
Birmingham Resilience Project

Frankley Water Treatment Works, Frankley, Worcestershire:

Historic Building Recording Survey Report

On Behalf of:	Jacobs 7th Floor 2 Colmore Square 38 Colmore Circus Queensway Birmingham B4 6BN <i>On behalf of</i> Severn Trent Water
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This document has been prepared in accordance with AOC standard operating procedures.

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Abstract

AOC Archaeology Group was commissioned by Jacobs UK Limited (Jacobs) to undertake a Level 2 Historic Building Recording Survey of the 1904 Frankley Reservoir and associated Outlet Houses and Inlet House at Frankley Water Treatment Works in Frankley, Worcestershire (centred on NGR: SP 00259 80358). The work was on behalf of Severn Trent Water Ltd for the proposed development of an alternative source of portable water for Birmingham.

The requirement for this historic building recording survey was identified in an Environmental Statement (ES) prepared by Jacobs in 2016. The fieldwork and reporting has been carried out in accordance with a Specification prepared by Jacobs in May 2016, which was agreed with the Worcestershire Archaeology Advisory Service (WAAS) in June 2016.

The Frankley Water Treatment Works was constructed between 1896 and 1904 to distribute a clean water supply to the population of the City of Birmingham from the Elan Valley. The main reservoir to the north-west of the present Frankley Water Treatment Works was built in concrete with a blue brick skin and a red brick parapet wall in a semi-circular shape with a capacity for holding 200,000,000 imperial gallons of water. The two Outlet Houses to the north-west of the reservoir were built identically in red brick with sandstone detailing, although the lead conical roof of the north-easternmost Outlet House (2) was removed and replaced with a flat roof in the 1970s. To the centre of these two Outlet Houses is a smaller rectangular Inlet House, also in red brick with sandstone detailing and a pyramidal roof.

The Frankley Reservoir and its associated Outlet Houses and Inlet House still form an important function providing drinking water to the citizens of Birmingham and, despite the loss of the original 1904 roof to Outlet House 2, and the modern security enclosure to the Inlet House, it has remained an interesting and architectural attractive feature in the landscape and Birmingham City Council consider the assemblage of structures as having regional importance.

It is recommended that no further historic building recording be undertaken on the structures prior to the new developments at Frankley Water Treatment Works.

1 INTRODUCTION

1.1 Project Background

1.1.1 AOC Archaeology Group was commissioned by Jacobs UK Limited (Jacobs) to undertake an Historic Building Recording Survey of the Frankley Reservoir and associated Outlet Houses and Inlet House of the 1904 Frankley Water Treatment Works in Frankley, Worcestershire. The work was carried out on behalf of Severn Trent Water Ltd for the proposed development of an alternative source of potable water for Birmingham.

1.1.2 The proposed project is to provide an alternative source of water from the River Severn to enable the Elan Valley in mid-Wales to be taken out of service for short periods to allow refurbishment work to be carried out. The intention is for the scheme to be operated for periods of around 50 days at a time, during the autumn or winter months when river levels are sufficiently high to enable abstraction without any significant environmental or social impacts. It is anticipated that one 50 day EVA outage would be planned every 1 - 2 years, subject to water availability in the river. The scheme comprises the following principal components:

- a new river intake and pumping station on the River Severn at Lickhill Quarry with a capacity for 130,000 m³/d (ie, 130 million litres/d);
- a raw water transfer pipeline of around 25km in length to Frankley Water Treatment Works;
- a break pressure tank located near to Romsley; and
- upgrades to the existing water treatment works at Frankley to allow treatment of River Severn water, which has higher treatment requirements compared to Elan Valley water.

1.1.3 As part of the proposals for the works, an Environmental Scoping Report (Jacobs 2014) and an Environmental Impact Statement (Jacobs 2015) was prepared which outlined the heritage assets that would be affected by the pipeline. The requirement for this historic building recording survey was identified in an Environmental Statement (ES) prepared by Jacobs in 2016. The fieldwork and reporting has been carried out in accordance with a Specification prepared by Jacobs in May 2016, which was agreed with the Worcestershire Archaeology Advisory Service (WAAS) in June 2016.

1.1.4 The work was undertaken on 9th and 10th June 2016 by Diana Sproat and Gemma Hudson of AOC Archaeology Group in warm dry weather.

1.2 Site Location

1.2.1 Frankley Water Treatment Works is located at Waterworks Drive to the south of the suburb of Bartley Green and the north-east of the suburb of Rubery. It has been built on an underlying geology of Till and glaciofluvial deposits (Jacobs 2015). The underlying Bedrock geology of the Water Treatment Works is red mudstone (from the Averley Member Mudstone) and sandstone (*ibid*). The Reservoir and Outlet Houses and Inlet House are located to the north-west of the present complex and the Reservoir is centred on NGR: SP 00259 80358 (Figure 1). This specific area to the north-west of the Water Treatment Works at Frankley was identified as a heritage asset whose setting would be affected by the upgrading works as part of the Birmingham Resilience Project.

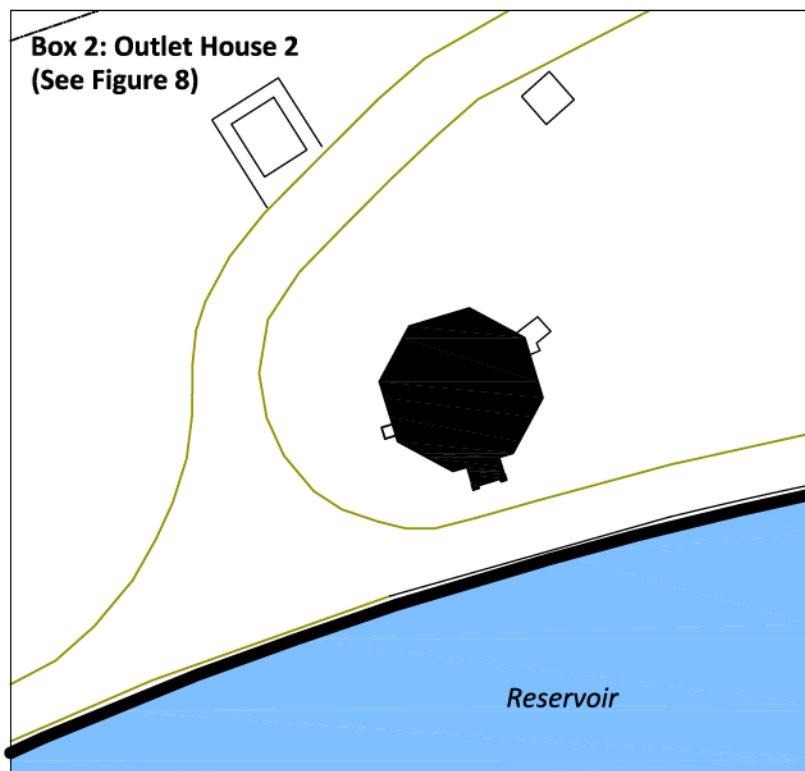
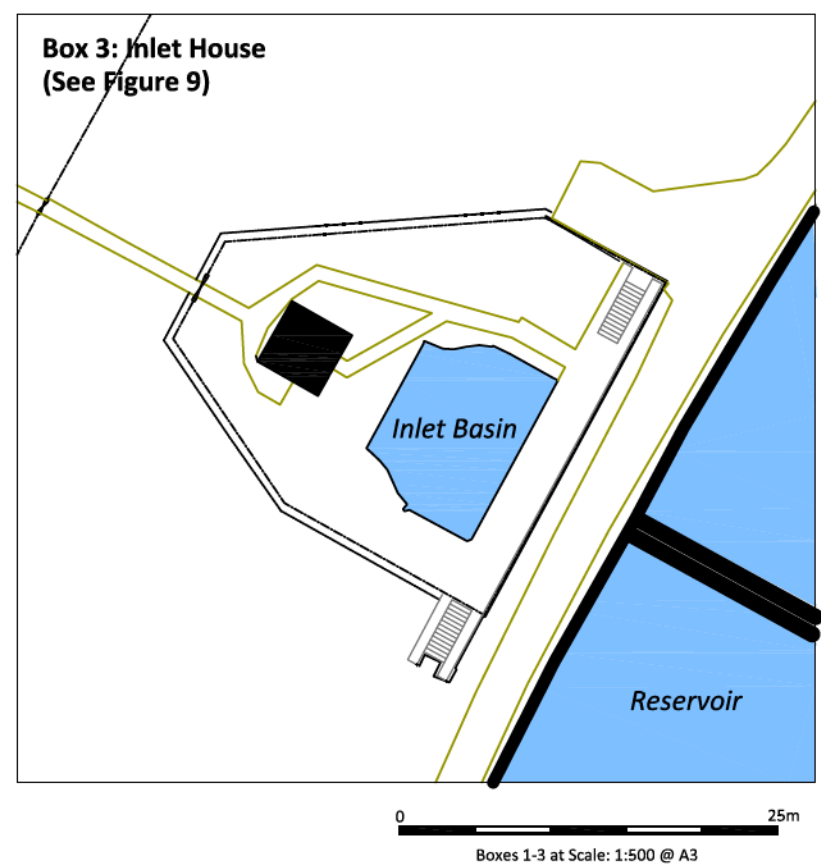
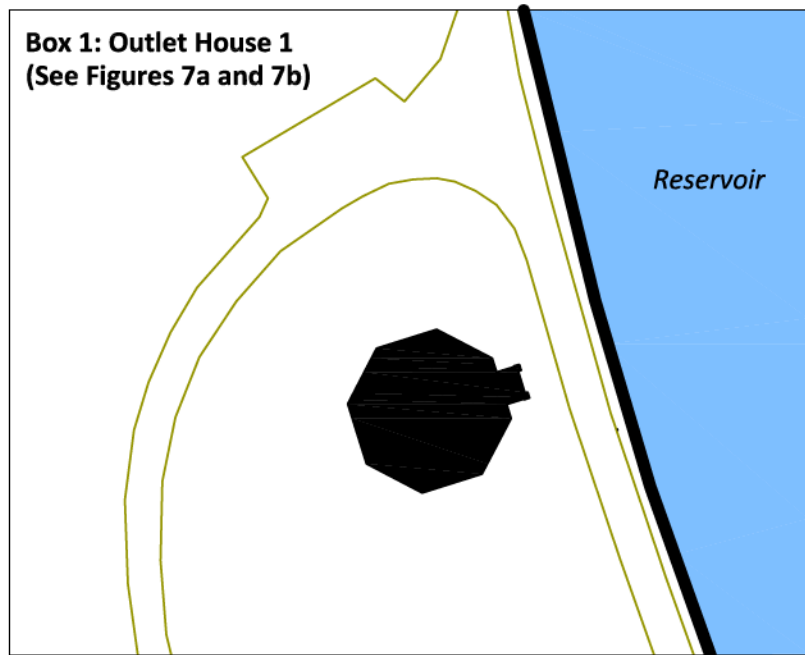
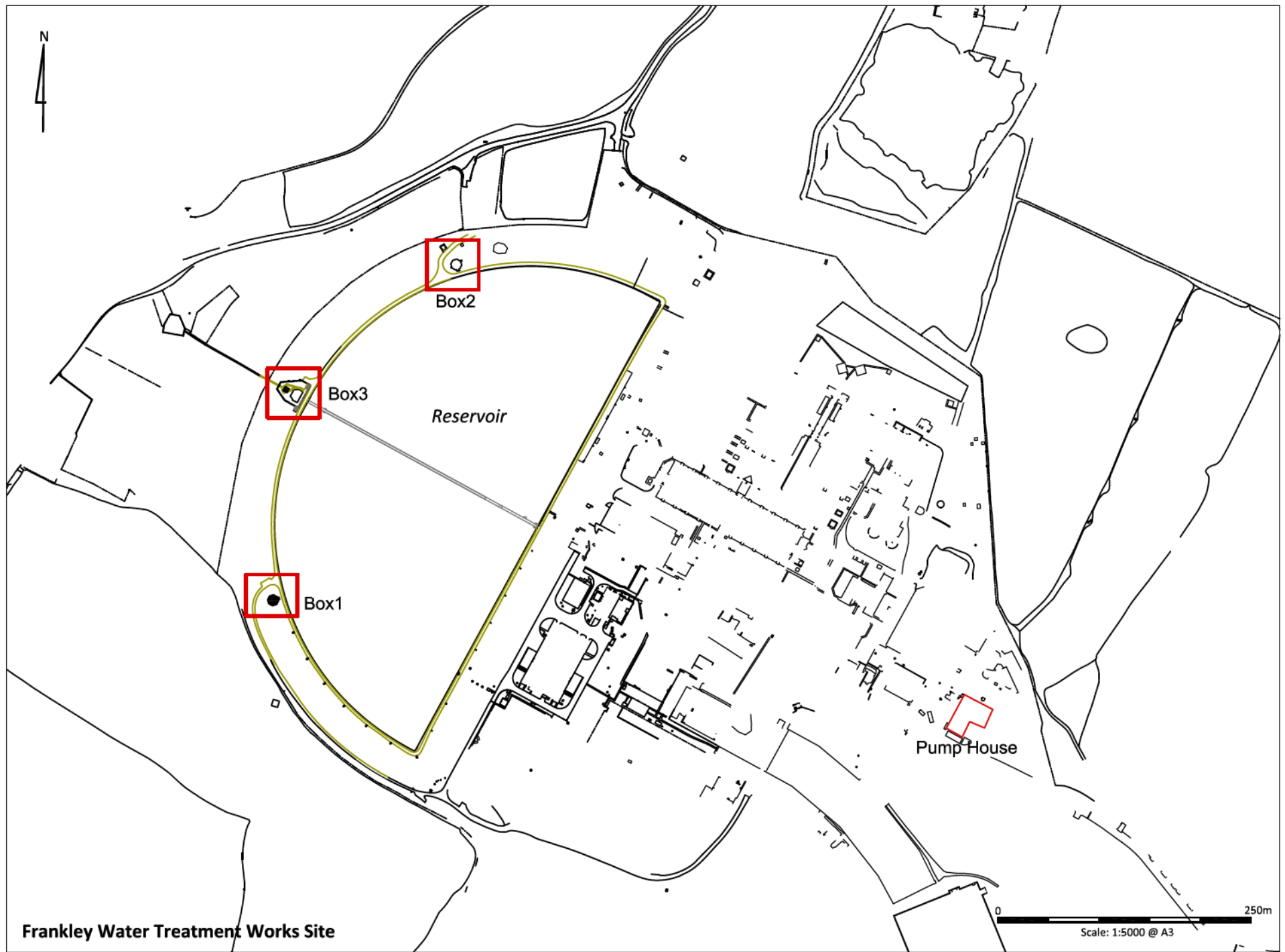


Figure 2: Site Plan

2 AIMS AND OBJECTIVES OF THE SURVEY

- 2.1 The Environmental Statement completed by Jacobs in January 2016 identified that there would be a moderate adverse effect on the setting of Frankley Water Treatment Works “...which comprises the Frankley reservoir and associated valve houses and treatment facilities...” and that “...The upgraded works would result in minor physical alterations to parts of the asset.” (Jacobs 2016, 16). As such, it was recommended, in agreement with WAAS, to undertake an Historic Building Recording survey of these structures, to create a baseline record. The works included archive research, a detailed measured survey including a site plan of the reservoir; a general site plan, elevations, plan and section survey of the Outlet Houses and Inlet House, a photographic survey in black and white print and colour digital, and a written record.

3 METHODOLOGY

3.1 Introduction

- 3.1.1 The methodology used conforms to the project Specification (Jacobs 2016) which was approved by WAAS in June 2016.
- 3.1.2 A Level 2 historic building survey was undertaken on the Frankley Reservoir and three buildings, including two Outlet Houses and an Inlet House, according to the guidelines set out in the Historic England *Understanding Historic Buildings: A Guide to Good Reporting Practice* (2016) and the project Specification (Jacobs 2016). The work has been undertaken to the standards outlined in the Chartered Institute for Archaeologist’s Standard and Guidance for the Archaeological Investigation and Recording of Standard Structures (2014), the Chartered Institute for Archaeologist’s Code of Conduct (2014) and the IHBC Code of Conduct (2003).
- 3.1.3 Information on Frankley Water Treatment Works site was obtained through archive research, including the desk-based assessment completed by Jacobs (2015), enabling the preparation of a written, photographic record and drawn survey, a more detailed methodology of which is outlined below.

3.2 Archive Research

- 3.2.1 Archive research was undertaken to put the results of the survey into context. A comprehensive map-regression exercise was initially undertaken looking at all publicly accessible Ordnance Survey maps prior to and after the Treatment Works were constructed in 1904. The 1842 Tithe Map was also examined at the National Archives, Kew Gardens (Surrey). In addition, archive research was undertaken on the background and history of development of the Treatment Works site, which also included a desk-based assessment on the entirety of the Birmingham Resilience Project (Jacobs 2015). One primary archive source, located and at the Worcestershire Archives at the Hive, Worcester, included details of a possible expansion plan in the 1920s (Ref: F209.161/518 (BA 338); See Section 9.3). Additional secondary sources, including works on the local history of the area, were examined both online and in the local history and archive library of the Hive, Worcester. References to all sources used as part of this report can be found in Section 9 of this report.

3.3 Photographic record

- 3.3.1 A general photographic survey was undertaken of the Frankley Reservoir, the two Outlet Houses and the Inlet House. This included the structures in their immediate and landscape settings, and their relationship to the other structures. Each elevation was then photographed in detail showing specific historical and architectural features, including examples of doors, windows, steps and roofs. A photographic survey of the interior of the Outlet Houses and Inlet House was also undertaken, including general views of each space from various vantage points, with detailed photographs depicting specific features such as doors, windows and other architectural and structural detail.

3.3.2 All photographs were taken in black and white print and colour digital using a 35mm SLR and a digital SLR respectively. A discreetly placed 1m ranging pole was placed in all shots where access and health and safety allowed. A register of photographs was made on site and is provided in Appendix 1 of this report. A selection of digital photographs taken during the survey has been included within this report to illustrate the results of the survey.

3.4 Written record

3.4.1 A written record was undertaken of the structures using AOC *pro forma* recording sheets which included the Site Reference, NGR, statutory designation, date of record, summary of type and purpose of building, as well as comments on the condition, construction, architectural features, modern interventions, and any other evidence for the development phasing and function of the structures.

3.5 Drawn record

3.5.1 Both the exterior and the interior of the two Outlet Houses and the Inlet House were subject to a full 3D laser scan using a Faro 3D laser scanner tied in using a total station survey, and tied into the National Grid by GPS survey. The results of this survey are provided in Appendix 2 of this report. The point cloud data was then used to create the 2D elevations, floor plans and sections using AutoCAD software, and have been represented in this report as Figures 7 to 9. A general site plan of the Frankley Reservoir was also undertaken using GPS, and included an outline of the Reservoir parapet wall, the access road around the Reservoir and an outline of the Outlet Houses and Inlet House.

3.6 Limitations

3.6.1 No access was permitted to the below-ground levels of the Outlet Houses and the Inlet House by Severn Trent Water due to the live operational nature of the reservoir and the requirement for confined spaces permission and training to enter the space.

4 HISTORICAL BACKGROUND

- 4.1 Prior to the Norman Conquest, the lands at Frankley were in the possession of Wulfwine, and is recorded in the 1086 Domesday Book as belonging to William Fitz Ansculf (VCH 1913). By the 14th century the lands were assigned to Joan de Botefort who held them until the 15th century, after which time they appeared to be in the hands of the Bishop of Worcester (*ibid*). The Lyttletons held Frankley Manor, with its associated Deer Park, by the time of the Civil War and the manor was burned down in the 1640s by Prince Rupert (Bradley 1909, 64; Jacobs 2015). The Deer Park was decommissioned soon after.
- 4.2 Into the 16th and 17th centuries, the general landscape around Frankley was transformed by the coal and iron-working industry and, by the 18th century, industrialisation became a catalyst to the breaking up of the manorial estates (Jacobs 2015). Population shifted towards the industrial city and town centres of the region and by the 19th century, the coming of the railways had established an extensive and widespread transport network in and around the Midlands and the Black Country.
- 4.3 At the turn of the 20th century and prior to the construction of Frankley Water Treatment Works, the site comprised a series of open fields, as evident on the 1884 Ordnance Survey map (Figure 3). St Leonards Church, which is still extant, can be seen to the immediate west of the Frankley Waterworks site, with the remains of the former Manor House opposite the church. To the east of the Frankley Waterworks site is an area of woodland called Cutler's Rough. The character of Frankley, prior to the Waterworks was described at the time as "...a few farms in the rural country on the very edge of the Industrial Midlands." (Mee 1968, 81). Frankley is also documented as consisting largely of agricultural fields in the 19th century made up of 1140 acres of pasture land, 682 acres of arable land and 112 acres of wood (VCH 1913).
- 4.4 The Frankley Water Treatment Works site was constructed between 1896 and 1904 and was built as part of a much wider development to improve the quality of and provide drinking water for the city of Birmingham from the Elan Valley in Wales. The scheme was established to improve the poor quality of the drinking water in Birmingham, a city which had become more industrialised throughout the 19th century, with population rising to almost 650,000 (CPAT ud). Many citizens still got their drinking water from wells which became contaminated with sewage, causing outbreaks of many diseases including cholera. The city petitioned the British government to allow them to compulsory purchase land to create a new system of dams, reservoirs and aqueducts. This was granted with the Birmingham Corporation Water Act in 1892. Between 1896 and 1906, thousands of navvies moved to purpose-built accommodation in the Elan Valley to construct the scheme under the management of James Mansergh (*ibid*). The Elan Valley was chosen due to its generally remote location, low population, rainfall, geology (low water absorption), its height above sea level (allowing a gravity fed system) and the general proximity of the two rivers, Elan and Claerwen (Powys Digital History Project 2002). Frankley was to be the termination point of the scheme, providing drinking water to the citizens of Birmingham via Frankley Reservoir.
- 4.5 Frankley Water Treatment Works is first represented on the 1905 Ordnance Survey map (Figure 4). The woodland known as Cutler's Rough was partially truncated by its construction, the remains of which are still present today. The structures were designed by Abraham Kellett of Ealing, with a semi-circular reservoir constructed from concrete with brick above the water's surface. Little evidence is available in the archives relating to Kellett's career, however he is known to have completed similar types of construction works in the late 19th and early 20th centuries (Brooks & Pevsner 2007, 156). When full, the reservoir holds an area of 25 acres (101,171m²) to a depth of 30 – 35 feet (9.1m – 10.7m) containing 200,000,000 imperial gallons (909,218,000 litres). After a site visit in 1904, the Architect and Contract Reporter reported:

'...It is mainly constructed of concrete and made water tight by a skin of asphalte uncovered on the floor and protected by blue brick facing on the wall. The east straight wall or embankment is nearly one-third of a mile in length, and the distance all round the

reservoir is little over four-fifths of a mile. It is divided into two equal portions by a main division wall running from the centre of the circle to the circumference, at which latter point the water is let into each or both divisions at will over a series of steps or cills extending to the floor of the reservoir. After leaving the aqueduct and just before entering the inlet basin, the water passes through a gauge chamber, in which the quantity flowing is measured and recorded by means of an instrument installed for that purpose in a small building on the west side of the reservoir [Inlet House] immediately behind the inlet. From the gauge chamber the water flows into the inlet basin, where it is controlled by sluices and passed into either or both divisions of the reservoir, or is diverted to the right or to the left round the reservoir to the outlet valve wells which are situated below the domed buildings on its north-east and south-west sides [Outlet Houses 1 and 2]. These buildings contain the requisite machinery for regulating the quantity of water allowed to enter the outlet well from the reservoir, the direct mains from the inlet basin or the mains leading therefrom to the filters...The work has been carried out under contract by Mr A. Kellett, Ealing. He received the order to commence in June 1897, although for several reasons not much progress was made until about a year later, so that it has just occupied six years in construction. During that period the number of men employed at times exceeded 600, but has of course varied according to circumstance...A good carriage runs right round the margin [of the reservoir], where it is divided from the water area by a substantial parapet with stone coping.' (The Architect and Contract Reporter 1904, pp 24 – 25)

- 4.6 There was little change to the Water Treatment Works throughout the early and mid-20th century as the 1921 and 1947 Ordnance Survey maps indicate (Figures 5 and 6). The Bartley Reservoir, to the immediate north-east of the 1904 Frankley Reservoir, was completed in 1930 as a consequence of growing demand for greater storage capacity, in order to maintain the daily supplies to Birmingham (Brooks & Pevsner 2007, 320). In the later 20th century and into the 21st century the Frankley Water Treatment Works were upgraded with new buildings and filtration systems installed to bring them up to modern standards.

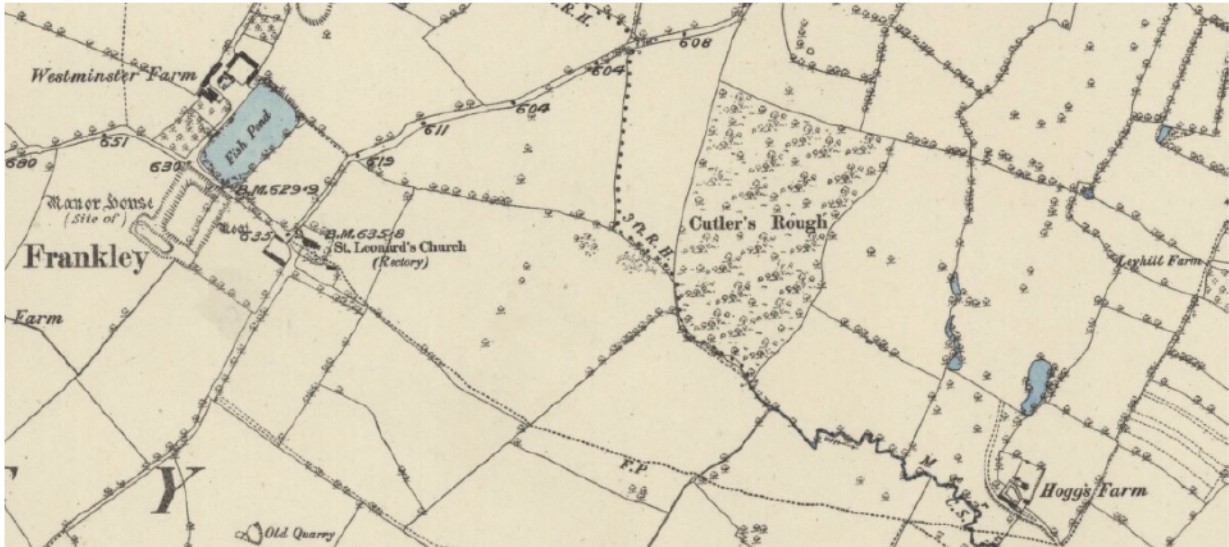


Figure 3: Extract from Ordnance Survey map, 1884 (the site of the future Frankley Reservoir is between Cutler's Rough and St Leonard's Church)



Figure 4: Extract from Ordnance Survey map, 1905, showing the Frankley Water Treatment Works for the first time cartographically



Figure 5: Extract from Ordnance Survey map, 1921



Figure 6: Extract from Ordnance Survey map, 1946

5 RESULTS

5.1 Introduction

5.1.1 The site subject to survey consists of the main Frankley Reservoir and three buildings including Outlet House 1, Outlet House 2 and the Inlet House (see Figure 2). These structures are located to the north-west part of the existing Frankley Water Treatment Works site, and are situated on a raised mound surrounded by a tall steel security fence. The site is approached from an unnamed road to the north-east which joins Waterworks Drive to Frankley Lane.

5.2 Reservoir

5.2.1 The Reservoir is constructed of concrete with a blue brick skim (Figure 2; Plates 1 to 3). The parapet wall is constructed in red brick in an English bond and set 120mm back from the blue brick, which is chamfered to its outer corner (Plates 4 and 5). The red brick parapet is straight vertical to the south-east side of the Reservoir, although to the semi-circular section the wall leans back to maximise the capacity of the structure (Plate 6). It rises to eight courses and has an overhanging pyramidal stone cap. In at least two places, the wall has been replaced/repared in a modern brick (Plates 7 and 8). The central division of the Reservoir is also constructed of blue brick with an overhanging flat cope with access via a stone stair to either side off-centred to the north-west side (Plates 9 to 12). There are several openings in the Reservoir parapet wall providing access to the water. There is a wide opening at the centre of the semi-circular north-west wall, with the top of the wall rising to a curve and a steel gate (Plate 13). Opposite this, to the straight south-east wall, is another similar wide opening (Plate 14). There are additional openings to the north-east and south-west sides of the straight south-east parapet wall, each with their own stone steps leading down to the water's edge (Plates 15 to 17).

5.3 Outlet House 1

5.3.1 Outlet House 1 has seen very few changes to its original construction date of 1904. It is an octagonal red brick building in English bond with chamfered sandstone quoins, a deep sloping and moulded footing course and an ogee conical roof with a lead fish-scale design and weather vane (Figure 7; Plates 18 to 20). The wall rises to an upper sandstone band course (Plate 21) with a dentil cornice consisting of moulded corbels to each bay below a rising parapet above the eaves. The main entrance faces the Reservoir to the south-east side, approached from a set of stone steps with small parapet wall and set in a moulded segmental-headed doorcase with keystone and a blank sandstone plaque above (Plates 22 to 24). Each of the remaining seven bays has a tall window – blocked with blue brick (seemingly an original design matching the blue brick used in the Reservoir) – set in a moulded sandstone surround with keystone and shaped sill stone (Plates 25 and 26).

5.3.2 The interior of Outlet House 1 consists of one room with a steel gantry floor with bare white-washed brick walls (Figure 7; Plate 27 to 30). The main outlet pump is in the centre behind a steel rail, which was operational at the time of survey. Each corner of the octagonal space is set back just below roof level with a moulded corbel supporting a large steel beam which circled the entirety of the building to support the machinery (Plates 31 and 32). Above this, and set back slightly, is a small pillar to support the roof, which consists of thin horizontal sarking boards angled with thin timber struts at each junction (Plate 33). Access to the lower part of the building was through a small straight gantry stair to the north-west stair. However, due to health and safety reasons, access was not permitted at the time of the survey.

5.4 Outlet House 2

5.4.1 Outlet House 2 is located to the north side of the Reservoir (Figures 2 and 8; Plates 34 to 36). The building is virtually identical to Outlet House 1, although the original roof was removed and replaced by a flat roof in the 1970s (Dave Phillips, pers comm). There is a generator set in a small steel compound to the south side of the building adjacent to the main entrance in the south elevation, which is identical to Outlet House 1 (Plates 37 and 38). Each of the remaining seven bays is also identical to Outlet House 1, housing a segmental-headed arched window with sandstone surround (Plates 39 and 40).

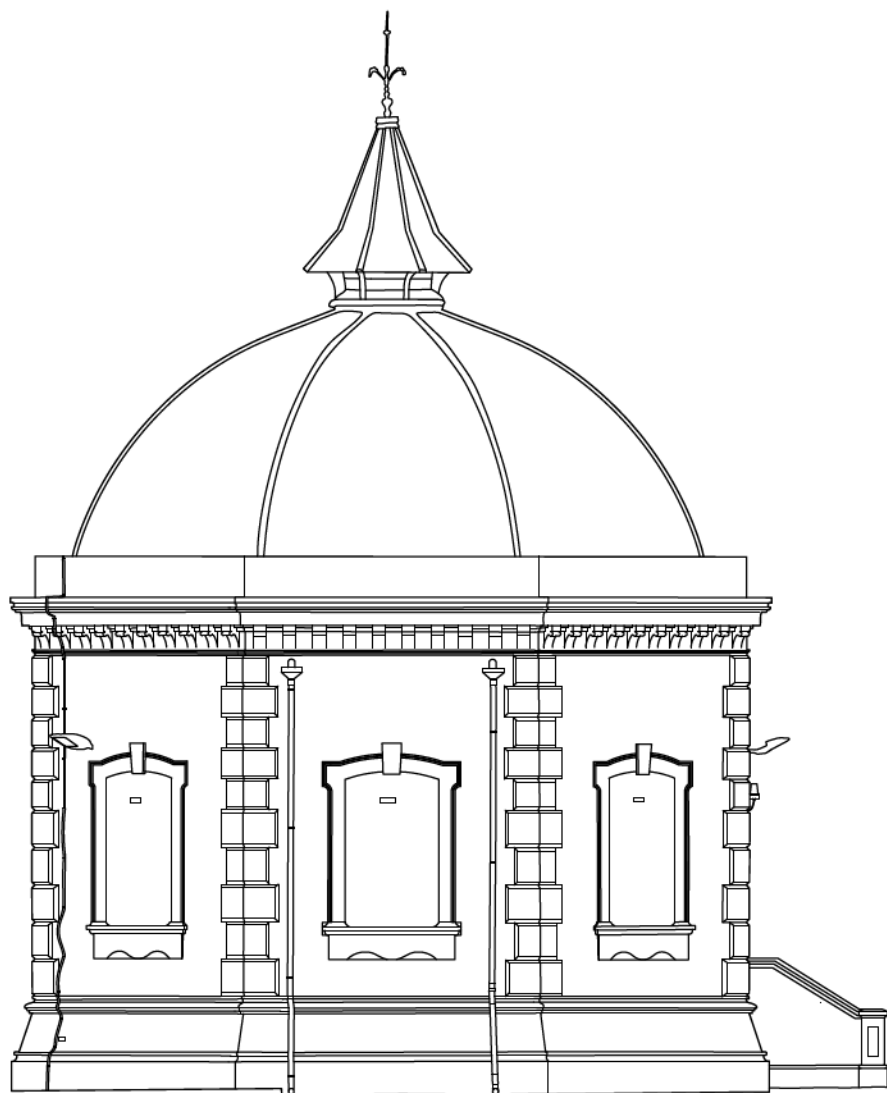
5.4.2 The interior of Outlet House 2 is identical to Outlet House 1, with the white-washed brick walls and steel beam arrangement just below roof level (Figure 8; Plates 41 and 42). The structural arrangement of the roof is also identical to Outlet House 1 with a corbel supporting the steel beam (Plate 43). As mentioned above in Section 5.4.1, the original roof was removed and not replaced, and is now a flat roof with an angled Perspex skylight (Plate 44).

5.5 Inlet House

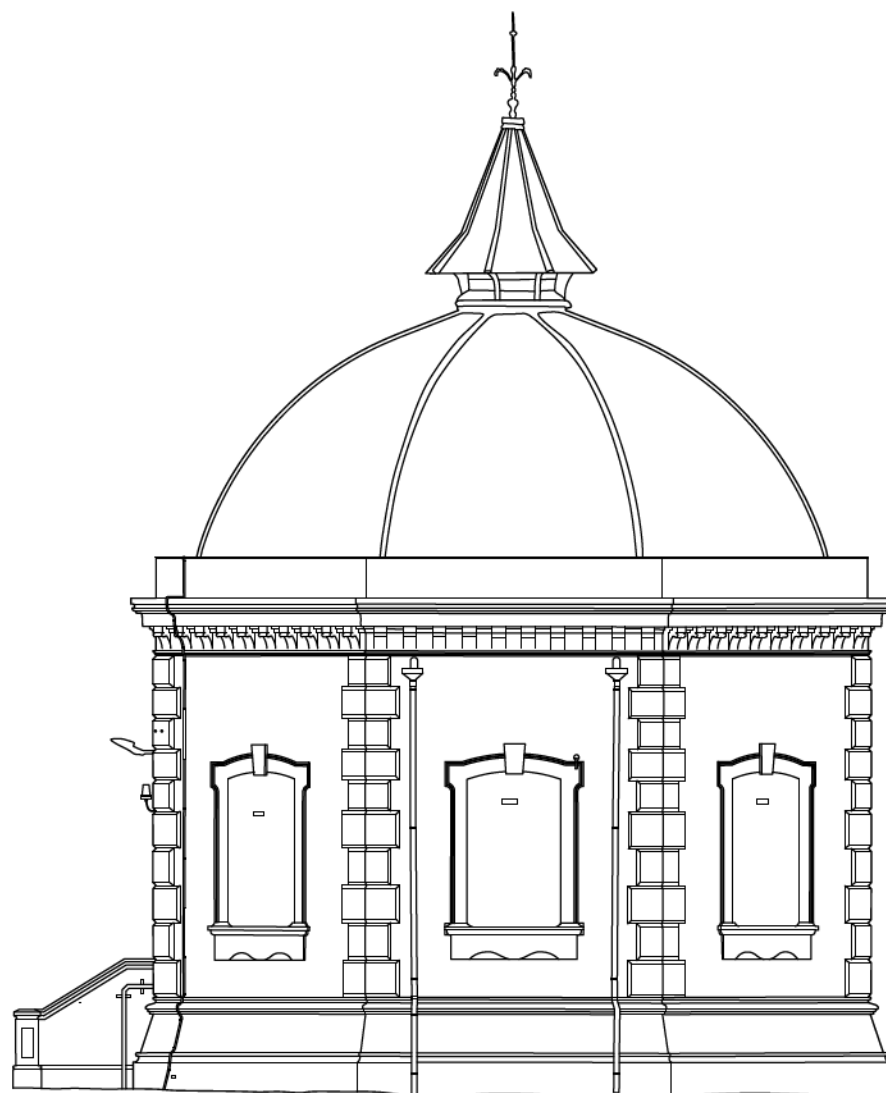
5.5.1 The Inlet House is located to the exact centre of the apex of the semi-circular parapet wall of the Reservoir, set into its own secure compound with steel electrified fence (Figure 9; Plates 45 to 47). Constructed in the same English brick bond style as the two Outlet Houses, this building is much smaller, rectangular in shape, with a pyramidal roof with lead flashings. It has a simple brick and sandstone chamfered footing, with the brick wall rising to a sandstone band course and dentil-style corncicing just below the guttering (Plate 48). The main entrance to the building is in the south-east elevation and is a muted version of the segmental-headed doorways seen in the two Outlet Houses with no keystone (Plate 49). The remaining three bays are then also muted versions of the windows to the Outlet Houses with sandstone surrounds and, again, no keystone (Plates 50 to 52).

5.5.2 Internally, the building is a plain rectangular open space with a stone flagged floor and bare white-washed walls and modern machinery, including modulating inlet valves and flowmeters, to control the flow of water in and out of the Reservoir (Plates 53 and 54). It has a timber planked ceiling above a very plain moulded cornice (Plate 55).

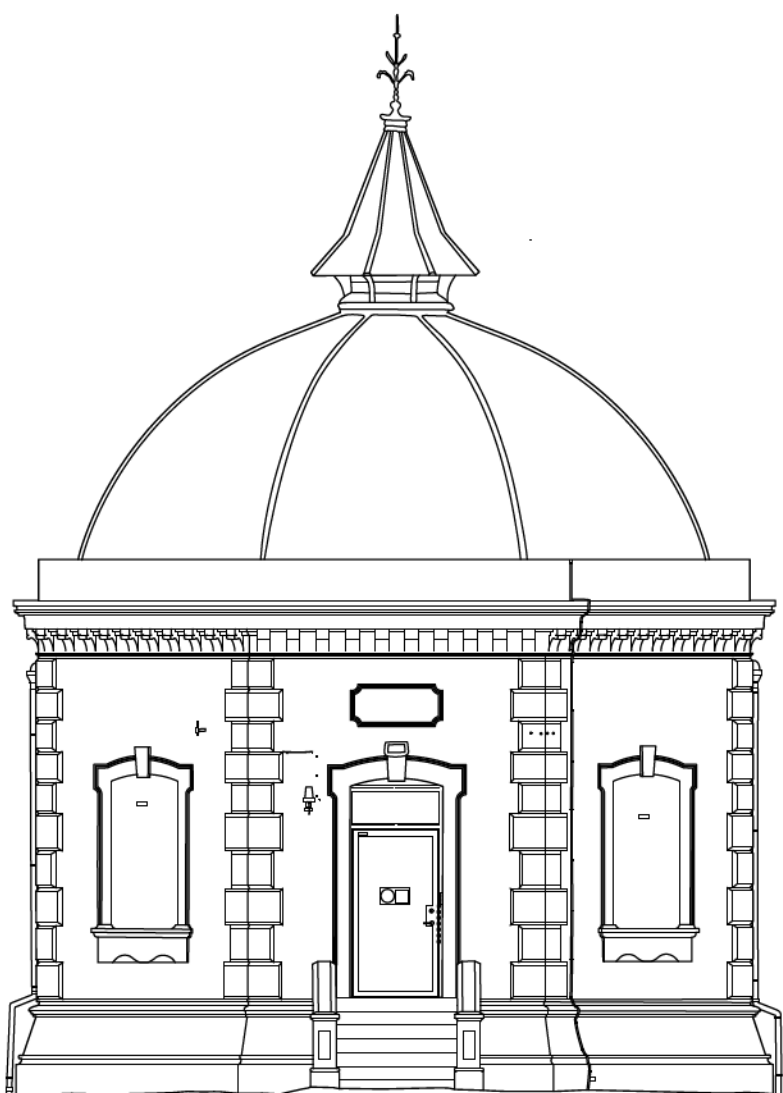
5.5.3 Set in front of the inlet house is the inlet basin, consisting of a large dark red brick enclosure. It has two small inlet arches to the north-west side (Plates 56 and 57) and two larger arches to the opposite south-east side with a breakwater between them with sandstone detailing (Plate 58). The modern steel enclosure is set around a much earlier frontage of a brick wall with a set of brick and stone steps to each side to the north-east and south-west. The steps to the north-east side provide the present access to the enclosure, whilst the steps to the south-west are very overgrown with vegetation and are set outside the modern enclosure (Plates 59 to 61).



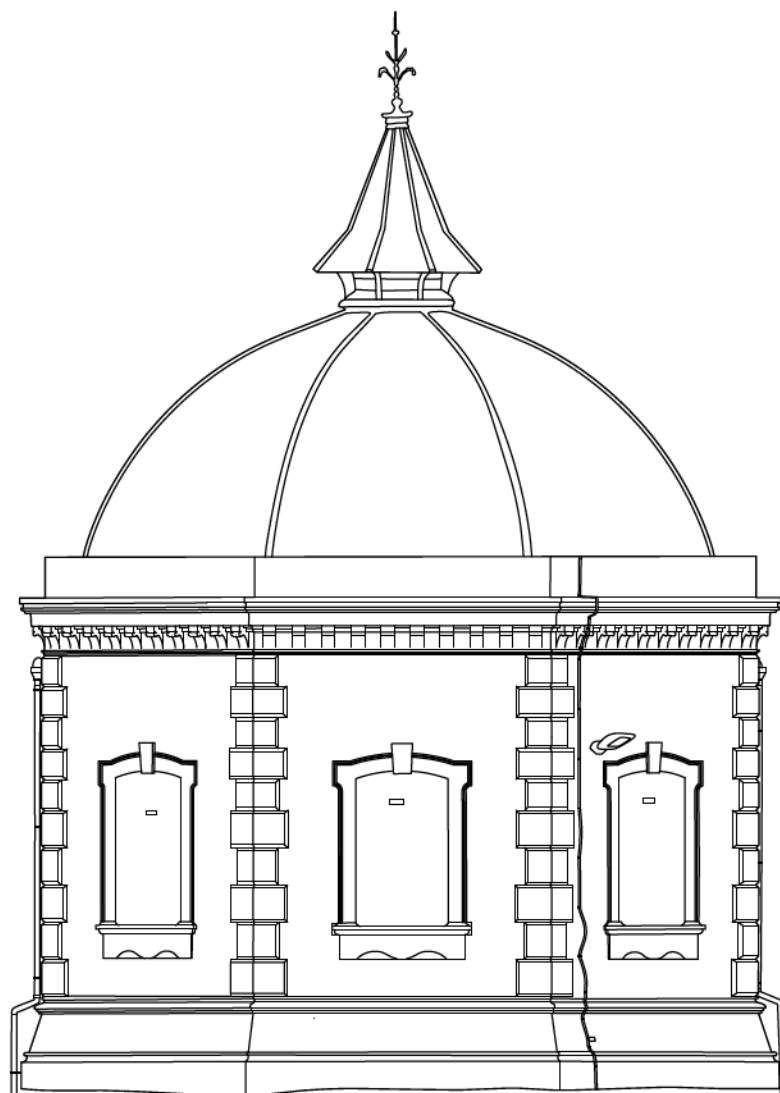
SSE facing elevation



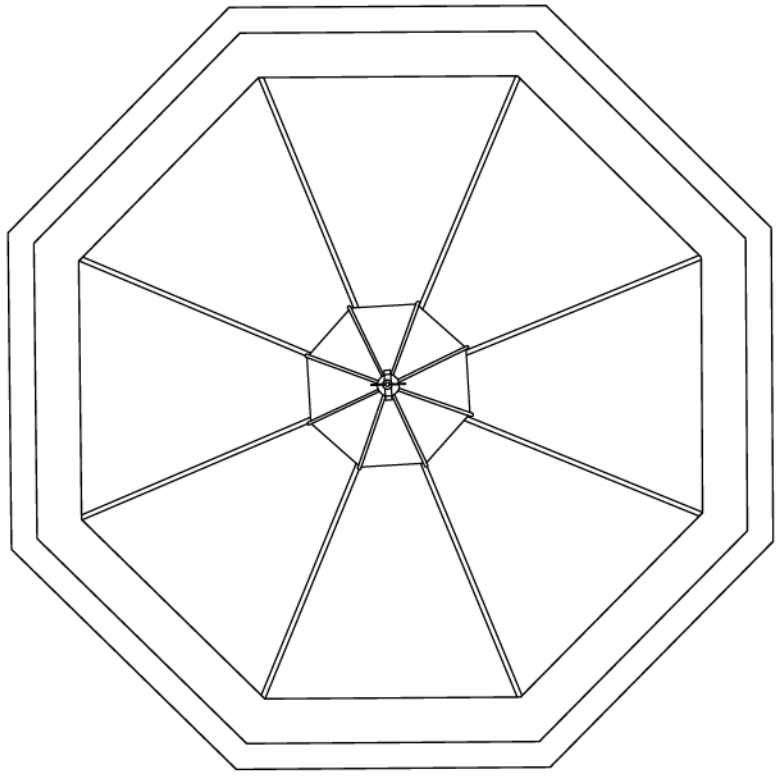
NNW facing elevation



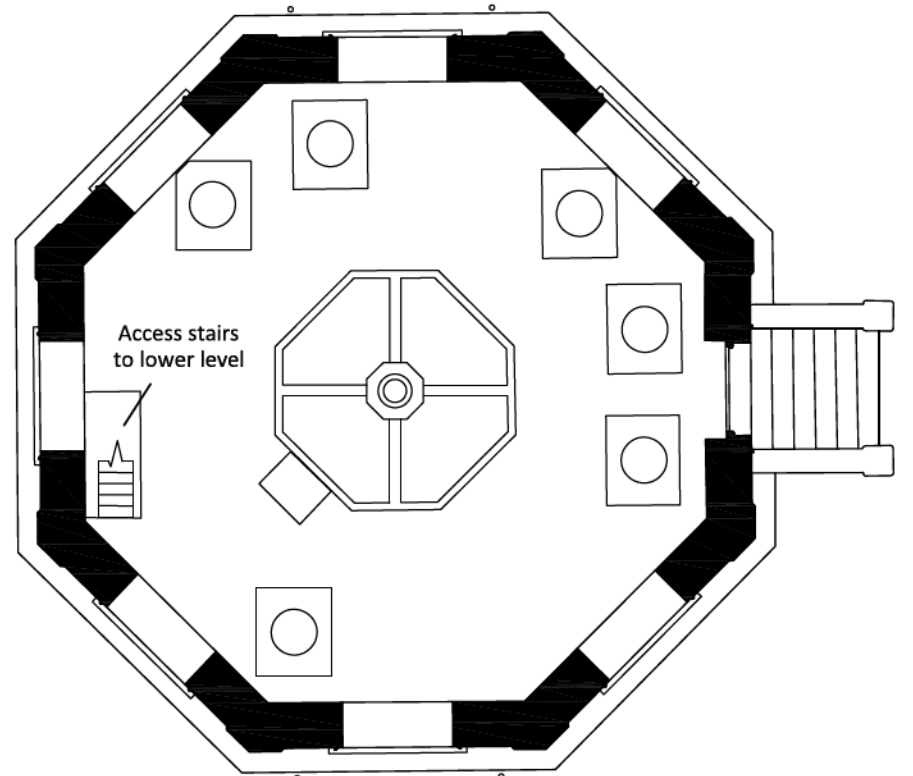
NEE facing elevation



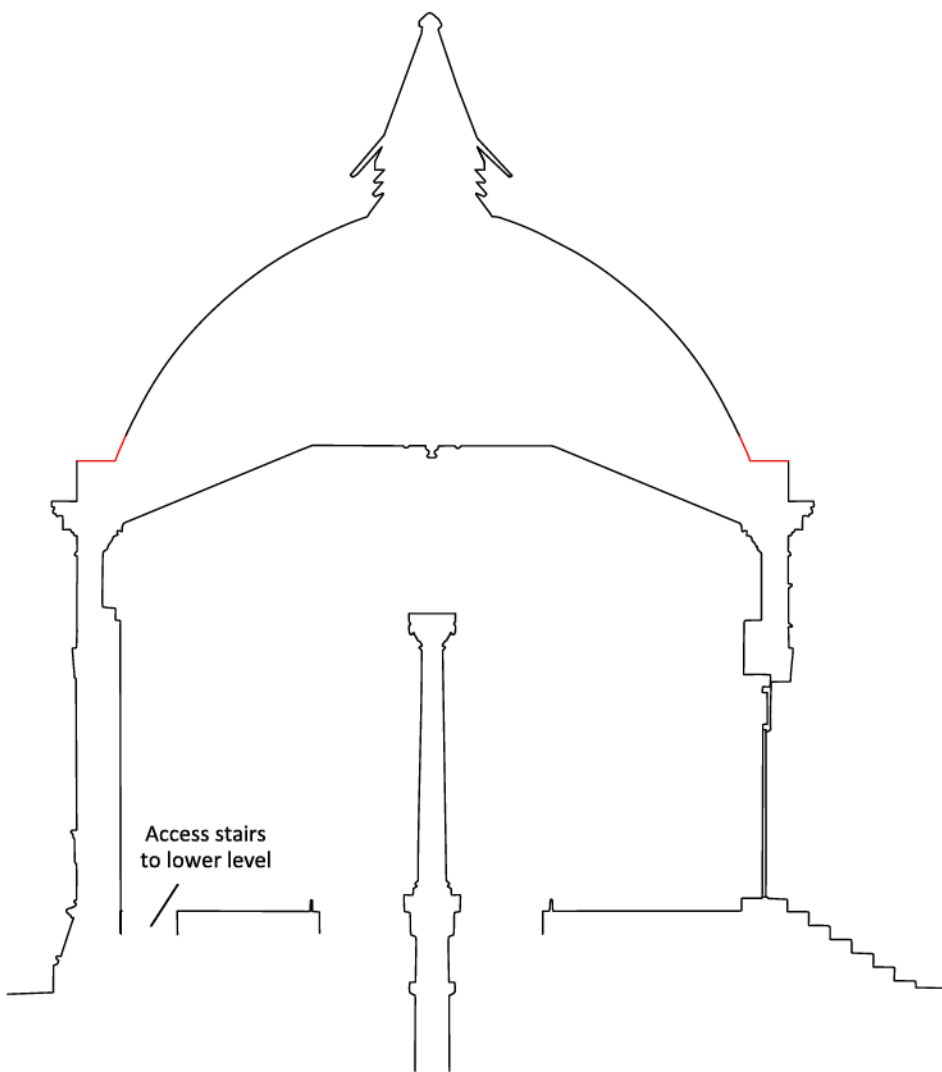
SWW facing elevation



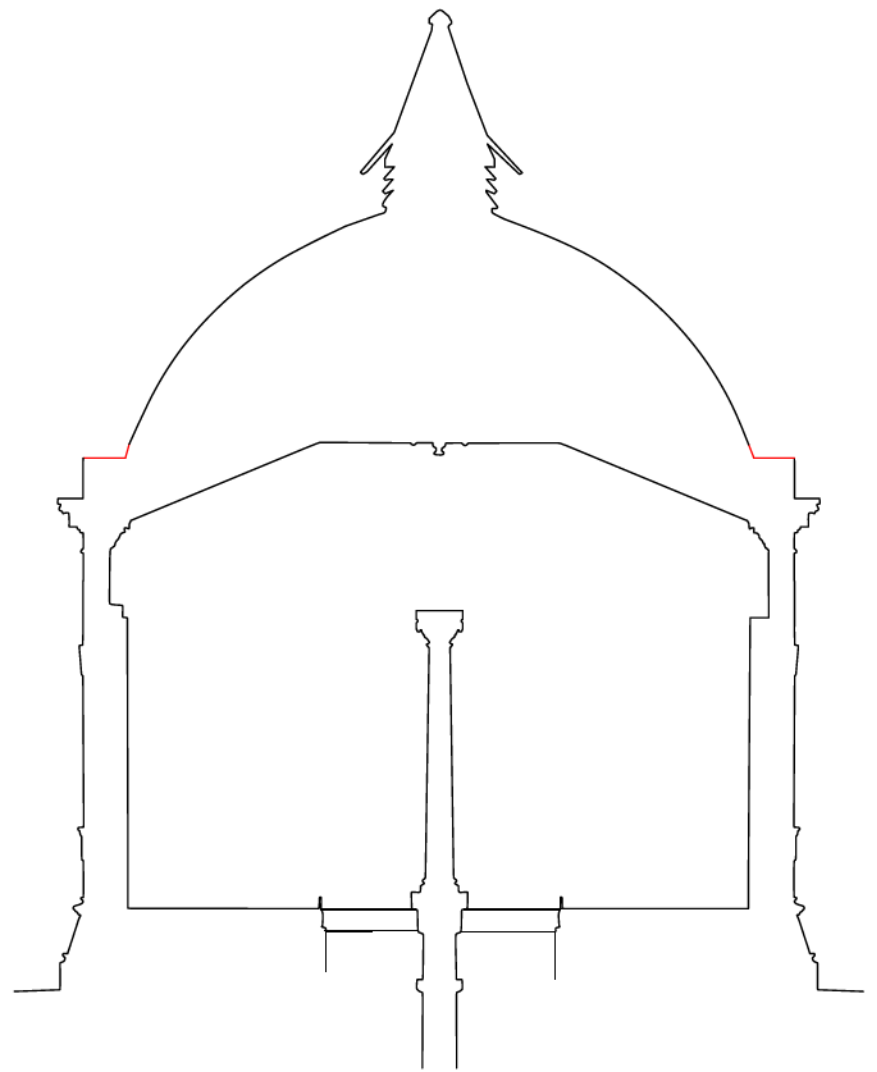
Roof plan



Ground floor plan
Section through walls just above windowsill height



SSE facing section



NEE facing section

Key

walling extrapolated due to inaccessible roof area

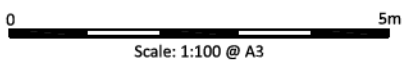
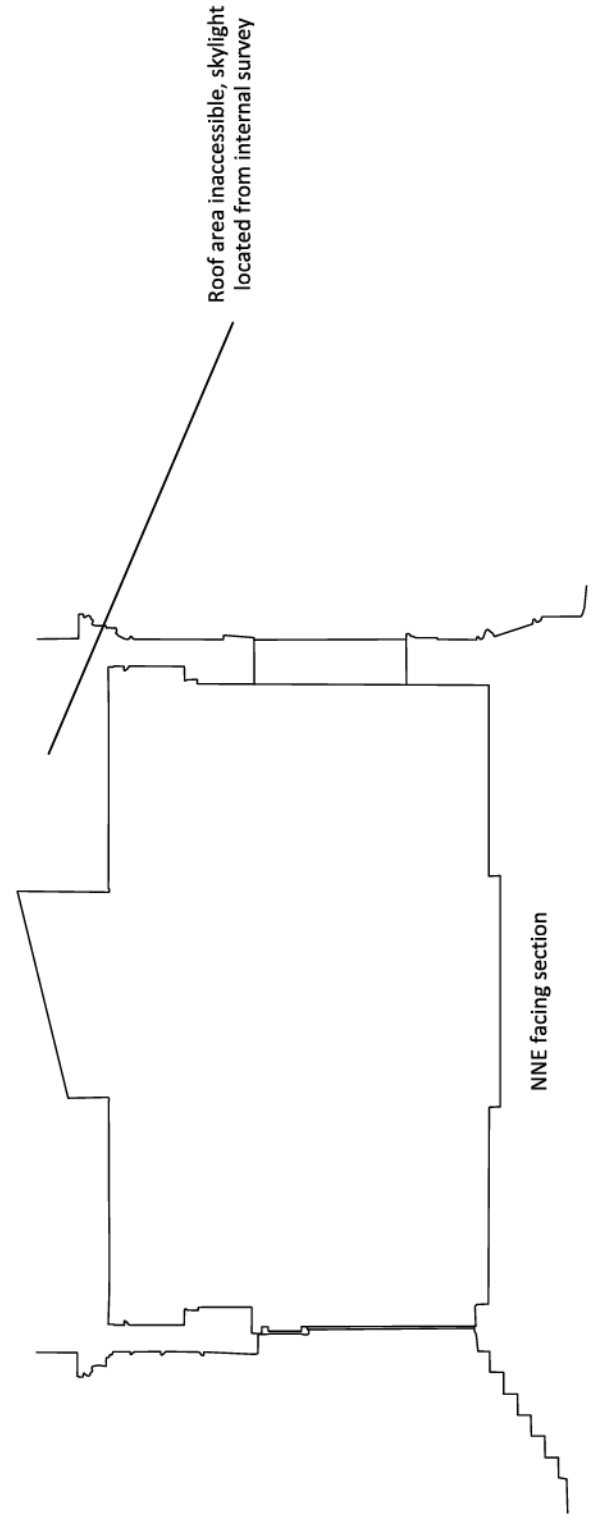
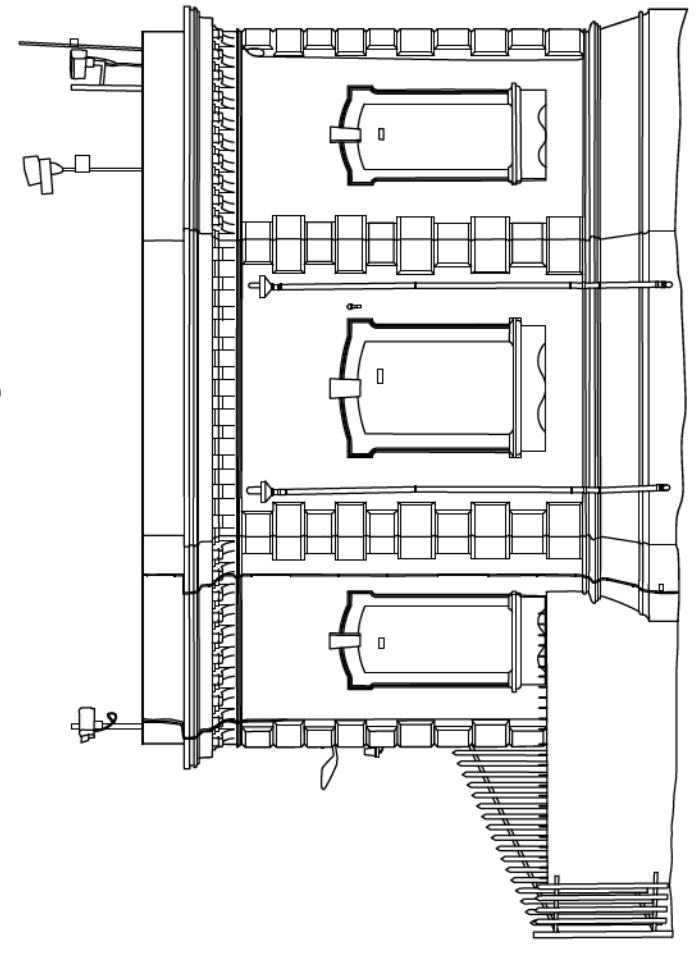
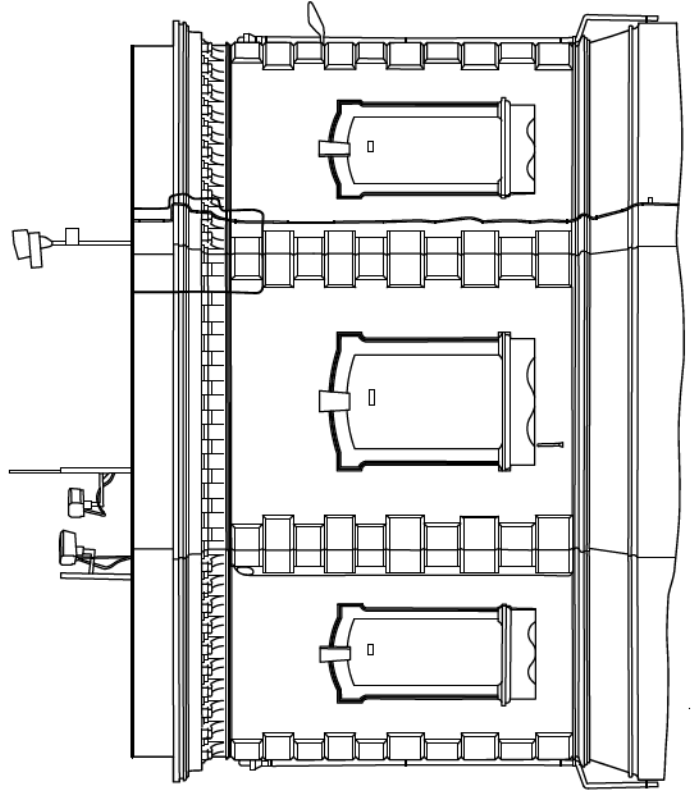
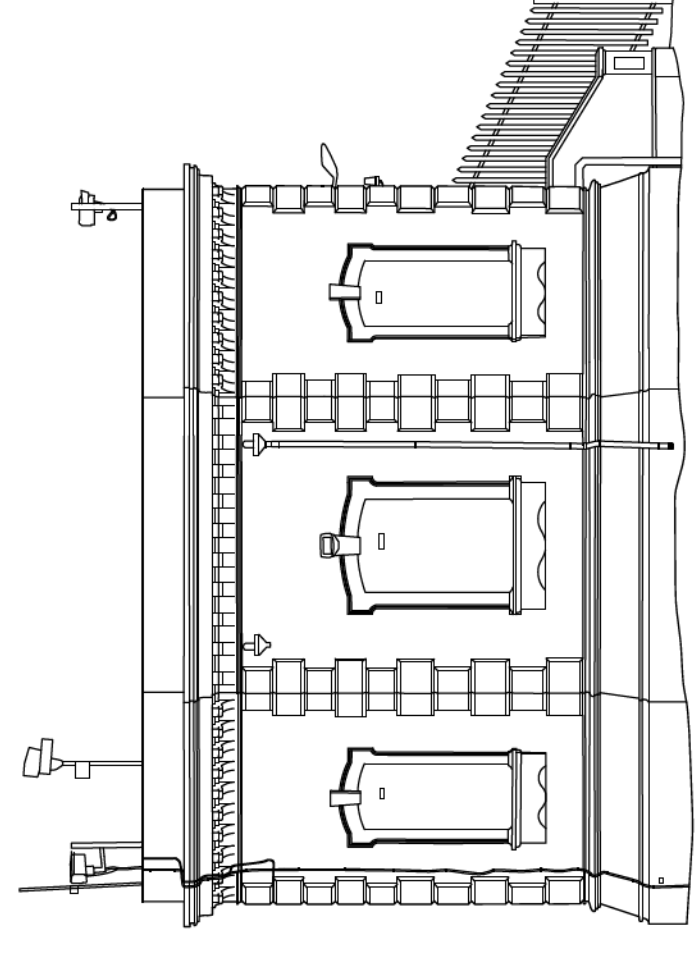
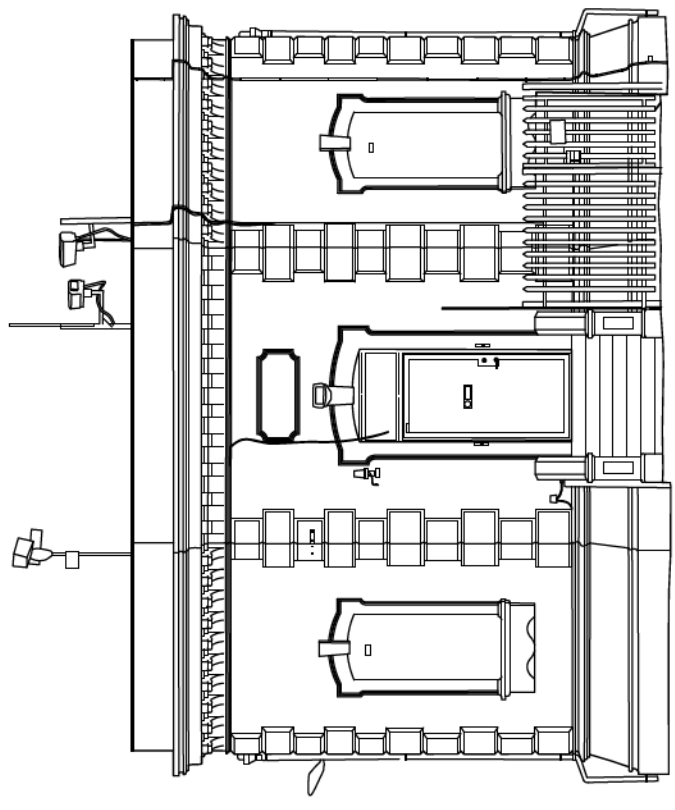
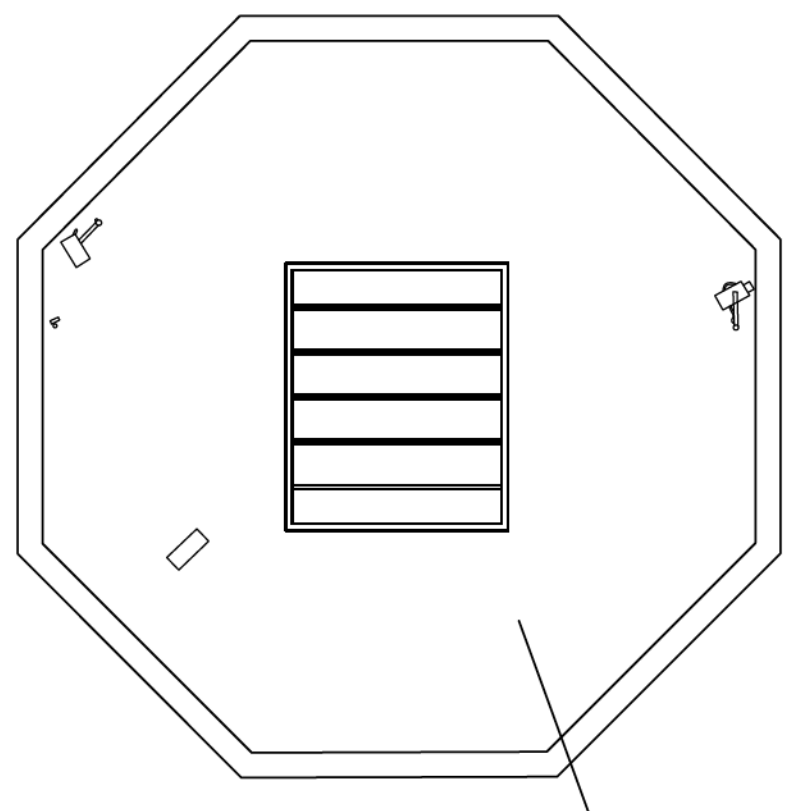
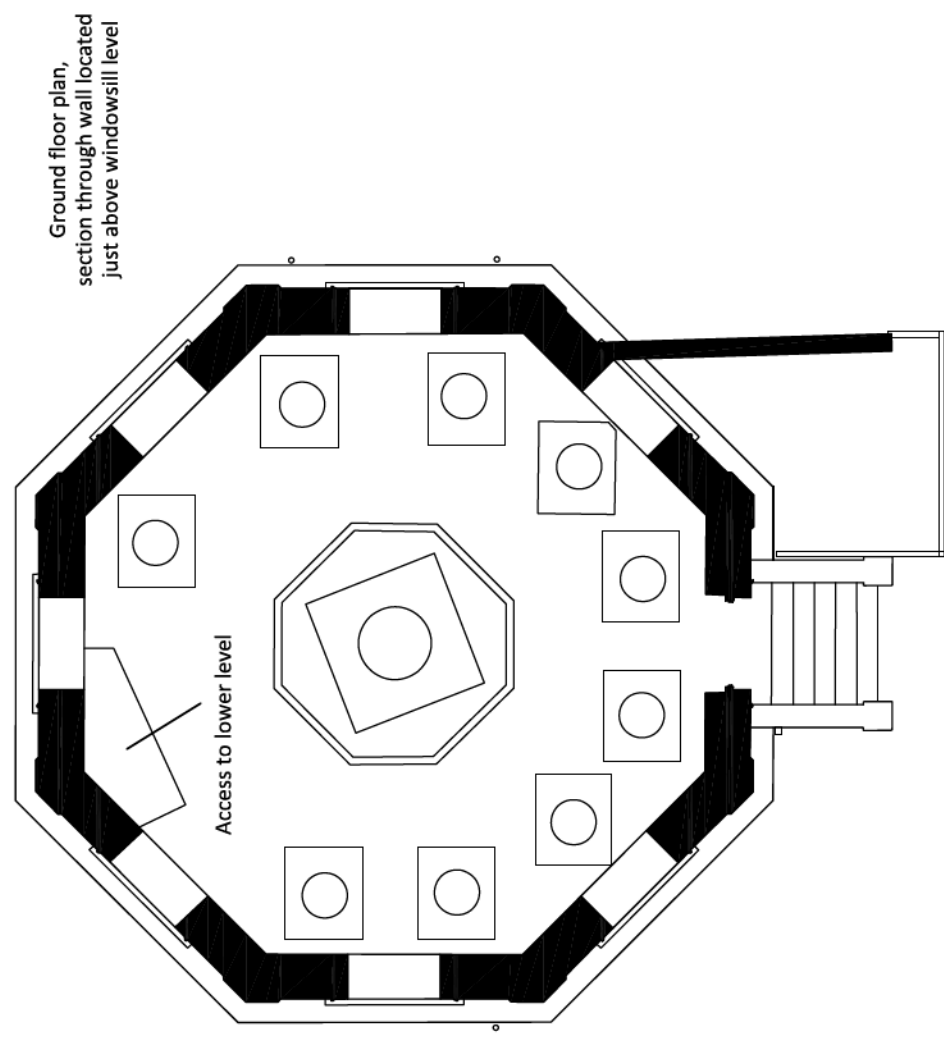
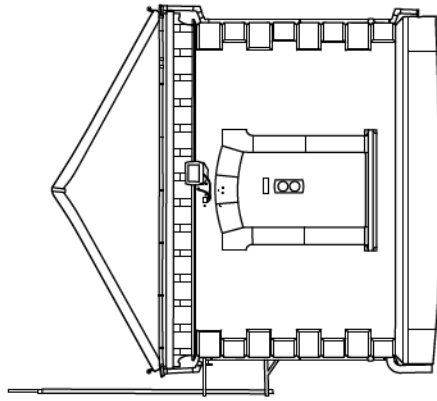


Figure 7b: Outlet House 1, floor plans and sections

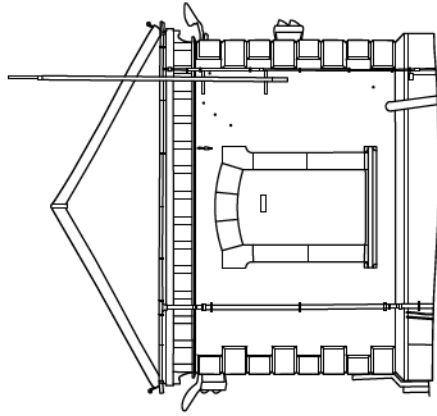


0 5m
Scale: 1:100 @ A3

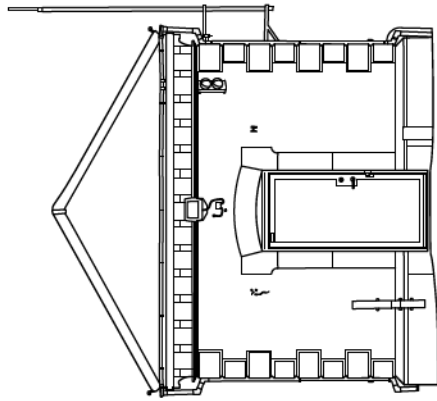
Figure 8: Outlet House 2, elevations, floor plan and section



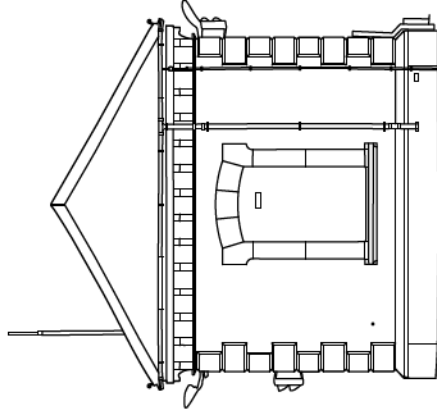
North-west facing section



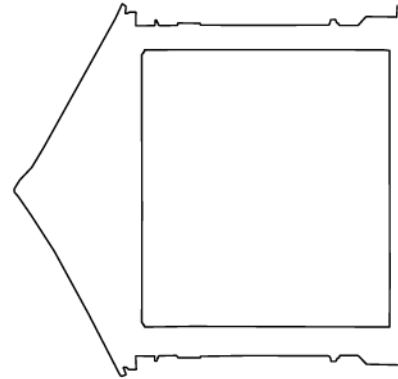
North-east facing section



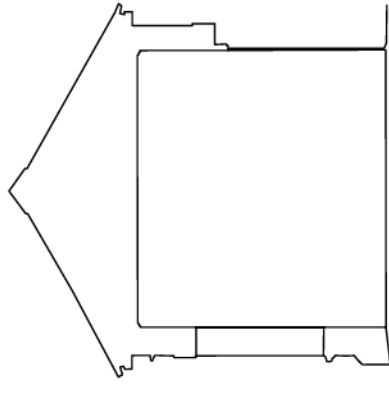
South-east facing section



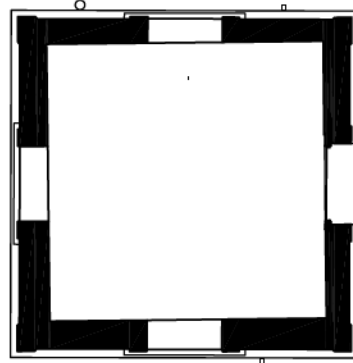
South-west facing section



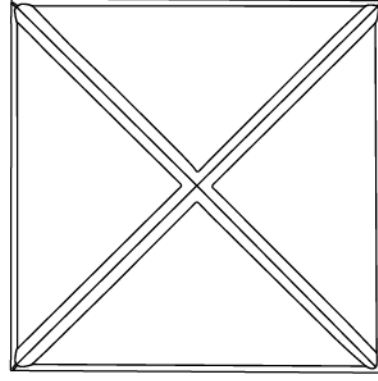
South-east facing section



South-west facing section



Ground floor plan
Section cut through wall
just above windowsill height



Roof Plan



0 5m
Scale: 1:100 @ A4

Figure 9: Inlet House, elevations, plans and sections



Plate 1: Reservoir, general view from the east



Plate 2: Reservoir, general view from the SSW



Plate 3: Reservoir, general view from the south-east



Plate 4: Reservoir, detail of the parapet wall on the north-west side from the north



Plate 5: Reservoir, general view from the north-east



Plate 6: Reservoir, general view from the south-west



Plate 7: Reservoir, detail of brick repair on the north side from the north-west



Plate 8: Reservoir, detail of brick repair on the north-west side from the north



Plate 9: Reservoir, detail of central dividing wall from the north-west



Plate 10: Reservoir, general view of the central dividing wall from the west



Plate 11: Reservoir, general view of the central dividing wall from the north



Plate 12: Reservoir, detail of steps on the central dividing wall from the west



Plate 13: Reservoir, detail of entrance in the north-west wall from the north-west



Plate 14: Reservoir, detail of entrance to the south corner from the south-east



Plate 15: Reservoir, detail of entrance to the north-east corner from the east



Plate 16: Reservoir, detail of entrance to the north-east corner from the south-east



Plate 17: Reservoir, detail of entrance to the south-west corner from the north-west



Plate 18: Outlet House 1, general view from the south



Plate 19: Outlet House 1, general view from the south



Plate 20: Outlet House 1, detail of roof from the south



Plate 21: Outlet House 1, detail of footing from the south-east



Plate 22: Outlet House 1, detail of main entrance from the south-east



Plate 23: Outlet House 1, detail of steps to the main entrance from the south



Plate 24: Outlet House 1, detail of steps to the main entrance from the north-east



Plate 25: Outlet House 1, detail of window bay from the north-east



Plate 26: Outlet House 1, detail of window bay from the south-west



Plate 27: Outlet House 1 Interior, detail of main entrance from the north



Plate 28: Outlet House 1 Interior, general view from the east



Plate 29: Outlet House 1 Interior, general view from the south



Plate 30: Outlet House 1 Interior, general view from the south-east



Plate 31: Outlet House 1 Interior, detail of roof support and steel beam from the east



Plate 32: Outlet House 1 Interior, detail of machinery in the roof supporting the main pump from the south



Plate 33: Outlet House 1 Interior, detail of the roof from the south-east



Plate 34: Outlet House 2, general view from the south-west



Plate 35: Outlet House 2, general view from the south-west



Plate 36: Outlet House 2, general view from the east



Plate 37: Outlet House 2, detail of the main entrance from the south-east



Plate 38: Outlet House 2, detail of the stone steps to the main entrance from the east



Plate 39: Outlet House 2, detail of window bay from the west



Plate 40: Outlet House 2, detail of window bay from the west



Plate 41: Outlet House 2 Interior, detail of the main entrance from the north



Plate 42: Outlet House 2 Interior, general view from the south



Plate 43: Outlet House 2 Interior, detail of corbel supporting the steel beam from the east



Plate 44: Outlet House 2 Interior, detail of ceiling and skylight, a modern intervention completed in the 1970s from the south-east



Plate 45: Inlet House, general view from the east



Plate 46: Inlet House, general view from the east



Plate 47: Inlet House, general view from the south-east



Plate 48: Inlet House, detail of cornice from the south-west



Plate 49: Inlet House, detail of the main entrance from the SEE



Plate 50: Inlet House, detail of north-east elevation from the east



Plate 51: Inlet House, detail of the north-west elevation from the north-west



Plate 52: Inlet House, detail of the south-west elevation from the SSW



Plate 53: Inlet House Interior, detail of main entrance from the north



Plate 54: Inlet House Interior, general view from the south-east



Plate 55: Inlet House Interior, detail of ceiling from the east



Plate 56: Inlet House, general view of small arches to the inlet basin from the north



Plate 57: Inlet House, general view of larger arches to the inlet basin leading to reservoir from the south



Plate 58: Inlet House, detail of the breakwater to the inlet basin from the west



Plate 59: Inlet House, general view of south-east boundary wall from the south



Plate 60: Inlet House, detail of south-west steps to the main compound from the south



Plate 61: Inlet House, detail of the north-east steps to the main compound from the north-east

6 DISCUSSION

6.1 Phasing

6.1.1 Frankley Reservoir and its associated Outlet Houses and Inlet House were all contemporary with the filter beds, pump house and other buildings which were constructed in 1904, all built in red brick as the main constructional material (apart from the Reservoir which had a concrete superstructure) with sandstone detailing. Later alterations/additions occurred in the later 20th century and the 21st century, namely the upgrading of the equipment within all the houses, a higher level of security within the Inlet House, and the removal of the roof of Outlet House 2 in the 1970s which was replaced with a flat roof. Despite these alterations/additions, the general setting of the structures has changed little from when they were first constructed in 1904.

6.2 Architecture

6.2.1 The architectural style of the reservoir, the Outlet Houses and Inlet House is different from the functional and minimalist architecture of modern waterworks, which is all the more evident with the eclectic nature of the later 20th and 21st century buildings that form the rest of the waterworks at Frankley. The Outlet Houses and Inlet House were constructed in a typically Edwardian style, a common style for public and utility buildings of that time. Their prominent location within the landscape, along with their architectural style and detailing, are reminiscent of mid-late 19th century dovecotes or garden summer houses. The structures appear to be similar in style to many of the smaller ancillary buildings located along the rest of the Elan Valley scheme, such as the small building at Pen-y-garreg dam, which are also octagonal in shape with conical roofs and arched openings (CPAT ud). At Frankley, they are identical in architectural style to the remaining buildings that are located to the south-east of the Treatment Works, the most important of these being the main pump house (annotated on Figure 2), a tall five-bay double-height brick building with the same style stone detailing and large oculus above the main entrance

7 CONCLUSIONS & RECOMMENDATIONS

7.1 The Frankley Reservoir, Outlet Houses and Inlet House still form an important function in providing drinking water to the citizens of Birmingham and, despite the loss of the roof to Outlet House 2 and the modern security enclosure to the Inlet House, they still remain an interesting and architectural attractive collection of structures in the landscape. This is due to their architectural detailing in comparison to the functional and eclectic architecture of mid and late 20th century and 21st century buildings within the Frankley Water Treatment Works. The value of the Reservoir, Outlet Houses and Inlet House at Frankley as heritage assets becomes all the more important as many water treatment works throughout the UK now seek to upgrade and move to larger premises, opening up the potential for former waterworks sites for brownfield development.

7.2 It is recommended that no further historic building recording be undertaken on the structures prior to the new developments at Frankley Water Treatment Works.

8 ACKNOWLEDGEMENTS

8.1 The authors would like to thank Dave Phillips and the staff of the Frankley Water Treatment Works for allowing access to the buildings and accommodating all aspects of the historic building survey. The author would also like to thank the helpful staff of the Hive, Worcester, for their assistance during the archive research.

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9.1 Bibliographical references

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Jacobs 2015 *Birmingham Resilience Project: Appendix 11.1 Archaeological Desk-Based Study*.

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9.2 Cartographic references

1842	Tithe Map	<i>Plan of the Parish of Frankley in the County of Worcester</i>
1884	Ordnance Survey	<i>Worcestershire Sheet X.6</i>
1884	Ordnance Survey	<i>Worcestershire Sheet X.NW</i>
1905	Ordnance Survey	<i>Worcestershire Sheet X.NW</i>
1921	Ordnance Survey	<i>Warwickshire Sheet XIXa.NW</i>
1933	Ordnance Survey	<i>Warwickshire Sheet XIXa.NW</i>

1946 Ordnance Survey *Warwickshire Sheet XIXa.NW*

9.3 Archive references

Hive, Worcester:

F209.161/518 (BA 338)

Birmingham Corporation: Intended Waterworks in Frankley and elsewhere and intended tramway, 29th November 1921

APPENDIX 1: PHOTOGRAPHIC RECORD

Black & White Print & Colour Print Film #1

Frame	Digital Ref	Area	Description	Taken From	Date
1	1_1	Outlet House 1	Detail of steps to main entrance	S	09/06/2016
2	1_2	Outlet House 1	General view	N	09/06/2016
3	1_3	Outlet House 1	General view	N	09/06/2016
4	1_4	Outlet House 1	General view	N	09/06/2016
5	1_5	Outlet House 1	Interior: Detail of corbel and pillar	E	09/06/2016
6	1_6	Outlet House 1	Interior: General view	S	09/06/2016
7	1_7	Outlet House 1	Interior: General view	S	09/06/2016
8	1_8	Outlet House 1	Interior: General view	E	09/06/2016
9	1_9	Outlet House 1	Interior: Detail of roof	S	09/06/2016
10	1_10	Outlet House 1	Interior: Detail of pumping machinery	S	09/06/2016
11	1_11	Outlet House 1	Interior: Detail of corbel supporting steel beam	S	09/06/2016
12	1_12	Outlet House 1	Interior: General view	E	09/06/2016
13	1_13	Outlet House 1	Interior: General view of door	N	09/06/2016
14	1_14	Inlet House	General view from Outlet House 1	S	09/06/2016
15	1_15	Outlet House 2	General view from Outlet House 1	SSW	09/06/2016
16	1_16	Outlet House 1	General view (including Reservoir)	SE	09/06/2016
17	1_17	Outlet House 1	General view	SE	09/06/2016
18	1_18	Outlet House 1	General view (as 17, wider shot)	SE	09/06/2016
19	1_19	Outlet House 1	Detail of moulded footing	NW	09/06/2016
20	1_20	Outlet House 1	Detail of steps	NE	09/06/2016
21	1_21	Outlet House 1	Detail of roof	SE	09/06/2016
22	1_22	Outlet House 1	General view	SE	09/06/2016
23	1_23	Outlet House 1	General view (not roof)	SE	09/06/2016
24	1_24	Outlet House 1	Detail of cornice	SW	09/06/2016
25	1_25	Outlet House 1	General view	SW	09/06/2016
26	1_26	Outlet House 1	General view	SWW	09/06/2016
27	1_27	Outlet House 1	General view	W	09/06/2016
28	1_28	Outlet House 1	General view	NW	09/06/2016
29	1_29	Outlet House 1	General view	NW	09/06/2016
30	1_30	Outlet House 1	Detail of roof	N	09/06/2016
31 - 34	1_31 - 34	Outlet House 1	General view	N	09/06/2016
32	1_31 - 34	Outlet House 1	General view	N	09/06/2016
33	1_31 - 34	Outlet House 1	General view	N	09/06/2016
34	1_31 - 34	Outlet House 1	General view	N	09/06/2016
35	1_35	Outlet House 1	Detail of main entrance	NE	09/06/2016
36	-		Registration	-	09/06/2016

Black & White Print & Colour Print Film #2

Frame	Digital Ref	Area	Description	Taken From	Date
1	2_1	Reservoir	General view	NE	09/06/2016
2	2_2	Reservoir	General view	W	09/06/2016
3	2_3	Reservoir	General view	W	09/06/2016
4	2_4	Reservoir	General view	NNE	09/06/2016
5	2_5	Inlet House	General view from other side of Reservoir	NEE	09/06/2016
6	2_6	Outlet House 1	General view from other side of Reservoir	NE	09/06/2016
7 - 8	2_7 - 8	Outlet House 1	As Shot 6, working shot including total station	NE	09/06/2016
9	No Digital	Outlet House 1	General view	NE	09/06/2016
10	No Digital	Outlet House 1	General view	NE	09/06/2016
11	2_11	Inlet House	General view showing the building behind its electrified compound	E	09/06/2016
12	2_12	Inlet House	Interior: Detail of stone flagged floor	N	09/06/2016
13	2_13	Inlet House	Interior: Detail of ceiling	S	09/06/2016
14 - 15	2_14 - 15	Inlet House	Interior: General view	SE	09/06/2016
16 - 17	2_16 - 17	Inlet House	Interior: Detail of main entrance	N	09/06/2016
18	2_18	Inlet House	General view from the east with the inlet basin in the foreground	E	09/06/2016
19	2_19	Inlet House	General view of the inlet basin	S	09/06/2016
20	2_20	Inlet House	Detail of breakwater in the SE side of the inlet basin	SW	09/06/2016
21	2_21	Inlet House	General view with inlet basin in the foreground	S	09/06/2016
22	2_22	Inlet House	General view with inlet basin in the foreground	SSW	09/06/2016
23	2_23	Inlet House	Detail of breakwater to the inlet basin	NW	09/06/2016
24	2_24	Inlet House	Detail of arch in the SE side of the inlet basin	NW	09/06/2016
25	2_25	Inlet House	General view of the inlet basin	N	09/06/2016
26	2_26	Inlet House	Detail of cornice on the E corner	S	09/06/2016
27	2_27	Inlet House	Close detail of window in the SW elevation	SW	09/06/2016
28	2_28	Inlet House	General view of the SW Elevation	SW	09/06/2016
29	2_29	Inlet House	Detail of roof in the NW Elevation	NW	09/06/2016
30 - 31	2_30 - 31	Inlet House	General view of the NW Elevation	NW	09/06/2016
32	2_32	Inlet House	General view of the NE Elevation	E	09/06/2016
33	2_33	Inlet House	Detail of cornice on the SE Elevation	S	09/06/2016
34	2_34	Inlet House	Detail of main entrance in the South East Elevation	SEE	09/06/2016
35	2_35	Inlet House	General view	S	09/06/2016
36	2_36	-	Registration	-	09/06/2016

Black & White Print & Colour Print Film #3

Frame	Digital Ref	Area	Description	Taken From	Date
1 – 3	-	-	Unassigned	-	09/06/2016
3	3_3	Outlet House 2	General view of building in the background with the parapet wall of the Reservoir in the foreground	SW	09/06/2016
4	3_4	Outlet House 2	General view of building in the background with the parapet wall of the Reservoir in the foreground (closer view than Shot 3)	SW	09/06/2016
5	3_5	Outlet House 2	General view of building in the background with the parapet wall of the Reservoir in the foreground	SW	09/06/2016
6	3_6	Outlet House 2	General view of building in the background with the parapet wall of the Reservoir in the foreground	SW	09/06/2016
7	3_7	Outlet House 2	General view	SW	09/06/2016
8 – 9	3_8 – 9	Outlet House 2	General view (closer view than shot 7)	SW	09/06/2016
10	3_10	Outlet House 2	Detail of main entrance	SE	09/06/2016
11 – 12	3_11 – 12	Outlet House 2	Interior: detail of main entrance	NW	09/06/2016
13 – 14	3_13 – 14	Outlet House 2	Interior: detail of machinery to the NE side supported by the main steel beam near the top of the wall	SW	09/06/2016
15 – 16	3_15 – 16	Outlet House 2	Interior: general view	W	09/06/2016
17 – 18	3_17 – 18	Outlet House 2	Interior: detail of the arrangement just below the ceiling	W	09/06/2016
19 – 20	3_19 – 20	Outlet House 2	Interior: general view	NWW	09/06/2016
21 – 22	3_21 – 22	Outlet House 2	Interior: general view	SE	09/06/2016
23 – 24	3_23 – 24	Outlet House 2	Interior: detail of corbel supporting the steel beam	NEE	09/06/2016
25 – 26	3_25 – 26	Outlet House 2	Interior: detail of main entrance	N	09/06/2016
27	3_37	Outlet House 2	Detail of steps to main entrance	E	09/06/2016
28 – 29	3_28 – 29	Outlet House 2	General view	E	09/06/2016
30	3_30	Outlet House 2	General view (closer shot than 28 – 29)	E	09/06/2016
31 – 32	3_31 – 32	Outlet House 2	General view	NE	09/06/2016
33	3_33	Outlet House 2	Detail of window in the NW Elevation	NW	09/06/2016
34 – 35	3_34 – 35	Outlet House 2	General view	NW	09/06/2016
36	3_36	-	Registration	-	09/06/2016

Black & White Print & Colour Print Film #4

Frame	Digital Ref	Area	Description	Taken From	Date
1	-	-	Unassigned	-	-
2	4_2	Reservoir	Detail of bricked-up/repared area in front of Outlet House 1	NNW	09/06/2016
3	4_3	Outlet House 1	Detail of roof	SW	09/06/2016
4	4_4	Outlet House 1	General view	SW	09/06/2016
5	4_5	Reservoir	General view looking over water	SWW	09/06/2016
6	4_6	Outlet House 2	General view from the other side of the Reservoir	SW	09/06/2016
7	4_7	Reservoir	General view of the parapet wall to the SW side	S	09/06/2016
8	4_8	Reservoir	Detail of the curved coping at the SE edge of the SW side of the Reservoir at the SW corner	SW	09/06/2016
9	4_9	Reservoir	General view of the SE straight side of the Reservoir	SSW	09/06/2016
10	4_10	Reservoir	Detail of entrance to the SW corner	SE	09/06/2016
11	4_11	Reservoir	Detail of pipe to the SW side of the SE straight side of the reservoir	S	09/06/2016
12	4_12	Reservoir	General view of the SE straight side of the reservoir	SSW	09/06/2016
13	4_13	Reservoir	Detail of main central entrance on the SE side of the reservoir	SE	09/06/2016
14	4_14	Reservoir	General view of the pump house on the other side of the complex from the SE side of the Reservoir	NW	09/06/2016
15	4_15	Outlet House 1	General view from the other side of Reservoir	E	09/06/2016
16	4_16	Outlet House 2	General view from the other side of Reservoir	S	09/06/2016
17	4_17	Reservoir	General view looking along the central dividing wall	SE	09/06/2016
18	4_18	Reservoir	General view of the SE straight side of the Reservoir	SSW	09/06/2016
19	4_19	Reservoir	Detail of concrete pillar on the SE straight side of the Reservoir	SSW	09/06/2016
20	4_20	Reservoir	As Shot 21, wider view	E	09/06/2016
21	4_21	Reservoir	General view looking over the water with Outlet House 1 in the background	E	09/06/2016
22	4_22	Reservoir	As Shot 23, wider view	S	09/06/2016
23	4_23	Outlet House 2	General view from the other side of the Reservoir	S	09/06/2016
24	4_24	Reservoir	General view looking along the straight SE section of the parapet wall	SW	09/06/2016
25	4_25	Reservoir	Detail of entrance in the NE corner of the Reservoir at the NE end of the SE wall	SE	09/06/2016
26	4_26	Reservoir	As Shot 27, a closer view	E	09/06/2016
27	4_27	Reservoir	General view of NE corner of Reservoir	E	09/06/2016
28	4_28	Outlet House 2	General view from the other side of the Reservoir	SE	09/06/2016
29	4_29	Reservoir	Detail of pipe on the N side of the NW semi-circular side of the reservoir	W	09/06/2016
30	4_30	Reservoir	Detail of the parapet wall and the far NE corner of the Reservoir showing the steps leading down to the water from the entrance on this corner	NW	09/06/2016
31	4_31	Reservoir	Detail of pillar on the N side of the NW semi-circular side of the Reservoir	W	09/06/2016
32	4_32	Reservoir	General view of the parapet wall on the NW semi-circular side of the Reservoir on the N side	E	09/06/2016
33	4_33	Reservoir	Detail of different style of brick on the centre-NW (semi-circular) side of the Reservoir	W	09/06/2016
34 – 35	4_34 – 35	Outlet House 2	Detail of skylight	SE	09/06/2016
36	4_36	Registration	-		09/06/2016

Black & White Print & Colour Print Film #5

Frame	Digital Ref	Area	Description	Taken From	Date
1 – 3	-	-	Unassigned	-	-
4	5_4	Outlet House 1	Detail of roof	SW	10/06/2016
5	5_5	Inlet House	Detail of original steps to Inlet House enclosure	NE	10/06/2016
6	5_6	Reservoir	General view of dividing wall of Reservoir	N	10/06/2016
7	5_7	Reservoir	As Shot 6, closer view showing steps to the NW side	N	10/06/2016
8	5_8	Outlet House 2	General view with the parapet wall of the Reservoir in the foreground	SW	10/06/2016
9	5_9	Outlet House 2	General view with the parapet wall of the Reservoir in the foreground	SW	10/06/2016
10 – 11	5_10 – 11	Outlet House 2	Detail of NW Elevation	NW	10/06/2016
12	5_12	Outlet House 2	General view	NW	10/06/2016
13	5_13	Reservoir	Detail of parapet wall to the NW semi-circular side showing the angling of the wall	NE	10/06/2016
14	5_14	Reservoir	Detail of the NW end of the central dividing wall to the NW end showing the steps	W	10/06/2016
15	5_15	Inlet House	General view with the reservoir in the foreground	SWW	10/06/2016
16 – 18	5_16 – 18	Outlet House 1	General view with the Reservoir to the left in the foreground	NE	10/06/2016
19 – 20	5_19 – 20	Inlet House	Detail of the brick boundary wall to the front of the building and compound and steps to the SW side (overgrown)	S	10/06/2016
21	5_21	Inlet House	Close detail of weathered brickwork to the face of the front boundary wall in front of the modern compound to the Inlet House	SE	10/06/2016
22	5_22	Reservoir	Detail of the weir to the SW side of the NW end of the central driving wall just before the inlet basin	SW	10/06/2016
23	5_23	Reservoir	Detail of steps down to the water on the SW end of the NW side of the central dividing wall	SW	10/06/2016
24	5_24	Reservoir	General view of the parapet wall	SW	10/06/2016
25	5_25	Reservoir	Detail of the main entrance to the centre of the semi-circular NW side of the reservoir in front of the Inlet House	N	10/06/2016
26	5_26	Reservoir	General view	SW	10/06/2016
27	5_27	Reservoir	General view of central dividing wall	W	10/06/2016
28	5_28	Reservoir	General view of central dividing wall	SW	10/06/2016
29	5_29	Outlet House 1	General view	NE	10/06/2016
30	5_30	Outlet House 1	General view	NE	10/06/2016
31	5_31	Reservoir	As Shot 32, closer view of the steps down to the water	NW	10/06/2016
32	5_32	Reservoir	Detail of central dividing wall	NW	10/06/2016
33	5_33	Reservoir	Detail of the SW side of the main entrance to the centre of the semi-circular NW side of the Reservoir in front of the Inlet House	NW	10/06/2016
34	5_34	Reservoir	Detail of the NE side of the main entrance to the centre of the semi-circular NW side of the Reservoir in front of the Inlet House	NW	10/06/2016
35	5_35	Inlet House	General view	SW	10/06/2016
36	-	-	Registration	-	10/06/2016

APPENDIX 2: MEASURED SURVEY REPORT

The measured survey of Frankley Reservoir and its associated Outlet Houses and Inlet House was undertaken using a Faro Focus 3D laser scanner. The Focus 3D scanner is a phase comparison system, capable of full dome scanning at ranges of ca. 0.5m to 50m, at resolutions of up to 92 lines per degree. Scanning was undertaken on Outlet House 1, Outlet House 2 and the Inlet House using resolutions as recorded below yielding a typical point-cloud resolution of between 6.136mm and 12.272mm at 10m from the instrument. Overlapping stations mean that the majority of the site was scanned at a greater resolution. The survey was controlled using spherical targets, located using a Trimble S6 total station with site control provided by a Trimble R6 GPS using the “vrs now” service. The laser scan data was registered in Trimble Realworks v.10.0.

The site drawings were produced in Rhino 4.0 with layouts produced using AutoCAD LT 2009.

Scan Number	Number of points	Resolution	Quality
BirmInlet001	28,204,848	1/5	4x
BirmInlet002	10,993,148	1/8	4x
BirmInlet003	8,913,487	1/5	4x
BirmInlet004	9,417,768	1/5	4x
BirmInlet005	10,594,098	1/5	4x
BirmInlet006	19,698,164	1/4	4x
BirmInlet007	17,615,318	1/4	4x
BirmInlet008	16,246,809	1/4	4x
BirmInlet009	14,287,511	1/4	4x
BirmInlet010	255,096	1/2	4x
BirmInlet011	16,931,970	1/4	4x
BirmInlet012	703,236	1/2	4x
BirmInlet013	3,340,660	1/8	4x
BirmWT001	17,319,994	1/4	4x
BirmWT002	18,388,826	1/4	4x
BirmWT003	23,622,401	1/4	4x
BirmWT004	22,153,485	1/4	4x
BirmWT005	18,474,268	1/4	4x
BirmWT006	17,088,490	1/4	4x
BirmWT007	17,061,548	1/4	4x
BirmWT008	17,689,050	1/4	4x
BirmWT009	17,543,334	1/4	4x
BirmWT010	42,692,198	1/4	4x
BirmWT011	27,538,980	1/5	4x
BirmWT012	10,359,239	1/8	4x
BirmWT2001	16,822,266	1/4	4x
BirmWT2002	16,955,571	1/4	4x
BirmWT2003	16,949,061	1/4	4x
BirmWT2004	VOID		
BirmWT2005	991,749	1/2	4x

BirmWT2006	16,665,507	1/4	4x
BirmWT2007	VOID		
BirmWT2008	VOID		
BirmWT2009	VOID		
BirmWT2010	1,440,102	1/2	4x
BirmWT2011	16,771,852	1/4	4x
BirmWT2012	15,793,162	1/4	4x
BirmWT2013	17,004,657	1/4	4x
BirmWT2014	VOID		
BirmWT2015	795,940	1/2	4x
BirmWT2016	16,882,113	1/4	4x
BirmWT2017	17,066,873	1/4	4x
BirmWT2018	42,263,862	1/4	4x
BirmWT2019	VOID		
BirmWT2020	27,133,732	1/5	4x
BirmWT2021	27,584,193	1/5	4x



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