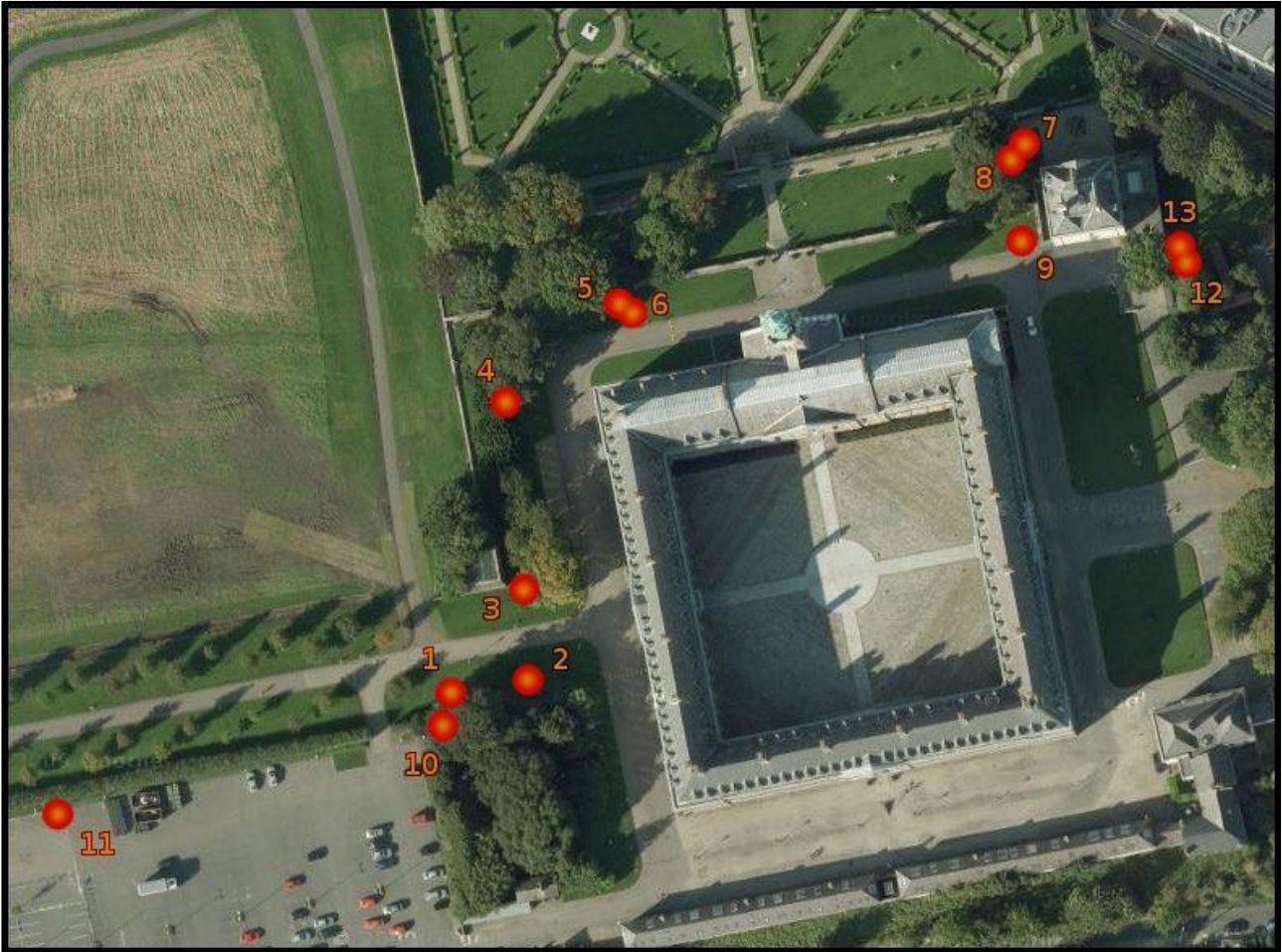
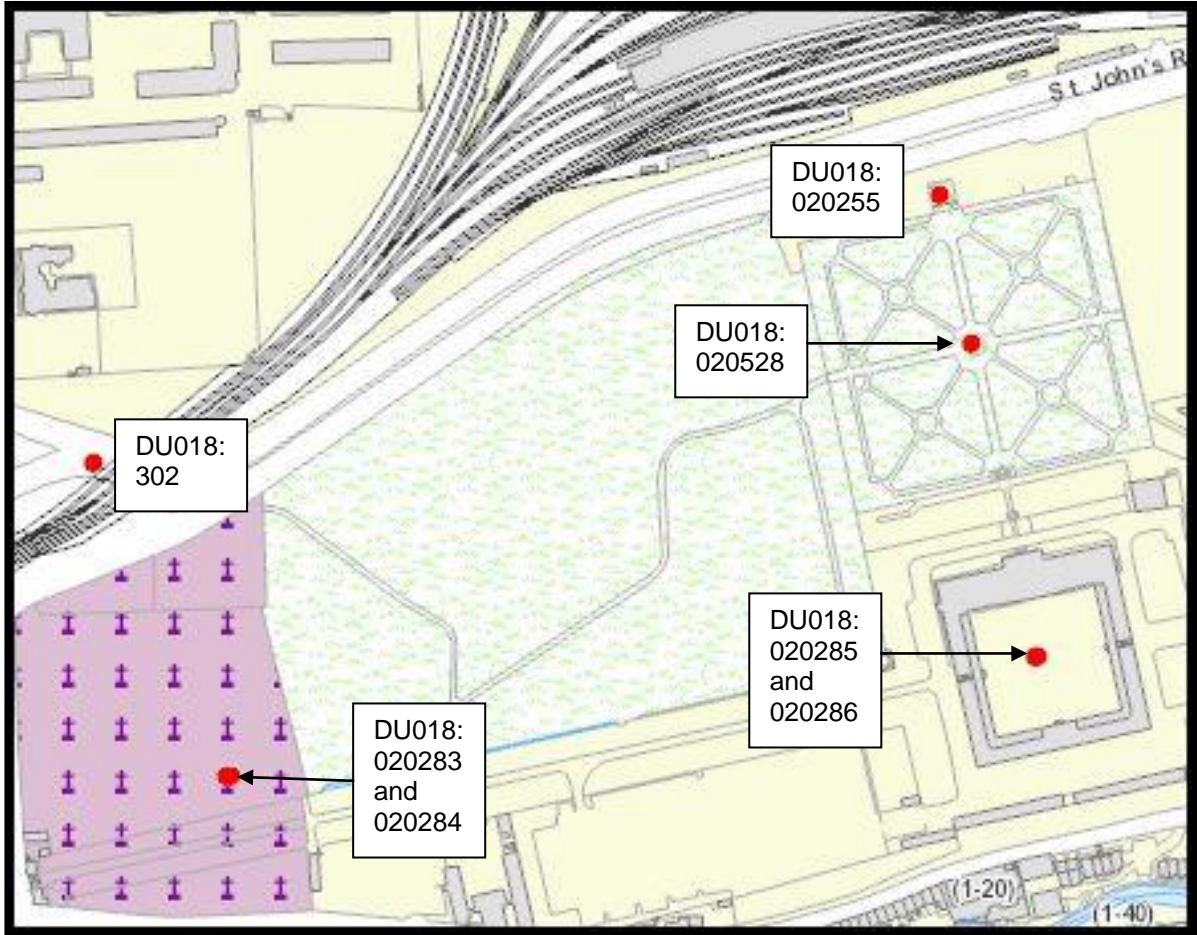




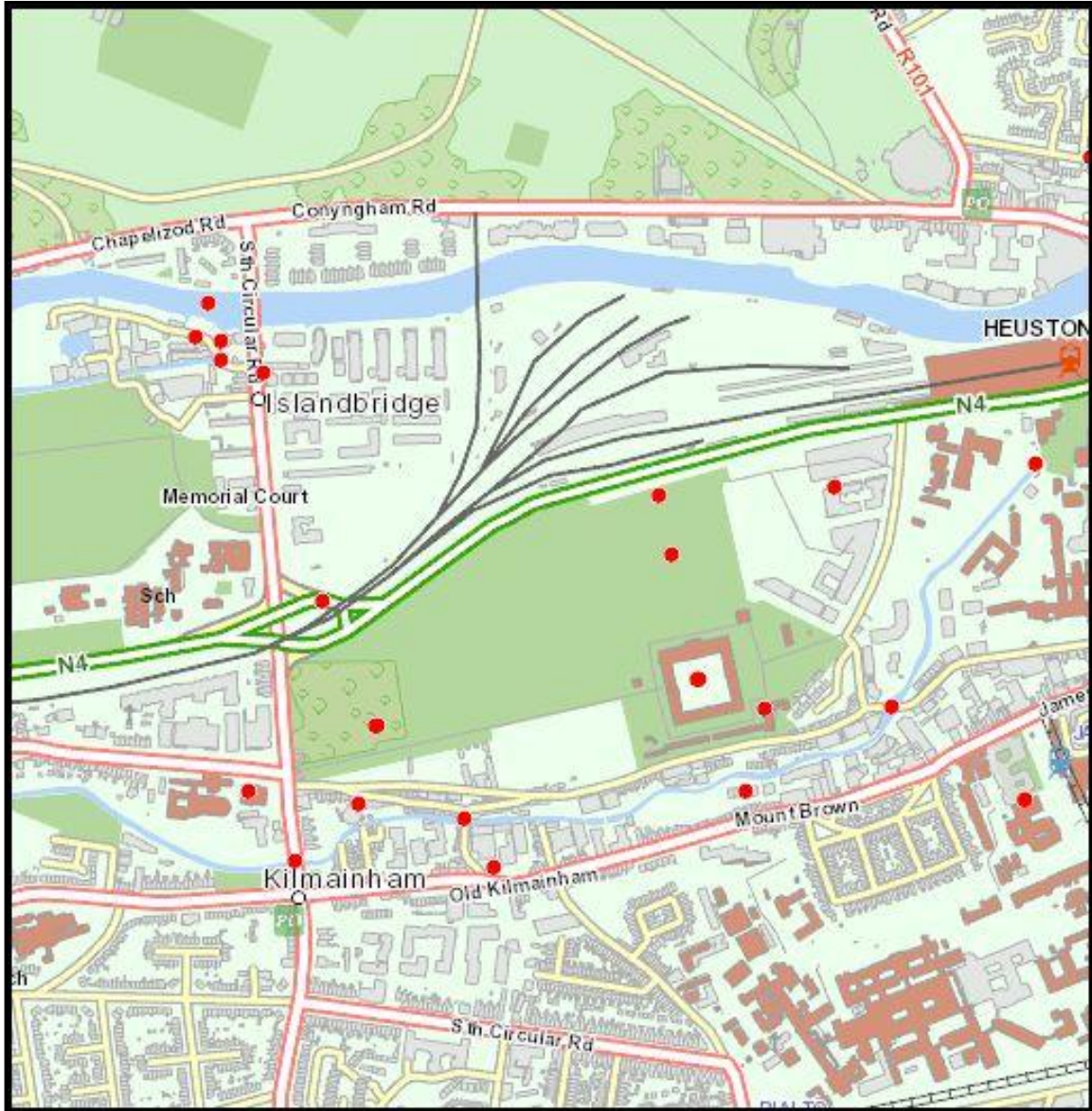
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Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Figure: 1



Project: Royal Hospital, Kilmainham, Dublin 8		Title: Location of 13 test pits excavated for CCTV masts and associated electrical services	
Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Figure: 3



Project: Royal Hospital, Kilmainham, Dublin 8		Title: RMP sites in close proximity to the development area	
Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Figure: 4



Project: Royal Hospital, Kilmainham, Dublin 8		Title: RMP sites within 500m of the development area	
Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Figure: 5



Project: Royal Hospital, Kilmainham, Dublin 8

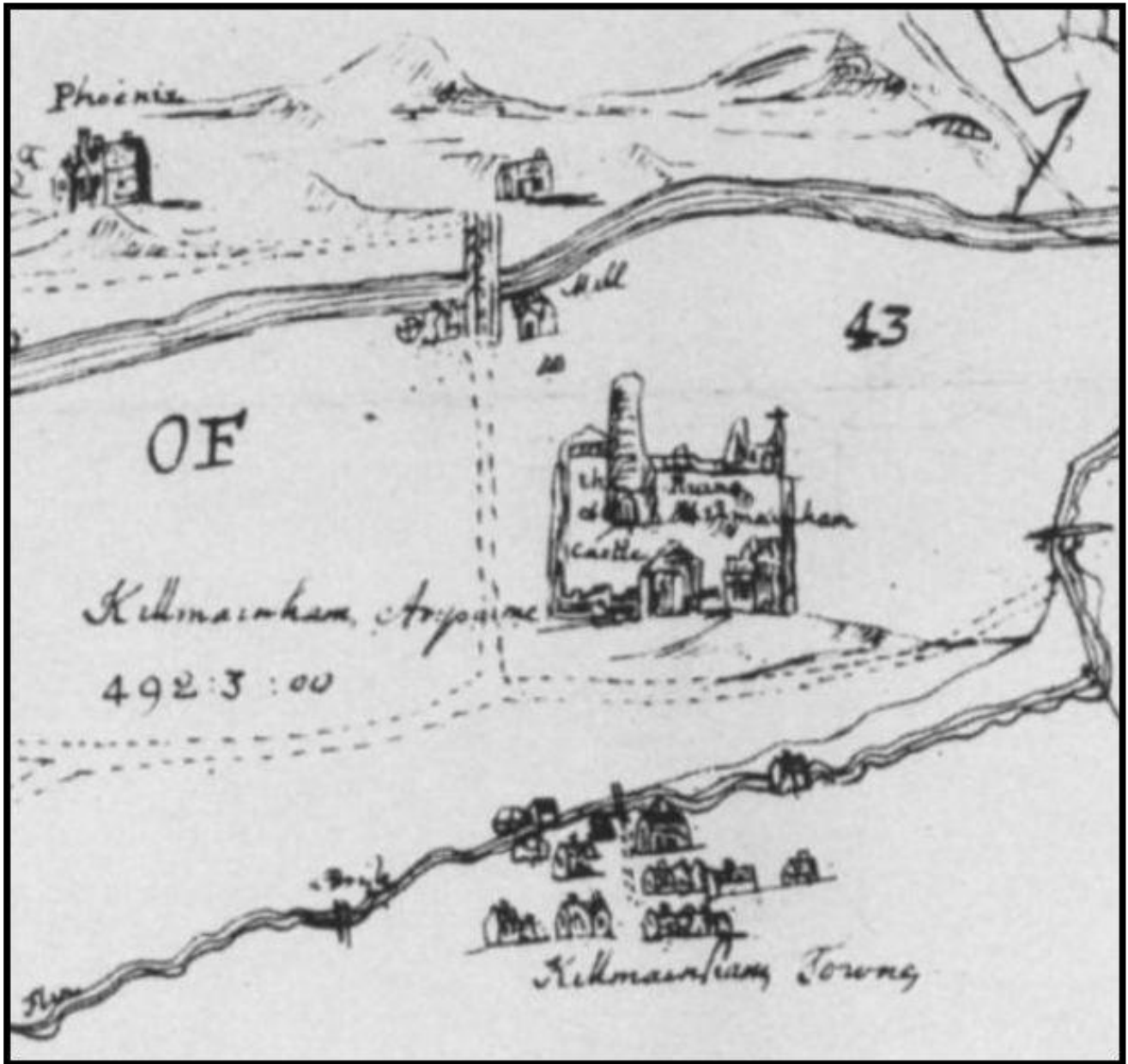
Title: 2005 Aerial photograph of the development area

Date: 30/8/2012

Scale: N.T.S.

Client: Office of Public Works

Figure: 6



Project: Royal Hospital, Kilmainham, Dublin 8

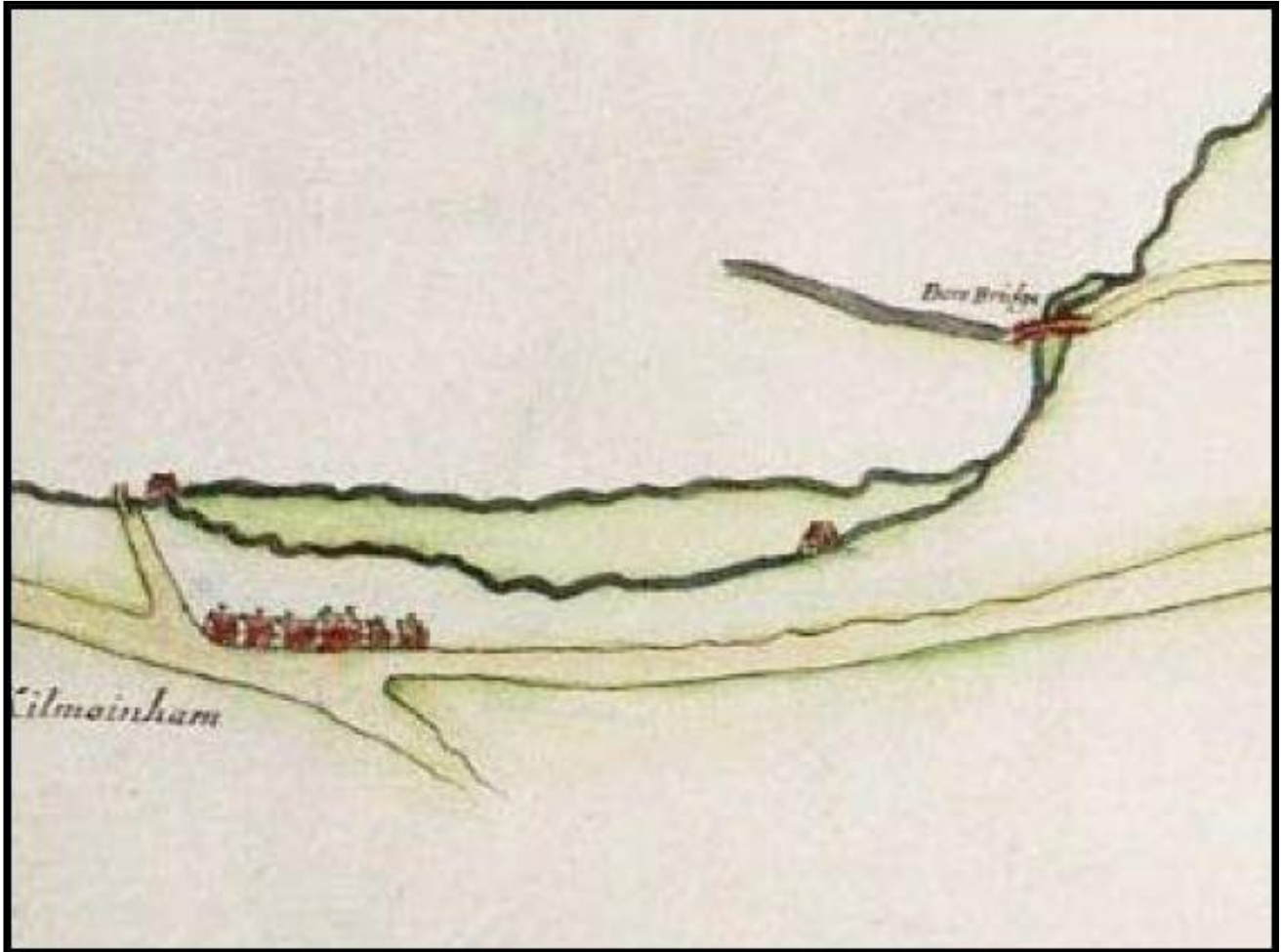
Title: Barony of Newcastle and Uppercross, c. 1655-56

Date: 30/8/2012

Scale: N.T.S.

Client: Office of Public Works

Figure: 8



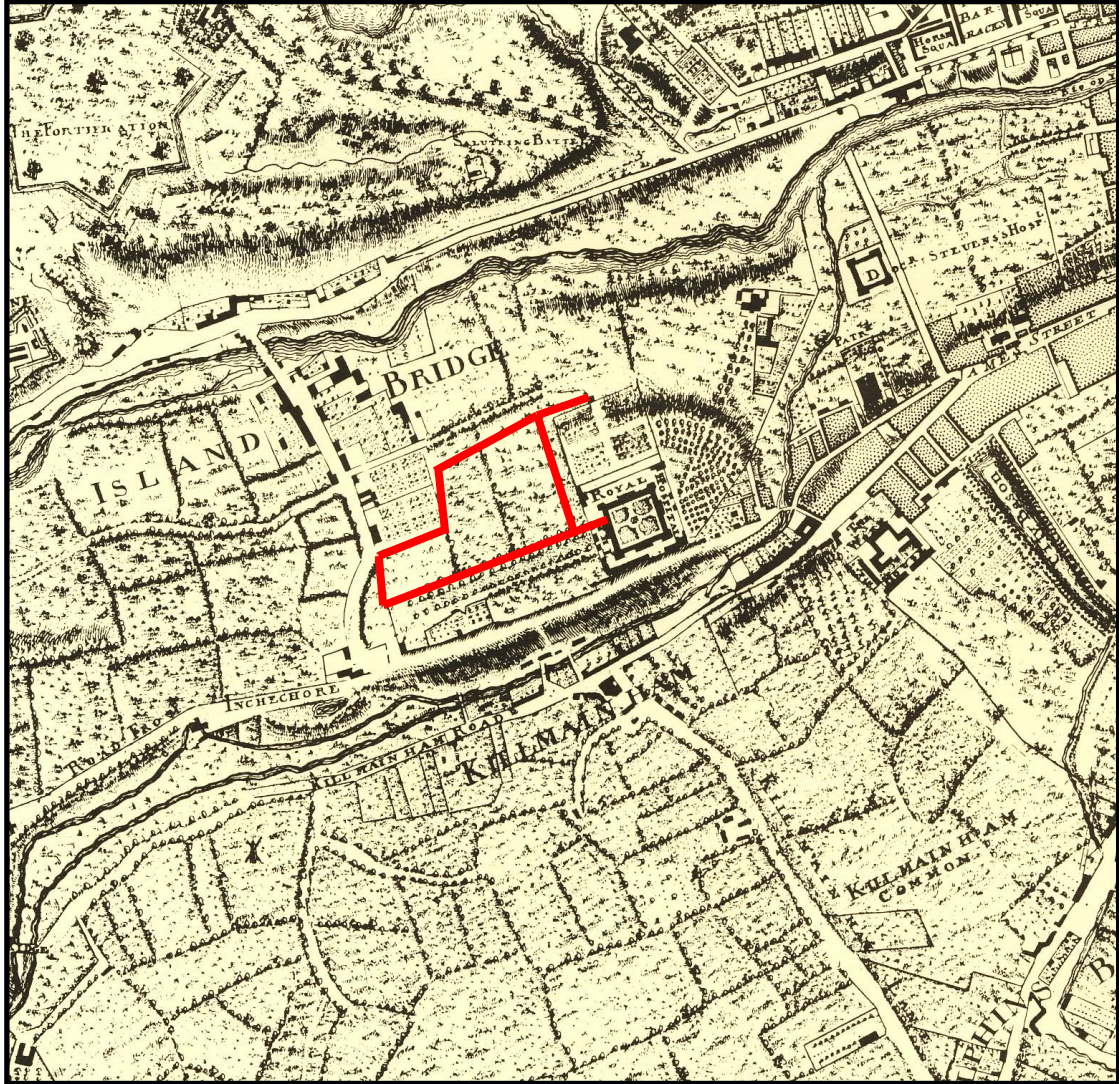
Project: Royal Hospital, Kilmoinham, Dublin 8 **Title:** "The city and suburbs of Dublin, 1673", Bernard de Gomme, showing "Kilmoinham" and "Bow Bridge"

Date: 30/8/2012

Scale: N.T.S.

Client: Office of Public Works

Figure: 9



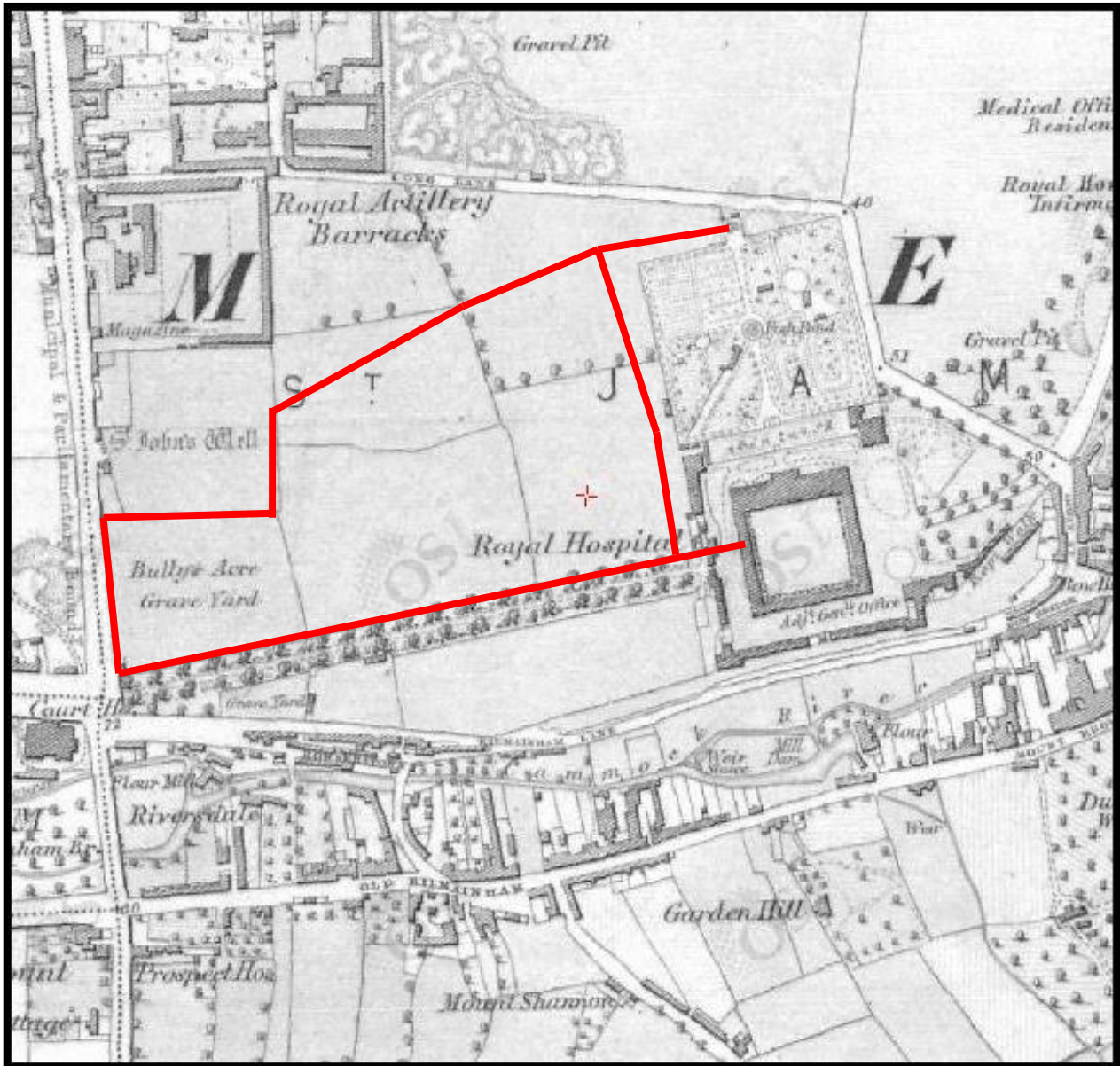
Project: Royal Hospital, Kilmainham, Dublin 8 **Title:** Extract from John Rocque, *Plan of the city of Dublin and the environs*, 1756, showing the development area

Date: 30/8/2012

Scale: N.T.S.

Client: Office of Public Works

Figure: 10



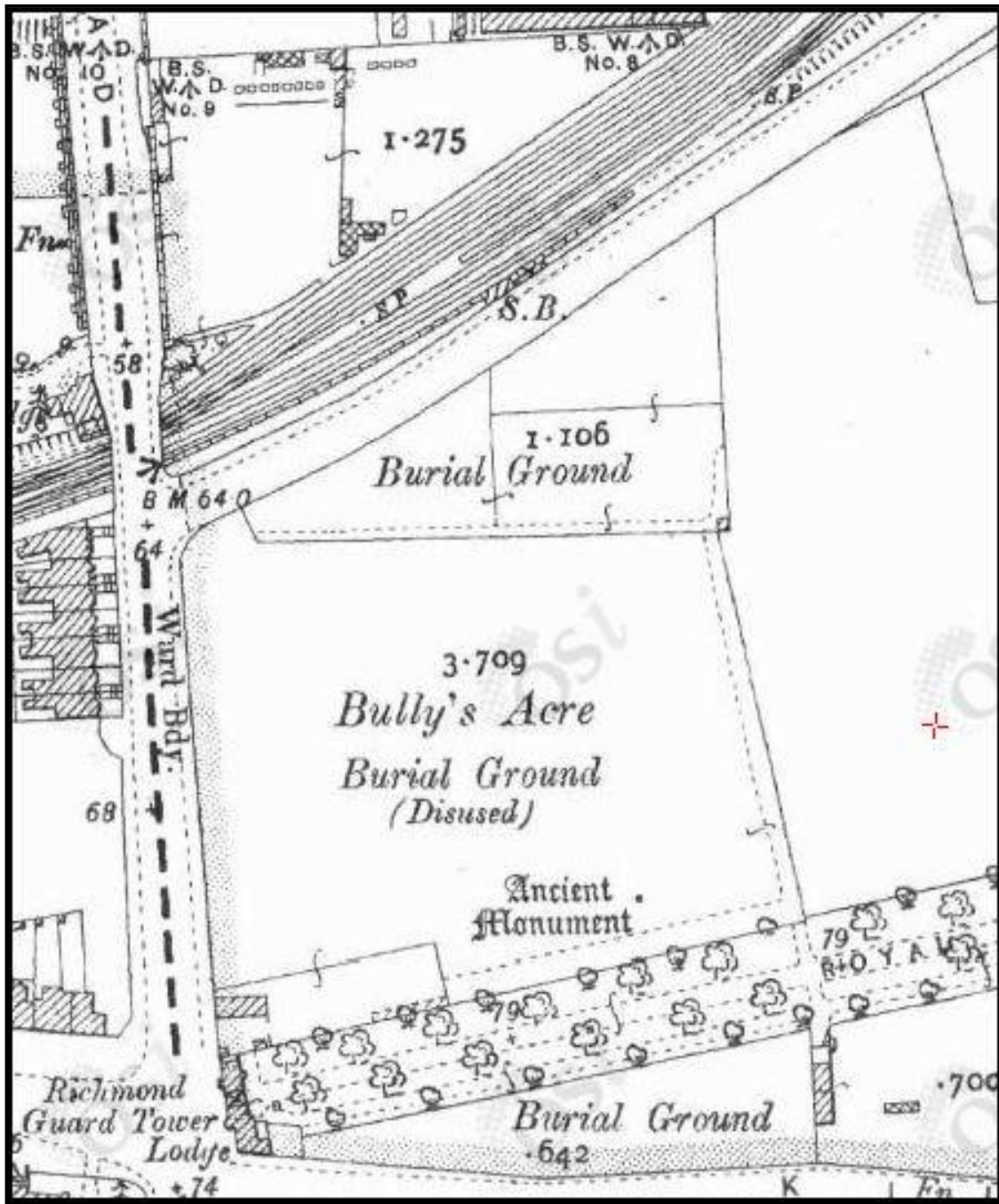
Project: Royal Hospital, Kilmainham, Dublin 8 **Title:** Extract from First Edition OS map 1844 (1:10:560), showing development area

Date: 30/8/2012

Scale: N.T.S.

Client: Office of Public Works

Figure: 11



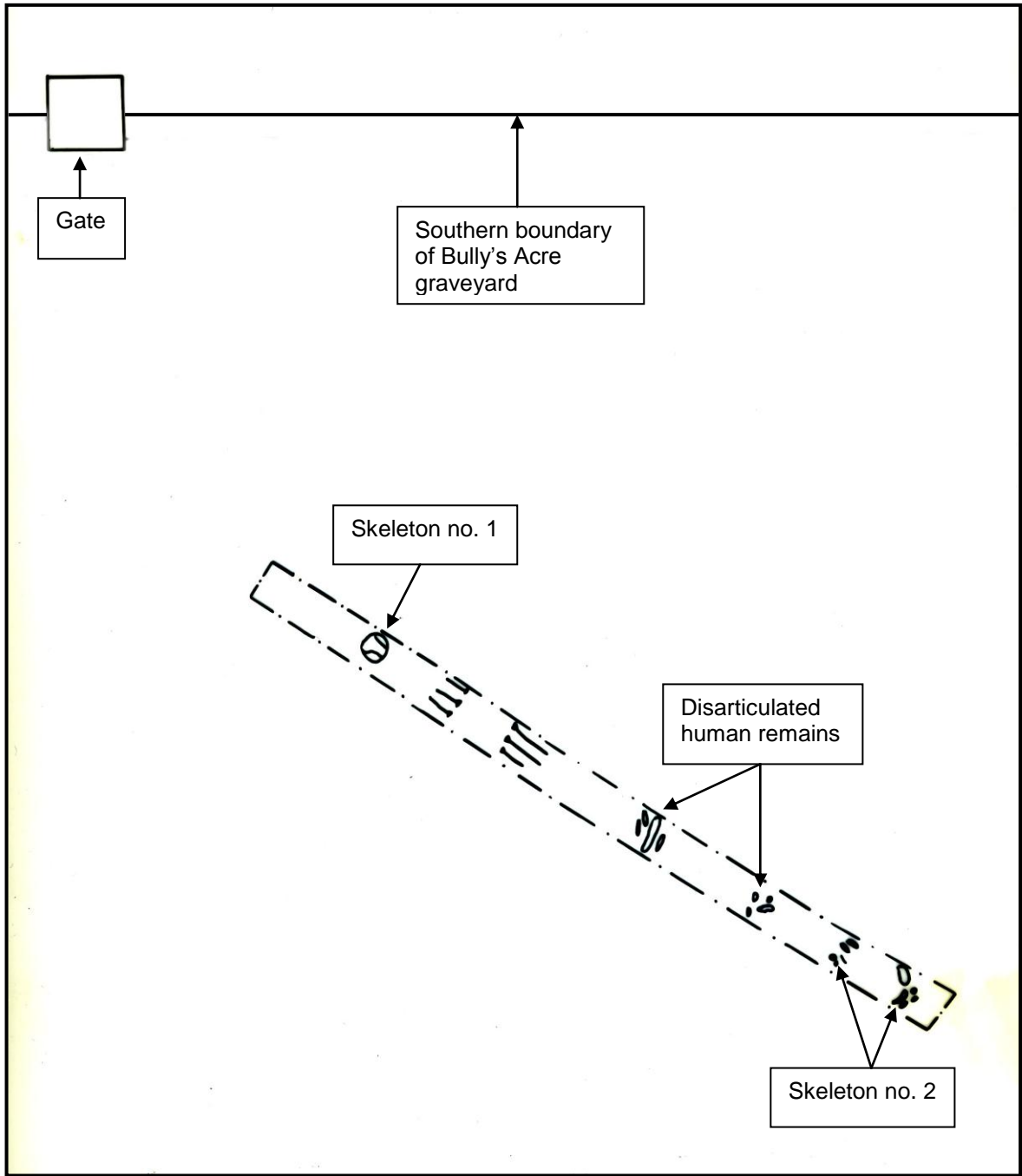
Project: Royal Hospital, Kilmainham, Dublin 8 **Title:** Extract from First Edition OS map 1863-67 (1:2,500), showing Bully's Acre

Date: 30/8/2012

Scale: N.T.S.

Client: Office of Public Works

Figure: 12



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4m

Project: Royal Hospital, Kilmainham, Dublin 8

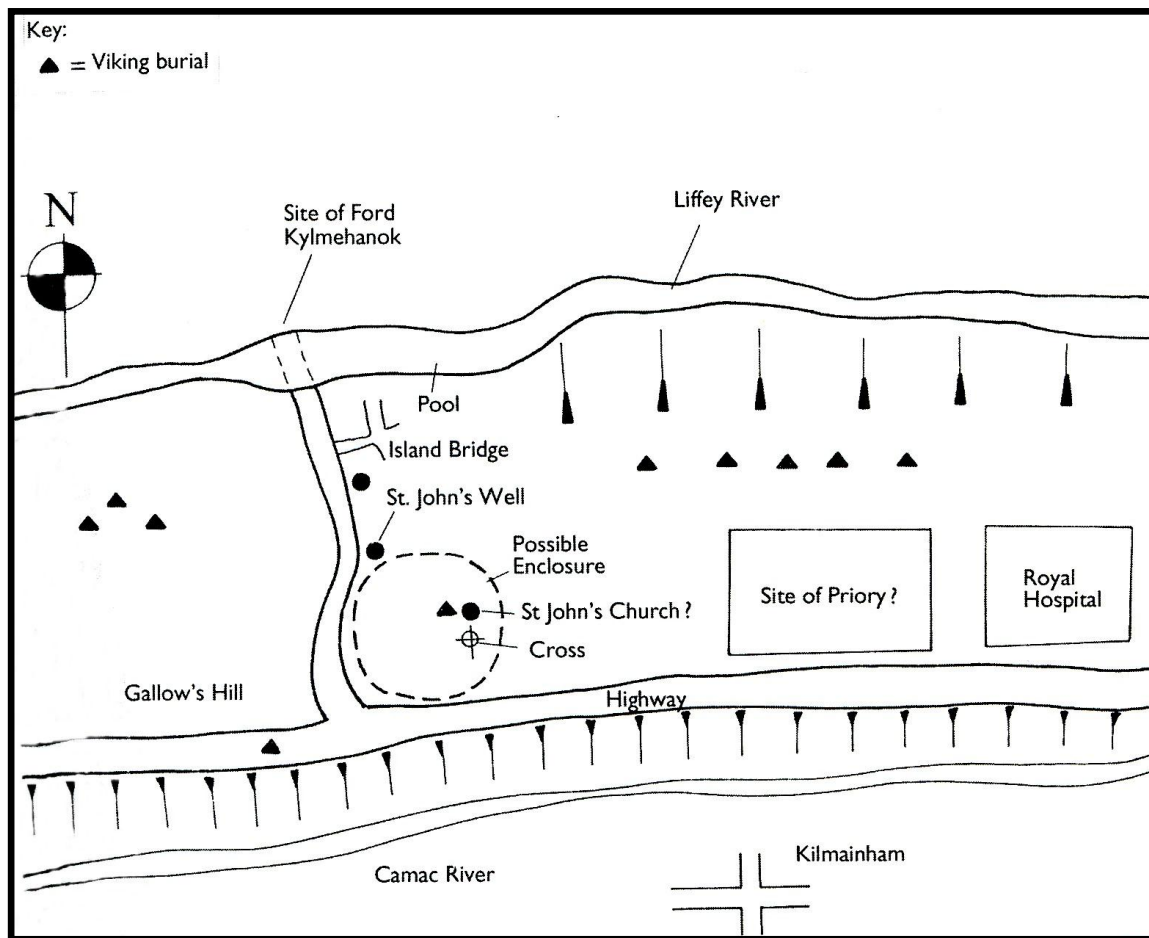
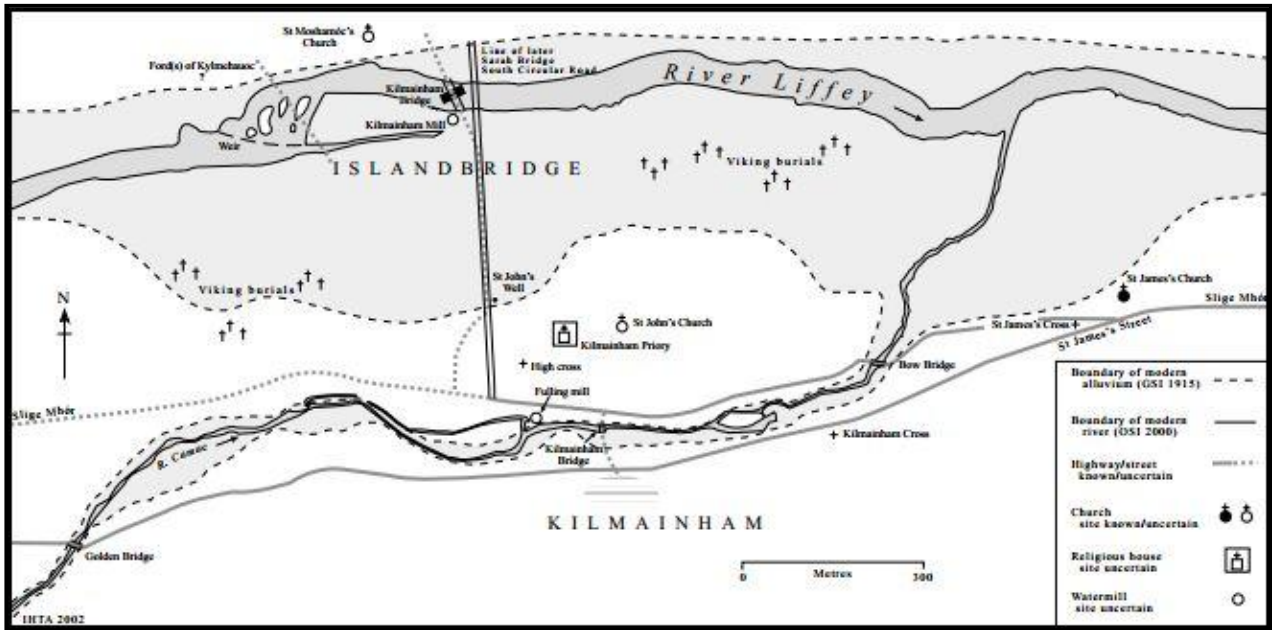
Title: Plan showing Skeletons 1 and 2

Date: 30/8/2012

Scale: see above

Client: Office of Public Works

Figure: 15



Project: Royal Hospital, Kilmainham, Dublin 8

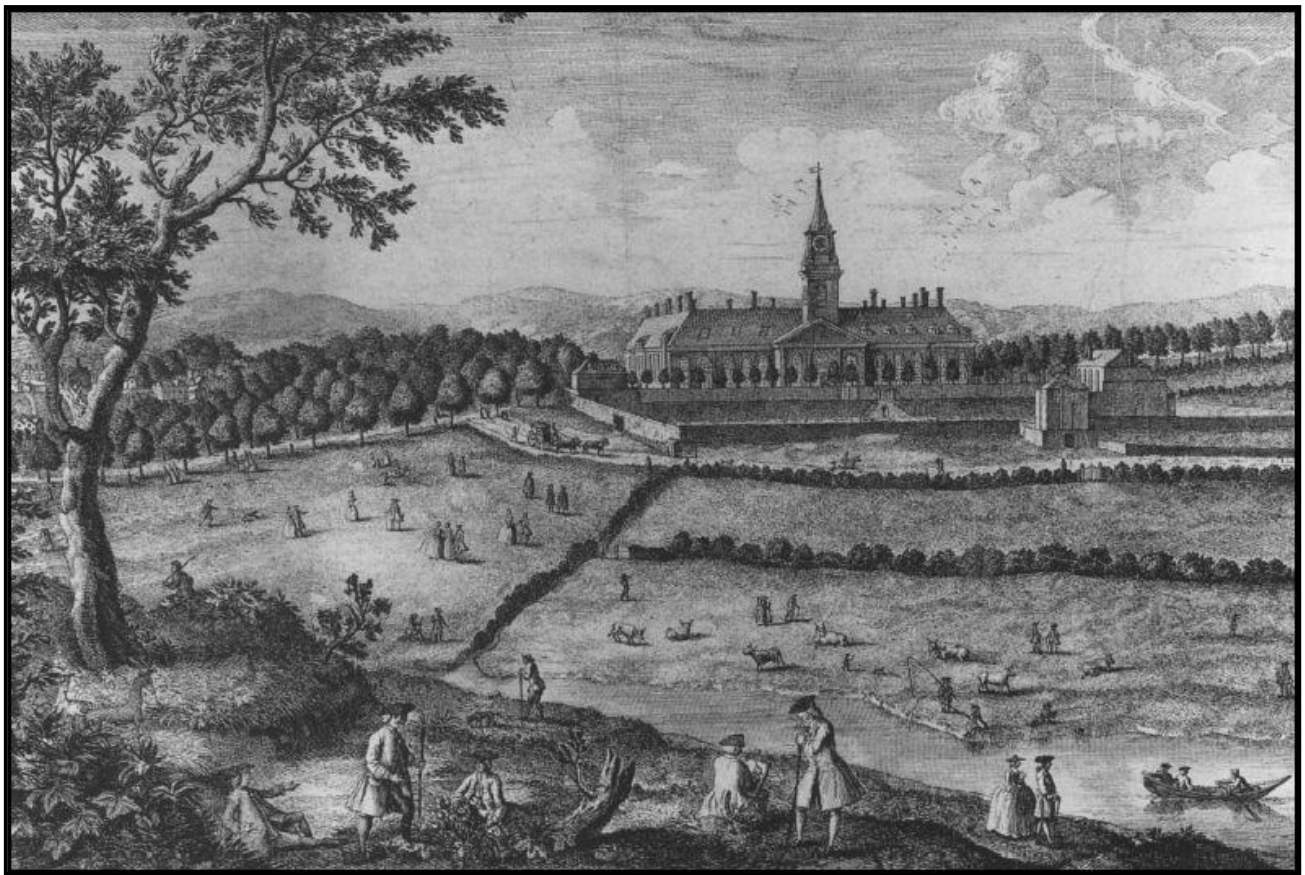
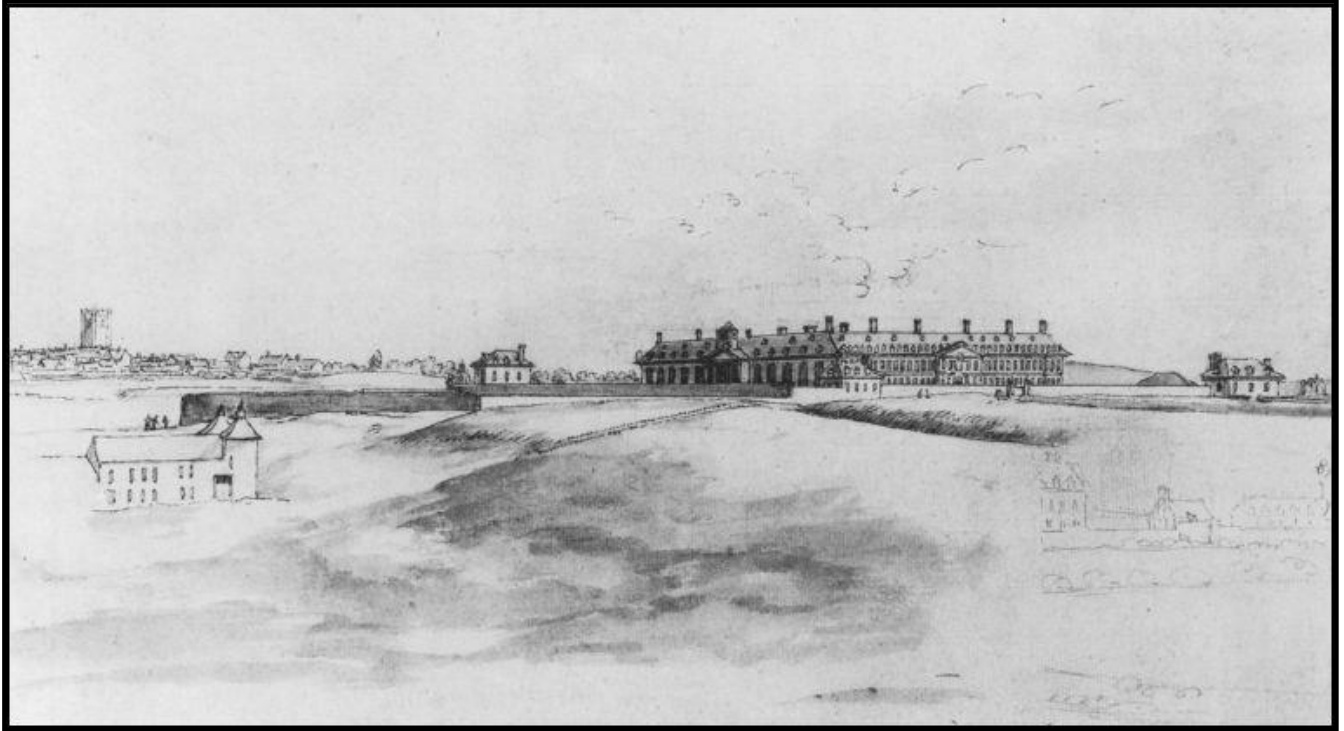
Title: "Principal Sites in Medieval Kilmainham", (after Clarke, 2002)
Reconstruction map showing the development area, (after Simpson, 2009)

Date: 30/8/2012

Scale: N.T.S.

Client: Office of Public Works

Figures: 13 and 14



Project: Royal Hospital, Kilmainham, Dublin 8

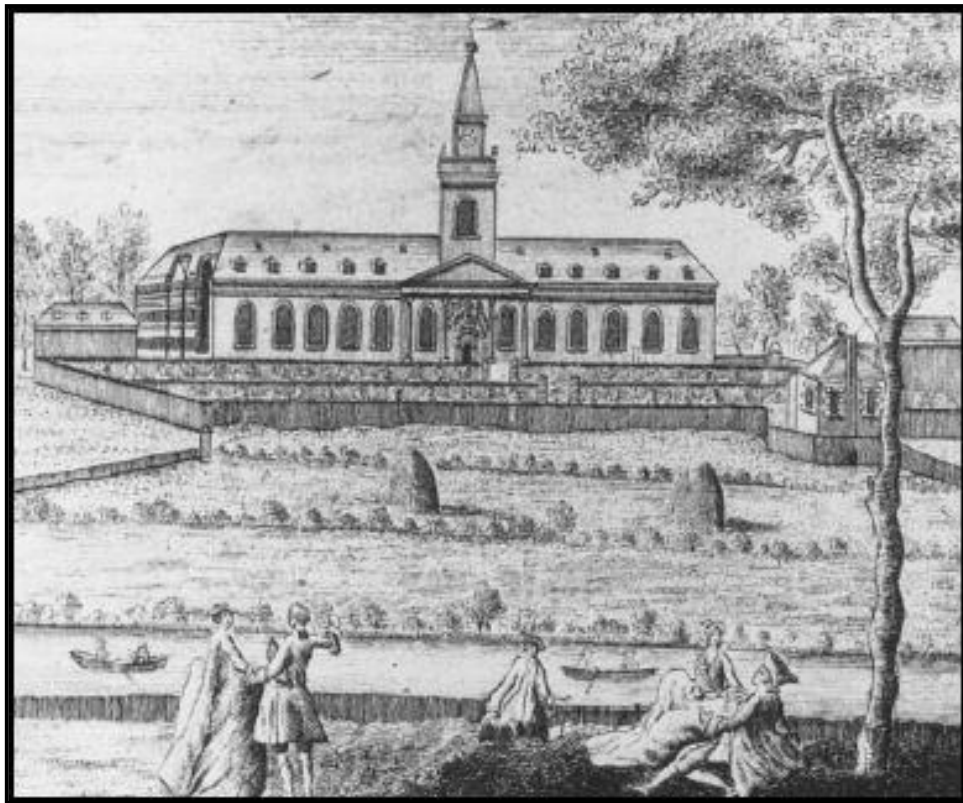
Title: The Soldiers Hospital at Dublin. By Francis Place, 1698
North East Prospect of the Royal Hospital. Attributed to Joseph Tudor, 1750

Date: 30/8/2012

Scale: N.T.S.

Client: Office of Public Works

Figures: 16 and 17



Project: Royal Hospital, Kilmainham, Dublin 8

Title: The Royal Hospital. By John Brooking, 1728
View of the Royal Hospital from across the Liffey. By John Rocque, 1757

Date: 30/8/2012

Scale: N.T.S.

Client: Office of Public Works

Figures: 18 and 19



ARCHAEOLOGICAL MONITORING REPORT

ROYAL HOSPITAL KILMAINHAM,
IRISH MUSEUM OF MODERN ART,
DUBLIN 8

ON BEHALF OF

OFFICE OF PUBLIC WORKS

LICENCE NUMBER: 11E0410

DUBLIN CITY COUNCIL PLANNING REFERENCE: 3961/05

DERMOT NELIS ARCHAEOLOGY

10th SEPTEMBER 2012

1	Introduction	1
1.1	General	
1.2	Planning Background	
1.3	The Development	
1.4	<i>In Situ</i> Preservation of Human Remains	
2.	Archaeological and Historical Background	4
2.1	General Archaeological and Historical Background	
2.2	Site Specific Background	
2.3	RMP Sites	
2.4	Topographical Files of the National Museum of Ireland	
2.5	Cartographic Analysis	
2.6	Aerial Photographs	
2.7	Previous Archaeological Fieldwork	
2.8	Field Inspection	
3	Archaeological Monitoring	27
3.1	General	
3.2	Results of Monitoring	
4	Non-Technical Summary	35

References

- Appendix 1 List of Contexts
- Appendix 2 Ceramic, Glass and Clay Pipe report
- Appendix 3 Osteoarchaeological report

List of Figures

- Figure 1 Site location
- Figure 2 Layout of development
- Figure 3 Location of 13 test pits excavated for CCTV masts and associated electrical services
- Figure 4 RMP sites in close proximity to the development area
- Figure 5 RMP sites within 500m of the development area
- Figure 6 2005 Aerial photograph of the development area
- Figure 7 “The parrish of Kilmainham in the County of Dublin by Robt. Girdler” (c. 1655-56), with detail showing “*The Ruins? Of Kilmainham*”
- Figure 8 Barony of Newcastle and Uppercross, c. 1655-56
- Figure 9 “The city and suburbs of Dublin, 1673”, Bernard de Gomme, showing “*Kilmainham*” and “*Bow Bridge*”
- Figure 10 Extract from John Rocque, *Plan of the city of Dublin and the environs*, 1756, showing the development area
- Figure 11 Extract from First Edition OS map 1844 (1:10,560), showing development area
- Figure 12 Extract from First Edition OS map 1863-67 (1:2,500), showing Bully’s Acre
- Figure 13 “*Principal Sites in Medieval Kilmainham*”, (after Clarke, 2002)
- Figure 14 Reconstruction map showing the development area, (after Simpson, 2009)
- Figure 15 Plan showing Skeletons 1 and 2
- Figure 16 The Soldiers Hospital at Dublin. By Francis Place, 1698
- Figure 17 North East Prospect of the Royal Hospital. Attributed to Joseph Tudor, 1750
- Figure 18 The Royal Hospital. By John Brooking, 1728
- Figure 19 View of the Royal Hospital from across the Liffey. By John Rocque, 1757

List of Plates

- Plate 1 *In situ* preserved remains of Skeleton 1
- Plate 2 Detail of cranial fragment of Skeleton 1
- Plate 3 *In situ* preserved remains of Skeleton 2
- Plate 4 Detail of cranial fragment of Skeleton 2
- Plate 5 Excavation along western end of Bully's Acre, looking south
- Plate 6 Excavation along northern end of Bully's Acre, looking east
- Plate 7 Excavation along northern end of Bully's Acre, looking west
- Plate 8 Excavation at eastern end of Bully's Acre, looking south
- Plate 9 Excavation in north west corner of Meadow, looking north east
- Plate 10 Excavation in northern end of Meadow, looking south west
- Plate 11 Excavation north of Formal Garden, looking north east
- Plate 12 Fill **C12** from eastern end of Meadow, looking north
- Plate 13 Excavation in north eastern end of Meadow, looking south
- Plate 14 Excavation in south eastern end of Meadow, looking east
- Plate 15 Excavation in southern end of Meadow, looking east
- Plate 16 Excavation in southern end of Meadow, looking west
- Plate 17 Excavation south of Bully's Acre, looking west
- Plate 18 North/south wall south of water tower and west of the Royal Hospital
- Plate 19 Excavation across West Avenue, looking north
- Plate 20 Excavation west of the Royal Hospital, looking west
- Plate 21 Terram sealing *in situ* preserved Skeletons 1 and 2
- Plate 22 Brick from structure at base of trench, west of the Royal Hospital
- Plate 23 Pit excavated for CCTV mast, looking north
- Plate 24 Excavation of temporary construction hoarding, looking west
- Plate 25 Cross shaft (DU018-020284), looking west
- Plate 26 Cross shaft (DU018-020284), looking north east

1 INTRODUCTION

1.1 General

This report describes the results of a programme of archaeological monitoring (Licence Number 11E0410) carried out at the Royal Hospital Kilmainham, Irish Museum of Modern Art, Dublin 8 (Dublin City Council Planning Reference: 3961/05, figure 1). Monitoring was undertaken by Dermot Nelis on behalf of the Office of Public Works.

The report integrates the results of the monitoring with a detailed interrogation of the archaeological and historical background of the development area. This includes information from the Record of Monuments and Places (RMP) of County Dublin (figures 4 and 5), Topographical Files of the National Museum of Ireland, aerial photographic, cartographic and documentary records. An osteoarchaeological report, on the analysis of two *in situ* preserved articulated human remains and disarticulated human bone, is included as Appendix 1.

The majority of fieldwork took place intermittently between 21st November 2011 and 30th January 2012, and in total this phase took 13.5 days to complete. Monitoring of the construction of temporary hoarding took place on 16th February 2012, while monitoring of limited groundworks in the interior of the Irish Museum of Modern Art took place on 24th and 25th May 2012. Monitoring of 13 no. pits excavated for the installation of new CCTV masts and associated electrical services was carried out between 20th and 24th August 2012, taking 3.5 days to complete.

Archaeological monitoring:

“involves an archaeologist being present in the course of the carrying out of development works (which may include conservation works), so as to identify and protect archaeological deposits, features or objects which may be uncovered or otherwise affected by the works” (DAHGI 1999a, 28).

1.2 Planning Background

A planning application (3961/05) was submitted to Dublin City Council in 2005. The Commissioners of Public Works in Ireland, on behalf of The Irish Museum of Modern Art, applied for permission for:

“the provision of a new security room adjacent to the existing; the provision of an addressable fire alarm system; the installation of 91 (no.) new internal C.C.T.V. cameras & 12 (no.) L.E.D. type infra-red spot/floodlights. It is also proposed to provide access control units to 43 (no.) doors throughout the building; upgrade the fire characteristics of all escape route doors; the upgrade of the existing emergency lighting system throughout the building; the refurbishment of the existing lighting system in each of the gallery rooms & the upgrade of the existing fuse board. The Royal Hospital Kilmainham, Boundary Wall, Gardens, Gates & Railings are protected structures. (Ref. 4333 in Dublin City Development Plan 2005 - 2011)”.*

*Reference in *Dublin City Development Plan 2011 - 2017* is 5244 (www.dublincity.ie).

No archaeological conditions were attached to the Grant of Planning. The Office of Public Works requested that all site development works be monitored by a suitably qualified archaeologist.

1.3 The Development

The development involved excavation for trenching and ducting around the site, the construction of draw chambers for site service cables and concrete bases for security camera columns. The works formed a phased part of a greater package of fire, security and mechanical and electrical upgrade works throughout the site.

Trenching measured approximately 1.35km in length. The trenches were approximately 0.80m deep and approximately 0.40m wide and were located in Bully's Acre, the Privates' Burial Ground (which is located immediately north of Bully's Acre), along the northern and eastern boundaries of the Royal Meadow, along the West Avenue and in the vicinity of the Royal Hospital (figure 2).

Bully's Acre and the Privates' Burial Ground, both of which were traversed by the development, are known to contain human remains. In addition, the possible presence of an Early Medieval ecclesiastical enclosure, the suggested location of the Medieval church of St. John the Baptist, and features associated with the development of the Royal Hospital confirmed that the development area is one of significant archaeological potential.

1.4 *In Situ* Preservation of Human Remains

Two articulated human remains were uncovered in the southern end of Bully's Acre on the first day of monitoring (21st November 2011). Trenching was immediately stopped in the area of fieldwork and a phone call was made to Denise Keating (osteologist) who immediately came to the site. Phone calls were then made to Dr. Ruth Johnson (City Archaeologist), Mr. Tom Condit (National Monuments Service, Department of Arts, Heritage and the Gaeltacht) and Mr. Pdraig Clancy (National Museum of Ireland). Phone calls were also made to the Coroner's Office and Kilmainham Garda Station to notify of the discovery of human remains.

It was agreed with the City Archaeologist, National Monuments Service and the National Museum of Ireland, and in consultation with the Office of Public Works, that the human remains would be preserved *in situ*. A Method Statement for the preservation of the human remains was prepared and submitted by the author and agreed to by all of the relevant authorities.

In situ preservation involved carefully covering the human remains by hand with clay to a depth of 0.10m above the remains. Terram (a geotextile layer) was then laid by hand over the clay layer. A sand blinding layer of 50mm was laid by hand over the terram. The plastic ducting was laid on this sand blinding layer which was then filled with earth to achieve a minimum cover of 0.30m.

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 General Archaeological and Historical Background

During the Mesolithic period (c. 7,000-4,000 BC) people existed as hunters/gatherers, living on the coastline, along rivers and lakesides. They used flint and other stones to manufacture sharp tools, and locating scatters of discarded stone tools and debris from their manufacture can sometimes identify settlements.

Late Mesolithic and Neolithic fish traps were discovered during archaeological monitoring of development works on reclaimed land on the north bank of the River Liffey in 2004 (at depths of approximately -6m OD and -4m OD, respectively) (McQuade and O'Donnell 2007, 569-584). A Mesolithic shoreline was revealed and the remains of up to five wooden fish traps were excavated. The fish traps were constructed almost exclusively of hazel (*Corylus avellana*), and while fragmentary, were in a relatively good state of preservation, with tool marks in evidence. Radiocarbon determinations from five wood samples returned a date range of between 6,100 – 5,720 cal BC, suggesting that these are the earliest fish traps recorded in Ireland and the United Kingdom. As a result it has been suggested that:

“other finds such as dugout canoes, hurdles and trackways, dating from prehistory onwards and reflecting shore-based fishing activity across mud flats, may also be preserved in situ at similar levels below the present ground level” (Margaret Cowen & Co. Ltd. 2009, 50).

The population became more settled during the Neolithic period (c. 4,000-2,400 BC) with a subsistence economy based on crop growing and stock-raising. This period also saw changes in burial practices, and a tradition of burying the dead collectively and carrying out of cremations emerged. Neolithic monuments from County Dublin include portal, passage and wedge tombs.

The Bronze Age (c. 2,400-600 BC) is characterised by the introduction of metalworking technology to Ireland and coincides with many changes in the archaeological record, both in terms of material culture as well as the nature of the sites and monuments themselves. Though this activity has markedly different characteristics to that of the preceding Neolithic period, including new structural forms and new artefacts, it also reflects a degree of continuity. During this period

knowledge of metalworking was acquired resulting in changes in material culture such as the introduction of metal tools and artefacts, as well as the introduction of a highly decorated pottery called Beaker pottery. In addition to changes in material culture, there were changes in burial rite from communal megalithic tombs to single burial in cists.

Bronze Age monuments from County Dublin include standing stones, stone pairs, cairns, barrows and *fulachta fiadh*, which are one of the most numerous monument types in Ireland with over 4,500 examples recorded (Waddell 2005, 174).

The Early Medieval period (c. 400-1169 AD) is depicted in the surviving sources as entirely rural characterised by the basic territorial unit known as *túath*. Walsh (2000, 30) estimates that there were at least 100, and perhaps as many as 150, kings in Ireland at any given time during this period, each ruling over his own *túath*.

The Early Medieval period is also characterised by the foundation of a large number of ecclesiastical sites throughout Ireland in the centuries following the introduction of Christianity in the 5th century AD. The early churches tended to be constructed of wood or post-and-wattle. Between the late 8th and 10th centuries mortared stone churches gradually replaced the earlier structures. Many of the sites, some of which were monastic foundations, were probably originally defined by an enclosing wall or bank similar to that found at coeval secular sites. This enclosing feature was probably built more to define the sacred character of the area of the church than as a defence against aggression. An inner and outer enclosure can be seen at some of the more important sites; the inner enclosure surrounding the sacred area of church and burial ground and the outer enclosure providing a boundary around living quarters and craft areas. Where remains of an enclosure survive it is often the only evidence that the site was an early Christian foundation.

The commencement of Viking raids at the end of the 8th century and their subsequent settlement during the following two centuries marked the first ever foreign invasion of Ireland. Viking settlement evidence is scarce and has been found in Dublin and Waterford, however excavations there have revealed extensive remains of the Viking towns. Outside these towns understanding of Viking settlement is largely drawn from documentary and place-name evidence. In addition to Dublin and Waterford, documentary sources provide evidence for the Viking foundation of the coastal towns of Limerick, Wexford and Cork (Edwards 2006, 179). Other indirect evidence which

suggest Viking settlement, or at least a Norse influence in Ireland, is represented by upwards of 120 Viking-age coin hoards, possible votive offerings of Viking style objects and the assimilation of Scandinavian art styles into Irish designs. Whilst the initial Viking raids would have been traumatic, the wealth and urban expansion brought into the country as a result of Viking trading would have eventually benefited the native Irish and the cultural assimilation in some parts would have been significant.

The arrival of the Anglo-Normans in Ireland towards the end of the 12th century caused great changes during the following century. Large numbers of colonists arrived from England and Wales and established towns and villages. They brought with them new methods of agriculture which facilitated an intensification of production. Surplus foods were exported to markets all along Atlantic Europe which created great wealth and economic growth. Results of this wealth can be seen in the landscape in the form of stone castles, churches and monasteries.

The political structure of the Anglo-Normans centred itself around the establishment of shires, manors, castles, villages and churches. In the initial decades after the Anglo-Norman invasion a distinctive type of earth and timber fortification was constructed- the motte and bailey. There are six motte and baileys recorded in County Dublin (www.archaeology.ie). In certain areas of Ireland however Anglo-Norman settlers constructed square or rectangular enclosures, now termed moated sites. Their main defensive feature was a wide, often water-filled, fosse with an internal bank. As in the case of ringforts, which they resemble in appearance and size, these enclosures protected a house and outbuildings usually built of wood. They appear to have been constructed in the latter part of the 13th century though little precise information is available. Moated sites were also built in Britain and elsewhere in north west Europe. There are six moated sites recorded in County Dublin (www.archaeology.ie).

More substantial stone castles followed the motte and bailey and moated sites in the 13th and 14th centuries. Tower houses are regarded as late types of castle and were erected from the 14th to early 17th centuries. Their primary function was defensive, with narrow windows and a tower often surrounded by a high stone wall (bawn). An Act of Parliament of 1429 gave a subsidy of £10 to “*liege*” men to build castles of a minimum size of 20ft in length, 16ft in breadth and 40ft in height (6m x 5m x 12m). By 1449 so many of these £10 castles had been built that a limit had to be placed on the

grants. The later tower houses were often smaller, with less bulky walls and no vaulting. There are 62 tower houses recorded in County Dublin (www.archaeology.ie).

The 14th century throughout north west Europe is generally regarded as having been a time of crisis, and Ireland was no exception. Although the Irish economy had been growing in the late 13th century, it was not growing quickly enough to support the rapidly expanding population, especially when Edward I was using the trade of Irish goods to finance his campaigns in Scotland and Wales. When the Great European Famine of 1315-17 arrived in Ireland, brought about by lengthy periods of severe weather and climate change, its effects were exacerbated by the Bruce Invasion of 1315-18. Manorial records which date to the early 14th century show that there was a noticeable decline in agricultural production. This economic instability and decline was further worsened with the onset of the Bubonic Plague in 1348.

Before the Tudors came to the throne the kings of England were also the kings of western France and so, during the 14th and 15th centuries, the various lords who ruled in Ireland were largely left to themselves. The Tudor conquest however brought a much greater interest in the affairs of Ireland. They wanted to put a stop to the raids of the native Irish on the areas under English rule. To do this, they ruthlessly put down any rebellions and even quashed inter-tribal feuds. English settlers were then brought in to settle their lands. The first of these plantations occurred in the mid-16th century in what is now Laois and Offaly. After the Desmond rising in Munster in 1585 came another plantation and parts of south western Tipperary were planted at that time.

From 1593 until 1603 there was a countrywide war between the native Irish, who were supported by the French, and the Elizabethan English. The Irish were finally defeated and with the "*Flight of the Earls*" from Rathmullan, County Donegal in 1607, Ulster, which had previously been independent of English rule, was planted.

2.2 Site Specific Background

Kilmainham

Kilmainham derives its name from "*Cill Maignenn*" or the 7th century church of Saint Maignenn (Ball 1906 (1995), 156; D'Alton 1838 (1976), 302). St. Mainen or Maghnenn is believed to have been the bishop and abbot of the church in the 7th century (Joyce 1996, 4). Kilmainham was subsequently an ecclesiastical, manorial and agricultural centre and appears to have been located somewhere at the junction

of the River Camac with the Liffey, and near the historically attested Liffey ford of Kilmehanoc or Kilmahalloch. This ford is thought to have lain at or upstream of the present-day Island Bridge (Ball 1906 (1995), 157; De Courcy 1996, 205-206, 215).

Early History

Evidence for prehistoric occupation of the area surrounding the Royal Hospital Kilmainham is relatively limited, and comprises the excavated remains of a Bronze Age (c. 2,400 – 600 BC) cemetery at Military Road and St. John's Road, Kilmainham (near Heuston Station) (www.excavations.ie). A variety of activities may have been carried out along the banks of the Camac and Liffey Rivers, on the ridges above the valleys of both rivers, and in the woods that until the middle ages covered much of Inchicore (Ball 1906 (1995), 157). The ancient "*Slighe Mhór*" routeway, which extended westwards from the eastern shore near the Liffey through the Irish midlands as far as Galway, although recorded in the Early Medieval period, may follow the course of an even older prehistoric route into Dublin's hinterland (Clarke 1998, 50). This routeway followed the approximate course of Thomas Street, James's Street and continued westwards through Kilmainham and Inchicore. A minor route branched southward, following the approximate course of the present Grattan Crescent and Tyrconnell Road and the southern arc of the Camac River.

The foundation of the church of St. Maignenn in the 7th century A.D. also strongly suggests the existence of established communities in the wider area, as many churches were founded to cater to the pastoral needs of existing Christians as well as to those of new converts. This foundation, and the associated settlement that developed around it, formed the basis for most of the concentrated human activity in the greater area until the expansion of the city and suburbs westwards in the 18th and 19th centuries. Much of the Medieval and later Medieval history of the site is tied in with the grants, regrants, confiscations and legal disputes surrounding the lands of Kilmainham.

Several commentators have located St. Maignenn's church (RMP DU018-020283) near to or within the presently disused cemetery of Bully's Acre in the grounds of the Royal Hospital. The choice of this location as a possible site for *Cill Maignenn* is based on a number of factors, such as the continuing ecclesiastical use of the wider area as part of the lands of the Knights Templar and later the Knights of St. John, and the potentially ancient nature of the Bully's Acre cemetery. Further contributory factors are the identification of the remains of what has been interpreted as the shaft

of a granite high cross of early (possibly 9th century) date (RMP DU018-020284) and the recovery of artefacts and human burials in the vicinity over the last 150 years.

A fording point is historically recorded in the vicinity under the name of “*Kilmehanoc*”, “*Kilmahalloch*” or “King’s Ford”. There are various assertions that its location lies at or upstream from the present-day Island Bridge (Ball 1906 (1995), 157; De Courcy 1996, 205-206, 215). In 1906, Ball described the site of the ford as being located:

“*Just above the weir at Dublin University Boat Club at Islandbridge*” (Ball 1906 (1995), 157).

Geographically this site would make sense as it lies in the shallow waters west of Mill Island where the main Liffey and millrace diverge. The shallows would have provided an easy crossing point as well as being ideal for the beaching of boats. The fording point would also have provided access to the Viking cemetery at Islandbridge.

A collection of artefacts dredged from the ford in the 1860s and 1870s further attest to the location and importance of the site. Such finds include iron and bronze spearheads, axeheads, harpoons, bronze ring pins, an iron blade, metal buttons, a bronze key and items of a more recent date including clay pipe bowls and stems (*ibid*, 40). These artefacts have been largely dated to the latter half of the 9th century, making them contemporary with the Viking longphort recorded in the Annals of Ulster as being established in “*Duiblin*” in 841AD (*ibid*, 40; Bradley 1992, 43).

Bully’s Acre

Bully’s Acre, which measures 3.6 acres, was truncated by the construction of the West Avenue in the late 17th century. It is best known as the burial-ground attached to the Royal Hospital of Kilmainham founded in 1681 for “*old and infirm soldiers*”, a function it served until 1922.

It has been suggested (McNeill 1924, 19; Simpson 2009, 42) that the Medieval church of St. John the Baptist was located at the site of the later cemetery. This church was attached to the priory of the order of the Knights Hospitallers, whose Dublin house was founded in the early 1170s to the east of Bully’s Acre. The possible cross shaft located in the cemetery and the presence of a holy well to the north of Bully’s Acre suggest however that the site may perhaps be the Early Medieval monastic site of Kilmainham.

The precise location of the priory is not known, but a source from 1681 (quoted in Kenny 1995, 43) states that the priory complex was to the west of the Royal Hospital, i.e. between Bully's Acre to the west and the Hospital to the east.

The priory had both a church and a chapel servicing the community. It has been suggested (Simpson 2009, 53) that the chapel was located within the priory complex west of the Royal Hospital. The church however was much larger and is recorded in documentary records as St. John's of Kilmainham. When a Viking sword was found near the cross shaft in Bully's Acre in c. 1740, it was on:

"a tiled floor, near the site of the old Priory of Kilmainham" (O'Brien 1998, 39).

Excavation in Bully's Acre in 1989/91 revealed 18 fragments of ceramic floor tile, which can be compared directly with similar examples found in Dublin at Christ Church cathedral, St. Audoen's church, St. Mary's abbey, St. Nicholas church, St. Patrick's cathedral and St. Saviour's friary (Simpson 2009, 68).

The priory suffered the same fate as the rest of the ecclesiastical establishments during the Dissolution (in Ireland from 1537 onwards). By the 1660s the priory's lands, its buildings being ruinous, were to form part of the newly planned Phoenix Park, which was laid out by the newly-created Lord Lieutenant of Ireland, the Duke of Ormonde.

In 1677 Ormonde began his plan for a hospital for retired soldiers, and in 1680 it was ordered by King Charles II that it be built on the site of the present-day Irish Museum of Modern Art. The remaining priory complex, including the castle and the chapel, were then demolished.

Bully's Acre was a communal graveyard where many of the poorer classes were buried. Celebrations associated with the feast of St. John (24th June) at the holy well became a huge social event, with hundreds camping in the hospital fields. In 1775 Major General Dilkes, Master of the hospital, tried to have Bully's Acre enclosed within a stone wall. While he was unsuccessful in this attempt, he levelled some of the existing graves and removed headstones. By 1795 Bully's Acre had fallen into a bad state of repair, and at that time a high wall was built to enclose the graveyard.

Bully's Acre was a favourite spot for "body-snatchers" in the 18th and early 19th century. The bodies were stolen for use in anatomy schools and the site was a popular location due to the abundant supply of pauper's remains. A cholera epidemic attacked Dublin in 1832 resulting in 3,200 burials taking place within the graveyard, forcing the Board of Health for the city of Dublin to close it down the same year.

Viking Activity

It is considered likely that the Norse founders of the primary Viking settlement in the Dublin area took advantage of the location (and possibly also the infrastructure) of *Cill Maignenn*. Such a location would also have commanded the ford of Kilmehanoc (known by numerous variant spellings) mentioned above. De Courcy tentatively suggested that in the Early Medieval period, the Liffey may have flowed through:

"the gorge formed by the Phoenix Park and the high Camac-Liffey watershed ridge on which the Royal Hospital stands" (1984, 166)

and which may in turn have been the location of *Cill Maignenn*.

In 841 AD the Vikings are reported to have established a *longphort* or:

"semi-permanent Viking encampment used initially as a pirate lair (which) developed over the next sixty years into a commercial centre" (Bradley 1992, 43).

References in the Annals report the defeat of these Dublin Vikings in 902 A.D. and the probable destruction at that time of the original *longphort*. When they returned in c. 917 A.D., they established the old core of the present city at the confluence of the Poddle near the "*Black Pool*", almost 2km downstream of the Kilmainham/Islandbridge site (*ibid.*). The Early Medieval burials uncovered at Kilmainham and at Islandbridge are thought to relate to both *Cill Maignenn* and the probable Viking settlement in this area. Both east/west oriented burials (probably Christian) without grave-goods and probable Viking inhumations oriented north/south and accompanied by grave-goods were recovered. The gravel and railway excavations on the bank of the Liffey at Kilmainham and Islandbridge in the 1840s and 50s and again in the 1930s revealed at least 40 Viking graves, making it the largest Viking cemetery found outside Scandinavia. Another Viking grave is recorded as being located within Phoenix Park on the north side of the Liffey. The grave

contained the remains of a woman with a pair of bronze oval Scandinavian brooches, one of which was attached to a gilt bronze mount, and which are datable to the 9th or 10th century. The decoration on the mount has been interpreted as dating to the first half of the 8th century (Hall 1974, 40). This burial shows a Viking presence on both sides of the Liffey at this time, while also suggesting an established settlement in the vicinity as the burial was that of a woman and not a male warrior, which would be more likely in a raiding camp environment.

It is unclear whether or not *Cill Maignenn* continued or resumed its ecclesiastical function after the temporary removal of the Dublin Vikings from the immediate area following their defeat by Irish and Scandinavian forces. The ford continued to be a focus of activity in the following century and the Annals contain accounts of several battles which were fought by the forces of successive kings (occasionally camped nearby as in the case of Roderic O’Conor and his army) (D’Alton 1838 (1976), 303) at the ford. These accounts formed the foundation for subsequent 19th century and later interpretations of many of the Early Medieval artefacts recovered from this vicinity as evidence of Early Medieval “warrior” burials. Lewis (1837, 170), for example, records that the coins and sword recovered from near the base of the cross shaft in Bully’s Acre were popularly:

“supposed to be a memorial of some of the Irish princes that fell in the battle of Clontarf”.

More specifically, this cross shaft was thought to mark the grave of Murrough, son of Brian Boru, who had been slain at the battle (D’Alton 1838 (1976), 303), and Brian’s armies are reported to have camped in the vicinity during the year preceding the battle.

Medieval Kilmainham

In 1170, according to D’Alton, Dermot Mac Murrough, with the first army of his Welch [*sic*] allies, extending from Kilmainham, appeared in formidable array before the city of Dublin and shortly thereafter took the city (*ibid.*, 301). Whatever the nature of *Cill Maignenn* in the immediate aftermath of the reported sacking of the city, with the advent of the Normans the area of Kilmainham, Islandbridge and Inchicore was subject to the growth and change that affected Dublin and its hinterland from the 13th century onwards (Bradley and King unpublished, 12).

As part of the early parcelling out of land in the vicinity of Dublin, King Henry II:

“enfeoffed Hugh Tyrrell the elder with land at Kilmohavoc with appurtenances together with the moiety of the River Liffey as far as the watercourse near the gallows”

on the northern side of the river (Went 1990, 183).

Richard de Clare, known as Strongbow, (as the original grantee) is generally credited with establishing the Knights Templar at Kilmainham in 1174, and this grant was confirmed by King Henry II, who also:

“exempted the establishment from all ordinary jurisdiction” (D’Alton 1838 (1976), 302-303).

The establishment in question was the newly founded priory (RMP DU018-020286) which was dedicated upon its foundation to St. John the Baptist (D’Alton 1838 (1976), 303; Lewis 1837, 169). Tyrrell subsequently granted a portion of these lands and the Liffey moiety to the Knights, but this moiety was in the possession of the abbey of St. Thomas by 1185. The construction of the weir and mill-race at Islandbridge by the Hospitallers in the 13th century does indicate however that they retained a significant degree of control over the river and its resources, as the weir effectively prevented river traffic from travelling further upstream and limited the effect of the tides on the river further to the west (De Courcy 1996, 206). It is also likely that the potential of the Camac watercourse as a source of water, food, power and other resources was recognised by the Hospitallers, although the 17th century Down Survey map suggests Medieval exploitation of the river was concentrated further to the east.

The secretive administration, great wealth and independence of the Knights Templar led eventually to their suppression throughout Europe in the 14th century. In 1307, King Edward II ordered their suppression in England and Ireland and their land and possessions throughout the two islands were seized. Shortly thereafter, Kilmainham priory:

“which was granted to the knights of the order of St. John the Baptist formally, but in fact to the order of St. John the Evangelist, was principally appropriated

for the reception of guests and strangers, to the exclusion of the sick and infirm who had constant admittance there before” (D’Alton 1838 (1976), 306).

That the priory continued to grow in wealth and power under the new regime until its final suppression in the 16th century is perhaps illustrated by the fact that the priors of Kilmainham sat as barons in the House of Lords throughout the middle ages. The proto-industrialisation of the Liffey banks also continued with the further development of mills and fisheries, and the occasionally acrimonious disputes over fishing rights and tithes illustrates the importance attributed to these rights by their possessors (Went 1990, 181-83). It is possible that the pattern-day of St. John was established in the Medieval period (as suggested by the dedication of the well). The well (RMP DU018-020282) is marked on the First Edition Six Inch Ordnance Survey map of the area and was the scene of gatherings on St. John’s Eve (June 24th) until the latter part of the 19th century. It has since been destroyed.

After the tumultuous career of Prior Keating in the latter years of the 15th century, which saw him seize Dublin Castle, dispose of part of the priory’s lands and imprison his successor (Lewis 1837, 169), an order was made requiring all priors of Kilmainham to be Englishmen.

The River Camac

The River Camac rises in the Knockannavea Mountain near Brittas and flows through Slade, by Saggart, to Clondalkin. It then flows east towards Drimnagh, passing by Goldenbridge and Inchicore. There it enters its final stretch flowing below Kilmainham Gaol and under the South Circular Road at the high-arched Kilmainham Bridge. Flowing through the steep-sided valley between the Royal Hospital and Old Kilmainham, the Camac and the Liffey demarcate the high bluff on which the hospital stands. The elevated area was of considerable strategic importance in military offensives against Dublin up to the time of the Anglo-Norman invasion, and the valley of the Camac below may well have been the site of one of the earliest settled areas at Dublin. A stream probably used as a mill race was an important feature of the Lower Camac in Medieval times, and is so depicted on the 1844 Ordnance Survey map. It appears in some variation on an earlier map by Rocque (1756). Clearly an ancient watercourse, it may be the water referred to in 1216 when Christ Church was given:

“two acres of land lying between the road and Camac, one messuage and some fields near the old Canal”.

It has been suggested that the mill may have been in existence prior to 1170, and that one of its functions may have been to tap the Camac as an early source of fresh water for the city (CARD, Calendar of the Ancient Records of Dublin).

There is a reference in 1534 to a bridge near Kilmainham in connection with the rebellion of Silken Thomas (Ball 1906 (1995), 157). In the following year a second incident was recorded involving the Kilmainham Bridge where the Lord Deputy Sir William Skeffington with a small force of archers and artillery evaded an ambush laid by the Geraldine army (*ibid*). It is also recorded that there were two mills of considerable importance close to the bridge.

With the exception of a brief period during the reign of Queen Mary in the mid-16th century, the disestablishment of the monasteries in the time of King Henry VIII marked the end of the presence of the Knights at Kilmainham. The greater part of Kilmainham and surrounding areas had remained as part of the priory's estate until the time of its dissolution. An inquisition of 1541 listed 41 acres at “*Inchigore*” among the possessions of the priory, while a further 30 acres of pasture on the south side of Goldenbridge, a fulling mill on the Camac and a large number of holdings in the area were also listed (D’Alton 1838, (1976), 320). The reference to a fulling mill, which would have been used in the processing of woollen cloth, further illustrates the role of Kilmainham priory as a generator of money and power at a local level. By the 16th century, wool had long been a valuable export commodity, and the monks may have been taking advantage of national and international markets as well as producing fabric for their own use. It is unclear however whether the reference to the fulling mill is an indication that sheep-farming was carried out to any great extent in the wider area.

Seventeenth, Eighteenth and Nineteenth Century Kilmainham.

After the dissolution of Kilmainham priory, its lands reverted to the Crown and were leased to a succession of private individuals so that, as Ball notes:

“at the beginning of the 17th century ruinous houses and waste places abounded there” (1906 (1995), 158).

A large portion of the former lands of the priory were controversially granted to Sir John Temple, Master of the Rolls, but following the Restoration in the 1660s, the lands of Inchicore, Islandbridge and Kilmainham were enclosed by the Duke of Ormonde as part of the newly established Phoenix Park (Ball 1906 (1995), 158; D'Alton 1838 (1976), 315).

The industrial use of the water power of the River Liffey at Islandbridge and Kilmainham, which had been recorded from a least the 13th century, continued through the 18th and 19th centuries and into the 20th century. The Hibernian wool mills to the south of Kilmainham Garda Station, which had been established by the Williams family in 1812, employed almost 500 people by the 1830s (Lewis 1837, 170). Construction of the South Circular Road dates from this period of increasing industrialisation at the end of the 18th century, and its final western spur runs almost north/south to the late 18th century stone span of Islandbridge (De Courcy 1996, 204).

Despite the number of mills and factories along the river, it would appear that the lands to the south of the Liffey at this point remained relatively rural in character throughout the 18th century, as reflected on Rocque's map of 1756 (figure 10). That century however also saw the gradual extension westwards of functions and activities associated with the south western sector of Dublin city, comprising parts of the Liberties and much of the parish of St. James. This parish had been established in association with the development of extramural suburbs in the middle ages, and:

“stretched from the river bank to Donore and from Bridge Street to the Kilmainham boundary excepting part of Thomas Street and the Coombe”
(Clarke 1998, 50).

Part of the impetus for the south western suburb's development was the availability of good water sources and the exploitation of trading and infrastructural opportunities offered by the main routeway to the west, the former *Slighe Mhór*. The activities carried out in the lands of Kilmainham and the wider area are consistent with Clarke's observation that:

“economically, suburbs often had a marked agricultural aspect”,

counterpointed by the structures and sites associated with manufacturing and processing industries which required more space and resources than were available within the city (*ibid.*, 56). As many of these industries remained concentrated along the watercourses of the Camac and Liffey, much of the remaining lands retained a rural character.

The infilling of the Inchicore/Islandbridge/Kilmainham area by housing and industrial structures throughout the latter half of the 19th century is cartographically documented. It was also in the second half of the 19th century that Kingsbridge (now Heuston) Station and the Great Southern and Western railway (GS & WR) were constructed to the north east and north of the development area. It was during these works that some of the Viking burials previously mentioned were discovered.

The development area lies within the Zone of Archaeological Potential for Dublin City (RMP DU018-020). There are five RMP sites within the immediate environment of the development area (figure 4). They include DU018-020255 an 18th/19th century house, DU018-020283 an ecclesiastical site, DU018-020284 a cross, DU018-020285 a hospital, DU018-020286 a religious house, DU018-020528 a designed landscape and DU018-302 a well.

Near to the south west of the site, the South Circular Road traverses the Camac River at the site of a much older bridge (DU018-020299), which is marked on the 1654-6 Down Survey Map. Its position relative to the southern route towards “*Kilmainham Towne*” may indicate its important usage as a trading route into the town from the mills situated north along the river Liffey at Islandbridge.

The Down Survey map of 1654-6 depicts three gabled houses at “*Kilmainham Towne*” (DU018-020300) and describes:

“*A street of good habitable houses*” (SMR file).

O’Dwyer’s “*Lost Dublin*” records a description from the 1940s of one of these houses, reputedly that of a miller, which had been re-roofed in the 19th century. This house had originally been gabled but is now no longer extant (SMR File).

To the south of the development area, the former site of a watermill is also recorded (RMP DU018-020288). The site is marked as a “*Flour Mill*” on the 1844 OS map,

although not as an antiquity (figure 11). It is possibly the site of one of the mills mentioned in the Down Survey maps for Kilmainham and is also possibly depicted on Bernard de Gomme's map of 1673.

Kilmainham Bridge (RMP DU018-020289) lies to the south west of the development area. The bridge spans the Camac River, and a bridge is depicted in this location on both the Down Survey of the 1650s and John Rocque's map of the 1750s. A bridge is referred to at Kilmainham in 1261 and again in 1535, however this is not the bridge over the Camac but that over the Liffey, probably in the vicinity of the ford of Kilmehanoc near Islandbridge (RMP DU018-020274), as the entire area including Islandbridge was known as Kilmainham until the 16th century (De Courcy 1996, 215).

Kilmainham Gaol (RMP DU018-125) lies to the west of the development area. It was built c. 1800 to replace an earlier prison, although the architect of the project is not known. It was enlarged c. 1848 (Craig 1969, 329). It featured heavily in Irish history in the following years, being the place of incarceration for a number of prominent individuals in the fight against British rule, including Robert Emmett, Charles Stewart Parnell and the leaders of the 1916 Easter Rising.

2.3 RMP Sites

Table 1: RMP sites within 500m of the development area

RMP No.	Description	Distance from development area
DU018-020254	House- 18 th /19 th century	c. 90m
DU018-020255	House- 18 th /19 th century	Inside
DU018-020274	Bridge	c. 440m
DU018-020276	Watermill- unclassified	c. 400m
DU018-020277	Mill- unclassified	c. 380m
DU018-020278	Watermill- unclassified	c. 410m
DU018-020282	Ritual site- holy well	c. 340m
DU018-020283	Ecclesiastical site	Inside
DU018-020284	Cross	Inside
DU018-020285	Hospital	Inside
DU018-020286	Religious house	Inside
DU018-020287	Bridge	c. 300m
DU018-020288	Water mill- unclassified	c. 70m

DU018-020289	Bridge	c. 130m
DU018-020290	Water mill- unclassified	c. 180m
DU018-020299	Bridge	c. 120m
DU018-020300	House- 16 th /17 th century	c. 180m
DU018-020304	Hospital	c. 480m
DU018-020305	Workhouse	c. 480m
DU018-020477	Mill- unclassified	c. 470m
DU018-020528	Designed landscape	Inside
DU018-112	Pit-burial	c. 220m
DU018-125	Prison	c. 70m
DU018-302	Burial	c. 90m

2.4 Topographical Files of the National Museum of Ireland

Information on artefact finds and excavations from County Dublin is recorded by the National Museum of Ireland. Location information relating to such finds is important in establishing prehistoric and historic activity in the study area.

The Topographical Files contain 211 separate files referring to artefacts or features recovered from Kilmainham and Islandbridge. Of these 211 files, the majority refer to unprovenanced finds which were purchased by or donated to either the Royal Irish Academy (RIA) or the National Museum from the 1840s onwards. The finds include a range of weaponry, metal objects, pottery fragments and tools of varying dates. Some of these probably relate to the Viking occupation of the area and to Later Medieval and Post-Medieval occupation associated with the church and lands of the Knights Templar and Knights of St. John. A large number of the artefacts recovered from Kilmainham were reportedly recovered during the “*cutting of the Great Southern and Western Railway*” and were in many instances presented to the RIA by the Directors of the Railway Company. The artefacts recovered in association with burials during the construction of the Irish War Memorial Park at Islandbridge were among the few objects uncovered from the broader area whose location can be relatively accurately pinpointed.

Eight files are concerned with the recovery of human bone and thus directly or indirectly refer to burials in the Islandbridge or Kilmainham area. These files contained information on finds or groups of finds which were given National Museum of Ireland Registration Numbers (NMI Reg. Nos.). Two of these files referred to

human bone recovered in January 1866, namely NMI Reg. No. 1866: R. 2381 and NMI Reg. No. 1866: R. 2379. No find locations were recorded for these burials. Three more of these files referred to the discovery of human burials during the construction of the Irish War Memorial Park in 1933 (RMP DU018-020272), which were registered as NMI Reg. No. RIA 1933: 7-16 & 16A. The remaining three files concerned further burials uncovered during continued work at the War Memorial Park in the following year (NMI Reg. No. 1934: 10,877-879; NMI Reg. No. 1934: 5,599 and NMI Reg. No. 1934: 425, 426).

A further three Topographical Files contained information referring to archaeological investigations in the Kilmainham/Islandbridge area which did not directly relate to human burials. The first of these files contained the site notebooks from Dr. Gerhard Bersu's 1948 excavation within the formal garden area to the north of the Royal Hospital quadrangle (NMI Reg. No. E931: 1). The second of the Topographical Files listed the material recovered from dredging the Liffey at the "*King's Ford*", Islandbridge, which included items such as bronze and iron spear heads, axeheads, harpoons, ring pins, blades, buttons and more recent everyday debris such as clay pipes (NMI Reg. No. 1937: 2379-2416). The third of the Topographical Files contained unregistered correspondence dating from 1912 between Irish and Norwegian Museum and Government officials regarding the Viking Cemetery and burials at Islandbridge.

2.5 Cartographic Analysis

Parish map of Kilmainham, c. 1655-56 (figure 7)

The Down Survey Parish map of the Parish of Kilmainham depicts largely the same environment as the Barony map as described below. The site lies to the north of the road "*to Lucan from Dublin*", which branches into the "*Highway to Fox and Geese*". To the north of the site "*The Ruins? of Kilmainham*" is depicted in a rectangular enclosure in the vicinity of the former Priory of St. John.

Barony of Newcastle and Uppercross, c. 1655-56 (figure 8)

The Down Survey of the Barony of Newcastle and Uppercross shows the site of the development in "*Killmainham Towne*". Two bridges across the River Camac are depicted within the town, together with two mills and a number of other buildings. To the north at Islandbridge, a bridge is depicted crossing the Liffey as well as two further mills. Situated within the confines of the development area, a large building possibly represents a ruinous castle on the site of the Priory of St. John.

Bernard de Gomme, *The city and suburbs of Dublin, 1673* (figure 9)

Bernard de Gomme's map records Kilmainham and Bow Bridge, along with two mills and two diversions of the Camac which represent mill races.

John Rocque, *Plan of the city of Dublin and the environs, 1756* (figure 10)

Rocque's map depicts the Royal Hospital at Kilmainham at the western edge of the 18th century city in a largely rural setting. The map clearly records the "*Royal Hospital*", central avenue west of the Hospital and the Formal Gardens to the north. Interestingly, the western end of the central avenue and an area to the north have a distinctive sub-circular curve and it is tentatively suggested that this may represent the remains of the ecclesiastical enclosure associated with St. Maignenn.

It is known that Rocque did not always accurately represent features which he considered to be unimportant, and therefore individual indications of land use as recorded on his map of 1756 should perhaps be regarded as representative of the wider environment. He calculated that the city consisted of 12,060 houses, with an average of eight people to a house, giving a total population of 96,480 people, a figure which is now regarded as being a little on the low side (National Library of Ireland 1988, 7). The map shows that Dublin had continued to expand towards the east, both north and south of the Liffey, and much of this new development was devoted to housing for the upper classes while the poor remained in slum conditions in the old city (*ibid.*).

William Duncan, *Map of the county of Dublin, 1821*

Duncan's map records the Royal Hospital and a "*Burying Ground*", i.e. Bully's Acre, to the west.

Ordnance Survey Map (1:10,560) First Edition 1844 (figure 11)

"*Bully's Acre Grave Yard*" is recorded, with the Royal Hospital to the east and St. John's Well to the north of the graveyard. The central avenue is shown extending from the Royal Hospital to south of Bully's Acre.

Kilmainham is depicted extending along the Camac to the south of the Inchicore Road with a millrace, millpond and other mill related features. Kilmainham Gaol is also depicted with a courthouse to the east.

Ordnance Survey Map (1:10,560) Second Edition 1876

The 1876 revision records the Royal Hospital with the Formal Gardens to the north. Bully's Acre graveyard is recorded and the area to the north of this, presently referred to as the Private's Burial Ground, is demarcated but not recorded as a burial ground. The main change in the wider area is the construction of the Great Southern and Western Railway to the north of the development area.

Ordnance Survey Map (1:2,500) First Edition 1863-67 (figure 12)

The "*Royal Hospital Avenue*" is recorded extending from south of Bully's Acre to the Royal Hospital. A small roofed structure is recorded in an enclosed area in the south west corner of Bully's Acre. The area to the north of Bully's Acre is also recorded as a "*Burial Ground*".

Ordnance Survey Map (1:2,500) Third Edition 1936

The Royal Hospital is recorded as "*Garda Síochána Headquarters*", while a large enclosed area with several small structures is noted in the south west corner of Bully's Acre.

Ordnance Survey Map (1:10,560) Revised Edition 1948

This map records the general layout of the wider development area without providing detailed cartographic information. A small roofed structure is recorded however in the south west corner of Bully's Acre.

Clarke's map of the Principal Sites in Medieval Kilmainham, 2002 (figure 13)

Clarke's map outlines the principal sites of the Kilmainham area during the Medieval period, as well as the floodplains of the rivers Camac and Liffey. The development area is seen to lie between these on a ridge of high land to the north of the *Slighe Mhór*, the main routeway from Dublin to the West of Ireland, which was a major trade route during this period. Kilmainham Priory overlooked an important crossroads along this route, with branched to the north and south bridging the Camac and Liffey Rivers. "*St. John's Church*", "*St. John's Well*" and "*High cross*" are all recorded in the general environment of the development area.

2.6 Aerial Photographs

Aerial photographs held by Ordnance Survey Ireland (2000 and 2005) were consulted to look for the presence of previously unrecorded remains within the development area (www.maps.osi.ie).

Both photographs record a similar landscape to that which was noted during the walkover survey (see 2.8 below), with a landscaped setting within an extensive urban environment being noted. A north/south feature is recorded on the 2005 aerial photograph in the location of a possible double ditch feature noted during the walkover survey, and this is on the line of a field boundary recorded on the First Edition OS map. The feature measures approximately 100m north/south and is outside all areas of land take.

The 2000 aerial photograph records the presence of several north/south linear features in the general location of the possible double ditch feature noted during the walkover survey. These features in total measure approximately 60m east/west x 40m north/south and again are outside all areas of land take.

There was no evidence of any previously unidentified archaeological, architectural or cultural heritage remains within any areas of land take recorded on the aerial photographs.

2.7 Previous Archaeological Fieldwork

Table 2: Previous excavations within the general environment of the proposed development area

Description	Location	Entry	License	Excavator
Post-Medieval	Royal Hospital, Kilmainham	1976:021	N/a	D. Sweetman
Medieval/Post-Medieval	Con Colbert Road, Inchicore	1989:025	N/a	P. Healy
Viking habitation & bridge	Islandbridge, Inchicore North	1989:026	N/a	E. O'Brien
Site of mills	Mount Brown Mills, Kilmainham	1994:075	94E079	D.L. Swan
Urban cobbled 17 th C surface	Bow Bridge/Irwin Street, Kilmainham	1996:128	96E159	D. Murtagh
Urban Post-Medieval	Bow Bridge House, Bow Lane West, Kilmainham	1998:206	97E435 ext.	R. Ó Baoill
Post-Medieval	7 Rowerstown Lane, Kilmainham	1998:207	98E124	G. Scally
Urban 18 th /19 th C	Bow Bridge, Kilmainham	1999:250	99E078	J. Eogan
Tanning pits	Mount Brown, Kilmainham	1999:251	99E258	E. Gibbons

Urban	Deputy Master's House, Royal Hospital	1999:252	98E365	S. Desmond
Post-Medieval	Goldenbridge House	2000:302	00E466	C. Walsh
Post-Medieval	Murray's Bar, Bow Lane West, Kilmainham	2000:307	00E368	D. Nelis & T. Bolger
Urban	Nestlé Factory, Inchicore Road	2000:308 2001:435 2004:610 2005:496	00E183 (& exts.)	I.W. Doyle & E. Sullivan
N/a	Irwin Street, Irwin Court, Kilmainham	2000:309	00E184	A. Hayden
19 th & 20 th C structures	Kearn's Place, Kilmainham	2000:310	00E206	A. Hayden
N/a	Royal Hospital, Kilmainham	2000:311 2000:312	99E711	J. Carroll & R. Elliott
N/a	Spa Road, Inchicore	2001:431	01E745	C. Walsh
N/a	Emo Garage, Mountbrown	2001:436	01E986	H. Kehoe
Urban Post- Medieval	52 Inchicore Road	2002:609	02E705	F. Myles
Prehistoric cemetery (Bronze Age)	Military Road, St. John's Road (near Heuston Stn.), Kilmainham	2002:610 2006:665 2007:522	02E067	C. Walsh
Medieval settlement and Post-Medieval tanneries	Faulkner's Terrace, Old Kilmainham	2004:566 2004:567 2005:500	04E145	C. Walsh & A. Hayden
Urban, Post- Medieval	12-14 Mount Brown, Kilmainham	2004:611 2005:499	04E1355	P. Stevens
N/a	Kilmainham Lane, Kilmainham	2005:497	05E272	C. Walsh
Urban 19 th C	Kilmainham Lane, Kilmainham	2005:498	05E273	C. Walsh
Urban modern	Kilmainham Lane, Kilmainham	2006:629	06E642	C. Walsh
N/a	Kilmainham Congregational Church, Inchicore Road	2008:418	08E711	A. Giacometti
Post-Medieval	Royal Hospital, Kilmainham	2008:471	08E505	N. Mitchell &

				M. Saunderson
Urban	1 Bow Lane, Kilmainham	2008:393	08E547	A. Giacometti
Human remains	Pensioner's Graveyard, Royal Hospital Kilmainham.	2008:472	08E141	E. Corcoran

An excavation was carried out within Bully's Acre between 1989 and 1991 by Mr. Paddy Healy as part of a road-widening scheme along the South Circular Road. This involved the removal of a section of the western boundary wall of the graveyard and a narrow strip within the line of the wall measuring approximately 80m north/south x 8.5m east/west (Simpson 2009, 38). Monitoring of the groundworks led to the discovery of a Medieval ditch sealed by 18th century burials, and this led to a full-scale excavation of the area. The line of the current development is partially within the area of land take required for the 1989/1991 excavation along the western boundary of Bully's Acre graveyard.

The Medieval phase was represented by the construction of a substantial ditch which was substantially truncated at its upper levels, sometime in the mid-13th/early 14th century. Simpson (*ibid.*, 57) suggests that the ditch may originally have formed part of an enclosure feature, and it appears to have functioned for a considerable period of time as it was in-filled in the mid-17th century. At that time it was backfilled with Medieval demolition masonry and can be related to the demolition of the Medieval church of St. John's in 1612.

The area was then left open for some time as a sod layer accumulated, and this was eventually sealed by 3m of what Healy termed "*burial soil*", which contained disarticulated human remains as well as fragments of headstones. Burial continued at the cemetery however, as at least four burials dating to the 18th and 19th centuries survived *in situ*, as well as a mass grave related to a cholera epidemic.

The physical evidence of the ditch at Bully's Acre suggests that its substantial size may have afforded it a defensive role, perhaps enclosing the church of St. John's. Importantly, finds from the ditch are suggestive of an ecclesiastical presence (floor tiles), as well as the possible presence of a lay community due to the recovery of iron and bronze slag and a furnace bottom, which are an indication that metal-working was taking place in the immediate vicinity. The large amount of pottery and butchered animal bone is another indicator of settlement in the immediate area.

Based on the above-mentioned evidence, Simpson suggests that the ditch at Bully's Acre may represent the remains of a moated site, built in response to the worsening political climate (*ibid.*, 64).

2.8 Field Inspection

The field inspection sought to assess the site, its previous and current land use, the topography and any additional environmental information relevant to the report. The inspection took place on 4th October 2011 and weather on the day of the site visit was dry and bright.

The site visit showed the development area to consist of a well-maintained landscaped environment within an urban setting. A possible north/south oriented double-ditch with a central bank, measuring approximately 40m in length north/south x approximately 11m wide east/west (maximum) was recorded west of the north/south footpath which leads from the Formal Garden to the West Avenue. This possible archaeological feature is outside all areas of land take and was not impacted upon by the site development works.

With the exception of the above-mentioned feature, no previously unidentified archaeological, architectural or cultural heritage features were revealed within any areas of land take area as a result of the walkover survey.

3 ARCHAEOLOGICAL MONITORING

3.1 General

The majority of fieldwork took place intermittently between 21st November 2011 and 30th January 2012, and in total this phase took 13.5 days to complete. Monitoring of the construction of temporary hoarding took place on 16th February 2012, while monitoring of limited groundworks in the interior of the Irish Museum of Modern Art took place on 24th and 25th May 2012. Monitoring of 13 no. pits excavated for the installation of new CCTV masts and associated electrical services was carried out between 20th and 24th August 2012, taking 3.5 days to complete.

Construction work at the site was monitored to determine, as far as is reasonably possible, the location, extent, date, character, condition, significance and quality of any surviving archaeological remains liable to be threatened by the development. Monitoring was also carried out to clarify the nature and extent of existing disturbance and intrusions and assess the degree of archaeological survival in order to formulate further mitigation strategies designed to reduce or offset the impact of the development.

Excavation was carried out using a five tonne tracked machine fitted with a flat grading bucket.

3.2 Results of Monitoring

For ease of reference, the development is divided in to six areas when discussing the results of the monitoring: Bully's Acre; the Privates' Burial Ground; northern end of Royal Hospital Meadow; eastern end of Royal Hospital Meadow; West Avenue; vicinity of Royal Hospital.

Bully's Acre

Fieldwork began in Bully's Acre on 21st November 2011 and took two days to complete. Excavation in this area measured approximately 220m in length, and extended from the southern end of Bully's Acre in a north west direction before extending northwards along the western boundary and parallel with South Circular Road. Excavation then extended to the east at the northern end of Bully's Acre (immediately south of the Privates' Burial Ground), before turning north and

extending northwards through a gate in the eastern side of the Privates' Burial Ground (figure 2).

Immediately on commencement of excavation in the southern end of Bully's Acre, two human cranial fragments were uncovered at a depth of 0.3m below present ground level. Detailed analysis of the two no. human remains is provided in Appendix 1 of this report.

The two human remains have been preserved *in situ* in agreement with the City Archaeologist, National Monuments Service of the Department of Arts, Heritage and the Gaeltacht and the National Museum of Ireland. *In situ* preservation involved carefully covering the human remains by hand with clay to a depth of 0.10m above the remains. Terram (a geotextile layer) was then laid by hand over the clay layer. A sand blinding layer of 50mm was laid by hand over the terram. The plastic ducting was laid on this sand blinding layer which was then filled with earth to achieve a minimum cover of 0.30m.

The exposed *in situ* human remains were located 5.8m apart north west/south east. Excavation to the north of this area and along the western boundary of Bully's Acre revealed made ground to the base of excavation (0.80m deep). This consisted of 0.20m of topsoil (**C1**) over 0.60m of loose dark brown silty clay with frequent small stone inclusions and occasional disarticulated human bone fragments (**C2**). This area was previously extensively disturbed as a result of road widening works carried out between 1989 and 1991, and is discussed in detail in **Section 2.7** above.

The line of excavation along the northern end of Bully's Acre, immediately south of the southern boundary of the Privates' Burial Ground, revealed 0.20m of topsoil (**C1**) sealing (**C3**) which was a loose dark brown silty clay with frequent small stone inclusions, occasional disarticulated human bone fragments, occasional red brick and occasional modern pottery fragments.

The eastern end of Bully's Acre immediately south of the Privates' Burial Ground revealed (**C1**) sealing loose black silty clay with frequent small stone inclusions, frequent mortar fragments, occasional red brick fragments and occasional disarticulated human bone fragments (**C4**). A c. 1.2m deep test pit was excavated at the eastern junction of Bully's Acre and the Privates' Burial Ground and this revealed **C4** to the base of excavation.

Excavation at the very southern end of Bully's Acre, south of the two *in situ* human remains, was approximately 3m long x 1.2m deep to facilitate laying of ducting under the wall of Bully's Acre graveyard (Protected Structure reference: 5244). This area consisted of **C1** sealing a made ground layer of rubble and red brick in a loose mid grey silty clay matrix (**C5**). **C5** sealed a loose dark brown silty clay layer with occasional small stone inclusions, modern pottery fragments, clay pipe stems and frequent disarticulated human bone (**C6**).

With the exception of the two articulated human remains, no archaeological features or artefacts were revealed as a result of monitoring in Bully's Acre.

Privates' Burial Ground

Excavation in the Privates' Burial Ground measured approximately 50m in length north/south and revealed **C1** sealing **C4**. Excavation in this area entered and exited through two modern gates, and there was no disturbance caused to the boundary walls through either the passage of machinery or excavation.

No archaeological features or artefacts were revealed as a result of monitoring in this area.

Northern end of Royal Hospital Meadow

Excavation along the northern end of the Royal Hospital Meadow, which took one and a half days to complete, measured approximately 360m in length, and extended from the Privates' Burial Ground in the west to the northern side of the Formal Gardens.

Excavation in the western end of the Royal Hospital Meadow revealed a 0.30m deep friable mid brown clay (**C7**) sealing a 0.30m deep made ground layer of compact mid to dark brown clay with frequent small stone inclusions, occasional red brick, plastic bags and steel-reinforced concrete at the base (**C8**). This layer sealed natural geology (**C9**) which was recorded in this area as compact mid brown silty clay with moderate small stone inclusions.

A linear feature, which extended beyond the width of the trench, was recorded 60m east of the Privates' Burial Ground and extended in an easterly direction for 45m. It consisted of a 0.15m deep layer of loose dark brown clay with moderate large stone

inclusions, modern metal fragments and plastic bags (**C10**). It was sealed by **C8** and continued beyond the base limit of excavation.

A 30m long layer of made ground was revealed in approximately the middle of the northern end of the Royal Hospital Meadow. It was sealed by topsoil (**C1**) and consisted of loose dark brown clay in a frequent small stone matrix which included concrete blocks, tarmac and occasional steel-reinforced bars (**C11**). It continued beyond the base limit of excavation and had an excavated depth of 0.60m.

Excavation of the remainder of the northern side of the Royal Hospital Meadow revealed topsoil (**C1**) directly sealing natural geology (**C9**).

No archaeological features or artefacts were revealed as a result of monitoring in this area.

Eastern end of Royal Hospital Meadow

The eastern end of the Royal Hospital Meadow was shown to contain made ground, with topsoil (**C1**) sealing black silty clay with frequent red brick and concrete blocks and occasional animal bone fragments and plastic bags (**C12**). **C12** continued beyond the base level of excavation. Excavation in the eastern end of the Royal Hospital Meadow measured approximately 210m in length north/south and several pipes and modern wall footings were revealed in this trench.

No archaeological features or artefacts were revealed as a result of monitoring in the eastern end of the Royal Hospital Meadow.

West Avenue

Excavation along the north of the West Avenue and immediately south of the ha-ha progressed from east to west and measured approximately 420m in length. Trenching at the southern end of the Royal Hospital Meadow to the eastern end of Bully's Acre revealed topsoil (**C1**) sealing an imported subsoil layer of compact mid brown slightly sticky silty clay with occasional red brick, modern pottery, glass, clay pipe and human bone fragments (**C13**). Excavation occasionally revealed natural geology at the base of the trench which took the form of a loose yellow sandy clay with no inclusions (**C14**).

The area of land take required for trenching between the West Avenue and the ha-ha is higher than the level of the Royal Hospital Meadow immediately north of the ha-ha, and this area appears to have been artificially raised with the above-mentioned imported soil (**C13**).

Excavation at the western end of the West Avenue was 1m south of the east/west wall at Bully's Acre. 0.30m of topsoil (**C1**) sealed 0.50m of loose light grey clay with frequent small stone and occasional human bone fragments, medium stone and red brick inclusions (**C15**). Excavation immediately north of Richmond Tower was 1.40m deep x 1.5m wide to facilitate a draw chamber. This revealed **C1** sealing **C15** sealing natural geology of 0.15m – 0.20m angular stone in a loose light brown clay matrix (**C16**).

An east/west oriented trench measuring 40m in length was excavated through grass and tarmac from the eastern end of the Meadow to a basement wall of the west wing of the Royal Hospital. This trench revealed several north/south oriented modern service pipes along with a north/south oriented wall 2m south of a water tower. A granite block measuring 0.50m x 0.45m x 0.25 was removed from the wall to facilitate pipe laying in this trench (plate 18).

Excavation at a point 3m west of the basement wall of the west wing of the Royal Hospital revealed a possible brick built structure at the base of the trench. Excavation did not extend in to this feature, which was fully preserved *in situ*, and therefore it is not possible to provide any detail on the nature of the feature. Several bricks were removed by hand and these had the maker's mark of "PIONEER Co BUXTON". The bricks were faced with a marble-effect coating, which presumably was intended to provide a formal appearance to the internal face of the structure.

Two trenches, each measuring approximately 15m in length north/south, were excavated across the West Avenue from the main east/west services trench immediately south of the ha-ha to the east/west tree-line north of the car park. Excavation in the grass verge north of the West Avenue revealed topsoil (**C1**) sealing **C13**, i.e. an imported subsoil layer of compact mid brown slightly sticky silty clay with occasional red brick, modern pottery, glass, clay pipe and human bone fragments. Excavation in this area also revealed three sets of east/west oriented metal and plastic service pipes in both trenches.

Excavation across the West Avenue revealed tarmac sealing made ground consisting of compact mid brown silty clay with medium sized stone, red brick and modern pottery fragments (C17) to a depth of 0.50m. C17 sealed natural geology (C14).

With the exception of the above-mentioned wall and possible brick structure which was preserved *in situ*, no archaeological features or artefacts were revealed as a result of monitoring in this area.

Vicinity of Royal Hospital

Monitoring of the construction of temporary hoarding took place on 16th February 2012, while monitoring of 13 no. pits excavated for the installation of new CCTV masts and associated electrical services was carried out between 20th and 24th August 2012, taking 3.5 days to complete.

Monitoring of the temporary construction hoarding took place around the perimeter of the south western grass verge in front of the eastern entrance to the Irish Museum of Modern Art. Thirty pits were mechanically excavated through the grass verge, and two further pits were excavated directly behind the grass through a tarmacadam surface adjacent to the building. Thirty of the pits measured 0.40m x 0.60m x 0.55m deep, while the two pits in the north east corner measured 0.80m x 0.60m x 0.55m.

Topsoil (C1) measured 0.50m in depth and below it was a dark brown compact clay layer with inclusions of red brick fragments and earthenware pantile (C18). Nine sherds of North Devon gravel-free earthenware (plain English pottery manufactured in the 17th and 18th centuries) representing at least three vessels and a fragment of glass (probably from a wine bottle) were found in this layer in one of the pits to the south west.

Archaeological monitoring of the installation of new CCTV masts and associated electrical services comprised the mechanical excavation of three no. pits measuring 1.0m x 1.0m x 1.3m deep (Pits 6, 7 and 9) and three no. pits measuring 1.4m x 1.4m x 1.5m deep (Pits 10, 11 and 12) to hold the CCTV mast supports. Seven smaller pits measuring 1.0m x 1.0m x 0.3m deep (Pits 1-5, 8 and 13) were excavated around existing service ducts to hold new service boxes. In most cases the excavations exposed only modern disturbance associated with the previous CCTV masts and services (the new masts were often situated in the same location as the masts they

were replacing). Most of the areas selected for the CCTV masts were criss-crossed with pre-existing services which frequently reached depths greater than 1.5m.

Three pits (Pits 7, 8 and 11) exposed pre-20th century material. Pit 7 was located between the Deputy Master's House and the Formal Garden. It revealed a layer of demolition rubble (i.e. rubble from a dismantled building, as opposed to construction rubble of general building material) measuring more than 0.80m thick, containing machine-made red brick, rough limestone blocks, lime mortar, roof slates, timbers and fragments of cast-iron pipes (**C19**). The rubble derives from a dismantled industrial-era building (late-18th or 19th century). No evidence was found to suggest when the building might have been dismantled.

Pit 8 was located between the Deputy Master's House and the Formal Garden, slightly to the south west of Pit 7. It revealed an east/west wall of limestone blocks heavily bonded with lime mortar which measured 0.60m in width (**C20**). Fragments of the wall survived from 0.20m below the present ground level, and the entire course survived fully from 0.55m below the surface. Over and around the wall were fragments of industrial-era machine-made red bricks with mortar adhesions which possibly once belonged to the upper courses of the wall, suggesting it is of late-18th or 19th century in date.

Pit 11, located south of the West Avenue, revealed a layer of topsoil (**C1**) sealing 0.40m of modern material (**C21**). This sealed natural subsoil comprising greyish-beige sandy clay with frequent unsorted stones (occasionally very large) (**C22**). A shallow, 0.50m deep, probable ditch (**C23**) was cut through the subsoil (**C22**) at the northern end of Pit 11. Neither width nor length could be established, but the feature appeared to run east/west just south of the existing car-park boundary hedge. The ditch was filled with a dark-brown organic layer which contained fragments of possible wood along its side and base and one fragment of red brick (**C24**), suggesting a Post-Medieval or later date for the feature.

Archaeological monitoring of limited groundworks in the interior of the Irish Museum of Modern Art took place in two large rooms and four side rooms in the east wing of the quadrangle on 24th and 25th May 2012.

Floorboards were removed by hand, exposing concrete and masonry building foundations. A very loose and dusty grey brown fine clay with mortar, plaster, red

brick and small stone inclusions (**C25**) was encountered at 0.60m below the foundation level, and this was excavated by hand to a depth of approximately 0.70m. One iron floor-board-type nail was recovered from this layer.

The masonry foundations were exposed, and were noted to project 0.30m from the walls at ground level. One line of building foundation, measuring 0.55m in width, crossed the excavated area to the north west and was constructed of smaller limestone blocks than the main wall foundations. A buffer-zone of geotextile material and/or plywood was placed against these exposed wall foundations, and hardcore and concrete were laid to raise the floor to the original level.

4 NON-TECHNICAL SUMMARY

This report describes the results of a programme of archaeological monitoring carried out at Royal Hospital Kilmainham, Irish Museum of Modern Art, Dublin 8. Monitoring was undertaken by Dermot Nelis on behalf of the Office of Public Works.

The development involved excavation for trenching and ducting around the site, the construction of draw chambers for site service cables and concrete bases for security camera columns. The works formed a phased part of a greater package of fire, security and mechanical and electrical upgrade works throughout the site.

Trenching measured approximately 1.35km in length. Trenches were approximately 0.80m deep and approximately 0.40m wide and were located in Bully's Acre, the Privates' Burial Ground (which is located immediately north of Bully's Acre), along the northern and eastern boundaries of the Royal Meadow, along the West Avenue and in the vicinity of the Royal Hospital.

Bully's Acre and the Privates' Burial Ground, both of which were traversed by the development, are known to contain human remains. In addition, the possible presence of an Early Medieval ecclesiastical enclosure, the suggested location of the Medieval church of St. John the Baptist and features associated with the development of the Royal Hospital confirm that the development area is one of significant archaeological potential.

The majority of fieldwork took place intermittently between 21st November 2011 and 30th January 2012, and in total this phase took 13.5 days to complete. Monitoring of the construction of temporary construction hoarding took place on 16th February 2012, while monitoring of limited groundworks in the interior of the Irish Museum of Modern Art took place on 24th and 25th May 2012. Monitoring of 13 no. pits excavated for the installation of new CCTV masts and associated electrical services was carried out between 20th and 24th August 2012, taking 3.5 days to complete.

An excavation was carried out within Bully's Acre between 1989 and 1991 as part of a road-widening scheme along the South Circular Road. Monitoring of the groundworks led to the discovery of a Medieval ditch sealed by 18th century burials, and this led to a full-scale excavation of the area. The line of the current development

is partially within the area of land take required for the 1989/1991 excavation along the western boundary of Bully's Acre graveyard.

Cranial fragments of two human remains were revealed in the southern end of Bully's Acre 0.30m below the topsoil and 5.8m apart. Both remains have been preserved *in situ*, with the agreement of all of the relevant authorities. The remainder of excavation in Bully's Acre revealed modern disturbed layers with quantities of disarticulated human bone.

Excavation in the Privates' Burial Ground measured approximately 50m in length north/south and revealed topsoil sealing a modern layer containing small stone inclusions, mortar fragments, occasional red brick and occasional disarticulated human bone remains.

Excavation along the northern end of the Royal Hospital Meadow measured approximately 360m in length, and extended from the Privates' Burial Ground in the west to the northern end of the Formal Gardens. Trenching in this area revealed a combination of topsoil sealing made ground or natural geology.

The eastern end of the Royal Hospital Meadow was shown to contain made ground sealed by topsoil.

Excavation immediately north of the West Avenue from the Royal Hospital to Richmond Tower revealed topsoil sealing either an imported subsoil layer or made ground. Excavation at a point 3m west of the basement wall of the west wing of the Royal Hospital revealed a possible brick built structure at the base of the trench. Excavation did not extend in to this feature, and it was fully preserved *in situ*.

Thirty two pits were mechanically excavated for temporary construction hoarding. Nine sherds of North Devon gravel-free earthenware (plain English pottery manufactured in the 17th and 18th centuries) representing at least three vessels and a fragment of glass (probably from a wine bottle) were found in one of the pits.

Archaeological monitoring of the installation of new CCTV masts and associated electrical services comprised the mechanical excavation of six large pits to hold the CCTV mast supports, while seven smaller pits were excavated around existing

service ducts to hold new service boxes. In most cases excavation exposed only modern disturbance associated with previous CCTV masts and services.

Three pits (Pits 7, 8 and 11) exposed pre-20th century material. Pit 7 revealed a layer of demolition rubble measuring more than 0.80m thick, containing machine-made red brick, rough limestone blocks, lime mortar, roof slates, timbers and fragments of cast-iron pipes. Pit 8 revealed an east/west wall of limestone blocks heavily bonded with lime mortar. Over and around the wall were fragments of industrial-era machine-made red bricks with mortar adhesions which probably once belonged to the upper courses of the wall, suggesting it is of late-18th or 19th century in date. Pit 11 revealed a shallow, 0.50m deep, probable ditch cutting natural geology. The ditch was filled with a dark-brown organic layer which contained fragments of possible wood along its side and base and one fragment of red brick, suggesting a Post-Medieval or later date for the feature.

Archaeological monitoring of limited groundworks in the interior of the Irish Museum of Modern Art revealed a very loose and dusty grey brown fine clay with mortar, plaster, red brick and small stone inclusions. The masonry foundations were exposed, and were noted to project 0.30m from the walls at ground level. One line of foundations, measuring 0.55m in width, crossed the excavated area to the north west and was constructed of smaller limestone blocks than the main wall foundations. A buffer-zone of geotextile material and/or plywood was placed against these exposed wall foundations, and hardcore and concrete were laid to raise the floor to the original level.

Skeleton 1, which was revealed in the southern end of Bully's Acre and which was preserved *in situ*, appeared to be the remains of a juvenile burial. As care was taken not to expose the remains any further than was necessary, it is not possible to make a definitive statement on the level of preservation or likely completeness of this burial. Parts of the cranial vault were exposed. Skulls are commonly found at a more elevated level in a grave than the rest of the skeleton- both for reasons of simple morphology and due to culturally defined burial norms- with the remainder of the skeleton lying at a lower level within the grave. The scatter of bones east of the skull suggest that this is the case in this example. The cranial vault fragments were thin and fragile and seemed to reflect those of a non-adult.

Skeleton 2 appeared to represent the remains of an east/west aligned supine extended burial. As every effort was made to avoid exposing the skeleton, it is not possible to determine the age or sex of the individual. It is clear however that it is the remains of an adult. Part of the skull and cervical vertebrae were exposed and, east of these, some tightly clustered bones of the hand appeared in the uppermost fills of the thoracic region. This suggests that the arms were flexed somewhat with the hands placed around the abdomen or chest for burial.

Analysis of disarticulated human remains recovered from the site show that the assemblage includes at least seven adults, two children and three infants (under one year). Among these were the remains of at least two adult males and two adult females. The adults produced age ranges that spanned from the early third to the late fifth decade of life. It was not possible to determine the age of the children but at least one adolescent is likely to have been represented and at least two of the three infants proved to be neonates who died at or around the time of birth.

A number of pathological processes were noted including the presence of dental calculus and tooth loss, and a number of individuals had experienced periosteal reaction which suggests infection or trauma in the limbs. One individual had experienced a severe fracture of the elbow. Subsequent to the fracture, the individual also developed post-traumatic arthritis which would have contributed further to the joint pain and stiffness that would have resulted from the fracture. There was also evidence of osteoarthritis in the knee joint of a further individual. Wear was also noted in the vertebrae of this assemblage and it occurred throughout the spine from the neck to the lower back. There were also generalised indications of health disturbance in both adults and children which illustrates the presence of periods of malnutrition and disease for some of the people who were buried at Bully's Acre.

The ceramic and glass assemblage was examined and found to date to mid to late-19th century. Numerous fragments of earthenware plates, chamber pots and bowls, stoneware paste jars, ink wells and blacking bottles were noted. All of these can be dated to c. 1800-1930.

The glass assemblage comprised glass utility bottles dating to the 19th and early-20th centuries, including sauce bottles, water and milk bottles and smaller glass pharmaceutical bottles which may be earlier in date but are likely to also belong to the 19th century.

Clay pipes from the site were mid to late-19th century in date. During this time clay pipes were produced by commercial factories rather than local craftsmen and wealthier individuals smoked tobacco using newly-available cigars and cigarettes, leaving clay pipes to be used predominantly by the working classes. Four of the clay pipes were decorated.

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APPENDIX 1: LIST OF CONTEXTS

C1	Topsoil. Friable mid brown silty clay.
C2	Loose dark brown silty clay with frequent small stone inclusions and occasional disarticulated human bone fragments.
C3	Loose dark brown silty clay with frequent small stone inclusions, occasional disarticulated human bone fragments, occasional red brick and occasional modern pottery fragments.
C4	Loose black silty clay with frequent small stone inclusions, frequent mortar fragments, occasional red brick fragments and occasional disarticulated human bone fragments.
C5	A made ground layer of rubble and red brick in a loose mid grey silty clay matrix.
C6	A loose dark brown silty clay layer with occasional small stone inclusions, modern pottery fragments, clay pipe stems and frequent disarticulated human bone.
C7	Friable mid brown clay.
C8	Made ground layer of compact mid to dark brown clay with frequent small stone inclusions, occasional red brick, plastic bags and steel-reinforced concrete at the base.
C9	Natural geology- a compact mid brown silty clay with moderate small stone inclusions.
C10	Loose dark brown clay with moderate large stone inclusions, modern metal fragments and plastic bags.
C11	Loose dark brown clay in a frequent small stone matrix which included concrete blocks, tarmac and occasional steel-reinforced bars.
C12	Black silty clay with frequent red brick and concrete blocks and occasional animal bone fragments and plastic bags.
C13	An imported subsoil layer of compact mid brown slightly sticky silty clay with occasional red brick, modern pottery, glass, clay pipe and human bone fragments.
C14	Natural geology- a loose yellow sandy clay with no inclusions.
C15	Loose light grey clay with frequent small stone and occasional human bone fragments, medium stone and red brick inclusions.
C16	Natural geology- angular stone in a loose light brown clay matrix.
C17	Made ground consisting of compact mid brown silty clay with medium sized stone, red brick and modern pottery fragments.
C18	Dark brown compact clay layer with inclusions of red brick fragments and

	earthenware pantile.
C19	Layer of demolition rubble measuring more than 0.80m thick, containing machine-made red brick, rough limestone blocks, lime mortar, roof slates, timbers and fragments of cast-iron pipes.
C20	An east/west wall of limestone blocks heavily bonded with lime mortar which measured 0.60m in width.
C21	Modern material in Pit 11 measuring 0.40m in depth.
C22	Natural geology- greyish-beige sandy clay with frequent unsorted stones.
C23	A shallow, 0.50m deep, probable ditch cutting natural geology.
C24	Fill of C23 . A dark-brown organic layer which contained fragments of possible wood along its side and base and one fragment of red brick, suggesting a Post-Medieval or later date.
C25	A very loose and dusty grey brown fine clay with mortar, plaster, red brick and small stone inclusions.

APPENDIX 2: CERAMIC, GLASS and CLAY PIPE REPORT

Antoine Giacometti

The ceramic and glass assemblage was examined and found to date to mid to late-19th century. Numerous fragments of earthenware plates, chamber pots and bowls, stoneware paste jars, ink wells and blacking bottles were noted. All of these can be dated to c. 1800-1930.

The glass assemblage comprised glass utility bottles dating to the 19th and early-20th centuries, including sauce bottles, water and milk bottles and smaller glass pharmaceutical bottles which may be earlier in date but are likely to also belong to the 19th century.

Clay pipes from the site were mid to late-19th century in date. During this time clay pipes were produced by commercial factories rather than local craftsmen and wealthier individuals smoked tobacco using newly-available cigars and cigarettes, leaving clay pipes to be used predominantly by the working classes.

Four of the clay pipes were decorated:

One bowl displays a “Crowned L” in a circular cartouche below a milled rim (bowl diameter 19mm). This is a Dutch design used from the mid-18th century to the end of the 19th century (Norton 1997, 183-4), however this example from Kilmainham is of a low quality and more likely to be an Irish mid to late-19th century copy (*ibid*). Similar pipes are frequently found in Irish assemblages from the second half of the 19th century, for example at the Timberyard Cork Street (06E710:105:1-2, 06E710:278:1 & 06E710:340:3) and Patrick Street (E543:110:74) in Dublin 8 nearby, and from as far away as Galway (E402:75) (all www.excavations.ie).

One of the pipes is stamped “J DALY 17 FRANCIS ST DUBLIN” (bowl diameter 18mm). The Daly’s were well-known clay pipe manufacturers based in Francis Street (along with many other pipe manufacturers). The pipe is of a style dateable to the mid-19th century to early-20th century. Thom’s Directory lists a James Daly as a pipe manufacturer at 17 Francis Street in 1862, suggesting a mid-19th century date for this example. Similar pipes manufactured by the Daly’s of Francis Street have been found at 24-26 Ardee Street (03E315:1:1) and Patrick Street (E543:100:11) in Dublin 8 (all www.excavations.ie).

Two of the pipe bowls are stamped “UNITED TRADES ASSOCIATION DUBLIN REGISTRD” (bowl diameters 18mm). These pipes are commonly found in Dublin and

can be dated to between 1864 (when the Dublin United Trades Associated (DUTA) was founded) and 1900 (Norton 1997, 183). Other pipes with the same stamp have been found in Patrick Street, Dublin 8 (E543:1100:75) (all www.excavations.ie).

Nine sherds of North Devon gravel-free earthenware (plain English pottery manufactured in the 17th and 18th centuries) representing at least three vessels and a fragment of glass (probably from a wine bottle) were found in a pit excavated in a grass verge south east of the Royal Hospital.

APPENDIX 3: OSTEOARCHAEOLOGICAL REPORT

Denise B. Keating

Contents

Materials	51
Methods.....	51
Preservation.....	51
Sex Determination	51
Age Estimation	52
Pathology	52
Minimum Number of Individuals (MNI).....	52
Results: Disarticulated Remains.....	53
Preservation.....	53
Sex, Age and MNI	53
Pathology	54
Dental Pathology.....	54
Non-Specific Infection and Periosteal Reactions	55
Trauma	57
Degenerative Joint Disease and Schmorl’s Nodes	57
Metabolic Disorders: Cribra Orbitalia	58
Endocranial lesions	59
Results: Articulated Burials	61
Skeleton 1	61
Skeleton 2	61
Conclusions	62
Bibliography	63
Catalogue	65

Figure 1: Maxilla (upper jaw) and right zygomatic (cheekbone). Maxilla is adentulous 54

Figure 2: A proliferation (indicated) of dark striated woven bone on the anterior face of a right radius from **C15**. 56

Figure 3: Right humerus. Grey porous woven bone on the shaft is arrowed..... 56

Figure 4: Right tibia. The lateral plateau facet (circled) exhibits porosity and eburnation, accompanied by marginal osteophytosis (arrowed) 58

Figure 5: Cribra Orbitalia of the orbits of a juvenile from **C3** 59

Figure 6: Cribra Orbitalia in the right orbit of an adult from **C15**. 59

Figure 7: Endocranial lesions in the frontal of a juvenile. Black arrow indicates a capillary formation. Red arrow indicates porous woven bone. 60

Materials

The disarticulated remains of a number of individuals were retrieved from the site of Bully's Acre, Kilmainham, Dublin 8 on foot of the development works. The assemblage consisted of a collection of remains from six contexts (**C2, C3, C4, C6, C13** and **C15**). **C12** produced solely animal bone. There were also two articulated burials identified (Skeletons 1 and 2) which were preserved *in situ* and are described below.

Methods

Preservation

The bones from each of the contexts were analysed separately. Examination of the remains included completing firstly an inventory of each of the bones and teeth, detailing the side from which they issued, the extant parts of the bone or tooth and the type of preservation they expressed according to the Brickley and McKinley (2004) classification system. Level of preservation was used to describe the condition of the bones regardless of completeness. It describes the effects of taphonomic conditions on the bones. Taphonomy deals with the processes that affect the skeleton after deposition and causes such things as chipping, flaking, abrasion or fragmentation of the bone. It also includes other exogenous factors such as animal activity (digging, gnawing *etc*).

Sex Determination

Sex was determined using a number of sexually dimorphic physiological traits of the pelvis (White 2000; Schwartz 1995; Rogers & Saunders 1994; Iscan & Derrick 1984) and cranium (White 2000; Schwartz 1995; Ubelaker 1989; Angel 1982; Meindl *et al* 1985).

Where preservation allowed, metric measurements were taken from elements of the postcranial skeleton. The measurements of a number of postcranial bones can be compared to the standard measurements of known-sex individuals (Brothwell 1981; Bass 1987; Sutherland and Suchey 1991) in order to determine sex. This is typically done however as part of an overall method of sexing the entire skeleton, where the results can be considered together with those from the more sexually dimorphic pelvis and cranium.

It should be borne in mind that the determination of sex, in the case of disarticulated remains, is based solely on the bone in question and that analysis of entire skeleton is preferable and tends to produce more reliable results.

Age Estimation

Estimation of age at death was based on diagnostic, age-related features of the cranial and post-cranial human skeleton. These include the Lovejoy *et al* (1985) and the Brooks and Suchey (1990) ageing techniques from the auricular surface and pubic symphysis of the pelvis respectively. Epiphyseal fusion sites, which complete as late as 25-28 years, were also observed in order to estimate age. Estimation of age in the adult skeleton resulted in each individual being placed in one of the categories listed below. Where an age range could not be determined but the individual was judged to be skeletally adult, it has simply been referred to as "adult".

18 – 25	-	Young Adult (YA)
26 – 35	-	Early Middle Adult (EMA)
36 – 45	-	Late Middle Adult (LMA)
> 46	-	Older Adult (OA)

Pathology

Pathologies were recorded for the remains and photographed, where possible. Detailed descriptions of location, severity and expression of the affected elements were made.

In recording dental calculus and periodontal disease, the Brothwell (1981) classification system was used in conjunction with the pictorial guides for description of severity.

Minimum Number of Individuals (MNI)

Finally the minimum number of individuals was calculated through collating an inventory of the main bones and joints of the skeleton.

Results: Disarticulated Remains

Preservation

All bones exhibited good surface preservation with little evidence of abrasion, erosion or any degradation of surface morphology, grading 1 on the Brickley and McKinley (2004) classification system. The remains did however show a high degree of fragmentation with few bones being preserved in their entirety. This is typical of the type of disturbance and re-deposition seen in cemeteries of some antiquity which have seen intensive use over time. Earlier excavations suggest that this site was in use from the Medieval period if not the Early Medieval, and disturbance of this type would be expected in burial soils overlying and within burial deposits.

Sex, Age and MNI

There was a minimum of seven adults, two children and three infants (under 1 year old) represented in this assemblage. Among these, at least two females and two males were identified among the remains. There were three male fragments that could also be aged approximately. The first fragment was estimated to be aged between 25-34 years (EMA), the second between 21-46 (YA-LMA) and the third between 30-39 years (EMA-LMA). All fragments were recovered from **C6** and were located relatively close to one another. While these three ranges may at first seem to represent three different individuals, it must be remembered that, considering the parts of the pelvis from which each of these fragments issued, it is conceivable that all derived from one individual. While the second fragment produced such a large range that it could match with either of the other two, the relatively shorter nine year ranges of the first and third fragments also offer some overlap and may simply reflect the sometimes varying age ranges produced within single individuals.

None of the bones that were determined to be female provided any indication of age at death. It was possible only to say that they were all anatomically adult.

There were six further fragments of pelvis which preserved evidence of age range. It was not possible to determine the sex of any of these, however. Two of the fragments derived from **C3** and, both being right-sided fragments, must represent the presence of at least two persons of 30-49 years (EMA-LMA). The remaining four fragments derived from **C6**. Their age ranges were as follows: 30-39 years, 35-49 years, 35-44 years and 25-34 years. The first three, being all right-sided bones, represent the presence of at least three further individuals which could be deemed to be of

approximately LMA to OA stages. The last fragment, deriving from the left side, may either represent the counter-lateral side of either one of these fragments or that of the EMA male from **C6**.

Two of the three right infant femora were well preserved enough for measurements of their lengths to be taken. They measured 77mm and 80mm which suggests, according to the Scheuer *et al* (1980) regression equations of radiographed femora, that they both represent neonatal infants of approximately full-term. These are likely to have been babies that were either stillborn or who died shortly after birth.

It was not possible to determine what ages were represented by the juvenile bones preserved in this assemblage. It was noted however that two separate hand bones from **C2** and **C3** were of approximate adult size, albeit unfused, suggesting that they derived from adolescent(s).

Pathology

Dental Pathology

Dental calculus was seen in a number of teeth in this assemblage. Calculus is formed as a result of the mineralisation of dental plaque. Micro-organisms together with proteins in the saliva combine to create plaque deposits. Failure to remove these deposits through activities such as regular brushing results in their eventual mineralisation and the subsequent build-up of calculus. A total of nine teeth were preserved in this assemblage and all exhibited calculus build-up. Seven of these exhibited moderate calculus deposits, as described by Brothwell (1981), while the remaining two exhibited mild calculus deposits.

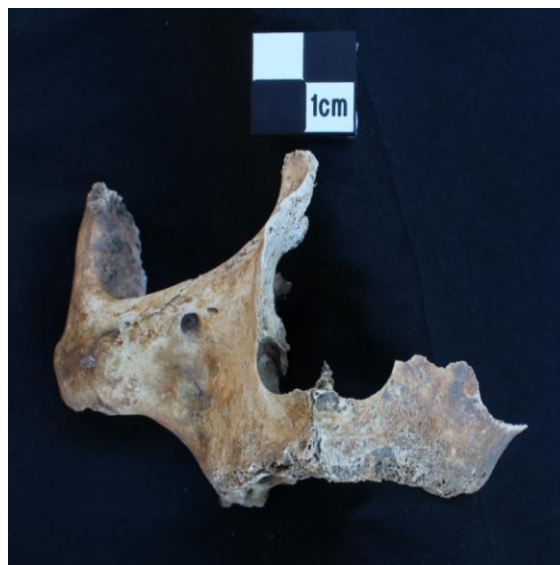


Figure 1: Maxilla (upper jaw) and right zygomatic (cheekbone). Maxilla is adentulous.

A maxilla (upper jaw) from **C3** was completely adentulous (Figure 1). All teeth had been lost before death and complete resorption of the sockets had occurred. It is not always clear what causes tooth loss. Periodontitis is one possible causal factor, as are the presence of carious cavities or dental abscesses. No indication of the cause of complete maxillary tooth loss was apparent, although it is suggested that advanced age may have been a factor.

Non-Specific Infection and Periosteal Reactions

A number of bones exhibited reactions of the periosteum. Periostitis describes a reaction in the periosteum, a connective tissue that covers all bones, which results in new bone formation on the bone surface. While its very name (*-itis*: inflammatory) suggests an inflammatory aetiology, *“anything that breaks, tears, stretches or even touches the periosteum”* can initialise bone formation (Weston 2008). Similarly, although the condition of periostitis is customarily recorded as part of the non-specific infections, it is not necessarily the case that infection was present. Although infections are among the most common of them, there are a number of diverse reasons why the periosteum might begin to form new bone such as in the presence of localised trauma, tumour formation or varicose veins (Roberts and Manchester 1999).

The central third of a left ulna exhibited reactive bone, giving a somewhat swollen appearance to the shaft. The anterior surface of this forearm bone exhibited reintegrating porous compact bone, and this appears to suggest that the bone was in the process of healing at the time of death. Another forearm bone exhibited periosteal reaction. This right radius (Figure 2), the dimensions of which suggest the individual was female, exhibited a proliferation of dark striated woven bone on the anterior and posterior faces of the midshaft. This lesion appeared active and reintegration of the new bone had not yet occurred. Considering their differing states of healing and the fact that the former was found in **C3** and the latter in **C15**, it is unlikely that these two bones were likely to have issued from the same person.



Figure 2: A proliferation (indicated) of dark striated woven bone on the anterior face of a right radius from C15.

The right humerus (upper arm) of a juvenile from **C15** also exhibited plaque-like grey porous woven bone on the anterior and medial faces of the shaft (Figure 3). As the only part of the bone that survived was the shaft, it was not possible to determine how widespread the lesion was.



Figure 3: Right humerus. Grey porous woven bone on the shaft is arrowed.

Three lower leg fragments also exhibited periosteal reactions. A left tibia from **C15** exhibited plaque-like porous woven bone on the inferior half of the medial face of its shaft while a fibular shaft fragment exhibited disorganised compact bone. The latter, also issuing from **C15**, was uneven in texture and undulating across its surface. A further fibular shaft segment from **C3** also exhibited striated compact bone. Both of the fibular fragments appeared to be in the process of resorption at the time of death, indicating a degree of healing.

Trauma

Severe malformation with associated osteoarthritis was noted in a left humerus. A large proliferation of bone was apparent at the distal articular surface and normal morphology was completely lost. Two large irregular proliferations of bone were apparent on the medial (right) and lateral (left) aspects of the elbow joint, the main bulk of each being on the anterior (front) side. The medial proliferation exhibited eburnation and porosity indicative of osteoarthritis, which extends posteriorly into the olecranon fossa. It is not clear how the head of the ulna could have been accommodated in this fossa during life, but the posterior proliferation did not appear to be the fractured remains of the olecranon process fused to the humerus.

It appears that this bone may represent a healed elbow or intercondylar fracture which could have occurred when force was directed against the posterior elbow, such as in a fall on a flexed elbow. Today, these types of fractures are rare and difficult to treat (Gupta 2002). Non-operative management of the fracture often leads to pseudoarthrosis (non-union) and stiffness in the joint. Subsequent to the break the individual developed post-traumatic arthritis.

Degenerative Joint Disease and Schmorl's Nodes

Vertebral degenerative joint disease was assessed by recording the presence of osteophytosis (outgrowths of bone tissue that grow around damaged joints) and joint surface porosity. Severe osteophytosis was apparent on the dens' articular surface of the atlas (first neck vertebra) from **C3**. This was accompanied by moderate osteophytosis on posterior aspect of the right superior articular facet, indicating that this individual had suffered degenerative joint disease in the neck.

A total of three thoracic and two lumbar vertebrae exhibited the lesion known as Schmorl's nodes. The term describes a defect seen mainly in the thoracic and lumbar parts of the spine (Roberts and Manchester 1999), although it can also be seen on the proximal discal facet of the first sacral vertebra (S1). It is characterised by impressions on the cortical surface of the body of the vertebra, which can measure up to 5mm in diameter and 1.5mm in depth (Aufderheide and Rodriguez-Martin 1998). These nodes are formed when the viscous component of the intervertebral disc exerts pressure on the bone either side of it. While they can be caused as a result of general degradation, they can also be caused by other factors such as a trauma.

Two of the affected vertebrae came from **C3**. While each of these two thoracic vertebrae exhibited the lesion on both their superior and inferior facets, one also exhibited accompanying osteophytosis

of the superior and inferior centrum facets showing further degeneration of this part of the spine. As both issued from the same archaeological context, it is possible that both belonged to the same skeleton.

In **C6**, a Schmorl's node on the superior articular surface of a thoracic vertebra was also accompanied by moderate osteophytosis at the anterior margin of the inferior articular surface. The presence of the lesion on two lumbar vertebrae may suggest that all three came from the same individual.



Figure 4: Right tibia. The lateral plateau facet (circled) exhibits porosity and eburnation, accompanied by marginal osteophytosis (arrowed)

Extra-spinal degenerative joint disease was also present. The lateral facet of the articular plateau of a right tibia exhibited porosity, eburnation and marginal osteophytosis identifiable as osteoarthritis at the knee joint (Figure 4).

Metabolic Disorders: Cribra Orbitalia

Cribra Orbitalia is recognisable by small pinprick sized holes in the orbital roofs of the cranium. It has traditionally been thought to be the physical manifestation of iron deficiency anaemia (Wright and Chew 1999). This theory arose from the fact that the porotic lesions are a result of increased activity in the bone marrow, and this is believed to be the body's method of increasing bone marrow production and increasing iron levels. It is more commonly accepted now however that these lesions are reflective of dietary deficiencies. Two individuals, one juvenile (Figure 5) and one adult (Figure 6), exhibited Cribra Orbitalia in this assemblage.

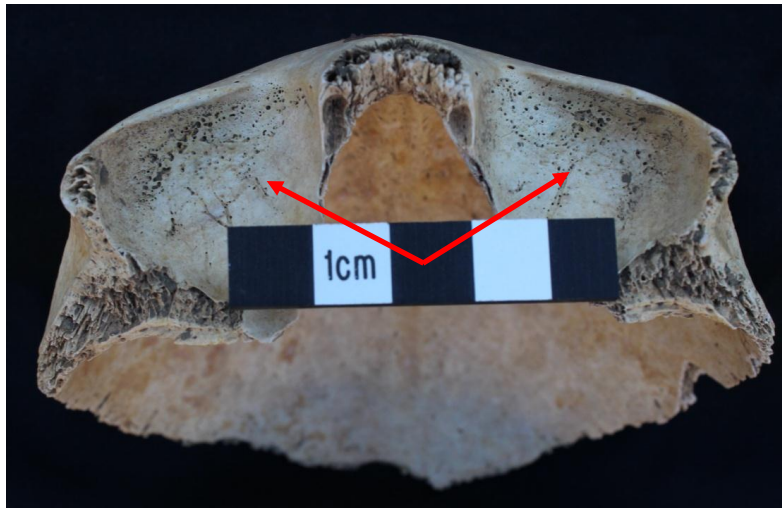


Figure 5: Cribra Orbitalia of the orbits of a juvenile from C3



Figure 6: Cribra Orbitalia in the right orbit of an adult from C15.

While one of the main hypotheses involves an insufficiency in the diet, it has also been suggested that disease and injury may play a role. Another factor may involve parasitic infection as it can cause intestinal bleeding. It is not possible to tell which of these factors are involved in affected individuals, but it is possible to detect if a lesion was active or healing at the time of death. Both individuals exhibited active lesions at the time of death.

Endocranial lesions

The juvenile remains which expressed Cribra Orbitalia also exhibited endocranial lesions, as did three adults in the assemblage. Lewis (2004) has described a type of lesion, composed of reactive new bone, that commonly appears in juveniles on the endocranial surface of the skull. She notes that it is "*commonly found on the occipital bone, outlining the cruciate eminence*" (Lewis 2004, 82), but has also been recorded on the parietal and frontal bones. In the case of this juvenile, lesions

which Lewis (*ibid.*) refers to as capillary formations were apparent within small pits throughout the inferior half of the frontal bone. In its inferior-most aspect, on either side of the nasal sutures and on the internal aspects of the orbital roofs, the lesions are composed of grey porous woven bone (Figure 7).

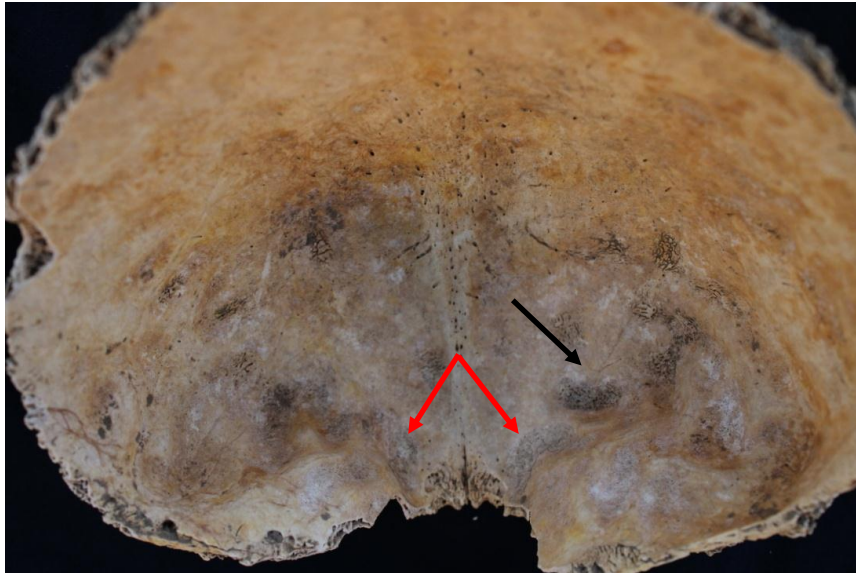


Figure 7: Endocranial lesions in the frontal of a juvenile. Black arrow indicates a capillary formation. Red arrow indicates porous woven bone.

A frontal from **C13** exhibits capillary type lesions on the endocranial aspect adjacent to the metopic suture. Only a small amount of bone was preserved and extent was unobservable. Similarly, a frontal from **C15** expressed the same type of lesion. Although the extent was not observable, it appeared to be located in the centre of the squama.

In a third adult frontal (**C15**), the right hemisphere exhibited concentrations of dark grey porous bone endocranially. The old bone surface also appeared porous but was accompanied by deposits of dark disorganised deposits of porous woven bone.

Their aetiology is unknown but it is suspected that the lesions follow areas of venous drainage inside the skull. Lewis (*ibid.*) cites diseases which can cause inflammation and/or haemorrhage of the meningeal vessels and which may therefore present a possible aetiology for these lesions. Some of these are chronic meningitis, trauma, anaemia, neoplasia, scurvy, rickets, venous drainage disorders and tuberculosis.

Results: Articulated Burials

Skeleton 1

These appeared to be the remains of a juvenile burial. As care was taken not to expose the remains any further than was necessary, it was not possible to make a definitive statement on the level of preservation or likely completeness of this burial. Parts of the cranial vault were exposed. The skull is commonly found at a more elevated level in a grave than the rest of the skeleton- both for reasons of simple morphology and due to culturally defined burial norms- with the remainder of the skeleton lying at a lower level within the grave. The scatter of bones east of the skull suggests this was the case in this example. The cranial vault fragments were thin and fragile and seemed to reflect those of a non-adult.

Skeleton 2

These appeared to represent the remains of an east/west aligned supine extended burial. As every effort was made to avoid exposing the skeleton, it was not possible to determine the age or sex of the individual. It was clear however that these were the remains of an adult. Part of the skull and cervical vertebrae were exposed and, east of these, some tightly clustered bones of the hand appeared in the uppermost fills of the thoracic region. This suggests that the arms were flexed somewhat with the hands placed around the abdomen or chest for burial.

Conclusions

Analysis of the human remains recovered from the site has shown that the assemblage included at least seven adults, two children and three infants (under one year). Among these were the remains of at least two adult males and two adult females. The adults produced age ranges which spanned from the early third to the late fifth decade of life. It was not possible to determine the age of the children, but at least one adolescent is likely to have been represented, and at least two of the three infants were neonates who died at or around the time of birth. Considering the disarticulated nature of the sample, no further comment can be made as to the demographic profile of the assemblage, except to say that both sexes and almost all ages are represented.

A number of pathological processes were noted, including the presence of dental calculus and tooth loss, and a number of individuals experienced periosteal reaction which suggests infection or trauma in their limbs. One individual had experienced a severe fracture of the elbow. Subsequent to the fracture, the individual developed post-traumatic arthritis which would have contributed further to the joint pain and stiffness that would have resulted from the fracture. There was also evidence of osteoarthritis in the knee joint of a further individual, although this did not have a traumatic aetiology being rather a consequence of wear and tear in the knee joint. Wear was also noted in the vertebrae of this assemblage, and it occurred throughout the spine from the neck to the lower back. There were also generalised indications of health disturbance in the expression of Cribra Orbitalia and endocranial lesions in both adults and children, which illustrates the presence of periods of malnutrition and disease for some of the people who were buried in Bully's Acre.

Bully's Acre witnessed a long period of interment, and the remains from this assemblage, even in their disarticulated state, serve as a small window to the lives of some of the people buried in this important corner of early Dublin.

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Catalogue

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
C2	C2	C2	C2	C2	C2	C2	C2
SKULL	—	—	—	—	—	—	—
Parietal	Left	Posterior half of bone	Adult	—	—	—	Joins with fragment detailed below
Parietal	Right	Postero-medial quadrant of the bone	Adult	—	—	—	Joins with fragment detailed above
Temporal	Right	Fragment comprising of proximal third of mastoid process and the parietal notch	Adult	—	—	—	—
Temporal	Right	Lateral half of the petrous portion	Adult	—	—	—	—
Temporal	—	Fragment of squama	Adult	—	—	—	—
Cranial vault	—	Fragment of squama	Juvenile	—	—	—	—
UPPER LIMB	—	—	—	—	—	—	—
Clavicle	Right	Complete except for chipping at the articular ends	Adult	—	—	—	—
Humerus	Left	Proximal half of the shaft	Adult	—	—	—	—
Humerus	Right	Inferior half of the shaft and medial epicondyle	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Humerus	Right	Shaft fragment including inferior extent of deltoid tuberosity	Adult	—	—	—	—
Humerus	—	Mid-section of shaft	Adult	—	—	—	—
Humerus	—	Small section of shaft	Adult	—	—	—	—
Radius	Right	Proximal three quarters of bone	Adult	—	—	—	—
Ulna	Left	Proximal two thirds of shaft	Adult	—	—	—	—
Proximal Manual Phalanx	—	Complete	Juvenile	—	—	—	Unfused but appears to have reached full size. Possibly adolescent.
THORAX	—	—	—	—	—	—	—
Ribs	—	3 rib shaft fragments	Adult	—	—	—	—
Lumbar Vertebra	—	Centrum only	Adult	—	—	—	—
Lumbar Vertebra	—	Fragment of neural arch incorporating one apophyseal facet	Adult	—	—	—	—
LOWER LIMB	—	—	—	—	—	—	—
Sacrum	—	First sacabra, centrum only	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Sacrum	—	2 fragments of dorsal wall	Adult	—	—	—	—
Os Coxa	Right	Fragment of ilium incorporating superior half of acetabulum and anterior inferior iliac spine	Adult	—	—	—	—
Os Coxa	Right	Fragment of ischium	Adult	—	—	—	—
Femur	Right	Femoral head and small section of shaft incorporating the intertrochanteric crest	Adult	—	—	—	—
Femur	Left	Proximal two thirds of shaft	Adult	—	—	—	—
Femur	—	Inferior third of shaft	Adult	—	—	—	—
Femur	—	Inferior quarter of shaft	Adult	—	—	—	—
Femur	Left	Inferior half of diaphysis	Infant	—	—	—	—
Tibia	Right	Shaft fragment	Adult	—	—	—	—
Fibula	Left	Proximal fifth	Adult	—	—	—	—
Fibula	—	Shaft fragment	Adult	—	—	—	—
Talus	Left	Complete	Adult	—	—	—	—
Metatarsal 4	Left	Proximal half	Adult	—	—	—	—
—	—	6 fragments of bone of human origin	—	—	—	—	—
—	—	9 fragments of bone of faunal origin	—	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
C3	C3	C3	C3	C3	C3	C3	C3
SKULL	—	—	—	—	—	—	—
Skull	—	Articulated skull remains comprising of the left parietal, left temporal, occipital and the posterior half of the right temporal	Adult	Male	—	—	—
Frontal	—	Small fragment of the left orbit comprising of the lateral quarter and the supraorbital margin	Adult	—	—	—	—
Frontal	—	Fragment of right squama superior to the orbit incorporating the temporal line and the glabella	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Frontal	—	Complete	Juvenile	—	<p>CRIBRA ORBITALIA: Scattered fine foramina are apparent in the orbital roofs. The lesions were active at the time of death.</p> <p>ENDOCRANIAL LESIONS: capillary type deposits are apparent within small pits on the endocranial surface throughout the inferior half of the squama. In its inferior-most aspect, on either side of the nasal sutures and on the internal aspects of the orbital roofs, the lesions are composed of grey porous woven bone.</p>	—	—
Parietal	Right	Posterior quarter of parietal and small section of the occipital articulating at the lambdoid suture	Adult	—	—	—	—
Parietal	Right	Fragment of parietal incorporating the sagittal suture and the parietal foramen	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Parietal	Right	Anterior three quarters of the right parietal	Adult	—	—	—	—
Parietal	—	Squama fragment comprising of the parietal striae	Adult	—	—	—	—
Sphenoid	—	Right greater wing	Juvenile	—	—	—	—
Temporal	Right	Squama fragment comprising of the temporo-mandibular joint, the superior extent of the external auditory meatus and the squama directly superior to it	Adult	—	—	—	—
Temporal	Left	Small fragment comprising of the temporo-mandibular joint and the superior extent of the external auditory meatus	Adult	—	—	—	—
Temporal	Left	Mastoid process only	—	—	—	—	—
Occipital	—	Proximal half of the occipital comprising of the cerebral fossae and the sagittal and transverse sulci	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Occipital	—	Two conjoining fragments consisting of the cerebral fossae, the sagittal and transverse sulci and the lateral part of the right cerebellar fossa	Adult	—	—	—	—
Occipital	—	Fragment comprising of the right transverse sulcus and the lambdoid suture	Adult	—	—	—	—
Mandible	—	Fragment of the left side of the mandible preserved from the level of the first premolar socket to the ascending ramus. The coronoid process is not preserved. The PM1, PM2 and M3 sockets are empty (teeth lost post mortem). The M1 and M2 are present.	Adult	Female	Moderate calculus deposits on the lingual surfaces of M1 and M2. Attrition: Moderate dentine exposure on M1 and mild dentine exposure (buccal) and polishing (lingual) on M2	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Maxilla	—	Left and right maxillae in articulation. The right side is almost complete. The hard palate alone is missing. The right zygomatic articulates with the bone and is also complete. The anterior third of the left maxilla is preserved with the exception of the frontal and zygomatic processes	Adult	—	The right maxilla is completely adentulous. All sockets are resorbed. The anterior half of the alveolus is preserved in the left maxilla and this too is adentulous.	—	—
Cranial vault	—	23 fragments cranial vault	Adult	—	—	—	—
UPPER LIMB	—	—	—	—	—	—	—
Clavicle	Left	Lateral half	Adult	Male	—	—	Very robust and large clavicle
Clavicle	Right	Medial third	Adult	—	—	—	—
Clavicle	Left	Medial third	Adult	—	—	—	—
Clavicle	Right	Lateral third. Acromion is damaged	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Scapula	Left	Lateral half of the proximal half comprising of the scapular spine (no acromion), the coracoid process and the glenoid fossa	Adult	Female	—	Glenoid width: 21mm	—
Scapula	Right	Scapular spine (no acromion)	Adult	—	—	—	—
Humerus	Left	Inferior three quarters	Adult	—	—	—	—
Humerus	Left	Inferior half	Adult	—	—	—	—
Humerus	Left	Shaft segment comprising of the deltoid tuberosity	Adult	—	—	—	—
Humerus	Right	Fragment of inferior articulation comprising of the trochlea and part of the capitulum	Adult	—	—	—	—
Humerus	Right	Inferior half of shaft	Adult	—	—	—	—
Humerus	Right	Segment of inferior quarter of shaft featuring the nutrient foramen and the lateral supracondylar crest	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Humerus	Right	Segment of superior quarter of shaft featuring the deltoid tuberosity	Adult	—	—	—	—
Humerus	—	Almost complete shaft of diaphysis	Juvenile	—	—	—	—
Humerus	Left	Proximal half of diaphysis	Infant	—	—	—	—
Radius	Left	Complete. Preserved in 2 fragments	Adult	—	—	—	—
Radius	Left	Inferior half. The styloid process is missing	Adult	—	The inferior third of the anterior face is covered in dark greyish-brown porous compact bone. The lesion is also apparent on the posterior aspect where it is apparent in the inferior quarter. In this location, it appears more proliferative and is striated in nature. The lesion does not spread into the recesses either side of the dorsal tubercle.	—	—
Radius	Left	Inferior third	Adult	—	—	—	—
Radius	Left	Complete shaft	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Radius	Left	Shaft segment	Adult	—	—	—	—
Radius	—	Small unside shaft segment	Adult	—	—	—	—
Radius	Right	Inferior half	Adult	—	—	—	—
Radius	Right	Inferior two thirds of shaft	Adult	—	—	—	—
Radius	Right	Complete shaft including the radial tuberosity	Adult	—	—	—	—
Radius	Right	Shaft segment of the central third of the shaft	Adult	—	—	—	—
Radius	Right	Inferior quarter	Adult	—	—	—	—
Ulna	Left	Proximal two thirds.	Adult	—	The central third of the shaft exhibits reactive bone, giving a somewhat swollen appearance to the shaft. The anterior surface exhibits reintegrating porous compact bone extending from the nutrient foramen inferiorly as far as the preserved extent	—	—
Metacarpal 3	Left	Complete	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Metacarpal 4	Right	Complete	Juvenile	—	—	—	Bone is almost full size but unfused at the distal end. Possibly adolescent
THORAX	—	—	—	—	—	—	—
Rib	Right	Medial fifth	Adult	—	—	—	—
Rib	—	Shaft fragment	Adult	—	—	—	—
Cervical Vertebra	—	Complete C1	Adult	—	Severe osteophytosis on dens articular surface. Moderate osteophytosis on posterior aspect of the right superior articular facet	—	—
Thoracic Vertebra	—	Complete except for the right transverse process and the superior right apophyseal facet	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Thoracic Vertebra	—	Complete except for the right and left apophyseal facets and the right and left transverse processes	Adult	—	Moderate osteophytosis on the superior and inferior centrum facets. Schmorl's nodes on the superior and inferior centrum facets	—	—
Thoracic Vertebra	—	Complete	Adult	—	Schmorl's nodes on the superior and inferior centrum facets	—	—
Lumbar Vertebra	—	Complete except for the right inferior apophyseal facet and the right transverse process	Adult	—	—	—	—
Lumbar Vertebra	—	Superior centrum facet and right superior apophyseal facet	Adult	—	—	—	—
Lumbar Vertebra	—	Right third of the centrum plus the right superior apophyseal facet	Adult	—	—	—	—
LOWER LIMB	—	—	—	—	—	—	—
Os Coxa	Left	Ischium	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Os Coxa	Left	Iliac fragment consisting of the anterior-most extent of the auricular surface and the superior-most extent of the greater sciatic notch	Adult	—	—	—	—
Os Coxa	Right	Iliac fragment consisting of the superior half of the auricular surface, the superior-most extent of the greater sciatic notch and the superior half of the acetabulum	Adult: Auricular surface 30-49 years	—	—	—	—
Os Coxa	Right	Iliac fragment consisting of auricular surface and greater sciatic notch	Adult: Auricular surface 30-49 years	—	—	—	—
Os Coxa	—	2 Iliac fragments both incorporating the iliac crest	—	—	—	—	—
Femur	Left	Superior half	Adult	Female	—	Femoral head 42mm	—
Femur	Left	Femoral condyles	Adult	—	—	Bicondylar width: 74mm	—
Femur	Left	Proximal half of shaft	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Femur	Left	Proximal two thirds of shaft	Adult	—	—	—	—
Femur	Left	Proximal third of shaft	Adult	—	—	—	—
Femur	Left	Inferior two thirds of shaft	Adult	—	—	—	—
Femur	Right	Inferior third of shaft	Adult	—	—	—	—
Femur	Right	Central third of shaft	Adult	—	—	—	—
Femur	—	Inferior third of shaft	Adult	—	—	—	—
Femur	—	Small shaft segment	Adult	—	—	—	—
Femur	—	Femoral condyle fragment	Adult	—	—	—	—
Tibia	Left	Proximal two thirds	Adult	Female	—	Epiphyseal breadth: 65mm	—
Tibia	Left	Proximal half	Adult	—	—	—	—
Tibia	Left	Proximal third of shaft	Adult	—	—	—	—
Tibia	Left	Proximal two thirds of diaphysis	Infant	—	—	—	—
Tibia	Left	Inferior fifth	Adult	—	—	—	—
Tibia	Right	Proximal two thirds	Adult	—	—	—	—
Tibia	Right	proximal quarter	Adult	Female	—	Epiphyseal breadth: 67mm	—
Tibia	Right	Proximal half of shaft	Adult	—	—	—	—
Tibia	Right	Complete shaft	Adult	—	—	—	—
Tibia	Right	Shaft segment of approximately one quarter of the shaft and including the inferior part of the soleal line	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Tibia	Right	Fragment of the posterior aspect of the proximal tibia including soleal line	Adult	—	—	—	—
Tibia	—	Fragment consisting of the tibial tuberosity	Adult	—	—	—	—
Tibia	—	Fragment consisting of the inferior articular facet	Adult	—	—	—	—
Tibia	—	2 tibial shaft segments	Adult	—	—	—	—
Fibula	—	3 fibula shaft segments	Adult	—	One of the fibular shaft segments exhibits striated compact bone.	—	—
Calcaneus	Left	Inferior half	Adult	—	—	—	—
Calcaneus	Right	Superior two thirds	Adult	—	—	—	—
Metatarsal 1	Left	Complete	Adult	—	—	—	—
Metatarsal 5	Right	Complete	Adult	—	—	—	—
OTHER	—	—	—	—	—	—	—
—	—	6 fragments of bone of faunal origin	—	—	—	—	—
—	—	10 fragments of bone of human origin	—	—	—	—	—
C6	C6	C6	C6	C6	C6	C6	C6
SKULL	—	—	—	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Skull	—	Frontal, both parietals and occipital (left parietal and occipital are separate fragments)	Adult	?Female	—	—	—
Frontal	—	Complete	Adult	—	—	—	—
Parietal	Right	Posterior third	Adult	—	—	—	—
Temporal	Right	Complete	Adult	—	—	—	—
Temporal	Left	Fragment incorporating auditory meatus and petrous portion	Adult	—	—	—	—
Occipital	—	Fragment incorporating the spheno-occipital synchondrosis and the left articular facet	Adult	—	—	—	—
Skull	—	7 cranial vault fragments	Adult	—	—	—	—
Maxilla & Zygomatic	Right	Lateral third of maxilla with articulated zygomatic incorporating tooth sockets from I1 to M3. M1 is preserved. All others are lost post mortem	Adult	—	Moderate calculus deposits on the buccal surface. Attrition: Polishing	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Mandible	—	Complete except for right ramus (left ramus is a separate fragment). The right M1 is preserved. All other teeth are lost post mortem.	Adult	—	Moderate calculus deposits on buccal, lingual, mesial and distal surfaces with moderate periodontal recession at M1. Attrition: Moderate dentine exposure. It appears there may have been a healing abscess at the base of the mesial root of the missing left M1	—	—
UPPER LIMB	—	—	—	—	—	—	—
Humerus	—	Anterior two thirds of the proximal quarter	Adult	—	—	—	—
Humerus	Left	Inferior third	Adult	—	—	—	—
Humerus	Left	Proximal shaft fragment	Adult	—	—	—	—
Radius	Right	Proximal three quarters	Adult	Male	—	—	—
Radius	Right	proximal third	Adult	Female	—	—	—
Radius	Left	Inferior half	Adult	—	—	—	—
Radius	Left	Proximal quarter of shaft	Adult	—	—	—	—
Ulna	Left	Proximal three quarters (represented by two fragments)	Adult	—	—	—	—
Ulna	Right	Proximal half	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Ulna	Right	Proximal three quarters	Adult	—	—	—	—
Ulna	Right	Inferior fifth of shaft and articular surface	Adult	—	—	—	—
Ulna	—	Shaft fragment	Adult	—	—	—	—
Metacarpal 1	Left	Complete	Adult	—	—	—	—
Metacarpal 2	Left	Complete	Adult	—	—	—	—
Metacarpal 3	Right	Complete	Adult	—	—	—	—
Metacarpal 4	Left	Complete	Adult	—	—	—	—
Metacarpal 5	Right	Complete	Adult	—	—	—	—
Proximal Manual Phalanx	—	2 proximal manual phalanges, both complete	Adult	—	—	—	—
THORAX	—	—	—	—	—	—	—
Sternum	—	Complete except for left inferior corner	Adult	—	—	—	—
Rib	Left	Medial quarter of rib incorporating the articular surface but not the rib head	Adult	—	—	—	—
Rib	—	4 rib shaft fragments	Adult	—	—	—	—
Cervical vertebra C1	—	Complete	Adult	—	—	—	—
Cervical vertebra	—	Centrum and right apophyseal facets	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Thoracic vertebra	—	Centrum only	Adult	—	Schmorl's node on the superior articular surface. Moderate osteophytosis at the anterior margin of the inferior articular surface.	—	—
Thoracic vertebra	—	Neural arch comprising of right superior and inferior apophyseal facets, right transverse process, right lamina, spinous process and medial third of left lamina	Adult	—	—	—	—
Lumbar vertebra	—	Complete. Possibly L1	Adult	—	Schmorl's nodes on the superior and inferior centrum facets	—	—
Lumbar vertebra	—	Complete. Possibly L5	Adult	—	—	—	—
Lumbar vertebra	—	Centrum only	Adult	—	Schmorl's node on the superior centrum facet	—	—
Lumbar vertebra	—	Centrum only	Adult	—	—	—	—
Vertebra	—	Centrum fragment	Adult	—	—	—	—
LOWER LIMB	—	—	—	—	—	—	—
Os Coxa	Left	Iliac blade	Adult: Auricular surface 25-34 years	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Os Coxa	Left	Inferior half of iliac blade	Adult: Auricular surface 25-34 years	Male	—	—	—
Os Coxa	Left	Ischium and inferior half of acetabulum	Adult	—	—	—	—
Os Coxa	Left	Ischium and inferior third of acetabulum	Adult	—	—	—	—
Os Coxa	Left	Ischium and inferior half of pubic ramus	Adult	—	—	—	—
Os Coxa	Left	Pubis, ischio-pubic ramus and ilio-pubic ramus	Adult: Pubic symphysis 21-46 years	Male	—	—	—
Os Coxa	Right	Iliac blade	Adult: auricular surface 30-39 years	—	—	—	—
Os Coxa	Right	Inferior two thirds of iliac blade and superior half of greater sciatic notch	Adult: auricular surface 30-39 years	Male	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Os Coxa	Right	Auricular surface	Adult: auricular surface 35-49 years	—	—	—	—
Os Coxa	Right	Superior half of acetabulum and arcuate line	Adult	—	—	—	—
Os Coxa	Right	Inferior third of acetabulum and superior half of ischium	Adult	—	—	—	—
Os Coxa	Right	Auricular surface and proximal third of greater sciatic notch	Adult: auricular surface 35-44 years	—	—	—	—
Os Coxa	Right	Pubis, proximal third of ischio-pubic ramus and dorsal aspect of ilio-pubic ramus	Adult	Female	—	—	—
Os Coxa	Right	inferior third of acetabulum and superior fifth of ischium	Adult	—	—	—	—
Os Coxa	Right	lateral half of ilio- pubic ramus	Adult	—	—	—	—
Os Coxa	Right	Fragment of iliac blade and iliac crest	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Sacrum	—	Complete S1-S5	Adult	—	—	—	—
Sacrum	—	Proximal left quarter is missing (including plateau and part of S1 centrum). Bone is preserved in two fragments	Adult	—	—	—	—
Sacrum	—	S1, (fused) left wing and left half of the neural arch	Adult	—	—	—	—
Femur	Left	Proximal quarter	Adult	Female	—	Femoral head: 41mm	—
Femur	Left	Inferior half	Adult	Male	—	Bicondylar width: 84mm	—
Femur	Left	Proximal half	Adult	Male	—	Femoral head: 48mm	—
Femur	Left	Proximal quarter. Femoral head missing	Adult	—	—	—	—
Femur	Right	Complete except for femoral head	Adult	Male	—	Bicondylar width: 83mm	—
Femur	Right	Proximal quarter	Adult	—	—	Femoral head: 42mm	—
Femur	Right	Fragment incorporating the greater trochanter and the intertrochanteric crest	Adult	—	—	—	—
Femur	Right	Femoral head	Adult	Male	—	Femoral head: 48mm	—
Femur	Right	Femoral head	Adult	Female	—	Femoral head: 42mm	—
Femur	Right	Proximal two thirds of shaft	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Femur	Right	Inferior two thirds of diaphysis (preserved in two fragments)	Juvenile	—	—	—	—
Femur	—	Shaft fragment incorporating the lesser trochanter	Adult	—	—	—	—
Femur	—	Femoral head fragment	Adult	—	—	—	—
Femur	—	Condylar fragment	Adult	—	—	—	—
Femur	—	2 shaft fragments	Adult	—	—	—	—
Tibia	Right	Articular plateau	Adult	Male	Slight osteophytosis surrounds the entire joint. The lateral facet exhibits moderate porosity and eburnation of its distal half suggestive of osteoarthritis at the knee joint.	—	—
Tibia	Left	Inferior two thirds	Adult	—	—	—	—
Tibia	Left	Shaft fragment incorporating the distal-most extent of the soleal line	Adult	—	—	—	—
Fibula	—	Shaft fragment incorporating the nutrient foramen	Adult	—	—	—	—
OTHER	—	—	—	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
—	—	11 fragments of bone of human origin	—	—	—	—	—
—	—	15 fragments of bone of faunal origin	—	—	—	—	—
C12	C12	C12	C12	C12	C12	C12	C12
—	—	40 fragments of bone of faunal origin	—	—	—	—	—
C13	C13	C13	C13	C13	C13	C13	C13
SKULL	—	—	—	—	—	—	—
Frontal	—	Small fragment of the left side of the frontal which exhibits persistence of the metopic suture The nasal suture is also visible, as is the medial-most extent of the orbit and the frontal sinus	Adult	—	Capillary type lesions are apparent on the endocranial aspect adjacent to the metopic suture. Only a small amount of bone was preserved (although the fragment detailed below may represent part of the same bone) and extent was unobservable.	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Frontal	—	Fragment of the (right?) half of the frontal which exhibits persistence of the metopic suture. The medial half of the fronto-parietal suture is also apparent	Adult	—	Capillary type lesions are apparent on the endocranial aspect of the squama. The extent was not observable but it appeared to be located in the centre of the squama	—	—
Cranium	—	Cranial vault fragment	Adult	—	—	—	—
LOWER LIMB	—	—	—	—	—	—	—
Femur	Right	Superior half of the femoral head and greater trochanter.	Adult	—	—	—	—
Femur	—	5 femoral shaft fragments	Adult	—	—	—	—
OTHER	—	—	—	—	—	—	—
—	—	4 fragments of bone of human origin	—	—	—	—	—
—	—	10 fragments of bone of human origin	—	—	—	—	—
C15	C15	C15	C15	C15	C15	C15	C15
SKULL	—	—	—	—	—	—	—
Frontal	—	Complete except for left superciliary arch	Adult	—	Right orbit exhibits active Cribra Orbitalia	—	—
Frontal	—	Complete except for right superciliary arch	Adult	M	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Frontal	—	Complete except for left third	Adult	M	The right hemisphere exhibits concentrations of dark grey porous bone endocranially. The old bone surface appears porous but is accompanied by deposits of dark disorganised deposits of porous woven bone.	—	—
Frontal	—	R orbit and squama directly superior to it	Juvenile	—	—	—	—
Zygomatic	Left	Complete	Adult	—	—	—	—
Zygomatic	Left	Complete	Adult	—	—	—	—
Zygomatic	Right	Complete	Adult	—	—	—	—
Occipital	—	Squama only	Adult	M	—	—	—
Occipital	—	Squama fragment	—	—	—	—	—
Occipital	—	Squama fragment	—	—	—	—	—
Occipital	—	Basilaris portion and condyles	Adult	—	—	—	—
Occipital	—	Basilaris portion and left condyle	Adult	—	—	—	—
Occipital	Left	Lateralis	Infant	—	—	—	—
Temporal	Right	Mastoid, EAM, root of zygomatic and petrous portion	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Temporal	Right	Mastoid, EAM, root of zygomatic and petrous portion	Adult	—	—	—	—
Temporal	Left	Mastoid and EAM	Adult	—	—	—	—
Temporal	—	Squama fragment with mandibular articular surface	Adult	—	—	—	—
Temporal	Right	Petrous portion	Adult	—	—	—	—
Temporal	Left	Petrous portion	Adult	—	—	—	—
Mandible	—	Complete. All tooth sockets are empty	Adult	M	—	—	—
Mandible	—	Fragment of left half of mandible containing molars 1 to 3. Premolar sockets empty	Adult	M	Moderate calculus deposits on the buccal and lingual surfaces of the teeth. Attrition: Pinpoint dentine exposure on the M1 and polishing on the M2 and M3	—	—
Mandible	—	Left articular condyle	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Maxilla	Left	Alveolar portion and lateral third of hard palate. Contains M1.	Adult	—	Moderate calculus on M1 with accompanying severe periodontitis buccally. Possible abscess at lingual root where a 2mm void is apparent around the root. M2 was lost PM. I1, I2, PM1 and PM2 were lost AM.	—	—
Tooth	Left	M1	Adult	—	Mild calculus on buccal side. Attrition: Pinpoint dentine exposure	—	—
Tooth	Left	M1	Adult	—	Mild calculus on buccal side. Attrition: Pinpoint dentine exposure	—	—
Tooth	Left	M2	Adult	—	Moderate calculus on lingual side. Attrition: Pinpoint dentine exposure	—	—
Tooth	Left	M2	Adult	—	Moderate calculus on lingual and buccal side. Attrition: Cusp polishing	—	—
Tooth	Left	PM2	Adult	—	Moderate calculus on buccal side. Attrition: Cusp polishing	—	—
Skull	—	22 squama fragments	Adult	—	—	—	—
Skull	—	2 squama fragments	Infant	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
UPPER LIMB	—	—	—	—	—	—	—
Scapula	Left	Fragmented glenoid, scapular spine (minus acromion) and proximal half of lateral border	Adult	—	—	—	—
Scapula	Left	Fragmented glenoid, coracoid and lateral quarter of scapular spine (minus acromion)	Adult	—	—	—	—
Scapula	Right	Fragment of scapular spine	Adult	—	—	—	—
Scapula	Right	Fragment of lateral border	Adult	—	—	—	—
Humerus	—	Complete humeral head	Adult		—	—	—
Humerus	—	Complete humeral head	Adult		—	—	—
Humerus	—	Central third of humeral head	Adult	—	—	—	—
Humerus	Left	Complete humerus except for humeral head	Adult	—	—	—	—
Humerus	Left	Inferior half of humerus	Adult	—	Supracondyloid process apparent	—	—
Humerus	Left	Complete shaft of humerus	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Humerus	Left	Inferior half of the humerus	Adult	—	Severe malformation with associated osteoarthritis. A large proliferation of bone is apparent at the inferior articular surface. Normal morphology has been lost. Two large irregular proliferations of bone were apparent on the medial and lateral aspects, the main bulk of each being on the anterior face. The medial proliferation (27mm M-L x 30mm S-I x 10mm height) exhibited eburnation and porosity indicative of osteoarthritis. It extends posteriorly into the olecranon fossa. The lateral proliferation (22mm M-L x 15mm S-I x 5mm height) also extends somewhat into the olecranon fossa. It did not exhibit any indicators of osteoarthritis.	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Humerus	Right	Inferior quarter. Radial notch is missing	Adult	—	—	—	—
Humerus	Left	Inferior half of the shaft of the humerus	Adult	—	—	—	—
Humerus	Right	Proximal half of the shaft of the humerus	Juvenile	—	Plaque-like grey porous woven bone is apparent on the anterior and medial faces of the shaft. It appears in two deposits measuring 30mm (S-I) x 7mm (M-L) on the medial side and 30mm (S-I) x 8mm (M-L) on the anterior.	—	—
Humerus	Right	Inferior half of the humerus	Infant	—	—	—	—
Ulna	Left	Complete left ulna	Adult	—	—	—	—
Ulna	Right	Proximal quarter of the bone	Adult	—	—	—	—
Ulna	Left	Shaft fragment	Adult	—	—	—	—
Radius	Left	Complete left radius	Adult	M	—	Radius head: 26mm	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Radius	Right	Proximal three-quarters	Adult	F	A proliferation of dark striated woven bone is apparent on the anterior a posterior faces of the midshaft. Anteriorly, it measures 66mm in length and 7mm in maximum width. Posteriorly the lesion is 31mm x 7mm.	Radius head: 20mm	—
Radius	Left	Proximal three-quarters of the radius minus the radial head	Adult	—	—	—	—
Radius	—	Shaft fragment	Adult	—	—	—	—
Hamate	Left	Complete	Adult	—	—	—	—
Metacarpal 2	Right	Complete	Adult	—	—	—	—
Metacarpal 3	Left	Complete but damaged proximally and distally	Adult	—	—	—	—
Metacarpal 4	Right	Proximal half of bone	Adult	—	—	—	—
Proximal manual phalanx	—	Complete	Adult	—	—	—	—
Proximal manual phalanx	—	Complete	Adult	—	Raised and slightly osteophytic flexor sheath ridges	—	—
THORAX	—	—	—	—	—	—	—
Rib	Left	Medial quarter	Adult	—	—	—	—
Rib	Left	Medial quarter	Adult	—	—	—	—
Rib	Left	Medial quarter	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Rib	Left	Medial quarter	Adult	—	—	—	—
Rib	Right	Medial quarter	Adult	—	—	—	—
Rib	Right	Medial half	Infant	—	—	—	—
Rib	—	Sternal quarter	Adult	—	—	—	—
Rib shaft fragments	—	8 rib shaft fragments	Adult	—	—	—	—
Cervical vertebra	—	Right half of the neural arch is missing	Adult	—	Osteoarthritis is apparent in the left proximal apophyseal facet. Its margins are moderately osteophytic and exhibit eburnation. The inferior facet exhibits moderate osteophytosis. The centrum also exhibits osteoarthritis. The inferior facet is moderately osteophytic at its anterior margins and, in the lateral third (right) exhibits severe porosity and eburnation.	—	—
Thoracic vertebra	—	Complete except for right transverse process	Adult	—	—	—	—
Manubrium	—	Right half of the manubrium body	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
LOWER LIMB	—	—	—	—	—	—	—
Os Coxa	Left	Ischium and inferior half of acetabulum	Adult	—	—	—	—
Os Coxa	Left	Complete	Infant	—	—	—	—
Os Coxa	Right	Ilium fragment incorporating posterior gluteal line and parts of the auricular surface	Adult	—	—	—	—
Os Coxa	Right	Ilium fragment incorporating the anterior inferior and superior iliac spines and the proximal quarter of the acetabulum	Adult	—	—	—	—
Os Coxa	Right	Ilium fragment incorporating the proximal most part of the greater sciatic notch and the anterior quarter of the auricular surface	Adult	M	—	—	—
Os Coxa	Right	Ilium fragment incorporating the arcuate line and the anterior half of the auricular surface	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Os Coxa	Right	Ischium and inferior half of acetabulum	Adult	—	—	—	—
Os Coxa	Right	Proximal half of the acetabulum and root of the pubic ramus	Adult	—	—	—	—
Os Coxa	—	Fragment of acetabulum	Adult	—	—	—	—
Os Coxa	—	Fragment of acetabulum	Adult	—	—	—	—
Os Coxa	—	Fragment of auricular surface	Adult	—	—	—	—
Femur	Right	Proximal half of femur	Adult	—	—	Femur head: 47mm	—
Femur	Right	Proximal third of femur	Adult	F	—	Femur head: 40mm	—
Femur	Right	Complete femoral shaft	Adult	—	—	—	—
Femur	Right	Complete femoral shaft	Adult	—	—	—	—
Femur	Right	Complete femoral shaft	Adult	—	—	—	—
Femur	Right	Complete except for inferior metaphysis	Infant	—	—	—	—
Femur	Right	Complete	Infant	—	—	Femur length: 77mm	—
Femur	Right	Complete	Infant	—	—	Femur length: 80mm	—
Femur	Left	Proximal half. Femoral head and lesser trochanter are missing	Adult	—	—	—	—
Femur	Left	Complete femoral shaft	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Femur	Left	Complete femoral shaft except for inferior metaphysis	Adult	—	The posterior aspect of the bone exhibits porous striated compact bone either side of the linea aspera. The linea aspera itself, at its inferior-most extent, is composed of disorganised striated compact bone. A patch of dense, undifferentiated compact bone (43mm S-I x 13mm M-L) is apparent on the lateral side of the linea aspera. The anterior of the shaft exhibits striated compact bone. No indication of trauma was apparent.	—	—
Femur	Left	Fragment of left shaft	Adult	—	—	—	—
Femur	Left	Fragment of left shaft	Adult	—	—	—	—
Femur	Left	Proximal fragment incorporating the greater and lesser trochanters	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Femur	Left	Proximal fragment incorporating the lesser trochanter and the trochanters fossa	Adult	—	—	—	—
Femur	Left	Proximal fragment incorporating the intertrochanteric line and the trochanteric fossa	Adult	—	—	—	—
Femur	—	Femoral head	Adult	M	—	Femur head: 53	—
Femur	—	Femoral head fragment	Adult	—	—	—	—
Femur	—	Femoral head and shaft fragment	Adult	—	—	—	—
Femur	—	8 femoral shaft fragments	Adult	—	—	—	—
Patella	Left	Complete	Adult	—	—	—	—
Tibia	Left	Inferior three quarters	Adult	—	The inferior half of the medial face of that shaft exhibits plaque-like porous woven bone.	—	—
Tibia	Left	Inferior third	Adult	—	—	—	—
Tibia	Left	Complete tibial shaft	Adult	—	—	—	—
Tibia	Left	Fragment of tibia shaft	Adult	—	—	—	—
Tibia	Right	Inferior two thirds	Adult	—	—	—	—
Tibia	Right	Complete tibial shaft	Adult	—	—	—	—
Tibia	Right	Proximal two thirds of tibial shaft	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Tibia	Right	Proximal two thirds of tibial shaft	Adult	—	—	—	—
Tibia	Right	Proximal quarter of the right tibia	Adult	—	—	—	—
Tibia	Right	Lateral half of proximal quarter of the right tibia	Adult	—	—	—	—
Tibia	Right	Inferior quarter of the tibia	Adult	—	—	—	—
Tibia	Right	Inferior articular facet	Adult	—	—	—	—
Tibia	Right	Complete tibial shaft	Infant	—	—	—	—
Tibia	Right	Fragment of tibia shaft	Adult	—	—	—	—
Tibia	Right	Fragment of tibia shaft	Adult	—	—	—	—
Tibia	—	Posterior half of the inferior articular surface	Adult	—	—	—	—
Tibia	—	Fragment of inferior articular surface	Adult	—	—	—	—
Fibula	Left	Inferior articular facet and section of shaft immediately superior to it	Adult	—	—	—	—

Bone	Side	Description	Age	Sex	Pathology	Metrics	Comment
Fibula	—	6 fibula shaft fragments	Adult	—	The shaft of a fibular fragment exhibits disorganised compact bone. The bone is uneven in texture and undulating across his surface.	—	—
Talus	Left	Complete	Adult	—	—	—	—
Cuboid	Left	Inferior half	Adult	—	—	—	—
Navicular	Left	Complete	Adult	—	—	—	—
Navicular	Right	Complete	Adult	—	—	—	—
Medial Cuneiform	Right	Complete	Adult	—	—	—	—
Metatarsal 1	Left	Complete	Adult	—	—	—	—
Metatarsal 4	Left	Proximal two thirds	Adult	—	—	—	—
Metatarsal 1	Right	Inferior half	Adult	—	—	—	—
Metatarsal 2	Right	Complete	Adult	—	—	—	—
Metatarsal 2	Right	Proximal three quarters	Adult	—	—	—	—
Metatarsal 4	Right	Complete	Adult	—	—	—	—
Metatarsal 5	Right	Proximal three quarters	Adult	—	—	—	—
OTHER	—	—	—	—	—	—	—
—	—	29 fragments of bone of human origin	—	—	—	—	—
—	—	35 fragments of bone of faunal origin	—	—	—	—	—



Project: Royal Hospital, Kilmainham, Dublin 8		Title: <i>In situ</i> preserved remains of Skeleton 1 Detail of cranial fragment of Skeleton 1	
Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Plates: 1 and 2



Project: Royal Hospital, Kilmainham, Dublin 8		Title: <i>In situ</i> preserved remains of Skeleton 2 Detail of cranial fragment of Skeleton 2	
Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Plates: 3 and 4



Project: Royal Hospital, Kilmainham, Dublin 8		Title: Excavation along western end of Bully's Acre, looking south Excavation along northern end of Bully's Acre, looking east	
Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Plates: 5 and 6



Project: Royal Hospital, Kilmainham, Dublin 8		Title: Excavation along northern end of Bully's Acre, looking west Excavation at eastern end of Bully's Acre, looking south	
Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Plates: 7 and 8



Project: Royal Hospital, Kilmainham, Dublin 8		Title: Excavation in north west corner of Meadow, looking north east Excavation in northern end of Meadow, looking south west	
Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Plates: 9 and 10



Project: Royal Hospital, Kilmainham, Dublin 8		Title: Excavation north of Formal Garden, looking north east Fill C12 from eastern end of Meadow, looking north	
Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Plates: 11 and 12



Project: Royal Hospital, Kilmainham, Dublin 8		Title: Excavation in north eastern end of Meadow, looking south Excavation in south eastern end of Meadow, looking east	
Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Plates: 13 and 14



Project: Royal Hospital, Kilmainham, Dublin 8		Title: Excavation in southern end of Meadow, looking east Excavation in southern end of Meadow, looking west	
Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Plates: 15 and 16



Project: Royal Hospital, Kilmainham, Dublin 8		Title: Excavation south of Bully's Acre, looking west North/south wall south of water tower and west of the Royal Hospital	
Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Plates: 17 and 18



Project: Royal Hospital, Kilmainham, Dublin 8		Title: Excavation across West Avenue, looking north Excavation west of the Royal Hospital, looking west	
Date: 30/8/2012	Scale: N.T.S.	Client: Office of Public Works	Plates: 19 and 20



Project: Royal Hospital, Kilmainham, Dublin 8

Title: Terram sealing *in situ* preserved Skeletons 1 and 2
Brick from structure at base of trench, west of the Royal Hospital

Date: 30/8/2012

Scale: N.T.S.

Client: Office of Public Works

Plates: 21 and 22



Project: Royal Hospital, Kilmainham, Dublin 8

Title: Pit excavated for CCTV mast, looking north
Excavation of temporary construction hoarding, looking west

Date: 30/8/2012

Scale: N.T.S.

Client: Office of Public Works

Plates: 23 and 24



Project: Royal Hospital, Kilmainham, Dublin 8

Title: Cross shaft (DU018-020284), looking west
Cross shaft (DU018-020284), looking north east

Date: 30/8/2012

Scale: N.T.S.

Client: Office of Public Works

Plates: 25 and 26