BEDFORD SQUARE No.48
LONDON

FIRST FLOOR FRONT ROOM
Decorative Ceiling Condition

November 2016

RICHARD IRELAND • PLASTER & PAINT

CONSULTANCY & CONSERVATION OF HISTORIC BUILDINGS

M: +44 (0)7900 584 230 E: info@richardireland.net W: www.richardireland.net

GB VAT No 765 1959 89 IE VAT No 4342066B

SUMMARY

This report was instructed by Rolfe Kentish of Long & Kentish Architects to assess safety and integrity of the first floor front room 1770s decorative plaster ceiling at No.48 Bedford Square, Bloomsbury, London.. A site visit and inspection was undertaken by Richard Ireland 11th November 2016.

The ceiling has been subject to past campaigns of repair and water ingress in some areas. Addressing structural loading issues and room use on the second floor above is a necessity to ensure the existing support structure is sufficient not to create additional and avoidable stresses to the ceiling fabric.

At this stage, it is recommended to implement localised ceiling restraint only, though not wholesale across the ceiling surface unless there is a significant change in physical circumstances. That is to the perimeter of the plaster loss once the area has been trimmed and neatened as noted above. Typically this would not exceed a border of 300 mm with restraints set at least 75 mm from the edge and at centres of between 250-400 mm. Also to the pink shaded areas illustrated in Fig. 35, and also selectively to each side of the more significant ceiling cracks. Note that the oft used pouring plaster of Paris onto hessian scrim laid over a ceiling back should not be undertaken under any circumstances.

Poor filling should be addressed by removal and replacement with Toupret Interior Filler.

Plasterwork in the area of loss in the north west section should be cleaned and straightened to be reinstated using riven laths and well-haired lime-based three coat plaster in emulation of the original material and following best practice for new lime plastering.

Enrichment can be recreated from cleaned representative elements and re-cast in plaster of Paris – as per the original method of fabrication – and re-fixed to the new flatwork.

Richard Ireland

31st October 2016

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All photographs by the author.

Front Cover: Detail of No.48 Bedford Square first floor decorative ceiling.

1.0 No.48 BEDFORD SQUARE FIRST FLOOR CEILING INVESTIGATION

1.1 INTRODUCTION

This report was instructed by Rolfe Kentish of Long & Kentish Architects to assess safety and integrity of the first floor front room 1770s decorative plaster ceiling at No.48 Bedford Square, Bloomsbury, London. No.48 Bedford Square is listed Grade I. Instruction was made 10th October 2016. Subsequently loss of a section of ceiling occurred 15th October 2016 prior to an initial site visit undertaken 20th October 2016 by Richard Ireland accompanied by Rolfe Kentish. A subsequent visit and inspection was undertaken by Richard Ireland 11th November 2016. (See Figs 01 & 02)

In the interim between both site visits, the two second floor front rooms have been emptied of the offices and associated loadings that had existed at the time of the plaster fall.

1.2 REPORT STRUCTURE

Section 1 includes the introduction and outlines the main aims and constraints of the report together with a brief background. Section 2 introduces a broad overview of plaster fabrication methods and materials used in the ceiling construction together with decorative finishes. Section 3 describes the ceiling plasterwork and details the investigation findings and condition. Section 4 discusses and summarises the findings of the investigation and recommendations. The conclusion is covered in Section 5. Section 6 lists references. Appendix A reproduces the Historic England listing. Appendix B provides a more extensive detailing of historic plaster construction materials and methods. Appendix C details treatment materials and techniques. Appendix D features labelled and annotated illustrations of the ceiling plasterwork.

1.3 SOURCES

The inspection principally relied upon visual and physical examination of the surfaces. No past building or maintenance records were available at the time of writing. A brief historic summary of No.48 is summarised from the Historic England listed building details.[1] A comprehensive approach to lime plaster conservation and treatment is provided by *Mortars, Renders and Plasters*.[2]

1.4 AIMS & OBJECTIVES

The purpose of the investigation is inspection and commentary on the first floor decorative plaster ceiling, its condition and structural integrity. This provides the basis for recommendation of the most appropriate conservation guided treatment for the conservation of the ceiling generally and reinstatement of the lost section of plasterwork.

1.5 BRIEF & SCOPE

Examine the first floor decorative plaster ceiling, advise and specify the most appropriate conservation guided physical ceiling treatment and reinstatement as deemed necessary.

[1] See Appendix A.
[2] Stewart and Henry (eds.), Richard Ireland, principal contributor, *Mortars, Renders & Plasters: Practical Building Conservation*, Ashgate Publishing & English Heritage (2012).

1.6 BRIEF BACKGROUND HISTORY[3]

The houses in Bedford Square form a very important and complete example of 18th century town planning. Built as a speculation, it is not clear who designed all the houses. Nos 40-53 form a symmetrical terrace with exteriors of three storeys, attics and basements of three windows each. Recessed, round-headed entrances with Coade stone vermiculated intermittent voussoirs and bands; mask keystones. No.48 interior noted to contain a fine plaster ceiling and good friezes. Though Leverton, a country house architect, may have been involved with the grander houses, though it is unlikely he was responsible for No48. Palmer was the Bedford Estate surveyor and may be responsible for the vagaries of the square. The majority of the plots leased by the estate were taken by Robert Grews, a carpenter, and William Scott, a brickmaker. Pevsner notes that Nos 40-53 were repaired and adapted as offices by Ellis, Clarke & Gallannaugh for Abbey Life Assurance, 1970-92.[4]

1.7 INSPECTION & METHODOLOGY

Observation of the ceiling face was carried out with the naked eye and hands on physical assessment from a full scaffold deck together with observation on the second floor from lifted boards of representative areas of the ceiling back. (See Fig. 35)

Inspection lighting was provided by a 600 lumens Light Emitting Diode (LED) focusable hand held torch.

Comments are guided by observation, past experience and specialist knowledge.

This report contains a description of materials and general construction methods together with outline recommendations deemed necessary for conservation treatment.

[3] The following paragraph is a brief introduction summarised from the listed building history, see Appendix A.
[4] Nikolaus Pevsner and Bridget Cherry, *The Buildings of England, London 4: North*, Yale, (2002), p. 325.

2.0 HISTORIC MATERIALS & APPROACH

2.1 TREATMENT

A policy of minimal intervention respecting significant original historic elements underpins the guiding philosophy and approach to the conservation and remedial treatment of the first floor decorative plaster ceiling.

2.2 GENERAL HISTORIC PLASTER CONSTRUCTION

An outline of the plasterwork construction follows to provide awareness of the manner of fabrication and in turn emphasise cultural development and significance of this form of interior decoration.

Plastering materials and methods, whether applied externally or internally, remained largely unchanged over several centuries in Europe until the older methods were gradually ousted during the nineteenth century by faster setting alternatives that included gypsum (plaster of Paris) and artificial cements.[5]

The first floor front room at No.48 Bedford Square is typical of the latter part of the eighteenth century in stylistic design and in construction, using three coat haired lime plaster (Figs 05 & 10) and lath construction. The decorative enrichment of the ceiling and run-moulded ribs has been formed from cast plaster of Paris patterns (Figs 13 & 14) cut in and applied to ceiling flatwork. The main profile of the cornice has been run-moulded and cast plaster enrichment applied in short lengths. The frieze is made up of cast tiles.

3.0 FIRST FLOOR PRINCIPAL CEILING

3.1 DESCRIPTION

Dimensions of the ceiling are approximately 26 ft wide (7,999 mm) along the window wall and 20 ft deep (6,313 mm) into the room.

Low relief decorative enrichment and run-moulded borders (Fig 02) decorate the flat ceiling bed. This is divided into a square central section which broadly has a scalloped centrepiece surrounded by a wide circular band of alternating floral and rosette enrichment; contained within a narrow bordered mid-sized circular border with inward pointing anthemion motifs; itself set within a narrow bordered square perimeter frame with long acutely angled swags depending inwards from ribbons close to the outer circular border framing twelve medallions of alternating figurative and still life subjects. The corners of the inside of the square border are occupied by quadrants touching the outer circular border with bands of enrichment that mirror the main central panel. A narrow elongated panel bookends each side of the central section at west and east containing alternating urn and floral motifs.

[5] See Appendix B: Plastering Materials for a more extensive explanation of typical construction methods and Richard Ireland ‘Peculiar Plaster: ‘Recent Conservation of Irish Eighteenth-Century Modelled Plaster’ in Christine Casey & Conor Lucey (Eds.) *Decorative Plasterwork in Ireland and Europe: Ornament and the Early Modern Interior*. Four Courts Press Ltd, Dublin (2012) pp.178-193.

The structural support for the first floor ceiling (and floor of the second floor rooms) was observed from above at five representative areas (Figs 23-34) designated in this report ‘A’ to ‘E’ which allowed approximate association of trusses (Fig. 35) with the layout of the first floor decorative ceiling beneath.

Lime pugging and pugging boards – a layer of rough timber boarding with an applied coating of lime plaster positioned just below the floorboards – survives in some parts beneath the floor, though has largely been removed across most areas viewable above the first floor ceiling.

Principal N-S trusses run between the north exterior wall and south interior wall. The truss running N-S exposed at area ‘A’ (Figs 23 & 24) has dimensions of approximately 9 ¼ ins wide (235 mm) by 12 ½ ins deep (317.5 mm). A series of trimming trusses run E-W in association with the fireplaces on the west and east walls. First floor ceiling joists run N-S parallel with the trusses (Fig. 23) with dimensions averaging 2 ins wide (50 mm) by 2 ½ ins deep (63.5 mm) and at approximately 16 ins centres (406 mm). Floor joists run E-W perpendicular to the ceiling joists (Figs. 23 & 24) with dimensions averaging 3 ins wide (76 mm) by 6 ½ ins deep (165 mm) and forming a void between ceiling back and floorboard underside of 12 ½ ins (317.5 mm).

The second floor room above the first floor ceiling is partitioned N-S on a line between the west and centre windows. (See Fig. 35)

Flatwork plaster layers (Fig. 10) are approximately ½ ins (12 mm) for the basecoat (known as the pricking coat), around ¼ ins (8 mm) for the floating coat, and ⅜ ins (5 mm) setting coat making an average thickness of 1 ins (25 mm).

3.2 CONDITION

3.2.1 **Ceiling face**

Overall accumulated layers of paint obscures decorative detail of enrichment. Paint removal (Fig. 02) has been commenced on sections of the ceiling plasterwork at the time of inspection.

A section of plasterwork has been lost from the north west corner of the ceiling (Figs 03-05) measuring approximately 2,400 mm by 1,200 mm revealing overlapped lathwork (Figs 05 & 06) and evidence of previous water ingress within the area evidenced by staining on the supporting floor and ceiling joists and bright orange rusting of lath nails.

A gap of 25 mm is evident around part of the perimeter of the plaster loss (Figs 07 & 08) – especially towards the centre of the ceiling.

Interim ‘first aid’ restraint of the plaster perimeter has been implemented in response to conservation advice offered in the initial feedback report of 21st October from the initial inspection using timber battens (Fig. 09) lightly screwed to the underside of the ceiling joists.

Salvaged plaster flatwork (Figs 11 & 12) is characterised by a loss of key.

Past repair campaigns of ceiling plasterwork are visible in raking light over the fireplace (Figs 15 & 16) and in the north west quadrant (Fig. 17) equating with deflection of the supporting structure – especially the westernmost N-S truss above, evidenced by the distorted door (Fig. 18) installed in the second floor partition at the north end against the exterior wall.

Deflection of the ceiling plane is principally characterised by the change of plane roughly beneath the second floor partition and adjacent truss line.

3.2.2 **Ceiling Back**

The area on the second floor above the first floor ceiling is divided into two offices (Figs 19-22) where areas of the first floor ceiling back were viewed at a series of representative locations (Fig. 35) by the lifting of floor boards and close inspection of the ceiling back.

It was observed that in several areas where pugging had been removed in the past, there has been an accumulation of building debris on the ceiling back.

Area ‘A’ (Fig. 23) running N-S along the central section adjacent to a truss in the east room revealed plaster key varying from moderate (Figs. 24 & 25) to well-formed and good (Fig. 26) along the exposed area.

Section ‘B’ in the north west corner of the east room (Figs 27 & 28) displayed adequate plaster key.

Section ‘C’ in the north west corner of the west room (Figs 29 & 30) displayed good plaster key though also had overlapped laths restricting key formation between the laths beneath.

Section ‘D’ in the cupboard area of the south west corner of the west room (Figs 31 & 32) displayed good plaster key.

Section ‘E’ the central N-S portion of the east room (Figs 33 & 34) displayed variable, though generally adequate plaster key.

4.0 DISCUSSION & RECOMMENDATIONS

4.1 CEILING INTEGRITY

The demised section of plasterwork in the north east corner appears to have resulted from an accumulation of factors including poor original plastering methods – the overlapping of laths creating a line of weakness, water ingress, past intervention and repair. The second floor rooms were originally designed with light domestic loadings probably as bedroom and dressing room, and not that of offices with, high occupancy, filing cabinets and desks. It is clear that the additional loading, though not the primary cause of loss, is not conducive to the long term preservation and survival of the decorative plaster ceiling beneath. Survival thus far has been greatly aided by the floor joists and ceiling joists being separate structures. However, they are not independent of each other as the trusses and trimmers connect the two together and thus are capable of transferring loads from floor to ceiling – as evidenced by the ceiling deflection beneath and partition deflection above.

Where floorboards are taken up, accumulated building debris resting directly on the back of the ceiling should be removed. This operation requires care and should not be carried out clumsily as plaster key can be easily broken and damaged by vigorous, if well intentioned, efforts to clean between keys. The chief requirement is removal of unnecessary load, obscuring dirt and random material that may mask or provide a means of holding water, where such ingress might occur in the future, and thus increase the potential for mould and rot infestation.

Plaster key varies across the ceiling with some localised areas falling below the levels that might be expected from best workmanship. However, it should also be borne in mind that it has been sufficient to support the ceiling despite the underspecified support structure and long recent history of significant additional loads and intervention.

Ensuring future and ongoing stability of the ceiling fabric is a balance of a number of differing elements relating to the room use, structural loading capabilities, prevention of water ingress, and augmenting ceiling fabric performance with minimal intervention methods.

4.2 CEILING RESTRAINT[6]

Implementation of ceiling restraint is required to those areas of the ceiling where stresses imposed by deflecting supporting structure above and limited plaster key, increase the potential for a loss of bond between plaster and lath. Past intervention campaigns suggest the these areas are mostly associated with shaded areas and cracking illustrated in Figure 35. Some of the crack pattern appears to relate directly to the full depth support timbers. Diagonal cracking is mostly associated with deflection around the west N-S truss and second floor room partition. Ceiling restraint may prove a useful augmentation in these areas. However, it should be applied with care and where needed – not wholesale across the ceiling with little thought or regard of the purpose and need as this can prove counterproductive and be a de-stabilising influence.

Note that the oft used pouring plaster of Paris onto hessian scrim laid over a ceiling back should not be undertaken under any circumstances. This is an outmoded and potentially

[6] See Appendix C, Section A: Ceiling Restraint for a detailed account of method and rationale.

disastrous method. Physical restraint, where necessary and viable, is recommended by means of forming shallow recesses at the ceiling face to bed 25mm diameter 316 austenitic stainless steel washers just below the painted ceiling face, tied off in the ceiling void to perforated steel band fixed between ceiling joists. Restraint is only viable where there is sufficient plaster thickness to reliably form a 3mm deep recess for washer insertion. Anything less than 12mm is unlikely to be that effective and would introduce more damage than leaving alone.[7]

At this stage, it is recommended to implement localised ceiling restraint only, unless there is a significant change in physical circumstances.

4.3 FILLING

Historic plaster of the eighteenth century is generally much softer than modern proprietary general purpose fillers. Use of such fillers can be counter-productive and lead to gradual loss and decay of historic fabric as they are too hard. Where any crack filling of the ceiling fabric, cornice or frieze is to be considered, the material used must be governed by the adjacent materials and the projected impact on original fabric. Generally, conservation guided filling and making good rarely employs the original materials – in this case lime – as the process required for new work can be the cause of further unnecessary damage. In the circumstances cracks to plasterwork requiring filling should be carried out with Toupret Interior Filler (Red Box).[8]

If in doubt leave and/or seek further direction from an experienced historic plaster conservator following the guidance set out above and with reference to the English Heritage *Mortars, Plasters & Renders* volume.

4.4 CEILING REINSTATMENT

Plasterwork in the area of loss in the north west section should be carefully cut back in line with the joists and support structure above. Care should be taken cutting through laths not to destabilise other areas beyond the batten perimeter restraint in removing and forming a neat rectangular area between north wall, east wall, trimmer and truss where plasterwork has separated from laths as illustrated in Fig. 35. Working to the west of the loss to reveal the next line of lath fixing nails would be the recommended limit.

The perimeter of the section bordering this area requires ceiling restraint to help stabilise the areas beyond and to provide a stable edge for new reinstatement. Typically this would not exceed a border of 300 mm with restraints set at least 75 mm from the edge and at centres of between 250-400 mm.

The cleaned and straightened area to be reinstated using riven laths and well-haired lime-based three coat plaster in emulation of the original material and following best practice for new lime plastering.

Enrichment can be recreated from cleaned representative elements and re-cast in plaster of Paris – as per the original method of fabrication – and re-fixed to the new flatwork.

[7] See Appendix C for explanation and illustration of appropriate and inappropriate restraint methods.
[8] See Appendix C, Section B, Filling, for a more detailed explanation.

Note that sufficient time between lime plaster coats are required to ensure shrinkage and drying out has been adequately achieved. Lime plaster materials also require considerable tending during the first week following completion to ensure that it is not allowed to dry out too quickly and is kept sufficiently damp during this initial setting up and carbonating period.

5.0 CONCLUSION

The ceiling has been subject to past campaigns of repair and water ingress in some areas. Addressing structural loading issues and room use on the second floor above is a necessity to ensure the existing support structure is sufficient not to create additional and avoidable stresses to the ceiling fabric.

Localised ceiling restraint is considered useful in local areas of the ceiling – though not wholesale across the ceiling surface. That is to the perimeter of the plaster loss once the area has been trimmed and neatened as noted above. Also to the pink shaded areas illustrated in Fig. 35, and also selectively to each side of the more significant ceiling cracks.

Great care should be exercised in ceiling back debris removal to ensure that existing conditions are not exacerbated and further damage not caused.

Poor filling should be addressed by removal and replacement with Toupret Interior Filler.

Richard Ireland

21st November 2016

www.richardireland.net

GB VAT No 765 1959 89   IE VAT No 4342066B

6.0 REFERENCES & FURTHER READING

Richard Ireland, 'Decorative Lime Plaster Conservation and Repair', *The Journal of the Building Limes Forum*, Vol.21, 2014, Edinburgh, (2014), pp.24-39.

Richard Ireland, 'Peculiar Plaster: Recent Conservation of Irish Eighteenth-Century Modelled Plaster' in Christine Casey & Conor Lucey (Eds.) *Decorative Plasterwork in Ireland and Europe: Ornament and the Early Modern Interior*. Four Courts Press Ltd, Dublin (2012)

Richard Ireland, 'Methods And Materials' A new introduction to the facsimile edition of the 1975 original *Decorative Plasterwork In Great Britain* by Geoffrey Beard. Donhead Publishing, Dorset, (2011)

Richard Ireland *Conserving Decorative Plaster Part1* (2009) http://www.projectbook.co.uk/article_40.html

Richard Ireland *Conserving Decorative Plaster Part2* (2009) http://www.projectbook.co.uk/article_41.html

Richard Ireland 'Cleaning Decorative Plaster' *BCD Special Report Magazine, 12th Edition, Historic Churches, Conservation and Repair of Ecclesiastical Buildings*, (Cathedral Communications, England 2005) pp.31-33

Nikolaus Pevsner and Bridget Cherry, *The Buildings of England: London 4: North*, Yale, (2002)

Stewart and Henry (eds.), Richard Ireland, principal contributor, *Mortars, Renders & Plasters: Practical Building Conservation*, Ashgate Publishing & English Heritage (2012)

Room Plans

'First floor plan BS 32 C', Long & Kentish Architects, 25 July 2016

'Second floor plan BS 33 C', Long & Kentish Architects, 25 July 2016

APPENDIX A

HISTORIC ENGLAND LISTING

BEDFORD SQUARE: NUMBERS 40-54 AND ATTACHED RAILINGS

List Entry Summary
This building is listed under the Planning (Listed Buildings and Conservation Areas) Act 1990 as amended for its special architectural or historic interest.

Name: NUMBERS 40-54 AND ATTACHED RAILINGS
List entry Number: 1244553

Location
33 AND 35, BEDFORD AVENUE
NUMBERS 40-54 AND ATTACHED RAILINGS, 40-54, BEDFORD SQUARE
The building may lie within the boundary of more than one authority.
County: Greater London Authority
District: Camden
District Type: London Borough
Parish:
National Park: Not applicable to this List entry.
Grade: I
Date first listed: 24-Oct-1951
Date of most recent amendment: 11-Jan-1999

Legacy System Information
The contents of this record have been generated from a legacy data system.
Legacy System: LBS
UID: 476705

Asset Groupings
This list entry does not comprise part of an Asset Grouping. Asset Groupings are not part of the official record but are added later for information.

List entry Description
Summary of Building
Legacy Record - This information may be included in the List Entry Details.
Reasons for Designation
Legacy Record - This information may be included in the List Entry Details.
History
Legacy Record - This information may be included in the List Entry Details.
Details
TQ 2981 NE 798-1/99/80

CAMDEN BEDFORD AVENUE Nos.33 AND 35

GV

I

See under: Nos.40-54 and attached railings BEDFORD SQUARE.

TQ2981NE 798-1/99/80

CAMDEN BEDFORD SQUARE (South side) Nos.40-54 (Consecutive) and attached railings Includes: Nos.33 AND 35 BEDFORD AVENUE. (Formerly Listed as BEDFORD SQUARE Nos.1-54 (Consecutive)) GV

I

Terrace of 15 houses forming the south side of a square. No.54 formed by the return of No.53 to Bloomsbury Street. All built by W Scott and R Grews; probably designed by Thomas Leverton or Robert Palmer; for the Bedford Estate. Nos 40-53 form a symmetrical terrace. Yellow stock brick with evidence on most of the houses of tuck pointing. Plain stucco band at 1st floor level. The centre houses, Nos 46 & 47 are stuccoed. Slate mansard roofs with dormers and tall slab chimney-stacks. EXTERIOR: 3 storeys, attics and basements. 3 windows each. Recessed, round-headed entrances with Coade stone vermiculated intermittent voussoirs and bands; mask keystones. Enriched impost bands and cornice-heads to doors. Side lights to panelled doors, some 2-leaf. Fanlights, mostly radial patterned. Gauged brick flat arches to recessed sashes, most with glazing bars. Nos 40-47 & 53 have cast-iron balconies to 1st floor windows. Cornice and parapet, Nos 40 & 53 with balustraded parapets. INTERIORS not inspected but noted to contain original stone stairs with cast and wrought-iron balusters of various scroll designs, decoration and features; special features as mentioned: No.40: 4-window return to Adeline Place, 3 blind. Rear elevation has a full height canted bay. INTERIOR has fine plasterwork, ceiling with 5 restored painted panels and joinery. No.41: rear elevation with a full height bowed bay. A fine plaster ceiling. No.42: a fine plaster ceiling and friezes. Interesting original staircase in the canted bay at the rear. No.43: rear elevation has a full height bowed bay. A fine plaster ceiling. No.44: rear elevation has a full height canted bay. Good detailing and a fine plaster ceiling. Nos 46 & 47: rusticated ground floor; 5 Ionic pilasters rise through the 1st and 2nd storeys to support a frieze, with roundels above each pilaster, and pediment with delicate swag and roundel enrichment on the tympanum. At 2nd floor level a continuous enriched band running behind the pilasters. Rear elevations with full height canted bays. INTERIORS have identical form staircases which terminate with a series of winders at the head of a straight flight and returns with a long landing. No.46 with some curved doors; No.47 with 2 fine plaster ceilings. No.48: rear elevation with full height canted bay which is bowed internally. A fine plaster ceiling and good friezes. No.49: rear elevation with full height canted bay. 2 fine plaster ceilings. No.50: rear elevation with full height canted bay which is bowed internally. 2 fine plaster ceilings. No.51: rear elevation with full height canted bay which is bowed internally. 2 fine plaster ceilings. Courtyard retains original York stone paving. No.52: rear elevation with full height canted bay. Friezes of interest but otherwise plain. No.53: return to Bloomsbury Street forming No.54. 4 blind windows and entrance with Gibbs surround and sash to right. Rear elevation with a full height canted bay. Some houses with original lead rainwater heads and pipes. SUBSIDIARY FEATURES: attached cast-iron railings to areas with urn or torch flambe finials. Most houses with good wrought-iron foot scrapers. HISTORICAL NOTE: the houses in Bedford Square form a very important and complete example of C18 town planning. Built as a speculation, it is not clear who designed all the houses. Leverton was a country house architect and may have been involved with only the grander houses; he lived at No.13 (qv). Palmer was the Bedford Estate surveyor and may be responsible for the vagaries of the square. The majority of the plots leased by the estate were taken by Robert Grews, a carpenter, and William Scott, a brickmaker. The following have plaques or tablets: No.41 was the residence of Sir Anthony Hope Hawkins, novelist; No.42 of William Butterfield, architect; and No.49 of Ram Mohun Roy, Indian scholar and reformer (LCC / GLC plaques). Nos 50 & 51 have oval plaques inscribed "St. G.F.1859" and "St. G.B. 1823", the line that divides the parishes of St Giles in the Fields and St George, Bloomsbury running along the party wall. (Byrne A: Bedford Square, An architectural study: London: -1990).

Listing NGR: TQ2980381514

Selected Sources
Books and journals
Byrne, A, Bedford Square An Architectural Study, (1990)

National Grid Reference: TQ 29877 81608

MAP

©

The above map is for quick reference purposes only and may not be to scale. This copy shows the entry on 13-Nov-2016 at 04:47:10.

APPENDIX B

PLASTER HISTORICAL DEVELOPMENT

PLASTERING MATERIALS

Plaster is an incredibly versatile material. Once a cheap and simple means of simply 'ceiling' internal and external architectural surfaces, it was to develop to reach its artistic apotheosis in the eighteenth century across Europe. Applied to all kinds of architectural surfaces, it can be manipulated by skilled modellers to form breathtakingly rich and varied three-dimensional enrichment. It could dramatically frame ceiling and wall paintings or provide the standalone architectural enrichment. Compared with the expense of carving in stone or timber, plaster provided a very economical form of decorative enrichment.

Plastering materials and methods remained largely unchanged over several centuries in Europe. In the UK and Ireland decorative run mouldings, added to the normal flatwork treatment from the early sixteenth century, were generally executed in lime. The greater brilliance and smoothness of plaster of Paris was exploited on occasion for high status use, particularly as a more suitable ground for decorative wallpainting.

The older methods were gradually ousted during the nineteenth century by faster setting alternatives including sand and cement based plasters and latterly 'fibrous plaster' (gypsum). These new technologies were coupled with the use of cast gypsum plaster enrichment which was ushered in during the late eighteenth century for the rapid replication of decorative enrichment from pre-carved moulds.

Two distinctive material types are generically termed 'plaster': lime and gypsum, commonly referred to as 'plaster of Paris'. Broadly, until the latter part of the eighteenth century, it was lime plaster that predominated.

<u>Lime</u>

Lime is produced by the calcination of limestone rock $CaC0_3$ (calcium carbonate) at temperatures in excess of 1,000°C forming quick lime Ca0 (calcium oxide). Slaking with water ($Ca0 + H_20$) produced a non-hydraulic lime putty – that is, a form of lime $Ca(0H)_2$ (calcium hydroxide) which does not set on contact with water. The lime reverts to a chemically identical material as its parent rock by slow absorption of carbon dioxide during carbonation.

Lime cycle: 1) $CaC0_3$ + 1,000°C = $Ca0 + C0_2$ 2) $Ca0 + H_20 = Ca(0H)_2$ 3) $Ca(0H)_2$ + atmospheric absorption of $C0_2$ & evaporation of H_20 = $CaC0_3$

The addition of set-enhancing pozzolans such as crushed brick to non-hydraulic lime plasters reduces setting time at the expense of malleability, as does the use of naturally hydraulic lime. Lime was common on building sites. It was used for mortar, external renders and for internal plastering. Ultimately artificial cements made pure limes all but redundant in new building construction, and gypsum based plasters emerged as the predominant finish for interior walls and ceilings, but this change was surprisingly late and limes were still commonly used on building sites up until the Second World War.

The unique qualities of lime plasters, when intimately combined with aggregates such as sand, include plasticity and controlled setting. These self-same traits restrict maximum coat thickness to some 3/4in. (18mm) and necessitate several days between applications to allow for shrinkage and development of adequate strength.

The inclusion of differing grades of aggregate and of organic ingredients such as cattle hair, modify and adjust performance to suit the work in hand. The resulting mixture may be used to render walls and ceilings, run mouldings, press ornament and model *in situ*.

A lengthy tending period is required for pure lime/sand plasters to ensure suitable setting conditions and to guard against too rapid drying which could lead to failure through excessive shrinkage, distortion and cracking. This led to the gauging of plasters with gypsum (plaster of Paris or casting plaster) towards the latter part of the eighteenth century. Its purpose was to provide a more rapid set and thus control shrinkage and reduce the excessive care otherwise required.

Lime renders were gradually superseded in the nineteenth century by natural and artificial cement binders. As a consequence, this led to the common use of very dense hard finishes often over softer coarser textured base coats. These were mixed with different coloured limestone dust or sand to create self-coloured mortars resembling many of the prestigious natural stones such as Bath and Portland stone. Some renders, such as those made with Roman cement, which was rather dark, or with Medina cement, which was yellowish-red, were frequently disguised with translucent washes either in plain colour or to emulate natural stone. Some materials such as Bayley's or Lockwood's cements, resembled Portland Stone and therefore were not coated. Many of these self-coloured or tinted imitation stone renders were rough textured, and proved a magnet for airborne pollution and dust, and after a few decades in a city atmosphere, many were almost black.

Gypsum ('Plaster of Paris')

While lime is inherently weather resistant and could be used inside or outside, the same is not true of gypsum ($CaS0_4$, calcium sulphate), otherwise known as 'plaster of Paris' or 'casting plaster'. Mined in England from natural gypsum deposits like alabaster, it is most often referred to as 'plaster of Paris' due to the large deposits found in Montmartre in Paris from where it was imported. Calcined at between 150°C and 160°C forces a reaction which changes it from dihydrate ($Ca\ SO_4.2H_2O$) to hemi-hydrate ($CaSO_4.½\ H_2O$) by driving off 1 ½ of the molecules of water. This produces a plaster that is commonly referred to as plaster of Paris, otherwise referred to as a Class A plaster. Higher calcining temperatures drive off more water and produce harder setting plasters, though they take longer to set. Class D plasters are completely anhydrous forming an especially hard surface such as Keene's.

Production of Class A hemi-hydrate plaster forms a white powder that typically sets rapidly and rigidly within fifteen minutes of mixing with water. This is a material for internal use only: it rapidly loses strength on contact with water. Gypsum was used in England from the sixteenth century and is occasionally mentioned in accounts for a variety of uses. It is not clear how widespread its use was in seventeenth century plasterwork as superficially it looks the same as lime plaster and it is only with chemical testing that the presence of gypsum can be confirmed. However, analysis of eighteenth century plasterwork at Uppark and elsewhere shows that lime plaster predominated. From the latter half of the eighteenth century gypsum was often used as an admixture combined with lime plaster to achieve an earlier physical set and to counteract shrinkage of the ongoing carbonating lime.

Its other chief use was for the casting of decorative ornament like medallions and runs of enrichment such as egg and a dart, a practice continuing today.

Harder and denser materials were increasingly employed for internal plastering with the development of various gypsum based patent formulations from the early nineteenth century. These included Martin's Cement, invented 1835 and patented 1840. Others included Keene's Cement (patented 1838) and Parian Cement (patented 1846). Parian and Keene's, which set exceptionally hard, could be polished to form a smooth surface. Such Class D plasters were commonly used where increased impact resistance and strength were required such as dado, skirtings and external angles where the flat work was of lime plaster.

By the twentieth century wall plasters for internal use were increasingly formulated from gypsum mixed with different aggregates from lightweight expanded minerals, such as perlite, or heavier and denser aggregates to suit, from bonding to hardwall finishes. Indeed gypsum plasters so dominated the market that by the second half of the twentieth century very few plasterers had any experience of mixing or working with lime plasters, which had almost entirely disappeared from regular use.

Additives

Numerous historical references are made to the use of organic additives to enhance and modify the performance and characteristics of lime plasters. The most commonly recurring references to additives are milk and cheese, eggs, blood, animal fat, animal glues, oil, beeswax, resin, beer, urine and dung. Some of these are highly questionable, for instance the use and benefits of urine. How frequently they were used is almost impossible to tell from surviving material due to the difficulties of tracing and appropriate analysis.

Aggregates

Aggregates are vital and act as fillers in the plaster mix adding bulk and strength reducing the amount of binder needed, and also help to reduce shrinkage as the plaster dries out. Sand is one of the most common aggregates for plasters, though crushed old lime plaster could also be added. It was usual from the eighteenth century onwards to wash sands, especially for better quality work. Angular sands, referred to as 'sharp', were traditionally used for superior performance and were obtained from quarries and pits. River sands were also good and widely used and were characterised by more rounded particles. Sea sands were also used in the past, though not without problems due to their more rounded particle size and contamination by sea salt that could have a deleterious effect on the finish and durability. In all cases, plastering required a well graded particle size which may not always have been readily obtainable.

Crushed marble was not used extensively in the UK and Ireland. It was an expensive commodity north of the alps where sand was much more readily available and it was not the essential ingredient – a myth that some of the historic literature perpetuated. Other crushed rocks such as limestone and granite were also a regular addition.

PLASTERING METHODS[9]

Materials and methods were widely adapted to suit local circumstances. Accumulation of experience and dissemination of knowledge incorporated and refined local variations. This led to the establishment and adoption of best practice that provides the core of the methods outlined below.

Flatwork

Wattle and daub techniques have been used for at least 6,000 years and predominantly formed the basis of earlier flatwork in the UK and Ireland. Panel grounds were formed from woven thin branches and daubed with mixtures that might include principal binders of clay and lime with tensile reinforcement provided by materials such as straw and animal hair. From the seventeenth century onwards wattle and daub was ousted by lath and plaster, though could still provide the flatwork base coats at Astley Hall, Chorley (1575-1600) retaining earth plaster with straw base coats and lime plaster finish coat in plaster surviving the later c.1650s work. Also haired earth plaster base coats surviving in the stair hall ceiling of c.1660 at Sydenham House, Devon (1600-1612).

Internal flatwork on walls and ceilings in the sixteenth and seventeenth centuries was mostly composed of two layers, with a base coat of coarse stuff keyed onto reeds or laths, covered with a finer layer and finished with white distemper. Reeds were in use as a support well into the eighteenth century, such as the unusually late use on the c.1760s decorative plaster Saloon and Dining Room ceilings at Fairfax House, York. By the eighteenth century, riven laths rather than reeds, were typically used to support flatwork not applied to solid grounds. By this time, flatwork was traditionally comprised of three layers: a render or pricking-up coat, floating coat and setting coat. The render or pricking-up coat was applied to solid or lathed backgrounds respectively. Laths would be hand riven sweet chestnut or oak until the introduction of sawn softwood in the mid-nineteenth century. Because the lathwork affected the stability and form of the finished product, plasterers were traditionally responsible for fixing laths to structures provided by the carpenter.

Lime plaster was made with sand and often had hair added. The use of coarse sharp sands reduced the effects of shrinkage whilst the inclusion of hair was typical for internal plastering to lathwork. A physical key for the following coat was formed by scratching the partially set surface with a rake assembled from a fan of three sharpened laths.

The floating coat was usually formulated and applied in the same way as the pricking-up coat but with more attention paid to its ‘straightening’. Keying for the next coat was shallower and less vigorous using a devil float formed with three nails projecting 1/8 in. (3mm) or so through the sole.

The setting coat was formulated with much finer softer sands using a higher ratio of lime to sand and could exceed 1:1. Where hair was included it was finer and shorter - usually goat

[9] Terminology employed in the description of historic methods described above is that of the present date in the interests of clarity and to help avoid confusion. The technical language of earlier periods, understood at the time, was often inadequate to convey critical nuances and detail. Modern usage should not be applied ad hoc to historic terms without research of the appropriate period – which in early work can prove particularly difficult to establish.

hair. Applied only to a maximum thickness of 1/8 in. (3 mm), considerable skill and attention was required to form fine surfaces.

External rendering was usually carried out without hair and a coarser finish left on the surface usually by rubbing up with a wooden float. The final coats would have a similar ratio of binder to aggregate as internal render and float till the nineteenth century. Subsequently experimentation led to the common use of very dense hard finishes often over softer coarser textured base coats.

Development of methods to increase productivity during the nineteenth century led to the invention and use of Expanded Metal Lath (EML). The use of EML became particularly popular in the construction of public buildings and the quest for fireproof solutions.

By the last quarter of the nineteenth century, fibrous plaster casting of large sections of flat plain-faced and curved panels became increasingly economical and heralded today’s extensive use of the techniques from domestic interiors through to the largest shopping malls. Cast slabs include woven hessian and sawn timber laths to enable lightweight sections and provide a strong internal framework for fixing to the desired structures as has been used for the Walter Crane panels in the Saloon at Combe Bank, Sevenoaks, Kent (1880). Plain flat plasterboard developed from its invention in 1894 by Augustine Sackett, marketed as ‘Sackett Board’, before it evolved into ‘Gypsum Board’ around 1910 and subsequently further developed into the plasterboard in use today.

Run-Mouldings

Architectural topography such as changes of plane, downstands and ribs would typically be reflected in the underlying structure to minimise the weight and thickness of plaster required to form a feature. Run-mouldings (current terminology) are so called because they are formed by the craftsman repeatedly passing a pre-cut profile (originally wooden and later metal) of the desired shape across a surface whilst adding plaster. The profile was mounted on a timber frame known as a horse and was run against timber rails or rules temporarily affixed, as appropriate, to the flatwork. By this means, continuous constant profile features, such as ribs, were formed *in situ* following the existing surface undulations. Features were built up layer by layer in the same manner as flatwork. Depressions and quirks would be run and incorporated in the profile, if desired, which allowed for the subsequent planting of separately formed units of decorative enrichment. These might take the form of small tiles of intertwining leaves, egg and dart or indeed, all manner of low relief enrichment.

‘Press-Moulding’

‘Press-moulded’ enrichment is a technique quite distinct from the later pouring of gypsum casting plaster into moulds that started in the late eighteenth century and continues today. In the early press-moulding technique, shallow low relief decorative elements were produced by the ‘pressing’ (beating) of a stiff, near dry lime plaster mix into reverse carved timber impressions. This was especially popular as a method to form decorative elements, ‘tiles’ and ‘plates’ commonly employed as enrichment in the sixteenth and seventeenth centuries.

Flat-backed press-moulded enrichment would be used for simple embellishments and decorative relief applied to run moulded ribs or would be set in to ceiling flatwork or wall panels as at Ormond Castle, Carrick-on-Suir, Co. Tipperary (1575), Gawthorpe Hall, Lancashire (1600-1605) and Sydenham House, Devon (c.1660). This method was also used to form entire elaborate low relief ‘tiled’ ceilings such as found, for instance, in the barrel-vaulted gallery at Chastleton, Buckinghamshire (1607-12), and window soffits and friezes of Dorton House, Buckinghamshire (1626).

The constraints of a solid and unyielding and inflexible timber mould resulted in the production of enrichment of characteristically low relief without undercut. Lime plaster press-moulded enrichment is also characterised by warping and unevenness resulting from shrinkage of the lime as it dried. The method was not particularly efficient though appears to have been a common enough practice for repetitive embellishment in the sixteenth and seventeenth centuries.

In the eighteenth century, the method continued to be used for the pressing of elements such as modillions and paterae, which were typically affixed by a combination of plaster and a large nail securing the ornament to the timber sub-structure. This was observed in the 1750s decorative plasterwork at Uppark for modillions, sections of egg and dart and paterae.

Freehand Modelling

Modelling of lime plaster is an additive process by which material is gradually added and built up from the surface by the craftsman. It is important to distinguish this method from that of other sculptural materials as it is fundamental to the methods and techniques of its creation. Lime is not carved like the subtractive process used for carving timber or stone where material is progressively removed by the craftsman to reveal the piece within. Nor is lime as pliant a medium as clay, which benefits from both additive and subtractive methods. The modelling of lime requires the individual hand-working of each element from the surface outwards. The introduction of small corrections and surface indentations are only possible as the material is actually applied. The nature of the lime does not allow for a later return to create recesses, indentations and undercut, for instance. Instead, the craftsman must work up and introduce detail as he adds new material a little at a time. It is by this means that the freehand lime plaster modeller is able produced the deep undercut and layering which has so enriched the many buildings of the late seventeenth and eighteenth century. It is this characteristic, in particular, that distinguishes such vibrant and individual work from the minimal undercut of the later technically and precise mechanical repetition of cast plaster produced from rigid moulds.

In the UK and Ireland, freehand modelling predominantly used slow-setting mixtures of non-hydraulic lime plaster. This meant that the modelling of a highly decorative ceiling might be measured in several months. This circumstance is quite different to the speed of some continental work, where the incorporation of gypsum plaster with its rapid setting qualities vastly accelerated production, and enabled several rooms to be completed in a few months.

Lime, without set enhancing additives, carbonates and hardens only very slowly and over many weeks. It remains malleable and soft for a considerable amount of time and thus requires some degree of support where great thickness or relief is required. Large projections such as limbs, wings, foliage or instruments required the use of a supporting armature. These could be ferrous: typically wrought iron wire, nails and lead, or organic: such as wood, leather and bone – indeed anything capable of providing suitable support for the carbonating plaster was used and often became a significant element in later deterioration.

Highly-skilled labour intensive hand modelling and press moulding of lime common up to the end of the eighteenth century, was gradually superseded by the 'mechanical' casting of ornament, poured in gypsum plaster, as the quest for economy and taste for less symmetrical voluptuous high relief was supplanted by the new wave of taste and economy of repetition.

Casting

The shrinkage of lime plaster and comparatively slow set could be exploited to create flat surfaces, beaten into shallow reverse cut moulds to form 'press-moulded' enrichment and manipulated or modelled in situ by those adept in the 'plastic art'.

However, the rapid setting time of gypsum (around fifteen minutes from mixing with clean water) lent itself to the more efficient casting of low relief repetitive architectural ornament. This typically used reverse carved hardwood moulds for durability and higher volume replication as well as less durable wax and clay moulds for comparatively small runs of enrichment. These methods became obsolete with the introduction of flexible moulding materials which were introduced and developed from the mid nineteenth century. To cast 'in the round' or with any degree of undercut, required complex piece moulds prior to flexible mould making technology. However, reverse carved timber or well-hardened plaster master moulds were sufficient for gypsum poured models without undercut. Artists' studios used more technical moulding and casting techniques to form complex models in the round using interlocking piece moulds that located in a larger case for the production of cast statuary and similarly complicated subjects.

Mixed on its own with water to a creamy consistency, gypsum is particularly suited to pouring into low relief moulds with an absence of undercut. Exploitation of these attributes in the late eighteenth century, together with the rise in popularity of the Neoclassical style, enabled large quantities of repetitive low relief ornament to be churned out in a fraction of the time taken to model lime *in situ*. This led to the rapid decline of the lime plaster modeller as artist craftsman and ushered in the decorative plasterer as more of a technician. However, *in situ* freehand modelling of enrichment enhancing cast principal elements of the decorative plaster ceilings was observed at Kiddington Hall, Oxfordshire as part of its wholesale remodelling by Barry in the 1850s. By the mid-nineteenth century, flexible gelatine moulding materials allowed a degree of undercut to be achieved in a single cast.

Casts could be large or small, plain faced or decorative. Sections would be made up of several smaller items if a large degree of undercut for the completed enrichment was required. Finished cast sections were then affixed to a latticework of timber joists or metal struts and all joints and gaps filled and made good using gypsum plaster.

Moulds today are generally formed from cold cure silicone rubber supplanting mouldable thermoplastics in use post 1950 such as Vinamold.

Pourable moulding materials are initially applied in a thin layer over a model typically of clay, timber or plaster and left until set. A hard cased backing is then formed over the rubber in plaster or glass reinforced plastic (G.R.P.) to give structural support when stripped from the model. Once stripped, and placed in its hard case, liquid plaster of Paris is poured into the mould and allowed to set – an operation of around half an hour. The mould is stripped off the set plaster to reveal the cast copy.

This form of decorative plaster work is not to be confused with the freehand in-situ modelling of lime plaster that characterises the outstanding undercut and relief of plaster decoration typical up until the late eighteenth century and surviving beyond in local areas.

APPENDIX C

MATERIALS & TECHNIQUES

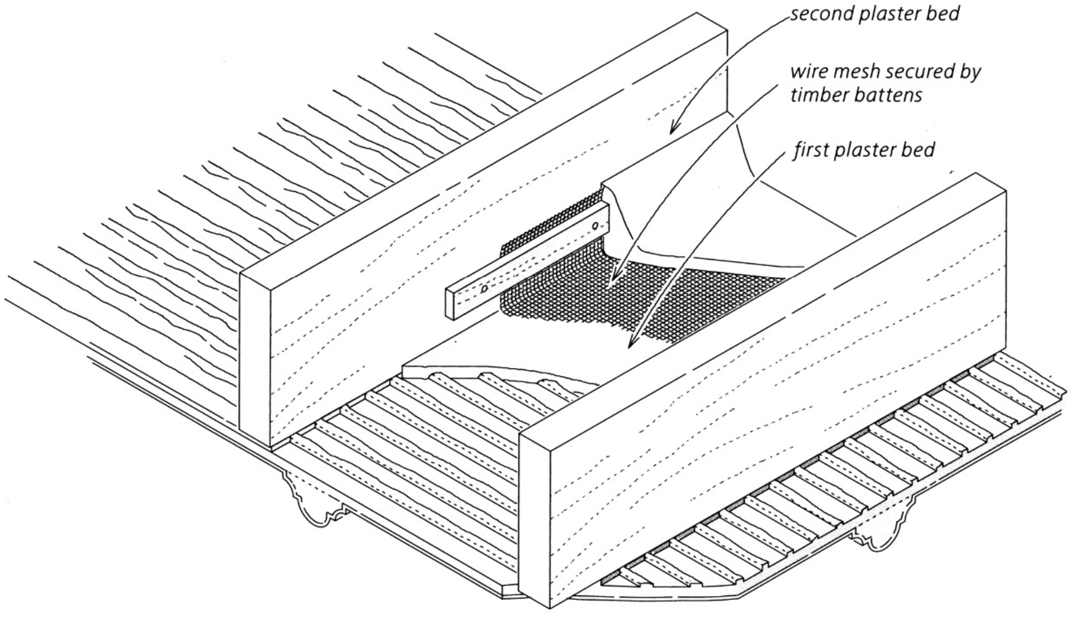
SECTION A

CEILING PLASTER RESTRAINT

The often used prescribed method of pouring plaster of Paris across a lath and plaster ceiling back over wire or hessian reinforcement is a potentially disastrous and unsuitable means of repair. This introduces large quantities of wet material setting as rigid monolithic blocks. These in turn accentuate any deflection forces at boundary edges, destabilising otherwise coherent existing plaster. Adhesion to an already limited plaster key, combined with the difficulty of ensuring adequate bonding of material, further compromises this potentially destabilising treatment. It is only partially mitigated when incorporating wire loops through the ceiling face. The incorporation of large quantities of water into a small area, often closed over as soon as complete, can only enhance the possibility of fungal attack and decay. Moreover, removal is virtually impossible without considerable damage.

Similarly, such wholesale plaster pouring techniques are likely to be as damaging to late nineteenth century fibrous plaster slab mouldings. These incorporate a structural latticework of narrow timber battens and laths with hessian reinforcement to fabricate a lightweight structure.

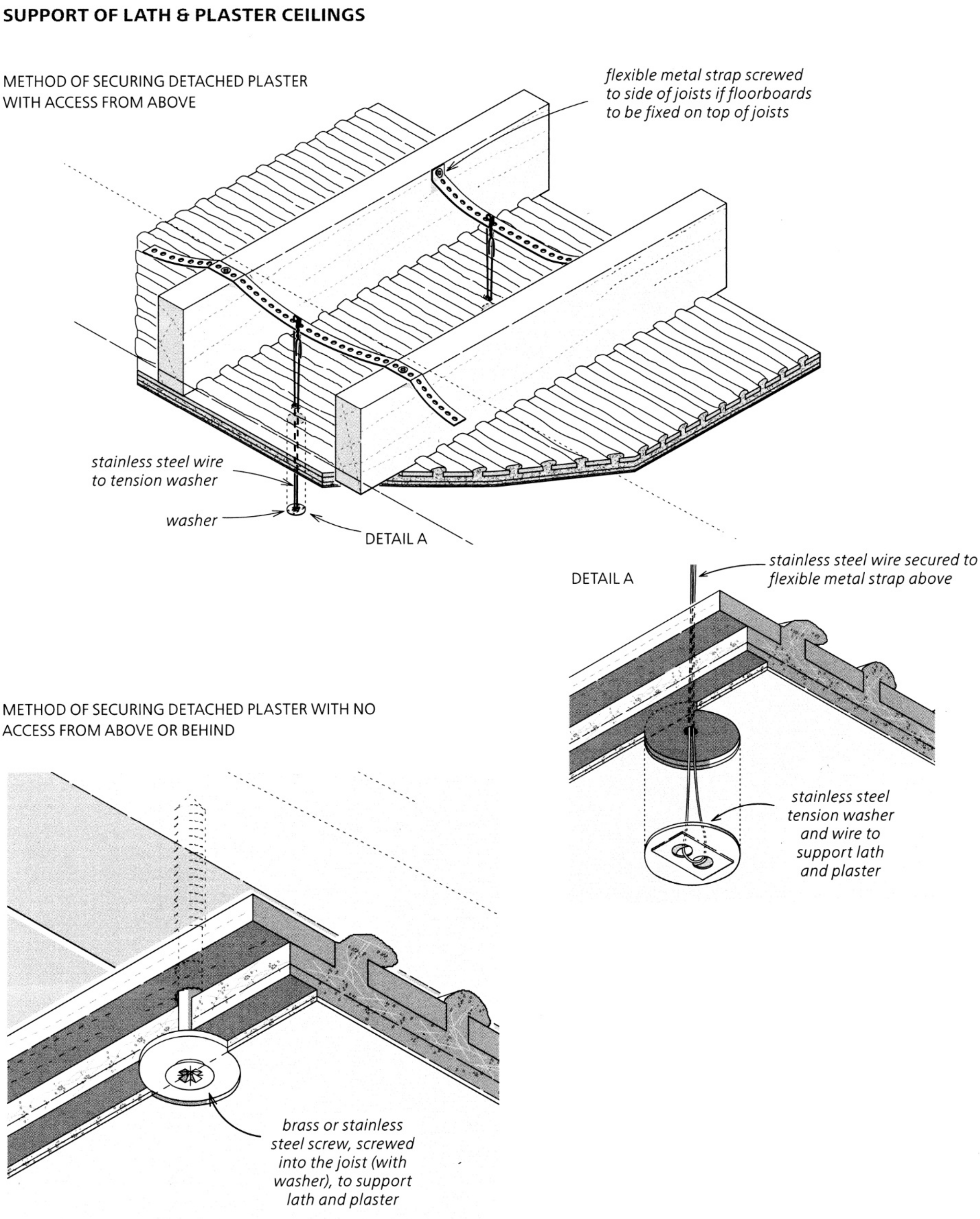
INAPPROPRIATE METHOD OF REPAIRING PLASTER CEILINGS



Inappropriate Method Of Repairing Plaster Ceilings illustrated in English Heritage *Mortars, Renders & Plasters: Practical Building Conservation,* Ashgate Publishing (2012), Richard Ireland, Eds. Stewart and Henry, pp.199. (See photo illustrations Plates 1 and 2 below)

Plate A Illustrating inappropriate repair method applied to the back of an original ceiling (1605-08) at Knole House, Kent with poured plaster of Paris and chicken wire reinforcement together with galvanised wire ties passing through the ceiling face. The result is the wholesale obscuring of the structure beneath and creation of rigid inflexible blocks of plaster.

Plate B Illustrating inappropriate repair method applied to a nineteenth century lath and plaster ceiling with poured plaster of Paris and hessian reinforcement obscuring structure beneath, adding weight and reducing flexibility.



Illustrated in English Heritage *Mortars, Renders & Plasters: Practical Building Conservation,* Ashgate Publishing (2012), Richard Ireland, Eds. Stewart and Henry, pp.371.

The suspended support methods illustrated on this page for lath and plaster ceilings are appropriate for most situations. These techniques are not intended for wholesale 'failsafe' gridded implementation, but are intended to be used locally in a spirit of minimum intervention.

SECTION B

FILLING

Repairs should never be harder than the adjacent existing fabric. Too often cracks are filled without considering the consequences of restricting the natural expansion and contraction of the building fabric – not least on a seasonal basis. Hard fills act as wedges and physically erode adjacent softer material or transfer and increase loads across to other areas which can be further destabilised.

The use of lime-based plaster to ensure like-for-like compatibility can also be counterproductive. The wider the crack, the more shrinkage may be anticipated together with poor lateral adhesion. Shrinkage cracks of lime may be impossible to avoid without addition of gypsum. Either way, care and wet tending will be required. Narrow cracks may have to be opened and raked out to provide sufficient purchase for lime based repairs and so cancel the benefits of any friction interference helping to retain structural integrity of plaster sections. The necessary wetting and saturation of the substrate may also be catastrophic to sensitive adjacent decorated or easily stained surfaces.

Some modern gypsum based fillers are particularly hard and are marketed on the strength of their water resistance and durability. These are unsuitable for the repair of soft historic plaster. Others are especially soft and thus eminently suitable. Easily adjusted and weakened further with the addition of whiting, they should be matched or be weaker than the surrounding fabric. Benefits include good adhesion, rapid drying to a neutral surface, fine texture and soft matrix which makes gentle smooth and controlled sanding an easy task.

The recommended filling material in these instances is Toupret Interior Filler. Other advantages are good adhesion, fine surface, and very easy sanding. These characteristics limit the need for raking out of cracks – which is not recommended – reducing preparation t removal only of loose and flaking material. In addition, the filler mixes to a consistency that prevents slumping. However, some shrinkage on drying of especially deep fills will occur and the fill should be undertaken twice – as is good practice. Finally, setting to a soft surface, it is especially easy to sand back level against existing soft surfaces – an especially useful characteristic when used in confined spaces such as between enrichment elements.

APPENDIX D

CEILING ILLUSTRATIONS

Fig. 01 No.48 Bedford Square north elevation

Fig 02 First floor front ceiling view east with plaster loss 15/10/16

Fig. 03 Ceiling plaster loss in NE corner

Fig. 04 Ceiling debris and mouldings on the floor

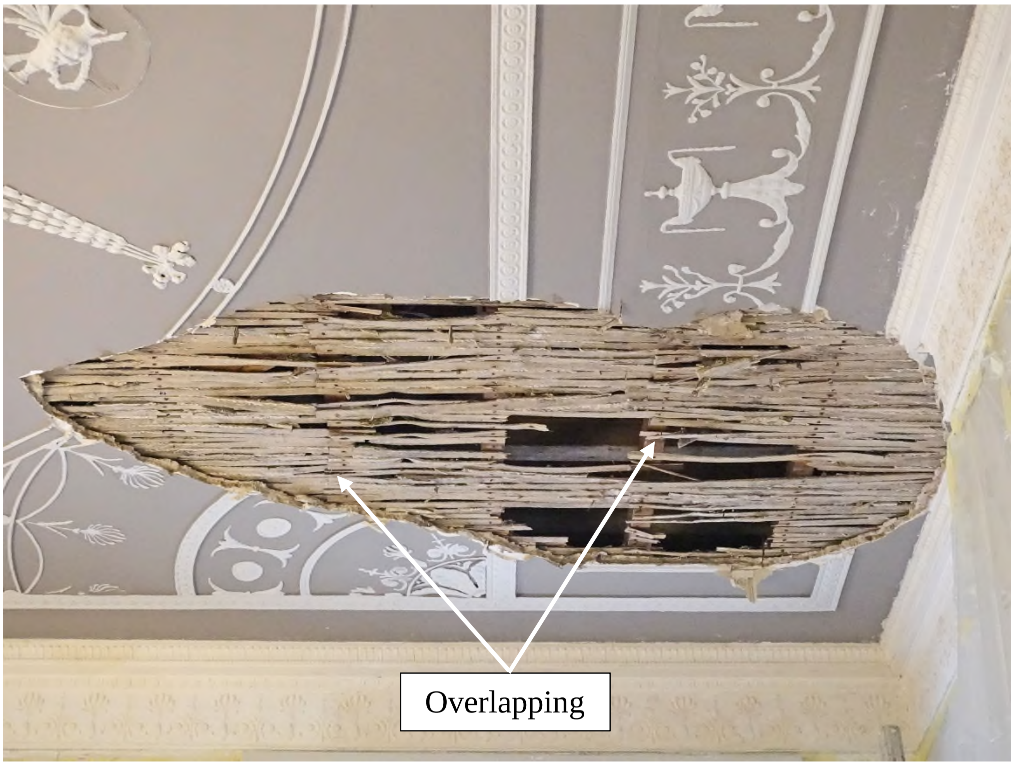


Fig. 05 View of ceiling loss towards north window wall

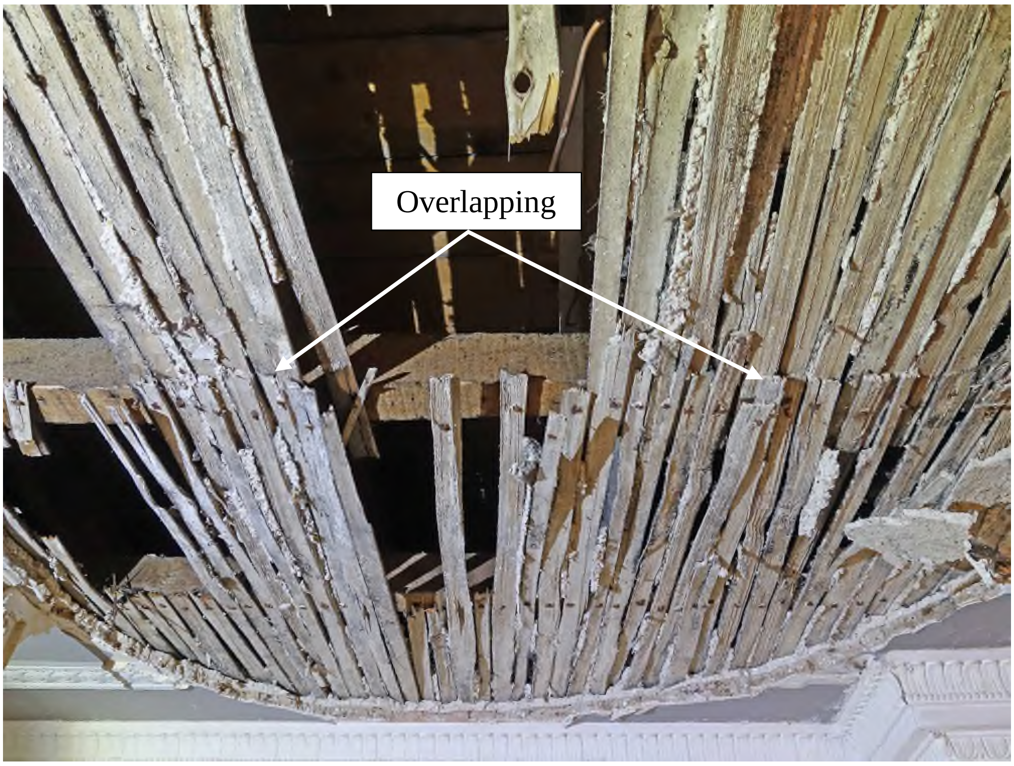


Fig. 06 Loss showing overlapping laths view east

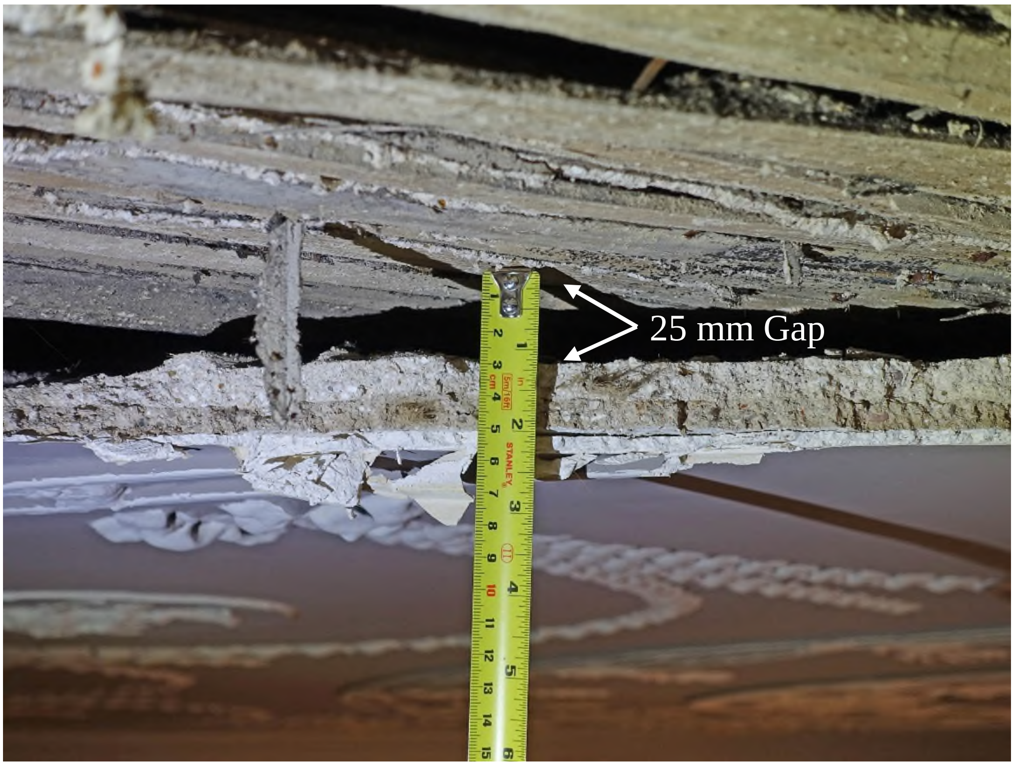


Fig. 07 Gap of 25 mm between ceiling plaster back and laths

Fig. 08 Deflection of ceiling visible from NE view to SW

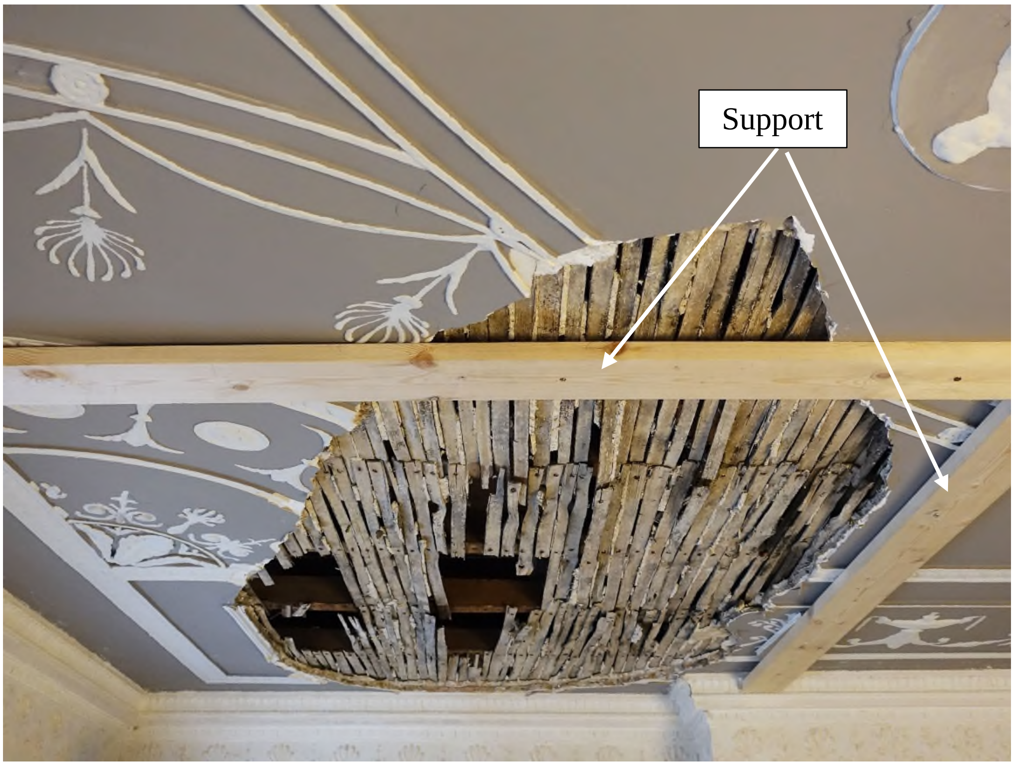


Fig. 09 Temporary 'first aid' restraint of plaster around hole perimeter

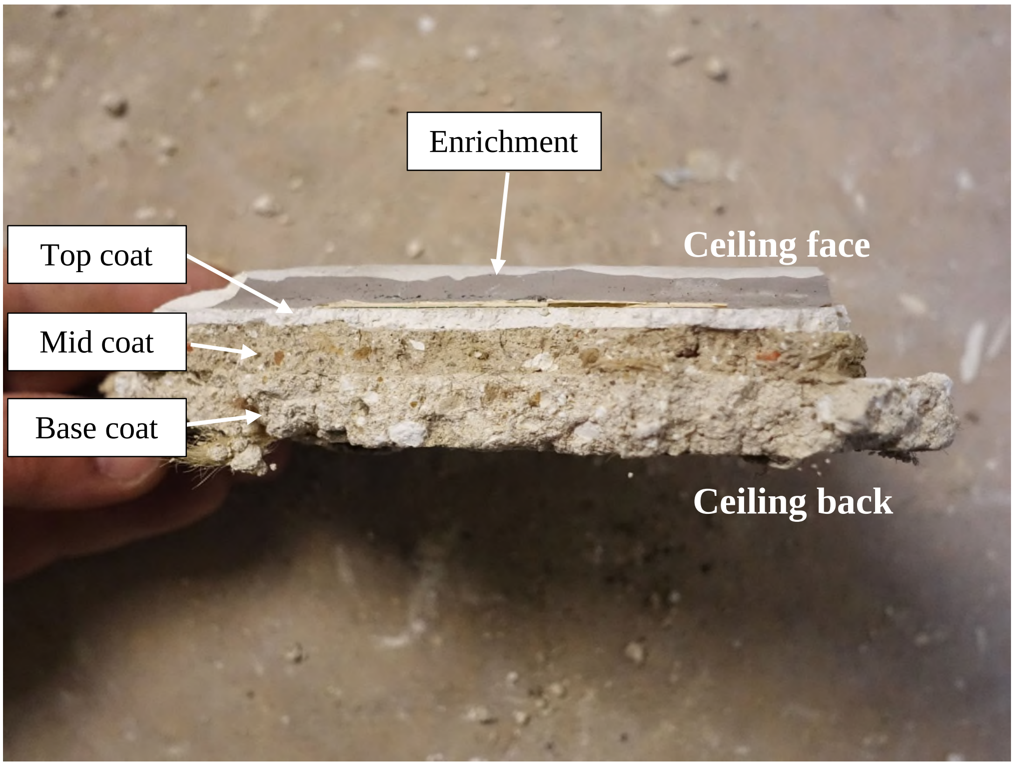


Fig. 10 Three coat haired plaster with coarse aggregate

Fig. 11 Decorative cast plaster moulding applied to flatwork

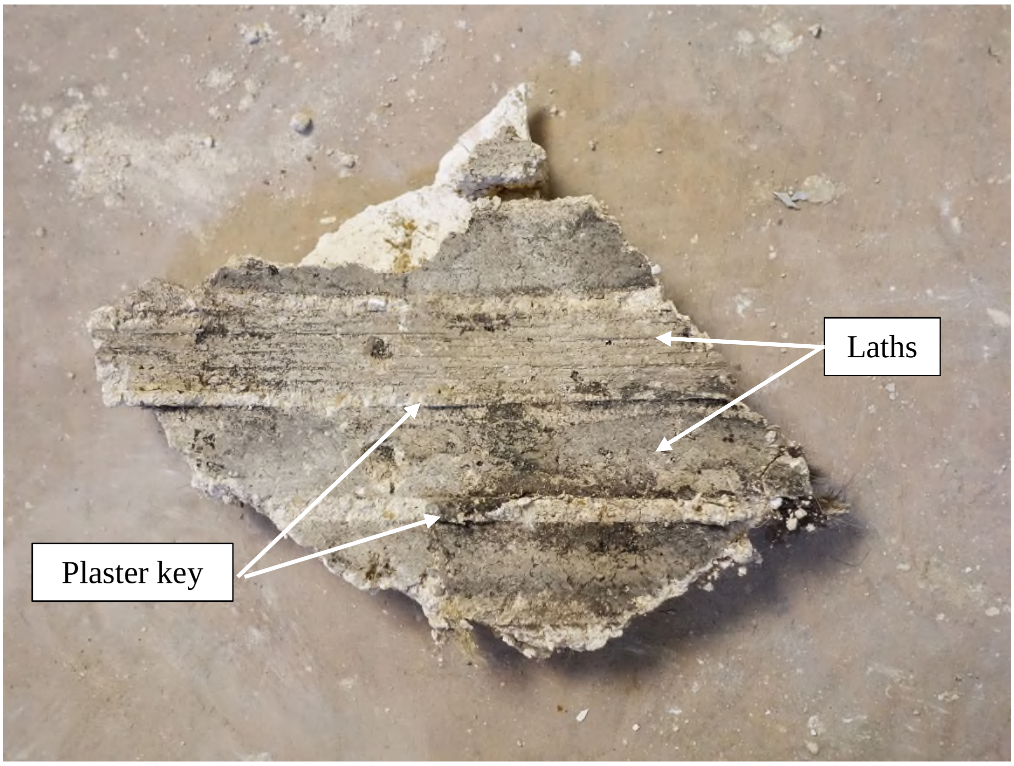


Fig. 12 Pattern of laths and broken key on fragment back

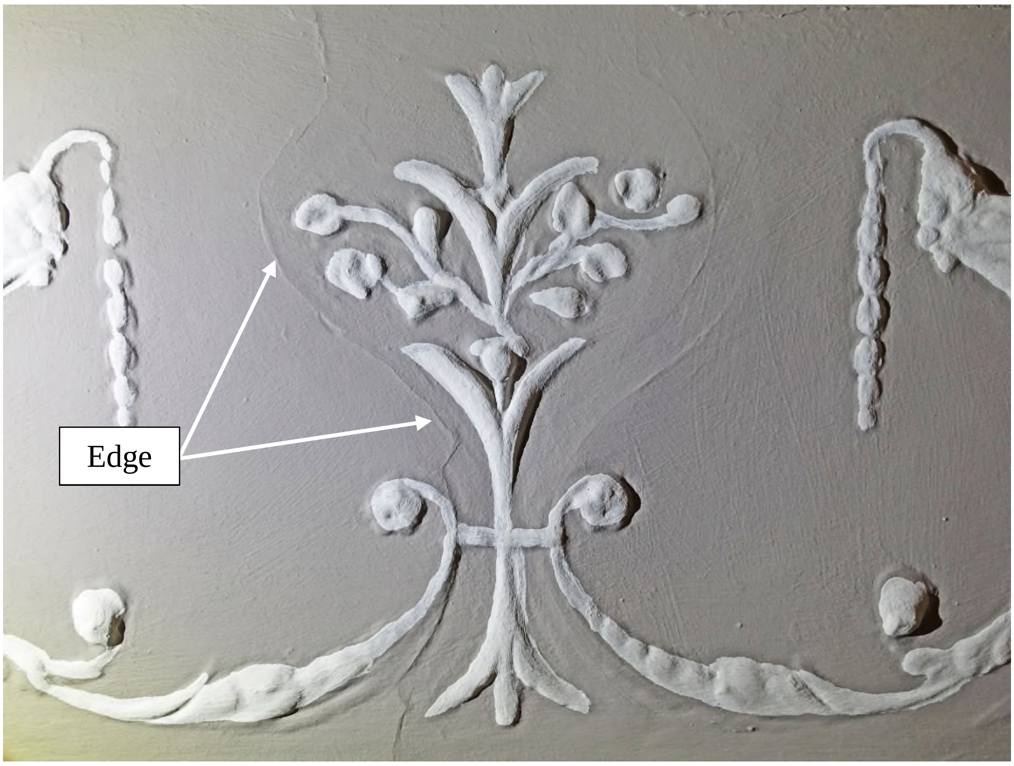


Fig. 13 Edge of cast enrichment evident in raking light

Fig. 14 Enrichment edge exposed from beneath paint

Fig. 15 Evidence of past repairs above fireplace adjacent to loss

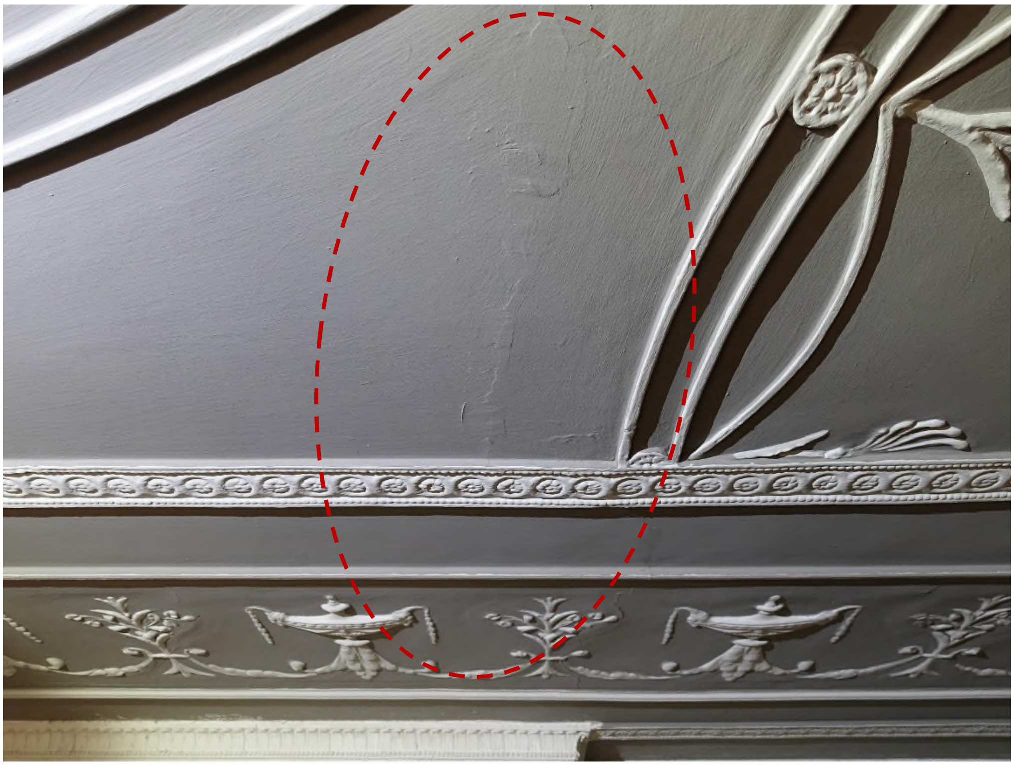


Fig. 16 Previous intervention over south side of fireplace

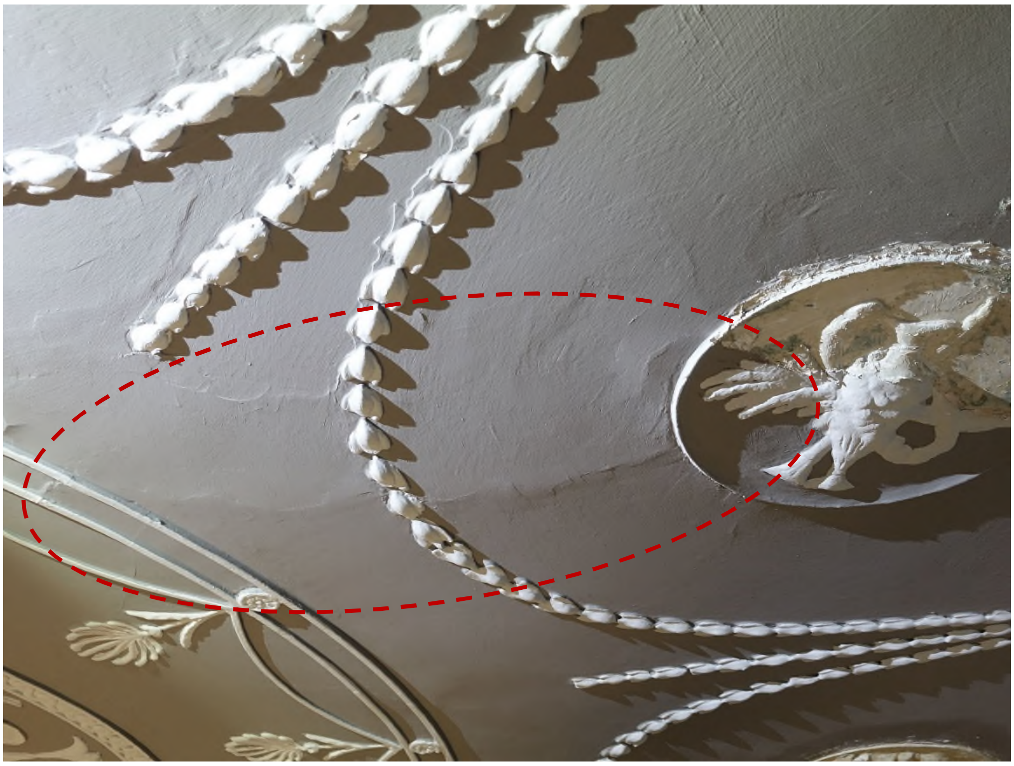


Fig. 17 Deflection and previous repairs to ceiling in NW quadrant

Fig. 18 Deflection of N-S partition and door distortion above on second floor

Fig. 19 Second floor east side room above ceiling view north

Fig. 20 Second floor east side room above ceiling view south

Fig. 21 Second floor west side room above ceiling view north

Fig. 22 Second floor west side room above ceiling view south

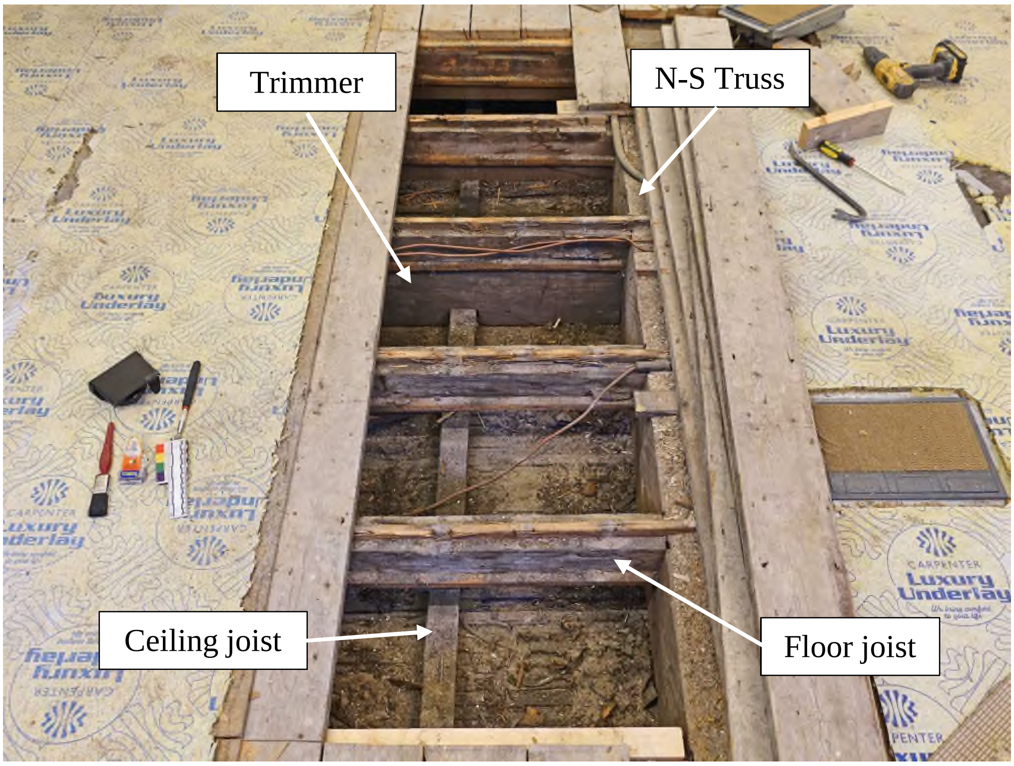


Fig. 23 Ceiling back exposed on second floor east room central area 'A'

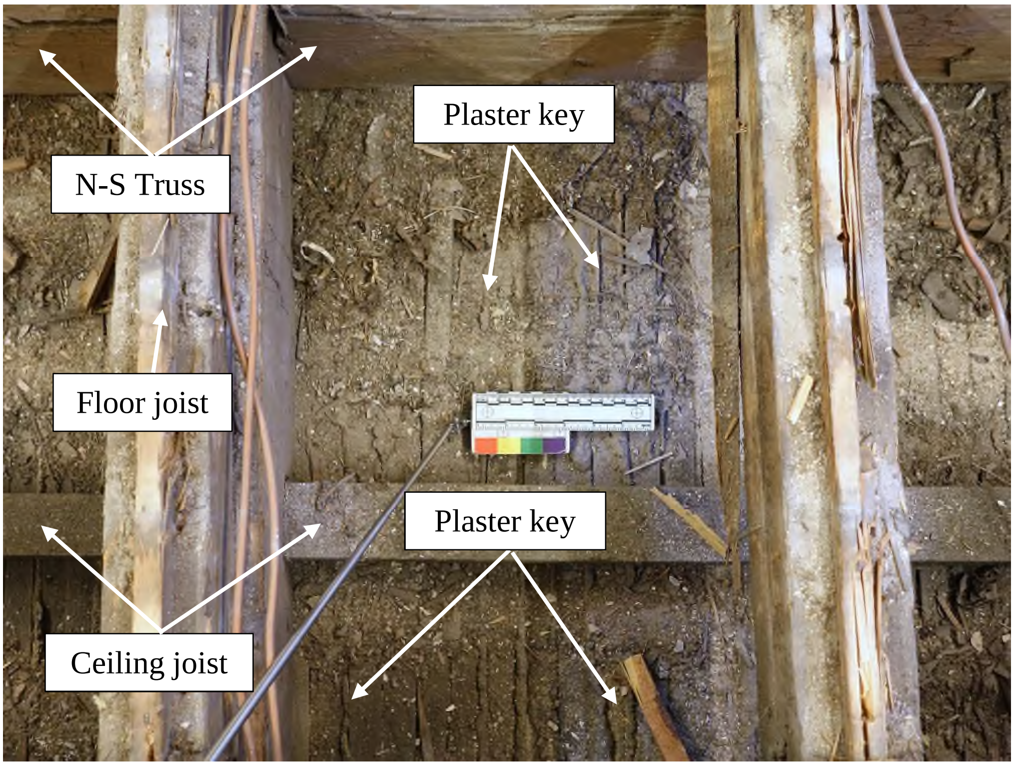


Fig. 24 Ceiling back showing moderate plaster key in central area 'A'

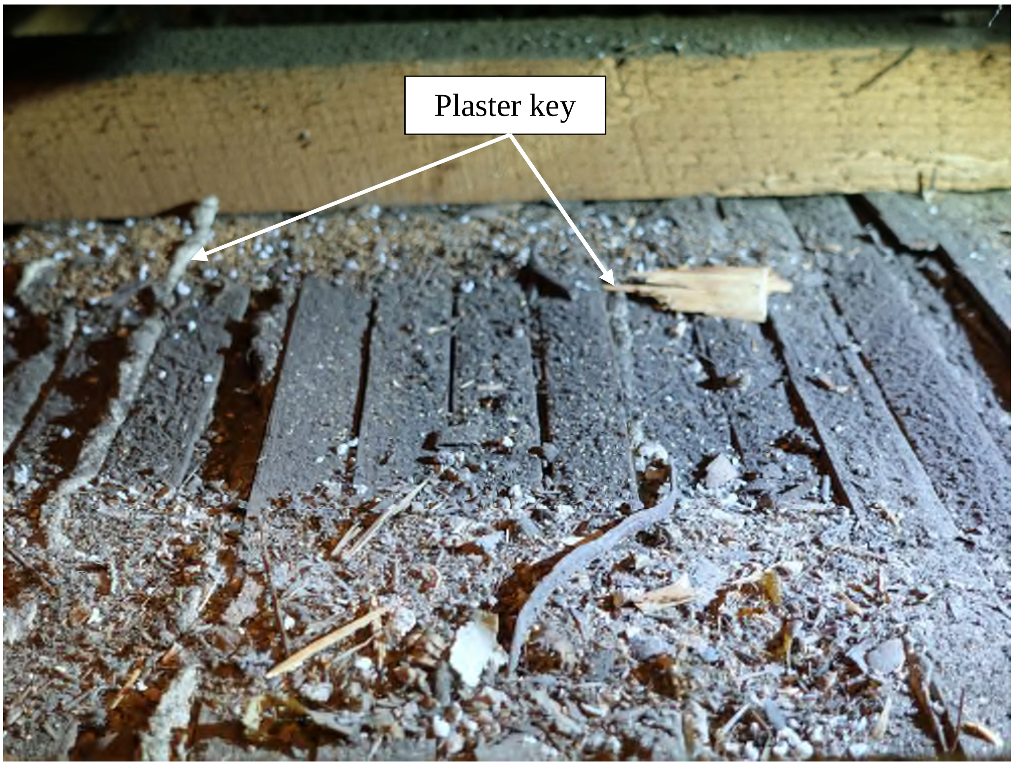


Fig. 25 View beneath central boards shows area of key loss

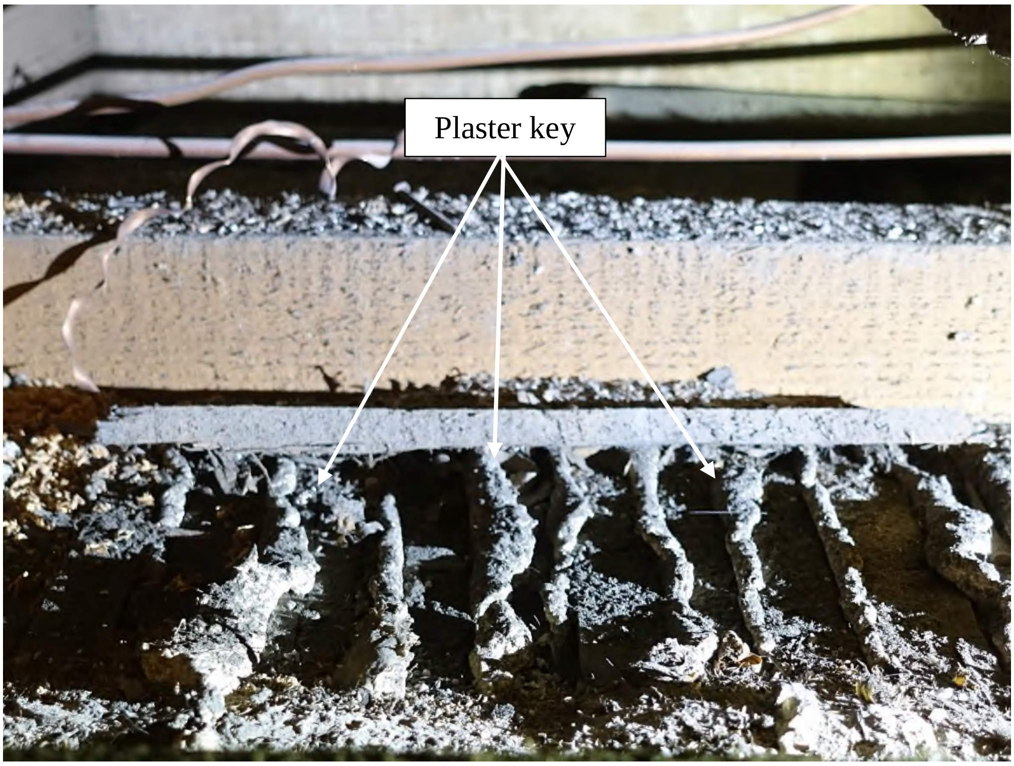


Fig. 26 View in different direction shows good plaster key

Fig. 27 Exposed ceiling back in east room NW corner ‘B’

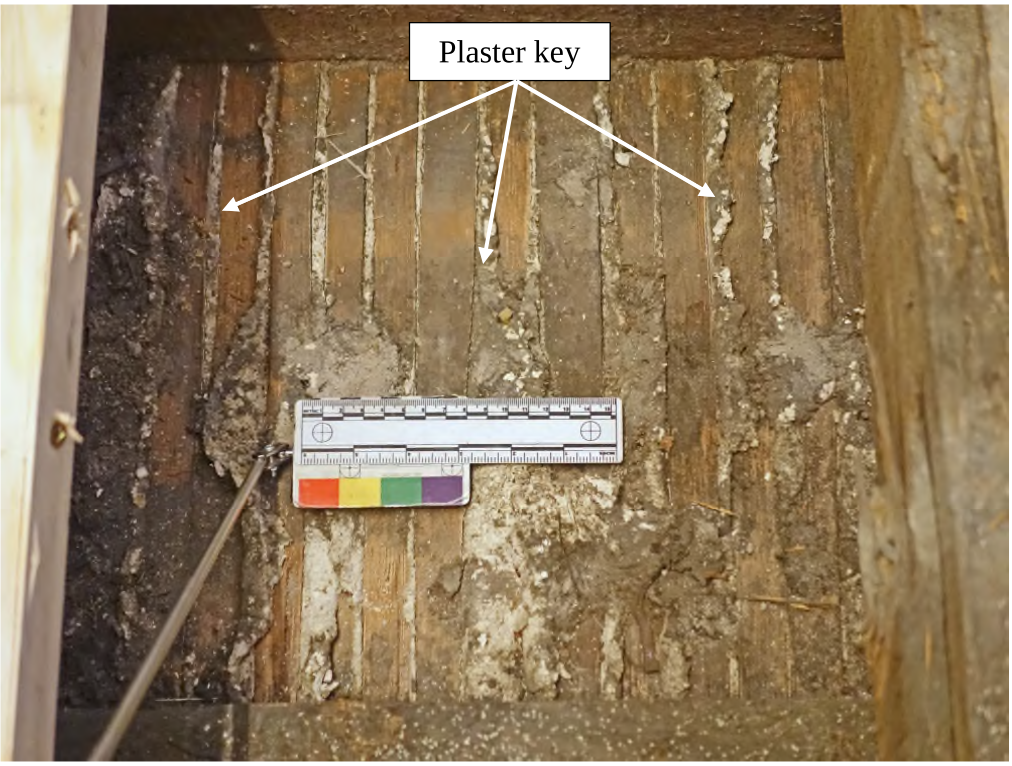


Fig. 28 Adequate plaster key with 150 mm reference scale

Fig. 29 East room in NW corner adjacent to fireplace ‘C’

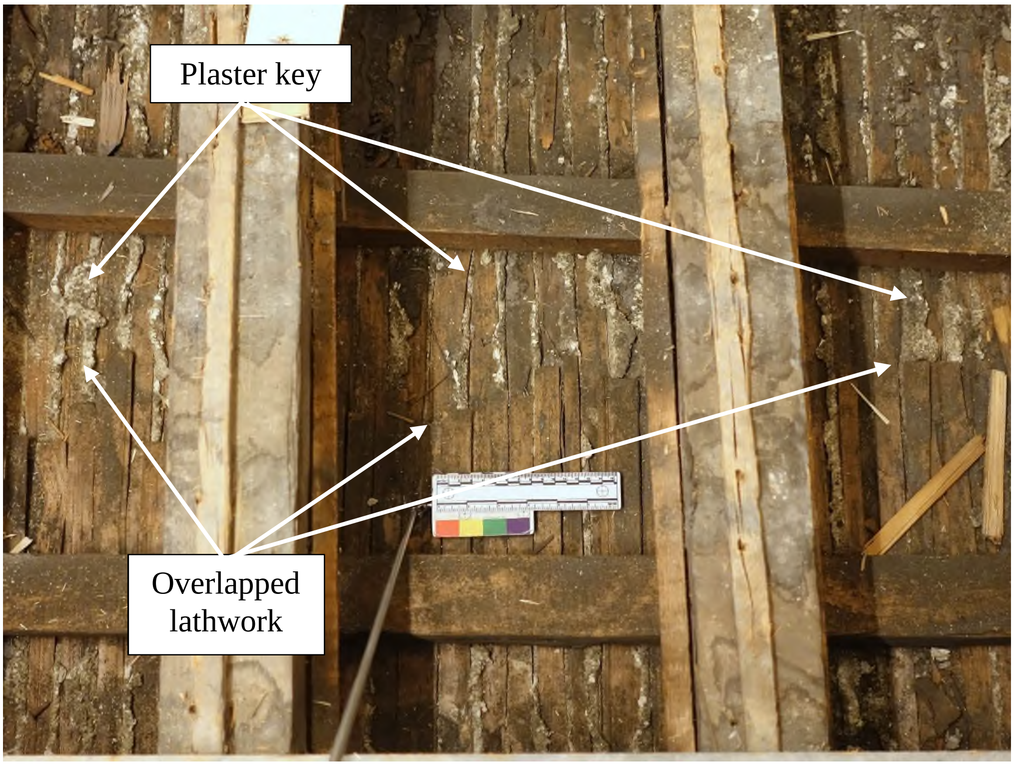


Fig. 30 Formation of plaster key restricted by overlapped laths

Fig. 31 Ceiling back exposed in SW corner cupboard of west room 'D'

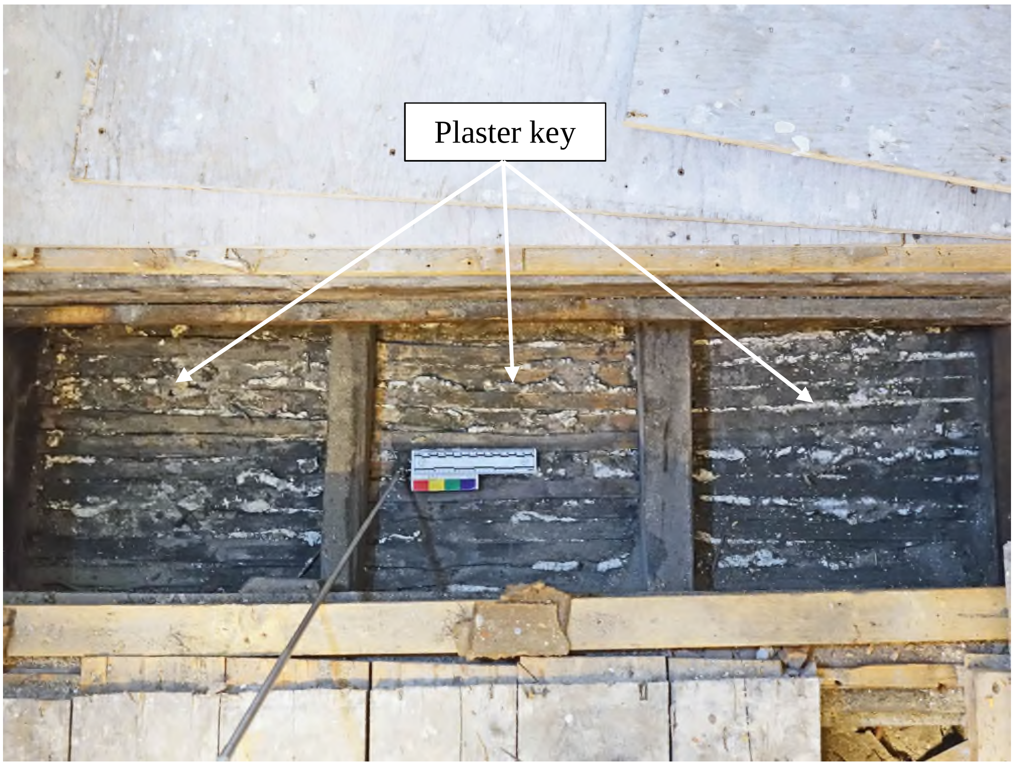


Fig. 32 Plaster key well formed in SW corner

Fig. 33 NW corner of ceiling in west room adjacent to small fireplace 'E'

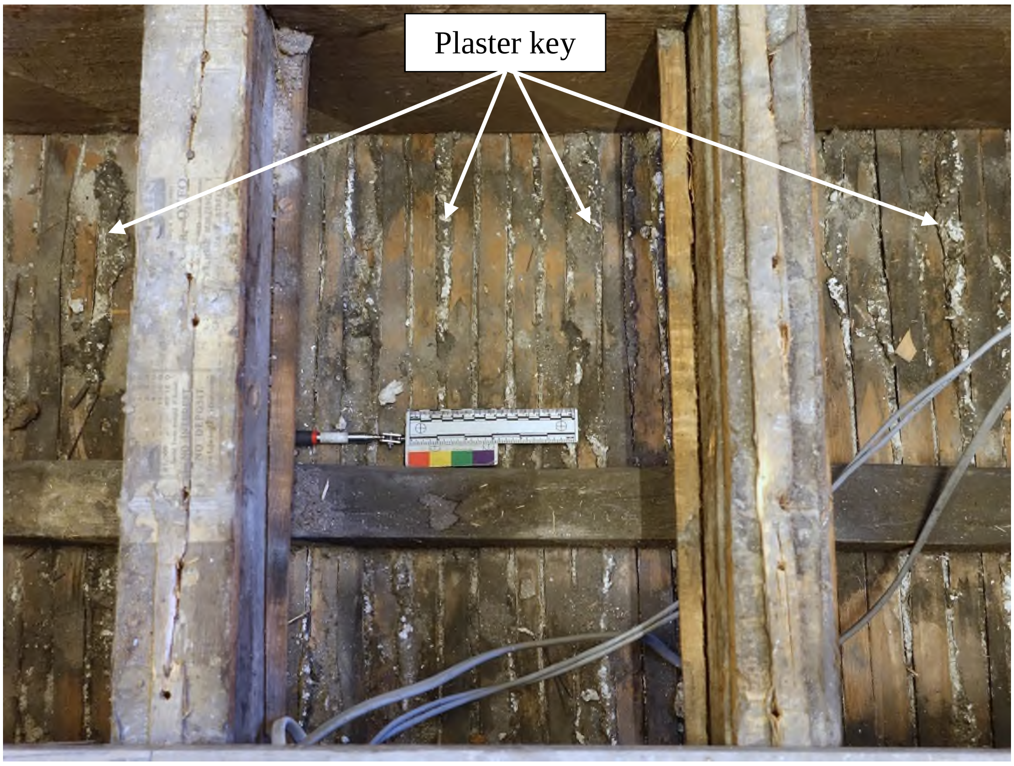


Fig. 34 Plaster key variable in the NW corner

First Floor Room Plan

(Plan outlines courtesy of Long & Kentish Architects)

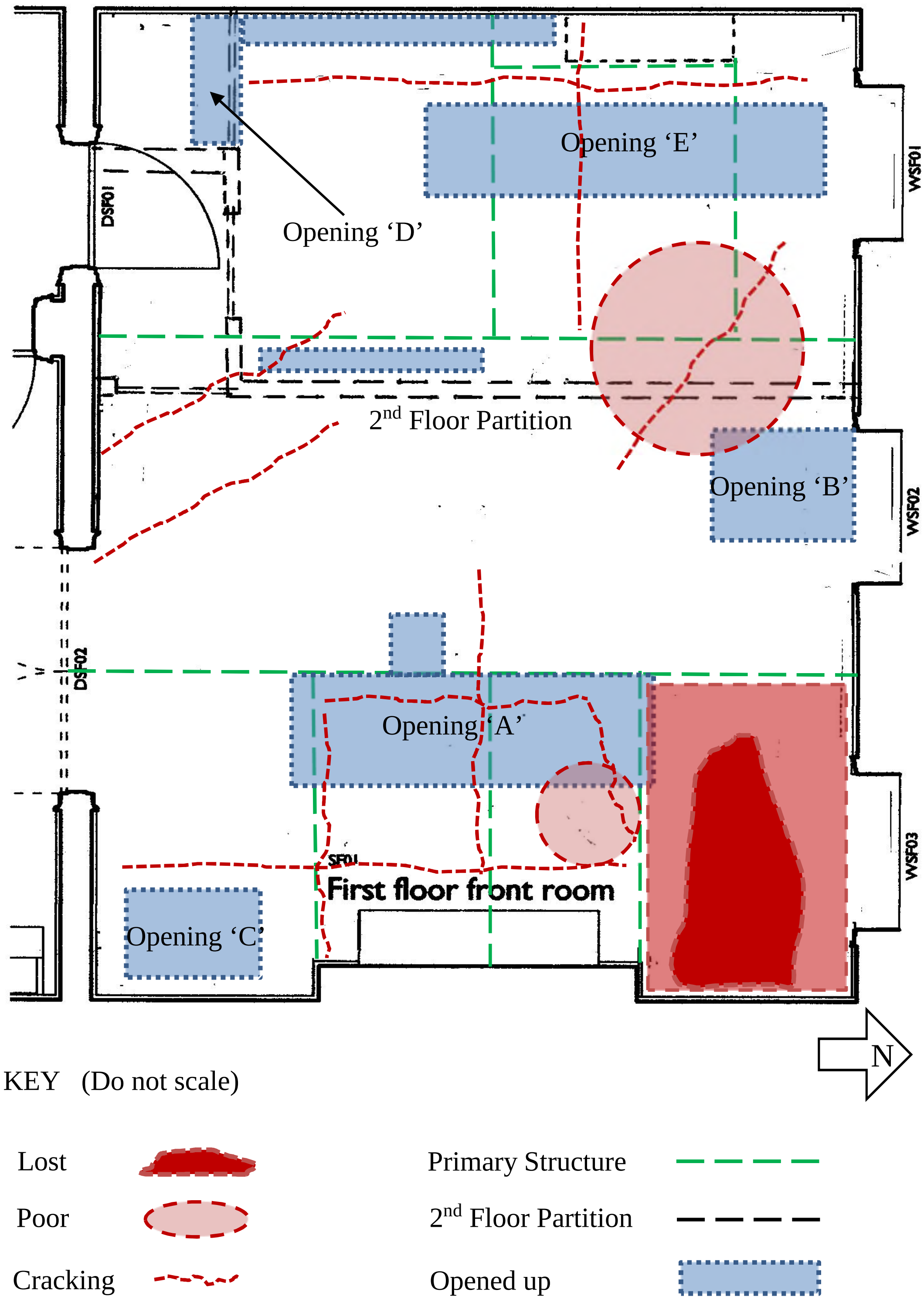


Fig. 35 Indicative plan of first floor ceiling showing key elements