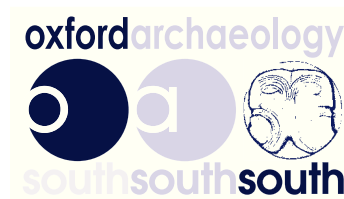


Sewer Ejector Replacement Round Kitchen Court Hampton Court Palace



Archaeological Watching Brief Report



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Sewer Ejector Replacement, Round Kitchen Court, Hampton Court Palace

Archaeological Watching Brief Report

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Summary

Between November and December 2012 OA was commissioned by Historic Royal Palaces to monitor ground excavations in connection with the replacement of four sewage injector pipes. The only archaeology observed was two possible demolition/make-up layers which had been truncated by modern services.

1 INTRODUCTION

1.1 Scope of work

- 1.1.1 Oxford Archaeology (OA) was commissioned by Historic Royal Palaces (HRP) to undertake a 'close' Watching Brief during the necessary replacement of the old and worn subterranean sewer ejector pumps, and their associated compressed air and electrical pipes, within Round Kitchen Court, Hampton Court Palace (Scheduled Monument No. LO 83) (Fig. 1).
- 1.1.2 Works by or on behalf of Historic Royal Palaces have Crown Exemption from statutory Scheduled Monument Consent controls under section 50 of the Ancient Monuments and Archaeological Areas Act 1979. The application was therefore treated as a non-statutory application for Scheduled Monument Clearance in accordance with paragraph 23 of DCMS, Scheduled Monuments. Identifying, protecting, conserving and investigating nationally important archaeological sites under the Ancient Monuments and Archaeological Areas Act 1979 (March 2010).
- 1.1.3 Scheduled Monument Clearance was granted on behalf of DCMS by Michael Turner, MVO, FSA, Inspector of Ancient Monuments and Historic Buildings, of the Government Historic Estates Unit, English Heritage under paragraph 23 of DCMS, Scheduled Monuments, Case No. S00042161 Round Kitchen Court sewage ejector. An Archaeological Written Scheme of Investigation which defined the methodology to minimise disturbance to, and record any exposure of the buried heritage resource was included as a condition of the Clearance (OA, 2012).
- 1.1.4 The works, which involved the re-excavation, by a groundworks contractor, of the original service pipe trench were allocated Archive Code HCP 92 and took place between November and December 2012, under the attendance of a qualified archaeologist from Oxford Archaeology.

1.2 Location, geology and topography

- 1.2.1 The Site, centred on NGR 5157 1684, lies within Round Kitchen Court at the historical heart of Hampton Court Palace (Fig. 1). The sewer ejectors were located within a 2m sq. chamber (accessed through a centrally positioned manhole – MH2) in the north-east corner of the courtyard. The existing cabling and pipework ran below ground, from the south-west corner of MH2 across the courtyard to then pass through the easternmost point of the wall of the southern room (the Control Room) of the 'Round Kitchen' in the centre of Round Kitchen Court (Fig. 2).
- 1.2.2 The Site lies on the First Gravel Terrace drift geology of the river Thames, which overlies London Clay at c. 9 m AOD.
- 1.2.3 The Site was paved in formally and randomly arranged stone cobbles cemented in place.



1.3 Archaeological and historical background

- 1.3.1 The archaeological and historical background detailed below has been taken from the *Sewer Ejector Replacement, Round Kitchen Court, Hampton Court Palace: Written Scheme of Investigation* (OA, 2012).
- 1.3.2 The historical background to Hampton Court Palace is well known and shall not be repeated here, suffice to say that Round Kitchen Court is located within the structural core of the royal palace, and similarly at the centre of the sites former phases of use as a medieval Preceptory belonging to the Knights Hospitallers, a residence for a leading member of the Henry VII's Tudor Court, and an Ecclesiastical Palace for Cardinal Wolsey.
- 1.3.3 Four locations (Trenches 3, 4, 30 and 31) were observed and recorded in Round Kitchen Court as part of an Archaeological Watching Brief during the renewal of the pipework for the palaces main gas supply, archive code HCP 43, (OA, 2004). The results of these trenches are repeated, in full, below and are shown in relation to the results of the 'close' Watching Brief on Figure 2.

HCP 43; Trench 3

- 1.3.4 Trench 3 was located inside Round Kitchen Court on the opposite side of the cloister wall to Trench 2. It was dug to an average depth of 0.8m keeping within the confines of the original gas-main cut (0306) as much as possible. Partial excavation of deposits beyond the boundaries of 0306 took place due to collapse of the trench sides.
- 1.3.5 Significant archaeology was seen at the southern end of this trench and took the form of a brick structure (0303) that had been damaged by the gas-main cut. Collapse of the eastern section of the trench revealed that structure 0303 was part of a disused culvert aligned on an east/west axis. No sign of the culvert was seen in the western section of the trench as this was occupied by an ejector pit but close examination of the culvert brickwork shows a clean western face, suggesting that this marks the terminus.
- 1.3.6 From the limited excavation around the culvert it was noted that it had thick vertical sides with an arched inner channel. Only one side to the culvert was seen and appeared to have a thickness in excess of 0.45m. It was built from bricks laid in courses with an English bond. The external height of the culvert is unknown, as the top has been truncated by cut 0306 and by additional service installation.
- 1.3.7 From the shape of the inner arch of the culvert, its exterior width is estimated at around 1.2m. Brick and mortar samples were recovered for further analysis (Brick No.4, Mortar No. 12).
- 1.3.8 Partial excavation of the deposits within the culvert revealed two fills. The lower fill (0305) was a loose rubble of brick fragments and mortar. The full depth of this deposit is not known but is in excess of 0.2m. It is likely to derive from debris generated by the gas-main installation, which truncated the roof of the culvert. The upper fill (0302) of the culvert was similar material to the gas-main backfill. The brick sample (Brick No.4), originally from the culvert arch, was recovered from this deposit.

HCP 43; Trench 4

- 1.3.9 The trench was situated against the eastern side of Round Kitchen Court, and measured 10m in length and between 0.6m to 0.8m wide. The gas-main backfill (0402) - a loose dark grey silty sand - was removed to a depth of 1.1m but not bottomed. Collapse of parts of the trench sides revealed *in situ* archaeological features.



- 1.3.10 Close to the northern end of the trench the brick-built remains of a culvert (0408), oriented NE-SW, with vertical sides and an arched roof, were revealed (Section 5). The exposed remains were 0.6m high with an internal width of 0.35m. No construction cut was visible for the culvert but deposits butting up against and overlying the culvert appear to be associated with back filling of the construction trench.
- 1.3.11 The earliest of these was a compact dark grey silty sand (0418) containing 20% fragmented brick, tile and mortar, deposited against the northern side of the culvert. Overlaying this deposit was a compact orange silty sand (0416), 0.7m in depth. This layer totally covered the culvert and in turn was overlaid by layer of light brown yellow sand (0410) 0.1m in depth. Sealing layer 0410 was a mid grey silty sand (0409) with a maximum thickness of 0.38m, itself overlaid by the cobbled yard (0401). The cobbles revealed in the trench section were unmortared, in contrast to those replaced when the original gas-main was installed, which had been mortared.
- 1.3.12 The disused culvert had silted up with loose, dark grey silty sand (0417). A mortar sample was recovered from this deposit (Mortar No. 1)
- 1.3.13 Opposite the remains of 0408 in the eastern section (Section 6 - not illustrated) were further brick remains (0419). Although these had been greatly damaged by the gas-main installation and more recent construction of a drain inspection pit, it likely that they represent a continuation of the culvert 0408 to the north-east.
- 1.3.14 At the southern end of the trench the foundations to Chapel Cloister walls (0412) were exposed. The brick footings extended a distance of 0.9m below ground level where they rested upon a chalk footing (0411), the depth of which was not revealed. The brick footing displayed the same English bond pattern seen above ground.
- 1.3.15 It was noted that the gas-main had been inserted through a hole (0415) driven through the brick footings. This hole measured 0.8m x 0.6m and had been infilled around the installed gas pipe with a cement plug (0414). It was also noted that at this point that the wall had been underpinned with new brickwork (0404), replacing the chalk foundations (0411).
- 1.3.16 Further alterations to the wall had occurred when a water pipe had been inserted through the wall at an oblique angle, with the footing face repaired with mortar and yellow brickwork (0413).

HCP 43; Trench 30

- 1.3.17 Following investigation by fibre-optic survey it was apparent that an extra trench would be needed between Trench 3 and Trench 4, in order to locate a dip in the gas-main, which would have to be removed. The resulting trench was situated alongside the eastern wall of Round Kitchen Court, and measured 1.2m north-south x 0.8m west-east. It was excavated to a depth of 1.1m, restricted to the gas pipe trench backfill (3015) and a small amount of disturbed ground (3012) on the eastern side of the trench. Archaeology was encountered in the base of the trench at a depth of 0.85m and in western section beginning at a depth of 0.1m and extending down to and beyond the base of the trench. Possible archaeological layers were also seen in the western section.
- 1.3.18 The earliest feature was a mortared brickwork structure (3010) that had been badly damaged following gas pipe installation. The depth of the structure could not be ascertained as it continued below the base of the trench. The brickwork took the form of a 90° corner structure at an alignment of 45° to the alignment of the trench and the Chapel Cloister wall less than half a metre to the east. The exposed remains had a



maximum width in excess of 1.2m north to south (trench length) at the eastern edge of the trench coming to a point at the west. The structure was of red bricks (measuring 220mm x 100mm x 55-60mm) laid in courses with an English bond. A mortar sample (No.13) was recovered from the structure.

- 1.3.19 Other than the gas pipe trench backfill, which covered most of this structure, two other layers were seen in the eastern section. Structure 3010 was overlaid by a loose dark grey silty sand (3013), 0.45m deep, containing 25% brick fragments. Sealing 3013 was a dark brown silty sand (3012) with 10% inclusions of building fragments. The surface cobbles at this point are cemented in place, suggesting that both 3013 and 3012 derive from the excavation of the original gas-main trench.
- 1.3.20 Extending from the corner of structure 3010 into the western baulk (Section 10) were the remains of a wall (3009) constructed from a much duller red coloured brick with light brown mortar bonding (Mortar no. 13). The brickwork survived in the section to a height of 0.8m, and measured 0.35m wide. The bricks were slightly bigger than those seen in 3010 being 225mm x 100mm x 60mm. No construction cut was seen for this feature.
- 1.3.21 On the south side of wall 3009, the earliest deposit revealed in section was a compact orange brown sand (3007) with occasional brick fragments. It had a depth of over 0.4m and was also present in the bottom of the trench at the southern end butting up to structure (3010).
- 1.3.22 This layer was overlaid by a compact orange/brown sandy clay (3006) measuring 0.25m deep, containing a small amount of brick and tile fragments, and overlaid by a thin band of black charcoal (3005), measuring 0.02m thick.
- 1.3.23 Layer 3005 was sealed by a 0.25m thick layer of loose dark grey/brown sandy silt (3004) with 3% building fragments within its matrix, which extended over the surviving top of wall 3009.
- 1.3.24 On the northern side of wall 3009, the earliest deposit was a compact dark grey/brown coarse sand (3008) containing 10% small mortar and brick fragments, and measuring at least 0.60m deep. This was cut by a shallow 'U'-shaped gully (3003) containing a modern service pipe and backfill (3002). This whole section was sealed by the cobbled yard surface (3001), which on this side of the trench were not cemented in place.
- 1.3.25 A significant quantity of residual finds, including bricks (Nos 2 and 3) were recovered from the backfill (3015) of the gas-main cut (3014).

HCP 43; Trench 31

- 1.3.26 This extra trench was situated across the front of the boiler house in Round Kitchen Court, and was dug to gain access to the spur that ran from the main gas pipe toward the west. The trench measured 5m west-east x 0.8m north-south with a 1.5m long spur at its eastern end. The excavated depth varied from 0.9m to 1.0m.
- 1.3.27 The deposits under the modern surface had clearly suffered much disturbance from the insertion of various services in addition to the gas-main. As a result it was not possible to distinguish the cut for the gas-main as the fill (3102 - a loose mid brown silty sand containing 5% brick fragments and gravels) was extremely similar to the disturbed ground. Despite the disturbance, the remains of two culverts were revealed in the sides of the trench.
- 1.3.28 The remains of culvert 3104, revealed in the trench spur, were very fragmented due to the damage caused by the gas-main with only partial remains of the sides being visible.



It was not possible to determine precise measurements of the brickwork. It is thought to be the same structure as culvert 0408 that was seen in the north end of Trench 4.

- 1.3.29 The second culvert (3105) was revealed emerging from the southern baulk (Section 15). It had a circular form with an internal diameter of 0.3m and was constructed from bricks noticeably different from those in structure 3104. The bricks, laid in stretcher bond, were red in colour, and measured 220mm x 110mm x 65mm and appeared to have 'frogs' in the upper surface. The culvert contained a loose silty sand (3103), within which were a number of bricks, the remains of the culvert roof damaged by the gas pipe installation. A sample brick was recovered (Brick no.5).

2 PROJECT AIMS AND METHODOLOGY

2.1 Aims

2.1.1 The aims of the project were to:

- (i) To identify and record the presence or absence, extent, condition, quality and date of archaeological remains in the impacted area;
- (ii) To preserve by record any archaeological remains (if present) that the works may remove or damage within the impacted area; and
- (iii) To make available the results of archaeological investigation.

2.2 Specific aims and objectives

2.2.1 The specific aims and objectives of the project were to:

- (iv) To minimise any impacts on potential surviving archaeological remains, both prior to commencement by planning the works using existing archaeological data and subsequently during the works;
- (v) To assist the groundworkers to identify the cuts and backfill material of previous services works and to direct the work to coincide with this positions;
- (vi) Upon removal of the backfills any archaeological remains exposed in the service trench sections will be recorded; and
- (vii) To consider the results of any excavated material in the context of the nearby extant structural elements, and the previously recorded archaeological remains.

2.3 Methodology

- 2.3.1 The attending archaeologist from OA was present during all excavation groundworks and advised and guided the groundworkers.
- 2.3.2 The works commenced from the easternmost point along the outside of the Control Room (where the cables enter the Control Room) and worked towards the location of the ejector pumps (south-west corner of the chamber under MH2).
- 2.3.3 The original service trench was located and re-excavated with the groundworkers directed by the attending archaeologist as to where to excavate to remove the backfill which minimised any impacts on potential archaeological remains beyond the limits of the original limits of the service trench.
- 2.3.4 Damage was prevented to existing archaeological remains, and records were made of any archaeological deposits revealed.



3 RESULTS

3.1 Description of deposits

- 3.1.1 No significant archaeological deposits were observed during the close watching brief.
- 3.1.2 The majority of the base of the excavation and the south and east facing sections remained within the backfill of the original service trench. A large amount of 'modern' disturbance was noted along the length of the trench, especially next to the Control Room and the manhole MH2. Only two archaeological deposits were observed, as discussed below.
- 3.1.3 Layer 5, a firm light red/brown silty sand containing frequent charcoal, CBM and mortar flecks and pockets of grey silt, was observed along the length of the excavations, and was observed mostly in the west facing section and occasionally at the base of the trench. This deposit was located between 0.42 -0.56 m below current ground levels and was 0.15 m+ thick.
- 3.1.4 Layer 11, a soft light brown/pink silty sand with moderate CBM flecks and frequent sub-angular gravel, was localised to the east facing section at the north end of the excavations. This layer was located at 0.45 m below current ground levels and was 0.04 m+ thick. Layer 11 was heavily truncated by modern service pipe trenches 6 and 8, which also obscured the relationship between layers 5 and 11.

3.2 Finds

- 3.2.1 No finds were recovered during the close watching brief.

3.3 Environmental remains

- 3.3.1 No deposits suitable for environmental sampling were located during the close watching brief

4 DISCUSSION AND CONCLUSIONS

- 4.1.1 It is thought that layers 5 and 11 are probably late medieval/post-medieval levelling or demolition layers. Alternatively these layers could be the backfill of a deeper service such as sewage pipes which were seen running north-south in MH2 and MH3 on roughly the same alignment as the sewer ejector pipes.



APPENDIX A. ARCHAEOLOGICAL CONTEXT INVENTORY

Context	Type	Depth	Width	Length	Comments	Finds	Date
1	Layer	0.13 – 0.16 m	5 m+	5 m+	Modern cobble surface.		
2	Cut	0.33 m	0.72 m	9 m	Sewer ejector ditch.		
3	Fill	-	-	-	Fill of sewer ejector ditch 2.		
4	Layer	0.14 m	1 m+	2 m+	Bedding layer for 1.		
5	Layer	0.15 m+	0.72 m+	9 m+	Possible landscape layer.		
6	Cut	0.31 m+	0.3 m	0.6 m+	Pipe ditch.		
7	Fill	-	-	-	Fill of pipe ditch 6.		
8	Cut	0.34 m	0.43 m	0.6 m+	Pipe ditch.		
9	Fill	-	-	-	Fill of pipe ditch 8.		
10	Structure	0.34 m+	0.2 m+	0.6 m+	MH3.		
11	Layer	0.04 m+	0.4 m+	0.6 m+	Soft light brown/pink silty sand. Moderate CBM flecks, frequent sub-angular gravel. Possible landscape layer, similar to 5.		



APPENDIX B. BIBLIOGRAPHY AND REFERENCES

OA, 2004. *Hampton Court Palace, Gas Main Renewal; Archaeological Watching Brief*

OA, 2012. *Sewer Ejector Replacement, Round Kitchen Court, Hampton Court Palace: Written Scheme of Investigation*



APPENDIX C. SUMMARY OF SITE DETAILS

Site name:	Sewer Ejector Replacement, Round Kitchen Court, Hampton Court Palace
Site code:	HCP92
Grid reference:	Centred at NGR 5157 1684
Type of watching brief:	Close watching brief during replacement of sewer ejector pipes
Date and duration of project:	Seven visits between 7 th November - 4 th December 2012
Area of site:	Trench 9 m long by 0.3 – 0.6 m wide by 0.4 – 0.5 m deep
Summary of results:	Identified two possible levelling/demolition layers truncated by modern services.
Location of archive:	Janus House, Osney Mead, Oxford, OX2 0ES



Figure 1: Site location

X:\HCP92_Round Kitchen Court Sewer Ejectors (HCP92_210512\Geomatics working\HCP92_Fig2_131212_RoundKitchenOnly.dwg(Figure 2))\Hampson Court Great Hall\leo.heatley* 17 Dec 2012

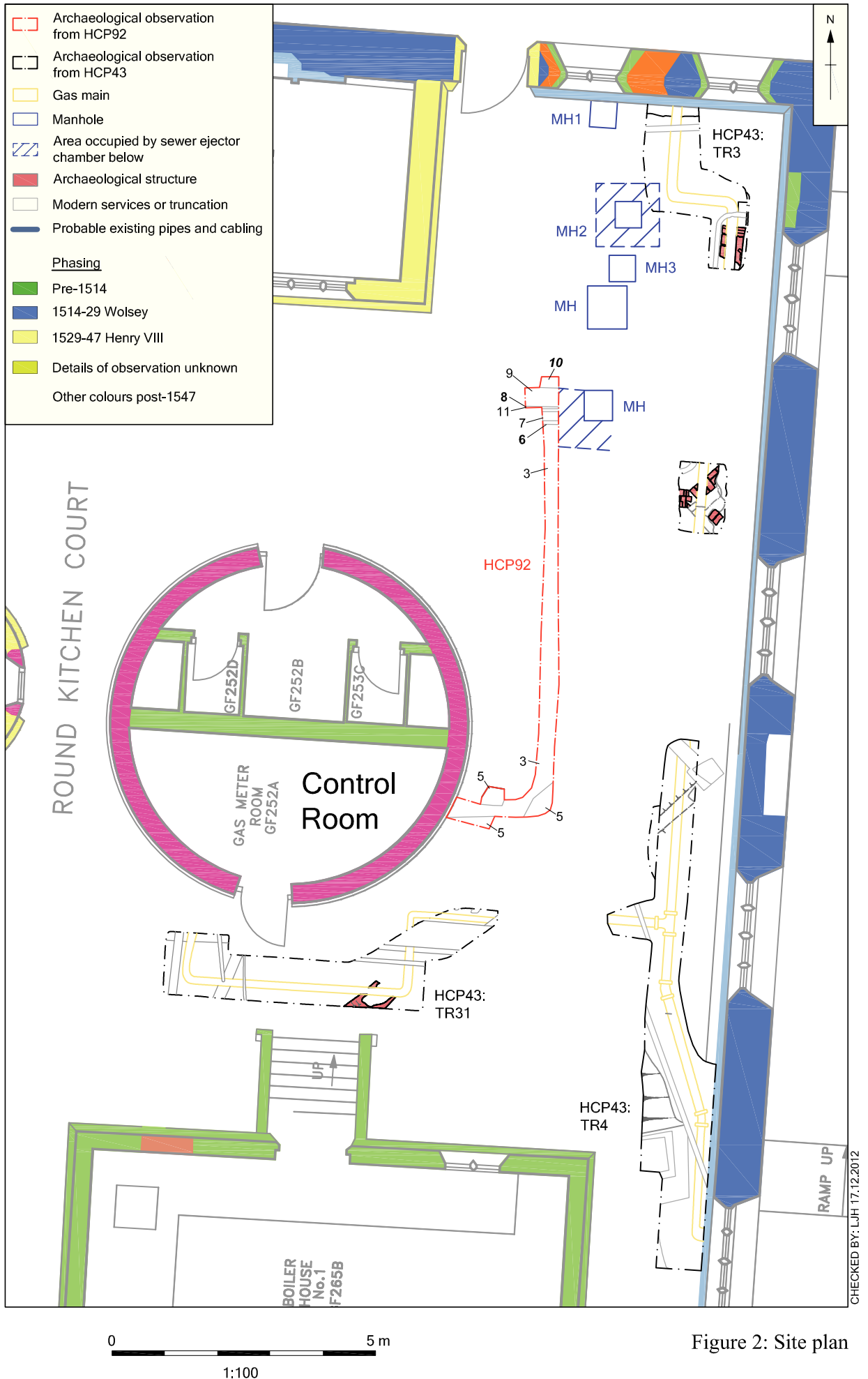


Figure 2: Site plan



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