

**City Hall Salisbury  
Malthouse Lane, Salisbury  
SP2 7TU, UK**

**Suspended Plaster Ceilings  
Inspection**

Prepared for  
**Kier Workplace Services**

July 2019

Job No: H199006



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Revision	Amendments	Prepared By	Checked	Date
A	Report issue			

# REPORT ON THE SUSPENDED PLASTER CEILINGS INSPECTION OF SALISBURY CITY HALL, MALTHOUSE LANE, SALISBURY

## 1. INTRODUCTION

- 1.1 AKSWard Ltd were instructed by [REDACTED] of Kier Workplace Services to undertake a suspended plaster ceilings inspection of Salisbury City Hall at Malthouse Lane, Salisbury. The purpose of the appointment was to inspect the condition of suspended plastered ceilings and to provide structural and plaster specialist report.
- 1.2 The site visit and inspection were undertaken on Monday 24<sup>th</sup> June 2019. The weather was dry and sunny. The survey was undertaken by [REDACTED] (Structural Engineer, AKSWard Ltd) and [REDACTED] (Plaster Specialist, Stonewest Ltd). The weather was dry and sunny.
- 1.3 The inspection was limited to visual survey, including photographic survey and measurements of the structural elements (but not measured building survey). No structural opening up works have been undertaken during the survey. No material testing was undertaken for the purpose of this report.
- 1.4 Externally there was good ground level access around the building to undertake the visual survey. No high-level access was provided externally.
- 1.5 Internally following areas have been inspected: Foyer, Servery / Kitchen, Auditorium, Alemein Room, Loft space. Access was provided to inspect these areas, including ladders and scaffold tower to gain access to high-level ceilings. Following access restrictions were encountered during the survey:
  - a) Foyer – access through the lighting panel opening (without possibility of getting into the space above ceiling).
  - b) Servery / Kitchen – access only through ceiling access hatch (without possibility of getting into the space above ceiling).
  - c) Auditorium – area of floor available to set scaffold tower was limited by the lighting box and the retractable seating.
  - d) Alemein Room – suspended panel ceiling, installed below the historic lath and plaster ceiling.
  - e) Loft space – timber floor installed over the ceilings, insulation placed over the ceiling, risk of asbestos fibres in the loft space preventing lifting of insulation.
- 1.6 The Client requirement was to deliver the report in accordance with the ABTT Guidance Note 20. The below report follows the Guidance Note as far as practicable.

- 1.7 The report has been produced only for use of Kier Workplace Services and should not be used by third parties without consultation with AKSWard Ltd.
- 1.8 The City Hall floor plans have been annotated with site observations and this is included as Appendix A.
- 1.9 A photographic record was made of the surveys and this is included as Appendix B.
- 1.10 The Plaster Specialist comments have been incorporated in the below report. The report is included as Appendix C.

## **2. BRIEF DESCRIPTION OF PROPERTY**

- 2.1 The City Hall was a three-storey detached building, irregular on plan.
- 2.2 The building was located at Malthouse Lane. The building abutted Fisherton Street on the South, Summerlock Approach on the West and the Chapel Place on the North.
- 2.3 The building was approx. 78 m long (North – South) and 32m wide (East – West). The auditorium and stage part of the building was two-storey high, 45m long and 25m wide. The auditorium part of the building dates to 1937, and was extended with:
  - the front three-storey part comprising bar, meeting room and offices;
  - side two-storey extension comprising lobby, staircase, offices;
  - rear two-storey extension comprising stage docks and dressing rooms.
- 2.4 The external walls of the building were brickwork construction. The roof over the auditorium was gambrel roof. The roofs over the extensions were flat and / or mono pitched.
- 2.5 See Appendix A for block plans and appendix B for photographs of the building.

### 3. OBSERVATIONS

#### 3.1 Foyer.

3.1.1 Good below access to the ceiling was provided. Above access only through lighting panel opening in the ceiling, not possible to walk into the ceiling void.

3.1.2 Structural parts supporting suspended plaster ceilings.

The ceiling was suspended from the floor structure, originally forming the auditorium balcony. The structure was formed of deep cranked primary beams and secondary beams spanning between, and supporting the stepped floor. The floor was presumably concrete cast on metal lath, tied to the steel beams with metal wire.



Photo 1 – ceiling void above Foyer.

The ceiling structure was suspended with flat, twisted bars. These bars were hooked over the top flange of off the secondary beams or fixed to the angles spanning between secondary beam and masonry wall. There was no access to measure size and gauge of the ties. Beside flat bar ties, hessian wadding ties had been used to suspend the ceiling (ceiling over the part of Foyer abutting Auditorium). It is likely that the hessian wadding ties fixed to secondary steel beams had metal wire reinforcement.



Photo 2 – ceiling void above Foyer.

The substructure supporting the plastered ceiling was formed of mild steel flat bars placed in two layers and in orthogonal directions. Top layer was formed of 30x6 flat bars, it was not possible to measure the exact size of the bottom layer flat bars, but considering the construction of the ceiling in other areas they are likely to be 18x6 mm.



Photo 3 – hessian wadding ties supporting the suspended ceiling.

### 3.1.3 Suspended plastered ceiling.

The ceiling was formed of solid work (cementitious mortar) applied to expanded metal lath. The lath was fixed to ceiling's substructure with metal wire and hessian wadding ties. The finish was undetermined (possibly anhydrous plaster). The decorative plasterwork was cast fibrous plaster panels (hemihydrate plaster and hessian / timber reinforcement). The ceiling over Foyer comprised five large coffers in the centre of the span with light fittings in the middle. It was noted that modern timber frames were introduced to support the ceiling around light fittings in the centre of coffers.



Photo 4 – The suspended ceiling over Foyer.



Photo 5 – timber frame around light fitting, over the coffer.



Photo 6 – void over Foyer ceiling, timber frames over the coffers.

In the area of the front entrance and the ticket office the historic suspended plastered ceiling was covered with new structure, presumably plasterboard fixed over the historic elements.

Visually the ceiling plane had slight undulations, however the plain and decorative areas were sound and firm to applied pressure.

Cracking was seen intermittently, mostly along the South external wall and at approximate 4.0m centres. The cracking was below the painted surface and so not active / live.



Photo 7 – crack in Foyer ceiling.



Fretwork at HAVC intact, no sign of the plaster suffering from hydrolysis. Plaster key robust and firmly keyed into the expanded metal lath.

Visually, the general condition of cast panels was satisfactory, wadding firm and intact.

### 3.2 Servery / Kitchen

3.2.1 Good below access to ceiling was provided. Above access only through access hatch opening in the ceiling, not possible to walk into the ceiling void.

3.2.2 Structural parts supporting suspended plaster ceilings.

The ceiling was suspended from the floor structure, originally forming the auditorium balcony, as per description in paragraph 3.1.2.

The ceiling structure was suspended with a few ties only. These ties were galvanized flat bars and they seemed to be modern alteration of the ceiling's structure. No hessian ties were observed in this area.



Photo 8 – ceiling void above Kitchen / Servery.

The substructure supporting the plastered ceiling was formed of mild steel flat bars placed in two layers and in orthogonal directions, similar to the ceiling over the Foyer. The flat bars (presumably 18x6mm) forming the bottom layer and supporting the expanded metal lath were placed at 350mm centres. The top layer was formed of 30x6 flat bars

placed at approximately 1080mm centres. These bars were spanning between external wall and the wall separating Servery from Foyer, on overall distance of approximately 3.5m. They were suspended in the mid span with ties (see photograph above). Beneath the ceiling there was partition wall installed up to the underside of the ceiling and likely providing support at the mid-span of the bars as well. In the centre of the 3.5m span the ceiling was deflected at approximately 30mm, which is above the acceptable serviceability limit. Presumably the deflection occurred before partition wall installation.



Photo 8 and 9 – ceilings over the Servery and the Kitchen.

### 3.2.3 Suspended plastered ceiling.

The ceiling was formed of solid work (cementitious mortar) applied to expanded metal lath. The lath was fixed to ceiling's substructure with metal wire and hessian wadding ties. The finish was undetermined (possibly anhydrous plaster). There was no decorative plasterwork in this area. There was no cracking in the ceiling over Servery / Kitchen.

Visually, the general condition of cast panels was satisfactory.

### 3.3 Auditorium.

3.3.1 Below access to the ceiling was provided from a scaffold tower and it was restricted by the lighting box and the retractable seating. The above access was provided over the central, flat part of the ceiling, although the timber floor did not allow to inspect details of the construction in the whole area. There was no safe access above the side vaults of the Auditorium ceiling.



Photo 10 – Auditorium, retractable seating and light box.

### 3.3.2 Structural parts supporting suspended plaster ceilings.

The ceiling was suspended from the roof structure, formed of steel trusses spanning over the auditorium, approximately 24 meters. The truss type was flat vault gambrel truss. Spacing of the trusses was approximately 3.8m. See Appendix B for schematic drawings of the structure over auditorium.



Photo 11 – loft above Auditorium.

The connections in trusses were formed with metal plates fixed to sections forming chords and struts with rivets and/or bolts. Presumably trusses had been divided into sections for transport and assembled on site.



Photo 12 – truss connection.

The trusses were formed with doubled steel angle sections - chords of 150x85x8 angles and struts of 60x50x6 angles. Lateral stability was provided by cross-bracing in direction perpendicular to trusses (in three lines) and diagonal bracing in the roof plane. All bracing was formed of steel angles.

The trusses were supporting purlins formed of angle sections, placed at 550mm and 1120mm centres. The purlins were supporting lightweight, insulated roof panels. We have not obtained information about the original type of roof covering installed over the building.

Beside the plastered suspended ceiling, the roof structure supported services (ventilation ducts, heating system, light box hoist, data and electric cables) and timber floor.



Photo 12 – services in loft above Auditorium.

The substructure supporting the plastered ceiling was formed of steel angles, spanning between the roof trusses. The angles were fixed to the bottom chord of trusses at approximately 1.4m centres. The timber floor joists were bearing directly on the edge of the vertical arm of the angle. The floor structure was formed of 150mm deep 45mm wide joists at 600mm centres and softwood floor boards placed with gap between. The steel angles gave support to flat ceiling over the central part of Auditorium and vaulted ceilings on sides, although the details differed depending on the area. The ceiling in the front part of the auditorium has been extensively altered, although the primary support system has not changed. Four types of ceilings were identified in the Auditorium

area: high level ceiling, lowered ceiling, vaulted ceiling and stage ceiling. See following pages for details.



Photo 15 – Loft over vaulted ceiling -vent ducts, no timber decking for access.

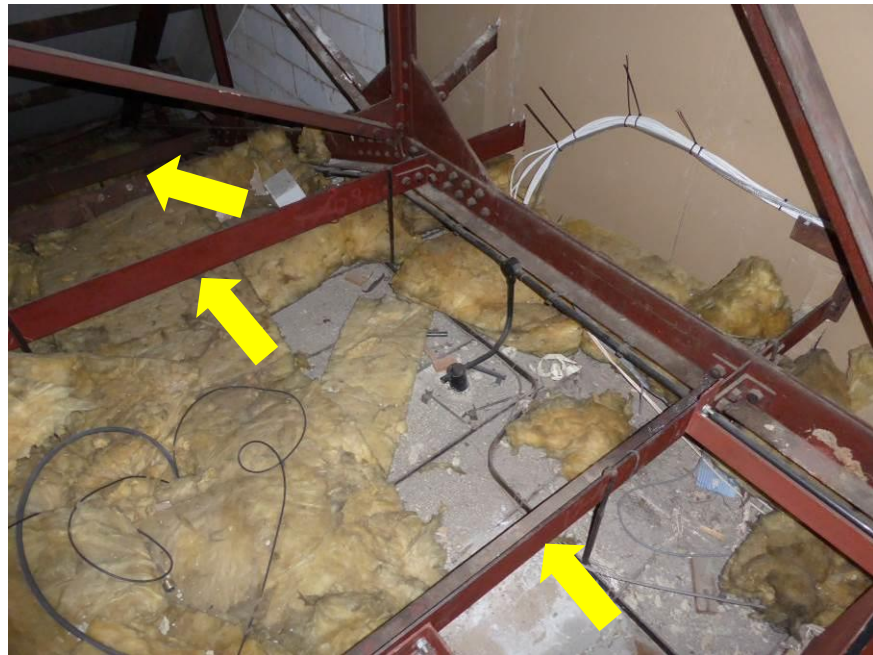


Photo 14 – steel angles spanning between trusses and supporting the suspended ceiling.

### High level ceiling

Part of ceiling fixed directly to the underside of the steel angles, acting as secondary beams. The substructure was formed of mild steel flat bars (presumably 18x6mm) at approximately 350mm centres, fixed to the steel angles with metal wire ties, hooked over the vertical arm of the angle.



Photo 15 – metal wire ties hooked over the angle arm.

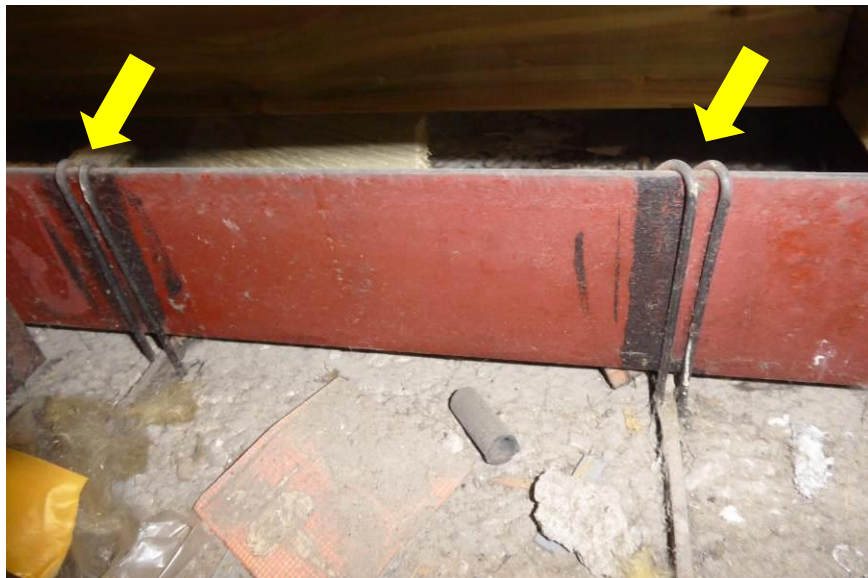


Photo 16 – metal wire ties fixing flat bars to the angle.

### Lowered ceiling

Part of the ceiling with solid work lowered below the supporting angles level, approximately 500mm (this distance may vary across the ceiling area). The substructure supporting the plastered ceiling was formed of mild steel flat bars placed in two layers and in orthogonal directions. The bottom layer was 18x6 mm flat bars placed at approximately 350mm centres. Top layer was formed of 30x6 flat bars at approximately 1.0m centres. The top layer was suspended off the steel angles (secondary beams) with ties formed of mild steel twisted flat bars (15x3 mm). The ties were hooked over vertical arm of the angle and over the flat bar. Metal wire was used generally to fix expanded metal lath to the bottom layer of supporting structure, although hessian wadding ties had been noted in few locations.



Photo 17 – suspended ceiling, visible junction with high level ceiling.

### Vaulted ceiling

Part of the ceiling over sides of the Auditorium, abutting the external walls. There was no good access to inspect details of the ceiling construction from the above. Considering the details of construction viewed in the loft, we assume that the construction of vaulted ceiling is similar to the lowered ceiling, where probably the ties were fixed to substructure and supporting angles (secondary beams) at closer centres.





Photo 18 – void over vaulted ceiling.

### Stage ceiling

This item refers to the ceiling in the area abutting the stage. The original suspended plastered ceiling in this area was altered and covered with new structure formed of timber and plasterboard. The original ceiling's construction is equivalent to the lowered ceiling described above. The substructure and ties formed of flat bars were retained. The historic ceiling was locally removed to allow construction of the lowered ceiling and lighting platform over the Stage / front Auditorium. The modern ceiling and platform were suspended with flat bar ties (24x6mm) and equal angles (35x35x5) from the supporting angles (secondary beams). The connections between ties and platform substructure were bolted – either with a single bolt through the angle arm (in shear) or a single bolt welded to the tip of the flat bar and secured with nut to the bracket or angle, fixed to timber structure of the platform. The new ties were penetrating through the retained historic ceiling. The spacing of the ties was approximately 2.0m along the secondary beams (angles). The lighting fixtures were suspended directly from the secondary steel angles or from the lowered ceiling structure.

The timber structure of the platform was formed with 150mm deep 47mm wide timbers installed at 450mm centres. Every second joist was suspended to the supporting (roof) structure with metal ties. The deck was formed with softwood floorboards installed with gaps between.



Photo 19 – historic ceiling substructure.



Photo 20 – steel subframe supporting lighting platform.



Photo 21 – suspension of the lighting platform.



Photo 22 – lighting platform, underside view.

### 3.3.3 Suspended plastered ceiling.

The ceiling was formed of solid work (cementitious mortar) applied to expanded metal lath. The lath was fixed to ceiling's substructure with metal wire. The finish was undetermined (possibly anhydrous plaster). The decorative plasterwork was cast fibrous plaster panels (hemihydrate plaster and hessian / timber reinforcement). The ceiling over Auditorium comprised large flat area in the centre and vaults on sides, along the external walls. At the junction of the flat and vault ceilings a strip of ceiling was lowered and the step was finished with decorative Greek key panels.

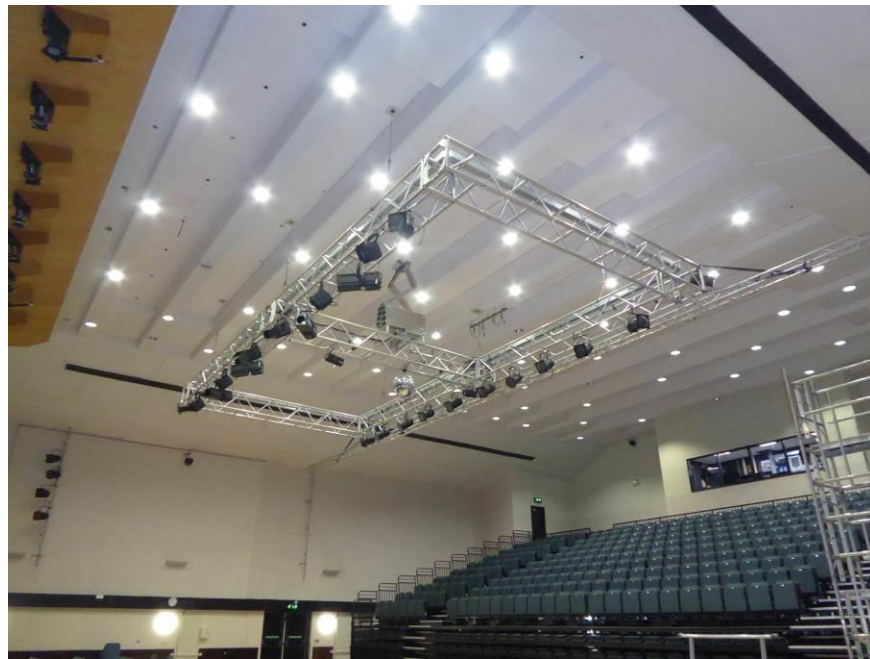


Photo 23 – ceiling over the Auditorium.

Lighting boxes formed of timber battens and chipboard. The timber framing was fixed through the solid work and EML to timber blocks with coach bolts. The fixings were tested with applied pressure in few random locations across the ceiling and all of them were sound.

Plain, flat areas where inspected were firm to applied pressure. Typical weak points, such as HAVC locations were also sound.

Greek key where inspected was cracked in several locations and unsound. Another area that could be closely seen had like results. The decorative panels are structurally only self-supporting and lightweight, hence these defects have not caused ceiling failure. Panels assumed wadded only to 30x5 flat bar and wadded at adjoining sections. It was not possible to ascertain if the wadding is reinforced or secure. Cracking immediately in front of the lighting room could not be accessed.

Cracking to left-hand side and right-hand side of the stage was noted. It appeared to be at the junction of historic suspended ceiling and modern ceiling infill. The immediate surrounding plasterwork was firm to applied pressure and sound.

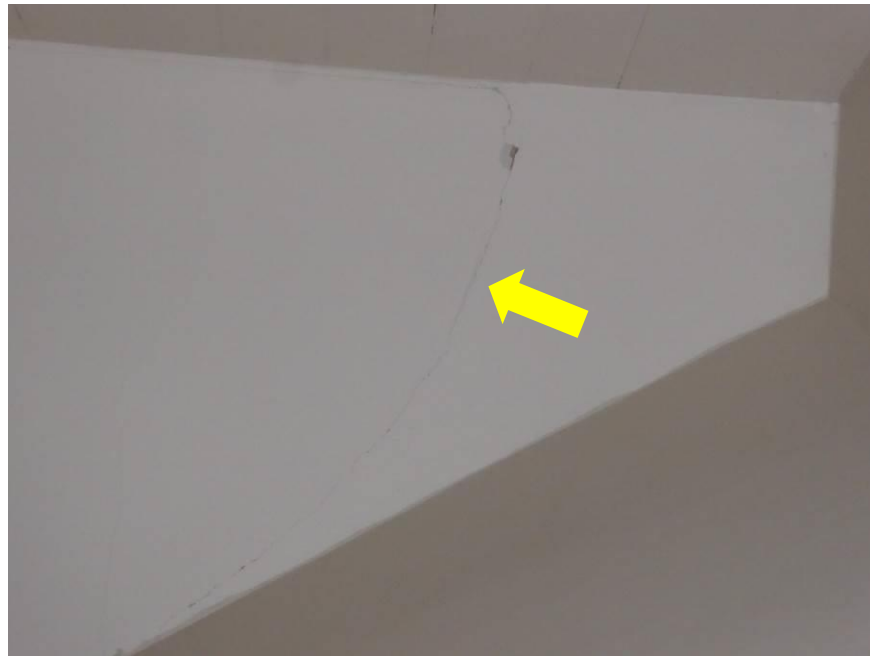


Photo 24 – crack to the left-hand side of the stage.

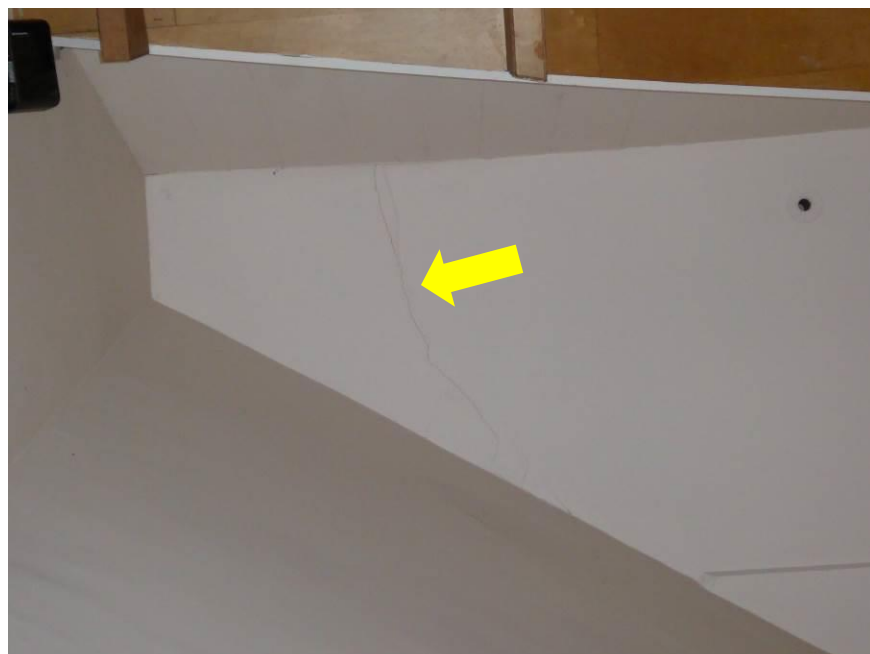


Photo 25 – crack to the right-hand side of the stage.

### 3.4 Alemein Room.

3.4.1 Limited below access to the ceiling was provided due to suspended tile ceiling installed on a timber frame. Above access was possible through the loft, but the accessibility was limited by insulation placed on top of the ceiling, services and strewn debris.

3.4.2 Structural parts supporting suspended plaster ceilings.

The ceiling was suspended from the roof structure, as described in paragraph 3.3.2. The trusses over the Alemein Room did not support timber floor. The access walkway was constructed of steel angles frame and chipboard. Ventilation ducts were hanged down from the top chords or propped on the bottom chords.



Photo 26 – loft above Alemein Room.

The thermal insulation placed on top of the suspended ceiling did not allow to investigate the details of construction. The ceiling plane was lowered below the supporting angles (secondary beams) and twisted flat bar ties hooked over the vertical arm of angles have been noted. Wadding ties have been noted as well, although the metal ties seem to be primary mean of support, even if the number of ties seem to be lower than over the Auditorium. It is likely that the hessian wadding ties have been used to fix the decorative plasterwork elements.

It is likely that the substructure supporting plaster ceiling is equivalent to the ceiling over the Auditorium, i.e. formed of two layers of flat bars suspended from the roof structure (steel trusses).

Staining on supporting angles and purlins have been noted, which can indicate water penetration issue prior to roof covering replacement. Corrosion of purlins' bearings onto the external wall has been noted, together with cracking and displacement of brickwork.



Photo 27 – ceiling above Almein Room.



Photo 28 – staining on supporting angles (secondary beams and purlins) and wall.



Photo 29 – surface corrosion of purlins bearing in external wall.

### 3.4.3 Suspended plastered ceiling.

The below comments are based on a visual inspection of this area only and assumed similarities in construction. The ceiling over Alemein Room seemed to be constructed at the same time as Auditorium ceiling and likely had formed one ceiling over the Auditorium and Balcony in the past. The ceiling was formed of solid work (cementitious mortar) applied to expanded metal lath. The lath was fixed to ceiling's substructure with metal wire. The finish was undetermined (possibly anhydrous plaster). The decorative plasterwork presumably was cast fibrous plaster panels (hemihydrate plaster and hessian / timber reinforcement). It was not possible to ascertain if wadding is reinforced or secure.

Numerous apertures were formed within existing ceiling, where hangers had been installed to support the timber subframe for the lightweight, tiled suspended ceiling. Openings for ventilation ducts have been cut in the historic suspended ceiling as well.





Photo 30 – The underside of suspended ceiling over Alemein Room.



Photo 31 – Tiled suspended ceiling and timber frame over Alemein Room.

#### 4. CONCLUSIONS

- 4.1 The main structure of the building where inspected was structurally sound. There was no sign of displacements or cracking indicating structural issues.
- 4.2 The plastered suspended ceiling over the Foyer has been retained in original form, with minor alterations around the light fittings and in the front, entrance area. The supporting structure was of size and form adequate to support the suspended ceiling. It was not possible to access and measure the substructure in details. The ties supporting the ceiling will need to be inspected when appropriate access is provided, to confirm it's suitability. There was no evidence of immediate failure to the plasterwork from our lower site investigation, however due to noted hairline cracking to ceiling's perimeter monitoring of the ceiling will be required, including areas used for access past and present, to record any possible detachment.
- 4.3 The plastered suspended ceiling over the Kitchen / Servery was altered. Although the substructure supporting solid work on expanded metal lath seems to be original, the supporting ties have been removed and replaced with new elements. Our opinion is that there is less ties than originally installed, hence the observed excessive deflection at the partition wall. We believe that the ceiling's structure is supported on the partition wall, which seems to have sufficient load bearing capacity. The supporting structure in this area is adequate and could be used to support new ties, if remedial works are undertaken. Similar to the ceiling over Foyer, monitoring of the ceiling will be required in the areas used for access past and present, to record any possible detachment.
- 4.4 The supporting structure over the auditorium is retained in the original form, although alterations affecting the loading on the roof structure have been introduced, including: modern composite panels roof covering, timber floor, hoist mechanism for the light box, new ceiling and lighting platform structure next to the stage. The installation of lightweight roof covering compensates the increased loading from timber floor on the bottom chord. The steel trusses were assessed structurally to confirm sufficient load bearing capacity. Where inspected we have not noted deep corrosion of structural elements except the bearings of steel purlins in the external walls. Surface corrosion on steel trusses was noted in a few locations and this is part of natural aging process of the building structure. Although that is not a structural issue, the condition of the steelwork needs to be monitored.

- 4.5 The plastered suspended ceiling over the auditorium is retained in original form with some alterations, including: installation of lighting boxing in the central part of the ceiling, cutting holes in the ceiling for lighting fittings, local replacement of the original ceiling with the suspended lighting platform. These alterations have not affected structural integrity of the ceiling, although nature of cracking next to the lighting room must be investigated in more details.

It is likely that the above alterations had some impact on the decorative panels of the ceiling, causing the cracking and defects (hollow panels). The two cracks noted on right-hand side and left-hand side of the stage are not structural as the plasterwork is firm in crack surrounding. It is likely that the cracks occurred at the junction between the historic ceiling and the modern replacement ceiling, due to different materials used for construction.

The fixings of lighting boxes have been checked in few representative locations across the ceiling, and all of them were sound and there was no movement under pressure. In our opinion the substructure of lighting boxes and the fixing details are sufficient.

- 4.6 The modern ceiling and lighting platform were suspended of the historic supporting (roof) structure, which we find to have sufficient capacity. The timber structure forming the platform is sufficient to transfer the loadings on the platform. The flat bar and angle ties used to suspend the platform structure have sufficient tensile capacity, but the connection details are not adequate and in future may cause failure of the platform structure. The welding of hardened steel bolt to mild steel flat bar, as shown on picture below, does not provide full strength and may be susceptible to fracture.



Photo 31 – tie connection in the lighting platform’s suspension system.

We also noted un-secured bolts in these connections, which presumably increase stress on surrounding ties and connections. In our opinion the suspension system used for the lighting platform requires detailed assessment to confirm its viability.

The shear connections between angles forming suspension frame, secured with single bolt need detailed structural assessment as well.

- 4.7 The limitations in access to the plastered suspended ceiling over the Almein Room do not allow to make unequivocal conclusions. We presume that the original ceiling's structure has not been altered, but openings were cut through the solid work and expanded metal lath to allow installation of modern ties and ventilation ducts. The ceilings substructure and supporting ties should be inspected in details when sufficient access is provided.

The installation of modern tiled suspended ceiling has not had impact on the historic suspended plastered ceiling. The timber frame substructure spans between masonry walls with intermediate ties fixed to supporting (roof) structure. These ties cause additional point loadings (approx. 0.9kN) on the steel trusses or secondary beams (angles). That loading should not have impact on performance of the trusses, but may affect the stability of steel angles, hence location of these ties needs to be investigated in details to confirm location of the ties.

Due to limitations the condition of the suspended plastered ceiling could not be inspected in details. The visual inspection from below proved decorative features are installed in this area. We've also noted some damage on the historic ceiling with abraded / broken pieces of plaster remaining. These should be removed to prevent future failure. Staining / discolouration on the ceiling was observed, which can be evidence of historic water penetration through the roof covering (see picture on the next page). Considering the visual observation and findings in other areas, we think that condition of the ceiling must be inspected in details and this should include plain areas and decorative plasterwork.

- 4.8 In general the supporting structures were of sufficient capacity to support the suspended plastered ceiling. Steel beams and trusses are not susceptible to deterioration, but two areas have been identified where water ingress could have occurred. This is the South gable wall of the historic Auditorium and the loft area over the Almein room. Further assessment of the structure in these areas and specification of remedial works will be required.

- 4.9 Where inspected, the solid work and expanded metal lath were of good quality, with good bond between these two elements. The mild steel wire ties used to fix the expanded metal lath to substructure and to tie flat bars forming substructure were adequate as well. Due to diameter of used ties corrosion may largely affect the performance of ties, hence inspection of areas indicated in paragraph 4.8 is required to confirm that the ties are sound. Hessian wadding ties where inspected seemed to be in good condition as well. When appropriate access is provided, ties across the whole ceilings should be inspected to confirm spacing, sizing and good condition of ties.



Photo 32 – damaged underside of the ceiling over the Alemein Room.

- 4.10 Where good access was provided, there was no sign of defects indicating risk of immediate failure of the ceiling. Currently the cracking in the ceiling over the Auditorium next to the lighting room is the primary concern and access is required to assess the condition of cracking and surrounding ceiling. Minor defects of decorative plasterwork over the Auditorium need detailed assessment as well. We anticipate that for these areas appropriate remedial works to eliminate failure risks.
- 4.11 Requirements for further assessments and monitoring are described in the ‘Recommendations’ section of the report.

## 5. RECOMMENDATIONS

- 5.1 In the Foyer area, provide safe access to the void above ceiling, to inspect whole area and assess full condition of ceiling's substructure, cast plaster panel attachments and plaster key attachments in the cracked areas.
- 5.2 In the Auditorium area, immediate access is required to inspect the cracking in ceiling next to the lighting room. This may require temporary removal of the retractable seating to allow access from the scaffolding or scaffold tower. The inspection should include all decorative plasterwork. Following the surveys and knowing the extent of defective areas, remedial works to the ceiling will be required to prevent failure in the future.
- 5.3 Safe access in the loft area over the Auditorium is required. All insulation and debris need to be removed and the Asbestos survey done to confirm conditions of the safe access. Means of safe access to the vaulted ceilings on the sides of Auditorium need to be provided as well.
- 5.4 In the loft space over the Auditorium a detailed survey of ceiling ties beneath the timber floor deck will be required. We assume this need to be undertaken by a couple of surveyors with use of endoscope camera or equivalent equipment. The survey should confirm details of construction and distribution of the ties across the ceiling. Having safe access the area over vaulted ceilings must be included in the survey.
- 5.5 Having safe access to the void over vaulted ceilings, both suspended ceiling and the supporting structure should be inspected for signs of water penetration. General survey and assessment of corrosion of steel structures should be undertaken.
- 5.6 The construction details of the modern lighting platform next to the stage must be investigated and assessed in details. Remedial works may be required to provide durability of the suspension system and prevent failure in the future.
- 5.7 Safe access in the loft area over the Alemein room is required. All insulation and debris need to be removed and the Asbestos survey done to confirm conditions of the safe access. Means of safe access to the vaulted ceilings on the sides of Auditorium need to be provided as well. The below access for detailed inspection should be organised by dismantling the tiled suspended ceiling locally and provision of ladder access to the ceiling level. Having the access organised, all loose / abraded / broken pieces of plaster ceiling should be removed to prevent failure in the future.
- 5.8 At the time of the survey a full record of defects present in the suspended plastered ceiling should be undertaken for future reference.

**Appendix A - PHOTOGRAPHIC RECORD**



Photograph A1 – Main entrance - East Elevation.



Photograph A2– East / side elevation, auditorium external wall.





Photograph A3 – East elevation (North end).



Photograph A4 – North elevation.



Photograph A5 – West elevation, North end.



Photograph A6 – West elevation, central part.



Photograph A7 – Front / South elevation.



Photograph A8 – Foyer ceiling general view.



Photograph A9 – Kitchen ceiling.



Photograph A10 – Servery ceiling.



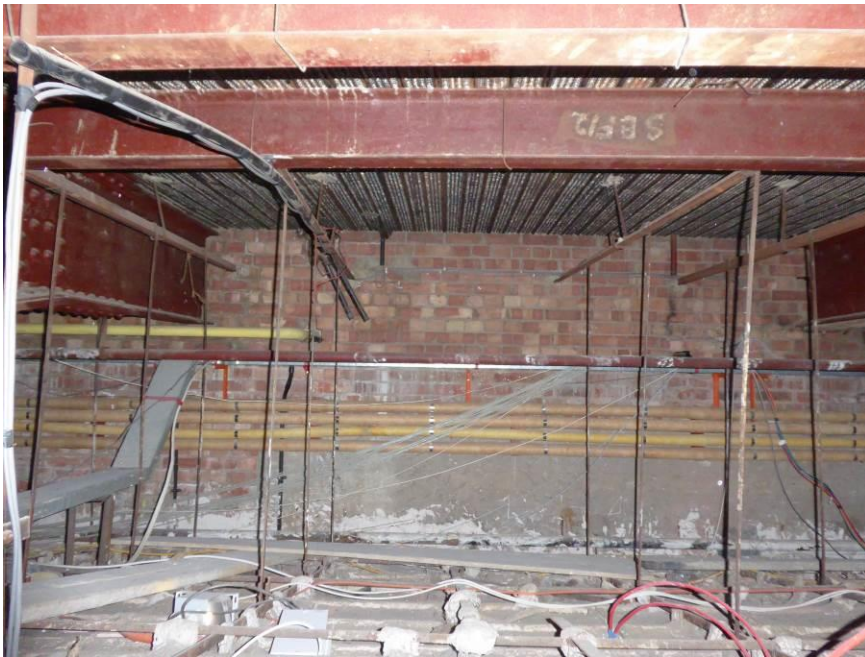
Photograph A11 – auditorium, view towards rear wall.



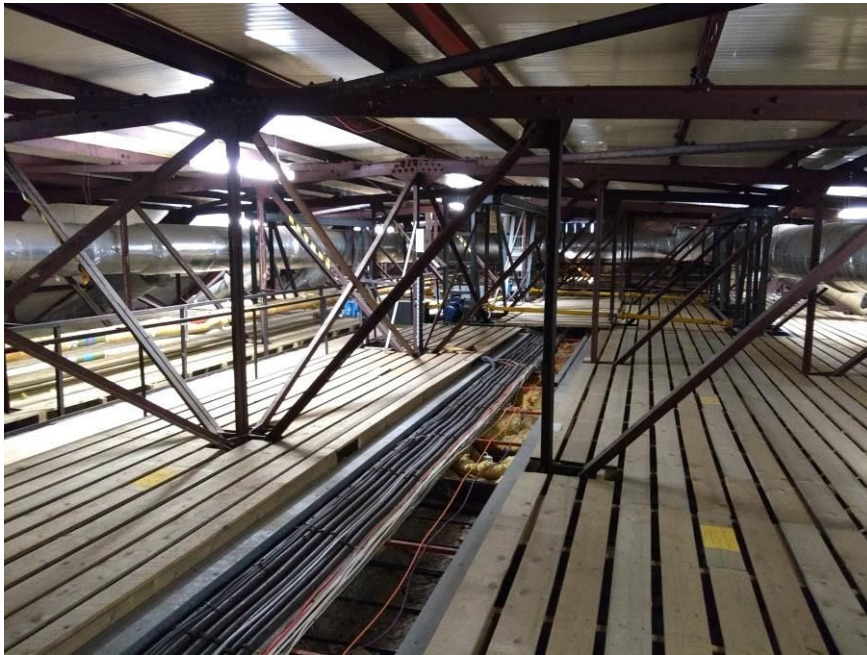
Photograph A12 – auditorium, view towards scene.



Photograph A13 – ceiling void over Kitchen / Servery.



Photograph A14 – ceiling void over Foyer.



Photograph A15 – loft over auditorium, general view.



Photograph A16 – light box hoist over auditorium.



Photograph A17 – lighting platform over Auditorium, next to the stage.



Photograph A18 – loft over Alemein Room.





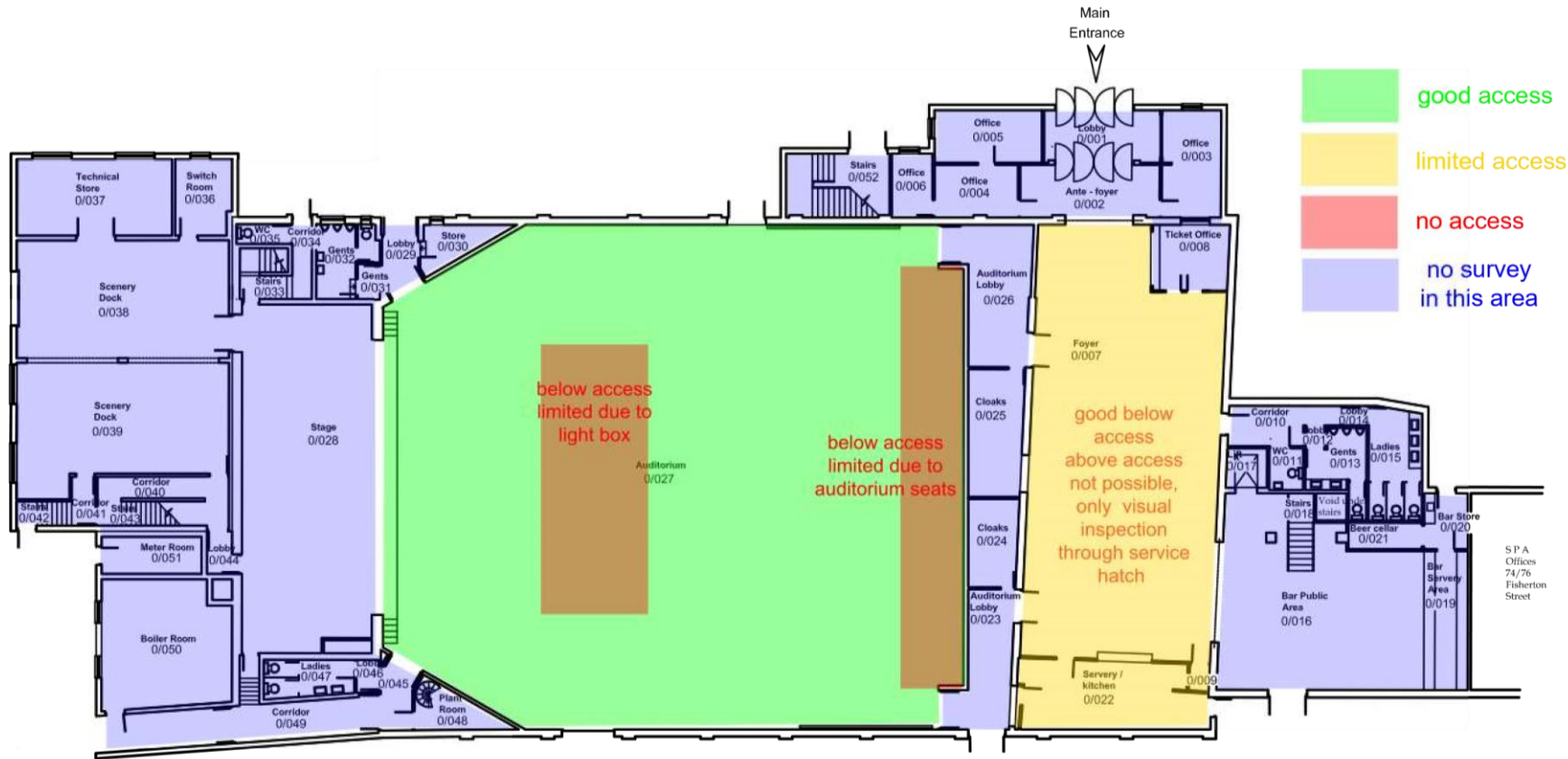
Photograph A19 – light box hoist over auditorium.



Photograph A20 – suspended plastered ceiling – typical construction detail.

## **Appendix B – DRAWINGS / SKETCHES**

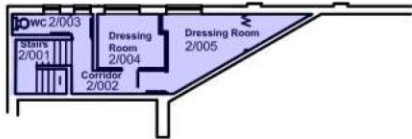
# ACCESS CHART – GROUND FLOOR



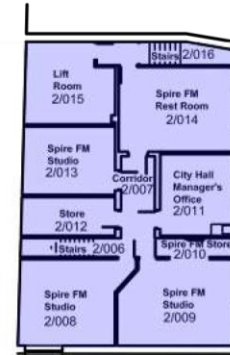
BLOCK 1 GROUND FLOOR

**AKSWard**<sup>®</sup>  
 CONSTRUCTION CONSULTANTS  
 SITE VISIT & SURVEY  
 24TH JUNE 2019, WJZ

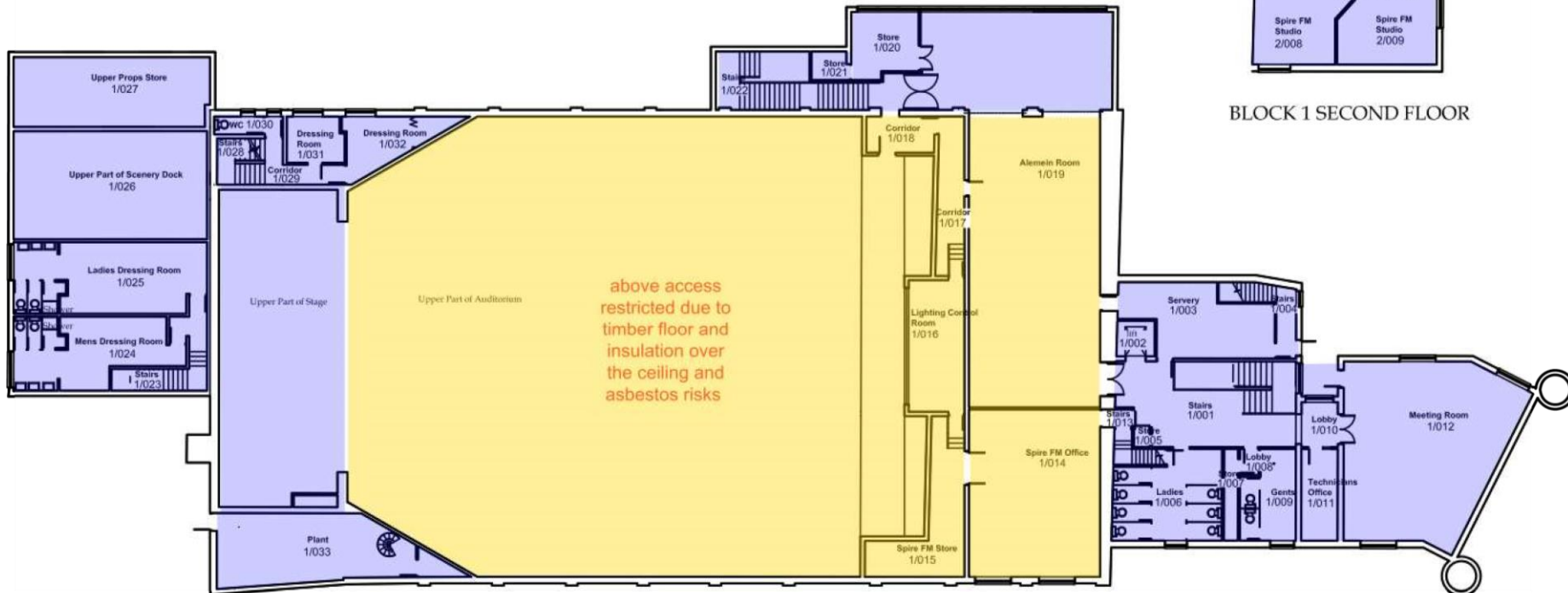
ACCESS CHART – FIRST FLOOR



BLOCK 1 SECOND FLOOR

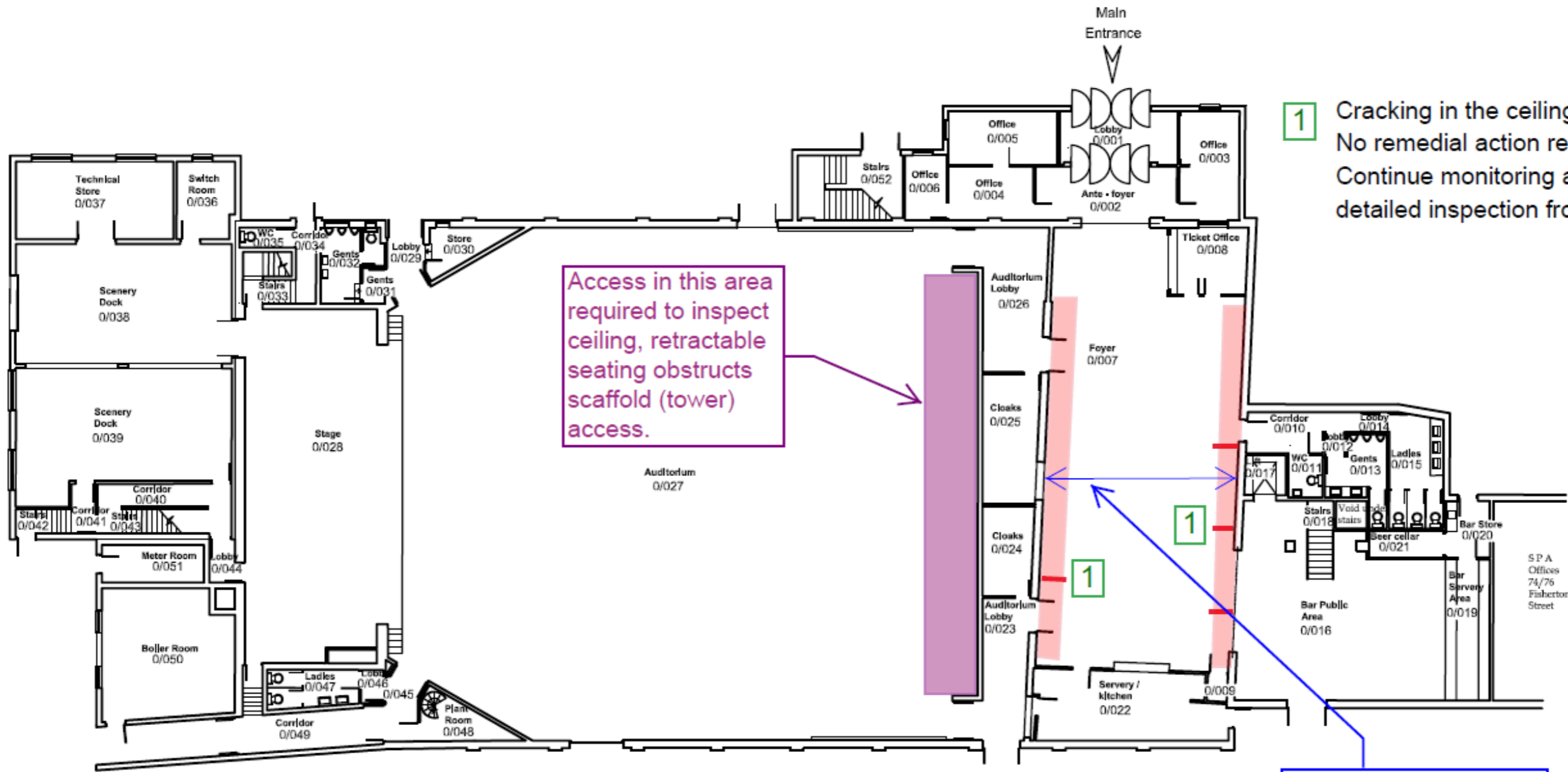


BLOCK 1 SECOND FLOOR



BLOCK 1 FIRST FLOOR

STRUCTURES AND DEFECTS CHART – GROUND FLOOR



Access in this area required to inspect ceiling, retractable seating obstructs scaffold (tower) access.

1 Cracking in the ceiling over Foyer. No remedial action required. Continue monitoring and allow for detailed inspection from above.

cranked beam spanning over Foyer (historically Auditorium balcony structure)

BLOCK 1 GROUND FLOOR



## **Appendix C – PLASTER INSPECTOR CEILING**

## City Hall Salisbury - Suspended Plaster Ceiling Inspections



Survey Date: 4<sup>th</sup> July 2019

Doc Ref No: 56588-SS-01

*Principal & Specialist Contractors in Restoration, Conservation & New Build Masonry*

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Rev	Date	By	Summary of Changes	Checked	Approved

This report has been prepared for the sole benefit, use, and information of the commissioning Client:

Client Details  
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It is assumed that all readers are familiar with the site, and with the techniques of historic plaster conservation.

Any reader not familiar with the site or with the conservation of historic plaster should not draw any conclusions, nor initiate any works on the basis of this report.

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## 1. Introduction

Stonewest were commissioned to undertake a survey of the suspended plaster ceilings, namely; Auditorium, Foyer, Servery/Kitchen & Alemein room.

We attended site with the structural consultants (AKS Ward Ltd) dated Monday 24<sup>th</sup> June 2019.

The purpose of the survey was to inspect the condition of the suspended plaster ceiling.

### 1.1 What This Report Is

This report is limited to the discussion of the suspended plaster ceilings only.

### 1.2 What this survey is not

A thorough review to the historic damage or decay drivers, inspecting the relevant parts of the building, both internally & externally.

Inspection of the structural parts supporting the suspended ceiling, past/present source(s) water and movement.

Exhaustive discussion surrounding traditional plaster ceilings, their construction and vulnerability.

### 1.3 Survey Limitations

The extent of the survey was limited due to the following constraints:

Upper part of the auditorium/Alemein ceiling inaccessible (Below fixed walkways) or where debris/insulation remains. The removal of these obstructions was deemed unsafe for risk of Asbestos Containing Materials.

Restricted access to the Lower part of the Alemein ceiling due to a suspended tile ceiling.

Stalls, circle seating stage and lighting rig prevented access to the lower part of the Auditorium ceiling.

No safe walkways to gain access to the upper part of the Foyer ceiling.

Since no off-site historical research has been undertaken, the significance of historic damage cannot be properly assessed.

### 1.4 Contents of the submission

Survey summary report to plasterwork condition.

Considerations in respect of potential remedial treatments.

**1.5 Issues covered and discussed within this summary document:**

Where accessible, assessment of the plaster ceiling condition.

Form of construction/plaster constituents.

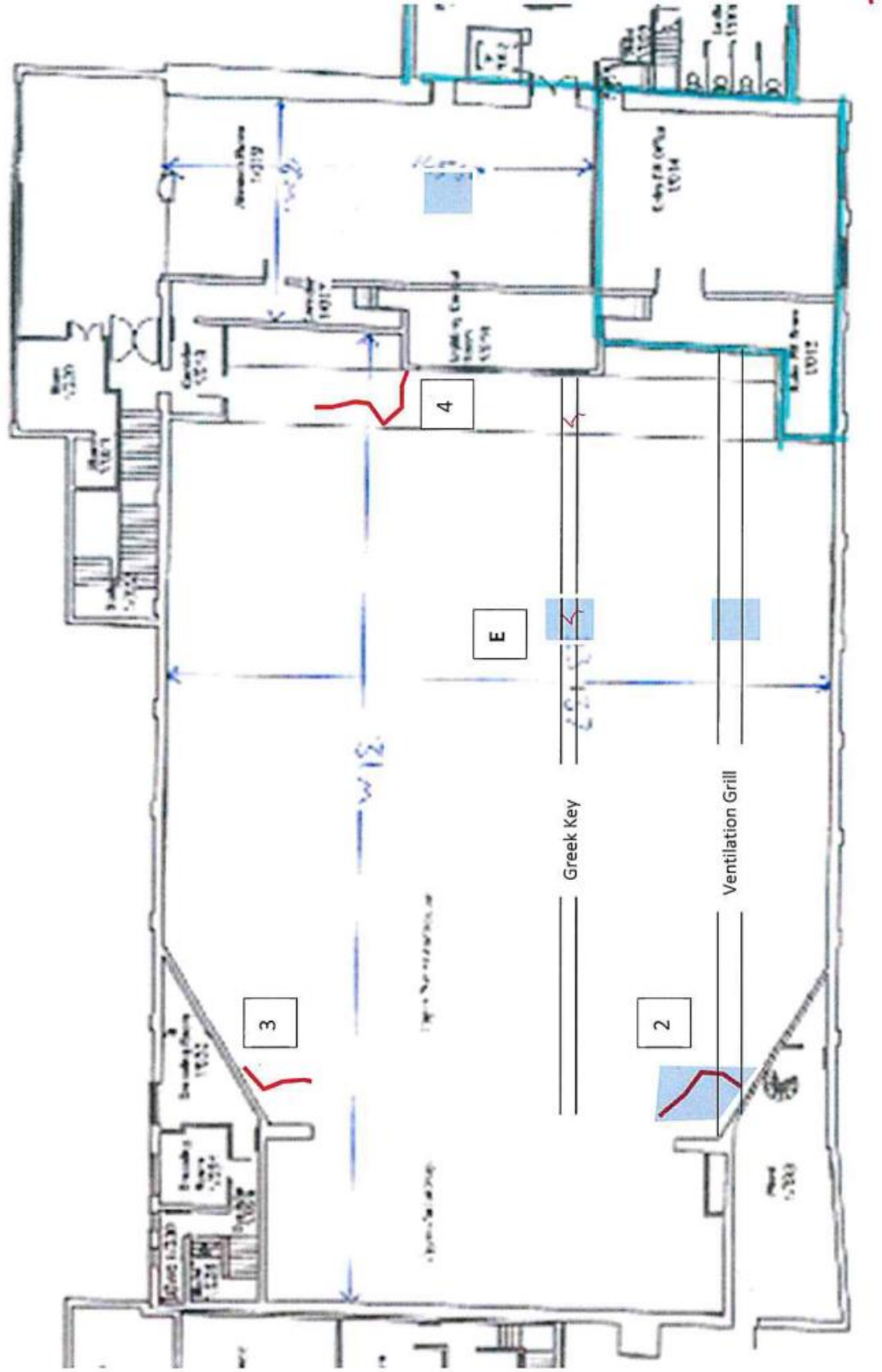
Condition of the attachment to the ceiling and supporting structure.

**2. *Annotated Survey RCPs***

The following mark-ups have been provided to illustrate, approximately, the building fabric in respect to as found defects.

Upper, and lower inspections were independently carried out and annotated. Only then have the two been reviewed in tandem.

The following drawings therefore illustrate the part, while the whole has been summarised in the summary section herein.



Location of Cracking

Inspection Areas

Figure 1 - 1st Floor RCP - Inspection from below

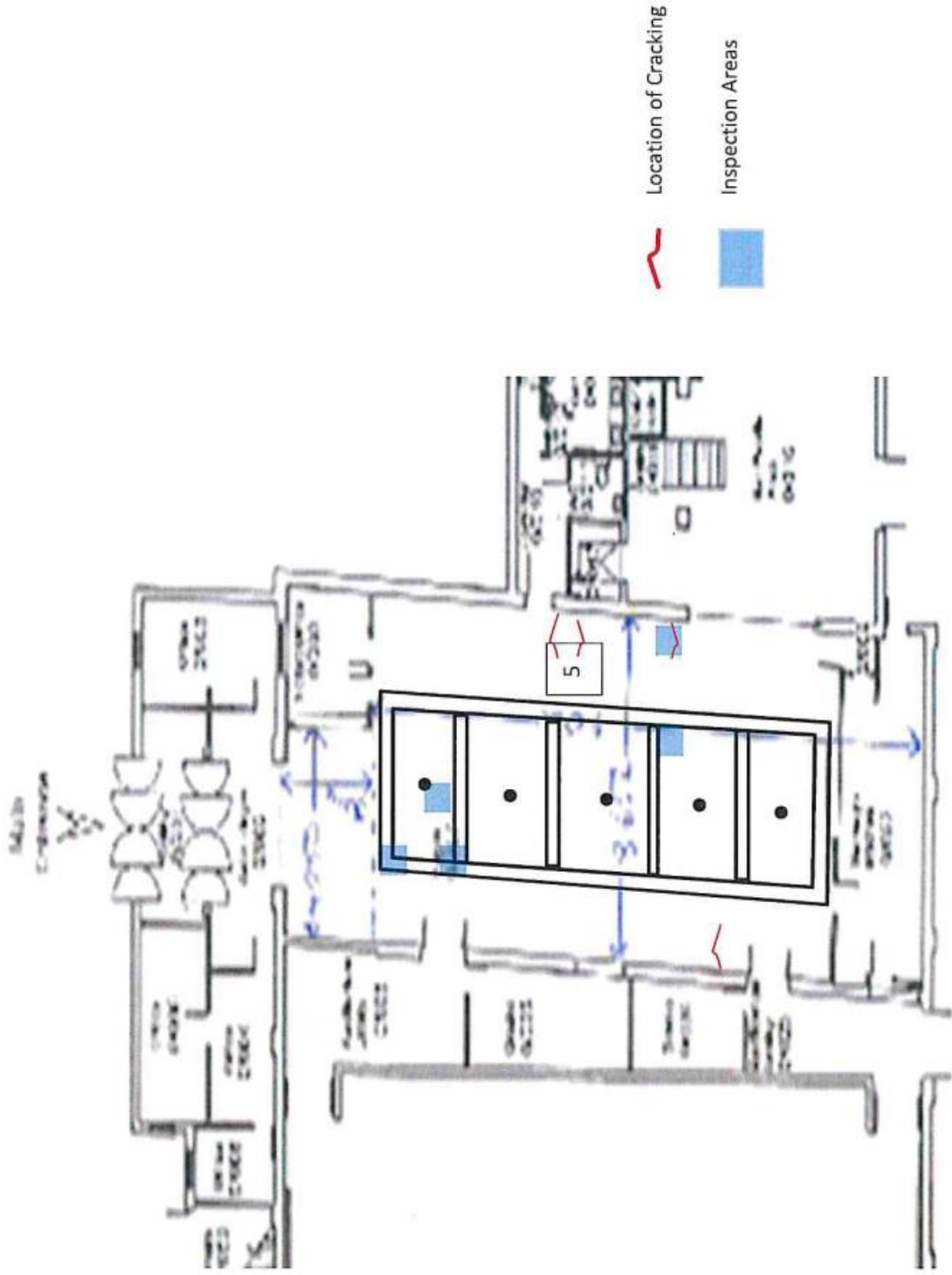


Figure 2 - G floor RCP - Inspection from below

3. Defect Schedule

Legend Reference	Illustration	Action long term ≥ 12-24 months	Comments	Action short terms ≤9 months	Action Immediate	Legend
		Defect Cracking	Projecting parts of the Greek key between and adjaento to cracking are loose. Remove debris from above these plaster casts. Loose/cracked areas cut out and made good.			Yellow
2		Cracking	Currently sound however, visual appearance undermines this and so it may be desirable to make good this crack. Continue to minitor crack.			Green
3		Cracking	Ditto			Green
4		Cracking	Access required to inspect the plasterwork and establish if this area is un-sound/live.			Red

5		Cracking	Continue to monitor cracking	
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Table 1 - Defect Schedule



#### 4. Discussion

##### Foyer (Inc. Servery/kitchen)

###### Form of Construction

###### Plain flat surfaces:

Solid work applied to expanded metal lath. Solid work formed in cementitious mortar, finish undetermined (Possibly anhydrous plaster).

EML fixed to suspended MS 30x5 flat bar with tying wire.

###### Decorative Plasterwork:

Cast fibrous plaster panels (Hemihydrate plaster & hessian/timber reinforcement)

Panels wire & wad to MS 30x5 flat bar, c/w additional unreinforced wadding

Panels wadded at adjoining junctions.

###### Inspection from Below:

Visually, the ceiling plane has slight undulations, (Circa several mm) most noticeable down sight lines, however, the plain and decorative areas were sound and firm to applied pressure.

Cracking was seen intermittently, and typically at the perimeter areas. The cracking was below the painted surface and so not active/live.

It is plausible that people(s) gaining access to the ceiling void naturally traverse the perimeter areas closes to the walls, resulting in the outward thrust of the solid work below and therefore cracking.

Fretwork at HAVC intact, no sign of the plaster suffering from hydrolysis.

###### Inspection from Above:

No walkways to gain access other than visual inspection via a hatch in the servery/kitchen & foyer light fixture.

Plaster key robust and firmly keyed into the expanded metal lath.

Visually, the general condition of cast panels was satisfactory, wadding firm and intact.

##### Auditorium

###### Form of Construction

###### Plain flat surfaces:

Solid work applied to expanded metal lath. Solid work formed in cementitious mortar, finish undetermined (Possibly anhydrous plaster).

EML fixed to suspended MS flat bar with tying wire.

###### Decorative Plasterwork:

Cast fibrous plaster panels (Hemihydrate plaster & hessian/timber reinforcement)

###### Below:

Plain flat areas where inspected were firm to applied pressure. Typical weak points, such as HVAC locations were also sound.

Greek key where inspected was cracked in several locations and unsound. Another area that could be closely seen had like results.

Fortunately, the decorative panels serve just that function and so structurally are only self-supporting and lightweight, otherwise failure would have been expected thereafter.

Cracking to LHS & RHS stage appear to be the junction between past repairs. The immediate surrounding plasterwork was firm to applied pressure and sound.

Cracking immediately in front of the lighting room could not be accessed.

Panels assumed wadded only to MS 30x5 flat bar, and wadded at adjoining sections.

**Above:**

Visual inspection was only possible.

Damage to the Greek key was likely to be from applied force, either historic or from the recent roof works undertaken (Apparent from new timber decking above roof space & insulated roof panels) however, debris was still apparent and strewn above.

These panels are quite thin, 1/8" – 1/16" THK therefore susceptible to damage.

Unable to ascertain if wadding is reinforced or secure.

Alemein Room

**Form of Construction**

**Plain flat surfaces:**

Solid work applied to expanded metal lath. Solid work formed in cementitious mortar, finish undetermined (Possibly anhydrous plaster).

EML fixed to suspended MS flat bar with tying wire.

**Decorative Plasterwork:**

Cast fibrous plaster panels (Hemihydrate plaster & hessian/timber reinforcement)

Panels assumed wadded only to MS 30x5 flat bar.

**Below:**

Suspended tile ceiling prevented access; visual inspection only possible.

Ceiling a continuation of the original scheme and carried forward from the Auditorium.

Numerous apertures formed within existing ceiling where hangers have been installed to support the timber and again, light weigh MF tile ceiling.

**Above:**

Visual inspection was only possible, but hindered by strewn debris & insulation.

Unable to ascertain if wadding is reinforced or secure.

Method of supporting suspended fibrous plaster:

**Form of Construction**

**Decorative Plasterwork:**

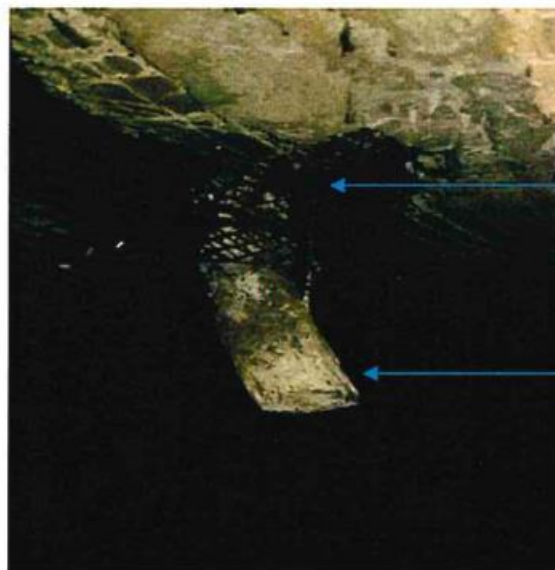
Cast fibrous plaster panels fixed with hemihydrate and hessian canvas wadding, c/w tying wire.

**Above:**

In the absence of close examination to the attachment of fibrous plasterwork, we would reasonably assume that the wadding is unreinforced.

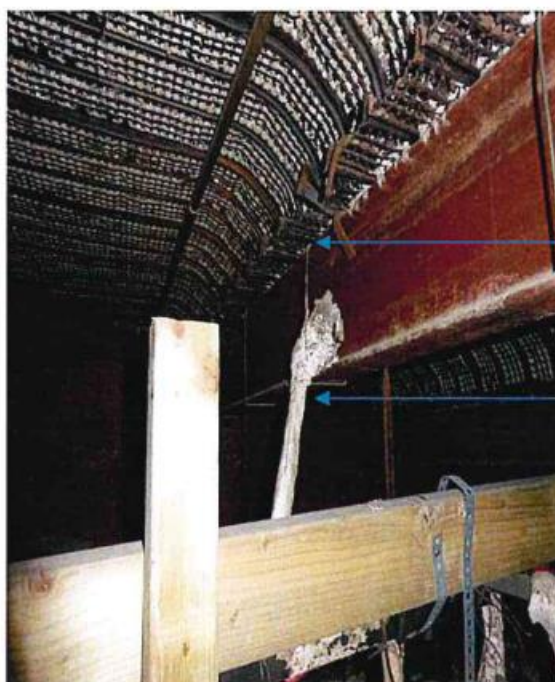
However, or at least in a single instance, we were able to illustrate that a wad has been reinforced.

Further instances of clip wadding to tying wire was also observed.



Plaster wad

Figure 3 - Wire & Wad Fixing



Mild steel tying wire

Clip wad

Figure 4 - Clip Wad Fixing

## 5. Conclusions

### Foyer (Inc. Servery/Kitchen):

We found no evidence of immediate failure to the plasterwork from our lower site investigation; however, we recommend the continued inspection of perimeter areas where cracked, and or where used for access past and present. This is to monitor any possible detachment.

Safe access should be made available in the ceiling void to inspect the whole of the ceiling, thus allowing the full condition of cast plaster panel attachments, as well as plaster key attachment in cracked areas.

### Auditorium:

Immediately, access is required to assess the condition of cracking around the lighting control room.

Full retraction of circle seating & removal of the seating area around the stalls is required to fully inspect the ceiling condition, including safe access in the ceiling void.

Remedial works required to the Greek key where cracked, the extents of which will be known once full access is available.

### Alemein Room:

Access is required to assess the stability of plain flat areas, suspended above the existing suspended tile ceiling.

Intermittent apertures have been formed, with abraded/broken pieces of plaster remaining. These should be removed to prevent future failure.

Access & removal of debris/insulation undertaken to allow the inspection of cast plaster attachment.