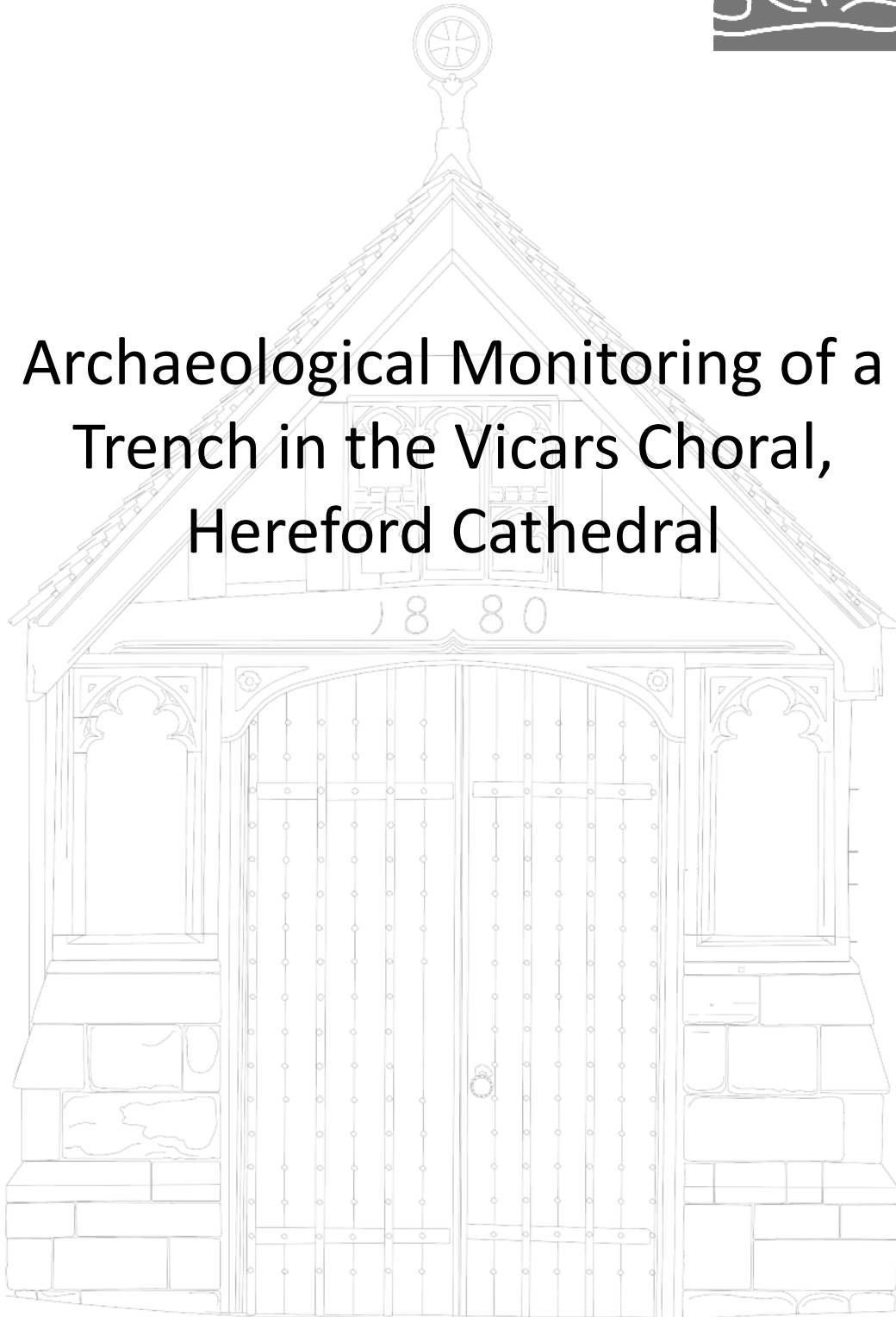


HEREFORD CATHEDRAL



HCVC-WB-18

Archaeological Monitoring of a
Trench in the Vicars Choral,
Hereford Cathedral



THE

**ARCHAEOLOGY
COMPANY LTD**

**HEREFORD CATHEDRAL
HEREFORDSHIRE**

Archaeological Monitoring of a Trench in the Vicars Choral

*Commissioned by Robert Kilgour Architect Ltd
On behalf of the Dean and Chapter, Hereford Cathedral.*

June 2018

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Summary

The Archaeology Company Ltd carried out a programme of archaeological monitoring during the excavation of a new service run to the south of the Vicars Choral.

The project has identified that the original service run appears to have been wider in places than the new service run and was in areas cut deeper than expected. However, a series of features truncated by the original service run remained at the lower levels of the excavation.

The work conducted has illustrated that the archaeological remains in the area of the service run have survived the impact of modern development, for instance a brick built well and two possible stone surfaces are preserved below the current yard surface at a depth of c 0.40m (55.82m AOD) and below the area of the Dean's garden at a depth of c 0.70m (54.63m AOD), respectively.

However the excavation of the original service run has, as expected severely impacted upon the stratigraphic relationships, nevertheless the endurance of archaeological features despite modern intrusion indicates that the potential for archaeological remains to be present at a higher levels outside the line of the service run is considered high.

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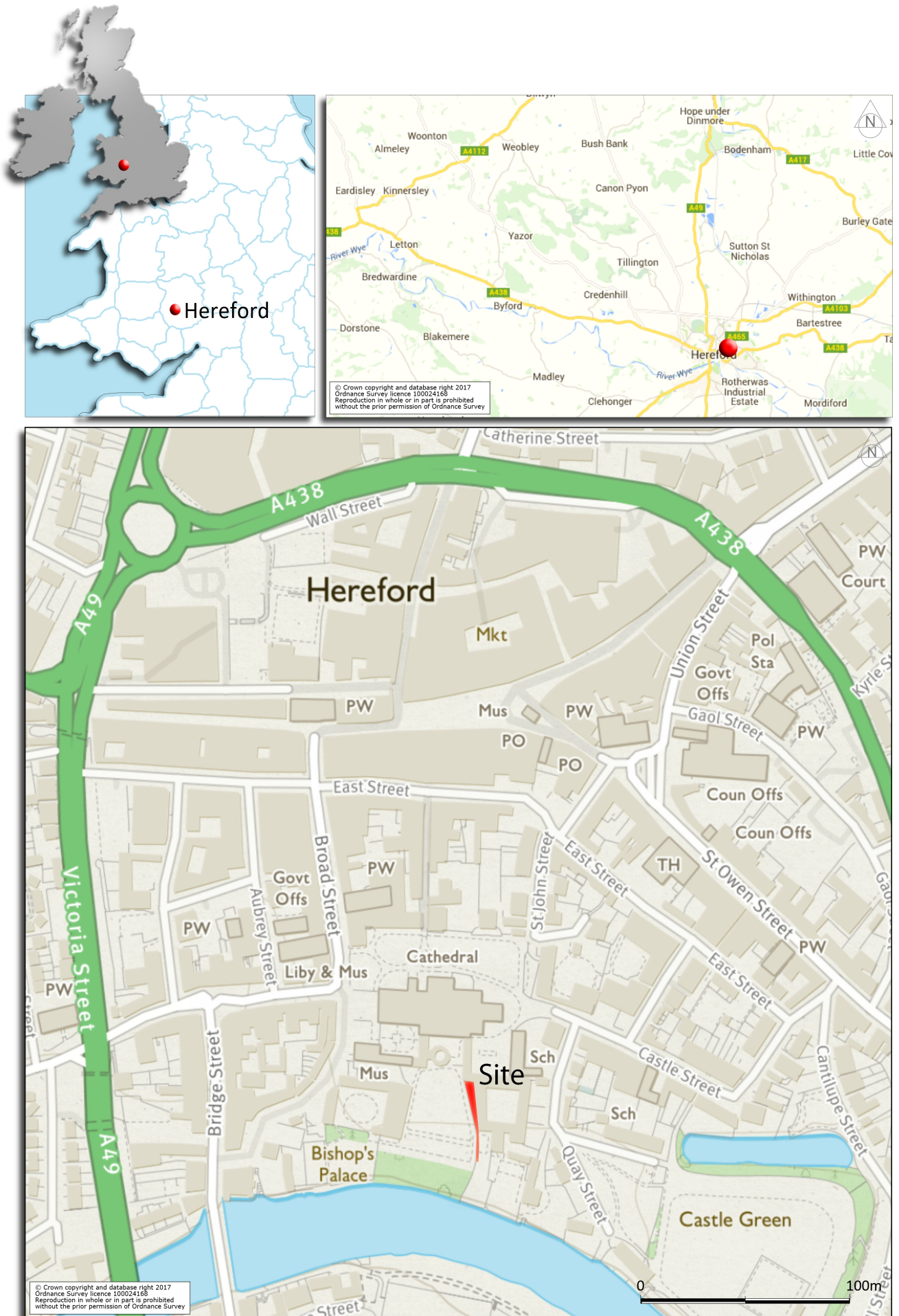
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Illus. 1 Site Location

Vicars Choral, Hereford Cathedral

Archaeological Monitoring

1 INTRODUCTION

The archaeology Company Ltd was commissioned by the Dean and Chapter of Hereford Cathedral through their agent Robert Kilgour Architects Ltd to undertake a programme of archaeological monitoring in connection with improvements to buildings and facilities in the Vicars Choral, Hereford Cathedral.

As part of the project it was necessary to replace existing services resulting in the deepening of the existing service trench to accommodate the new invert depth and flows required for the new building.

The proposal is the deepen of the existing trench to accommodate the new invert depth and flows required.

Due to the significance of the site and its importance to the understanding of the development of Hereford, a programme of archaeological monitoring was commissioned during the groundwork.

A Written Scheme of Investigation (WSI) was prepared by The Archaeology Company (Mayes 2017) on behalf of the Dean and Chapter, setting out the proposed strategy for archaeological monitoring. This report details the results of the subsequent fieldwork.

1.1 PROJECT BACKGROUND

A scheme is under way at Hereford cathedral to improve facilities for the choir which includes several elements that will enable better and separated changing facilities for the choristers.

This includes the construction of a new building on the site of the demolished 'Custos Lodge' at the north-western corner of the late-15th century College of the Vicars Choral which lies to the south-east of the cathedral church.

The latest element of the scheme is the re-excavation of a service trench running along the western side of the western arm of the College.

At present the invert depth of the pipe run is approximately 470mm deep at the northern end and 770mm at the southern end. The depth is considered adequate for the revised run at the southern end, but the northern end is approximately 400mm too high.

1.2 SITE DESCRIPTION

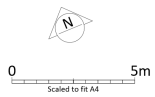
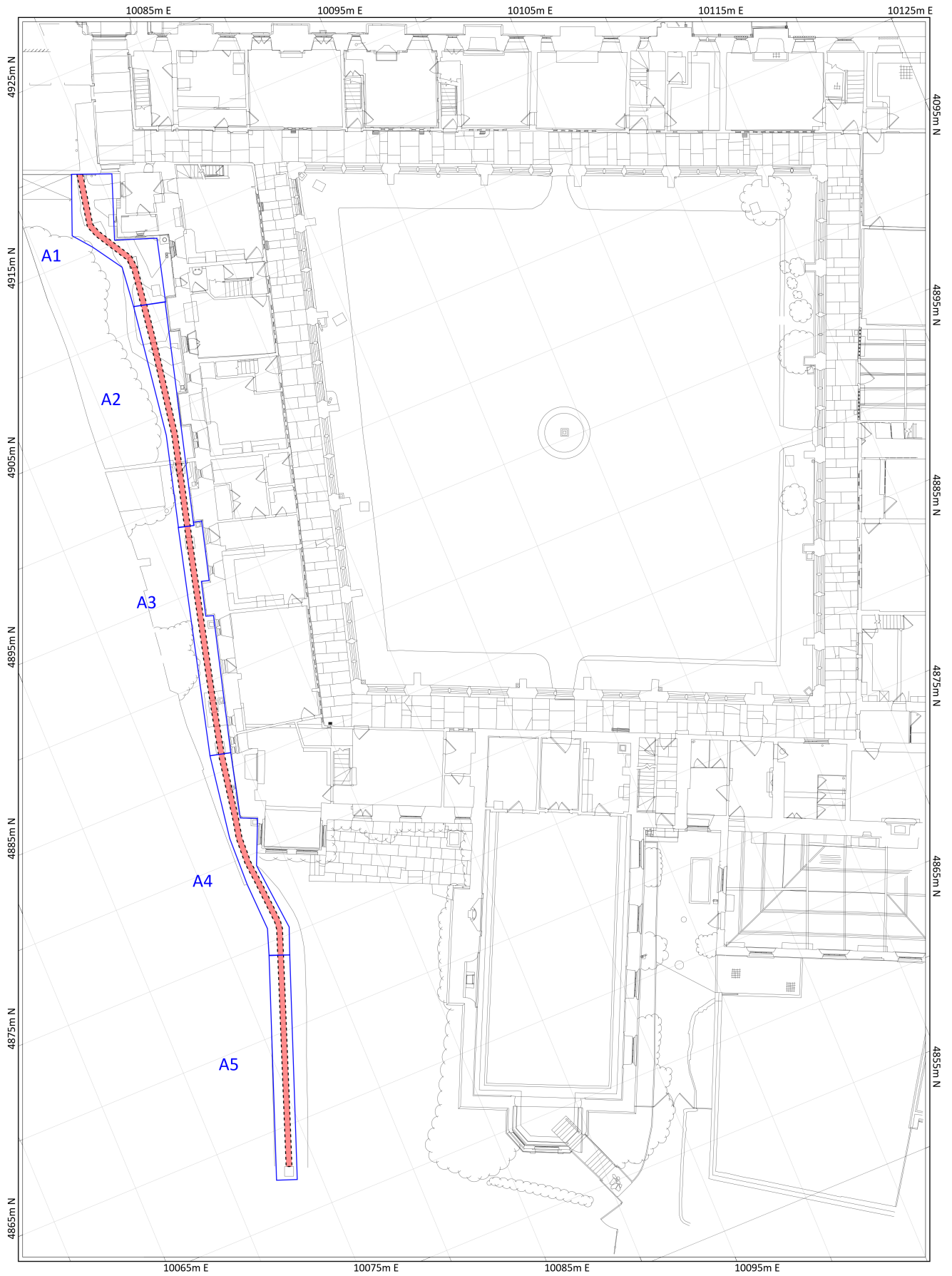
The site is located at the far west of the north range of the Vicars Choral, Cathedral Church of St Mary & St Ethelbert, Hereford, Herefordshire, NGR: SO 51029 39706. (Illus 1 and 2)

The area currently comprises a narrow passage way running between the western arm of the College and the Bishop's Palace garden wall, leading from 'Custos Lodge' in the north to the Deans Garden at the southern end, approximately 59.0m.

The site is located within the statutorily designated Hereford Area of Archaeological Importance (Ancient Monuments and Archaeological Area Act 1979) and lies at a height of c 57m AOD at the north and inclined down to 55.50m AOD in the south.

The site is underlain by Raglan Mudstone Formation, a siltstone and mudstone sedimentary bedrock formed approximately 419 to 424 million years ago in

HEREFORD CATHEDRAL HCVC-WB-18



— Service Run.



Illus. 2 Site Plan, Vicars Choral, Hereford Cathedral, and excavated areas

2 ARCHAEOLOGY BACKGROUND

The background history of Cathedral Church of St Mary and St Ethelbert is well known and documented. There has been a place of worship on the cathedral site since at least the 8th century, although no part of any building earlier than the 11th-century.

Between 1020 and 1040, Athelstan, the 25th Bishop rebuilds the Cathedral at Hereford. Unfortunately, in 1055 it was attacked by Welsh armies and destroyed the cathedral. The 12th century saw the Cathedral rebuilt in a Norman style.

In 1786 the West tower collapse. The Cathedral has significant restoration in 19th century and had further investment in the twentieth century to build a new home for the Chained library and Mappa Mundi. Further well documented excavations took place in 21st century, they are well known so will not be included here.

The site under investigation is situated towards the west of the Vicar Choral and to the South of the recognised location of the site of the Custos Lodge and the excavation will follow the line of an existing service run.

3 OBJECTIVES

The general purpose of the investigation was to evaluate the impact of the development proposal on the archaeological resource through the acquisition of a full archaeological record and an interpretation of that record.

The archaeological investigations were carried out to;

- assess extent, layout, structure and date of features and deposits of archaeological interest.
- place, where possible, the identified features within their local and regional context.

The resulting archive (finds and records) will be organised and deposited with the local Museum to

facilitate access for future research and interpretation for public benefit.

4 METHOD

A single trench run of approximately 59m long and approximately 0.60m wide was excavated by a combination of both hand and mechanical excavator to a depth of approximately 0.80m at the northern boundary to approximately 0.70m at the southern end.

C J Bayliss (Hereford) Ltd (the main site contractor) undertook the groundwork between October 2017 and December 2017, with archaeological monitoring visits coinciding during the excavation works.

The work was undertaken as specified in the 'Brief for Archaeological Monitoring of a Trench in the Vicars Choral', (R K Morriss 2017).

Natural geology was not encountered during the excavation of the service trench.

Detailed recording of features and sections was undertaken. Plans were drawn at a scale of 1:10, and sections at a scale of 1:20.

An overall site plan was recorded digitally using a Leica TS16 Total Station and site plan was accurately linked to the National Grid using information supplied by the client.

All contexts and drawings were given unique identifying numbers starting at 1001. Recording was undertaken on the Archaeology Company pro forma record sheets and a diary record was kept of the excavation works.

A photographic record using a digital camera was created. The photographs record archaeological features encountered and the progress of the trenching works.

Finds were collected and recorded by context, the artefacts retrieved during the investigation were cleaned using appropriate techniques and packaged and stored in accordance with First Aid for Finds (Watkinson & Neal 1998).

Working practices followed the ClfA Code of Conduct (2014a) and all recording was in line with ClfA

Standards and Guidance for conducting archaeological excavations (2014b).

5 RESULTS

A register of excavated deposits listed features is included in Appendix I. Bone assessments are included in Appendix II, Finds assessments in Appendix III and the Photographic record is recorded in Appendix IIII.

For ease of reference the service trench was divided into five areas, A 1 to A 5, consisting of approximately 12m lengths these areas were based upon the cut and fill method used by the main contractor in the construction of the new service run (See *Illus. 2*).

Despite the length of the service run the stratigraphy was relatively consistent due to the new excavation work being conducted within the re-deposited material from the original service run.

A 1

Located to the south of the new 'Custo Lodge' the service run connected with a previously excavated service run within the building foot print (see Plate ILLUS X) that cut the south wall footing of the original building (see Plate X).

The cast concrete surface (101) was removed by the main contractor, underneath the concrete and its associated levelling and bedding layer (102), was a dark mixed backfill deposit (103), suggesting that the area had been previously excavated, (103) contained modern glass, roof tile fragments, brick rubble and fragments of disarticulated animal bone.

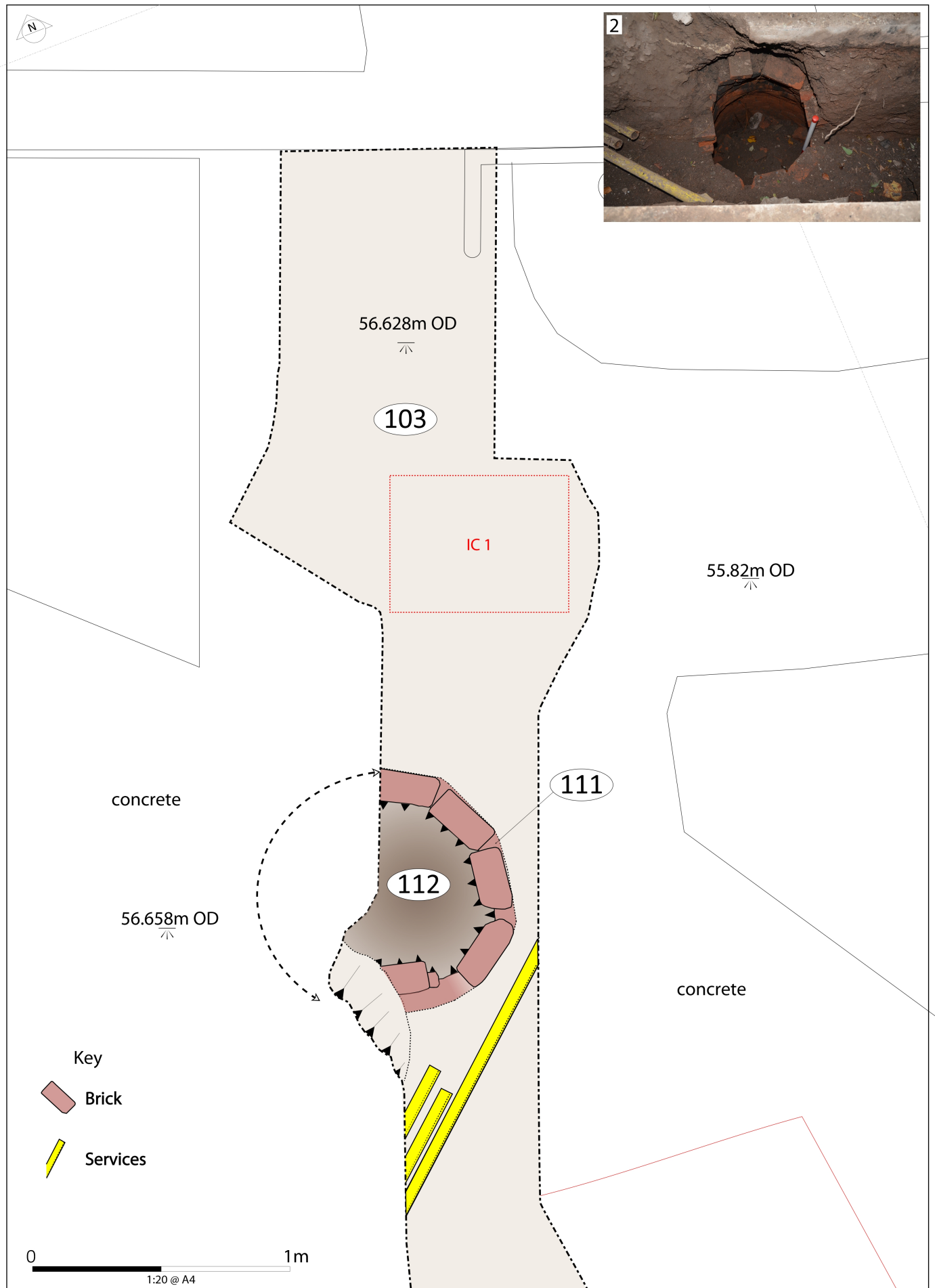
Located approximately 3m south of 'Custo Lodge' and close to the location of the excavation for the Inspection chamber IC1, a circular brick-built structure was identified, previously truncated by the original service trench, the circular structure (111) was constructed from buff red bricks (0.25m x 0.12m

x 0.10m) and at the level of excavation was to be un-bonded.

The structure has an external diameter of approximately 1m. The structure contained a mixed earthen fill with inclusions of brick rubble and concrete debris (112), due to structural considerations the internal cavity was not excavated. (see Plate 1, 2 and Illus 3).



Plate 1, facing west showing (111) section



Illus. 3 Area A 1, showing Brick Built structure
Plate 2 showing depth of (111)

A 2

The excavation of the service run within area A 2 did not identify any features of archaeological significance. (See Plate 3) the level of the original service run was considered suitable to achieve the necessary fall required by the new service run.

Examination of the stratigraphy identified that the new service run was cut in re-deposited material containing inclusions of bone, brick, and general building debris indicating that the original service run was cut wider than the new works therefore limiting the amount of information that could be ascertained from the current works relating to the formation of the site.



Plate. 3 West facing section Area A 2

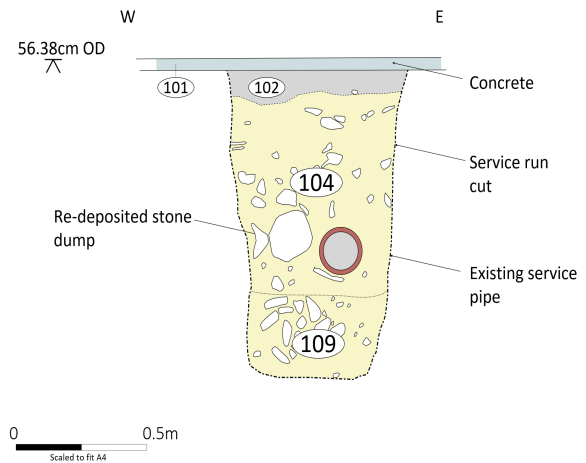
A 3

Excavation of the service run towards the south west corner of the Vicars Choral identified a large stone dump / deposit, the original service trench had cut this deposit, the resulting spoil being re-deposited in the backfill of the service trench.

The cast concrete surface (101) and associated levelling and bedding layer (102) overlay a dark brown silty loam containing a very large amount of

re-deposited irregular stone rubble (104) with overlay (109).

104 extended for approximately 3m in length and was approximately 0.80m deep, the new service run was excavated approximately 0.30m deep than the original service run through the undisturbed stone dump (109) (See Illus. 4, Plates 4 & 5)



Illus. 4 South facing section , showing re-deposited (104)

104 and 1909 contained modern glass, brick ,rubble, and fragments animal bone, examination of the section suggested that 104 and 109 may have represented a levelling deposit although the exact relationship was unclear due to the original service trench being considerably wider than the cut of the new service trench.



Plate 4 South facing section A 3, showing re deposited (109)

Plate 5 East facing detail showing (109)



Illus. 5 Location of Stone dump (109)

A 4

Primarily excavated within the flower bed of the Dean's garden, area A 4, largely consisted of a 0.30m deep deposit of cultivated soil (107) overlaying a 0.45-0.50 m sandy loam deposit of a mid-red- brown colour with frequent inclusions of stones and gravels (106), 106 was likely to have been re-deposited as part of the original excavation of the service run, as the original service trench was cut considerably wider than the new service trench.

At the base level of the original service run (0.72m BGL) and overlaid by context 106, was a layer of irregular stones and river worn cobbles which formed a possible metallised surface (107).

107 measured approximately 3.5m in length and appeared to have straight cut ends at both the north and south extremity's, possibly suggesting that the

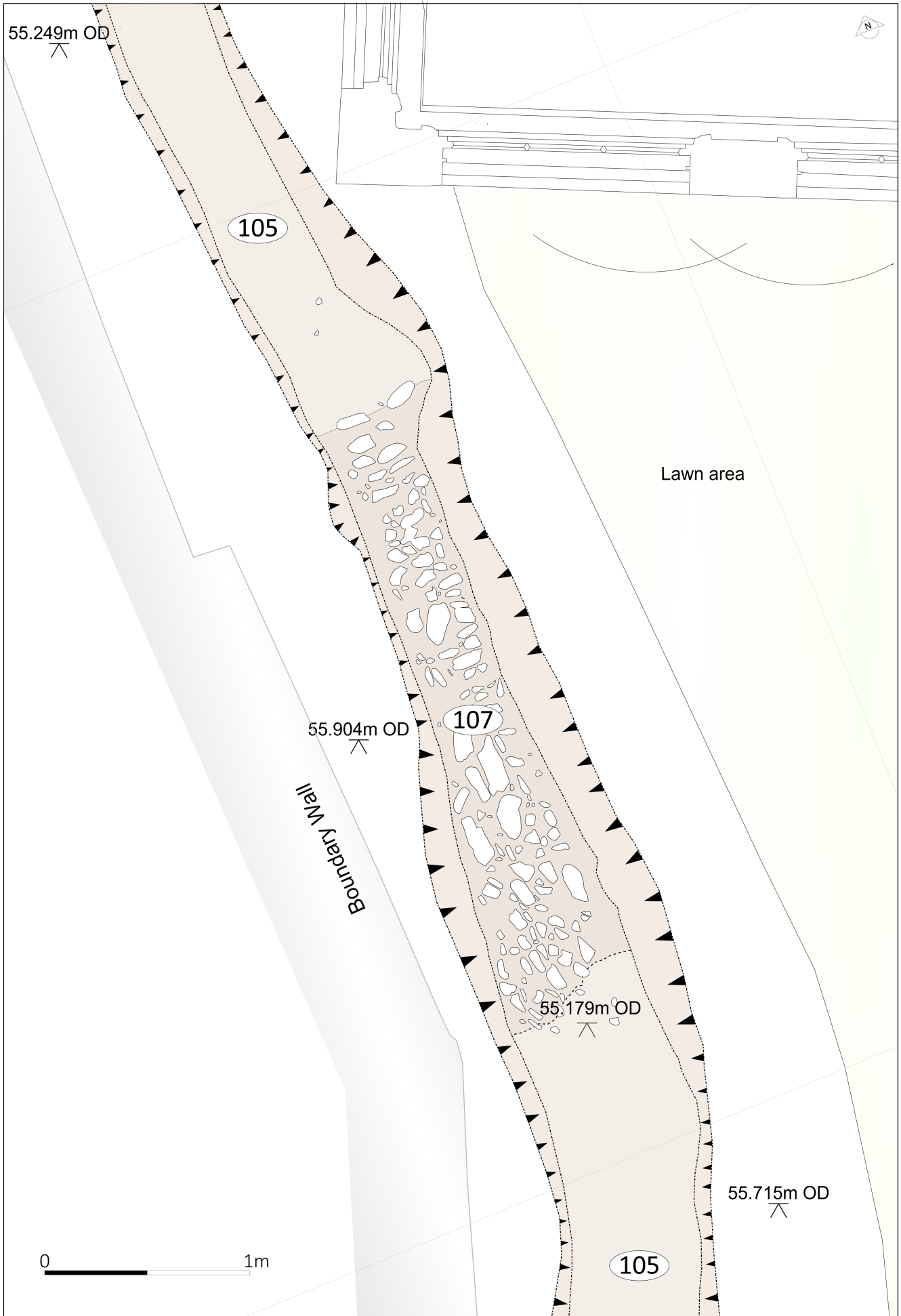
surface may have formed an internal floor level with the external walls removed by the original excavation

of the service run or could have represented a metallised track way with set on an east west alignment.

The original cut of the service trench had stopped at the level of 107, however to achieve the correct fall on the new survive run it was necessary to remove a portion of 107. 107 was laid upon 105, a mid-red-brown sandy deposit similar to 105 but containing fewer inclusions of stones and gravels, no finds were observed to date 107 and no features were observed below 107.



Plate 6. Facing North showing cobbled area (107)



Illus. 6 Plan showing cobbled area (107)

A 5

Continuing the excavation of service trench within the flower bed of the Dean's garden, from A 4, area A 5, shared similar stratigraphy.

Within Area A 5 the stratigraphy consisted of a 0.30m deep deposit of cultivated soil (107), overlaying a sandy loam deposit of a mid-red-brown colour (106) (0.45-0.50m), with frequent inclusions of stones and gravels .

106 was likely to have been re-deposited material resulting from the original excavation of the service run, as the original service trench appeared to be cut substantially wider than the new service trench.

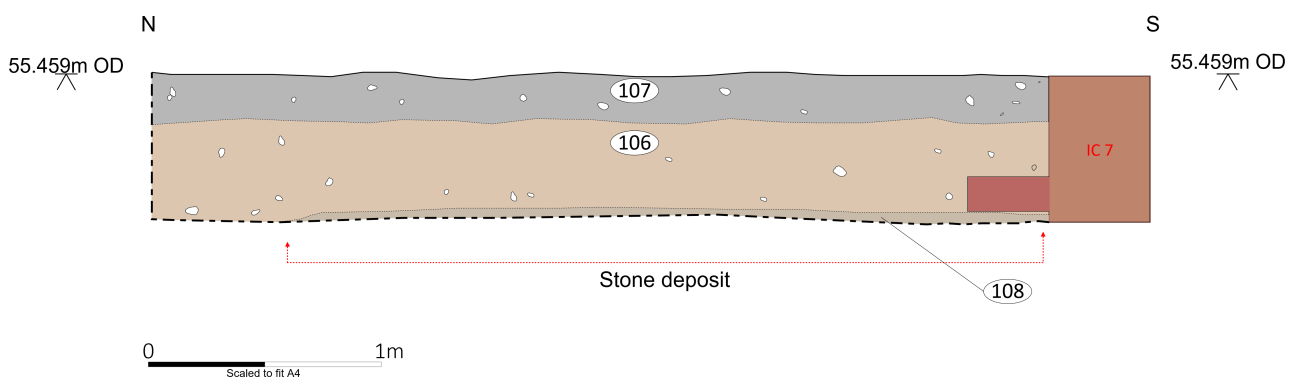
At the junction with of inspection chamber 7 (IC7) at the southern end of the service trench, a stone surface was observed.

108 consisted of both medium and large irregular shaped, yellow sand stones laid flat, in a matrix of mid red brown sandy loam, no indication of bonding was observed.

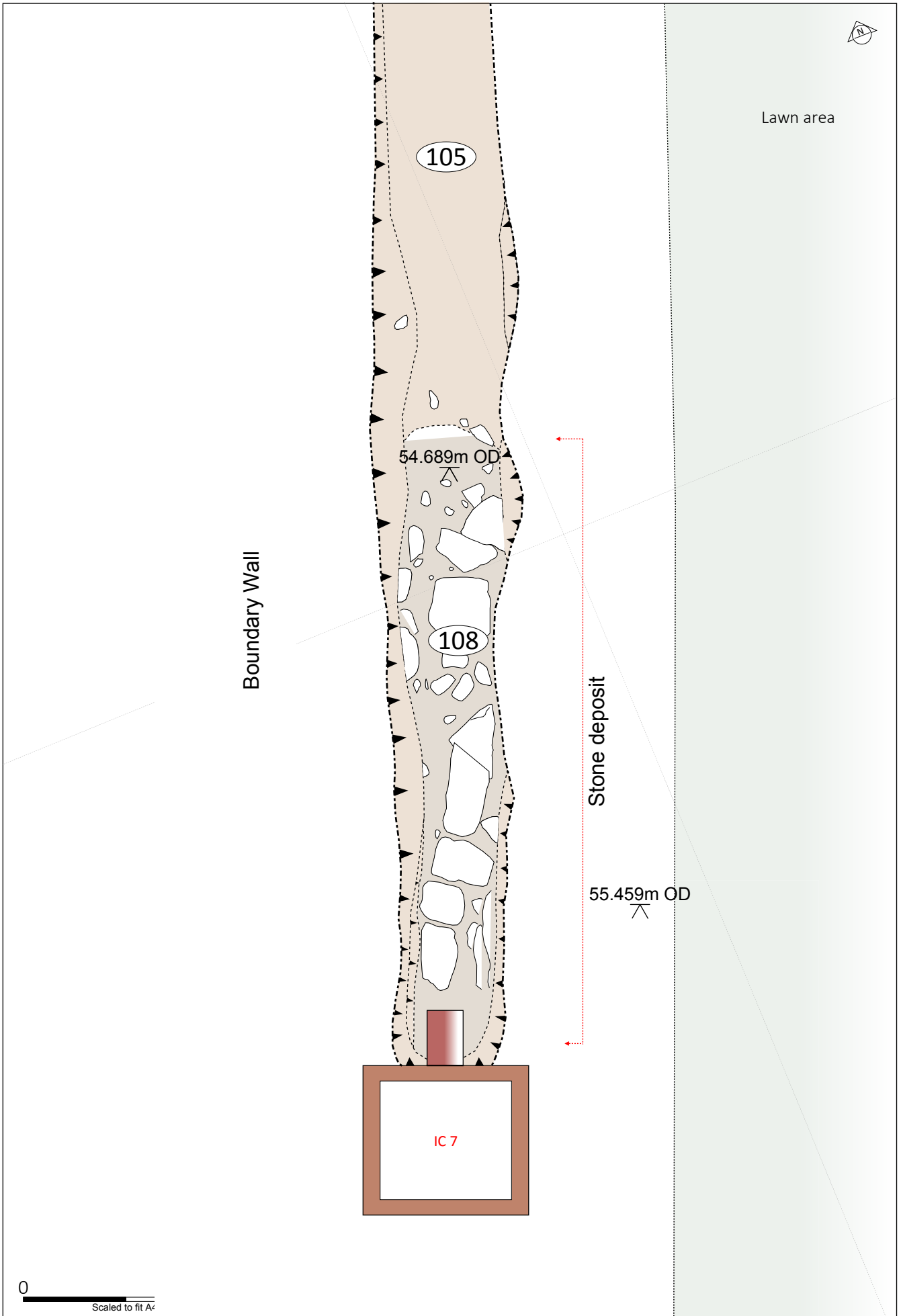
The depth of the original service pipe excavation was satisfactory to achieve the necessary fall of the new service pipe and excavation was stopped at this level.



Plate 7 showing (108)- 3D model data



Illus. 7 West facing section over Stone deposit (108)



Illus. 8 plan showing Stone deposit (108)

5 DISCUSSION

A 1

An un-bonded circular brick-built structure (111) was identified directly south of Custos Lodge, the structure had been truncated by the original service run but survived within the east facing section to a height of six brick courses above the base level of the new service trench.

The upper courses of brick work at first appeared to be tapering in to the centre of the structure, but following examination of the fill (112) which contained brick fragment suggests that the apparent tapering is not a construction feature but is rather due to the un-bonded structure collapsing in on its self.

As to the function of the brick structure, the circular and un-bonded nature would suggest that 111 was in fact a well, the abandonment and subsequent in filling may relate to the mid-late 19th century redevelopment of the Custos Lodge site when the parts of the building were demolished.

A 3

Within the excavation of the service run towards the south west corner of the Vicars Choral a large amount of stone was identified (109), the stone consisted primarily of large flat irregular shape fragments, in a loose matrix and most likely represent a stone dump or levelling deposit, due to the nature of single trench excavation it was not possible to ascertain the full extent of the deposit although it is interesting to note that the majority of champagne bottle fragments came from (104) which appeared to be re-deposited 109, suggesting that the stone dump may represent a later phase of levelling works.

A 4

Located within the flower bed of the Dean's garden, area A 4, at the base level of the original service run (0.72m BGL) and overlaid by context 106, a layer of

irregular stones and river worn cobbles formed a possible metallised surface (107).

107 measured approximately 3.5m in length and appeared to have straight cut ends at both the north and south extremity's, possibly suggesting that the surface may have either formed an internal floor level with the external walls removed by the original excavation of the service run or may in fact represented a metallised track way set on an east west alignment.

No finds of archaeological significance were observed to allow the dating of 107, however the identification and existence of 107 despite the intrusion of modern services suggests that the potential for archaeological remains to be present at a higher level outside the line of the service run is high.

A 5

Continuing the excavation of the service run within the flower bed of the Dean's garden, both area A 4, area A 5 share similar stratigraphy, however at the junction with the modern inspection chamber (IC 7) at the southern end of the service trench, a substantial stone surface or dump was observed.

108 consisted of both medium and large flat irregular shaped, yellow sand stone, laid in a matrix of mid red brown, sandy loam.

No finds of archaeological significance were observed to allow the dating of 108.

Due to the limited nature of the excavation of the service trench no indication as to the function of 108 was possible, although it is worth noting that the survival of both 108 and 107 in relation to the boundary wall of the Bishops palace and the depth of both features may indicate that they predate the construction of the boundary wall.

6 CONCLUSION

The project has identified that the original service run appears to have been wider in places than the new service run and was in areas cut deeper than expected. However, a series of features truncated by the original service run remained at the lower levels of the excavation.

The work conducted has illustrated that the archaeological remains in the area of the service run have survived the impact of modern development, for instance a brick built well and two possible stone surfaces are preserved below the current yard surface at a depth of c 0.40m (55.82m AOD) and below the area of the Dean's garden at a depth of c 0.70m (54.63m AOD), respectively.

However the excavation of the original service run has, as expected severely impacted upon the stratigraphic relationships, nevertheless the endurance of archaeological features despite modern intrusion indicates that the potential for archaeological remains to be present at a higher levels outside the line of the service run is considered high.

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MAGIC (Multi-Agency Geographic Information for the Countryside) <http://www.magic.gov.uk/>
National Library of Scotland (<http://maps.nls.uk>)

6 APPENDICES

APPENDIX I

CONTEXT REGISTER

See Illustration 2						
Minimum Depth to level of archaeological horizon		0.40m	Maximum Depth to level of archaeological horizon		0.70m	
Datum height		@ northern end 56.65m OD @ southern end 55.52m OD, slope % -1.92				
	Description (Layer, Cut, Fill)	Dimensions (as appropriate)				
		Area	Length	Width	Depth	
-101	Concrete, cast- mixed patches indicating various phases of construction and repair.	A 1, A 2, A 3, A 4	<35m	<7m max	0.10m-015m	
-102	Levelling -bedding deposit for (101), mixed, gravels, rubble.	A 1, A 2, A 3, A 4	<35m	<7m max	0.20m max	
-103	Dark black silty deposit contained modern glass, roof tile fragments, brick rubble and fragments of disarticulated animal bone. Butting south wall of Custo Lodge and sealing brick structure (111) - Re-deposited material.	A 1	5.4m	<050m	0.50m Excavation stopped at this level	
-104	Stone Dump – re-deposited stone dump within the existing service run, cut by the original service run the stone dump lays directly below the concrete levelling deposits (102) – same as (109)	A 3	3.0m approx.	<050m	0.90m Excavation stopped at this level	
-105	Mid red brown, sandy loam (2.5YR5/6), mouldable. Inclusions of small irregular yellow sand stone flecks and small rounded yellow gravels - pebbles.	A 5, A 5, extending into A 3.	<20m	<0.50m	Excavation stopped at this level	
-106	Mid red brown colour with frequent inclusions of stones and gravels, re-deposited material – possible (105)	A 5, A 3, A 2	<20m	<0.50m	045 -0.60m	
-107	Buff grey deposit of cultivated soil (flower boarder), inclusions of irregular small stones, rounded gravels, and modern construction debris. Above (106)	A 5, A 4	<20m	<2.5 max	0.30m max	
-108	Both medium and large sized flat irregular shaped, yellow sand stone in a matrix of mid red brown sandy loam. Possible stone dump, original and new service runs stopped at this level. Below (106) above (105) – cut by original inspection chamber (IC7)	A 5	3.0m	<0.50m	Excavation stopped at this level	
-109	Stone Dump – stone dump within the existing service run, cut by the original service run the stone dump Overlain by re-deposited stone dump (104) –(104 and 109= same as)	A 3	3.0m approx.	0.30m	0.30m Excavation stopped at this level	
110	0	0	0	0	0	
-111	Circular structure constructed from buff red bricks (0.25m x 0.12m x 0.10m), appears to be un-bonded. sealed by (103) Filled by (112)	A 1	1m ø	1m ø	Not excavated	
-112	Dark grey silty loam, fill of (111), containing inclusions of brick rubble and concrete debris - possible back fill to seal cavity of (111)	A 1	1m ø	1m ø	Not excavated	

APPENDIX II

BONE ASSESSMENT

Bone Assessment By D.Rouse

In total 142 pieces of animal bone were recovered from the site (combined weight 2.337 kg). All the bone recovered apart from a few small unidentified bird bones is from domesticated animals i.e. cattle, sheep, pig, chicken, and pheasant. Most of the bone was in fairly good condition though some of the larger bones of cattle and pig were abraded. The bone is listed by species in table (2) below.

Species	Weight	Total number of bones
Cattle	1.254 Kg	32
Sheep	655g	41
Pig	355g	47
Bird	27g	14
Unidentifiable	46g	8
Total	2.337 kg	142

Table 2

The bone assemblage is associated with Medieval and Post Medieval activity on the site. All the bone was recovered from a group context (102, 103, 104,105, 106, 107) comprising the fill of an old drain run.

The assemblage is not particularly large considering the extent of the context. The largest proportion of the bone by volume from a single identifiable species came from cattle.

Sheep bones provided the next largest volume bone recovered from the site along with pig bone and a small number of bird bones. A small percentage of the assemblage could not be identified due to its abraded condition or the fragmentary nature of some of the smaller pieces.

Teeth marks visible on some of the bones (cattle, sheep, and pig) were probably from dogs though some could also have been from humans.

A few (6) of the bones showed evidence of cut marks indicating butchery. These cut marks were present on cattle, sheep and pig bones and suggests that these were domesticated animals.

Of the bird bones from context (104) most were chicken bones with the exception of 2 pieces from a pheasant leg bone and 2 small pieces of leg bone from an unidentified, probably undomesticated bird species.

Archive recommendations

The assemblage is small and contains no material of medieval interest. The finds should be discarded and not be retained, as the modern pottery is of little further archaeological value.

APPENDIX III

FINDS ASSESSMENT

The finds assemblage numbered 12 sherds (8g) of pottery (white ceramic, blue and white transfer print), and various finds of ceramic building material, clay pipe, bottle glass (Champagne) and occasional metalwork (nails). These were found along the length of the service run in the re-deposited material from the original cut of the service trench.

The finds dated from post-medieval and modern periods.

Due to the nature of the excavation of re-deposited material, the finds from contexts (102, 103, 104, 105, 106, 107) comprising the fill of an old service are grouped together.

Post-medieval to modern pottery

The pottery assemblage comprised 8 sherds with a total weight of 8g. It consisted of a mixture of post-medieval and modern wares (whiter ceramic and Blue and white transfers).

Most of the sherds are quite small and doubtless the product of secondary deposition during the redevelopment of the area.

Metalwork

The metalwork the remains of 4 of iron nails, found in modern re-deposited layers (102) and (103) although any diagnostic detail was obscured by corrosion products and damage. No finds of a medieval date were observed

Clay pipe

There were 5 fragments of clay pipe shaft, unfortunately no bowls were observed limiting the diagnostic values of the assemblage, however the wide bore of the stems indicates they are of probable 17th century date (Peacey 1985).

Glass

The glass amounted to 3 large bottle bases with very pronounced punt and thick-walls, typical of champagne bottles.

Ceramic building material

The ceramic building material consisted of a large number of red brick fragments and the remains mottled brown (salt glazed) large diameter (8") ceramic pipe, the amount of ceramic pipe fragments may indicate that the service run has undergone various phases of alteration or repair.

Discussion

The assemblage was small but varied in terms of materials, no indication of medieval activity associated with the development of the Cathedral was identified, suggesting that the original service trench was not necessary excavated through medieval layers but rather suggests that the site has undergone various phases of development in relatively modern periods.

Archive recommendations

The assemblage is small and contains no material of medieval interest. The finds should be discarded and not be retained, as the modern pottery is of little further archaeological value.

References

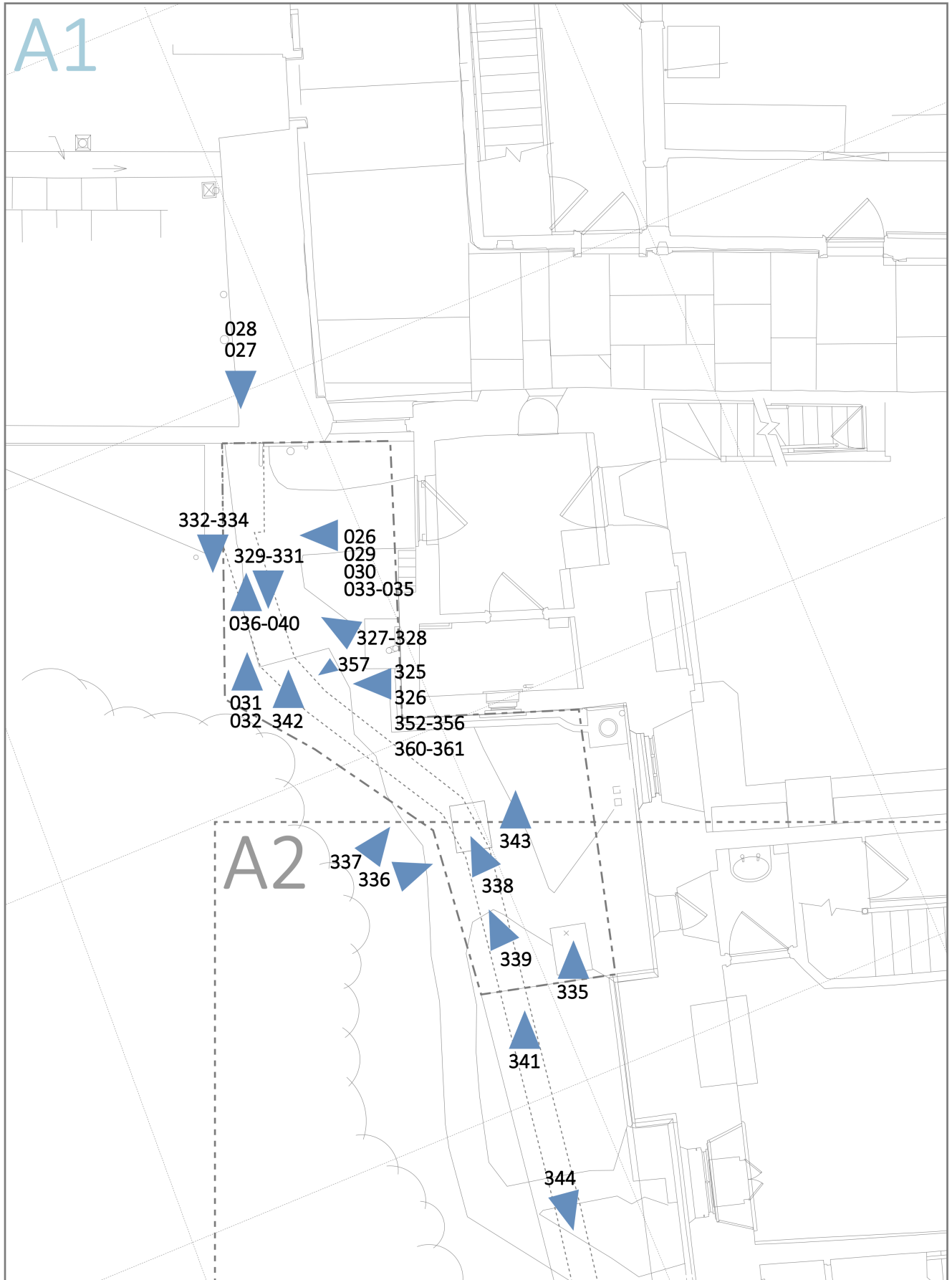
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Vince, A G 1977 'The Medieval and Post-Medieval Ceramic Industry of the Malvern Region: The Study of a Ware and its Distribution', in Peacock, DPS (ed) Pottery and Early Commerce. Characterization and Trade in Roman and Later Ceramics Academic Press: London

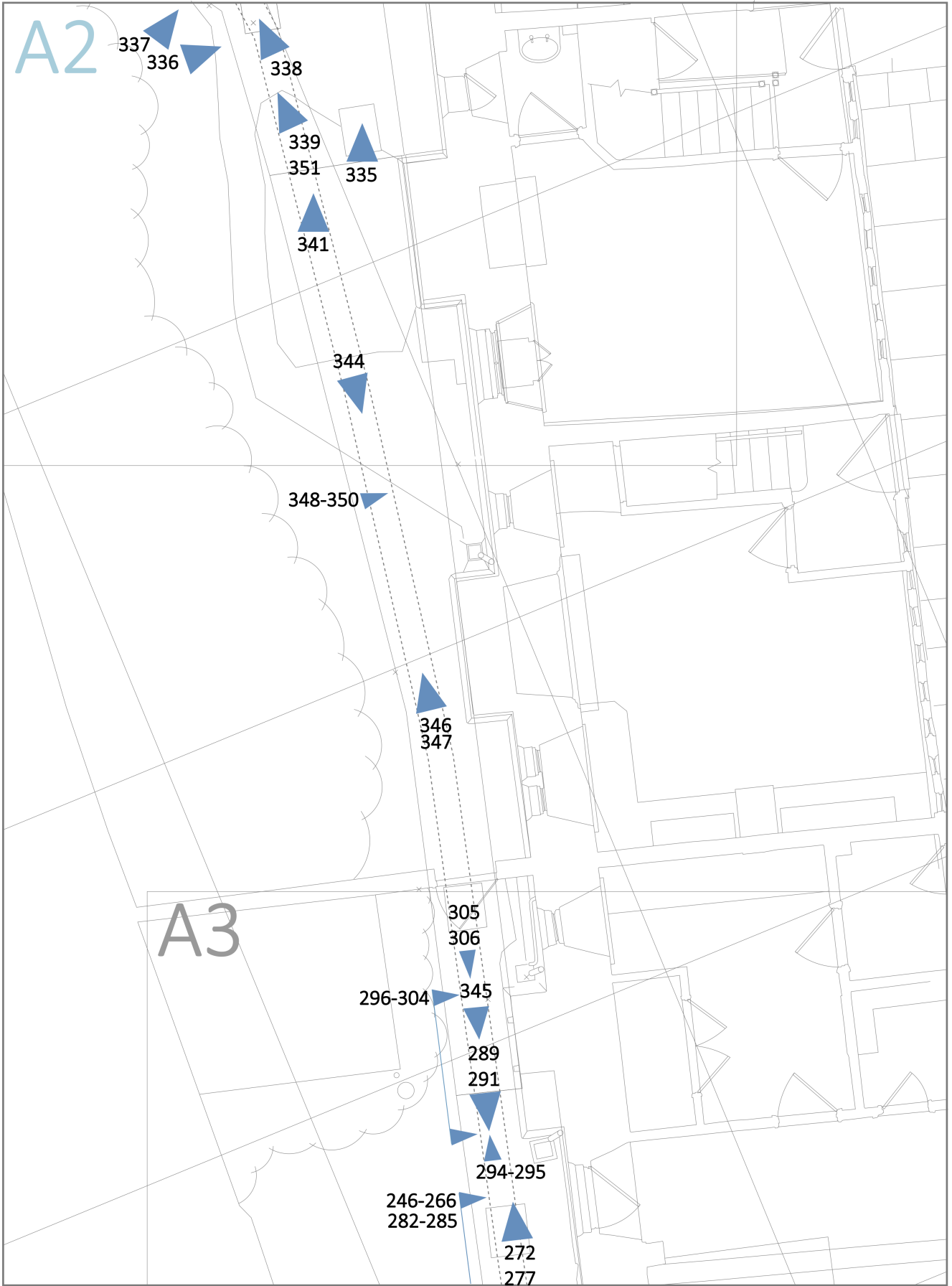
Vince, AG 1985 'The Ceramic Finds', in Shoesmith, R Hereford City Excavations, Volume 3: The Finds CBA Research Report 56:

APPENDIX III

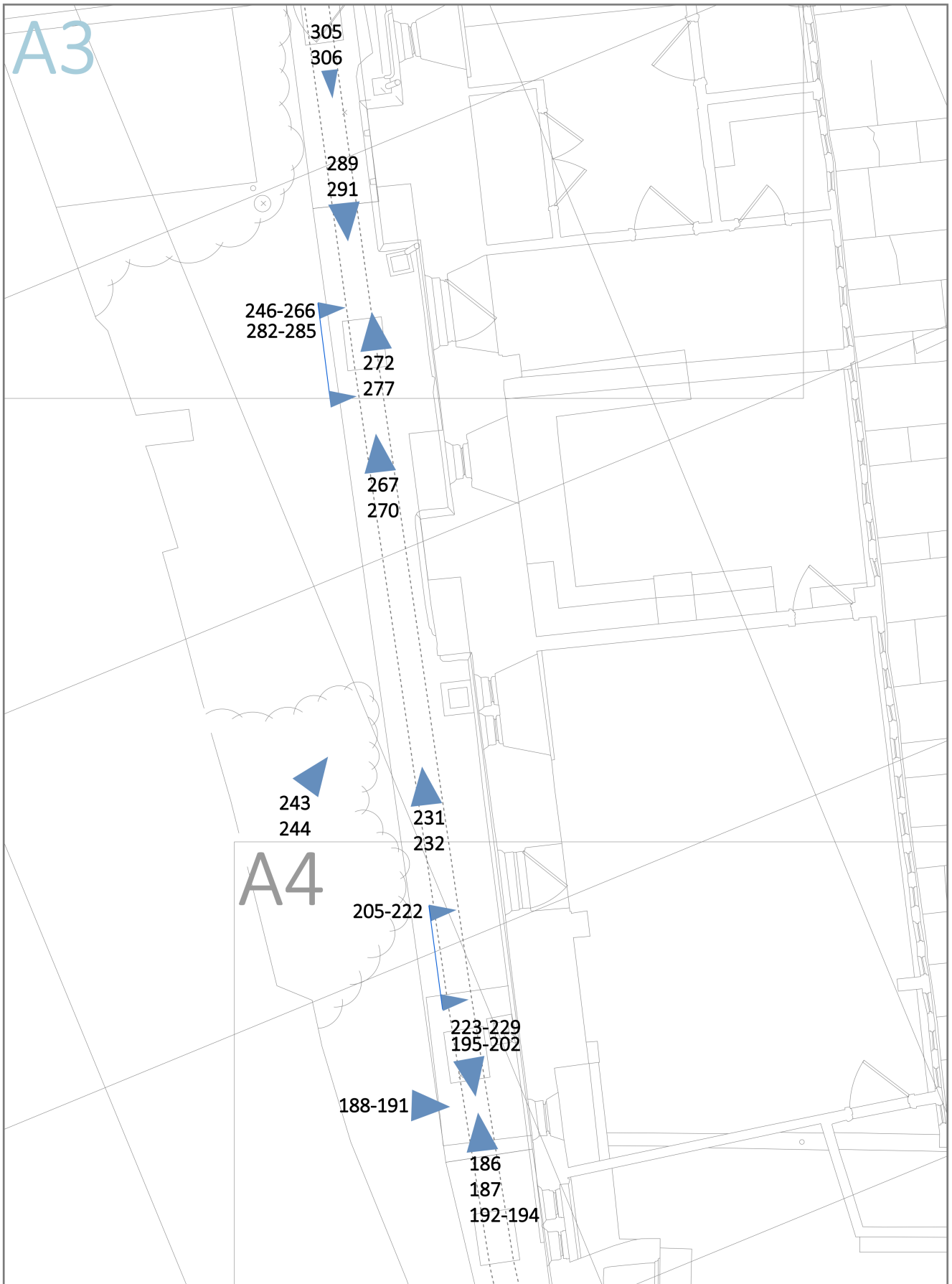
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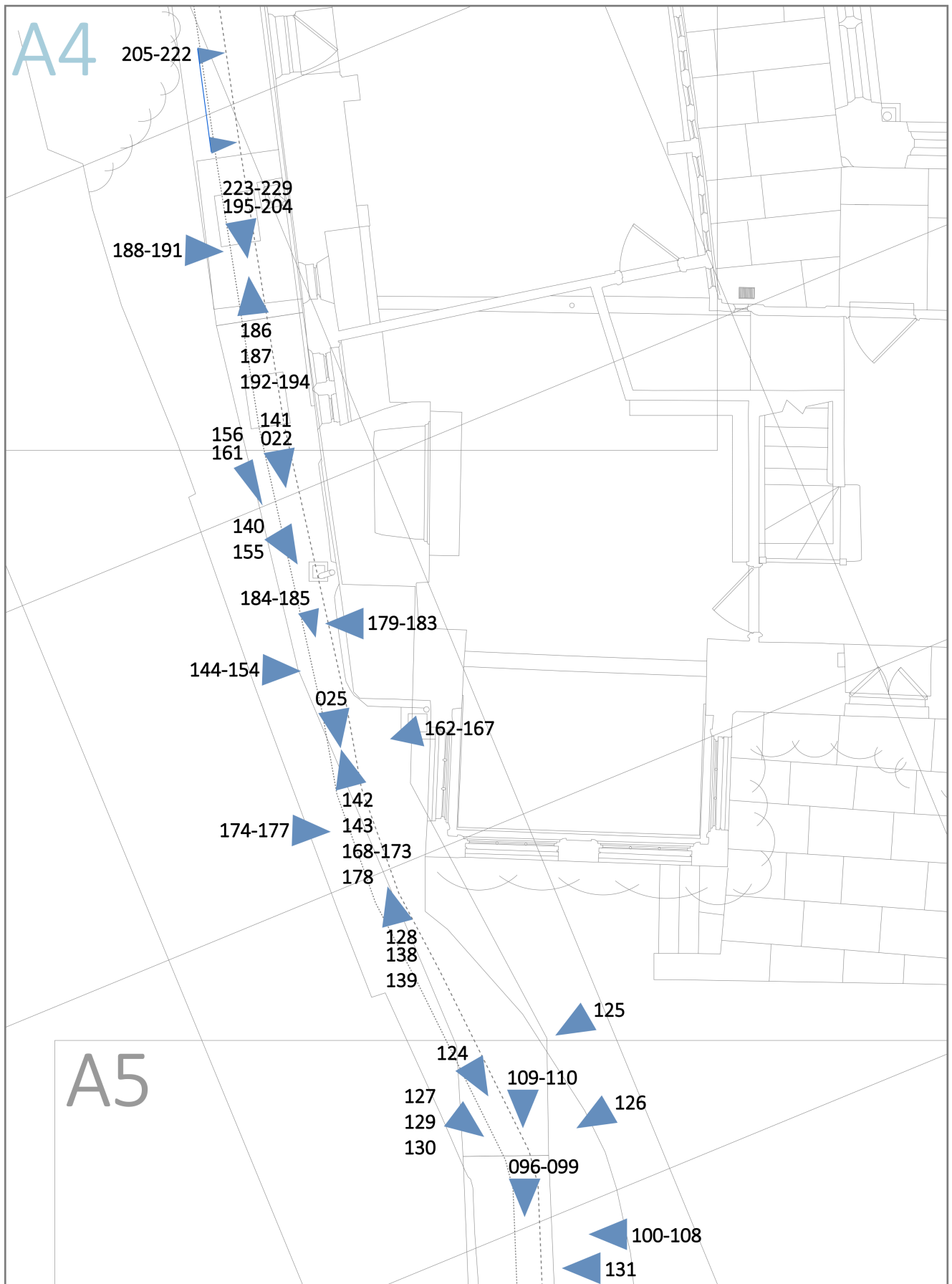
Illus. 9 Photo Location Plan - A 1



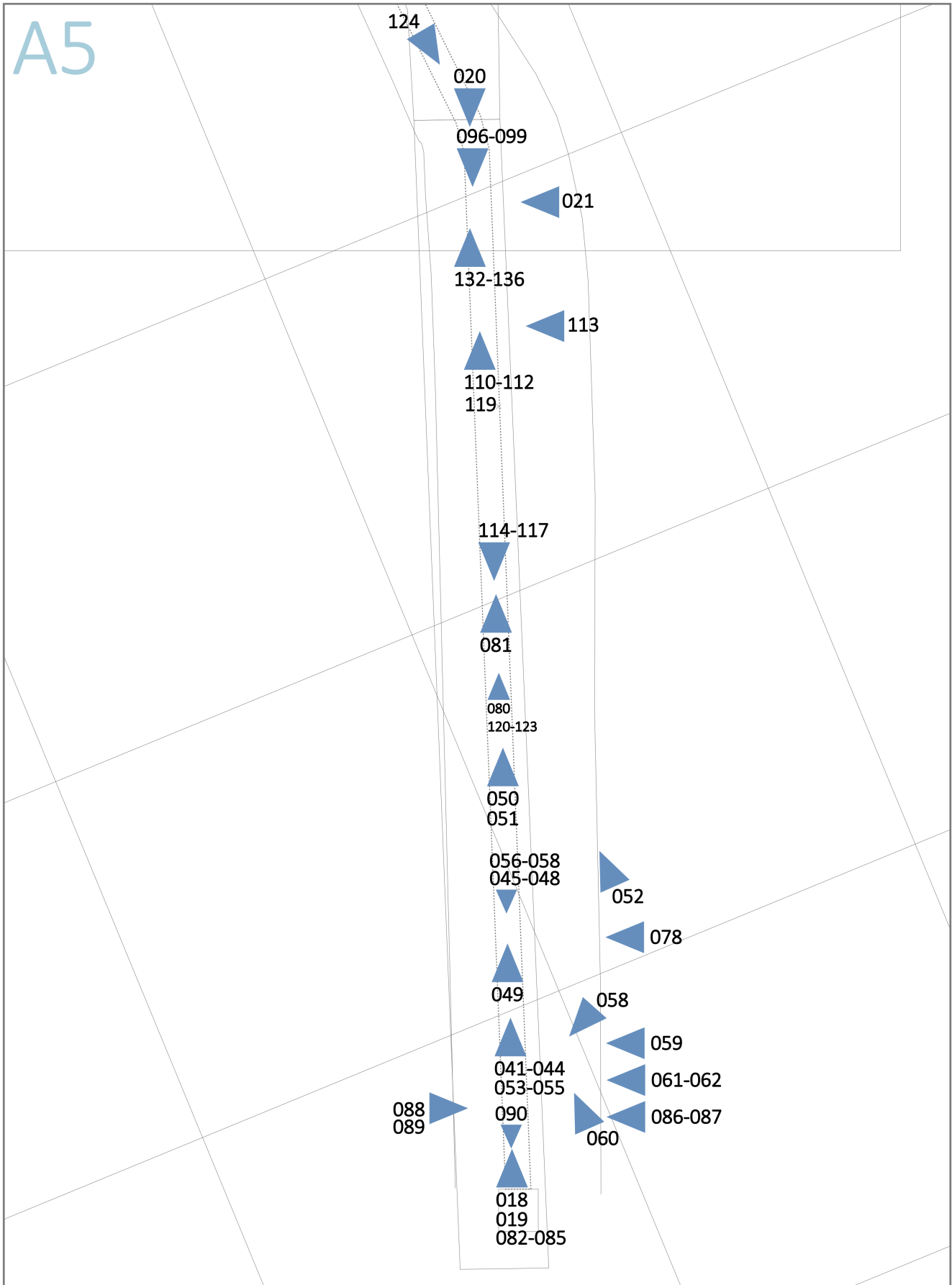
Illus. 10 Photo Location Plan - A 2



Illus. 11 Photo Location Plan - A 3



Illus. 12 Photo Location Plan - A 4



Illus. 13 Photo Location Plan - A 5

PHOTO NUMBER	DIGITAL NUMBER	DIRECTION FACING	DESCRIPTION
01	TAC-5998	N	General view, Pre-excavation of service trench. A 1
02	TAC-5999	N	General view, Pre-excavation of service trench. A 1
03	TAC-6000	S	General view, Pre-excavation of service trench. A 2-A 3
04	TAC-6001	S	General view, Pre-excavation of service trench. A 2-A 3
05	TAC-6002	S	General view, Pre-excavation of service trench. A 3-A 4
06	TAC-6003	S	General view, Pre-excavation of service trench. A 3-A 4
07	TAC-6004	N	General view, Pre-excavation of service trench. A 2-A 3
08	TAC-6005	N	Overview of A 5 Pre-excavation.
09	TAC-6006	N	Overview of A 5 Pre-excavation.
10	TAC-6007	N	Overview of A 5 Pre-excavation.
11	TAC-6008	N	Overview of A 5 Pre-excavation.
12	TAC-6009	N	Overview of A 5 Pre-excavation.
13	TAC-6010	W	Overview of Site Pre-excavation.
14	TAC-6011	S	General view, Pre-excavation of service trench. A 3
15	TAC-6012	N	General view of Hereford Cathedral.
16	TAC-6013	N	General view of Hereford Cathedral.
17	TAC-6014	N	General view of Hereford Cathedral.
18	TAC-6015	N	Overview of A 5, showing existing service pipe.
19	TAC-6016	N	Overview of A 5, showing existing service pipe.
20	TAC-6017	S	Overview of A 5-A 4, showing existing service pipe.
21	TAC-6018	W	Section detail, A 5
22	TAC-6019	S	Overview of A 4 – work in progress
23	-	-	-
24	-	-	-
25	TAC-6022	S	Overview showing removal of concrete. A 4
26	TAC-6023	W	Showing excavation of inspection chamber, Custos House. A 1
27	TAC-6024	S	Showing excavation of inspection chamber, Custos House. A 1
28	TAC-6025	S	Showing excavation of inspection chamber, Custos House. A 1
29	TAC-6026	W	Section detail, A 1, inspection chamber.
30	TAC-6027	W	Section detail, A 1, inspection chamber.
31	TAC-6028	N	Overview, inspection chamber, Custos House area. A 1
32	TAC-6029	N	Overview, inspection chamber, Custos House area. A 1
33	TAC-6030	E	Overview, inspection chamber, Custos House area. A 1
34	TAC-6031	E	Section detail, A 1, inspection chamber.
35	TAC-6032	E	Section detail, A 1, inspection chamber.
36	TAC-6033	N	Overview, inspection chamber, Custos House area. A 1
37	TAC-6034	N	Overview, inspection chamber, Custos House area. A 1
38	TAC-6035	N	Overview, inspection chamber, Custos House area. A 1
39	TAC-6036	N	Overview, wall cut, Custos House area. A 1
40	TAC-6037	N	Overview, inspection chamber, Custos House area. A 1
41	TAC-0718	N	Detail showing stone area (107). A 1.- max depth of service trench.
42	TAC-0719	N	Detail showing stone area (107). A 1.
43	TAC-0720	N	Detail showing stone area (107). A 1.
44	TAC-0721	S	Detail showing stone area (107). A 1.
45	TAC-0722	S	Detail showing stone area (107). A 1.
46	TAC-0723	S	Detail showing stone area (107). A 1.
47	TAC-0724	N	Overview of service trench. A 1
48	TAC-0725	N	Overview of service trench. A 1
49	TAC-0726	N	Overview of service trench. A 1
50	TAC-0727	NE	Overview of service trench. A 1
51	TAC-0728	N	Detail showing stone area (107). A 1.

PHOTO NUMBER	DIGITAL NUMBER	DIRECTION FACING	DESCRIPTION
52	TAC-0729	N	Detail showing stone area (107). A 1.
53	TAC-0730	N	Overview of service trench. A 1
54	TAC-0731	S	Detail showing stone area (107). A 1. Showing inspection chamber.
55	TAC-0732	S	Detail showing stone area (107). A 1. Showing inspection chamber.
56	TAC-0733	S	Detail showing stone area (107). A 1. Showing inspection chamber.
57	TAC-0734	W	Section detail, A 5, inspection chamber.
58	TAC-0735	W	Section detail, A 5, inspection chamber.
59	TAC-0736	W	Section detail, A 5, inspection chamber.
60	TAC-0737	W	Section detail, A 5, inspection chamber.
61	TAC-0738	-	-
62	TAC-0739	W	Detail showing stone area (107). A 5.
63	TAC-0740	S	Detail showing stone area (107). A 5. inspection chamber.
64	TAC-0741	S	Detail showing stone area (107). A 5. inspection chamber.
65	TAC-0742	S	Detail showing stone area (107). A 5.-3D model data.
66	TAC-0743	S	Detail showing stone area (107). A 5. 3D model data.
67	TAC-0744	S	Detail showing stone area (107). A 5. 3D model data.
68	TAC-0745	S	Detail showing stone area (107). A 5. 3D model data.
69	TAC-0746	S	Detail showing stone area (107). A 5. 3D model data.
70	TAC-0747	S	Detail showing stone area (107). A 5. 3D model data.
71	TAC-0748	S	Detail showing stone area (107). A 5. 3D model data.
70	TAC-0749	S	Detail showing stone area (107). A 5. 3D model data.
71	TAC-0750	S	Detail showing stone area (107). A 5. 3D model data.
72	TAC-0751	S	Detail showing stone area (107). A 5. 3D model data.
73	TAC-0752	S	Detail showing stone area (107). A 5. 3D model data.
74	TAC-0753	S	Detail showing stone area (107). A 5. 3D model data.
75	TAC-0754	S	Detail showing stone area (107). A 5. 3D model data.
76	TAC-0755	S	Detail showing stone area (107). A 5. 3D model data.
77	TAC-0756	S	Detail showing stone area (107). A 5. 3D model data.
78	TAC-0757	-	Detail showing stone area (107). A 5. 3D model data.
79	TAC-0758	-	Detail showing stone area (107). A 5. 3D model data.
80	TAC-0762	N	Detail showing stone area (107). A 5. 3D model data.
81	TAC-0763	N	Detail showing stone area (107). A 5. 3D model data.
82	TAC-0764	N	Detail showing stone area (107). A 5. 3D model data.
83	TAC-0765	N	Detail showing stone area (107). A 5. 3D model data.
84	TAC-0765	N	Detail showing stone area (107). A 5. 3D model data.
85	TAC-0767	N	Detail showing stone area (107). A 5. 3D model data.
86	TAC-0768	W	Detail showing stone area (107). A 5. 3D model data.
87	TAC-0769	E	Detail showing stone area (107). A 5. 3D model data.
88	TAC-0770	E	Detail showing stone area (107). A 5. 3D model data.
89	TAC-0771	E	Detail showing stone area (107). A 5. 3D model data.
90	TAC-0772	S	Detail showing stone area (107). A 5. 3D model data.
91	TAC-0773	-	Detail showing stone area removed from (107). A 5.
92	TAC-0774	-	Detail showing stone area removed from (107). A 5.
93	TAC-0775	-	Detail showing stone area removed from (107). A 5.
94	TAC-0776	-	Detail showing stone area removed from (107). A 5.
95	TAC-0777	S	Detail showing cobbled area (108). A 4- A 5.-3D model data.
96	TAC-0778	S	Detail showing cobbled area (108). A 4- A 5.-3D model data.
97	TAC-0779	S	Detail showing cobbled area (108). A 4- A 5.-3D model data.
98	TAC-0780	S	Detail showing cobbled area (108). A 4- A 5.-3D model data.
99	TAC-0781	S	Detail showing cobbled area (108). A 4- A 5.-3D model data.
100	TAC-0782	W	Detail showing cobbled area (108). A 4- A 5.-3D model data.
101	TAC-0783	W	Detail showing cobbled area (108). A 4- A 5.-3D model data.
102	TAC-0784	W	Detail showing cobbled area (108). A 4- A 5.-3D model data.

PHOTO NUMBER	DIGITAL NUMBER	DIRECTION FACING	DESCRIPTION
103	TAC-0785	W	Detail showing cobbled area (108). A 4- A 5.-3D model data.
104	TAC-0786	W	Detail showing cobbled area (108). A 4- A 5.-3D model data.
105	TAC-0787	W	Detail showing cobbled area (108). A 4- A 5.-3D model data.
106	TAC-0788	W	Detail showing cobbled area (108). A 4- A 5.-3D model data.
107	TAC-0789	W	Detail showing cobbled area (108). A 4- A 5.-3D model data.
108	TAC-0790	S	Detail showing cobbled area (108). A 4- A 5.-3D model data.
109	TAC-0791	S	Detail showing cobbled area (108). A 4- A 5.-3D model data.
110	TAC-0792	N	Detail showing cobbled area (108). A 4- A 5.-3D model data.
111	TAC-0793	N	Detail showing cobbled area (108). A 4- A 5.-3D model data.
112	TAC-0794	N	Detail showing cobbled area (108). A 4- A 5.-3D model data.
113	TAC-0795	N	Detail showing cobbled area (108). A 4- A 5.-3D model data.
114	TAC-0796	S	Overview of service trench. A 4-A 5.
115	TAC-0797	N	Overview of service trench. A 4-A 5.
116	TAC-0798	N	Overview of service trench. A 4-A 5.
117	TAC-0799	-	Detail showing stone area removed from (107). A 5.
118	TAC-0800	-	Detail showing stone area removed from (107). A 5.
119	TAC-0801	N	Detail showing cobbled area (108). Removed A 4- A 5.-3D model data.
120	TAC-0802	N	Detail showing stone area (107). A 5. working
121	TAC-0803	N	Detail showing stone area (107). A 5. working
122	TAC-0804	N	Detail showing stone area (107). A 5. working
123	TAC-0810	N	Detail showing cobbled area (108). A 4- A 5.
124	TAC-0811	S	Detail showing cobbled area (108). A 4- A 5.
125	TAC-0812	E	Detail showing cobbled area (108). A 4- A 5.
126	TAC-0813	E	Detail showing cobbled area (108). A 4- A 5.
127	TAC-0814	E	Detail showing cobbled area (108). A 4- A 5.
128	TAC-0815	N	General view A 4 working
129	TAC-0816	E	Detail showing cobbled area (108). A 4- A 5. note cut end.
130	TAC-0817	E	Detail showing cobbled area (108). A 4- A 5. note cut end.
131	TAC-0818	W	Section above (108).
132	TAC-0819	N	Detail showing cobbled area (108). A 4- A 5. note cut end.
133	TAC-0820	N	Detail showing cobbled area (108). A 4- A 5. note cut end.
134	TAC-0821	N	Detail showing cobbled area (108). A 4- A 5. note cut end.
135	TAC-0822	N	Detail showing cobbled area (108). A 4- A 5. note cut end.
136	TAC-0823	-	General view of work in progress.
137	TAC-0824	N	Overview of service trench. A 4-A 5.
138	TAC-0856	N	Detail showing footings in A 4.
139	TAC-0856	N	Detail showing footings in A 4.
140	TAC-0857	N	Detail showing footings in A 4.
141	TAC-0858	S	Detail showing footings in A 4. Pipe cut.
142	TAC-0859	S	Detail showing footings in A 4. Pipe cut.
143	TAC-0860	N	Detail showing footings in A 4.
144	TAC-0861	N	Detail showing footings in A 4.
145	TAC-0862	E	Detail showing brick in pipe cut section.
146	TAC-0863	E	Detail showing brick in pipe cut section. 3D model data.
147	TAC-0864	E	Detail showing brick in pipe cut section. 3D model data.
148	TAC-0865	E	Detail showing brick in pipe cut section. 3D model data.
149	TAC-0866	E	Detail showing brick in pipe cut section. 3D model data.
150 T	AC-0867	E	Detail showing brick in pipe cut section. 3D model data.
151			
152	TAC-0868	E	Detail showing brick in pipe cut section. 3D model data.
153	TAC-0869	E	Detail showing brick in pipe cut section. 3D model data.
154	TAC-0870	E	Detail showing brick in pipe cut section. 3D model data.
155	TAC-0871	S	Detail showing brick in pipe cut section. 3D model data.

PHOTO NUMBER	DIGITAL NUMBER	DIRECTION FACING	DESCRIPTION
156	TAC-0872	S	Detail showing brick in pipe cut section. 3D model data.
157	TAC-0873	S	Detail showing brick in pipe cut section. 3D model data.
158	TAC-0874	S	Detail showing brick in pipe cut section. 3D model data.
159	TAC-0875	S	Detail showing brick in pipe cut section. 3D model data.
160	TAC-0876	S	Detail showing brick in pipe cut section. 3D model data.
161	TAC-0877	S	Detail showing brick in pipe cut section. 3D model data.
162	TAC-0878	S	Detail showing brick in pipe cut section. 3D model data.
163	TAC-0879	W	Detail showing brick in pipe cut section. 3D model data.
164	TAC-0880	W	Detail showing brick in pipe cut section. 3D model data.
165	TAC-0881	W	Detail showing brick in pipe cut section. 3D model data.
166	TAC-0882	W	Detail showing brick in pipe cut section. 3D model data.
167	TAC-0883	N	Detail showing pipe cut section. 3D model data.
168	TAC-0884	N	Detail showing pipe cut section. 3D model data.
169	TAC-0885	N	Detail showing pipe cut section. 3D model data.
170	TAC-0886	N	Detail showing pipe cut section. 3D model data.
171	TAC-0887	N	Detail showing pipe cut section. 3D model data.
172	TAC-0888	N	Detail showing pipe cut section. 3D model data.
173	TAC-0889	N	Detail showing pipe cut section. 3D model data.
174	TAC-0890	E	Detail showing pipe cut section. 3D model data.
175	TAC-0891	E	Detail showing pipe cut section. 3D model data.
176	TAC-0892	E	Detail showing pipe cut section. 3D model data.
177	TAC-0893	N	Detail showing pipe cut section. 3D model data.
178	TAC-0894	N	Detail showing pipe cut section. 3D model data.
179	TAC-0915	E	Section detail A 4.
180	TAC-0916	E	Section detail A 4.
181	TAC-0917	E	Section detail A 4.
182	TAC-0918	E	Section detail A 4.
183	TAC-0919	E	Section detail A 4.
184	TAC-0920	S	A 4. Service cut overview.
185	TAC-0921	S	A 4. Service cut overview.
186	TAC-0922	N	A 4. South facing section.
187	TAC-0923	N	A 4. South facing section.
188	TAC-0924	N	A 4. South facing section. Stone dump detail (109)
189	TAC-0925	N	A 4. South facing section. Stone dump detail (109)
190	TAC-0926	N	A 4. South facing section. Stone dump detail (109)
191	TAC-0927	N	A 4. South facing section. Stone dump detail (109)
192	TAC-0928	N	A 4. South facing section. Stone dump detail (109)
193	TAC-0929	N	A 4. South facing section. Stone dump detail (109)
194	TAC-0930	N	A 4. South facing section. Stone dump detail (109)
195	TAC-0931	N	A 4. South facing section. Stone dump detail (109)
196	TAC-1251	S	A 4. Overview of work in progress.
197	TAC-1252	S	A 4. Overview of work in progress.
198	TAC-1253	S	A 4. Overview of work in progress.
199	TAC-1254	S	A 4. Overview of work in progress.
200	TAC-1255	S	A 4. Overview of work in progress.
201	TAC-1256	S	A 4. Overview of work in progress.
202	TAC-1257	S	A 4. Overview of work in progress.
203	TAC-1258	S	A 4. Overview of work in progress.
204	TAC-1259	S	A 4. Overview of work in progress.
205	TAC-1260	S	A 4. Overview of work in progress.
206	TAC-1261	W	A 4. Overview of work in progress. 3D section model data.
207	TAC-1262	W	A 4. Overview of work in progress. 3D section model data.
208	TAC-1263	W	A 4. Overview of work in progress. 3D section model data.

PHOTO NUMBER	DIGITAL NUMBER	DIRECTION FACING	DESCRIPTION
209	TAC-1264	W	A 4. Overview of work in progress. 3D section model data.
210	TAC-1265	W	A 4. Overview of work in progress. 3D section model data.
211	TAC-1266	W	A 4. Overview of work in progress. 3D section model data.
212	TAC-1267	W	A 4. Overview of work in progress. 3D section model data.
213	TAC-1268	W	A 4. Overview of work in progress. 3D section model data.
214	TAC-1269	W	A 4. Overview of work in progress. 3D section model data.
215	TAC-1270	W	A 4. Overview of work in progress. 3D section model data.
216	TAC-1271	W	A 4. Overview of work in progress. 3D section model data.
217	TAC-1272	W	A 4. Overview of work in progress. 3D section model data.
218	TAC-1273	W	A 4. Overview of work in progress. 3D section model data.
219	TAC-1274	W	A 4. Overview of work in progress. 3D section model data.
220	TAC-1275	W	A 4. Overview of work in progress. 3D section model data.
221	TAC-1276	W	A 4. Overview of work in progress. 3D section model data.
222	TAC-1277	W	A 4. Overview of work in progress. 3D section model data.
223	TAC-1278	W	Overview A 4 working in progress.
224	TAC-1279	S	Overview A 4 working in progress.
225	TAC-1280	W	A 4. General view of section details.
226	TAC-1281	W	A 4. General view of section details.
227	TAC-1282	W	A 4. General view of section details.
228	TAC-1283	W	A 4. General view of section details.
229	TAC-1284	W	A 4. General view of section details.
230	TAC-1285	W	A 4. General view of section details.
231	TAC-1286	N	Overview of work in progress A 4-A 3.
232	TAC-1287	N	Overview of work in progress A 4-A 3.
233	TAC-1288	-	Overview of work in progress A 4-A 3.
234	TAC-1289	-	Overview of work in progress A 4-A 3.
235	TAC-1290	-	Overview of work in progress A 4-A 3.
236	TAC-1291	-	Overview of work in progress A 4-A 3.
237	TAC-1292	-	Overview of work in progress A 4-A 3.
238	TAC-1293	-	Overview of work in progress A 4-A 3.
239	TAC-1294	-	Overview of work in progress A 4-A 3.
240	TAC-1295	-	Overview of work in progress A 4-A 3.
241	TAC-1296	-	Overview of work in progress A 4-A 3.
242	TAC-1297	-	Overview of work in progress A 4-A 3.
243	TAC-1298	-	Overview of work in progress A 4-A 3.
244	TAC-1299	-	Overview of work in progress A 4-A 3.
245	TAC-1300	-	Overview of work in progress A 4-A 3.
246	TAC-1301	E	Section detail A 3 – 3D model data.
247	TAC-1302	E	Section detail A 3 – 3D model data.
248	TAC-1303	E	Section detail A 3 – 3D model data.
249	TAC-1304	E	Section detail A 3 – 3D model data.
250	TAC-1305	E	Section detail A 3 – 3D model data.
251	TAC-1306	E	Section detail A 3 – 3D model data.
252	TAC-1307	E	Section detail A 3 – 3D model data.
253	TAC-1308	E	Section detail A 3 – 3D model data.
254	TAC-1309	E	Section detail A 3 – 3D model data.
255	TAC-1310	E	Section detail A 3 – 3D model data.
256	TAC-1311	E	Section detail A 3 – 3D model data.
257	TAC-1312	E	Section detail A 3 – 3D model data.
258	TAC-1313	E	Section detail A 3 – 3D model data.
259	TAC-1314	E	Section detail A 3 – 3D model data.
260	TAC-1315	E	Section detail A 3 – 3D model data.
261	TAC-1316	E	Section detail A 3 – 3D model data.

PHOTO NUMBER	DIGITAL NUMBER	DIRECTION FACING	DESCRIPTION
262	TAC-1317	E	Section detail A 3 – 3D model data.
263	TAC-1318	E	Section detail A 3 – 3D model data.
264	TAC-1319	E	Section detail A 3 – 3D model data.
265	TAC-1320	E	Section detail A 3 – 3D model data.
266	TAC-1321	E	Section detail A 3 – 3D model data.
267	TAC-1322	N	Overview of work in progress. A 3.
268	TAC-1323	N	Overview of work in progress. A 3.
269	TAC-1324	N	Overview of work in progress. A 3.
270	TAC-1325	N	Overview of work in progress. A 3.
271	TAC-1326	-	Overview of work in progress. A 3.
272	TAC-1327	N	Overview of work in progress. A 3.
273	TAC-1328	N	Overview of work in progress. A 3.
274	TAC-1329	N	Overview of work in progress. A 3.
275	TAC-1330	N	Overview of work in progress. A 3.
276	TAC-1331	N	Overview of work in progress. A 3.
275	TAC-1332	N	Overview of work in progress. A 3.
276	TAC-1333	-	-
277	TAC-1334	-	-
278	TAC-1335	-	-
279	TAC-1336	-	-
280	TAC-1337	N	Overview A 3-A 2. Work in progress.
281	TAC-1338	N	Overview A 3-A 2. Work in progress.
282	TAC-1339	E	Overview A 3-A 2. Work in progress. Section detail.
283	TAC-1340	E	Overview A 3-A 2. Work in progress. Section detail.
284	TAC-1341	E	Overview A 3-A 2. Work in progress. Section detail.
285	TAC-1342	E	Overview A 3-A 2. Work in progress. Section detail.
286	TAC-1343	E	Overview A 3-A 2. Work in progress. Section detail.
287	TAC-1344	E	Overview A 3-A 2. Work in progress. Section detail.
288	TAC-1345	S	Overview A 3-A 2. Work in progress.
289	TAC-1346	S	Overview A 3-A 2. Work in progress.
290	TAC-1347	S	Overview A 3-A 2. Work in progress.
291	TAC-1348	-	-
292	TAC-1349	-	-
293	TAC-1350	-	-
294	TAC-1351	N	Overview A 3-A 2. Work in progress.
295	TAC-1352	N	Overview A 3-A 2. Work in progress.
296	TAC-1353	E	Overview A 3-A 2. Work in progress. Running Section detail.
297	TAC-1354	E	Overview A 3-A 2. Work in progress. Running Section detail.
298	TAC-1355	E	Overview A 3-A 2. Work in progress. Running Section detail.
299	TAC-1356	E	Overview A 3-A 2. Work in progress. Running Section detail.
300	TAC-1357	E	Overview A 3-A 2. Work in progress. Running Section detail.
301	TAC-1358	E	Overview A 3-A 2. Work in progress. Running Section detail.
302	TAC-1359	E	Overview A 3-A 2. Work in progress. Running Section detail.
303	TAC-1360	E	Overview A 3-A 2. Work in progress. Running Section detail.
304	TAC-1361	E	Overview A 3-A 2. Work in progress. Running Section detail.
305	TAC-1362	S	Overview A 3-A 2. Work in progress.
306	TAC-1363	S	Overview A 3-A 2. Work in progress.
307	TAC-1364	E	Overview A 3-A 2. Work in progress. Section detail.
308	TAC-1365	N	Overview A 3-A 2. Work in progress. Section detail.
309	TAC-1366	N	Overview A 3-A 2. Work in progress. Section detail.
310	TAC-1367	E	Overview A 3-A 2. Work in progress. Section detail.
311	TAC-1368	-	Overview A 3-A 2. Work in progress. Section detail.
312	TAC-1369	-	Overview A 3-A 2. Work in progress. Section detail.

PHOTO NUMBER	DIGITAL NUMBER	DIRECTION FACING	DESCRIPTION
313	TAC-1370	-	Overview A 3-A 2. Work in progress. Section detail.
314	TAC-1371	-	Overview A 3-A 2. Work in progress. Section detail.
315	TAC-1372	-	Overview A 3-A 2. Work in progress. Section detail.
316	TAC-1373	-	Overview A 3-A 2. Work in progress. Section detail.
317	TAC-1374	-	Overview A 3-A 2. Work in progress. Section detail.
318	TAC-1375	-	Overview A 3-A 2. Work in progress. Section detail.
319	TAC-1376	-	Overview A 3-A 2. Work in progress. Section detail.
320	TAC-1377	-	Overview A 3-A 2. Work in progress. Section detail.
321	TAC-1378	-	Overview A 3-A 2. Work in progress. Section detail.
322	TAC-1379	-	Overview A 3-A 2. Work in progress. Section detail.
323	TAC-1380	-	Overview A 3-A 2. Work in progress. Section detail.
324	TAC-1381	-	Overview A 3-A 2. Work in progress. Section detail.
325	TAC-2101	W	A 1. Well detail.
326	TAC-2102	W	A 1. Well detail.
327	TAC-2103	W	Overview-section detail inspection chamber. A 1
328	TAC-2104	W	Overview-section detail inspection chamber. A 1
329	TAC-2105	S	A 1. Well detail.
330	TAC-2106	S	A 1. Well detail.
331	TAC-2107	S	Overview - A 1. Well detail.
332	TAC-2108	S	Overview - A 1. Well detail.
333	TAC-2109	N	A 1. Well detail.
334	TAC-2110	N	A 1. Well detail.
335	TAC-2111	E	Overview - A 1. Work in progress.
336	TAC-2112	E	Overview - A 1. Work in progress.
337	TAC-2113	N	Overview - A 1. Work in progress.
338	TAC-2114	N	Overview - A 1. Work in progress.
339	TAC-2115	N	Overview - A 1. Work in progress.
340	TAC-2116	N	Overview - A 1. Work in progress.
341	TAC-2117	N	Overview - A 1. Work in progress.
342	TAC-2118	N	A 1. Well detail.
343	TAC-2119	N	Overview - A 1. Work in progress.
344	TAC-2120	S	Overview - A 1. Work in progress.
345	TAC-2121	S	Overview – A 2-A 3. Backfilled.
346	TAC-2122	S	Overview – A 2-A 1. Backfilled.
347	TAC-2123	S	Overview – A 2-A 1. Backfilled.
348	TAC-2124	W	Overview A 2. Section detail.
349	TAC-2125	W	Overview A 2. Section detail.
350	TAC-2126	W	Overview A 2. Section detail.
351	TAC-2127	N	Overview – A 2. Work in progress.
352	TAC-2128	W	Overview - A 1. Well detail. 3D model data.
353	TAC-2129	W	Overview - A 1. Well detail. 3D model data.
354	TAC-2130	W	Overview - A 1. Well detail. 3D model data.
355	TAC-2131	W	Overview - A 1. Well detail. 3D model data.
356	TAC-2132	W	Overview - A 1. Well detail. 3D model data.
357	TAC-2133	S	Overview - A 1. Well detail. 3D model data.
358	TAC-2134	-	-
359	TAC-2135	W	Overview - A 1. Well detail. 3D model data.
360	TAC-2136	W	Overview - A 1. Well detail. 3D model data.
361	TAC-2137	W	Overview - A 1. Well detail. 3D model data.

