JULIAN HARRAP

ARCHITECTS LLP

THE MONUMENT TO THE GREAT FIRE OF LONDON

VOLUME II: QUINQUENNIAL INSPECTION SURVEY

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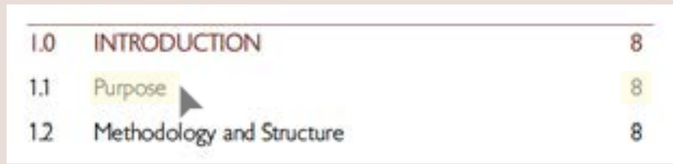

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City Corporation	City of London Corporation
CMP	Conservation Management Plan
CS	City Surveyors
FM	Facilities Management
HE	Historic England
HES	Heritage Estate Section
JHA	Julian Harrap Architects LLP
LVMF	London View Management Framework
MMP	Management and Maintenance Plan
NE	Natural Environment
OPS	Operations Division
PD	Planning Department
TB	Tower Bridge

1.1 AIMS OF THE REPORT

The principal aim of the quinquennial inspection is to assess the overall condition of the building and identify defects and potential problems which should be further considered. In addition, the inspection report identifies where fittings or elements are inappropriate to the status of the Grade I Listed Building.

The City of London has a responsibility to ensure that regular inspections and maintenance are carried out. The quinquennial survey forms part of the programme of regular inspections, to give an overview and identify future measures necessary to secure the soundness of the building fabric.

The Monument is a seventeenth century building of international importance, which is used as a visitor attraction receiving over 100,000 visitors per year. The building was not designed to accommodate so many visitors; the great number of visitors has consequences in terms of the visitor experience, damage and wear to the fabric of the building, the risk of 'over development' of facilities for visitors and the management of visitors, repairs and maintenance.

It is essential that the historic building fabric is maintained in good order, both to fulfil the City of London's obligations to keep the grade I listed building and Scheduled Ancient Monument, wind and weather tight, and for the safety and enjoyment of the visiting public.

1.2 RECENT BACKGROUND TO THE REPORT

The Monument was closed to the public from July 2007 to February 2009 for a major repair contract, following several years of careful preparation, monitoring, opening-up works and trials.

On completion of the contract, the building was in good condition and well presented to the public.

In 2016 the first Quinquennial Survey Inspection was carried out since the major repair contract of 2007-2009.
This is the second Quinquennial Survey Inspection report since the major repair contract.

1.3 SCOPE OF THE CONDITION INSPECTION REPORT

This report has been prepared following inspections of the Monument undertaken in July and August 2024.

The report is principally a visual record of finishes, materials and methods of construction where identifiable; an assessment of their condition and any present or potential future defects; comments on appearance where relevant and recommendations for maintenance and repair work.

1.4 LIMITATIONS OF THE CONDITION INSPECTION REPORT

Interiors have been visually inspected from the floor levels, to include the interior above viewing platform level and the basement. The external elevations have been inspected from ground level and from the viewing platform.

There are several areas which were not visible during the inspections. These have been identified within the body of the report and recommendations made accordingly.
Opening-up of concealed areas has not been carried out during the course of the inspections.
The recommendations which appear in the report identify defects and suggest possible causes and future necessary actions. However, the report should be read as a comment upon the overall condition of the property, and its construction. It is not an inventory of every single defect, nor does it attempt to quantify defects or provide a detailed specification for remedial work.

1.5 PLANNING AND SCHEDULED MONUMENT CONSENT ISSUES

1.5.1 Removal of Turnstiles

Prior to the 2007-2009 contract, Victorian cast iron turnstiles were fixed inside the entrance to the Monument, installed in 1891.
The turnstiles comprised a central barrier of seven circular iron balusters with a flat iron top rail, painted iron gates, one each side of the barrier, with brass digital counters, semicircular on plan with eleven balusters and flat iron top rail. The wrought-iron hoop gates were pegged in position and operated by a floor mounted ratchet mechanism. The mechanism was still in good working order.

Following the 2007-2009 repair contract, the central barrier and parts of the wrought-iron hoop gates were removed by the City Corporation on a temporary basis.
It is understood by JHA that these are safely stored at Tower Bridge in the diesel room. The permanent removal of these historic fixtures is likely to be a planning and Scheduled Monument Consent issue.

Fig. 1 c.1981 turnstiles reinstated in 2009, now partly removed, 2009

Fig. 2 Light Bureau's design drawing, 2008

1.5.2 Lighting on the Viewing Platform: 2008 Proposals & CoL Planning

External lighting was not included in the planning application for the 2007-2009 major repair contract.
In 2008 Julian Harrap Architects and lighting designers Light Bureau, were instructed to prepare designs for lighting on the viewing platform. These proposals were discussed with the planning authority to install lighting at the corners of the viewing platform in order to light the dome and flaming orb and reduce the visibility of the cage mesh. Detailed proposals were prepared by Light Bureau, fittings were designed by Mike Stoane lighting and mock-ups were undertaken on site, after dark. It was recorded that if light fittings were not visible, planning consent may not be required.

1.5.3 Exterior Lighting installed by CoL since 2009

A strip of LED lights has been fixed to the underside of the balustrade handrail on the viewing platform.
The new lighting performs none of the functions of the subtle lighting proposal discussed with the planners in 2008. The LED strip light source is directly visible from the ground, it highlights the balustrade handrail by causing glare from the underside; it harshly lights only the lowest part of the stone drum and does not light at all the dome and flaming orb. In the opinion of Julian Harrap Architects, it detracts from the appearance of the historic building.

1.5.4 Exterior Lighting installed since 2016

A temporary builder's spotlight is now located in the south-west corner of the viewing platform, fixed to the stainless-steel mesh inside the corner baluster with cable ties.

Fig. 3 Night photo balustrade glare, 2018

Fig. 4 & 5 Single uplighter, 2024

2.1 CONDITION OF THE EXTERNAL FABRIC

The structural condition survey focussed on three areas and recommends regular inspections and monitoring at specific time intervals. The flaming orb area has minor corrosion to iron structural straps inside the Drum dome and a hole in the copperwork. The viewing platform (observation deck) has cracking at the base of the railings; inspection of the slabs is recommended, and a repair and stabilisation scheme developed once the causes are better understood. The steps have cracks evident in stonework around the base of some balusters and regular crack monitoring is recommended. A thin metal strap has been fixed to the stair balusters, which currently appears to be stable. Balustrade strengthening details were proposed by Hockley & Dawson in 2016, which are still recommended by the structural engineers.

The architectural condition survey considers the exterior stonework to be in good condition except for a weathering roll-moulding at the top of the column plinth which is cracking and friable; immediate action is recommended. The hardwood doors and bronze casements are generally in good condition, with minor damage to ironmongery.

2.2 CONDITION OF THE INTERIORS

Internally, the previous condensation problems within the stairwell appear to be greatly reduced, likely with the installation of casement windows, trace heating and absorbent stone finishes. A concern is the extent of damp in the basement and the current blocking of ventilation routes, accelerating decay to the masonry.
Within the stairwell, local repairs are needed to the oak handrail. Interior decoration is in poorer condition in the most inaccessible places, such as the timber enclosure at the top of the stairs, but at lower levels is in reasonably good condition.

The condition of fixtures in the entrance foyer has deteriorated and the number of fittings increased, to the detriment of the historic interior.
Electrical services have been added or altered since the 2016 condition inspection, which are individually reviewed and are not all considered to be improvements to those they replaced.
Statutory inspections are regularly undertaken although the latest lightning protection inspection notes repair work is required.
Externally, the railings have local paint damage and the paving drainage routes appear blocked.

2.3 SUMMARY OF PRIORITY A + B OF RECOMMENDED WORKS

RECOMMENDATION	PRIORITY	COSTS
5.2B EXTERIOR STONEWORK: VIEWING PLATFORM OR ABACUS i) Structural engineer's condition survey	A	See Struc.Eng. Fees
5.3 THE FLAMING ORB i) Closer inspection of the hole would be required in order to better assess the condition.	B	£2,300
5.4 THE BALUSTRADE & CAGE ii) Regular inspections and maintenance for the cage & balustrade	B	£2,000
5.6 EXTERNAL TIMBER DOORS: PAIR OF HARDWOOD ENTRANCE DOORS AND FRAME i) Remove paper sign from glazing to entrance door.	A	Inc. in Staff Budget
5.8 WINDOWS ii) Clean chewing gum from windows described	A	Inc. in Staff Budget
6.3 GENERAL AREAS OF STONEWORK DAMP AND DECAY i) Avoid blocking up the ventilation grille at the apex of the basement vault which reduces ventilation of the basement and avoid blocking up the grilled opening at the top of the public spiral staircase, which reduces ventilation to the stonework of the interior above.	A	Inc. in Staff Budget
ii) Monitor damp within the ground floor interior stonework in different weather conditions.	B	Inc. in Staff Budget
iii) Measure damp in interior walls before redecorating and apply silicate masonry paint in accordance with manufacturer's instructions, as far as possible.	B	-
iv) Record where the walls are damper than recommended for paint application and anticipate paint flaking here in due course. Record this residual hazard.	B	-
6.5 STAIRWELL AND SPIRAL STAIRCASE i) Remove board blocking circular ceiling opening	A	Inc. in Staff Budget
6.5A STAIRWELL AND SPIRAL STAIRCASE: STONE WALLS i) Investigate long-handled specialist cleaning equipment to enable an even clean of the painted walls	B	Inc. in Staff Budget
6.5B STAIRWELL AND SPIRAL STAIRCASE: STEPS i) Crack monitoring of steps to be put in place, recommended to be 6 monthly [subject to review of previous balustrade records]	A	See Struc.Eng. Fees
ii) Review of the noted cracking and stone condition against previous records	B	See Struc.Eng. Fees

RECOMMENDATION	PRIORITY	COSTS
6.5D STAIRWELL AND SPIRAL STAIRCASE: OAK HANDRAIL		
i) Detailed inspection of the oak handrail by a suitably qualified carpenter, to check if there is any splintered timber immediately above the iron bar supporting the timber, if so, ensure the splits are sanded to avoid damage to hands.	B	-
6.5E STAIRWELL AND SPIRAL STAIRCASE: HIGH-LEVEL IRON & TIMBER PARTITIONING		
ii) Clean and decorate the temporary infill board. Fix onto the top of the board, large clear instructions to say that the board is to be used while operatives are working above, as temporary protection to prevent objects falling down the stairwell; the board is to be removed from the opening after every use.	B	£400
iii) Ensure there is a place for the board to be kept, adjacent to the opening, but out of sight to the public.	A	Inc. in Staff Budget
6.6C GROUND FLOOR ENTRANCE LOBBY: JOINERY - GLASS FRONTED PAINTED SOFTWOOD CUPBOARD		
iii) Avoid duplication of Fire Extinguisher notices. Locating the notices directly above the fire extinguishers is preferable for the presentation of the historic interior.	B	-
iv) Review the number of CCTV signs displayed at the Monument, reduce the number to the recommended minimum by eliminating those which detract from the visitor experience of the historic building.	B	-
6.6D GROUND FLOOR ENTRANCE LOBBY: JOINERY - LOW LEVEL CUPBOARD AT REAR OF ATTENDANT'S RECESS		
ii) Rationalise and tidy cupboard contents.	B	Inc. in Staff Budget
iii) Redesign the new shelf (if needed) above the cupboard door to a more appropriate design for the historic interior.	B	£400
6.6E GROUND FLOOR ENTRANCE LOBBY: JOINERY - SMALL TIMBER ELECTRICAL SERVICES CUPBOARD WITH SHELF OVER		
i) Review and rationalise the equipment and services required in the attendant's recess.	B	-
6.6F GROUND FLOOR ENTRANCE LOBBY: TURNSTILES		
i) Inspect the missing parts of the turnstiles to ensure they are recorded and safely stored.	B	Inc. in Staff Budget
6.6G GROUND FLOOR ENTRANCE LOBBY: OCULUS & WROUGHT IRON GRILLE / BAG STORE AREA		
i) Reinstate the main means of ventilating the basement, by removing the plywood which is blocking the grille.	A	Inc. in Staff Budget
ii) Ensure the red basement lighting is switched on during visiting hours to allow the possibility of visitors understanding the form of the building and obtaining a glimpse of Hooke's workshop	B	Inc. in Staff Budget

RECOMMENDATION	PRIORITY	COSTS
6.6H GROUND FLOOR ENTRANCE LOBBY: FURNITURE & EQUIPMENT		
i) Do not store cleaning equipment within public view at the base of the helical stair. Store with the other cleaning equipment, in the Pavilion building in Monument Yard.	A	Inc. in Staff Budget
ii) Review the bag store and consider alternative locations to store bags, to allow the grille to the basement to remain unobstructed.	A	CS
6.7 BASEMENT: STAIRWAY TO THE BASEMENT		
i) Sweep steps and landing.	A	Incl. Staff Budget
ii) Clear away metal platform, if no longer in use (retain at present)	B	No cost
6.7A BASEMENT: BASEMENT CIRCULAR CHAMBER (HOOKE'S WORKSHOP)		
ii) Lightly brush the walls to reduce flaking paintwork, and efflorescence, sweep all floors and ledges.	A	Incl. Staff Budget
6.8 INTERIOR SIGNAGE		
i) Remove paper sign on front door glazing	A	Incl. Staff Budget
7.2 HEATING		
iii) City Corporation to provide information on heaters, installation dates and testing certification	B	CS
7.3B FLAMING ORB DISPLAY LIGHTING		
i) Remove the mouldy infill board to the circular ceiling opening. Supply new round plywood board and decorate	A	£800
7.3C STAIRWELL LIGHTING		
ii) The existing light fittings should be fixed to the balusters with the base of the light fitting in line with the top of the adjacent tread.	A	Incl. Staff Budget
7.3E GROUND FLOOR LIGHTING		
ii) Remove the barrel vault uplighter if it is redundant, and make good at the fixings	B	Incl. in 7.2 ii)
7.3F BASEMENT DISPLAY LIGHTING		
i) It has been recommended elsewhere that the plywood board is removed for ventilation reasons, and that the iron floor grille remains unobstructed to allow air movement through the currently unventilated and damp basement.	A	Incl. Staff Budget
ii) Ensure the red-tinted basement lighting is working and switched on daily.	B	Incl. Staff Budget

RECOMMENDATION	PRIORITY	COSTS
7.5 LIGHTNING CONDUCTOR i) Undertake repair work as quotation provided to CoL by Omega Red Ltd	A	Client to Provide Quote
7.6A FIRE RISK ASSESSMENT i) Include regular cleaning of the flame area and cellar on the cleaning rota	A	Incl. Staff Budget
7.6C FIRE EXTINGUISHERS i) Undertake recommendations from 'StandBy Fire Protection' to ensure fire extinguishers are compliant	A	Client to Provide Quote
7.7A DISABLED ACCESS AND THE 2004 ACCESS AUDIT i) Sign over the glazing to the entrance door: remove	A	Incl. Staff Budget
7.8A HEALTH & SAFETY POLICY i) Ensure the Monument attendants have appropriate health & safety training	B	Incl. Staff Budget
8.1 ENTRANCE STEPS & EXTERNAL PAVING i) Wash Yorkstone steps with bristle brush and water and freeze remove chewing gum	B	£400
ii) Clean paving and two paving drain-pipes within railings paved area	B	£1,000
iii) Improve appearance of earthing cable to exterior water supply pipe	B	Incl. Staff Budget
9.1 PAVILION BUILDING i) Prepare detailed scope of exterior & interior repairs and alterations to the Pavilion building to provide adequate facilities for Monument staff and a presentable exterior in the setting of the Listed Monument	B	Client to Provide Quote
TOTAL		£7,300

2.4 SUMMARY CONDITION OF THE PAVILION

The Pavilion in Monument Yard is in poor condition and a detailed scope of repairs and alterations to provide adequate facilities, is recommended.

Externally, the building looks shabby and appears to have been designed for a short lifespan only. Structural glass walls have open joints and flex when pushed against, some joints are crudely filled; the cavity between glazing and gabions is inaccessible and therefore not maintained. The disused public WC has a temporary plywood door and the payment point is taped over. The unusual roof looks dirty.

The condition of the interior is described by the Operations Team as unsuitable for its multi-purpose use as a staff welfare area, storage facility and secure space for cash. Maintenance is required to the external door, interior decoration, tiles and kitchen equipment

3.1 SUMMARY OF HISTORY OF THE MONUMENT

The Monument to the Great Fire of London was constructed between 1671 and 1677, built on the orders of King Charles II to commemorate the Great Fire of London of September 1666 and to celebrate the rebuilding of the City.

The following introduction to the history of the Monument is taken from the official website for the Monument www.themonument.info/history/introduction.html.

The Monument stands at the junction of Monument Street and Fish Street Hill in the City of London. It was built between 1671 and 1677 to commemorate the Great Fire of London and to celebrate the rebuilding of the City.

The fire began in a baker's house in Pudding Lane on Sunday 2nd September 1666 and finally extinguished on Wednesday 5th September, after destroying the greater part of the City. Although there was little loss of life, the fire brought all activity to a halt, having consumed or severely damaged thousands of houses, hundreds of streets, the City's gates, public buildings, churches and St. Paul's Cathedral. The only buildings to survive in part were those built of stone, like St. Paul's and the Guildhall. As part of the rebuilding, it was decided to erect a permanent memorial of the Great Fire near the place where it began. Sir Christopher Wren, Surveyor General to King Charles II and the architect of St. Paul's Cathedral, and his friend and colleague, Dr Robert Hooke, provided a design for a colossal Doric column in the antique tradition. They drew up plans for a column containing a cantilevered stone staircase of 311 steps leading to a viewing platform. This was surmounted by a drum and a copper urn from which flames emerged, symbolising the Great Fire. The Monument, as it came to be called, is 61 metres high (202 feet) - the exact distance between it and the site in Pudding Lane where the fire began.

The column was completed in 1677, and in accordance with Wren's original intention, was at first used as a place for certain experiments of the Royal Society, but vibrations caused by ceaseless traffic proved too great for the success of these experiments and they were discontinued; thereafter the Monument became a place of historic interest, unique of its kind, providing visitors with an opportunity to look across London in all directions from a height of about 160 feet, being the level of the public gallery.

3.2 CONSTRUCTION

The Monument is constructed mainly of Portland stone and remains the tallest isolated stone column in the world.

The plinth of the column is 28 feet square beneath the pedestal of about 21ft square and 40ft high.
Arising from the pedestal is the fluted shaft, 120ft high and 15ft in diameter at its base, reducing slightly with height.
The abacus at the top of the fluted shaft is the viewing platform, wrapped around a stone cylinder, or drum.
A stone dome on the circular drum carries the Flaming Orb, which is a massive urn constructed from deep bands of sheet copper, riveted together with a bowl at the very top.

The urn is decorated externally with copper garlands and the bowl with many twisted strips of copper, all fixed with rivets.
The exterior copperwork is gilded with sheets of gold leaf, the effect is a bowl of dazzling gold flames atop a golden urn, which symbolizes the Great Fire of London.

A structural wrought iron armature fastens the copper flaming orb down to the stone mass of the dome and drum below.
The west side of the base displays a sculpture, by Caius Gabriel Cibber of the destruction of the City; with King Charles II, and his brother, James, the Duke of York surrounded by Liberty, Architecture, and Science, giving directions for its restoration.

3.3 BRIEF DESCRIPTION OF THE INTERIOR

Inside the column is a continuous cantilevered spiral stone staircase of 345 black limestone steps, lit by narrow slit windows. The first 311 steps take the visitor up to the viewing platform and the last 34 steps lead up to the top landing from where a circular iron ladder continues up to the underside of the copper bowl; the top of the Flaming Orb. From this copper bowl, Wren, in his letter of 1675, described the idea of fireworks cascading down over the City below.

4.1 QUINQUENNIAL INSPECTION REPORT 1991

In 1991, Julian Harrap Architects carried out a comprehensive condition survey of the Monument for the Corporation of London. The survey included contributions from a series of specialist consultants including conservators, structural engineers, quantity surveyors and environmental consultants.

The report concluded with a series of prioritised recommendations and a budget cost estimate for the work. Some of the high priority works were undertaken.

4.2 SURVEY AND INVESTIGATION WORK 2003-2005

In 2003, the Julian Harrap Architects undertook further survey work and prepared The Monument Investigation Work report, May 2005, which included:

- A detailed measured survey of the building.
- Structural investigations, which describe the construction of the viewing platform and the condition of any concealed ironwork.
- Cleaning and repair trials to establish acceptable methods of stone cleaning and repairs.
- Environmental monitoring which measures the existing conditions and advises whether measures need to be adopted in order to secure the long-term future of the internal fabric.
- Again, specialist consultants were appointed to review the structure, environmental conditions and cost estimates for repair.

4.3 THE 2007-2009 MAJOR REPAIR CONTRACT: SUMMARY OF WORKS

Due to the difficulty and expense of scaffolding the 202ft column, the Monument is only scaffolded approximately every 80 – 100 years.

The brief for the Major Repair Contract was to undertake external repairs for a very long-life span from the scaffold, repair the interior and re-present the building for the visitors to the Monument. This included replacing and upgrading all services and replacing the 1950s balustrade and cage at viewing platform level with new design to improve visitor circulation and safety and enhance the visitor experience.

Works included repairing and re-gilding the copper flaming orb, structural restraining of the wrought iron armature supporting the orb and structural repairs to stone courses dislodged by the movement at high level.

A major element of work was cleaning the entire Portland stone exterior and repairing the fluted shaft, stone carvings and the sculpture relief panel by Claus Cibber. Four large carved stone paterae, each to new designs, replaced those which had been removed from the underside of the abacus in the 19th century.

The black limestone viewing platform was stripped of its later asphalt coating and repaired, together with the entire black limestone spiral staircase which had suffered structural damage.

The lightning protection system was renewed and discretely connected to the internal wrought iron balustrade which itself was repaired, re-caulked in lead and spiral oak handrail repaired and re-polished.
Calcium-silicate paint was applied to the interior allowing the masonry walls to breathe, and bespoke slim bronze casements designed and fixed into repaired rebated window slits.

A new pair of oak doors replaced the previous 1980s entrance door.

Services were renewed and upgraded with all the cables being brought up the stairwell in spiral stainless-steel conduits, each shaped on site to fit the diminishing circumference of the stairwell.
Innovative LED light strips fixed to the slim square stair balusters, to light the spiral staircase.

A camera was erected at the top of the Monument to produce images of the views from the top of the Monument, which are available on the Internet, and intended in the future to be shown on a screen in Monument Yard.

New materials used: many unusual and scarce materials were required for the work.

To repair the original fabric, materials were selected to match the original, such as Pooil Vaaish limestone and Purbeck.

Modern materials had to be compatible with the historic fabric, such as the weld specification to connect pure iron to seventeenth century wrought iron or the tinted Fisher epoxy resin, compatible with the density of black limestone. The highest quality modern materials were used for items of new work, for example grade 316 stainless steel for the new cage and balustrade to the viewing platform and the curved electrical conduits, Belzona for waterproofing vulnerable inaccessible areas of stonework.

High quality workmanship was ensured by carefully vetting and selection of the contractor and specialist subcontractors, who undertook trials and samples for approval in advance of the works. Some 15 specialist subcontractors were involved in working on the very special conservation challenges of this unique structure.

4.4 WORKS 2009 – 2024

- Viewing platform lighting under balustrade handrail
- Viewing platform spotlight in corner of viewing platform cage
- Repair works to viewing platform cracks
- Staircase balusters new steel strap
- Replacement of staircase balustrade lights
- Replacement of light over attendance recess
- Additional electrics at ground floor level
- Perspex screen fixed to attendance recess door
- Boarded coverings to grilles across circular openings at top and bottom of staircase
- External timber sign

5.1 GENERAL CONDITION

PRIORITY RATINGS	
A	Requires urgent/ immediate attention
B	Recommended within 12 months
C	Recommended within 3 years
D	Desirable

5.1A MONITORING VERTICALITY OF THE MONUMENT

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
A new system of monitoring the verticality of the Monument was installed in 2005. The method of recording is by laser, measuring offsets to brass studs set into the wall at different heights. Four 10mm diameter brass studs are resin fixed into the masonry inner face of the shaft, on the north, east, west and south points at the following locations: basement level, ground floor level, mid-height up the shaft, viewing platform level. A steel bar is fixed in the circular basement chamber to provide a basepoint for the Autoplumb. In 2005, during the measured survey of the Monument in 2005, the surveyors the Downland Partnership Limited were asked to record the present lean of the Monument by overlaying the actual building over the true vertical position. In 2013 The Downland Partnership monitored the verticality and found the results to be remarkably similar to the 2005 visit, with very little variation at any of the levels. The surveyors would not state that there was movement unless the measured deviation was greater than 2mm. In 2015 the Downland Partnership monitored the verticality. Site conditions had slightly changed which meant readings could not be taken from quite the same place. The iron grille over the circular opening at the apex of the basement dome has been fixed in position, preventing the measuring instrument being centrally located in the stairwell. In summary, the readings showed that the position of the tower had become slightly more vertical than it was on the base visit in 2005.	The 2024 monitoring of the verticality by the Downland Partnership summarises: the readings are showing that the position of the tower has maintained the trend of slightly more vertical than it was on the base visit. A copy of the report: Monument Verticality Report 07 July 2024 is appended	i) Allow for re-measuring the verticality in five years from the last measurement, ie. in 2029. ii) The monitoring is to be done by a firm of surveyors with the necessary equipment to record with the degree of accuracy required.	FIVE YEARLY	£1,050

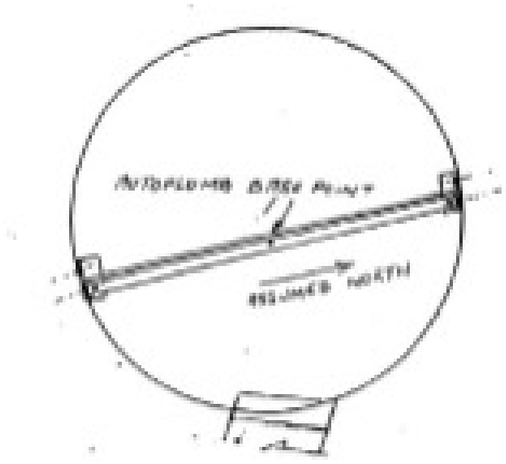

Fig. 6 Basement plan showing Auto plumb base point, 2024

Fig. 7 Photo of steel angle locating survey plumb base point, 2024

5.2 THE EXTERIOR STONEWORK

The Monument column was constructed entirely from Portland stone with a black limestone viewing platform and spiral staircase. The external stonework could only be inspected from the ground and the viewing platform.

5.2A EXTERIOR STONEWORK: THE DRUM				
DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The Drum has a moulded base and cornice to the throating immediately below the gilt vase and flaming orb. There is a square headed doorway on the east side giving access to the viewing platform from the interior of the column.	From the viewing platform the Portland stonework was generally in very good condition with no graffiti on the stone Drum. The deep joint at the base of the Drum, above the black limestone viewing platform is slightly vulnerable due to its depth and location and may require repointing in the near future if the mortar spalls. Stonework defects noted: • Wide joint at base of Drum • Slight algae on drum on west side at dado height.	i) Wide joint at base of Drum: locally repoint. ii) Slight algae on drum on west side at dado height.	C D	£1,800 £600

Fig. 8 Location of the Drum, 2006

Fig. 9 & 10 Wide joint at the base of the Drum, 2024

5.2B EXTERIOR STONEWORK: VIEWING PLATFORM OR ABACUS

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The Viewing Platform is constructed from particularly large slabs of black limestone. Archaeological remains of earlier balustrades and support posts remain set into the stone.	The black limestone platform: Grey resin repairs undertaken in the 2007-2009 contract are well adhered to the stonework but the finish appears duller and dirtier than at the end of the 2007-2009 contract, which makes the repairs more visible against the shiny stonework. Condition of stone platform as Structural Engineer's Condition Survey report, which notes significant cracking observed along the railing line, particularly to the west and east sides. These cracks had not been noted on previous inspections and did not form part of the previous set of monitoring. This would suggest that whilst they may have been present, they would have been less severe. It is therefore assumed that the cracking has worsened since the last set of structural inspections.	i) As structural engineer's condition survey Detailed inspections of the cracking around the base of the railings; the position of the cracks makes stud monitoring difficult due to the proximity to the railings. Repair and stabilisation scheme to be developed once the causes are better understood. ii) Provisional sum for injecting crack repairs and using resin anchors across cracks subject to results from monitoring and inspections (minor structural interventions only)	WITHIN 6 MONTHS C	See St.Eng. Fees £7,600

Fig. 11 Southeast corner of the viewing platform, 2024

Fig. 12 Crack line along the base of balusters, 2024

Fig. 13 Detail of a balustrade corner post, 2024

5.2C EXTERIOR STONEWORK: COLUMN CAPITAL				
DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	TOTAL
The Capital comprises a Portland stone torus necking with carved relief. Above the necking the ovolo immediately beneath the abacus is carved with an egg and dart motif surmounted by a leaf and dart cyma-reversa moulding to the square viewing platform.	From the ground, the underside of the viewing platform or abacus appears to be fairy dirty where the Portland stone is sheltered from rainfall, as expected. No obvious defects; extensive works undertaken 2009 with a long lifespan.	No action. Underside of viewing platform is not accessible without a scaffold.		

5.2D EXTERIOR STONEWORK: PATERAE				
DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	TOTAL
Beneath the viewing platform are four re-carved stone paterae some 900mm in diameter. These were installed in 2009, suspended by stainless steel bolts, replacing the original carvings which detached themselves in 1882 and were never replaced.	Only inspected from the ground. No obvious defects; extensive works undertaken 2009 with a long lifespan.	No action. Paterae are not accessible without a scaffold.		

5.2E EXTERIOR STONEWORK: COLUMN SHAFT				
DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	TOTAL
The fluted shaft is 99 feet in height with 24 flutes and convex carving at top and bottom. The central fillet on each face of the column is pierced with 8 no. narrow slit lights which light the internal staircase.	The fluted shaft remains clean and appears to be in very good condition. Stone indents from the 2009 repair works show up colour-wise against the historic stonework.	No action. The fluted shaft is not accessible without a scaffold.		

5.2F EXTERIOR STONEWORK: COLUMN BASE

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	TOTAL
The Base comprises a torus moulding on a square plinth, which is decorated on each of the four sides by a carved garland with a shield and scroll and is decorated on each corner by a carved dragon.	Extensive reinforced stone repairs were undertaken in 2008 to the carved stone dragons to replace missing tails, wings and tongues. These were inspected from the ground and appear to be intact. The stone carving at the base is dark in sheltered areas and the cornice streaky beneath the uneven projecting cornice. Green algae is present on the torus moulding and carved garlands and at the column base, especially on the east elevation. North: Roll moulding (drip moulding): Eroded but less severe than south and west sides; heavy lichen and some bad erosion but no broken sections. East: Column base and dragons: Dragons and carving good condition some dark patination. Drip moulding: missing sections of drip moulding and algae and soiling South: Base to column: Drip moulding missing in places, heavy soiling under. Stonework including carving: Very good condition West: Drip moulding: Drip missing and very heavy soiling Column base: Heavy soiling. Dragons: Very good condition	i) The drip moulding is eroding and lichen stained and is eroding. ii) Lightly steam (Doff) clean from a Moving Elevated Working Platform (MEWP) to reduce black staining iii) Carefully loosen by hand any loose stonework and remove, inspect condition. Allow for this to be undertaken annually until the drip moulding is repaired. iv) Natural stone indent repairs to roll moulding; consider adding a lead or Belzona protective cover flashing.	 C C C	 £10,500 £5,200 £58,000

Fig. 14 North elevation Column Base, 2024

Fig. 15 East elevation Column Base, 2024

Fig. 16 South elevation Column Base, 2024

Fig. 17 West elevation Column Base, 2024

5.2G EXTERIOR STONEWORK: PEDESTAL

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The Pedestal is of Portland stone ashlar blockwork, comprising a plinth surmounted by a sunken dado panel beneath the moulded and enriched Column Base and Cornice.	The relief and lettering panels are in good condition although are unevenly cleaned by rainfall. The mouldings to the top of the base to the column plinth are heavily stained with green algae, especially on the east and west elevations, which is rather unsightly. Algae is an indicator of damp problems which should disappear when the stonework dries out and is not known to damage stonework but can be disfiguring. North: Border to tablet carved work: very good condition. Plinth: algae staining to plinth at high-level under roll moulding, Pointing: very good condition East:Border to tablet carved work: carved border to tablet very good condition; some erosion at bottom in north and south corners. Tablet & window surround: very good condition Roll moulding: some erosion to top of roll moulding but historic at north and south corners only, good condition slight soiling Plinth: generally good condition heavy soiling Plinth ashlar base: all very good condition, heavy algae at bottom course north side of door Pointing very good condition	i) Roll moulding as COLUMN BASE, above ii) Lightly steam (Doff) clean the Plinth from a Moving Elevated Working Platform (MEWP) to reduce black staining. Last undertaken in November 2024. (English Heritage Practical Building Conservation: Stone, p75). Steam cleaning can be used for removing algae.	C	£10,600

Fig. 18 Pedestal North side, 2024

Fig. 19 Pedestal East side, 2024

5.2G EXTERIOR STONEWORK: PEDESTAL (CONTINUES)				
DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The Pedestal is of Portland stone ashlar blockwork, comprising a plinth surmounted by a sunken dado panel beneath the moulded and enriched Column Base and Cornice.	South: Tablet: very good condition, some erosion to border leaf mouldings Roll moulding: severe historic erosion, algae at base 1no.stone Pointing: all very good condition West: Tablet surround carved moulding: very good condition. Carved cyber relief tablet: very good condition, slight pigeon fowling to top two statues Base moulding: very eroded in places and algae staining full length of roll moulding Plinth: algae at top course under roll moulding but generally very good condition Pointing: all very good condition	Roll moulding as COLUMN BASE, above Lightly steam (Doff) clean the Plinth from a Moving Elevated Working Platform (MEWP) to reduce black staining. (English Heritage Practical Building Conservation: Stone, p75). Steam cleaning can be used for removing algae.	C	Inc. in figure on Page 21 5.2F ii)

Fig. 20 Pedestal South side, 2024

Fig. 20 Pedestal West side, 2024

5.2H EXTERIOR STONEWORK: BELZONA FINISH TO STONEWORK

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Belzona was applied in 2009 to the stonework externally at base of the column shaft for waterproofing this vulnerable inaccessible area of stonework. Belzona is a one component, flexible liquid polymer, membrane-reinforce, roof covering system, applied to prepared concrete or masonry surfaces.	At such high level, the Belzona finish is not expected to be maintained regularly. Belzona has a long lifespan and is expected to last at least 25 years	No action. The Belzona is not accessible without a scaffold.	-	

5.3 THE FLAMING ORB

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Externally, above the neck of the dome, is a circular stone cornice with a plain band of stonework above, on which sits the copper flaming orb. The form of the flaming orb is a massive urn with a bowl at the very top constructed from deep bands of sheet copper, 1/8 in. thick, riveted together. The urn is decorated externally with copper garlands and the bowl with many twisted strips of copper, all fixed with rivets. The copperwork is externally gilded with sheets of gold leaf. The effect is a bowl of dazzling gold flames atop a golden urn.	The condition of the Flaming Orb gilding was not inspected on site due to access restrictions. The copper work was re-gilded in 2008 and is not anticipated to require redecoration for 40+ years. The structural engineers condition report refers to a hole in the wall of the structure, observed from a video provided of the interior condition of the flaming orb.	i) Closer inspection of the hole would be required in order to better assess the condition.	B	£2,300

5.4 THE BALUSTRADE & CAGE

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
In 2009 the balustrade and cage were replaced with the current curved stainless steel balustrade and lightweight cage. Only alternate balusters are actually structurally embedded in the viewing platform in an attempt to avoid inducing a crack along the edge of the black limestone. The cage structure of stainless-steel tubes is clad with woven stainless-steel mesh to provide security and prevent the throwing of large objects, while at the same time enabling clear views. The stainless-steel tubes carry data and electric cables serving the stainless-steel telescopes, public address system, cameras and speakers.	The cage and balustrade appeared to be in good condition. The stainless-steel mesh above the balustrade is not taut at the centre of each side. Holes remain in the corners of the wide stainless steel balustrade handrail where the telescopes were fixed, now removed.	i) Unless the telescopes are to be replaced, the holes in the corners of the wide stainless-steel balustrade should be filled and finished by the manufacturer.	D	£4,000
		ii) Regular inspections and maintenance for the cage & balustrade is described in the 2007-2009 Repair Contract O&M manual. Jakob, manufacturer of Webnet, (mesh) suggest a visual inspection at least every 2 years. Visual inspection of the rope in the net should be done, but more importantly the sleeves that are around the perimeter of the net need to be checked and if anything has failed then these need to be addressed.	B	£2,000

5.5 RAINWATER GOODS AND DISPOSAL SYSTEMS

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The floor of the viewing platform falls towards the stone Drum at the centre of the viewing platform, where a small drainage channel, cut out of the stone paving, collects the rainwater and discharges it into a shallow stone catchpit with round cast iron drainage grille. A lead pipe then takes the rainwater under the black limestone and discharges beneath the black limestone pavement via a long lead spitter. No rainwater is taken down through the building. There are no gutters and downpipes to the building.	The rainwater drainage outlet and circular iron grille look to be in good condition. The lead spitter spout is difficult to see but what can be seen from the viewing platform looks to be in good condition. The drainpipe between outlet and spitter is concealed. The lead spitter pipe appears to project about 180mm, but is difficult to measure	None at present. Monitor stonework beneath spitter for any signs of damp after wet conditions as the spitter pipe is quite short	-	-

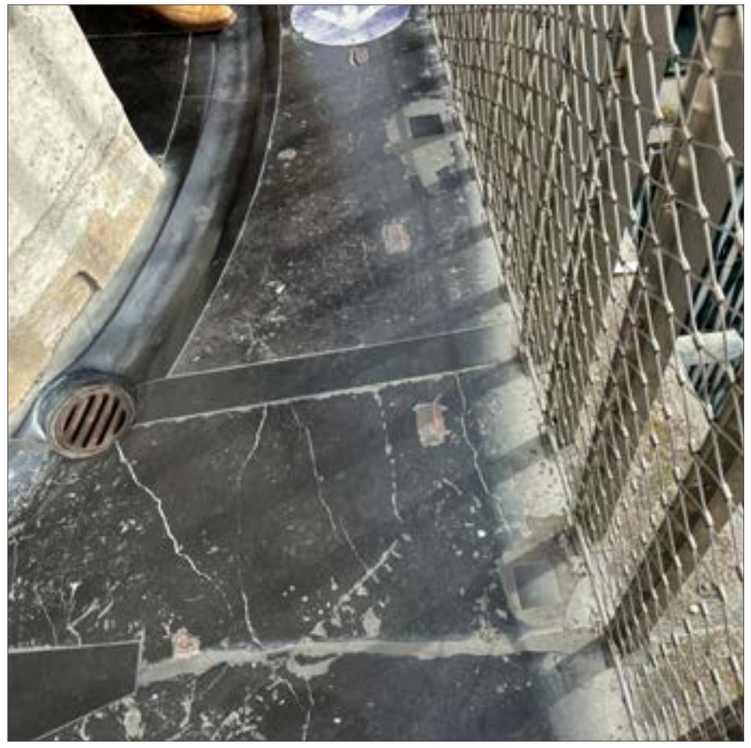

Fig. 22 Viewing platform, 2024

5.6 EXTERNAL TIMBER DOORS: PAIR OF HARDWOOD ENTRANCE DOORS AND FRAME

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The entrance doors are a pair of substantial four-panel doors on pivot hinges, held open within the stone reveals of the doorway by a pair of heavy iron hooks. The south door can be bolted shut and the north door has a latch and mortice locks, to latch/lock it to the south door. The doors are of solid oak, glazed within their upper two panels with bevelled and polished 3x15mm laminated glass panels, set within an oak frame. Following construction and installation of the doors in 2009, the fabricator advised: The doors are of timber and will therefore expand and contract in relation to the ambient humidity and will be affected by direct heat, moisture and sunlight.	The doors are a bit stiff to open; there are gaps between the door and frame due to the pivot hinge design in order to leave space for the oak to expand and contract. The lower parts of the doors are particularly weathered Ironmongery: Pivot hinges: Doors are a bit stiff to open Lock : 2no. mortice locks with interior escape latches, attendant reported working well Internal bolts: iron floor bolt to south door, works well. iron top bolt and keep fixed to frame, working well Latches & knobs: 2009 internal drop handle latches & external knobs, good condition Security door movement detector to north leaf: Unattractive white plastic	i) Remove paper sign from glazing to entrance door	A	Incl. Staff budget
		ii) Entrance doors: consider replacing white plastic security door movement detector with more appropriate design	C	£300
		iii) Clean and oil with a coat of DEKS OLJE D1 oil. Inspect for signs of movement, overhaul the doors as required. Inspect ironmongery and oil moving parts as appropriate; ensure ironmongery is securely fixed.	C	£2,100

Fig. 23 Pair of oak entrance doors, 2024

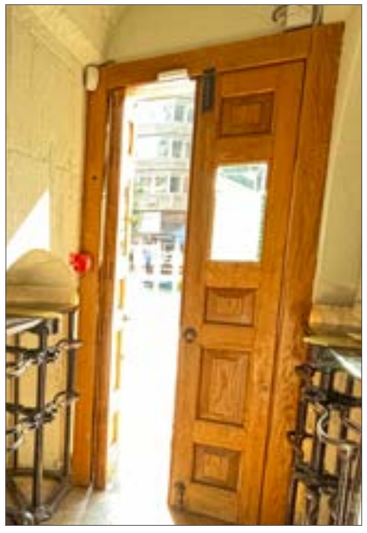

Fig. 24 Interior view of entrance doors , 2024

Fig. 25 Mortice escape latch, 2024

Fig. 26 Mortice interior escape latch, 2024

Fig. 27 Door movement detector, 2024

Fig. 28 Oak doors to viewing platform, 2024

5.7 PAIR OF HARDWOOD DOORS TO VIEWING PLATFORM

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Pair of two panelled oak doors within oak frame, which appear to be c.1950s, the upper panels of each door glazed, the doors formerly stained or varnished a slightly yellow colour. The south-leaf bolts shut and has a keep to take the latch on the north-leaf. Each door has pair of oval brass knobs with roses, and brass keeps on then back faces to receive brass hooks fixed to the stone reveals, to hold the doors open.	Reasonably good condition Timber bead detail has split, externally, adjacent to the exterior knob rose; a previous timber repair behind the latch plate is damaged Ironmongery: • Latch requires overhaul as feels loose • Fixed handles to south-leaf are loose and rotate	i) North door-leaf: repair damage adjacent to the exterior knob rose, and to damaged timber repair behind the latch plate.	C	£961
		ii) Clean and oil with a coat of DEKS OLJE D1 oil. Inspect ironmongery annually and oil moving parts as appropriate; ensure ironmongery is securely fixed.	C	Inc. in figure on Page 26 5.6 ili)

5.8 WINDOWS

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Immediately above the entrance on the east side of the Monument is an oval iron framed centre-hung pivot window, W1. The window has a modern white window lock fixed on the casement and frame to prevent opening. Each face of the column shaft has 8 no. narrow slit window openings, each within niched recesses of varying sizes. The windows within the column shaft were nearly all replaced in 2009 with slim bronze casement windows, or fixed glass panes within bronze frames where the openings are very narrow. Glass is 3mm thick and very slightly imperfect in order to provide slightly distorted reflections; ironmongery is hand forged. An early iron framed window in the Drum was used as a prototype.	The Windows Condition spreadsheet has been updated at 2024, Appended to the MMP Oval iron framed centre-hung pivot window, W1, has a white window lock fixed on the casement and frame to prevent opening. Some ironmongery (a former window lock?) has been removed from the top of the oval casement leaving holes which should be filed and decorated. A scratch was noted to the inside of the glass. The internal putty is in poor condition and should be redone. The bronze casement windows and fixed lights are generally in good condition and have developed a good patina; there are no broken panes of glass. The bespoke ironmongery: hinges, casement-stay and casement fastener are fixed with small bronze screws. Some of the ironmongery was stiff to operate and damaged or stuck ironmongery requires overhaul	i) Undertake repairs as described for each window on the schedule	C	£3,000
		ii) Clean chewing gum from windows described	A	Incl. Staff Budget
		iii) Oval window repairs	C	£650

6.1 GENERAL DESCRIPTION

Inside the column is a continuous cantilevered spiral stone staircase of 345 black limestone steps, lit by narrow slit windows. The first 311 steps take the visitor up to the viewing platform and the last 34 steps lead up to the top landing from where a circular iron ladder continues up to the underside of the copper bowl; the top of the Flaming Orb.

6.2 VENTILATION AND CONDENSATION

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The Conservation Maintenance Plan of March 2014 (5.4.5) describes the monitoring of the internal environment of the Monument since the quinquennial inspection of 1991. The conclusion at 2005 was that openable windows should be relocated in the slot window openings, and the high level doors should be reinstated, to allow air exchange with the exterior to be controlled. These works were undertaken in the 2007-2009 repair contract.	At the time of the inspections on site in July & August 2024, the windows were all closed. There was no sign of condensation on the internal walls or puddling on the stone steps from condensation having run down the walls, -although inspections were during a warm period, so condensation is not expected.	i) Note if there are any condensation problems within the stairwell, keep a record of the extent of the problem and weather conditions	-	-

6.3 GENERAL AREAS OF STONEWORK DAMP AND DECAY

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The Monument was constructed of solid stone walls with stone foundation walls in 1671 – 77. It is not known if there are any damp-proof materials used in the wall construction to reduce rising damp. The Monument is built close to the River Thames. The levels of the tidal river and the level of the water table may have changed since the building was constructed.	The basement walls are damp; there is evidence of salts on the surface due to evaporation of moisture, which has led to local spalling of some soft stonework and soft red bricks. A breathable lime floor was laid in the basement in 2009 to allow ground moisture to evaporate from the floor, rather than just from the basement walls. There are signs of damp in the lower internal walls where the silicate masonry paint is peeling. This may be due to damp ingress or that the paint was applied on stone surfaces insufficiently dry at the time.	A low level of damp ingress and spalling masonry in the basement should be anticipated and accepted.		
		i) Avoid blocking up the ventilation grille at the apex of the basement vault which reduces ventilation of the basement and avoid blocking up the grilled opening at the top of the public spiral staircase, which reduces ventilation to the stonework of the interior above.	A	Incl. Staff Budget
		ii) Monitor damp within the ground floor interior stonework in different weather conditions.	B	Incl. Staff Budget
		iii) Measure damp in interior walls before redecorating and apply silicate masonry paint in accordance with manufacturer's instructions, as far as possible.	B	-
		iv) Record where the walls are damper than recommended for paint application and anticipate paint flaking here in due course. Record this residual hazard.	B	-

6.4 THE FLAMING ORB AND SUPPORTING IRON ARMATURE - INTERIOR

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The Portland stone drum above the viewing platform is a continuation of the Portland stone stairwell shaft below. The walls of the circular drum are solid Portland stone, over 2 ft thick. Above the circular drum is a dome of Portland stone blocks, which reduces the internal diameter of the Monument from about 7.5 ft to approximately 3 ft. The form of the flaming orb is a massive urn with a bowl at the very top constructed from deep bands of sheet copper, 1/8 in. thick, riveted together. Inside the stone dome and flaming orb is a structural wrought-iron armature, the purpose of which is to fasten the copper flaming orb down to the stone mass of the dome and drum below. The armature within the flaming orb is a circular ladder with four iron vertical legs and circular iron rungs. The ladder gives access from the black limestone landing at the top of the drum up into the copper bowl at the very top of the flaming orb.	The condition of the interior stonework and the wrought iron armature, with iron reinforcement rings, was reviewed by structural engineers Hockley & Dawson, based on video images provided by City of London, due to access restrictions. See structural engineer's report: local corrosion noted A lanyard system has been fixed to the centre of the iron ladder since the 2007- 2009 contract which makes ladder climbing slightly more difficult. A free-standing melamine cabinet is located on the top landing, within the armature.	i) Remove the free-standing melamine cabinet is located on the top landing, within the armature. ii) As structural engineer's Condition Inspection report: rust treat and locally redecorate local corrosion to ironwork	D C	£700 £2,200

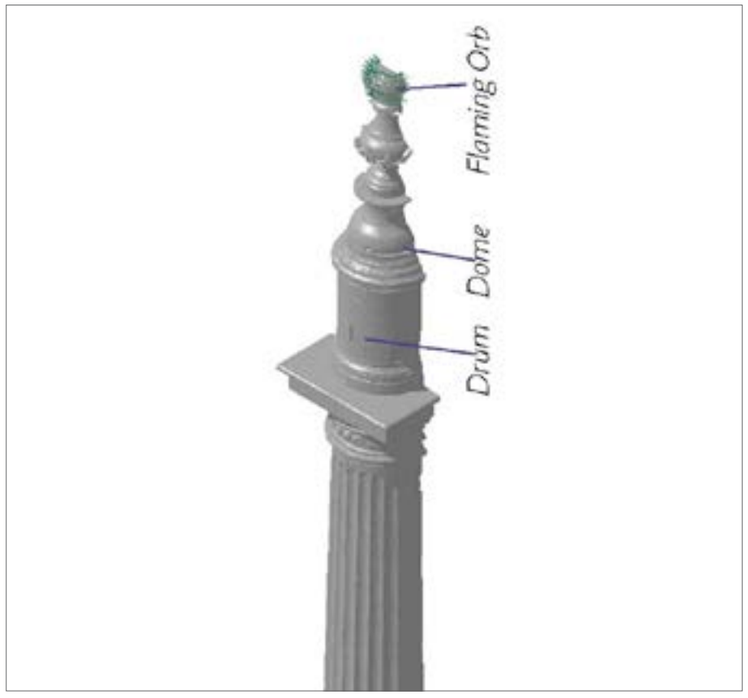

Fig. 28 Location of the Drum, 2006

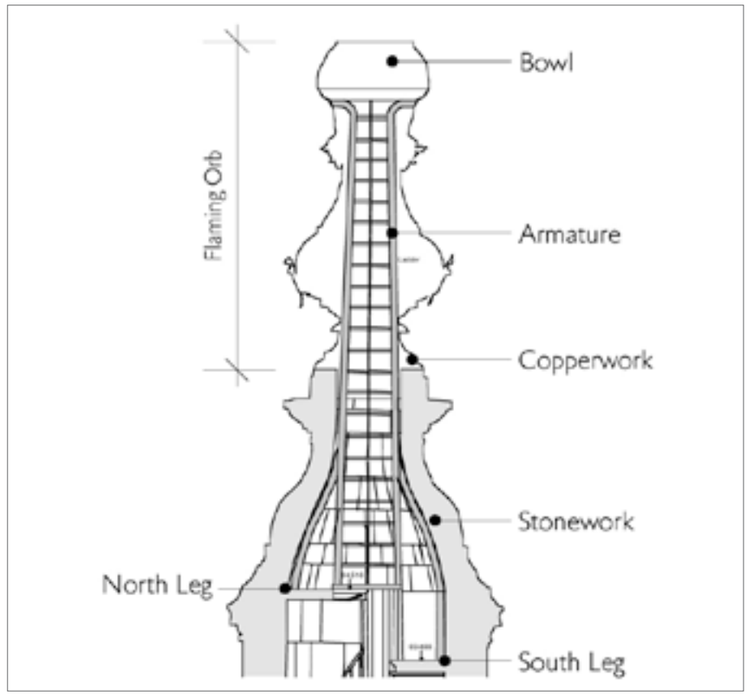

Fig. 29 Section through Flaming Orb, 2024

6.5 STAIRWELL AND SPIRAL STAIRCASE

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The stairwell is circular on plan with solid Portland stone walls; 13 of the 37 windows in the circular stairwell are within niches in the stone walls. The continuous spiral staircase is the original 1670s cantilevered stair structure constructed from black limestone, with a wrought iron balustrade, lead-caulked into the stone steps, supporting the curved oak handrail. Ironwork and timber partitioning at viewing platform level restrict public access beyond this point. Stairwell internal finishes: The walls of the stairwell are Portland stone painted with silica masonry paint. The undersides of the black limestone steps are unpainted. Ironwork and timber partitioning have a painted finish. Stainless steel conduits fixed with bespoke stainless-steel brackets contain electrical services. The staircase was extensively structurally repaired during the 2009 contract using Fischer resin and stainless- steel reinforcement rods. Stone repairs to the steps were undertaken using black limestone from the Pooil Vaaish quarry on the Isle of Man, believed to be the original source of the stone.	General notes on the appearance of the stairwell and helical stair a) Views up and down stairwell: In the 2007-2009 contract, the lighting design included blue lighting in the flaming orb area, visible to the public through a circular grille at the top of the staircase, and a red glow from the basement, visible down through a circular grille at the bottom of the staircase. At the 2024 inspections, the view up into the top of the staircase to the flaming orb was blocked with a dirt-stained circular board laid on top of the grilled opening. The view down into the basement, (former workshop), was blocked by plywood. Both the blue and red lighting was blocked off from public view, greatly detracting from public enjoyment and understanding of the form and function of the building. The mouldy board used to block the top round grille greatly detracts from the interior at this level b) Cleaning The uneven cleaning of the paintwork of the stairwell walls, due to difficulties of being able to reach to clean above a certain level, results in a poor appearance. c) Balustrade reinforcement strap The steel reinforcement strap design is below the standard required in this historic interior.	i) Remove board blocking circular ceiling opening ii|) Described under Staircase Stone Walls iii) Described under Wrought Iron Balustrade	A - -	Incl. Staff Budget - -

6.5A STAIRWELL AND SPIRAL STAIRCASE: STONE WALLS

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The stairwell is circular on plan with solid Portland stone walls; 13 of the 37 windows in the circular stairwell are within niches in the stone walls.	Stonework is generally in good condition. Paint is flaking from the stone stairwell walls at low level which may be due to slight dampness, or the walls being insufficiently dry when the silicate masonry paint was applied; this was noted as a residual risk after the 2007-2009 repair contract. Defects noted: Slight hairline crack observed at window no.4 jamb Minor areas of surface spalling at low level, likely due to damp The wall surface has slight wearing to the paint finish where people brush against it. The paintwork is obviously difficult to clean above a certain level. The stairwell has been partly repainted at low-level, but paintwork has extensively eroded from the wall at approximately six stair treads up from entrance	i) Investigate long-handled specialist cleaning equipment to enable an even clean of the painted walls ii) Redecoration of the stairwell walls	B C	Incl. Staff Budget £3,800

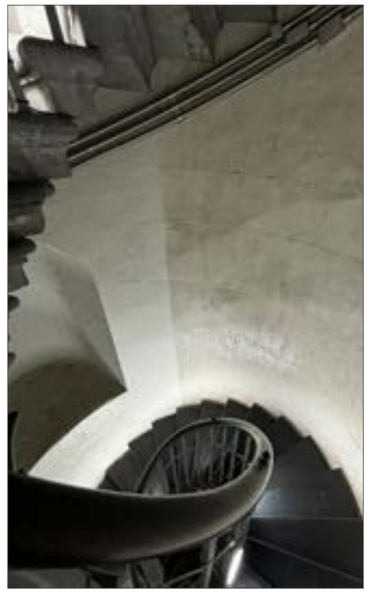

Fig. 30 3 wall finishes: repainted walls at bottom of stairwell; upper stair is cleaned to head-height, then dirty above, 2024

Fig. 31 Paintwork is difficult to clean above a certain level, 2024

Fig. 32 Eroded paintwork, 2024

Fig. 33 Local spalling of stonework, 2024

6.5B STAIRWELL AND SPIRAL STAIRCASE: STEPS				
DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The continuous spiral staircase is the original 1670s cantilevered stair structure constructed from black limestone, with a wrought iron balustrade, lead-caulked into the stone steps, supporting the curved oak handrail.	As structural engineer's Condition Inspection report The stair treads, extensively repaired in 2009, are wearing well. The undersides of the historic treads are generally in good condition, but several are locally spalling. Defects noted: Some crumbling to underside some steps Extensive delamination to underside of 2no. steps (1no. at approx sixth window from top, 1no.at number 18 window) Badly hacked underside of tread at window no.4 and tread above Oval window Corner nosing to one tread end is missing Badly cracked tread 30 treads up from entrance	i) Crack monitoring of steps to be put in place, recommended to be 6 monthly [subject to review of previous balustrade records] ii) Review of the noted cracking and stone condition against previous records	A B	See St.Eng. Fees See St.Eng. Fees

Fig. 34 Black limestone indents to stair treads, 2024

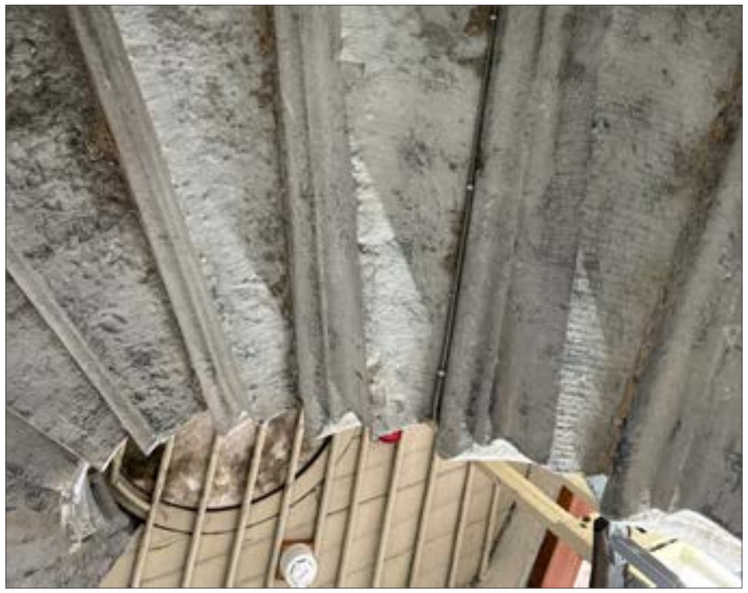

Fig. 35 Stair soffit showing local damage (next to emergency light), 2024

Fig. 36 Underside of stairs with pocket in stonework of central tread, 2024

Fig. 37 Underside of one step is in markedly poorer condition, 2024

6.5C STAIRWELL AND SPIRAL STAIRCASE: WROUGHT IRON BALUSTRADE

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The original wrought iron balustrade, comprises 1"square-section wrought iron balusters, each fixed at the top to a slim flat wrought iron spiral rail supporting a curved spiral oak handrail. Each baluster is lead-caulked into a black limestone step; caulking to one baluster end is missing or loose	The balustrade was not designed for the intensity of use it has received in the last fifty or so years and has previously been found to move slightly, particularly near the top of the stairwell. Since the 2016 condition survey, a flat steel band has been fixed, clasped, to the balustrade, approximately two-thirds up the balusters, to restrict movement. The steel strap and baluster clasps are a reasonably neat solution but overall they detract from the appearance of the balustrade and simplicity of the interior. The strap does not appear to be parallel to the handrail and the strap is slightly too thin and easily bends; the strap is not curved in a spiral around the balusters, rather it is multi-faceted. No information is available about the reinforcing straps, their design, designer or any consents obtained. Structural Engineer's Condition Inspection report refers to condition of balustrade as currently appearing to be stable.	i) Re-caulk baluster ends where lead caulk is missing or loose	C	£2,500
		ii) Redecoration, locally	C	£1,500
		iii) Redecoration, fully	C	£14,000
		iv) The structural engineers report recommends the balustrade strengthening details are undertaken, as proposed by Hockley & Dawson in 2016	C	£55,000

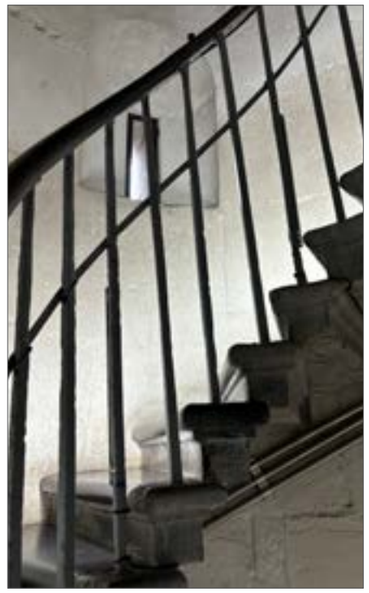

Fig. 38 Balustrade strap detracts from the simplicity of the interior, 2024

Fig. 39 Steel flat clasped to balusters, 2024

Fig. 40 Steel flat bends around baluster , 2024

Fig. 41 Balusters lead-caulked into treads, 2024

6.5D STAIRWELL AND SPIRAL STAIRCASE: OAK HANDRAIL

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The curved oak handrail is screwed to the wrought iron flat which is either welded to the top of the wrought iron balusters or screw-fixed where balusters have been replaced. The spiral handrail is made up of shaped lengths of oak sections, butted together. The spiral oak handrail was removed during a repair contract in the late twentieth century and some sections were replaced. The original timber sections appear to have been cut along the grain and steam-bent into the curve required. Replacement sections have been cut out of a large oak block to a curved shape, across the wood grain. Timber movement and shrinkage have caused the joints to open and misalign. This was addressed in the 2007-2009 repair contract by sanding off sharp timber edges and introducing timber slithers and butterfly repairs at junctions between sections of handrails. The 2016 inspection noted that timber had continued to move and in some cases parts of the timber slithers had come out, or butterfly repairs snapped; good quality further repairs have since been undertaken	From the 2024 inspection, the movement of the curved timber continues: some reinforced joints are slightly opened-up, though the oak butterfly reinforcement remains intact, there are several splits along the handrail, typically located where the timbers are most restrained, at their ends; in one place a section of timber has broken off All the brass knobs on the top of the oak handrail are present except one, where the knob is missing from its back-plate, (knobs installed to dissuade people from sliding down the balustrade)	i) Detailed inspection of the oak handrail by a suitably qualified carpenter, to check if there is any splintered timber immediately above the iron bar supporting the timber, if so, ensure the splits are sanded to avoid damage to hands. ii) Repair the handrail where a timber section has broken off iii) Replace the missing knob on the existing back plate	B 2 YEARS D	- £2,000 £400

Fig. 42 Carved oak spiral handrail, 2024

Fig. 43 Fixing of timber to ironwork, 2024

Fig. 44 Brass 'anti-sliding' knob, 2024

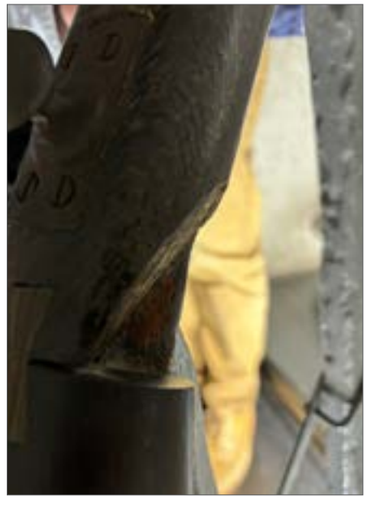

Fig. 45 Damaged section of handrail, 2024

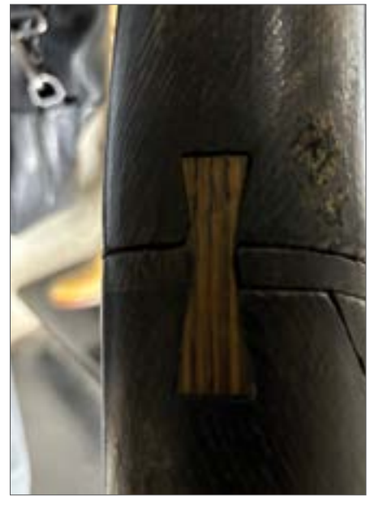

Fig. 46 Recent unstained butterfly joint, 2024

Fig. 47 Stained butterfly joint c.2009

6.5E STAIRWELL AND SPIRAL STAIRCASE: HIGH-LEVEL IRON & TIMBER PARTITIONING

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The wall partition and the ceiling at the landing, level with the viewing platform, is painted timber t&g boarding. An iron gate is at the base of the stairs leading from viewing platform up into the flaming orb area; a timber door behind the gate is painted softwood. The circular board, which is infilling the circular 'ceiling' opening, is for temporary protection of falling objects for operatives working above the enclosure. It has not been removed after previous use and is blocking the view up to the top of the Monument, preventing visitors' enjoyment and understanding of the continuing view up into the Flaming Orb area.	The painted enclosure is in reasonable condition although very dirty; there is evidence of condensation on the timber boarding and slight flaking of paint. The painted iron gate has slight paint chipping. The circular board used to temporarily block the circular opening in the ceiling, (during any works above), is blackened from mould/condensation and unsightly, has been left blocking the public's view up to the top of the Monument. This was also the case at the 2016 Condition Inspection, when the board was also described as blackened from mould/condensation and unsightly.	i) The iron & timber partitioning would benefit from redecoration on the public side and both sides of the door.	C	£5,500
		ii) Clean and decorate the temporary infill board. Fix onto the top of the board, large clear instructions to say that the board is to be used while operatives are working above, as temporary protection to prevent objects falling down the stairwell; the board is to be removed from the opening after every use.	B	£400
		iii) Ensure there is a place for the board to be kept, adjacent to the opening, but out of sight to the public.	A	Incl. Staff Budget.

Fig. 48 Balustrade strap detracts from the simplicity of the interior, 2024

Fig. 49 Steel flat clasped to balusters, 2024

Fig. 50 Steel flat bends around baluster, 2024

Fig. 51 Balusters lead-caulked into treads, 2024

6.6A GROUND FLOOR ENTRANCE LOBBY: WALLS & FLOORS

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The east entrance doors open into the small entrance lobby which leads to the circular stairwell to the west; the lobby has an arched opening on the north side into a small, recessed area: the attendant's recess, where the attendant sells tickets to the visitors. The lobby soffit is barrel-vaulted; recessed into the ashlar walls are three semicircular niches. The attendant's recess has a flat stone ceiling, a low niche to the rear and access steps beneath the timber floor leading down to the basement. Interior finishes are the fine coursed ashlar Portland stone, painted with silica masonry paint. The floor of the lobby is paved with slabs of Purbeck stone, laid in 2009, with black limestone paving the ground floor the circular stairwell. The floor of the attendants' recess is timber boarding, with access to the basement via a hinged timber boarded hatch set in the floor.	Walls & ceiling: painted ashlar masonry is generally in good condition. Paint is lifting from the font and niche above; there is slight powdering of stone to the recesses behind the turnstiles Floor to the lobby: Purbeck paving is in good condition, except where the central turnstile rail, which was formerly fixed to the Purbeck flooring, has been temporarily removed, leaving remains of 3 fixings and local damage to the floor finish. (Reinstatement of central rail would conceal the damage). Floor to attendant's recess: the softwood floor is in reasonably good condition; the hinged access door to the basement fits neatly in the steel frame.	i) Masonry redecoration	C	Incl. in 6.5A ii) Page 32
		ii) Attendant's recess softwood floor: clean and treating with Deks Olje No.1 and clean out the steel angle receiving the floor hatch	C	£590

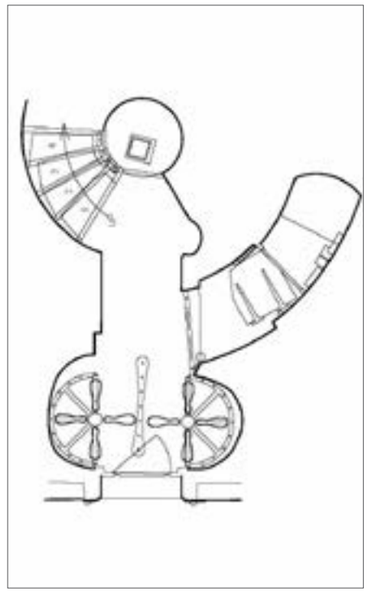

Fig. 52 Plan of entrance lobby, 2006

Fig. 53 Looking east to entrance door, 2024

Fig. 54 The attendants' recess, 2024

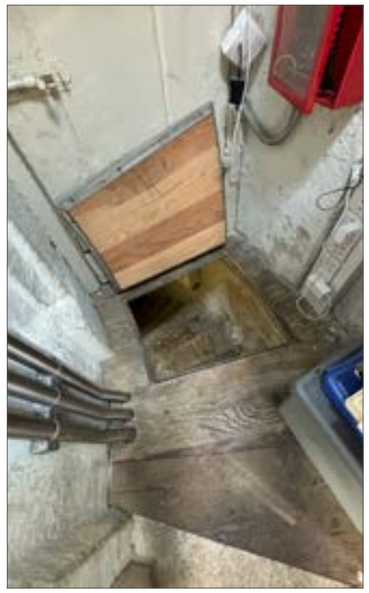

Fig. 55 Floor hatch access to the basement, 2024

6.6B GROUND FLOOR ENTRANCE LOBBY: JOINERY - HISTORIC TIMBER GATE DOOR TO ATTENDANT'S RECESS				
DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Two-panelled painted timber gate fixed to a simple timber frame, timber skirting, 3no. hinges, small brass bolt. Added since the 2016 inspection:	Painted timber wear pattern at top One screw missing to hinges	i) Redesign the Perspex screen (if still needed) to be more appropriate for the historic interior	C	£1,000
2no. timber display boxes attached to front of gate containing postcards, etc for sale		ii) Replace missing ironmongery	C	£200
Obtrusive laminate glass screen fixed to pair of timber posts, each fixed to the rear of the historic timber gate		iii) Redecoration	FIVE YEARLY	£750

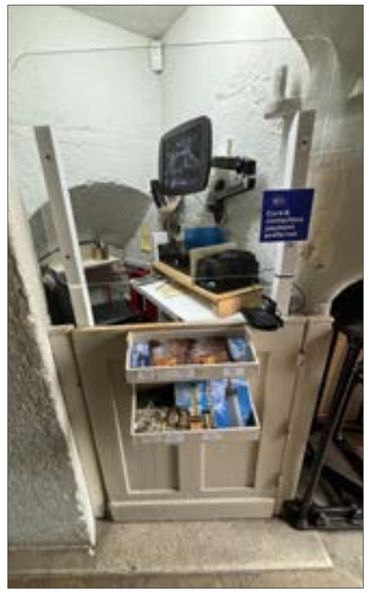

Fig. 56 Painted timber gate to attendants' recess, With display boxes attached, 2024

Fig. 57 The gate shown opened, Recent Perspex screen support timbers, 2024

Fig. 58 Detail of the screen support fixed around historic bolt, 2024

6.6C GROUND FLOOR ENTRANCE LOBBY: JOINERY - GLASS FRONTED PAINTED SOFTWOOD CUPBOARD

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Above turnstile on south wall, built into niche: pair of glazed doors with wide drawer below, 1 shelf in cupboard. Appears to be nineteenth century. East leaf bolts shut, west leaf mortice locks to fixed leaf. Neat keyhole, not known if key exists. Each door has pair of original hinges and small painted iron knobs.	Reasonable, except for surface damage from adhesive remnants Comments on Appearance: Modern notices fixed to the front of the historic glass fronted cupboard disproportionally detracts from the appearance of the entrance to the Monument: Large CCTV in Operation sign stuck onto the glass of the left hand side glazed door CO2 Fire Extinguisher sign glued to the right hand side timber frame, which appears to duplicate the CO2 Fire Extinguisher sign fixed to the stone wall above the CO2 fire extinguisher. Remains of adhesive from a former sign, now removed, same size as the above sign World Tag disc – possibly used as part of the security system, whereby security officers use a wand/pipe tool and scans the point to prove they made the round.	i) Carefully remove remains of adhesive applied to the historic joinery, make-good the damage by redecorating the frame	FIVE YEARLY	£200
		ii) Redecoration	FIVE YEARLY	Incl. in 6.6B ili) Page 38
		iii) Avoid duplication of Fire Extinguisher notices. Locating the notices directly above the fire extinguishers is preferable for the presentation of the historic interior.	B	-
		iv) Review the number of CCTV signs displayed at the Monument, reduce the number to the recommended minimum by eliminating those which detract from the visitor experience of the historic building.	B	-

Fig. 59 Glass fronted painted softwood cupboard, 2024

Fig. 60 Detail showing remains of adhesive applied to the joinery, 2024

6.6D GROUND FLOOR ENTRANCE LOBBY: JOINERY - LOW LEVEL CUPBOARD AT REAR OF ATTENDANT'S RECESS

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
A historic single cupboard door of flush boards in a softwood frame built across the back of the attendant's recess, with small fixed-panel above and fixed skirting below, iron strap hinges and a large iron bolt. Appears to be nineteenth century. Timber skirting has been altered to accommodate a heating grille.	Adequate. Door operates smoothly, ironmongery is historic and functional. Altered skirting board has paint chipping and appears poorly prepared for decoration Comments on Appearance: A crude chipboard shelf with chipped melamine top has been screw-fixed to the historic timber panel above the doorway, (since 2016). This detracts from the appearance of the historic door and together with other poorly designed joinery in the attendant's recess, disproportionally detracts from the appearance of the entrance to the Monument	i) Redecorate, particularly to skirting which requires careful preparation before redecoration ii) Rationalise and tidy cupboard contents iii) Redesign the new shelf (if needed) above the cupboard door to a more appropriate design for the historic interior	FIVE YEARLY B B	£200 Incl. Staff Budget £400

Fig. 61 Looking into the attendants' recess at the historic cupboard front at the back of the recess, 2024

Fig. 62 Inside the rear cupboard showing the skirting heater and cupboard contents, 2024

Fig. 63 Recent chipboard shelf, 2024

6.6E GROUND FLOOR ENTRANCE LOBBY: JOINERY - SMALL TIMBER ELECTRICAL SERVICES CUPBOARD WITH SHELF OVER				
DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
This cupboard was designed in 2008 as a temporary cupboard (for approximate lifespan 5 years) to accommodate electrical services required at that time. It was acknowledged that technology and demands for electrical services change frequently and the adequacy of this cupboard would need to be reviewed in future. The timber shelf has since been replaced with chipped melamine-faced boarding with a MDF & softwood shelf above and a chipped melamine shelf adjacent.	The cupboard is no longer fit for purpose; it cannot contain all the electrical services and equipment currently required in the attendant's recess. Comments on Appearance: The C21 built-in furniture and fittings in the attendant's recess are poor quality and not to the design and construction standards appropriate for a Grade I listed building. They detract from the appearance of the entrance to the Monument	i) Review and rationalise the equipment and services required in the attendant's recess. ii) Redesign and fabricate the cupboard and countertop, together with any shelving required in the attendant's recess, to the quality standard appropriate for a grade I interior.	B C	- £2,300

Fig. 64 Looking into the attendants' recess at ad hoc shelving fixed to the services cupboard, 2024

Fig. 65 The electrics' cupboard c.2009 can no longer contain all electrical services, 2024

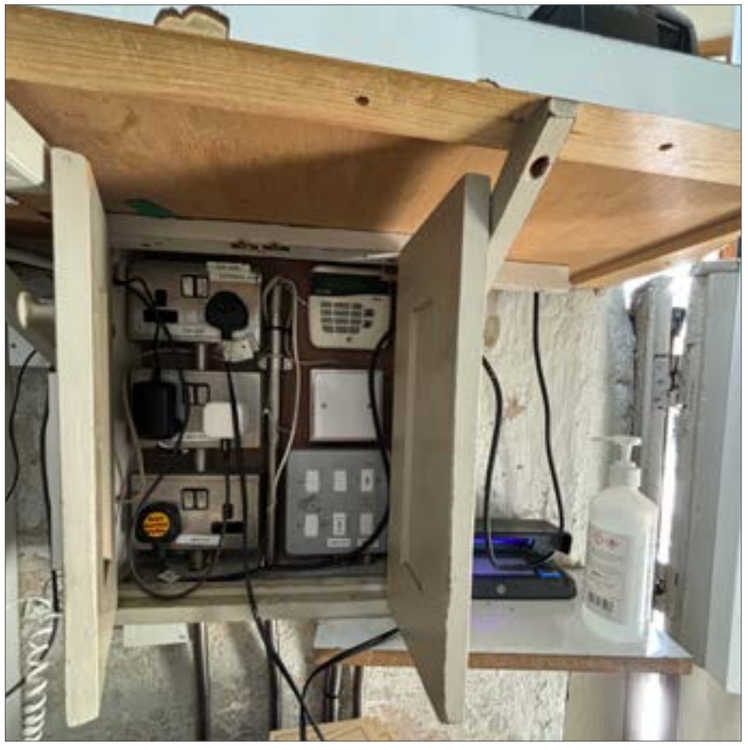

Fig. 66 Inside the electrics' cupboard, 2024

6.6F GROUND FLOOR ENTRANCE LOBBY: TURNSTILES

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The cast-iron turnstile, made by Le Grand & Sutcliff was installed in 1891. It comprises a central barrier of 7 no. circular iron balusters, 25mm diameter with two end newels 32mm diameter, with a flat iron top rail, (temporarily removed). The painted iron gates, one each side of the barrier have brass digital counters and are semicircular on plan with 11 no. square section balusters and flat iron top rail. The wrought-iron hoop gates are pegged in position and operated by a floor mounted ratchet mechanism. The mechanism was in good working order until parts of the gates were temporarily removed c.2010 (without Scheduled Monument Consent).	The central bar and parts of the gates have been removed off site and have not been inspected. The remaining frames and gate parts appear to be in good condition, but the gates are held open with plastic ties so were not rotated. Comments on Appearance: Removal of the central bar and turnstile gates detracts from the understanding of how the turnstiles operated, and from the appearance and enjoyment of entering the Monument.	i) Inspect the missing parts of the turnstiles to ensure they are recorded and safely stored. ii) Give consideration to either reinstating the working turnstiles or obtaining the statutory consents required to alter the formerly working turnstiles.	B C	Incl. Staff Budget £3,200

Fig. 67 Turnstile central rail, 2009

Fig. 68 Turnstile shown open, (one set of arms is missing), 2024

Fig. 69 Turnstile in north recess (arms missing), 2024

Fig. 70 Turnstile in south recess (arms missing) ,2024

6.6G GROUND FLOOR ENTRANCE LOBBY: OCULUS & WROUGHT IRON GRILLE / BAG STORE AREA

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Central at the base of the helical staircase is an oculus (circular opening in the centre of the stone dome of the basement room below); the oculus is an important architectural feature. Within the oculus is a historic wrought iron grille which allows some daylight and ventilation to the circular basement room below, (formerly Robert Hooke's seventeenth century workshop) A circular disc of painted plywood now conceals the grilled opening which is used for storing visitors' bags when they ascend the Monument. The bag store is enclosed with a neat bespoke curved Perspex panel. Neither plywood disc or curved Perspex panel are fixed to the historic fabric and both are easily removable.	The wrought iron grille was refurbished and redecorated in the 2009 contract and appears to be in good condition. Covering the grille reduces ventilation of the basement room below, likely contributing to the damp conditions and decay of the masonry in the basement room and staircase Comments on Appearance: The location of the bag store and the blocking up of the historic oculus greatly detracts from the enjoyment of the Monument as many visitors enjoy and photograph the extraordinary view down the centre of the spiral staircase. Formerly the view ended at the historic circular floor grille, with the basement glowing from the red lighting (installed in 2009) within it. Now the view is down onto visitors' bags which greatly detracts from the view, experience and understanding of the building. (It is appreciated that visitors' bags are a real problem at the Monument as they cannot be taken up the stairs, due to the very restricted width towards the top).	i) Reinstate the main means of ventilating the basement, by removing the plywood which is blocking the grille.	A	Incl. Staff Budget
		ii) Ensure the red basement lighting is switched on during visiting hours to allow the possibility of visitors understanding the form of the building and obtaining a glimpse of Hooke's workshop	B	Incl. Staff Budget
		iii) Decorate Ground Floor grill	C	£400

Fig. 71 Looking down the spiral staircase at the boarded-over oculus (circular floor opening), 2024

Fig. 72 The view of the oculus at the base of the stairwell is concealed by a bag-store Perspex screen, 2024

Fig. 73 Looking down at the iron grill in the oculus, with the board-cover removed

6.6H GROUND FLOOR ENTRANCE LOBBY: FURNITURE & EQUIPMENT

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The following have been brought into the ground floor of the Monument: Floor mop and large yellow plastic sign warning about a Wet Floor, prominently stored at the base of the stairwell in full view of the visiting public. Curved Perspex panel with the large, printed instruction: LEAVE BAGS HERE	Comments on Appearance: Storing cleaning equipment at the centre of the helical stair, spoils one of the principal views (and photo opportunities), within the Monument. The curved Perspex panel with the large, printed instruction obscures the historic oculus	i) Do not store cleaning equipment within public view at the base of the helical stair. Store with the other cleaning equipment, in the Pavilion building in Monument Yard. ii) Review the bag store and consider alternative locations to store bags, to allow the grille to the basement to remain unobstructed.	A A	Incl. Staff Budget CS

Fig. 74 Looking down the spiral staircase, mop and yellow sign stored in public view, 2024

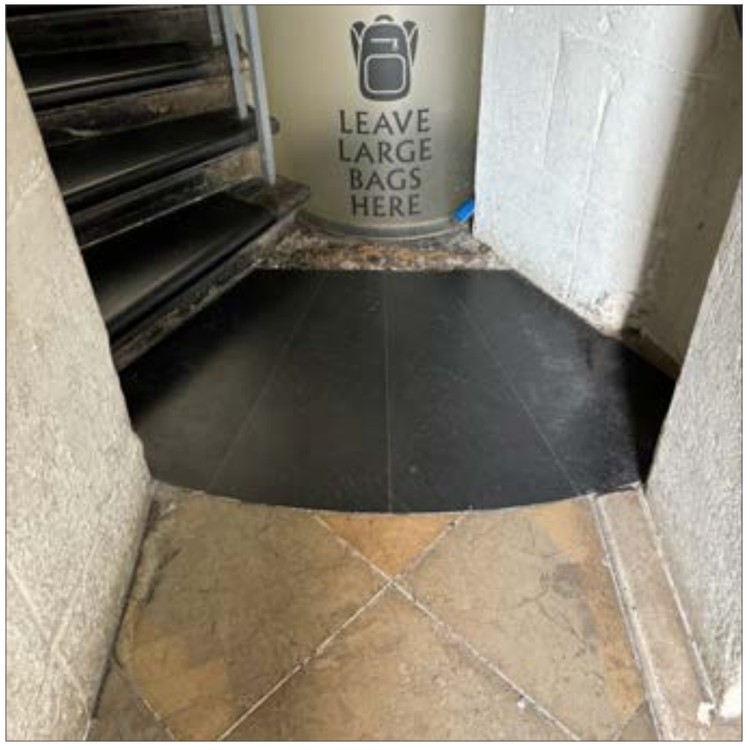

Fig. 75 Perspex screen to bag storage area, 2024

Fig. 76 Detail: mop and yellow sign, 2024

Fig. 77 Attendant's chair, 2024

6.7 BASEMENT: STAIRWAY TO THE BASEMENT

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Within the entrance hall is a small recess where the attendant stands. The floor of the attendants' recess is timber boarding, with access to the basement is via a small, hinged timber boarded hatch set in the floor. Access to the basement is difficult, but there is little scope for easing the situation due to the limited space in the attendant's recess. Walls, steps and soffits are Portland stone, walls & soffit are painted with silicate masonry paint. Seven stone steps, curved on plan, lead down to a stone landing. To the north of the landing is a recessed bay which may have been a flue or vent, ventilating the basement in combination with the oculus opening in the domed ceiling. A stainless-steel platform, on pull-out runners, was installed in the recess in 2009 to support and access the Uninterrupted Power Supply unit (USP) formerly located there. To the south, a further five stone steps lead down into the circular basement chamber	Stone steps and landing are in good condition Painted stone walls have extensive paint flaking, some erosion, efflorescence and several severely eroded blocks There is an excessive accumulation of stone particles under stainless steel platform which indicates active erosion of the stonework. At the back of the flue recess, beneath the flue is a streaking paint stain and extensive calcite staining	i) Sweep steps and landing. ii) Clear away metal platform, if no longer in use (retain at present) iii) Reinstate (what is likely to have been) the original basement ventilation system: allowing air to enter the basement via the flue in the north wall recess and for air to be drawn up out of the basement via the large oculus opening in the domed ceiling of the circular basement room. Ventilation to be improved before any redecoration, local stonework repointing or repairs are undertaken	A B C	Incl. Staff Budget No cost £3,500

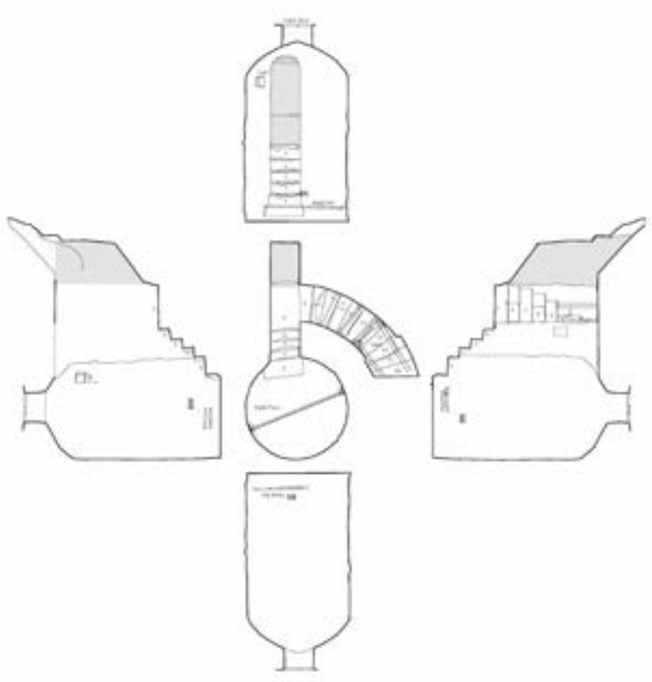

Fig. 78 Basement Plan and Elevations (N at top), 2006

Fig. 79 Floor access hatch to basement, shown open, 2024

Fig. 80 Looking up from the basement steps to the floor access hatch opening, 2024

6.7A BASEMENT: BASEMENT CIRCULAR CHAMBER (HOOKE'S WORKSHOP)

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The floor hatch in the attendants' recess leads via a series of radiating stone steps to a circular chamber 2.14 metres (7 feet) in diameter with a semi-circular domed Portland stone ceiling. The chamber lies directly beneath the circular staircase enclosure. The walls are constructed of coursed rubble stone blocks and red clay brickwork, all unpainted. The floor to the chamber is made up of a compacted lime screed c.2009. A steel angle is fixed across the circular basement just above floor level. This is to support the verticality testing equipment used to regularly (but infrequently) measure the verticality of the Monument to assess any movement. Computers and large protection boxes are located in the basement, together with what appears to be rubbish.	The stonework is very damp when the Moisture Condition tested. There is efflorescence on stonework in places, some spalling of pointing and calcification of stones, some eroded stones and bricks very severely decayed. The large circular ventilation grille at the apex of the vault is closed-off with a board, reducing natural ventilation in the basement The limecrete floor is damp but in good condition. The stainless still conduit is all in good condition	i) Inspect all stored items, remove all redundant items.	C	£400
		ii) Sweep all floors and ledges.	A	Incl. Staff Budget
		iii) Computer & electrical equipment in connection with former temporary panoramic camera system (now disused), to be removed together with all the associated equipment and cabling in the Monument.	C	£1,600
		iv) Re. the steel angle fixed across the circular basement just above floor level used for verticality testing of the Monument, it is important that this steel bar is not damaged in any way.	NOTE	-

Fig. 81 Blocked-up oculus opening at the apex of the basement vaulted soffit, 2024

Fig. 82 Debris and redundant wiring in the central circular basement, 2024

Fig. 83 Steel angle to support the verticality testing equipment

6.8 INTERIOR SIGNAGE

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The following signs were installed in the 2007-2009 contract: - 1no. CCTV sign - Fire Alarm signs & notices - 2no. Fire Action - 2no. Call Point - 2no. Fire Extinguisher - 1no. Fire Alarm pagers - 1no. Assembly Point - 1no. Assembly Point location - 1no. Induction Loop - 1no. First Aid sign - 1 no. Font sign which reads: *FONT:* *Discovered during restoration 2007/08* *Originally used for blessings* The signs are in good condition, including the hand painted signs.	The hand painted signs are in good condition Alterations to signs since the 2007-2009 contract are removal (or overpainting) of the former sign reading: 'CELLAR Robert Hooke's laboratory 1677-1683' with a sign reading: 'Visitors must leave large bags here' Differences to existing hand-painted signs: background colour, lettering colour, lack of border, different typeface.	i) Remove paper sign on front door glazing ii) Generally: keep signage to a minimum and design new signage to match existing; avoid paper signs	A NOTE	Incl. Staff Budget -

7.1 ELECTRICAL INSTALLATION

7.1.1 Date of Electrical Installation

During the 2007-2009 Monument major repair contract the previous electrical installation was entirely removed from the Monument with the exception of the incoming supply.

The new electrical services provided in the contract included the provision of:

- a new meter for the existing incoming electrical service
- an electrical distribution system from the incoming service head and meter to the main distribution panel and high-level distribution board, ancillary power supplies, heating supplies and controls. Together with the sub-circuit wiring to the lighting, power points, fixed equipment and appliances.
- a lighting system, including all accessories, luminaries and lamps
- a power system, including all accessories, electric heaters and connection of fixed equipment, appliances and controls, etc.
- CCTV cameras, recording equipment and monitors
- an additional dedicated telephone lines for security and fire alarm
- an intruder alarm system and a panic alarm.
- a PA and Intercom system.
- a fire detection and alarm system
- a hearing aid induction loop system, including all equipment and system wiring.
- Conduits, cables and plugs for the real-time camera installation.
- Earthing and bonding of the installations.
- The inspection, commissioning and testing of the installations.
- The identification of the installations.

7.1.2 Electrical Services Operations and Maintenance Manual 2009

On completion of the 2007-2009 repair contract, the following documentation was prepared by the electrical subcontractor Cofatec, for the operation and maintenance of the electrical services:

Electrical Services Operations and Maintenance Manual 2009
Electrical Equipment Schedules,
Electrical testing certificates
As-built electrical services drawings. The drawings clearly show the locations of incoming mains, meters and distribution boards

The Electrical Services Operations & Maintenance Manual, describes recommended regular maintenance for each of the electrical services, as follows:

Electrical Service Electrical Services O&M Manual section:
Maintenance matrix 5-1
Specialist maintenance 5-3
Periods between maintenance 5-4
Maintenance programme - implementation 5-5
Monitoring of electrical services 5-6
Periodic testing & inspection 5-7
Distribution boards - maintenance schedule 5-8-1
Battery charging equipment - maintenance schedule 5-10-1
Accessories - maintenance schedule 5-11-1
Isolators, switch fuses and fuse switches - maintenance schedule 5-12-1
Lighting - maintenance schedule 5-13-1
External lighting fittings - maintenance schedule 5-14-1
Fire alarm system - maintenance schedule 5-18-1

7.1.3 Latest Electrical Installation Inspection Report

CoL Risk Assessment for Monument & Pavilion, ref. no. TB FIRE 14, date: January 2024.
“Electrical systems regularly inspected by the Tower Bridge maintenance team; statutory inspections carried out by the facilities provider.“

The Electrical Installation Inspection Report by NICEIC approved contractor provided for this inspection report is dated 18.03.2021, which notes that No Remedial Action is Required

7.1.4 Test Certificates Provided by City of London

In 2024, the City of London provided copies of the following test certificates for this report:

- The Electrical Installation Inspection Report 18.03.2021
- Lightning Protection by Omega Red Group Ltd dated 20.06.2024
- Fire Alarm System, maintenance and testing, dated 24.06.2024
- Smoke detection, maintenance and testing, dated 24.06.2024
- Fire extinguishers, 09.11.2023

No current test certificates yet provided for:

- Telecomms / Data System
- Security Alarm Systems
- Emergency Lighting :
- Mechanical Equipment
- Appliances : PAT testing

7.2 HEATING INSTALLATION

7.2 HEATING				
DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
An electric radiant heater has been installed in the entrance foyer at the top of the south wall. This replaces the previous electric heater in this location, which replaced the over-door fan heater installed in 2009. A kick-space or plinth fan heater installed at the base of the cupboard at the back of the attendant's recess	Appearance The entrance foyer heater has a smart appearance and is a good colour (silver) against the light-coloured painted stonework. It is located just above the LED strip uplighter, which was not switched on, (or possibly was not working), at the time of the inspection. The appearance of the heater is marred by the thick black electric cable, tied to the slim white LED strip light with white cable ties.	i) It may be advisable not to turn on the LED strip uplighter along the south side of the barrel vault, as this will directly light, and draw attention to, the electric radiant heater.		-
		ii) Consider removing the strip uplighter if the heater is to be permanently located here and installing a slim stainless-steel conduit to take the black cable.	C	£800
		iii) City Corporation to provide information on heaters, installation dates and testing certification	B	CS

Fig. 84 Radiant electric heater, black cabling is visible, 2024

Fig. 85 Heater is located just above LED strip lighting, 2024

Fig. 86 Power supply and isolator, 2024

Fig, 87 Kick-space fan heater in skirting of cupboard, 2024

7.3 LIGHTING SYSTEMS

7.3A VIEWING PLATFORM LIGHTING

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
2007-2009 Major Repair Contract Lighting Design An outline lighting design was prepared during the 2007-2009 repair contract. The intention of the design was to light inside the viewing platform cage, to make the cage netting almost invisible when looking at the exterior of the Monument. The viewing platform luminaires would also light the gilded flaming orb. The light fittings were successfully mocked-up on site by Light Bureau Ltd on completion of the 2007-2009 repair contract. Power supplies have been provided to each of the four corners of the viewing platform for the future installation of bespoke light fittings. 2024 Viewing Platform Lighting Design Viewing Platform lighting is: A rope of LED lights fixed to the underside of the balustrade handrail on the viewing platform. A portable LED work-light fixed with cable ties to the balustrade mesh in the south-west corner of the viewing platform, directed upwards towards the flaming orb Light fittings have not been installed at the corners of the viewing platform. It is not known if the current lighting design has received planning approval	2024 Viewing Platform Lighting Design The 2024 lighting design is not the subtle lighting proposal discussed with the planners in 2008. The LED rope-light fixed under the balustrade handrail is directly visible from the ground after dark as a series of glaring dots of white light, strongly highlighting the balustrade handrail and harshly lighting only the lowest part of the stone drum. It does not light the dome or the flaming orb. . The single portable uplighter has quite a good effect for a temporary light; seen from the ground after dark, it lights the flaming orb well, although perhaps too brightly, and only from one side. It is assumed that this is a temporary installation.	i) Replace the current amateur temporary lighting design with a permanent design by a lighting designer for historic buildings.	C	£26,000

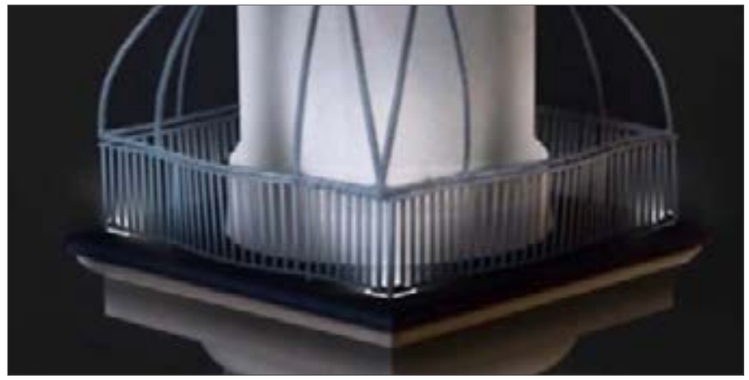

Fig. 88 2007-2009 Major Repair Contract Lighting Design

Fig. 89 2018 Viewing Platform Lighting Design

Fig. 90 A rope of LED lights fixed to the underside of the handrail, 2024

Fig. 91 A portable LED work-light fixed to the balustrade mesh, 2024

7.3B FLAMING ORB DISPLAY LIGHTING

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
In 2009, following the Major Repair Contract 2007-2009, looking up from the stairwell, the flaming orb area was gently lit by subtle blue feature lighting using cold cathode tubes concealed at high level. In 2024 (and in 2016) the circular opening at the top of the public helical staircase is block-up with a mouldy circular board, obscuring the view up into the flaming orb. At the time of the inspection, the lights were not on in the flaming orb area, so it is not known if the blue lighting still exists, or if it works. One uplighter was noted on the top stone platform directed up towards the flaming orb.	The 2007-2009 contract lighting design included blue lighting in the flaming orb area, visible to the public through a circular grille at the top of the staircase, and a red glow from the basement, visible down through a circular grille at the bottom of the staircase. At the time of the inspection, the view up, to the top of the centre of the helical staircase, looked ugly and ill-considered. The circular central opening was blocked with a mouldy circular board laid on top of the grilled opening.	i) Remove the mouldy infill board to the circular ceiling opening. Supply new round plywood board and decorate ii) Only put board on top of the circular ceiling opening when operatives are working above, otherwise always leave the circular opening clear ventilate above to allow visitors to see the continuation of the Monument interior up into the flaming orb. iii) Switch on the blue lighting when the Monument is open to the public; the blue lighting was not tested at the inspection.	A As required Daily	£800 - Incl. Staff Budget

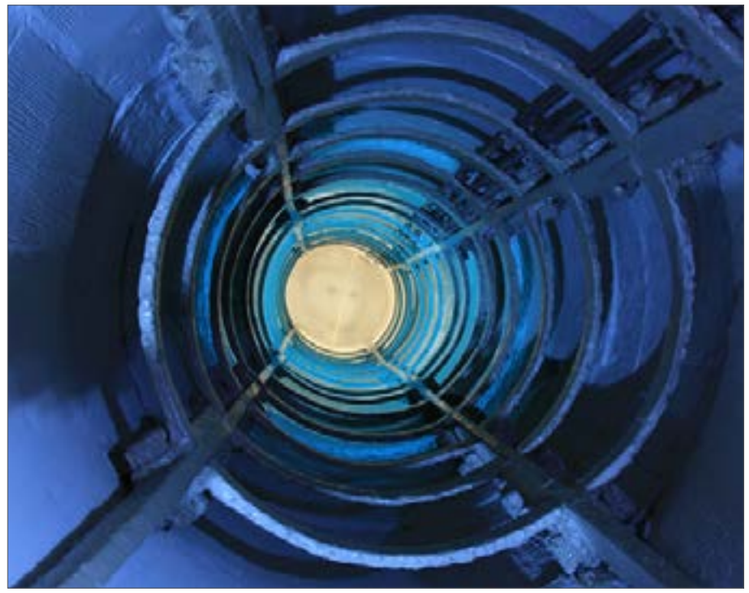

Fig. 92 View up towards the flaming orb 2009

Fig. 93 2009 display lighting

Fig. 94 Mouldy board over circular opening, 2024

Fig. 95 Uplighter on top landing, 2024

7.3C STAIRWELL LIGHTING

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
In 2009, the stairwell was lit by bespoke light fittings mounted onto every fourth baluster with light directed onto the steps rather than flooding the whole stairwell with light (as the previous scheme). The baluster light fittings are the same width as the iron balusters, approx. 25mm, and fixed to the flat face of the baluster, facing the stair tread. Each fitting is fitted with micro louvres to prevent a direct view of the lamp source and long life, low energy warm white LED lamps, which, according to the Maintenance Plan, should only require maintenance once every ten years. The powder-coated finish colour-matched the paint colour of the balusters, then a dark grey colour. At the 2024 inspection, it was noted that all the 2009 baluster light fittings have been replaced except for those above viewing platform level, where the original bespoke light fittings remain.	The replacement baluster light fittings are inferior in appearance to the bespoke fittings, as the replacement lights: • are wider than the iron balusters • have a black finish, which contrasts with the light grey painted iron balusters, to which they are fixed • do not have micro louvres to prevent a direct view of the lamp source • are not positioned on the flat-face of the balusters, but are tilted away from the stair tread to try to reduce glare • emit a harsh cold light, rather than a warm white light • are not all well fixed to the balusters The baluster lights are no longer used as the emergency lighting system, whereby selected lights were provided with battery back-up.	i) Consider the merits of the 2009 staircase baluster lighting scheme to inform the brief, when replacing the lights on the main staircase. ii) The existing light fittings should be fixed to the balusters with the base of the light fitting in line with the top of the adjacent tread.	C A	£88,000 Inc. Staff Budget

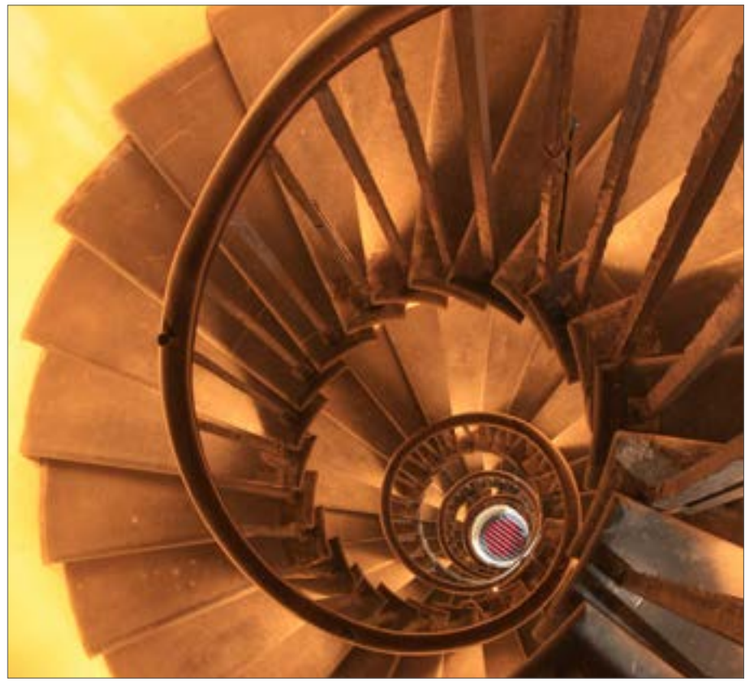

Fig. 96 2009 lighting: Warm light & anti-glare louvres

Fig 97 2024 lighting: cold strong light

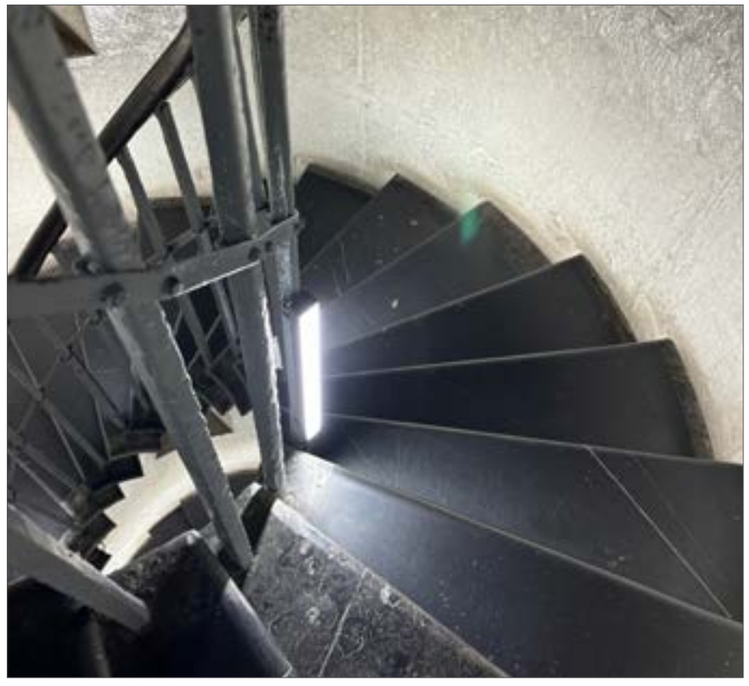

Fig. 98 2024 glare

7.3D EMERGENCY LIGHTING

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The Monument Risk Assessment describes emergency lights as being located in the entrance, cellar, stairs & flame room area. (CoL Risk Assessment for Monument & Pavilion, ref. no. TB FIRE 14, date: January 2024) White plastic emergency lights have been introduced into the stairwell, replacing the previous emergency lighting system, which was a battery back-up to selected baluster lights, and therefore entirely unobtrusive within the stairwell.	Appearance The white plastic emergency lights in the stairwell detract from the historic interior Condition The Monument Risk Assessment describes the emergency lighting testing regime: “Emergency lighting tested monthly by Tower Bridge staff and annually by the facilities provider” (CoL Risk Assessment for Monument & Pavilion, ref. no. TB FIRE 14, date: January 2024)	i) Consider the merits of the 2009 staircase baluster lighting scheme to inform the brief, when replacing the lights on the main staircase.	C	Incl. in 7.3C Page 52

Fig. 99 Black cabling connecting a transformer to the replacement baluster lights, 2024

Fig. 100 Recent emergency lights in the stairwell, replacing baluster emergency lights, 2024

Fig. 101 White emergency light and black transformer, 2024

7.3E GROUND FLOOR LIGHTING

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Door architrave lighting: the discreet LED luminaires located within door architrave light the turnstiles' area and have pleasant warm light-colour Attendant's recess lighting: the LED strip light in the attendant's recess is a replacement (since 2016); the light colour is a harsh brilliant white, rather than the softer and warmer original light, the junction box & conduit are white plastic rather than stainless steel as the 2009 designed set of conduits & junction boxes within the Monument. Barrel vault uplighter: the LED luminaire uplighting the barrel vault were not switched on, or were not working at the time of inspection. Base of stair light: this appears to be the 2009 fitting, with a warm light.	Barrel vault uplighter: the LED luminaire was not working at the time of inspection. Check if it works and what effect it produces, as an electric heater has recently been installed directly above it.	i) Maintain the system of stainless-steel conduits and junction boxes when adding new ones, to prevent the general downgrading of the appearance of the historic interiors. ii) Remove the barrel vault uplighter if it is redundant, and make good at the fixings	NOTE B	£900 Incl. in 7.2 ii) Page 49

Fig. 102 Wall light fitting showing warm lighting colour, 2024

Fig. 103 Attendants' recess with bright white 'cold' lighting, 2024

Fig. 104 Replacement light fitting, plastic conduit and junction box, 2024

7.3F BASEMENT DISPLAY LIGHTING

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Looking down from the spiral staircase, before the bag store area was added, visitors could see through the circular opening in the stone ground floor down into the basement below, from where a gentle red-ish glow of light was previously visible through the iron floor grille.	The basement light was not switched on at the 2024 inspection, so it is not known if it is working. The view down into the basement, (Robert Hooke's former workshop), is blocked by a plywood board laid over the iron floor grille. Visitors are not aware of the basement workshop below and the effect of a red glow from the basement has been expunged.	i) It has been recommended elsewhere that the plywood board is removed for ventilation reasons, and that the iron floor grille remains unobstructed to allow air movement through the currently unventilated and damp basement.	A	Incl. Staff Budget
		ii) Ensure the red-tinted basement lighting is working and switched on daily.	B	Incl. Staff Budget

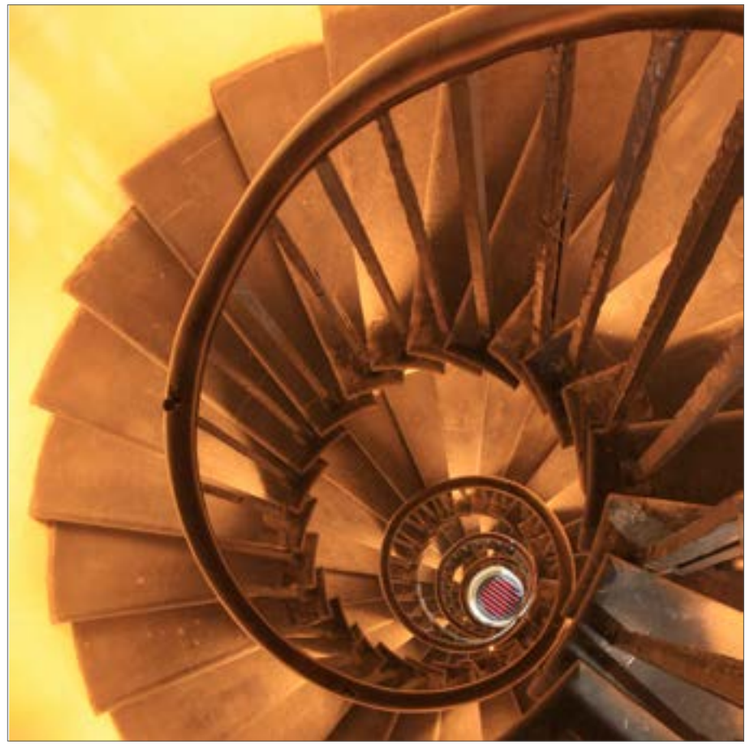

Fig. 105 2009 red light glowing from the basement

Fig. 106 2009 red tinted lighting in the basement

Fig. 107 2024 Blocked view to basement

7.4 SOUND SYSTEMS

7.4A PA AND INTERCOM SYSTEMS

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The purpose of the PA system is for an attendant at ground floor level to speak to visitors on the viewing platform. A microphone and amplifier are located at ground floor level connected to 2 no. sound projectors at high level.	Not tested at the inspection.			

7.4B INDUCTION LOOP

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
A small portable induction loop was provided in 2009, located in the attendant's recess at the entrance to the Monument. The unit required the attendant to switch it on each time it is required and ensure that it is charged regularly. It provides a 1.2m area of coverage. At the 2024 inspection, the induction loop appears to no longer be available	No longer existing at 2024	Consider reinstatement (discuss at Client Workshop)		

7.4C CCTV & TANNOY SYSTEMS

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
CCTV monitoring Information from: CoL Risk Assessment for Monument & Pavilion, ref. no. TB FIRE 14, date: January 2024: • CCTV monitoring is maintained by facility provider • CCTV coverage of the viewing platform is linked to the ticket counter and Tower Bridge control room • The monument and pavilion are monitored remotely by CCTV from Tower Bridge control room Tannoy A Tannoy voice communication facility is provided on the Monument viewing platform from the Ticket Office which has visibility of the CCTV feed	Not tested at the inspection			

7.5 LIGHTNING CONDUCTOR

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Date of installation: 2009. Lightning protection down-conductors are UPVC coated copper tape and upvc copper rod, with the appropriate high-quality fixings, which connect the copper flaming orb, the stainless-steel cage and the internal wrought iron balustrade to the ground earthing points. Conducting tapes are connected at high level to the inside of the copper urn, iron ladder and iron support cradle. From here, two tapes to go out to the exterior of the column and connect to the top of the 2008 viewing platform cage on east and west elevations. The stainless steel of the balustrade and cage is part of the conductor system. Conductor tape is connected to the bottom of the cage railings, on the east and west elevations; it goes down to the top of the shaft of the column, to the base, from where the tapes go horizontally: 1 no. to the north elevation and 1 no. to the east elevation, then down the plinth to the 2no. earthing points. The east down conductor is labelled: 'System maintained by Omega Red Group Ltd 0871 540 666'	Visual inspection: the lightning conductors look to be secure and in good condition. The lightning protection system was inspected and tested by Omega Red Group Ltd on 20.06.2024, who reported the following: The lightning protection system for this structure has been inspected in accordance with BS 6651:1999. The structure has a system designed in accordance with the requirements of BS 6651:1999, or an earlier British standard. The lightning protection system for this structure does not comply with the standard to which it has been inspected (see statement above). Please contact us if you require further explanation. The lightning protection system has an overall resistance value to earth of 8.42 ohms. The lightning protection system requires repair works to bring it into a serviceable condition. Please refer to the attached quotation. The lightning protection system will not comply with the standard to which it has been inspected if the identified repair works are completed. However, it will be returned to a serviceable state of repair.	i) Undertake repair work as quotation provided to CoL by Omega Red Ltd (Quotation for repair work not provided to JHA)	A	Client to Provide Quote

Fig. 108 North elevation down conductor, partly concealed, and test pit, 2024

Fig. 109 East elevation down conductor, surface mounted, 2024

Fig. 110 East elevation, lightning conductor test pit, 2024

7.6 FIRE PRECAUTIONS

7.6A FIRE RISK ASSESSMENT

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
CoL have provided JHA with copies of: • External Fire Risk Assessment for The Monument and Pavilion, by Fire Protection Association, dated 30.10. 2019. • CoL Risk Assessment for Monument & Pavilion, ref. no. TB FIRE 14, date: January 2024 "CoL Risk Assessment for Monument & Pavilion, ref. no. TB FIRE 14, date: January 2024" The assessment identifies the hazards, describes who may be harmed and how, describes the existing controls and risk rating and recommends any further action necessary.	The CoL Risk Assessment requires the flame area and the cellar to be cleaned regularly to remove any build-up of litter/dust or rubbish. At the 2024 inspection the flame area and cellar were not clean	i) Include regular cleaning of the flame area and cellar on the cleaning rota	A	Incl. Staff Budget

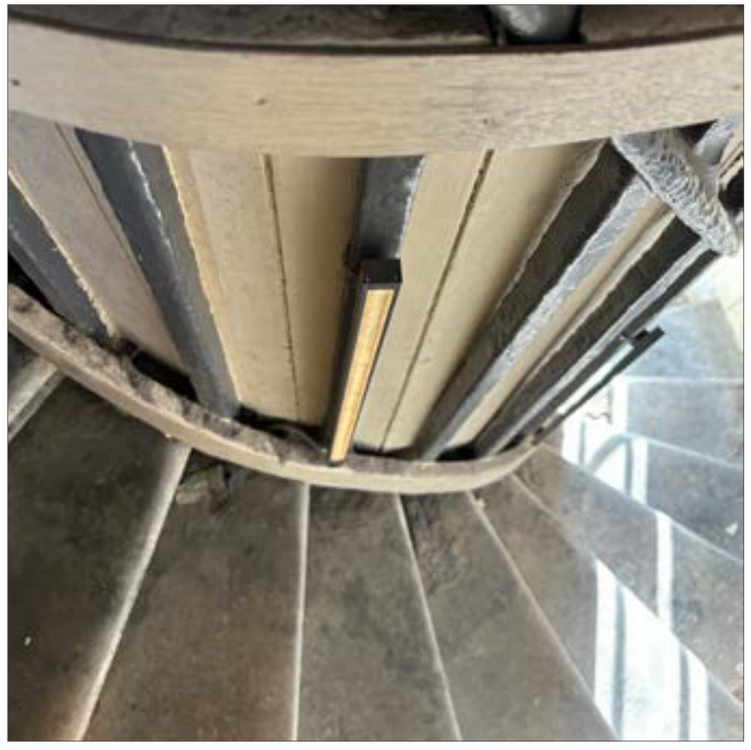

Fig. 111 Dust build-up in flame area, 2024

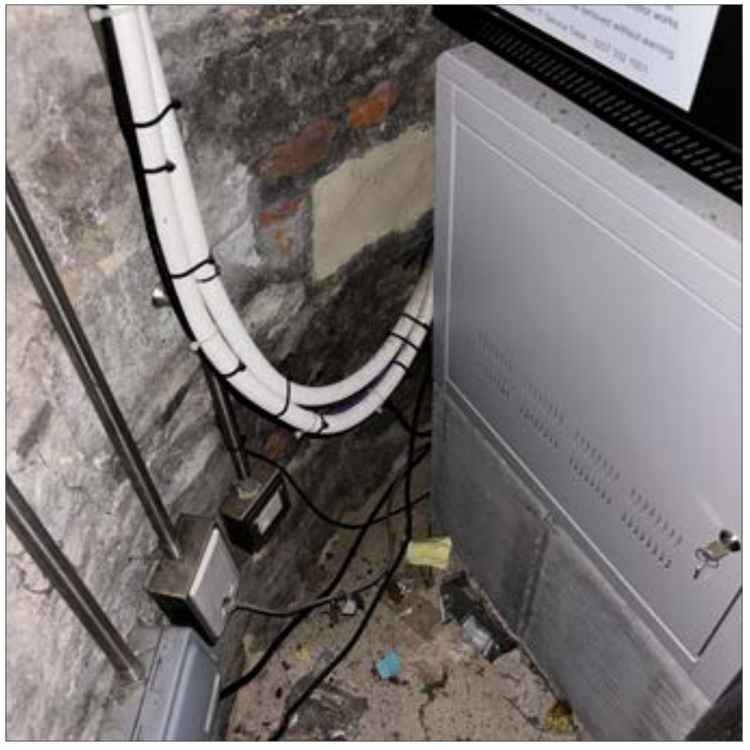

Fig. 112 Litter in cellar, 2024

Fig. 113 Rubbish? & cardboard boxes in cellar, 2024

7.6B FIRE DETECTION

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Information from: "CoL Risk Assessment for Monument & Pavilion, ref. no. TB FIRE 14, date: January 2024" <u>Smoke detectors:</u> In the Monument, smoke detectors, linked to fire alarm system, are located on ceiling of the basement, entrance, stairs and flame room area In the Pavilion, smoke detectors are linked to sounders <u>Call points</u> Call points are located by the exit and at the top of the stairs, linked to fire alarm system with remote monitoring by monitoring station and Tower Bridge security control room. <u>Audible sounders and beacons</u> The fire detection system is supplemented with audible sounders and beacons, staff make announcements using the PA system <u>Activation of fire alarm:</u> The alert is transmitted to a monitoring centre who in turn contact Tower Bridge security control room In hours: The security team contact attraction staff located there Out of hours: security from tower bridge attend to investigate	Inspections/Testing Information from: "CoL Risk Assessment for Monument & Pavilion, ref. no. TB FIRE 14, date: January 2024" Call points tested weekly by Tower Bridge security and maintained by facility provider. Statutory inspections are carried out by the facilities provider. Information from: External Fire Risk Assessment for The Monument and Pavilion, by FPA. Fire drills are held approximately four times per year – records were seen. All are unannounced but occur outside of visiting / events hours. A detailed report of each drill and/or evacuation are maintained (typed) and findings disseminated (records were seen for the incident on 17/04/19). The Fire Detection and Alarm System has been tested and certified as satisfactory by Square Mile Fire & Security on 24.06.2024	No recommendations by 'Square Mile Fire & Security'	-	-

7.6C FIRE EXTINGUISHERS

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Fire extinguishers are located just inside the entrance door and at high level behind the south door (of a pair) onto the viewing platform.	Information from: CoL Risk Assessment Fire extinguishers checked monthly by Tower Bridge staff and inspected annually by the facilities provider Information from: 'StandBy Fire Protection' Certificate of Inspection 09.11.2023 Inspected: 3no. 2kg CO2 extinguishers and 3no. 6L foam extinguishers Corrective action required to 1no. 2kg CO2 extinguishers and 1no. 6L foam extinguishers, -refer to report (not provided to JHA)	i) Undertake recommendations from 'StandBy Fire Protection' to ensure fire extinguishers are compliant	A	Client to Provide Cost

7.7 DISABLED PROVISION AND ACCESS

7.7A DISABLED ACCESS AND THE 2004 ACCESS AUDIT

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
There is no disabled access into the foyer of the Monument or up to the viewing platform. The City of London confirm that most recent Access Audit report was prepared in 2004, prior to the 2007-2009 Major Repair Contract. The following recommended improvements to improve physical access were made in 2009: Removal of sign over the glazing to the entrance door Installation of Hearing Induction Loop Improvements to lighting on the steps	Sign over the glazing to the entrance door: not removed at 2024 inspection Hearing Induction Loop: no longer (obviously) existing at 2024 inspection Lighting on the steps: strong glare from replacement baluster lighting	i) Sign over the glazing to the entrance door: remove	A	Incl. Staff Budget
		ii) Hearing Induction Loop: CoL to advise reason for removal	-	
		iii) Lighting on the steps: replace baluster lighting with louvres, as originals	C	Incl. in 7.3C i) page 52

7.7B FUTURE PROVISION OF A DIGITAL SCREEN TO DISPLAY VIEWS

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
A suggestion in the access audit report of 2004 is that one or more webcams or real-time moving image cameras could be installed on or above the viewing platform level and for the images to be relayed to ground level. This would give access to the views from the viewing platform to those who cannot climb the stairs. The planning application for the 2007-2009 contract stated that provision would be made for high level cameras and a ground level display screen to be installed either in the contract or following completion of the contract. Provision was made in the contract for a camera and for conduits to take data cables to relay digital information from the camera to the base of the Monument.		i) The City Corporation gives consideration to instructing the provision of a screen at the base of the Monument to show images of views from the top of the Monument.	D	Not Costed

7.8 HEALTH & SAFETY POLICY

7.8A HEALTH & SAFETY POLICY

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
The Monument receives many public visitors and climbing the 311 steps to the viewing platform is quite a challenge for some visitors. The form of the building is unusual and difficult for access by the emergency services; when contacting the emergency services, attendants should provide information necessary about the unusual form of the building.		i) Ensure the Monument attendants have appropriate health & safety training	B	Incl. Staff Budget

8.1 ENTRANCE STEPS & EXTERNAL PAVING

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Paving outside the entrance to the Monument and steps up to east entrance door. The stone steps were installed in 2009 in honed Yorkstone with "anti-slip"stainless steel studs resin-fixed into drilled holes into the edges of the treads. The riven Yorkstone paving slabs were laid in2005. There is an external water pipe and tap, both lagged.	Stone steps & studs: good condition, cleaning & chewing gum removal is desirable Drainage pipe beneath Yorkstone step, and drainage outlet from paving within railings (south end) appear to be blocked	i) Wash Yorkstone steps with bristle brush and water and freeze remove chewing gum	B	£400
		ii) Clean paving and two paving drain-pipes within railings paved area	B	£1,000
		iii) Improve appearance of earthing cable to exterior water supply pipe	B	Incl. Staff Budget

8.2 EXTERNAL RAILINGS AT GROUND LEVEL

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Painted cast iron external railings and central gate around the east entrance to the Monument	Local damage to paintwork leading to rusting of ironwork	i) Prepare, prime and paint local areas of ironwork where paint is damaged.	C	£500
		ii) Full redecoration	C	£4,000

Fig. 114 Tap, with earthing cable, 2024

Fig. 115 Drain pipe from north area beneath entrance step, 2024

Fig. 116 Close-up blocked pipe, 2024

Fig. 117 Pipe discharges to south area, 2024

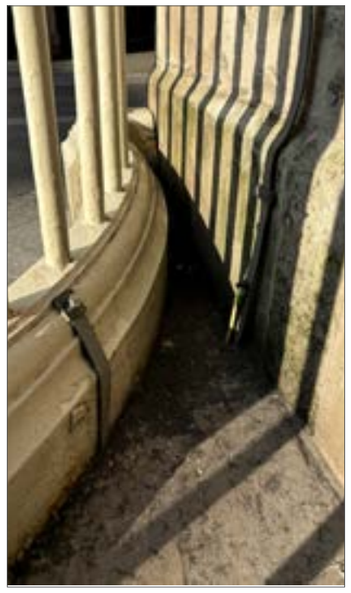

Fig. 118 Corner of south area (drain in corner), 2024

Fig. 119 Drainage gap from south Area to surrounding paving, 2024

9.1 PAVILION BUILDING

DESCRIPTION	CONDITION	RECOMMENDATION	PRIORITY	COSTS
Small pavilion building square on plan circa 5.4m x 5.4m and approx. 3m high. Structural glass enclosure around gabion walls lined with timber stud walls with insulation and plasterboard. Reflective angled glass panels on the flat roof. Steel door to attendants' room; 'temporary plywood door (originally a sliding door) to the public wc, now closed.	Exterior: the pavilion was designed as a 'temporary' structure and is not in good condition. Structural glass walls have open joints between panels, some joints now (badly) mastic-filled, glazing joint north side, above doorway, is temporarily taped over, some glass panels flex when pushed against. In s-w corner, glazing not aligned with metal ground trim around the paving 'rocks', revealing blue plastic shims and chipboard packing. Inside of glazing is dirty in places, particularly horizontal glazing above doorways,shattered glass remnants in gabions. Attendants' door, poor aluminium drip detail, door to (disused) public wc, temporary plywood, payment point is taped over, paint is peeling from threshold & mastic detailing Interior: As described by Operations team: Pavilion not suitable for multi-use purpose as a staff welfare area, storage facility and secure space for cash. Issues particularly with use by multi staff of different sexes concurrently. Insufficient space to store all operation equipment needed to run visitor attraction. Maintenance issues include overall state of interior decoration and repair, tiles, paint and equipment. Kitchen area especially hobs need removal and making good – This is scheduled for refurbishment in 24/25 . Recurring issues with external door.	i) Prepare detailed scope of exterior & interior repairs and alterations to the Pavilion building to provide adequate facilities for Monument staff and a presentable exterior in the setting of the Listed Monument	B	Client to Provide Quote

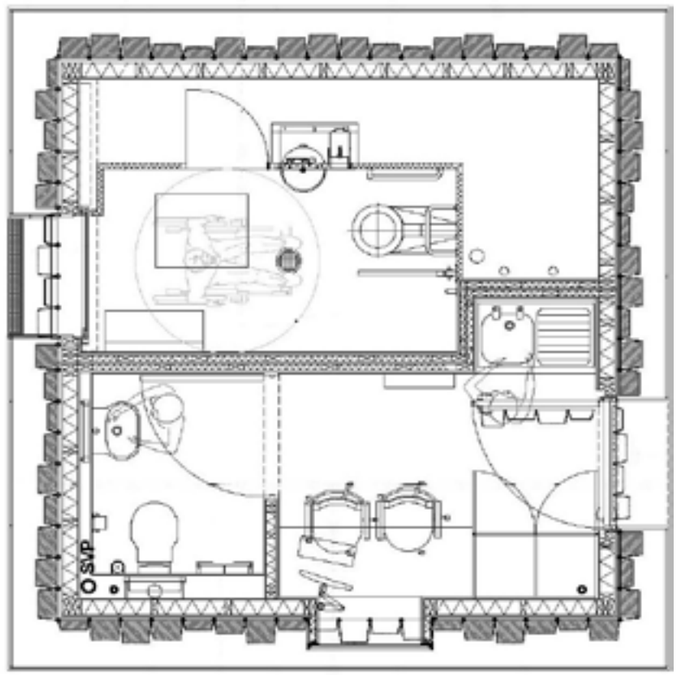

Fig. 119 Floor plan © Bere Architects 2005

Fig. 120 Open joints between structural glass, 2024

Fig. 121 Door to public WC, 2024

SOURCES OF INFORMATION

Condition Survey 2014 by Julian Harrap Architects

Julian Harrap Architects Site inspections 2024

The Monument Major Repair Contract 2007-2009 informPark by Purcell March 2024

City Surveyor Department, City of London Corporation

City of London Workshop 1 for The Monument CMP

https://www.themonument.org.uk/history

https://www.themonument.info/history/design.html

Monument Verticality Report 07 July 2024 by The Downland Partnership

The Monument Investigation Work, May 2005 by Julian Harrap Architects

The Monument Major Repair Contract 2007-2009 O&M Manual

Electrical test certificates

Lightning protection system test report by Omega Red Group Ltd on 20.06.2024,

External Fire Risk Assessment for The Monument and Pavilion, by Fire Protection Association, 30.10. 2019.

CoL Risk Assessment for Monument & Pavilion, ref. no. TB FIRE 14, date: January 2024

The Monument Access Audit report 2004

Historic England, Conditional approval letters for Scheduled Monument Consent applications

APPENDIX I

MONUMENT STRUCTURAL REPORT

2024

Hockley & Dawson

HOCKLEY & DAWSON
CONSULTING ENGINEERS

Title	**The Monument CMP – Structural Report**
Job No:	**22071**
Date:	**September 2024**
Client:	

DRAFT

HOCKLEY & DAWSON

P

Author	Name Qualification		Signature
Checked	Name Qualification		Signature
Approved	Name Qualification		Signature
Reference		Revision	Issue Date

HOCKLEY & DAWSON

Contents

HOCKLEY & DAWSON

1.0 Introduction and Brief

The structural condition of The Monument was instructed as part of the ongoing conservation and management plan. This report focusses on the structural observations and should be read in conjunction with the reports and information compiled by Julian Harrap Architects.

2.0 Description

Survey inspections were carried out on the mornings of the 31st July, 5th August, and 7th August 2024. The top section of the flaming orb (above the ladder access platform) was not accessible due to lack of a rescue plans, but all other areas of the structure were inspected directly.

Previous inspections and survey records will be referred to in the finalised report, with measured survey comparisons where possible.

3.0 Observations

Flaming Orb

The original ribs, and modern plates / brackets installed circa. 2008 were showing signs of corrosion throughout the lower section of the orb. At this stage it is all assumed to be minor surface corrosion, however treatment and maintenance of these structural elements should be undertaken to ensure that it does not worsen.

Access to the higher levels of the orb was denied, however an operative recorded a video of the condition in this area. Based on his observations, comments, and a review of this video, the internal structure of the orb appeared to generally be in a reasonable condition. One hole was noted in the wall of the structure, although it was not clear whether this was a recent change or had been there unchanged for a considerable time. Closer inspection of the hole would be required in order to better assess the condition.

As with the ribs and plates at the lower orb level, all painted metalwork at high level should be inspected, and any areas of corrosion cleaned back and treated.

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Observation Deck

Significant cracking was observed along the railing line, particularly to the west and east sides. These cracks had not been noted on previous inspections and did not form part of the previous set of monitoring. This would suggest that whilst they may have been present, they would have been less severe. It is therefore assumed that the cracking has worsened since the last set of structural inspections.

The monitoring studs from previous phases of recording were mostly lost. A few were still in situ and where possible measurements were taken for comparison. Overall there did not appear to be any substantial additional cracks to those which had previously been monitored apart from those at the base of the railings described above.

A visual survey using binoculars was conducted of the external stonework above the observation deck level. No notable issues were observed apart from one spalled area of stonework where the top of the cage structure met the stonework above the doorway. It was assumed due to the surface condition that this defect was not a recent change and that the structure was stable.

Stairs and Balustrade

In general the railings and balustrade appeared to be stable. It was noted that a thin strap had been introduced wrapping around the balusters approximately a quarter of the way down from the handrail. Based on previous archive information, this strap had been installed after 2016, when Hockley & Dawson carried out a detailed survey of the balustrade and produced a series of proposed strengthening details. It did not appear that any of these proposals had been implemented. There were several instances of splits within the timber handrail, generally at the joints between sections.

There was visible cracking around base of balusters on many steps. The severity of these cracks varied, with many just hairlines or 1mm. A detailed review of the previous balustrade surveys should be undertaken to compare the extent of this cracking.
In some cases stone repairs had been carried out to the ends of the stone steps, which may have been carried out for the most significant cracking in these areas. These repairs may also have been necessary to address areas of severe spalling. There were a number of steps which showed loss to the underside surface at the time of the recent inspections. It was unclear whether the remaining defects have worsened since the repairs, or whether the issues which were repaired were far more significant. It is currently assumed that these steps are stable and that there is no

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ongoing loss of material (as there have been no reports of debris etc.) however these should be carefully recorded and monitored going forward.

4.0 Conclusions and Recommendations

Of all the issues observed, the most concerning is the cracking at the base of the cage railings. This was the most significant cracking and was in an exposed position. The cause of the cracking at this stage is unknown, however it could be linked to lateral overloading of the railing or and issue in the method of fixing back into the slab.

Flaming Orb

- Corroding iron ribs, plates, and brackets within the orb
  - All areas of corrosion to be carefully cleaned back to bare metal, treated, and repainted in accordance with the specification.
  - All other areas to be cleaned and painted as per recommended maintenance
- Close inspection of the hole within the high level orb structure
  - Ongoing monitoring
    - Recording of hole size and wall thickness, and photographs
    - Suggested to be 6 monthly until proven to be stable and then monitoring requirements reviewed

Observation Deck

- Detailed inspections of the cracking around the base of the railings
  - The position of the cracks makes stud monitoring difficult due to the proximity to the railings
  - Measurements of extent
  - Stud monitoring where possible
  - Photographic records
  - Review of the construction details
- Repair and stabilisation scheme to be developed once the causes are better understood.
- Visual inspection of the slabs recommended to be annually [subject to the review of the monitoring data before the final report issue]

Stairs and balustrade

- Crack monitoring of steps to be put in place, recommended to be 6 monthly [subject to review of previous balustrade records]
- Review of the noted cracking and stone condition against previous records
- Repair and stabilisation of the split timber handrail
- Installation of the proposed strengthening systems from 2016
  - Low priority with the thing wrapping strap in situ

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- Railings currently seem stable

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5.0 Standard Conditions

This report is the property of and is confidential to the client designated in the report. Whilst it may be shown to the client's professional advisors, the contents are not to be disclosed to, or made use of, by any third party, without our express written consent. Without such consent, we can accept no responsibility to any third party.

Whilst every effort will be made to fully inspect those parts of the building requested of us to inspect, no permanent or secured fixtures and fittings will have been removed. We will not have inspected woodwork or other parts of the structure which were covered, unexposed or inaccessible and we are unable to report that any such part of the property is free from defect.

Hockley and Dawson certify that they have carried out the works contained herein with due care and diligence to their best belief and knowledge based on the time and information available.

This report is made on behalf of Hockley and Dawson. By receiving it and acting on it, the client – or any third party relying on it – accepts that no individual is personally liable in contract, tort or breach of statutory duty (including negligence).

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6.0 Appendices

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6.2 Appendix A – Photographs

Flaming Orb

Example of typical corrosion to the modern brackets

Minor surface corrosion to original rib and plate

Corrosion to the internal railings below the orb

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Loss of underside surface to stone steps within upper section (between observation deck and orb)

Observation Deck

Example of incomplete set of monitoring studs – crack #1 from previous surveys

Example of incomplete set of monitoring studs – crack #2 from previous surveys

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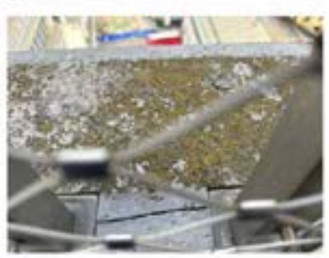
Full set of monitoring studs in situ

West elevation south end
Crack along base of railings from southern corner, extending beyond mid length of the elevation



West elevation central

East elevation north end
Crack along the base of the railings from the northern corner approximately to the mid point. In general less severe cracking than the western elevation.

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Typical minor surface corrosion on railing

Spalled stone surface around the bracket – visible with binocular survey

Staircase and Balustrade

Underside corner of step #68 missing

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Cracked step at baluster base (#103)

Damage to top corner of stone step #125

Crack through load path of cantilevered stone steps (#142)

Cracked step at baluster base (#162)

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Railings not perpendicular to step

Damage around infill at base of baluster (#185)

Loss of material to underside of step and cracking across underside corner at wall face (#202)

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Corrosion at base of baluster and damage to stone around the base

Significant loss of underside surface #218

Scabbled underside #246

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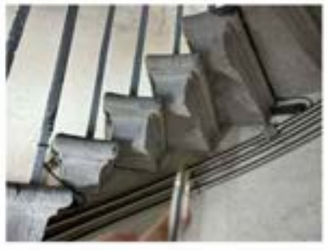
Damage to stone around base

Damage to handrail timber (#234)

Horizontal crack across vertical back face of stone step #283



Uneven underside #287

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Cracking at base of baluster and horizontal cracking across the end of the stone step (#298)

Damage to timber handrail – near observation deck level

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