

Donald Insall Associates
Chartered Architects and Historic Building Consultants

Rutherford Building, Coupland Street, Manchester, M13 9GP

Level 3 Building Record

For University of Manchester



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Contents

1.0	Introduction	**2**
2.0	Staircase	**8**
3.0	Basement	**12**
4.0	Ground Floor	**16**
5.0	First Floor	**36**
6.0	Second Floor	**62**
7.0	Third Floor	**92**
Appendix A	Heritage Impact Assessment Vol.1	**108**
Appendix B	Heritage Impact Assessment Vol.2	**158**

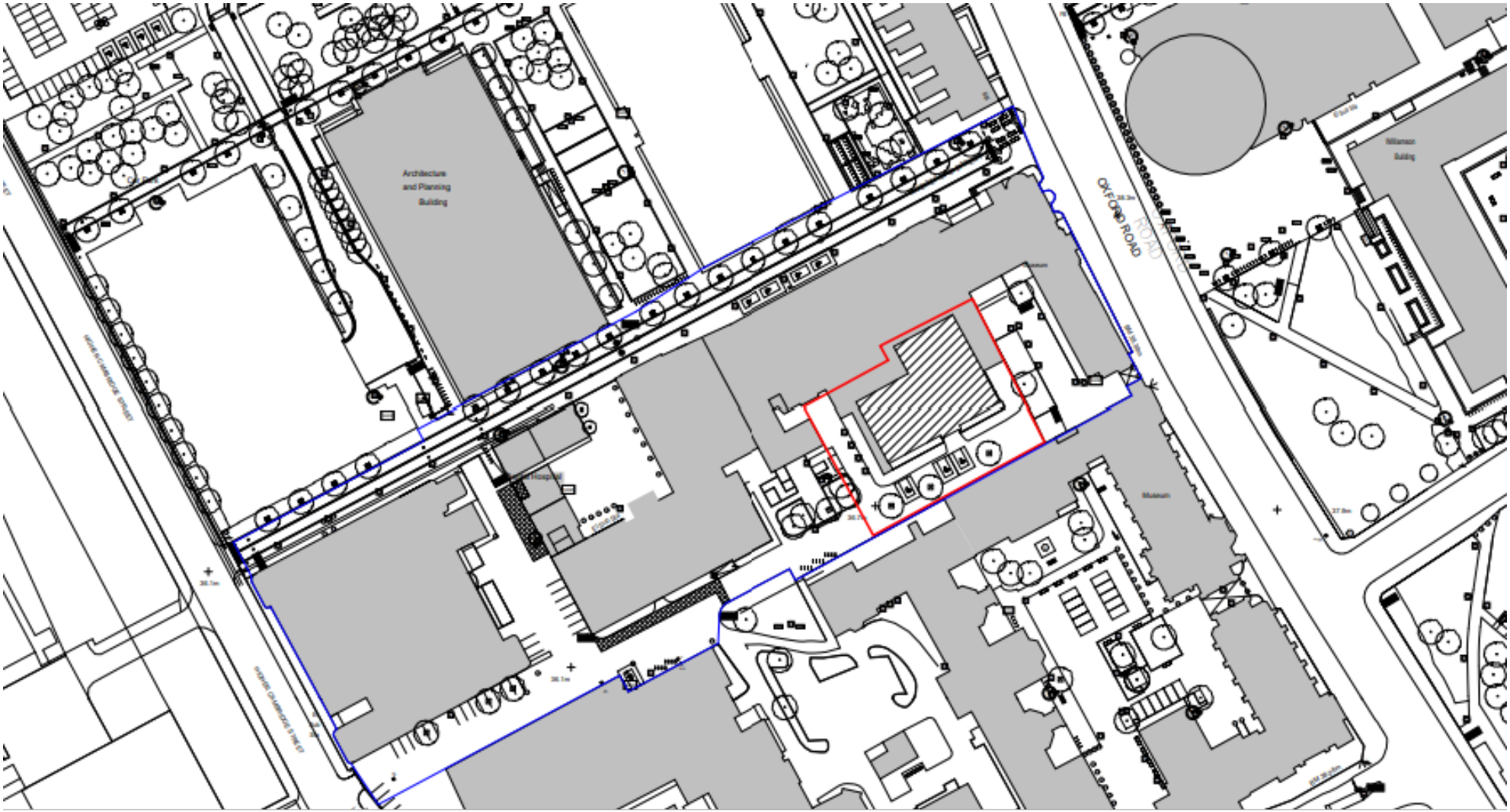


Plate *1.1 Site location plan (Arcadis) NTS*

1.0 Introduction

1.1 Introduction

Donald Insall Associates was commissioned by University of Manchester to assist in a series of proposals for the repair and refurbishment of the Rutherford Building **[Plates 1.1].** Listed building consent (RN: 138277/LO/2023) was granted for the 'repair, part removal and reinstatement of areas of floors and ceilings, and alteration of internal partitions' in February 2024. Condition 3 of the decision notice requires the following:

> *Notwithstanding the details as set out in condition 2 above before the following elements proceed final details (including where appropriate specification and method statements) of the following must be submitted to and approved in writing by the City Council as Local Planning Authority:*
>
> - *Before the works hereby granted consent are commenced details of a **watching brief for the strip out / removal of any existing features, finishes and partitions** must be submitted to and approved in writing by the City Council as Local Planning Authority.*
> - *Before the works hereby granted consent are commenced a **Level 3 historic building recording of the interior** of the Grade II listed building and including a complete photographic record of its current condition must be submitted to and approved in writing by the City Council as Local Planning Authority*

This document is submitted to Manchester City Council (MCC) to part discharge this condition, representing the **Level 3 Building Record.** The Watching Brief will be submitted separately.

1.2 Aims and Objectives

This building record comprises a written, drawn, and photographic survey of the building to a **Level 3 standard**, as prescribed by Condition 3 and defined by Section 5.3 in Historic England's *Understanding Historic Buildings: a guide to good recording practice* (2016) which states:

> *Level 3 is an analytical record and will comprise an introductory description followed by a systematic account of the building's origins, development, and use. The record will include an account of the evidence on which the analysis has been based, allowing the validity of the record to be re-examined in detail. It will also include all drawn and photographic records that may be required to illustrate the building's appearance and structure and to support an historical analysis.*

A summary of the building and its significance is outlined below (sections 1.6 and 1.7), before a floor-by-floor record of the interior in sections 2-7. A comprehensive description of the building, its historical development and significance is outlined in Appendix A and B (comprising the Heritage Impact Assessment for the scheme, also prepared by Donald Insall Associates), and should be read in conjunction with, and to inform, the photographic and drawn record below.

1.5 Professional Standards

The recording has followed the requirements outlined in *Historic England's Understanding Historic Buildings: A Guide to Good Recording Practice (2016)* and conform to *the IHBC Code of Conduct.* The recording field work has been undertaken by Antony Lowe AssocIHBC. It has also been subject to internal review in accordance with our company Quality Assurance standards (ISO 9001 and 14001) by Rebecca Burrows IHBC.

1.6 Building Summary

1.6.3 Description

The site comprises part of the Grade-II listed Rutherford Building and Hopkinson Memorial Wing **[Plate 1.2]** located on Coupland Street, off Oxford Street. Some of the interior spaces, including the basement, are in separate use by the Manchester Museum and are not subject to the approved scheme (and as such have been scoped out of this recording exercise). This is also the case for other parts of the Listed Building including the Hopkinson Memorial wing and frontage on Bridgeford Street.

The relevant part of the building is L-shaped with two intersecting ranges oriented east-west and north-south (simplified for this record from the 'south-west to north-east', and 'north-west to south-east' orientation onsite). Three storeys with a basement and mezzanines, the building is brick with stone detail and plain clay tile pitched roofs incorporating brick stacks (other than a flat-roofed section which was originally intended as an observatory). The historic entrance to Coupland Street (still in operation) incorporates a masonry surround with university heraldry, a later entrance has been added to the west elevation with access ramp. The interior is arranged primarily with east-west corridors leading to cellular rooms to the north and south, historically a range of research and study rooms for the Department of Physics, with the staircase (rising from basement to third floor) to the north-east adjoining the intersection of the two ranges.

[Plates 1.3-1.10]



Plate *1.2 Extent of Listed Building (Historic England)*



Plate *1.3 Front (south) elevation*



Plate *1.5 Rear (north) elevation, visible only over adjoining structures*



Plate *1.7 Modern ramp, west elevation*



Plate *1.4 West return elevation*

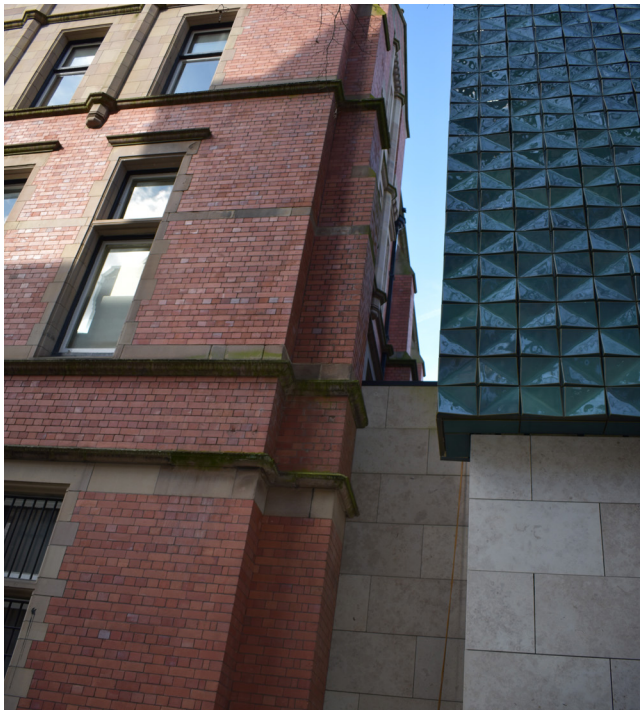


Plate *1.6 East return elevation, enclosed by museum building*



Plate *1.8 Balcony structure, west elevation*



Plate *1.9 Railing detail, south elevation*



Plate *1.10 Masonry surround, main entrance, south elevation*

There is a common historic decorative pattern across the interior that includes moulded beams and cornices to ceilings set onto an expanded metal lath and plaster sub-structure, terrazzo flooring, glazed blue tiles at dado level and buff brick above to circulation spaces, and a distinctive use of glazed bricks to the main cellular rooms with a pattern of cream above the dado, orange for dado level and dark brown to denote skirtings and dado rail levels, though these have largely been over boarded other than around windows, doors and some walls. Some spaces use buff, rather than glazed brick, which may indicate the historic use of the space. Windows are timber casements, the outer frames historic but inner casement all replaced, incorporating well-detailed chamfers to the interior reveals. The building retains historic panelled interior doors. Whilst some historic floorboards are retained, most have been replaced with chipboard and carpets. The structure below is a mix of timber and steel joists with expanded metal lath and plaster.

[Plates 1.11-1.15]



Plate *1.11 Example blue glazed tile detail to circulation*



Plate *1.12 Example door joinery*



Plate *1.13 Example glazed brick scheme*



Plate *1.14 Example ceiling detail*



Plate *1.15 Example window interior reveal detail (aRCADIS)*

1.6.2 Significance

The building was designed specifically for the Department of Physics between 1898 and 1902, a collaboration between the Head of Physics, Arthur Schuster, and architect Wiliam Beaumont. The building is a fine example of late Victorian and early Edwardian educational architecture and spatial planning, adopting Germanic practises of practical learning. It further incorporates purpose-built spaces for research into newly developing fields of Physics and innovative approaches to building services. Following its construction, the building played host to a range of highly significant figures including Ernest Rutherford, Henry Geiger and Alan Turing, and holds associations with historically significant discoveries such as Rutherford's splitting of the atom. Further reflecting Schuster and Beaumont's sense of innovation were the historic insertion of a lift shaft, ventilation system and the use of expanded metal lath for the plaster ceilings.

The building remains in educational use though no longer as the Department of Physics. Whilst the original uses of each room have changed, documentary evidence remains to outline the clustering of specialist research and teaching spaces, with some evidence remaining to the interior (such as volume of spaces indicating former lecture theatres, and specialist elements such as a stone aperture to the second floor which allowed light into the room for spectroscopic experiments). Similarly, Schuster and Beaumont's original vision is evident with interior finishes, most notably a scheme of glazed bricks to wall surfaces as well as decorative plasterwork, though this has been undermined by extensive plasterboard and addition of modern service trunking throughout the building.

2.0 Staircase

The staircase rises from basement to third floor level and is a cantilevered design though incorporating some historic iron girders. It has a polished handrail with cast-iron balustrading, concrete steps with mosaic design to the half and main landings (other than between the second and third floors) and walls are glazed blue tile to dado level with buff (unglazed) brick above (English bond). Large timber casement windows are set on the half landings, with modern furniture. Cornices run around the underside of stair flights, with molded support beams to landings. Timber screens separating the staircase from corridors are modern additions and there is modern suspended lighting throughout.

[Plates 2.1-2.16].



Plate *2.1 Staircase from third floor down*



Plate *2.2 Relationship between floors (ground to first)*



Plate *2.3 Relationship between main and half landings (first to second floor)*



Plate *2.4 Indicative example of modern fire screen (ground floor)*



Plate *2.5 Modern fire screen to third floor.*



Plate *2.6 Glazed tile to dado level*



Plate *2.7 Buff brickwork above dado level*



Plate *2.8 Stair detail*



Plate *2.9 Step detail*



Plate *2.11 Main landing mosaic detail*



Plate *2.13 Handrail detail*



Plate *2.10 Half landing mosaic detail*



Plate *2.12 Balustrade detail*



Plate *2.14 Window detail (second to third floor flight)*



Plate *2.15 Cornice and beam detail, third floor*



Plate *2.16 Underside of stair flight with support and cornice detail*

3.0 Basement

[Plate 3.0]

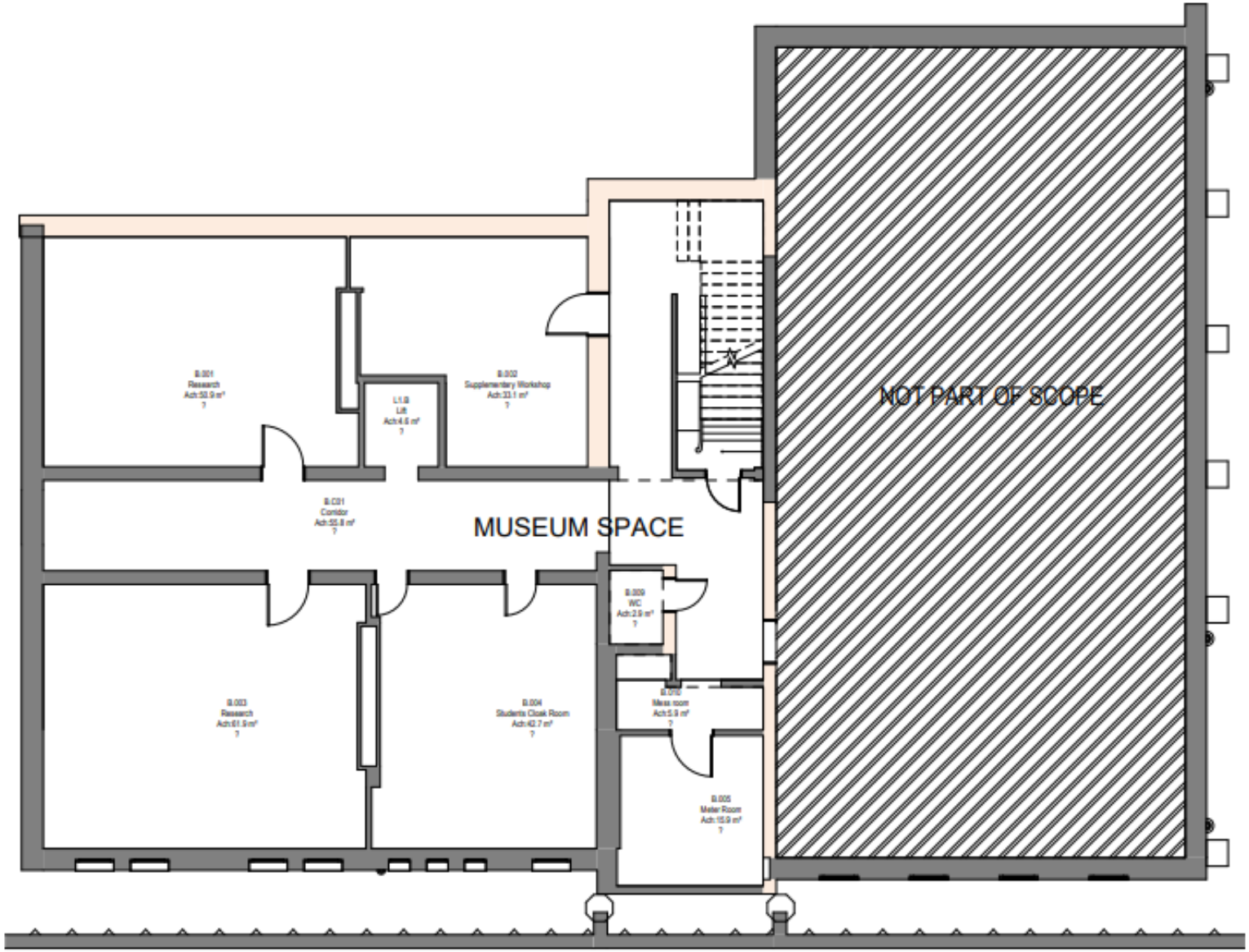


Plate *3.0 Basement floor plan and room numbers (Arcadis) NTS*

Most of the basement is outside the scope of the scheme, other than the following:

B.C01 Corridor

- **Historic use:** Circulation.
- **Current use:** As historic.
- **Layout:** As historic plan, with some partitioning to the south for WC and mess room (outside demise).
- **Doors:** Historic timber doors with architraves leading to cellular spaces.
- **Walls:** Exposed glazed brick, upper section painted.
- **Ceiling**: Plaster with cornices.
- **Floors**: Concrete.
- **Services**: Significant range of pipework at ceiling level leading to an adjoining subterranean tunnel.
- **Other features:** Arched brick openings at crossing of the north-south and east-west corridors.

[Plates 3.1-3.4].



Plate *3.1 B.C01 General view east to west*



Plate *3.2 B.C02 General view west to east*



Plate *3.3 B.C01 Door to subterranean tunnel*



Plate *3.4 B.C01 Cornice level and services*

B.002 Pottery Store

- **Historic Use:** Workshop with staircase to room above (G.056, now removed).
- **Existing use:** Museum storage (with later shelving and cupboards added).
- **Layout**: As historic.
- **Doors**: Historic timber door with architraves.
- **Walls**: Generally painted brick, plasterboard to lift shaft.
- **Ceiling**: Plaster with molded beams but no cornice.
- **Floors**: Historic parquet floor.
- **Services**: *Ad hoc* pipework throughout, including leading into B.C01.
- **Other features**: Arched openings to north wall, now blocked with breezeblock.

[Plates 3.5-3.9].



Plate *3.5 B.002 Arches in north wall*



Plate *3.7 B.02 Plasterboard around lift shaft*



Plate *3.6 B.002 Parquet flooring*



Plate *3.8 B.02 General View east to west showing painted brick*



Plate *3.9 B.002 Timber doorway*

4.0 Ground Floor

[Plate 4.0]

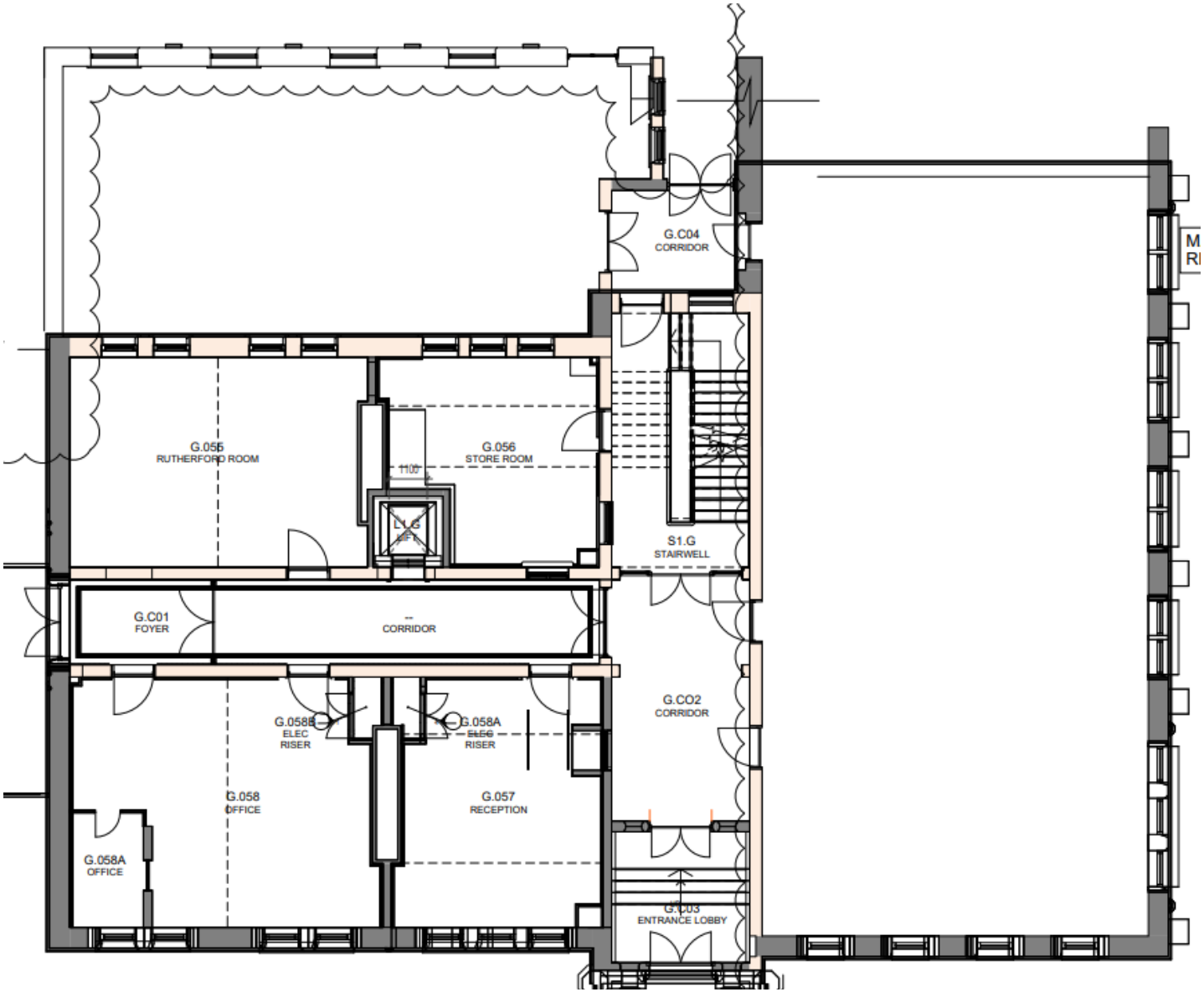


Plate *4.0 Ground floor plan and room numbers (Arcadis) NTS*

G.C01 Corridor

- **Historic use**: Circulation.
- **Current use**: As historic.
- **Layout**: Modern secure foyer added to west end entrance door.
- **Doors**: Historic timber doors with architraves, modern furniture leading to cellular rooms, other than glazed timber door from foyer into G.058 which is modern. Screen separating G.C.01 with GC.02 is modern, though surrounding buff brick arch is historic.
- **Walls**: Plaster (likely modern given finishes elsewhere in the building) with blue glazed tile to dado level (generally historic, with some repairs).
- **Ceiling**: Plaster with cornice.
- **Floors**: Terrazzo.
- **Windows**: Interior window to G.057 is a historic location, but the frame is modern.
- **Services**: Modern suspended lighting and service trunking to cornice level.
- **Other features**: Lift shaft is in a historic location but may have been enlarged and has been reclad in stainless steel.

[Plates 4.1-4.11].

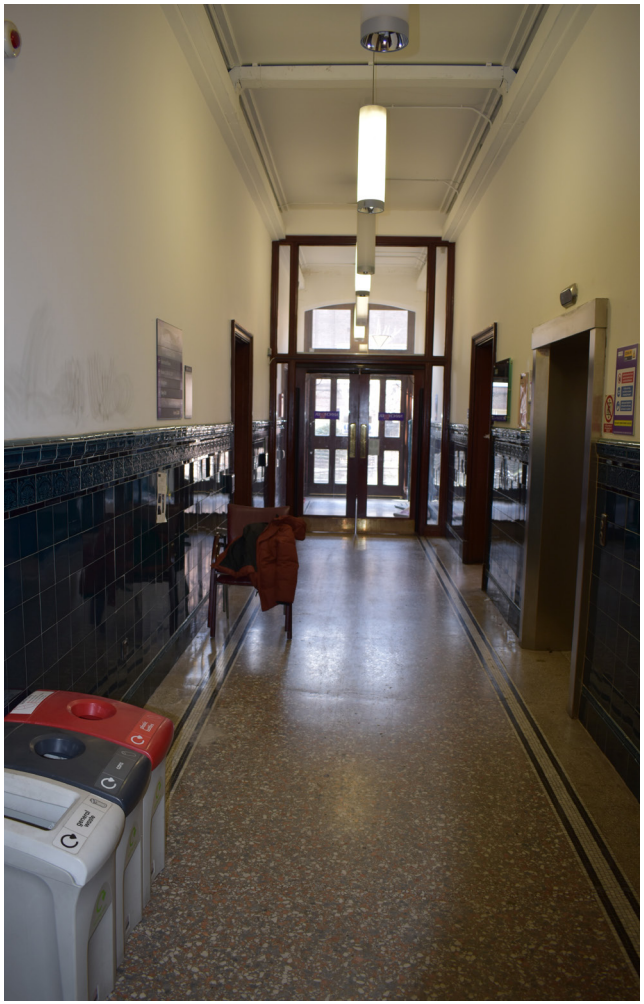


Plate *4.1 G.C01 General view east to west*



Plate *4.2 G.C01 General view west to east*



Plate *4.3 G.C01 Ceiling detail*



Plate *4.4 G.C01 Cornice with trunking below*



Plate *4.5 G.C01 Terrazzo floor detail*



Plate *4.6 G.C01 Glazed blue tile*



Plate *4.7 G.C01 Lift doors*



Plate *4.8 G.C01 Modern door into G.058*



Plate *4.9 G.C01 Modern door to foyer*



Plate *4.10 G.C01 Modern timber door to west elevation*



Plate *4.11 G.C01 Modern window frame into G.056*

GC.02 Corridor

- **Historic use**: Circulation, leading from entrance vestibule.
- **Current use**: As historic.
- **Layout**: Opening added to west wall to create a reception area in G.057.
- **Doors**: Modern fire screen doors added separating G.C02 from G.C01 and G.C03. Historic door openings in east wall, historically leading to switchboard room and electricity research but now in separate museum use. Northeast door is historic, southeast door is a later replacement. Timber door frame in the terracotta screen separating GC.02 from GC.03 is modern.
- **Walls**: Plaster, likely later given finishes elsewhere, with historic glazed blue tiles to dado level. Buff brick exposed around arches at crossing of east-west and north-south corridors. Screen separating G.C02 from G.C03 is terracotta (historic).
- **Ceiling**: Plaster with molded beams and cornice.
- **Floors**: Terrazzo.
- **Windows**: Historic leaded lights inset into the terracotta screen separating G.C02 from G.C03.
- **Services**: Modern suspended lighting and general pipework.

[Plates 4.12-4.20].



Plate *4.12 G.C02 Teracotta screen, with modern door frame, with G.C03*



Plate *4.13 G.C02 Modern fire screen door to staircase.*



Plate *4.14 G.C02 Door leading to G.C01*



Plate *4.15 G.C02 Ceiling detail*



Plate *4.16 G.C02 Northeast door, historic, into museum*



Plate *4.17 G.C02 Southeast door, modern into museum*



Plate *4.18 G.C02 Modern window into G.057 for reception area*



Plate *4.19 G.C02 Terrazzo floor detail*



Plate *4.20 Leaded light detail*

G.C03 Entrance Lobby

- **Historic use**: Entrance and vestibule.
- **Current use**: As historic.
- **Layout**: As historic.
- **Doors**: Large heavy timber door to Coupland street (historic). Modern timber door inserted into terracotta screen with G.C02.
- **Windows**: Leaded lights to main entrance and screen to G.C02.
- **Walls**: Ashlar stone to Coupland Street, remainder is terracotta.
- **Floors**: Terrazzo with mosaic design, steps leading to screen with G.C02.
- **Ceiling**: Barrell vault, molded timber.
- **Services**: Modern suspended lighting.

[Plates 4.21-3.31].



Plate *4.21 G.C03 Teracotta entrance screen to G.C02*



Plate *4.22 G.C03 Teracotta detail to east wall*



Plate *4.23 G.C03 Teracotta detail to west wall*



Plate *4.24 G.C03 Barrell Vault ceiling*



Plate *4.27 G.C03 Steps*



Plate *4.28 Terrazzo floor detail*



Plate *4.30 G.C03 Junction of terracotta with stone detail*



Plate *4.29 G.C03 Leaded light detail to Coupland Street*



Plate *4.31 G.055 Doorway to G.C01*

G.055 Rutherford Room

- **Historic use:** Private laboratory, though research suggests Rutherford's laboratory was actually at basement level.
- **Current use:** Meeting room incorporating interpretation boards.
- **Layout**: As historic.
- **Doors**: Historic timber door and architrave, with modern furniture, from G.C01.
- **Walls**: Glazed brick throughout.
- **Ceiling**: Plaster with molded beams and cornices.
- **Floors**: Historic timber boards.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern service trunking and lighting throughout.
- **Other features**: Historic vent exposed to chimney stack. Rutherford's desk (affixed, though likely moved from the basement). Former lecture theatre benches are not affixed.

[Plates 4.31-3.4.42].



Plate *4.31 G.C03 Main entrance*



Plate *4.32 G.055 General view*



Plate *4.33 G.055 North exterior wall*



Plate *4.34 G.055 South interior wall*



Plate *4.36 G.055 East interior wall*



Plate *4.38 G.055 Rutherford's desk*



Plate *4.35 G.055 West exterior wall*



Plate *4.37 G.055 Floor*



Plate *4.39 G.055 Ceiling detail*



Plate *4.40 G.055 Cornice detail around chimney stack*



Plate *4.41 G.055 Vent to chimney stack*

G.056 Storeroom

- **Historic use:** Workshop with staircase to room below (B.02), now removed.
- **Current use:** Storeroom.
- **Layout** As historic, though without earlier staircase to basement.
- **Doors**: Historic timber door and architrave, with modern furniture, from S1.G.
- **Walls**: Plaster, modern with skirting boards over, other than exposed buff brick around the exterior windows and interior window to G.C01.
- **Ceiling**: Plaster with molded beams and cornices.
- **Floors**: Carpet, chipboard below.
- **Windows**: Interior window to G.C01 is a historic location but frame is later.
- **Services**: Modern trunking and lighting throughout. Lift shaft projects into the room and adjoins the chimney stack, though this is shown on the historic plans smaller, suggesting a rebuild.

[Plates 4.42-4.49].



Plate *4.42 G.055 Ceiling*



Plate *4.44 G.056 East interior wall with door and window*



Plate *4.45 G.056 West interior wall*



Plate *4.43 G.056 General view from doorway*



Plate *4.46 North exterior wall*



Plate *4.48 G.057 Floor*



Plate *4.47 G.056 South interior wall with window to G.C01*



Plate *4.49 G.056 Ceiling*

G.057 Reception

- **Historic use:** Library and reading room.
- **Current use:** Reception.
- **Layout**: Incorporates later riser and opening to G.C02 (the latter to create a reception). Blocked up doorway evident within riser cupboard to G.058.
- **Doors**: Historic door and architrave, with modern furniture, from G.C01.
- **Walls**: Modern plaster, modern with skirting boards over, other than exterior windows and interior door to G.C01 where there is exposed glazed brick.
- **Ceiling**: Plaster with molded beams and cornices.
- **Floors**: Carpet, chipboard below.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern trunking and lighting throughout.

[Plates 4.50-4.61].



Plate *4.50 G.057 General view from doorway*



Plate *4.52 G.057 North interior wall*



Plate *4.51 G.057 South exterior wall*



Plate *4.53 G.057 West interior wall with stack*



Plate *4.54 G.057 East interior wall with modern reception window*



Plate *4.56 Ceiling detail to G.057*



Plate *4.58 G.057 Doorway to G.C01*



Plate *4.55 G.057 Floor*



Plate *4.57 G.057 Glazed tile behind modern plasterboard*



Plate *4.59 Riser joinery to G.057*



Plate *4.60 G.057 Cornice within the modern riser cupboard*



Plate *4.61 G.057 Exposed glazed brick in riser cupboard*

G.058 Ofiice

- **Historic use:** Alternating currents research.
- **Current use:** Office.
- **Layout**: Incorporates a modern plasterboard and glazed partition to the southwest.
- **Doors**: Two doors, with architraves and modern furniture from G.C01. That to the foyer is modern, inserted when G.C01 was divided.
- **Walls**: Plaster, modern, with skirting boards over, other than exterior windows and interior door to G.C01 where there is exposed glazed brick.
- **Ceiling**: Plaster with molded beams and cornices.
- **Floors**: Carpet, chipboard below.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern trunking and lighting throughout.

[Plates 4.62-4.73].



Plate *4.62 G.058 General view from doorway*



Plate *4.63 G.058 South exterior wall*



Plate *4.65 G.058 East interior wall*



Plate *4.64 G.058 North interior wall*



Plate *4.66 G.058 West exterior wall with partition*



Plate *4.67 G.058a Floor*



Plate *4.68 G.058a Window*



Plate *4.69 G.058a Ceiling*



Plate *4.70 G.058 Ceiling*



Plate *4.71 G.058 Ceiling Detail*



Plate *4.72 G.058 Historic door to G.C01*



Plate *4.73 G.058 Modern door to foyer (G.C01)*

5.0 First Floor

[Plate 5.0]

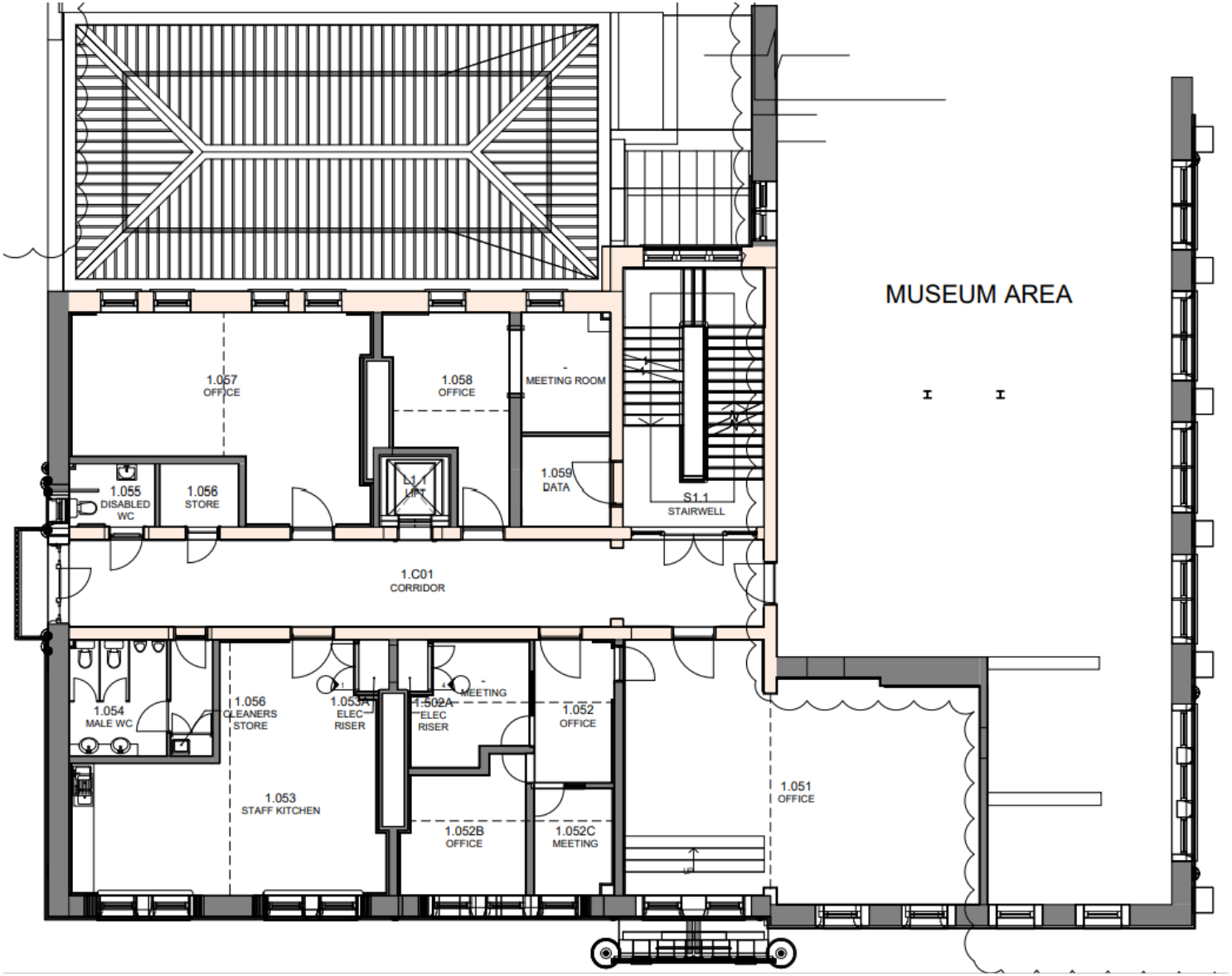


Plate *5.0 First floor plan and room numbers (Arcadis) NTS*

1.C01 Corridor

- **Historic use:** Circulation.
- **Current use:** As historic.
- **Layout**: As historic.
- **Doors**: Historic timber doors with architraves, modern furniture, leading to cellular rooms. Screen to stair core, and door onto balcony, are modern (the balcony aperture itself is historic).
- **Walls**: Plaster (likely modern given finishes elsewhere in the building) with blue glazed tile to dado level. Exposed buff brick to arches and around door to external balcony.
- **Ceiling**: Plaster with cornice.
- **Floors**: Terrazzo.
- **Services**: Modern suspended lighting and service trunking to cornice level.
- **Other features:** Lift shaft is in a historic location but may have been enlarged and has been reclad in stainless steel.

[Plates 5.1-5.7].



Plate *5.1 1.C01 General view west*



Plate *5.2 1.C01 General view east*



Plate *5.3 1.C01 General view along south interior wall*



Plate *5.4 1.C01 General view along north interior wall*



Plate *5.5 1.C01 Terrazzo floor detail*



Plate *5.6 1.C01 Modern screen to staircase*



Plate *5.7 1.C01 Cornice detail*

1.051 Office

- **Historic use:** Electricity research
- **Current use:** Office.
- **Layout:** Volume as historic, though originally had an opening to an adjoining lecture theatre (north) and a Balance Room (east). These are now blocked, and the associated spaces in museum use. Connection to 1.025, also historically used for electricity research, remains.
- **Doors**: Historic timber doors with architraves to 1.C01 and 1.052.
- **Walls**: Modern plaster, with exposed glazed brick to south exterior wall, part of north interior wall and surrounding doorways.
- **Ceiling**: Plaster with cornice and molded beams.
- **Floors**: Carpet, chipboard below.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern suspended lighting and service trunking throughout.

[Plates 5.8-5.19].



Plate *5.8 1.051 General view from doorway*



Plate *5.10 1.051 North interior wall*



Plate *5.9 1.051 South exterior wall*

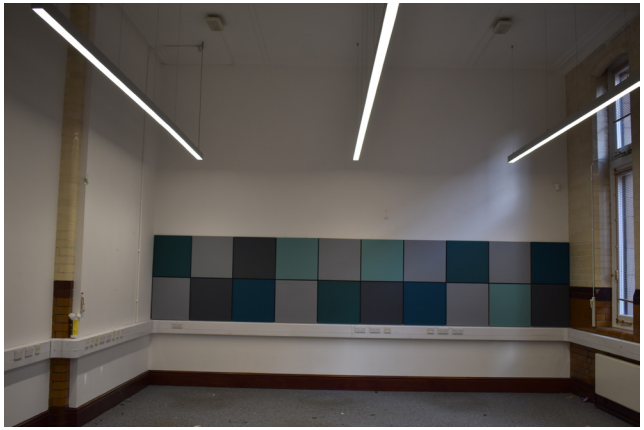


Plate *5.11 1.051 East interior wall*



Plate *5.12 1.051 West interior wall with connection to 1.052*



Plate *5.14 1.051 Floor*

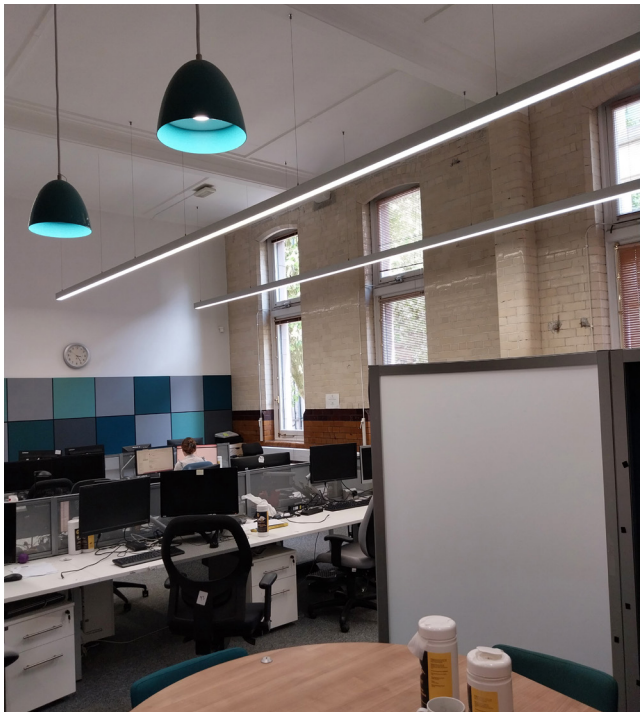


Plate *5.16 1.051 Ceiling (Arcadis)*



Plate *5.13 1.051 North interior wall - historic lcoation of doorways into adjoining lecture theare*



Plate *5.15 1.051 Ceiling*



Plate *5.17 1.051 Beam detail*



Plate *5.18 1.051 Doorway to 1.C01*



Plate *5.19 1051 Doorway to 1.052*

1.052 Offices

- **Historic use:** Electricity research
- **Current use:** Offices.
- **Layout**: Room has been subdivided into an entrance and three meeting rooms. Connection with the adjoining room (1.051) survives, which was also used for electricity research. A riser has been inserted to the northwest corner, where historically there was an opening to 1.053 (historically used for optics research).
- **Doors**: Historic timber doors with modern furniture to 1.C01 and 1.051.
- **Walls**: Modern plaster with skirtings, other than exposed glazed brick around doors and windows.
- **Ceiling**: Plaster with molded beams and cornice, continuing into riser.
- **Floors:** Carpet, chipboard beneath.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern lighting and trunking throughout.
- **Other features:** Blocked up doorway to 1.053 evident in the riser cupboard, where some glazed tiles are exposed.

[Plates 5.20-5.33].

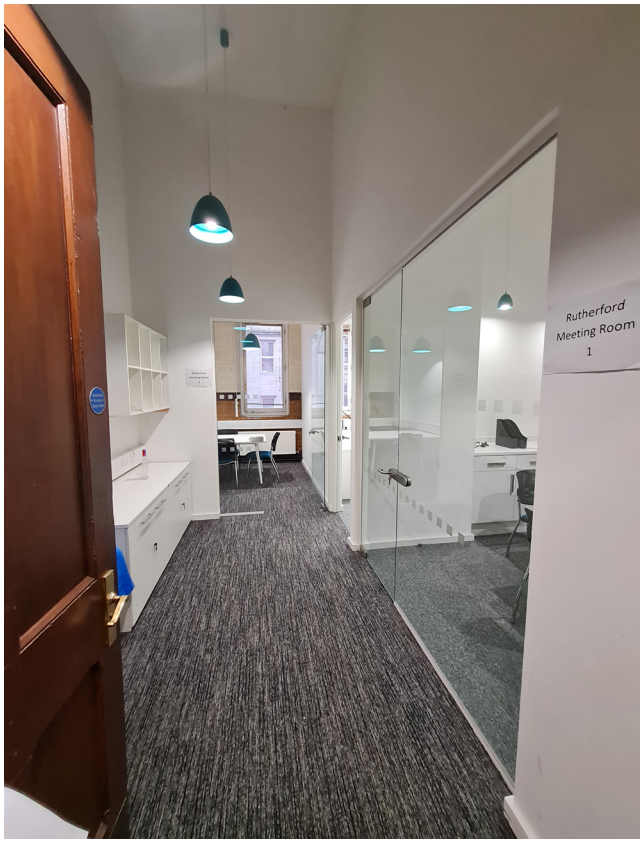


Plate *5.20 1.052 General view from doorway (Arcadis)*



Plate *5.21 1.052 General view back to doorway, and connecting door with 1.051 (Arcadis)*



Plate *5.22 1.052A General view of partition (Arcadis)*



Plate *5.22 1.052B Interior (Arcadis)*

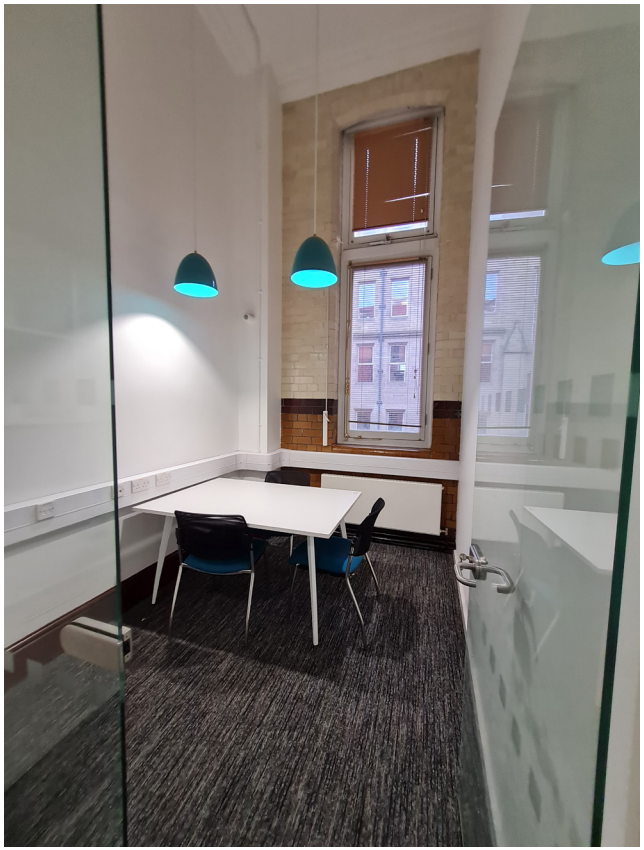


Plate *5.23 1.052C Interior (Arcadis)*



Plate *5.24 1.052A Ceiling*



Plate *5.24 1.052B Ceiling*



Plate *5.25 1.052B Cornice detail*



Plate *5.26 1.052 Ceiling 1.052 Ceiling*



Plate *5.27 1.052B Window*



Plate *5.28 1.052C Window*



Plate *5.29 1.059C Floor*



Plate *5.30 1.052 Door to 1.051*



Plate *5.31 1.052 Door to 1.C01*



Plate *5.32 1.052 Cornice within riser*



Plate *5.33 1.052 BLocked up doorway to 1.053 in riser*



Plate *5.34 1.053 General view from doorway*

1.053 Staff Kitchen

- **Historic use:** Optics research.
- **Current use:** Staff kitchen.
- **Layout**: Heavy subdivision to the northwest corner to create separate WCs. Riser has been inserted, where historically there was a connection with 1.052.
- **Doors**: Historic timber door and architrave to 1.CD01.
- **Walls**: Modern plasterboard with skirtings, red (non-glazed) brick to door surround and window cills.
- **Ceiling**: Plaster with cornice and molded beams.
- **Floors**: Linoleum, with chipboard beneath.
- **Windows**: Timber casement with modern furniture.
- **Services**: Modern kitchen fit out, lighting and service trunking.

[Plates 5.34-5.46]



Plate *5.35 1.053 South exterior wall*



Plate *5.36 1.053 North interior wall and partition with 1.054*



Plate *5.38 1.053 East interior wall*



Plate *5.38 West exterior wall and partition with 1.054*



Plate *5.39 1.053 partition with 1.054*



Plate *5.40 1.053 Ceiling*



Plate *5.41 1.053 Ceiling beam detail adjoining partition with 1.054*



Plate *5.42 1.053 Riser cupboard*



Plate *5.43 1.053 Flooring*



Plate *5.44 1.053 Door with 1.C01*



Plate *5.45 Red brick and skirting detail*



Plate *5.46 1.053 Brick detail around windows*

1.054 Male WC

- **Historic use:** None, modern insertion.
- **Current use:** WC.
- **Layout**: Projects into the historic volume of 1.053.
- **Doors**: Modern timber doors to 1.C01 and internal (but matching historic joinery). Modern doors to interior (with architraves matching historic joinery).
- **Walls**: Plaster.
- **Ceiling**: Suspended, with painted brick visible above.
- **Floors**: Linoleum / vinyl.
- **Windows**: Timber casement window, modern furniture.
- **Services**: Modern WCs.

[Plates 5.47-5.51]



Plate *5.47 1.054 Timber door from 1.C01*



Plate *5.48 1.054 Modern interior doors, though architraves reflect historic joinery in the building*

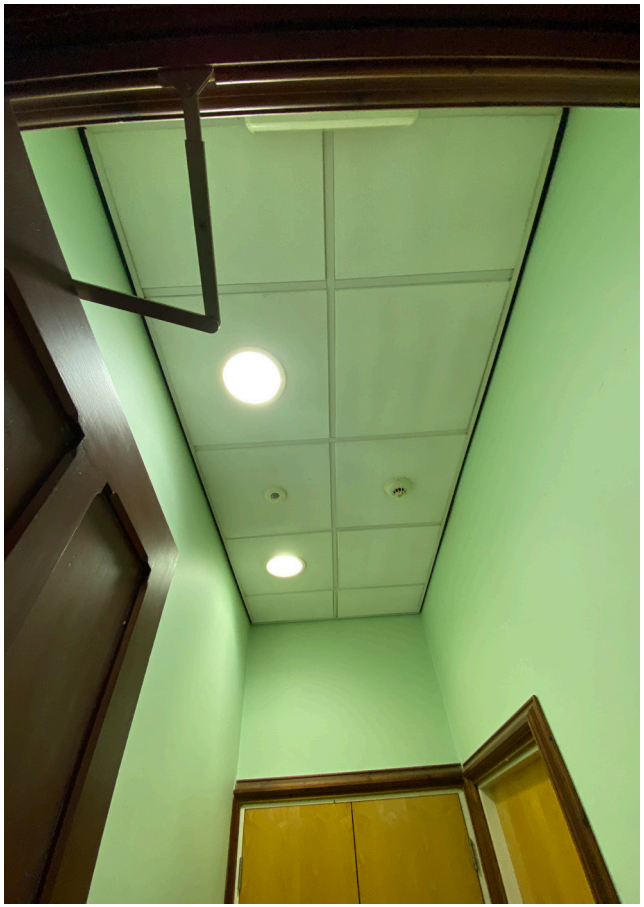


Plate *5.49 1.1054 Suspended ceiling to vestibule area*



Plate *5.50 1.054 Supsended ceiling in main toilet area*



Plate *5.51 1.054 Painted brickwork visible above suspended ceiling (north interior wall)*

1.055 Disabled WC

- **Historic use**: WC.
- **Current use:** As historic.
- **Layout**: Historically a WC, but historic plans indicate it may have been enlarged.
- **Doors**: Likely historic door from 1.C01.
- **Walls**: Modern plaster, with glazed brick exposed around window, and modern skirting.
- **Ceiling**: Suspended ceiling with painted brick visible above to west exterior wall.
- **Floors**: Vinyl / Linoleum.
- **Windows**: Timber casement with modern furniture.
- **Services**: Modern WC fittings.

[Plates 5.52-5.55]



Plate *5.52 1.055 General view from doorway*



Plate *5.53 1.055 Window*



Plate *5.54 1.055 Suspended ceiling with painted brick above (west exterior wall)*



Plate *5.55 1.055 Door in 1.C01*

1.056 Store

- **Historic use:** Unknown, likely storeroom or wash facilities.
- **Current use**: Storeroom.
- **Layout**: Historically a store, but historic plans indicate it may have been enlarged.
- **Doors**: Likely historic door from 1.C01.
- **Walls**: Modern plaster with skirting boards.
- **Ceiling**: Suspended ceiling with painted brick visible above.
- **Floors**: Modern plaster, with glazed brick exposed around window.

[Plates 5.56-5.59]



Plate *5.56 1.056 Doorway from 1.C01*



Plate *5.57 1.056 Suspended ceiling*



Plate *5.58 1.056 Painted brick above suspended ceiling (south interior wall)*



Plate *5.59 1.056 Skirtings*

1.057 Office

- **Historic use**: Sound, and general physics research
- **Current use**: Office.
- **Layout**: Generally as historic, but the adjoining WC and storeroom (1.055 and 1.056) may have been enlarged, with some visible alterations to the cornice.
- **Doors**: Historic timber door to 1.C01.
- **Walls**: Modern plasterboard with skirtings, other than exposed glazed brick to north exterior wall and around doorway.
- **Ceiling**: Plaster with cornice and molded beams.
- **Floors**: Carpet with chipboard beneath.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern suspended lighting and general service trunking.

[Plates 5.60-5.69]



Plate *5.60 1.057 North exterior wall*



Plate *5.61 1.057 Doorway from 1.C01 on south interior wall*



Plate *5.63 1.057 Potential redirection of cornice around 1.055 and 1.056*



Plate *5.62 1.057 South interior wall, and partition with 1.055 and 1.056*



Plate *5.63a 1.057 Close up of cornice around 1.056*



Plate *5.64 1.057 West exterior wall*



Plate *5.65 1.057 East interior wall*



Plate *5.67 1.057 Floor*



Plate *5.68 1.057 Door to 1.C01*



Plate *5.69 1.057 Ceiling*

1.058 Office

- **Historic use:** Office of the Head of Physics with adjoining anteroom.
- **Current use**: Office
- **Layout**: Historic wall between the Head of Physics' Office and anteroom remains, but the opening has been moved and enlarged, and the anteroom has been partitioned to create a separate server room (1.059). Lift shaft projects into room. Historic location for a lift shaft but may have been enlarged and replaced.
- **Doors**: Historic timber door with architrave from 1.C01. Timber portal adjoining two rooms is later.
- **Walls**: Plaster with modern skirtings.
- **Ceiling**: Plaster with molded beam and cornice, truncated (though continuing) where it is separated from 1.059.
- **Floors**: Carpet, with chipboard below.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern suspended lighting and service trunking.
- **Other features**: Timber picture rails are modern, inserted atop the plasterboard.

[Plates 5.70-5.78]



Plate *5.70 1.058 View to north exterior wall from doorway*



Plate *5.71 1.058 View to south interior wall with doorway to 1.C01*



Plate *5.72 1.058 Ceiling and partition with the lift shaft*



Plate *5.74 1.058 Skirting*



Plate *5.76 1.058 adjoining room general view*



Plate *5.73 1.057 View through modern portal to adjoining space (east interior wall)*



Plate *5.75 1.058 left hand room ceiling*



Plate *5.77 1.058 Window in adjoining room*



Plate *5.78 1.058 Ceiling in adjoining room truncated by modern partition with 1.059*

1.059 Server Room

- **Historic use:** Part of the anteroom to the Head of Physics' office.
- **Current use:** Server room.
- **Layout**: Has been subdivided from the remainder of the historic anteroom to create a server room. Historic connection from S1.1 remains.
- **Doors**: Historic timber door from S1.1.
- **Walls**: Modern plaster with skirting boards.
- **Ceiling**: Plaster with cornice, continuing from 1.058.
- **Floors**: Modern tile and chipboard.
- **Services**: Modern services intrude into cornices.

[Plates 5.79-5.82]



Plate *5.79 1.059 Door from 1.C01*



Plate *5.80 1.059 Ceiling, full pattern runs into 1.058*

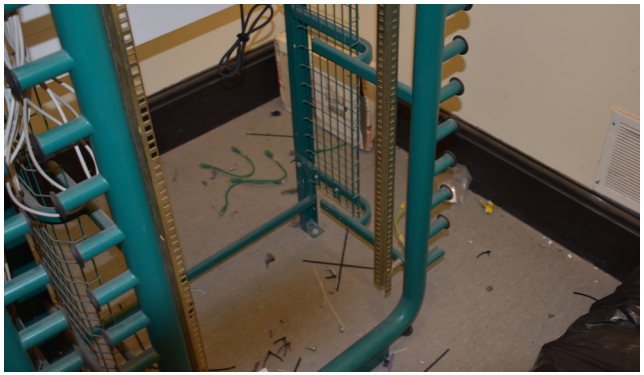


Plate *5.81 1.059 Floor and skitings*



Plate *5.82 1.059 Floor coverings*

6.0 Second Floor

[Plate 6.0]

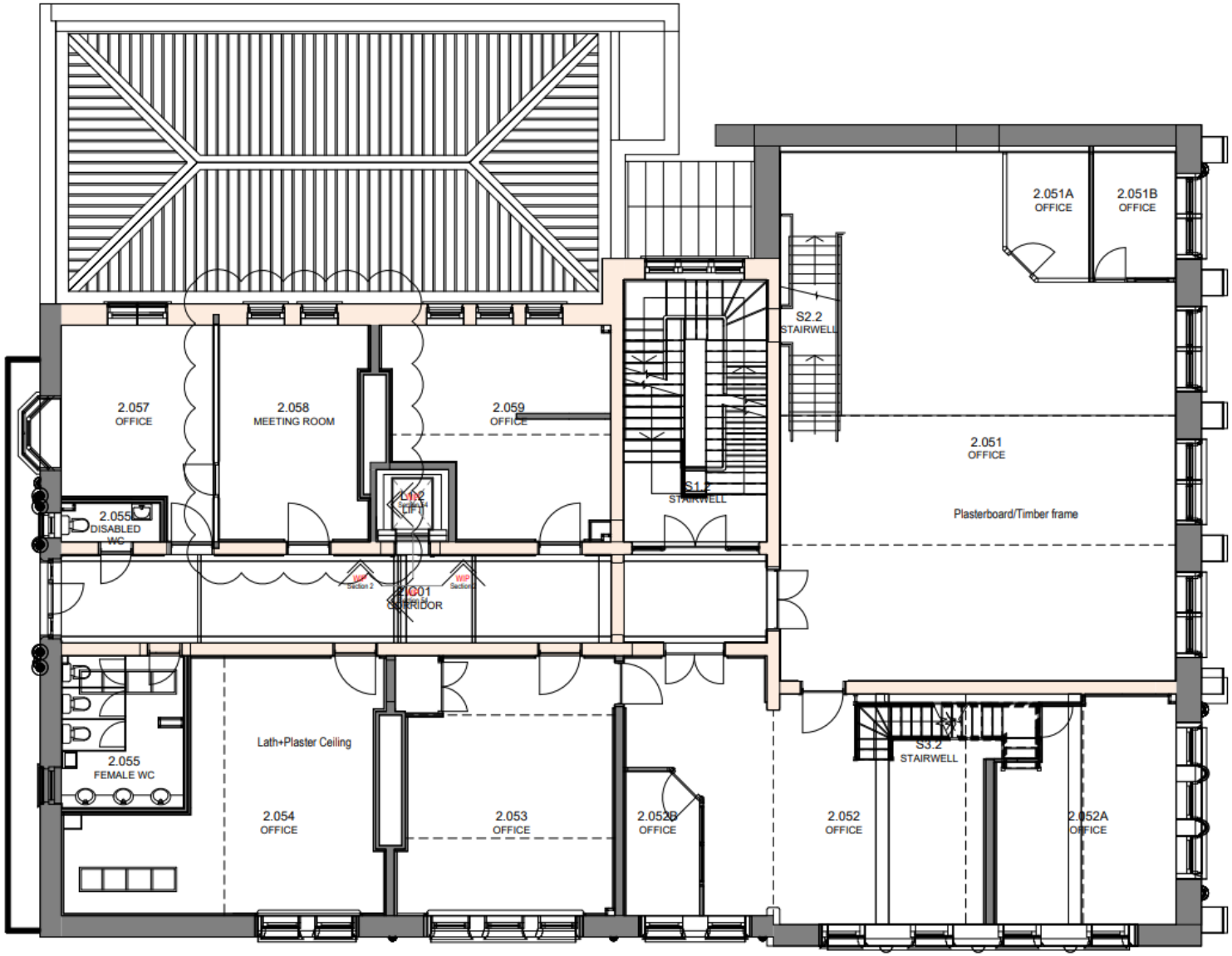


Plate *6.0 Second floor plan and room numbers (Arcadis) NTS*

2.C01 Corridor

- **Historic use:** Circulation.
- **Current use:** As historic.
- **Layout**: As historic.
- **Doors**: Historic timber doors with architraves, modern furniture leading to cellular rooms. Screen to stair core, and door onto balcony, are modern (the balcony aperture itself is historic).
- **Walls**: Plaster (likely modern given finishes elsewhere in the building) with blue glazed tile to dado level. Exposed buff brick to arches and around door to external balcony. Height appears lower than that of the first-floor corridor.
- **Ceiling**: Plaster with cornice, color scheme modern.
- **Floors**: Terrazzo.
- **Services**: Modern suspended lighting and service trunking to cornice level.
- **Other features:** Lift shaft is in a historic location but may have been enlarged and has been reclad in stainless steel.

[Plate 6.1-6.9]



Plate *6.1 2.C01 looking east to west*



Plate *6.2 2.C01 View west to east leading to door with 2.051, showing arch detail*



Plate *6.3 2.C01 General view along south interior wall*



Plate *6.4 2.C01 Dado tile detail*



Plate *6.6 2.C01 Terrazzo floor detail*



Plate *6.4 1.C01 General view along north interior wall*

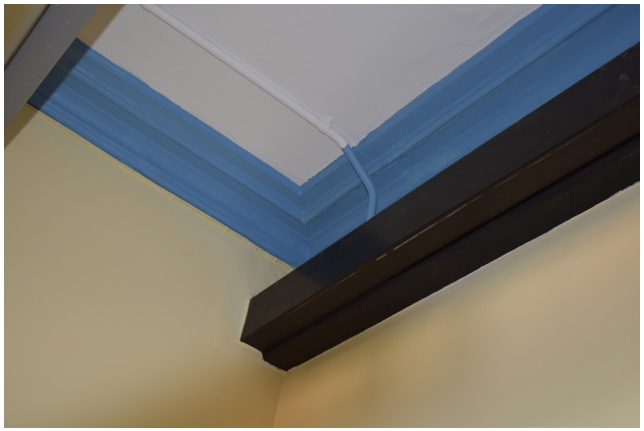


Plate *6.5 2.C01 Cornice and trunking detail*



Plate *6.7 2.C01 Terrazzo detail*



Plate *6.8 2.C01 Exterior door to balcony*



Plate *6.9 2.C01 Modern screen door with staircore*

2.051 Office

- **Historic use:** Large lecture theatre.
- **Current use**: Office
- **Layout**: Volume of the space remains, but the lecture seating (tiered with separate doorway to stair core remaining on the stair flight) has been removed and a mezzanine added (modern – see M.2001). Has functional association with 2.052 (historically the apparatus room) and 2.052a (historically a preparation room) though only the doorway to 2.052 remains, the other having been blocked up.
- **Doors**: Historic timber doors with architraves, modern furniture, leading to 2.C01, 2.052 and stair core (elevated above ground level, indicating historic tiered lecture seating).
- **Walls**: Plaster (likely modern) with historic tongue and groove paneling (modern paint scheme) to dado level.
- **Ceiling**: Large, vaulted ceiling, paneled, incorporating ventilation grilles leading to windcatchers above. Decorative iron roof trusses and brackets.
- **Floors**: Carpeted, chipboard below.
- **Services**: Modern suspended lighting and general service trunking throughout.
- **Other features:** Two historic timber balconies with doors, retained to upper part of south interior wall. These were observation balconies for the lectures (doors lead to M.2002).

[Plates 6.10-6.20]

N.B. Close up images of the ceiling and observation balconies are shown in M2.001.



Plate *6.10 2.051 General view from doorway to 2.C01*



Plate *6.12 West interior wall*



Plate *6.11 2.051 East exterior wall*



Plate *6.13 2.051 West interior wall, underneath mezzanine*



Plate *6.14 2.051 Door to 2.052*



Plate *6.15 2.051 Door to 2.C01*



Plate *6.16 2.051 South interior wall with observation balconies*



Plate *6.16 2.051 Tongue and groove panelling*

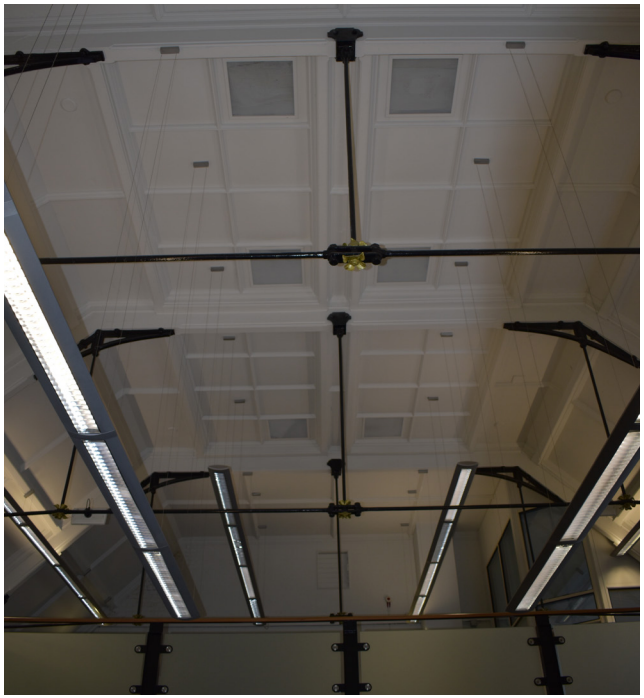


Plate *6.17 2.051 Ceiling*



Plate *6.19 2.051 Middle ceiling section*



Plate *6.18 2.051 Ceiling section adjoining south interior wall*



Plate *6.20 2.051 Ceiling section over M2.001*

2.052 Office

- **Historic use:** Apparatus room, associated with former lecture theater (2.051).
- **Current use:** Office
- **Layout:** Partitioned office (2.052b) added to southwest corner. Modern staircase to M.2002 (historically, a staircase was sited in 2.052a).
- **Doors**: Historic timber door with architrave from 2.C01, 2.051, 2.052a, and 2.053.
- **Walls**: Plaster with modern skirtings, exposed glazed tiles around doors to 2.C01, 2.052 and 2.053 (not to 2.052a), and south exterior wall.
- **Ceiling**: Plaster with molded beam and cornice.
- **Floors**: Carpeted, chipboard below.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern suspended lighting and service trunking.
- **Other features**: No.2 historic vent covers remain to south exterior wall with fleur-de-lys pattern. Deterioration in the plaster ceiling has revealed the expanded metal lath and plaster structure.

[Plate 6.21-6.33]



Plate *6.21 2.052 General view from doorway*



Plate *6.23 2.052 Partition wall with 2.052a*



Plate *6.22 2.052 South exterior wall (fleur de lys vent grilles to glazed tile covered vent stack)*



Plate *6.24 2.052 East interior partition, door to 2.053 and partition (2.052b)*



Plate *6.25a 2.052 Ceiling (Arcadis)*



Plate *6.25b 2.052 Ceiling (Arcadis)*



Plate *6.26 2052 Floor*



Plate *6.27 2.052 Staircase (Arcadis)*



Plate *6.28 2.052b South exterior wal*



Plate *6.29 2.052b Cornice*



Plate *6.30 2.052b Exposed expanded metal lath*



Plate *6.31 2.052 Exposed expanded metal lath*



Plate *6.32 2.052 Fleur-de-lys vent grille*



Plate *6.33 2.052 Fleur-de-lys vent grille*

2.052a Office

- **Historic use:** Preparation room associated with 2.051 (former lecture theatre).
- **Current use:** Office
- **Layout**: Historic doorway to 2.051 has been blocked. Entrance from 2.052 appears to have been re-aligned, with a modern projection into the room (where the cornice is truncated). The historic staircase to M2.002 has been removed, and a modern staircase built in 2.052.
- **Doors**: Historic timber door with architrave from 2.052.
- **Walls**: Plaster with modern skirtings to north and west interior walls, glazed brick to east and south exterior walls.
- **Ceiling**: Plaster with moulded beam and cornice.
- **Floors**: Carpet, with chipboard below.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern suspended lighting and service trunking.

[Plates 6.34-6.41]



Plate *6.34 2.052a South exterior wall*



Plate *6.36 2.052a west interior wall*



Plate *6.35 2.052a east exterior wall*



Plate *6.37 2.052a North interior wall (lost connection with 2.051)*



Plate *6.38 2.052a Ceiling*



Plate *6.40 2.052a Floor*



Plate *6.41 2.052a doorway with 2.052*



Plate *6.39 2.052a Ceiling detail to north interior wall adjoing 2.051*

2.053 Office

- **Historic use:** Museum.
- **Current use:** Office
- **Layout**: Riser has been added to the northwest corner.
- **Doors**: Historic timber door with architrave from 2.C01 and 2.052.
- **Walls**: Plaster with modern skirtings, exposed brick around doorways and south exterior wall.
- **Ceiling**: Vaulted, plaster but no decoration.
- **Floors**: Carpet, with chipboard below.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern suspended lighting and service trunking.
- **Other features**: Historic vent cover to south exterior wall with fleur-de-lys pattern.

[Plates 6.42-6.53]



Plate *6.42 2.053 General view*



Plate *6.44 2.053 North interior wall*



Plate *6.43 2.053 South exterior wall*



Plate *6.45 2.053 West interior wall*



Plate *6.46 2.053 East interior wall and doorway to 2.052*



Plate *6.48 2.053 Ceiling*



Plate *6.50 2.053 Door to 2.C01*



Plate *6.47 2.053 Floor*



Plate *6.49 2.053 Ceiling*



Plate *6.51 2.053 Door to 2.052*



Plate *6.52 2.053 Riser*



Plate *6.53 2.053 Fleur-de-lys vent cover to south exterior wall skirting level*

2.054 Office

- **Historic use:** Grating room (dark space for spectroscopic and optics experiments).
- **Current use:** Office
- **Layout**: Heavy partition added to northwest corner for WCs. Historic lobby area shown on historic mapping now absent (it presumably controlled light entering the room).
- **Doors**: Historic timber door with architrave from 2.C01.
- **Walls**: Plaster with modern skirtings, other than exposed red brick with buff-brick headers (not glazed, potentially given issues of glare with light experiments) to doorway and around windows.
- **Ceiling**: Plaster supported by larger arched timber beams.
- **Floors**: Carpet, with chipboard below.
- **Windows**: Timber casements with modern furniture. UPVC skylight added.
- **Services**: Modern suspended lighting and service trunking.
- **Other features:** A stone aperture is evident to the exterior of the building on the west elevation. This, historically, allowed light to enter the building for experimentation. This has been covered with plasterboard to the interior and is not visible.

[Plates 6.54-6.64]



Plate *6.54 2.054 General view*



Plate *6.56 2.054 North interior wall*



Plate *6.55 2.054 South exterior wall*



Plate *6.57 2.054 North interior wall and partition with 2.055*



Plate *6.58 2.054 East interior wall*



Plate *6.60 2.054 Modern rooflight*



Plate *6.61 2.054 Windows*



Plate *6.59 2.054 Ceiling*



Plate *6.62 2.054 Exposed roof beam*



Plate *6.63 2.054 Doorway with 2.C01*

2.055 WC

- **Historic use:** None (modern addition).
- **Current use**: WC.
- **Layout:** Truncates the historic volume of 2.054.
- **Doors**: Timber door with architrave from 2.C01 (likely modern but matches historic joinery).
- **Walls**: Plaster, heavily spalled to west exterior wall.
- **Ceiling**: Modern suspended ceiling (painted brick visible above).
- **Floors**: Linoleum.
- **Windows**: Timber casements with modern furniture.
- **Services:** Modern WC installation.

[Plates 6.64-6.68]



Plate *6.64 2.054 Plasterboard shown to be on metal hangers (north interior wall)*



Plate *6.65 2.055 General view*



Plate *6.66 2.055 Doorway to 2.C01*



Plate *6.67 2.055 Ceiling*



Plate *6.68 2.055 Painted brick above suspended ceiling (west exterior wall)*

2.056 WC

- **Historic use:** None (modern addition).
- **Current use:** WC.
- **Layout**: Truncates the historic volume of 2.057.
- **Doors**: Timber door with architrave from 2.C01 (likely modern but matches historic joinery).
- **Walls**: Plaster.
- **Ceiling**: Modern suspended ceiling.
- **Floors**: Linoleum.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern WC installation.

[Plates 6.69-6.72]



Plate *6.69 2.056 Window*



Plate *6.70 2.056 Suspended ceiling*



Plate *6.71 2.056 Floor*



Plate *6.72 2.056 Door to 2.C01*

2.057 Office

- **Historic use:** Transit room (for astronomic research, and later radium room).
- **Current use:** Office
- **Layout:** Heavy partition to southwest corner for WC (2.056). Later doorway added to 2.059.
- **Doors**: Historic timber door with architrave from 2.C01, that to 2.058 is likely later (though matching).
- **Walls**: Plaster with modern skirtings to east and south interior walls, glazed brick to north and west exterior walls.
- **Ceiling**: Vaulted, plaster with cornice at wall plate
- **Floors**: Carpet, with chipboard below.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern suspended lighting and service trunking.
- **Other features**: Bay window to west exterior wall (modern paint scheme), may historically have been used for apparatus such as a telescope and, later, when used to store radium, a Toepler pump.

[Plates 6.73-6.82]



Plate *6.73 2.057 General view*



Plate *6.74 2.057 West exterior wall and bay window*



Plate *6.75 2.057 North interior wall and partition with 2.056*



Plate *6.76 2.057 East interior wall and partition with 2.058*



Plate *6.78 2.057 Ceiling*



Plate *6.80 2.057 Floor*



Plate *6.77 2.057 North exterior wall*



Plate *6.79 2.057 Cornice to north exterior wal*



Plate *6.81 2.057 Doorway to 2.C01*



Plate *6.82 2.057 Doorway to 2.058*

2.058 Meeting Room

- **Historic use**: Research.
- **Current use:** Meeting room.
- **Layout**: As historic, later doorway added to 2.057 (and wall rebuilt).
- **Doors**: Historic timber door with architrave from 2.C01. That to 2.057 is likely later (but matching).
- **Walls**: Plaster with modern skirtings, exposed glazed brick to north exterior wall and doorway to 2.C01.
- **Ceiling**: Vaulted, plaster with cornice to wall plate.
- **Floors**: Carpet, with chipboard below.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern suspended lighting and service trunking.

[Plates 6.83-6.87]



Plate *6.83 2.058 South interior wall*



Plate *6.85 2.058 West interior wall and door to 2.057*



Plate *6.84 2.058 North exterior wall*



Plate *6.86a 2.058 Door to 2.C01*



Plate *6.86b 2.058 Door to 2.057*



Plate *6.87 2.058 Ceiling (Arcadis)*

2.059 Office

- **Historic use:** Small lecture theatre.
- **Current use:** Office.
- **Layou**t: All furniture for the lecture theatre removed. Lift shaft evident on historic plans, but likely enlarged.
- **Doors**: Historic timber door with architrave from 2.C01.
- **Walls**: Plaster with modern skirtings, exposed glazed brick to east interior and north exterior walls, as well as around doorway.
- **Ceiling**: Plaster with cornices and molded beams.
- **Floors**: Carpet, with chipboard below.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern suspended lighting and service trunking.

[Plates 6.88-6.94]



Plate *6.88 2.059 South interior wall and lift shaft*



Plate *6.90 2.059 East interior wall*



Plate *6.89 2.059 West interior wall and lift shaft*



Plate *6.91 2.059 Ceiling*



Plate *6.92 2.059 Floor*



Plate *6.93 2.059 Door to 2.C01*



Plate *6.94 2.056 North exterior wall (Arcadis)*

7.0 Third Floor

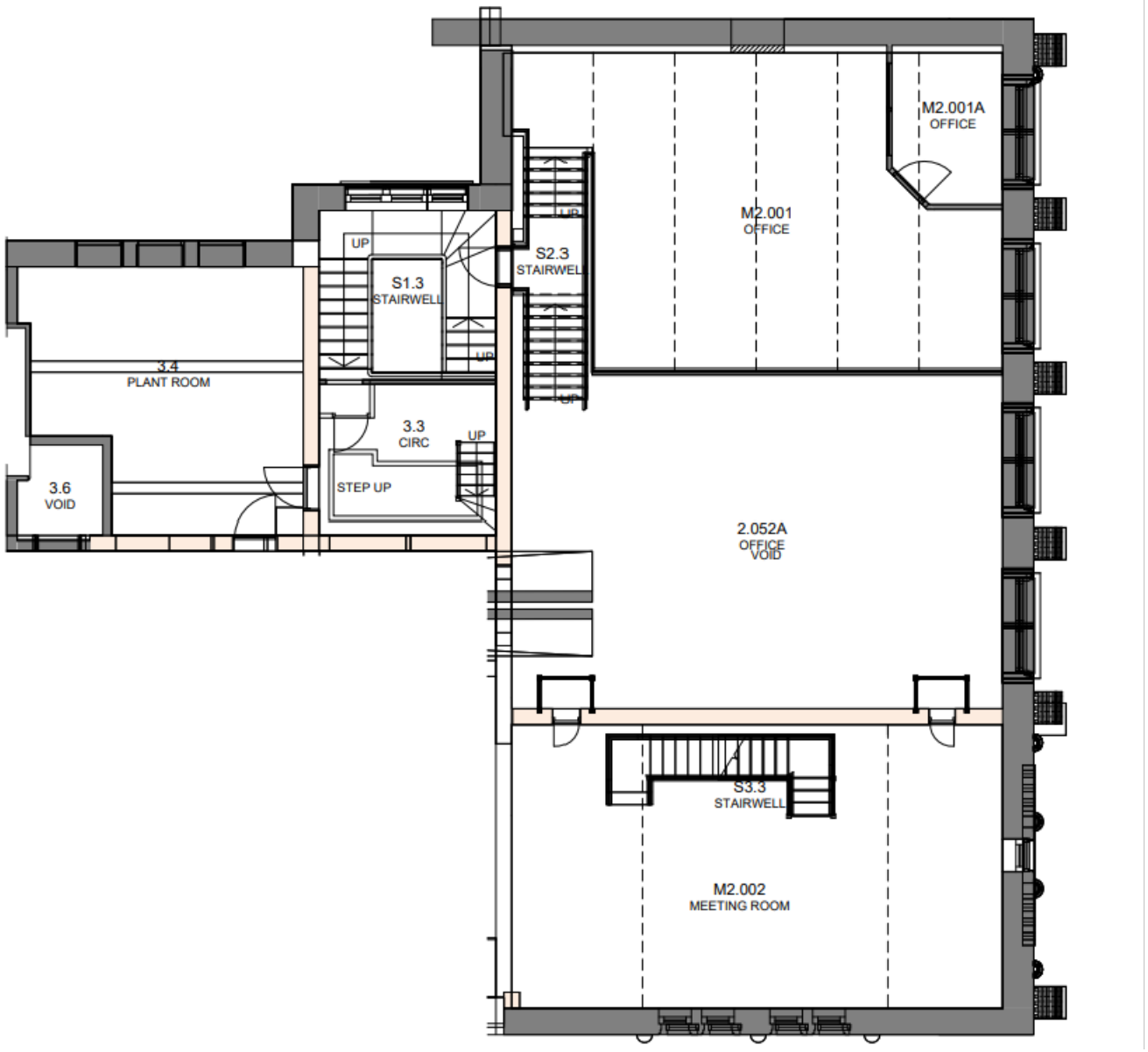


Plate *7.0 Third floor plan and room numbers (Arcadis) NTS*

M2.001 Office

- **Historic use:** None, modern mezzanine (previously site for tiered lecture theatre seating).
- **Current use:** Office.
- **Doors**: Historic timber door and architrave up the modern stair flight aligned with previous lecture theatre seating.
- **Walls**: Painted brick. Partition (M2.001a) is plasterboard and glazing.
- **Ceiling**: Ceiling as described in 2.051.
- **Floors**: Carpeted, timber and steel substructure.
- **Windows**: As described in 2.051.
- **Services**: Modern suspended lighting and services.
- **Other features:** Vent, likely historic, to north exterior wall.

[Plates 7.1-7.20]



Plate *7.1 M2.001 Staircase from 2.051*



Plate *7.2 M2.001 Structure from 2.051*



Plate *7.3 M2.001 Doorway halfway up flight into staircore*



Plate *7.4 M2.001 General view*



Plate *7.5 M2.001 West interior wall*



Plate *7.6 M2.001 North exterior wall*



Plate *7.7 M2.001 East exterior window*



Plate *7.8 M2.001 view to partition (M2.001a)*



Plate *7.10 M2.001 Observation balcony to soutwest side of 2.051*



Plate *7.12 M2.001 Close up of ceiling to 2.051*



Plate *7.9 M2.001 South with view beyond mezzanine to south interior wall of 2.051*



Plate *7.11 M2.001 Observation balcony to southeast side of 2.051*

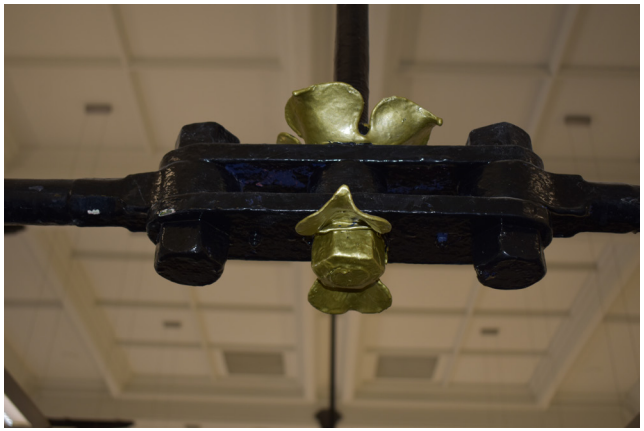


Plate *7.13 M2.001 Closeup of beam detail 1*



Plate *7.14 M2.001 Closeup of beam detail 2*



Plate *7.15 M2.001 Closeup of ceiling upper bracker*



Plate *7.16 M2.001 Closeup of ceiling lower brackers*



Plate *7.17 M2.001a general view*

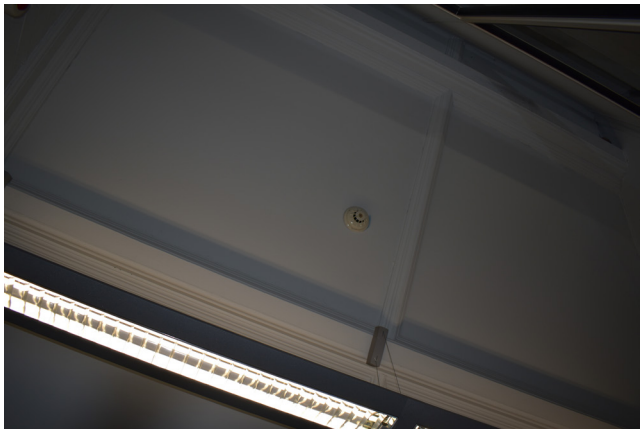


Plate *7.18 M2.001a Ceiling detail*



Plate *7.19 M2.001a Ceiling detail*



Plate *7.20 M2.001 vent in north exterior wall*

M2.002 Meeting room

- **Historic use:** Chart room.
- **Current use**: Office.
- **Layout**: Historic staircase from 2.052a removed, and modern staircase built from 2.052.
- **Doors**: Two low historic timber doors with architraves leading to the observation balconies to the former lecture theatre (2.051).
- **Walls**: Exposed glazed brick to majority of walls, upper sections painted. Plaster to the roof pitches.
- **Ceiling**: Plaster with steel support beams, cornices to pitch.
- **Floors**: Carpet, with chipboard below.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern suspended lighting and service trunking.
- **Other features**: Deteriorated plaster has exposed the expanded metal lath structure.

[Plates 7.21-7.34]

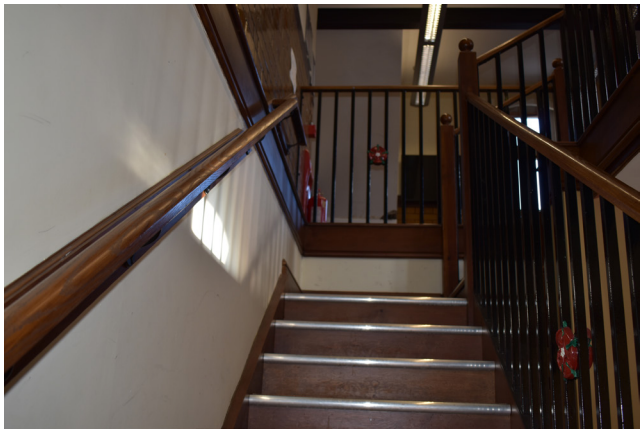


Plate *7.21 M2.002 Staircase from 2.052*



Plate *7.23 M2.002 South exterior wall*



Plate *7.22 M2.002 General view*



Plate *7.24 M2.002 North interior wall (central)*



Plate *7.25 M2.002 North interior wall (left) with observation balcony door*



Plate *7.27 M2.002 East exterior wall*



Plate *7.29 M2.002 Floor*



Plate *7.26 M2.002 North interior wall (right) with observation balcony door*



Plate *7.28 M2.002 West exterior wall*



Plate *7.30 M2.002 Observation balcony door (left)*



Plate *7.31 M2.002 Observation balcony door (right)*



Plate *7.32a M2.002 Ceiling (left) (Arcadis)*



Plate *7.32b M2.002 Ceiling (right) (Arcadis)*



Plate *7.33 M2.002 Exposed expanded metal lath and plaster*



Plate *7.34 M2.002 Beam detail*

3.3 Circulation

- **Historic use:** Historic maps show this as the site of an observatory, accessed by small timber steps (which are extant). Some sources indicate the observatory was not built, but a historic photograph shows a domed structure.
- **Current use**: Circulation (following insertion of screen from staircase).
- **Doors**: Timber door and architrave to 3.4 (likely modern but matches historic joinery). Modern timber screen separating from staircase.
- **Walls**: Painted brick with glazed blue tiles to dado level.
- **Ceiling**: Plaster with sections of cornice.
- **Floors**: Carpet, with chipboard below, some floorboards to landing.
- **Windows**: Timber casements with modern furniture.
- **Services**: Modern suspended lighting and service trunking.
- **Other features**: Small historic timber staircase, currently leads to roof exterior but would historically have led to the observatory.

[Plates 7.35-7.46]



Plate *7.35 3.3 Screen with staircase*



Plate *7.37 3.3 East exterior wall*



Plate *7.36 3.3 West interior wall and doorway with 3.4*



Plate *7.38 3.3 South exterior wall*



Plate *7.39 3.3 general view*



Plate *7.41 Cornice detail*

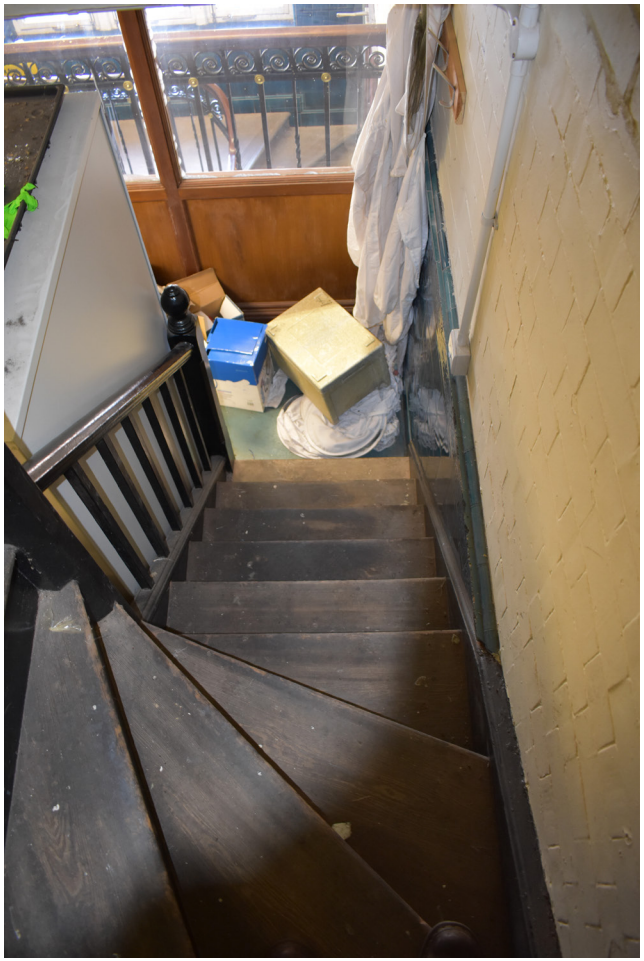


Plate *7.42 3.3 Staircase*



Plate *7.40 3.3 Glazed tile detail*



Plate *7.43 3.3 Top of the staircase (door leads out to the roof)*

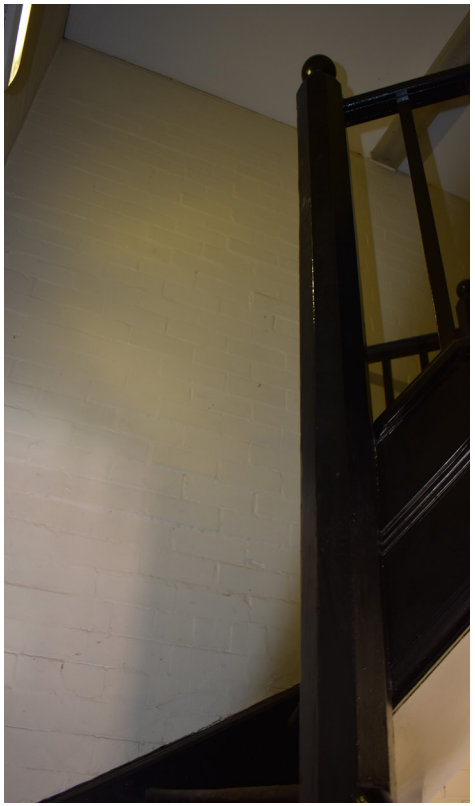


Plate *7.44 3.3 Stair detail*



Plate *7.45 3.3 Stair detail*



Plate *7.46 3.3 Stair detail*

3.4 Circulation

- **Historic use:** Historic maps show this as the site of an observatory, accessed by small timber steps (which are extent to 3.3). Some sources indicate the observatory was not built, but a historic photograph shows a domed structure.
- **Current use:** Plant room.
- **Doors**: Timber door and architrave to 3.3 (likely modern but matches historic joinery).
- **Walls**: Painted brick with breeze block section.
- **Ceiling**: Plaster.
- **Floors**: Concrete.
- **Services**: Modern suspended lighting and other service infrastructure, other than a small remaining section of a historic drain.

[Plates 7.47-7.56]



Plate *7.47 3.4 General view*



Plate *7.49 3.4 East interior wall*



Plate *7.48 3.4 West wall*



Plate *7.50 3.4 South wall*



Plate *7.51 3.4 North wall*



Plate *7.52 3.4 Door to 3.3*



Plate *7.53 3.3 Floor*



Plate *7.54 3.4 Ceiling*



Plate *7.55 3.4 Painted brick*



Plate *7.56 Potential historic drainage to northwest corner*

Appendix A Heritage Impact Assessment Vol.1





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Contents

1.0	Summary of Heritage Impact Assessment	**1**
2.0	Historical Background	**6**
3.0	Site Survey Descriptions	**49**
4.0	Assessment of Significance	**83**
5.0	Commentary on the Proposals	**87**

Appendix II	Planning Policy and Guidance	**96**
Appendix III	Commemorative Plaques	**102**
Appendix IV	Associated Figures	**103**

1.0 Summary of Heritage Impact Assessment

1.1 Introduction

Donald Insall Associates was commissioned by Arcadis IBI Group, in December 2022, to assist them in developing proposals, on behalf of the University of Manchester, for the refurbishment of the Rutherford Building to deliver new academic and postgraduate study and research spaces.

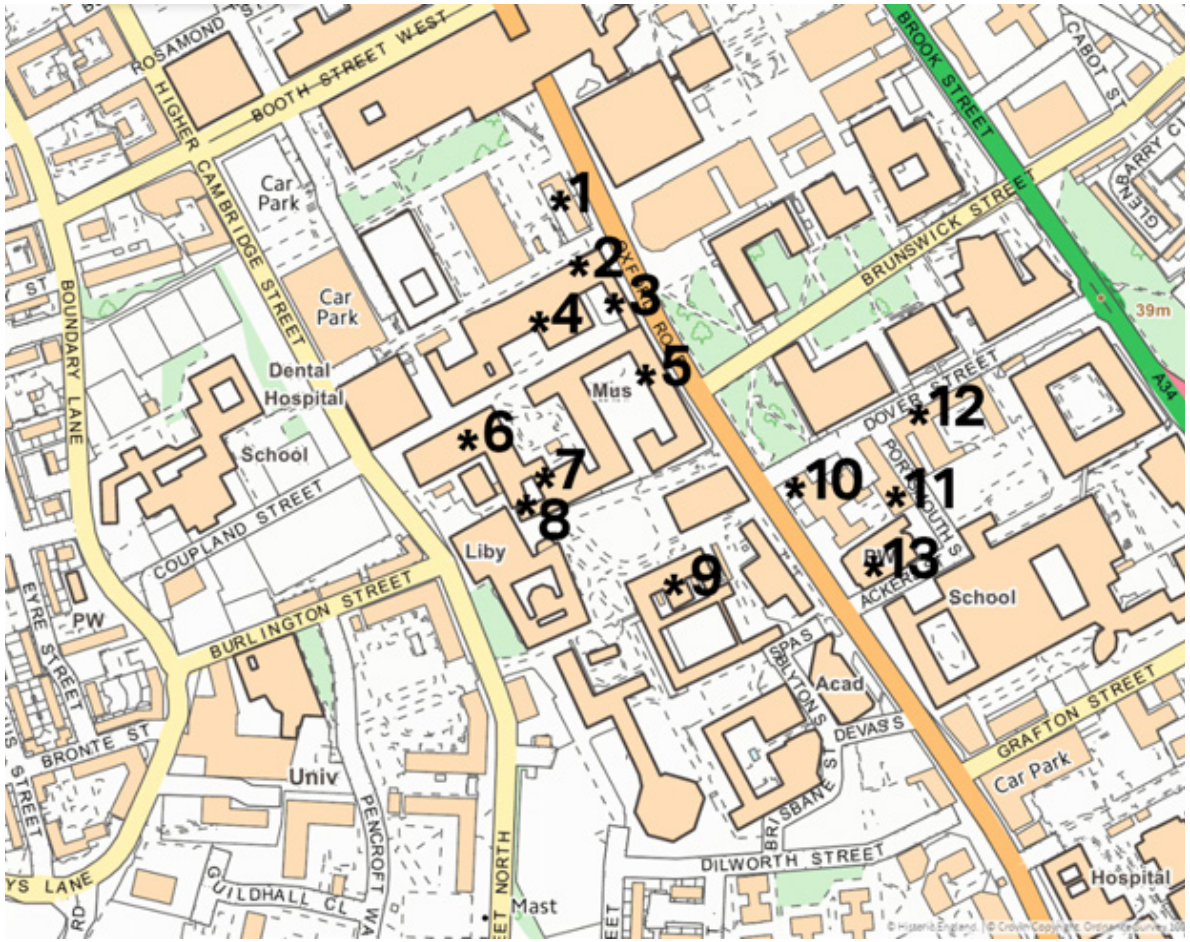
This involves select alterations to the internal layout alongside significant rationalisation and enhancement of interior finishes, a programme of upgrades to windows and roofs for thermal efficiency, as well as repair of historic fabric and enhancements to the modern external access ramp. The proposal should be considered in relation to an application (RN: 138277/LO/2023) currently being determined for repair works to the internal floor and ceiling structures.

The investigation has comprised historical research, using both archival and secondary material, and a site inspection. An illustrated history of the building, with sources of reference and bibliography, is in Section 2; the site survey findings are in Section 3. The investigation has established the significance of the building, which is set out in Section 4 and summarised below. Section 5 provides a justification of the scheme according to the relevant legislation, planning policy and guidance.

1.2 The Building, its Legal Status and Policy Context

The proposals relate to part of the Rutherford Building, a Grade II listed Building.

* 1 Waterloo Place (Grade II)
* 2 Former Department of Metallurgy, University of Manchester, and attached railings (Grade II)
* 3 Manchester Museum Extensions (Grade II)
* 4 Manchester University Rutherford Building and Hopkins Memorial Wing (Grade II)
* 5 Victoria University of Manchester including Christie Library, Whitworth Hall (Grade II*)
* 6 Pharmacy Department, Department of Adult Education, University of Manchester (Grade II)
* 7 Manchester University Laboratories (Grade II)
* 8 Burlington Rooms (Shunk Laboratories, Manchester University)
* 9 Samuel Alexander Building (Grade II)
* 10 323-7 Oxford Road (Grade II)
* 11 Holy Name Presbytery (Grade II)
* 12 University of Manchester Faculty of Economics and Social Studies and attached railings (Grade II)
* 13 Roman Catholic Chrch of The Holy Name of Jesus (Grade I)



1.1 *Heritage Assets*

The Rutherford Building is in the context of a number of listed buildings **[Plate 1.1]** including:

- Former Department of Metallurgy, University of Manchester, and Attached Railings (Grade II)
- Manchester Museum Extensions (Grade II)
- Victoria University of Manchester including Christie Library, Whitworth Hall (Grade II*)
- Manchester University Laboratories (Grade II)
- Pharmacy Department, Department of Adult Education, University of Manchester (Grade II)
- Burlington Rooms (Schunk Laboratories, Manchester University) and Attached Railings (Grade II)

Alterations to a listed building generally require listed building consent. The statutory list description of the listed building is included in Appendix I, along with extracts from the relevant legislation and planning policy documents in Appendix II.

The Planning (Listed Buildings and Conservation Areas) Act 1990 is the legislative basis for decision-making on applications that relate to the historic environment. Sections 16 and 66 of the Act impose statutory duties upon local planning authorities which, with regard to listed buildings, require the planning authority to have *'special regard to the desirability of preserving the listed building or its setting or any features of special architectural or historic interest which it possesses*'.

Section 38(6) of the Planning and Compulsory Purchase Act 2004 requires planning applications to be determined in accordance with the development plan unless material considerations indicate otherwise. The development plan applicable to the site comprises the Manchester Core Strategy 2012-2027 (2012) specifically Policy ENV 3 'Heritage' and saved policies in the Unitary Development Plan (1995) including Policy 19 'Listed Buildings', which encourage development that secures the reuse of heritage assets when consistent with their conservation, avoiding adverse effect on their interest.

The courts have held that following the approach set out in the policies on the historic environment in the National Planning Policy Framework 2021 will effectively result in a decision-maker complying with its statutory duties. The Framework forms a material consideration for the purposes of section 38(6). At the heart of the Framework is *'a presumption in favour of sustainable development'* and there are also specific policies relating to the historic environment. The Framework states that heritage assets are *'an irreplaceable resource and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations'*. The Glossary to the National Planning Policy Framework defines a heritage asset as:

> *A building, monument, site, place, area, or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. It includes designated heritage assets and assets identified by the local planning authority (including local listing).*

The Framework, in paragraph 194, states that:

> *In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance.*

Section 4 of this report – the assessment of significance – meets this requirement and is based on the research and site surveys presented in sections 2 and 3, which are of a sufficient level of detail to understand the potential impact of the proposals.

The Framework also, in paragraph 199, requires that:

> *When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.*

The Framework goes on to state at paragraph 200 that:

> *Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting) should require clear and convincing justification.*

The Framework requires that local planning authorities categorise harm as either 'substantial' or 'less than substantial'.

Where a development proposal will lead to 'less than substantial harm' to the significance of a designated heritage asset, the Framework states, in paragraph 202, that:

> *...this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use.*

Section 5 of this report provides this clear and convincing justification.

1.3 Summary Assessment of Significance

The Rutherford Building is an example of late 19th and early 20th century institutional architecture, constructed between 1898 and 1900 as the Physical Laboratories and designed by architect James William Beaumont. It is sited in a significant cluster of purpose-built university buildings developed from the 19th century onwards, reflecting the growth of Manchester as part of the country's first civic university (Victoria University).

Of arguably greater importance, however, is the building's historic interest. Through its design and layout, Beaumont in collaboration with The Langworthy Professor of Physics, Arthur Schuster, sought to adapt Germanic practices of collaborative teaching and learning, and create a space sufficient to enable research into the rapidly expanding topics within physics evident at the end of the 19th century, reflecting recent discoveries such as radium. As part of this, the building was used for internationally important research that has had a phenomenal influence on the course of human history, including atomic research, by key figures such as Ernest Rutherford.

Whilst the original uses of the building and its individual rooms are no longer extant, this importance is reflected in both the legibility of the original architectural design scheme, the integrity of the spatial layout of its interior and the survival of the original internal decorative schemes and of fragments that hint at the earlier uses of academic spaces. These have however been significantly impacted by later fitouts and additions.

1.4 Summary Impact Commentary

The proposal seeks to undertake substantial refurbishment of the Rutherford Building to secure its longer-term use as an academic research and study space. Read in conjunction with application 138277/LO/2023, this involves select changes to the internal layout to provide useable work and study spaces, the rationalisation and enhancement of interior finishes and services, repair of exterior fabric and enhancements to the modern external doors and ramp, as well as a series of works to enhance the thermal efficiency of the building including replacement of the window glass and casements (retaining the frame) and insertion of mineral wool insulation into the roof. These works would result in 'less than substantial' harm in some areas, including a higher level of partitioning needed to service spaces to the interior, removal of some earlier window and roof fabric and changes to the roof profile. However, these works are considered necessary to achieve the key benefits which underpin the scheme, principally securing the building's longer-term use through the provision of amenities and spaces demanded by modern academic requirements and improvements to thermal efficiency, coinciding with specific benefits such as the removal of poor modern services, revealing previously covered historic surfaces and enhancing the aesthetic appearance of the prominent access ramp. It is therefore the conclusion of this report that the proposals would meet the statutory duties of the Town and Country Planning (Listed Buildings and Conservation Areas) Act 1990, the policy requirements of the Local Plan and the tests for sustainable development outlined in the NPPF insofar as they relate to the historic environment.

2.0 Historical Background

2.1 Summary History of Owens College (later Victoria University)

2.1.1 Founding and Early Operation, 1846-1870

In the 1820s and 1830s there were various proposals for an institution of higher education to educate the men of Manchester for careers in the professions and the upper levels of industry and commerce. These gained increasing volume in the 1840s and 1850s, as Manchester's growing economic confidence made itself manifest in several cultural and intellectual organisations.

On his death, the textile merchant and industrialist **John Owens** (1790-1846) bequeathed £96,954 for a non-denominational college *"providing the means of instructing and improving young persons of the male sex (and being of an age not less than fourteen years) in such branches of learning and science as are usually taught in the English Universities"*. A traditional liberal curriculum combining maths, classics, philosophy, natural philosophy (sciences, broadly conceived), with natural history and modern languages as secondary subjects, was adopted by the trustees (engineering and commerce being identified as areas for future expansion).

The new college opened on Quay Street in **Cobden House** (formerly a residence) in 1851 and is regarded as the first modern university college outside of London. Its early years were problematic, with students often young and ill-prepared, the quality of tuition inconsistent and courses of varying merit. In 1859, however, Owens College was accepted as a provincial examination centre for the University of London and in the 1860s changing cultural values created a new appreciation of higher education as advanced preparation for the professions.

Seizing on the example of the Germanic universities, where student involvement in research was actively encouraged, Owens College capitalised on this change in attitude. This was particularly true of the Chemistry Department, which was feted as the college's most important contribution to local industry. Building on the German example, Henry Roscoe (1833-1915), Professor of Chemistry from 1857, established a department offering regular courses of instruction, with the opportunity for accreditation, that were attuned to the needs of the local economy and yet simultaneously academically rigorous and research led. This was part of a growing shift in scientific higher education, moving away from simple instruction towards active involvement in investigation.

2.1.2 The Move to Oxford Street (now Oxford Road), 1868-73

Student numbers grew rapidly in the 1860s, the lecture rooms and laboratories now becoming inadequate. This was regarded as preventing both the introduction of engineering and physics and a proposed union with the Manchester Royal School of Medicine (founded in 1824). A Building Committee established in 1865 also identified the need for a museum that would the collections of the Manchester Natural History Society and Geological Society, and for halls of residence. An "Extension" committee under the industrialist **Thomas Ashton** (1818-1898) was formed and a programme of fundraising began.

At his own cost, Ashton purchased a site in **Chorlton on Medlock** in 1868 in trust for the college. Situated outside of the city centre, on the road that led to the new suburbs in the south, this was bound by **Oxford Street** (now known as Oxford Road) to the east, **Coupland Street** to the north and **Burlington Street** to the south. This area between modern-day Booth Street West and Dover Street had only recently been developed, mainly as housing. The map of 1836 shows that development had only just begun to spread west from Oxford Road, with several large gardens (and a bowling green) still existing and few buildings existing beyond Chatham Street **[Plate 2.1.1]**. Even in the 1850s, it remained outside of Manchester proper **[Plate 2.1.2]**.



2.1.1 *Design for Owens College, Alfred Waterhouse, 1872 (RIBA Pix)*



2.1.2 *Design for the west range of the quadrangle of Owens College, Alfred Waterhouse, 1869 (RIBA Pix)*

Alfred Waterhouse was appointed as the architect in December 1868 and the foundation stone was laid in September 1870. A private bill resulted in the Owens Extension College Act (1870), which created a new body to administer the Extension funds. This was merged with Owens College in an Act of 1871, creating The Owens College.

Construction of the new buildings began in 1870; the west range, the first and main building – today the **John Owens Building** – was opened in 1873 and incorporated laboratories, lecture rooms and offices **[Plate 2.1.3-2.1.4]**. An ornate **Chemistry** building housing extensive laboratories and the College's largest lecture theatre was constructed on Burlington Street, designed to Roscoe's personal specifications and opened later in 1873. The equally decorative **Medical School**, on Coupland Street, was completed in 1874, these buildings together forming the beginnings of the quadrangle.

The curriculum expanded accordingly, with Political Economy, Zoology, Geology and Engineering added in the 1860s and 1870s, and the first private halls of residence to serve the new college erected in 1876.



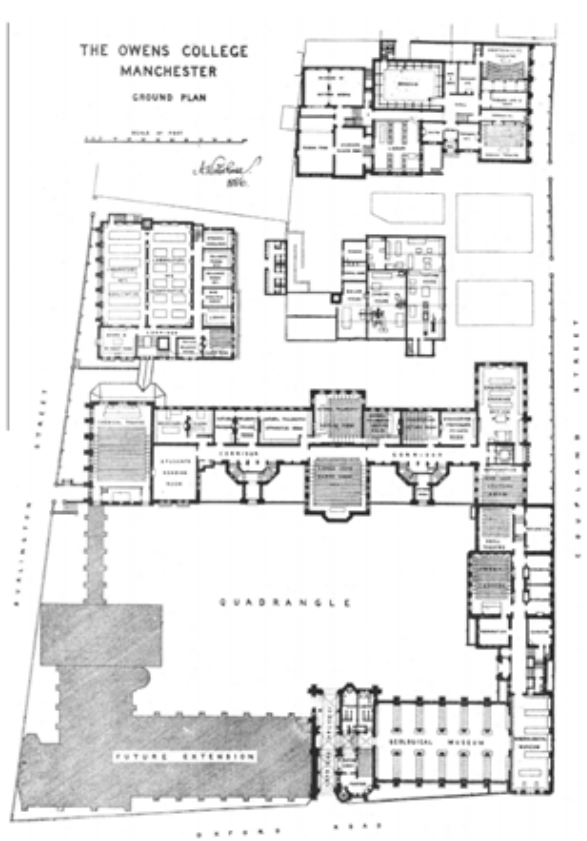
2.1.3 *Area between Booth Street and Dover Street, J. Pigot, 1836 (University of Manchester)*



2.1.4 *Southern extent of the built-up area of Manchester, J. Adshead, 1850-51 (University of Manchester)*

2.1.3 Consolidation and Expansion, 1873-1914

Its efforts to become an independent university having failed, in 1880 Owens College became the first affiliate college of the new **Victoria University** (England's first civic university). Owens quickly became increasingly dominated by day-time students, a growing number following systematic three-year courses leading to degrees. A **teacher training college** was added in 1890 but the university's reputation was for science and, above all, Chemistry. Having established a syllabus that was attuned to the practical needs of local industry whilst equipping its students with the ability to carry out original research (in both academia and industry), the **Chemistry Department** was a recognised leader in pure research and, by the 1880s, England's leading university chemistry department. The **Medical School** was also thriving and its building on Coupland Street was extended in 1883 and (more substantially) in 1894, whilst an independent **Dental School** was established outside of the campus in 1884 and a **Department of Public Health** founded in 1888 **[Plate 2.1.5]**. Development had also occurred around the university site and by the 1890s it was thoroughly enclosed by a grid of streets of densely packed terraced housing and scattered industrial buildings (two at its immediate west) **[Plates 2.1.6a-2.1.6b]**. By 1899/1900 there were more than 1,000 students, over 1/3 studying in the Medical School, and Owens College had its first postgraduate researchers.



2.1.5 *Owens College, undated, c.1890 (University of Manchester)*



2.1.6a *Victoria University and surroundings, 1893 OS (Promap)*



2.1.6b *Victoria University, 1893 (Promap)*

Construction continued throughout the 1880s and 1890s, usually reliant on bequests and donations from Manchester's industrialists and merchants. The **Whitworth Engineering Laboratories** were opened in 1886, the **Beyer Laboratories** (Botany and Zoology) and the **Natural History Museum** in 1888 (Grade II*), the **Christie Library** in 1898 and the **Physical (Physics) Laboratories** in 1900, all of the academic departments (with the possible exception of Physics) heavily reliant upon, and named for, donors. On Oxford Road, the **Whitworth Hall** followed in c.1895-1902 to designs by Paul Waterhouse (Grade II*), the last building to be completed in the short quadrangle between Oxford Road, Coupland Street and Burlington Street (today known as the **Old Quadrangle**). The Museum was extended to the north in 1911-27, the designs by Paul and Michael Waterhouse adding the archway entrance into the Old Quadrangle, with bridge above (Grade II). This generosity also extended to apparatus and equipment and Manchester's reputation as one of the main centres for scientific research was by now firmly established.

2.1.4 The 20th Century

The federation began to break down in the first years of the 20th century and in 1903 the university was reconstituted as the **Victoria University of Manchester**. Owens College was legally merged with the university a year later.

The **Engineering Department** began to grow in prominence and by the interwar period it was a rival to **Chemistry** in its perceived contribution to the local economy. The **Physics Department** was also attracting eminent researchers and a strong scientific community had been established in the group of buildings concentrated between Coupland Street and Burlington Street. Indeed, *'almost all the Manchester researchers who have become accepted as globally important contributors to science worked (albeit in different periods) in extremely close geographical proximity, on one side or the other of Coupland Street'*.[1]

Further donations and bequests allowed continued investment in new buildings and in 1908 a purpose-built **Dental School** (closely associated with the university but still officially independent) was constructed at the corner of Oxford Road and Coupland Street, designed by Charles Heathcote (Grade II). Some years later, the **Computer Laboratory** (as it was later named) was added on Coupland Street (1951) for the Ferranti Mark 1 computer. Housing both engineers and mathematicians, it was here that Alan Turing worked on morphogenesis modelling in the years immediately before his death.

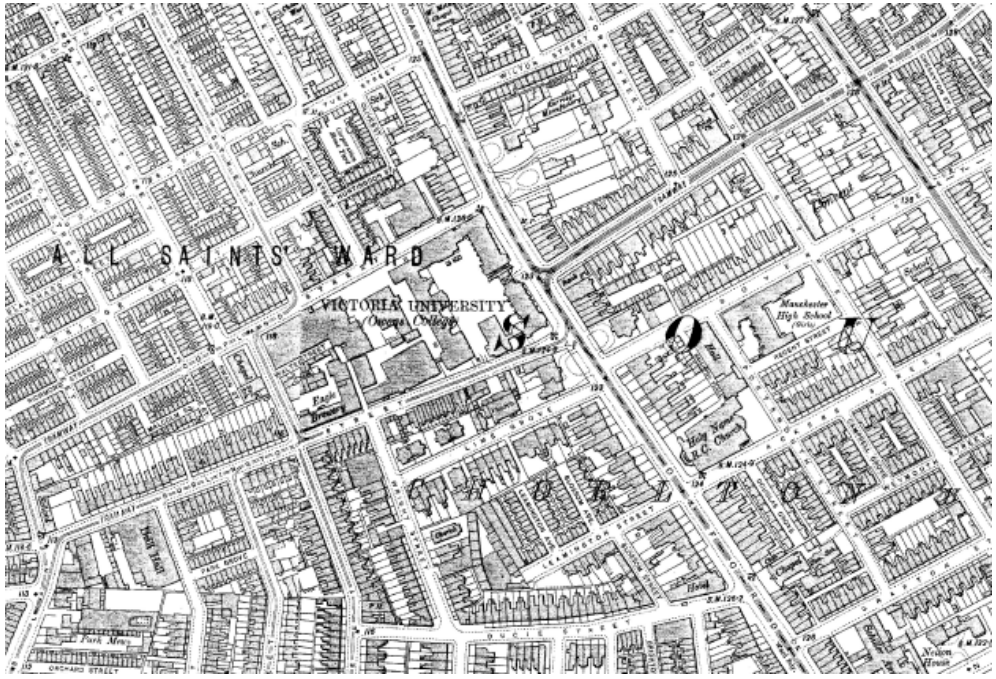
In general, however, the university began to move beyond the site bound by Wright Street (to the west), Coupland Street, Oxford Road, and Burlington Street, expanding to the west, north and south. Maps of 1908 show buildings already running along the southern side of Coupland Street as far west as **Lloyd Street [Plate 2.1.7]**. The campus was also now expanding to the north, maps and photographs showing not only the Museum extension but also several other large buildings running between Coupland Street and Bridgeford (Bridge) Street, where the new Engineering Building had been added in 1909 **[Plates 2.1.8-2.1.9]**. This trend continued, new **arts and humanities buildings** being added to the south of Burlington Street in 1918-39 whilst in 1940 the **Dental School** was relocated to Bridgeford (Bridge) Street. In 1945 the **Medical School** also moved out, relocating to buildings on the east side of Oxford Road and by 1950 an offshoot building also existed on the east side of Oxford Road, situated on Dover Street **[Plate 2.1.10]**.

In the 1950s the **Science Quadrangle** began to emerge to the east of Oxford Road with the construction of the **Electrical Engineering Laboratory** (1954), **Simon Engineering Laboratories** (1962) and **Chemistry Building** (1964). The Science Quadrangle was completed in 1967, when the seven-storey **Schuster Building** was built on Brunswick Street (today Brunswick Park) to house what was now known as the **Physics and Astronomy Department [Plate 2.1.11]**. By the 1970s the sciences, and the Medical School, were firmly situated on the east of Oxford Road. Another major reconfiguration of the campus came in 1970-72 with the **Education Precinct Centre** project. Construction of the first phase, extending above Oxford Road from Booth Street West to Booth Steet East, involved heavy clearance but plans for the intended mile-long zoned precinct of academic and residential complexes were subsequently abandoned.

1 Sumner (2013), p. 708.

Expansion continued in subsequent years, resulting in buildings such as the **Stopford Building** (the new medical school, 1974) and the **Information Technology Laboratories** (1988), and extending the university to both the southeast and the southwest **[Plate 2.1.12]**. By this time many of the historic buildings in the original core had entered new uses, whether by different department or under administrative teams.

In addition, buildings in other parts of Manchester have also been brought into the university estate, the **Whitworth Art Gallery** being acquired in 1958 and the **John Rylands Library** in 1972.



2.1.7 *Victoria University and surroundings, 1908 OS (Promap)*



2.1.8 *Victoria University and surroundings, Kelly's Directory, 1920 (University of Manchester)*



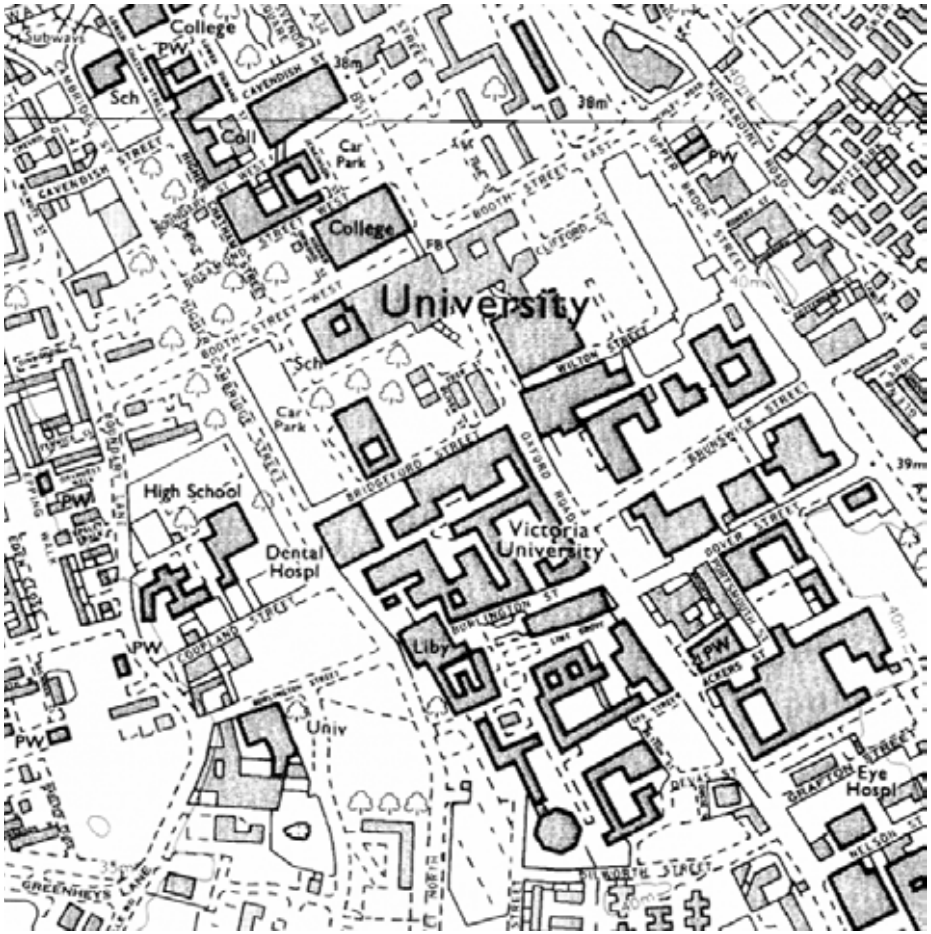
2.1.9 *Victoria University and surroundings, c.1925 (University of Manchester)*



2.1.10 *Victoria University and surroundings, 1950-51 OS (Promap)*



2.1.11 *Victoria University, 1972 OS (Promap)*



2.1.12 *Victoria University, 1994 OS (Promap)*

2.1.5 The 21st Century

The **Victoria University of Manchester** merged with the **University of Manchester Institute of Science and Technology** (UMIST) in 2004 to create the UK's largest single-site university. Today, the **University of Manchester** has the biggest university estate in England, comprised of some 229 buildings (30 of these statutorily listed), across a site of 270 hectares.[2] New buildings have included the £50m **Manchester Business School** (replacing the Precinct Centre) and the **Manchester Engineering Campus Development** (one of the single largest construction projects at any British institute of higher education).

In and around the Old Quadrangle, only the Museum, Whitworth Hall and 1940 Dental School have retained their original uses. The Dental School of 1908, fronting onto Oxford Street, was acquired by the Museum in 1977 and is now **Café,** as part of a wider development relocating the Museum's main entrance to Coupland Street (2003) **[Plate 2.1.13]**. The Chemistry building has been repurposed for Student Services and the Physics and Engineering buildings north of Coupland Street reallocated to Psychology, Music and Drama and the Museum. Little of Victorian Chorlton on Medlock survives, although the townhouses at 176-188 (even) Waterloo Place (Grade II, now offices) act as a reminder of the area's former residential character.

2 University of Manchester (2018).



2.1.13 *University of Manchester, site of first Oxford Road buildings, c.2022 (Historic England)*

2.2 The Physics Department

2.2.1 Early Years

The **Chemistry Department** had quicky established a dominance at Owens College and its Professors, Edward Frankland (in post in 1851-57) and Enfield Roscoe (from 1857), were loud advocates of the need for a Physics faculty. Under their influence, the first Chair in Physics was appointed in 1860 (Robert Bellamy Clifton) and the second in 1865 (William Jack).

Little is known about the provision for Physics at Quay Street, said to have been 'a few rooms which nobody else wanted in Cobden's House'. This was not unique to Manchester, even at the end of 1870s so-called Physical Laboratories typically being confined to *'a few odd rooms, wrung from a reluctant governing body by the importunity of the professor'*.[3]

The Physics syllabus initially covered a broad range of mathematical physics and experimental mechanics but was reformulated in the 1870s under Balfour Stewart (1828–87) and Thomas Core (1836–1910). Greater emphasis was now given to laboratory research, regarded as an important means of providing training in method and encouraging analytical skills and inquisitiveness. The laboratory provision remained, however, poor, particularly in comparison to the Chemistry Department, although a **Dynamo House** was added in 1886, allowing **Electrotechnics** to be taught as a branch of Applied Physics.

2.2.2 Demand for a New Building

As a college, Owens could not offer degrees and Physics students studied simply in preparation either for work or for a degree course elsewhere. This changed when **Victoria University** was founded in 1890, two students graduating with Physics degrees in that year. One of these, Albert Griffiths, completed an MSc in 1893 and a doctorate in 1899, becoming the Head of the Physics Department at Birkbeck in 1900. However, the number of graduating students remained small, typically one or two per year (sometimes reaching three or four), with few postgraduate students.

The call for new laboratories was taken up by **Alfred Schuster** (1851–1934), former student and now **Langworthy Professor of Physics and Director of the Physical Laboratories** (1888-1907). He too believed in the importance of laboratory- and research-based study, with the opportunity for progression to advanced post-graduate research. For Schuster, new laboratories were needed not only to support research but also to equip young men, and, indeed industry itself, with the increasingly important knowledge of electricity and magnetism.

As with other buildings, construction of new **Physical Laboratories** was reliant upon bequests and donations, Schuster carrying out a rigorous fundraising programme (and, indeed, contributing from his own personal funds). He was also believed to have been heavily involved in influencing its design, informed by those that he had observed at universities in Cornell and in Germany. In addition, Beaumont, the architect, *'was sent by the council of the Owens College to visit the principal modern laboratories of Germany'*.[4]

There were a number of contemporary trends combining to encourage, in Britain and abroad, the emergence of new academic research laboratories. Laboratories for Physics instruction were comparatively new, Schuster having experienced some of the very first physics laboratories in England during his time in Cambridge and Owens College. At this time, student laboratories had been intended mainly for observation, not for active investigation, whilst those institutions with superior laboratories, such as Cambridge, often reserved these for the exclusive use of "pure" research. By the end of the century, however, there was growing movement towards research and laboratory-based investigation in higher education, rejecting earlier purely lecture- and observation-based instruction. Expected standards of attainment were rising and as education became more widely accessible there was a growing desire to accommodate greater numbers of advanced-level students.

The subject matter of Physics was also entering a new age, X-rays, radioactivity, the electron and radium all being discovered between 1895 and 1898 and an "old physics" based on the qualitative discovery of new physical phenomena on the cusp of being displaced. New allied subjects, including electrical engineering, radioactivity and electrochemistry, were also emerging. This, it was argued, demanded professional, well-equipped, and plentiful laboratory accommodation.

3 Thomson (1926), p. 772.

4 Anon. (1899).

2.2.3 The Early-20th Century (1900-1945)

Having relocated to its new building in 1900 (see below, Section 2.3), the Physics Department continued to build on its earlier reputation. It also entered into the "new physics", Schuster purchasing his first supply of **radium bromide** in 1903 and new Research Fellow Walter Makower also conducting research on radioactivity by 1905. By 1907 there were five researchers, including Schuster, involved in practical investigations with radioactivity using radium. Spectroscopic work had also started, perhaps carried out in the first floor **Optics Room** or second floor **Grating Room**.[5]

In 1907, when Schuster retired, there were some 150 students studying elementary courses in Physics and Electrical Engineering and around 100 carrying out advanced studies.[6] The laboratories were still seen as some of the best in England, although perhaps now second to those at the Cavendish Laboratory in Cambridge.

The "second scientific revolution" was now underway and many students and researchers were attracted to Manchester by the prospect of working with the Nobel Prize winner **Ernest Rutherford, Langworthy Professor of Physics**. In 1911 Rutherford and his team of staff and advanced students (for which see below, Appendix III) developed *'the nuclear model of the atom to account for alpha-particle scattering results achieved by Hans Geiger (who prototyped his eponymous radiation counter here), and Ernest Marsden'*.[7] This discovery, *'the Bohr-Rutherford quantum atom and the firm establishment by Moseley of the concept of atomic number 1913, to name only the most outstanding'*, were of such importance that the Physical Laboratories have for a long time been regarded as "the birthplace of modern physics" **[Plate 2.2.1]**.[8]

The teaching activities of the department were disrupted during the First World War (1914-19) and much of its research was paused. Rutherford became a consultant for the Admiralty Board of Invention and Research, investigating underwater acoustics as part of its work on anti-submarine warfare. He was, however, able to continue his own research and in 1917, whilst the war was still underway, *'Rutherford demonstrated the **artificial disintegration of nitrogen**, the most prominent of the several discoveries known journalistically as **"splitting the atom"**'*.[9]

An increase in the number of graduates occurred in the mid-1920s, reflecting not only growing intake but also the new value that was attached to degrees **[Plate 2.2.2]**. Further growth occurred in the immediate post-war years and by 1951 the Physics Department had 74 graduates, many students attracted by the opportunity for collaboration with the adjacent Electrical Engineering Department, led by F. C. Williams **[Plates 2.2.3-2.2.4]**.

The department retained its international reputation for research and continued to attract staff and students of high calibre, Nobel Prizes being granted to **Lawrence Bragg** (1915, prior to his joining the department), **Niels Bohr** (1922, after his departure), **C. T. R. Wilson** (1927, a former undergraduate student), **James Chadwick** (1935, whilst working in Cambridge) and **Patrick Maynard Stuart Blackett** (1948, whilst Professor of Physics).[10]

5 Todd (2008), p. 29.

6 Anon., (1934) p. 595.

7 Sumner (2013), p. 708.

8 Todd (2008), p. 12.

9 Sumner (2008), p. 708.

10 University of Manchester (2018).



2.2.1 *Rutherford and Physics staff and senior research students outside the main entrance, 1913 (Todd)*



2.2.2 *Graduating class of 1927, with lecturers W. L. Bragg and R. W. James (Alison Goddard)*



2.2.3 *Graduating class of 1950 (Robin Marshall)*



2.2.4 *Graduating class of 1953, with staff (Robin Marshall)*

2.2.5 The Post-War Period to the Present Day (1945-2022)

Experimental Physics had divided from Theoretical Physics in 1938 to form a separate department and in 1952 Astronomy was similarly cleaved away. **Strange particles** were discovered in 1947 (in the former **Electrochemical Laboratory**) under the leadership of Patrick Blackett (1937-52), whilst Samuel Devons (Langworthy Chair in 1955-60) presided over a new interest in **nuclear physics**. The **Rutherford Jubilee** was held in 1951, celebrating the discovery of 1911, and brought figures such as Marsden, Chadwick and Bohr back to the building as visitors.

The **Electrical Engineering Department (formerly Electrotechnics)** which started as a section of the Physics Department, seemingly becoming independent in 1912, when it was given its own space in the new **John Hopkinson** annexe of 1912 and a dedicated Chair was founded. It was here that the engineer **Sir F. C. Williams** (1911-77) established the **Computing Group** on his appointment in 1946 and, with **Tom Kilburn** (1921-2001), developed the "Baby", *'the world's first stored-program computer, a true universal computer, where changing a program would take minutes rather than days'* (1948), the Manchester Mark 1 and, in collaboration with the Ferranti engineering company, *'the first commercial computer in the world'*.[11] **Dr Alan Turing** (1912-54) joined in 1948, researching the potential applications of computer technology and developing the "Turing test" definition of artificial intelligence. Until 1951, this work was carried out in what had been built as the extension's **Magnetic Testing Room**, renamed the **Computing Laboratory**.[12]

A building was then constructed on Coupland Street to house the Ferranti computer (1951), itself then superseded by a space in the new Electrical Engineering building (1954-55). The Computing Group became Britain's first *Department of Computer Science* in 1964 and played a *'prime role in the national computing infrastructure of the 1970s'*.[13]

The Physics Department has continued to attract eminent researchers and to carry out research of international importance. Nobel Prize winners associated with the department have included **John Cockcroft (1951), Hans Albrecht Bethe (1967), Nevill Francis Mott (1977), Sir Kostya Novoselov (2010)** and **Sir Andre Geim (2010).**[14]

11 Sumner (2008), p. 708.

12 University of Manchester School of Computer Science (2007).

13 Sumner (2008), p. 710.

14 University of Manchester (2018).

2.3 The Physical Laboratories (now the Rutherford Building)

2.3.1 Predecessor Building

The first space provided at **Oxford Road** was a 'three-room laboratory' in a basement, at a time when student numbers hovered around 10 or fewer.[15] Additional rooms were added in an ad hoc manner as space allowed, with the result that by 1898 it *'occupied almost the whole of the base of the west side of the quadrangle'* **[Plate 2.3.1]**. A **lecture room** with an associated **apparatus room** was situated on the first floor, while the **dynamos** were located in a separate building inside the 'courtyard' (presumably the west quadrangle).[16] The use of these buildings after 1900 is unknown.



2.3.1 *Site of the predecessor building (red) and its future replacement (blue), 1893 OS, revised 1888-1889 (Promap)*

15 Anon., (1934) p. 595.

16 Hartog (1900).

2.3.2 The new 'Physical Laboratories' (1900)

Design influences

A key influence shaping the design of the new building was 'Schuster's conception of laboratory work — that it should be interdisciplinary and cooperative', with space both for dually practical and theoretical teaching and for pure research.[17]

As Schuster also insisted the importance of shared knowledge, there was a conscious rejection of the tendency, allegedly commonplace in European universities, to spatially segregate the senior and elementary students and a similar renunciation of the new fashion for individual research rooms (regarded by Schuster as a barrier to the Professor's rounds). Indeed, according to a later publication, Schuster '*carefully thought out every detail likely to increase the comfort and efficiency of the Laboratories*'.[18]

At Schuster's behest, the building also made provision for both the **Electrotechnical** and the **Electrochemistry Laboratories,** Schuster envisioning *'an integrated culture spanning industrial testing, teaching and research'*.[19] Initial plans to contain the Electrotechnical Laboratories in a large interconnected annexe, dedicated to the late **Dr John Hopkinson**, were, however, abandoned during construction and instead these rooms were incorporated within the main building, ostensibly as a temporary measure. The initial plans for an **Observatory** were also abandoned due to the cost of equipment, although it was noted that the space remained available (and an octagonal dome can be seen on a photograph from 1912 – see plate 2.3.24 - suggesting it may have been added later).

The estate, or circle, of **John Hopkinson** is likely to have been a major source of funds, a memorial plaque being visible in photographs of the corridor between the Dynamo House and the Electrochemical Laboratory **[Plate 2.3.2]**. Also in this corridor, a separate plaque of unrecorded date states: 'THE JOHN HOPKINSON ELECTROTECHNICAL LABORATORY. This portion of the building was erected and equipped in the year 1899 in memory of Dr JOHN HOPKINSON F.R.S. by his parents relatives and friends'. Oddly, however, the several accounts and histories published by Schuster, the university and others, effusive on Schuster's role, make no reference to the donors.



2.3.2 *Memorial plaque to John Hopkinson (Dynamo House), 1903 (University of Manchester)*

Construction

A plot of 105 x 72 feet, containing room for future expansion, was purchased to the north of Coupland Street, bound by housing on Huntingdon Street to the north, Eagle Street to the west and Oxford Street to the west. A complex of buildings, seemingly industrial, already existed on the site but appears to have been vacant.

James William Beaumont (1848-1931) FRIBA was commissioned as the architect. The foundation stone was laid in October 1898, on the 25th anniversary of the opening Oxford Road site, by the donor **Henry Gustav Simon (1835-99)**, an engineer and proponent of both technical education and scientific knowledge.

Opened on 24 June 1900 by **Lord Rayleigh**, the building was 100 feet long and 60 feet wide, having three principal floors plus a basement. It was claimed (by Schuster) to be the **fourth largest university laboratory building in the world** and, in terms of working space, by Schuster, surpassed only by Baltimore and Darmstadt.

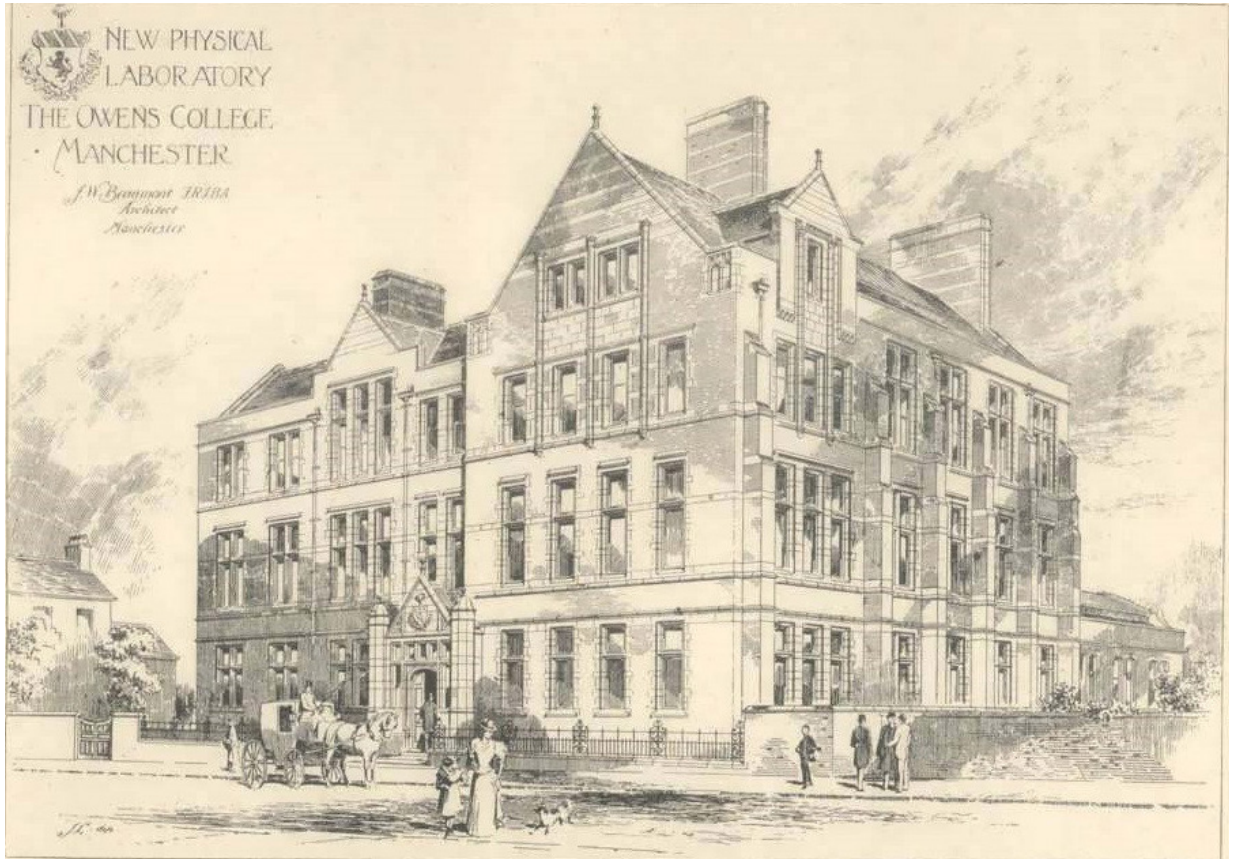
Plans show it as roughly square, with a small courtyard in the northwest of the building, leading to a loading door. A lightwell at basement level ran along the south elevation and the adjacent parts of the east and west walls, whilst a tunnel provided access to neighbouring buildings. The main entrance was on the south elevation at ground floor level, where a spine corridor ran north, through the main stairwell to terminate at the side of the Dynamo House. A second, shorter, corridor ran to the west and provided access to stairs to the basement and the lift. Externally, the

17 Peters (2020

18 Schuster (1912.

19 Sumner (2013) p. 707.

red brick façade may have been a conscious decision, part of Schuster's invocation of the fertile relationship between industry and science (from which the building had evidently benefitted) and his vocal renunciation of alleged ivory tower elitism in those academic laboratories that shunned anything but pure research, carried out by elite staff alone **[Plate 2.3.3]**.



2.3.3 *The Builders' Journal, 1900 (Ebay)*

Fit out

Schuster was also closely involved in the fit out of the building and responsible for all of its equipment and apparatus.

Initial reports stated that **air filtration equipment** had been provided, an electric **lift** had been fitted (running the full height of the building) and **electric lighting** was to be provided throughout. There was to be a carefully planned system of ventilation, combined with efforts to exclude dust, as far as possible, from all rooms, and especially from the instrument cases'. On the ground floor, the Electrotechnics room were to be provided with access to *'large currents... available for electric furnaces'*.[20]

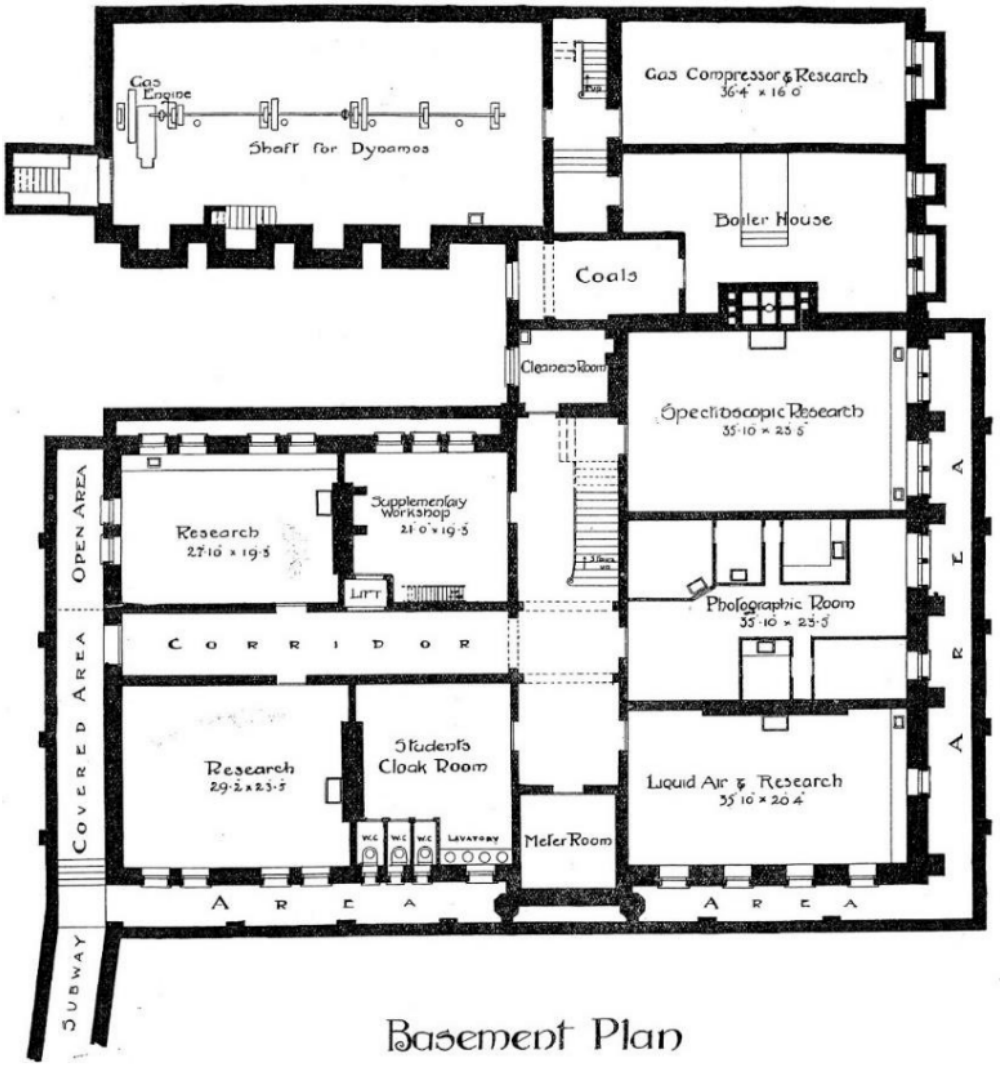
It was expected that around £10,000 would be spent on equipment, bringing the total cost to **£30,000.** There was extensive use of glazed brickwork to the interior, the first available photographs showing dark glazing to the bottom and lighter bricks above (see above, Plate 2.3.1). Workbenches and other furniture were also installed as part of the construction.

20 Anon. (1899); Schuster (1900).

Basement **[Plate 2.3.4]**[21]
Although necessarily containing a small amount of service space – the coal-fired boiler house (with coal store adjacent), the meter room, the cleaner's closet and student WCs – the basement was in the main given over to research, as the main research space for non-Electrotechnics.

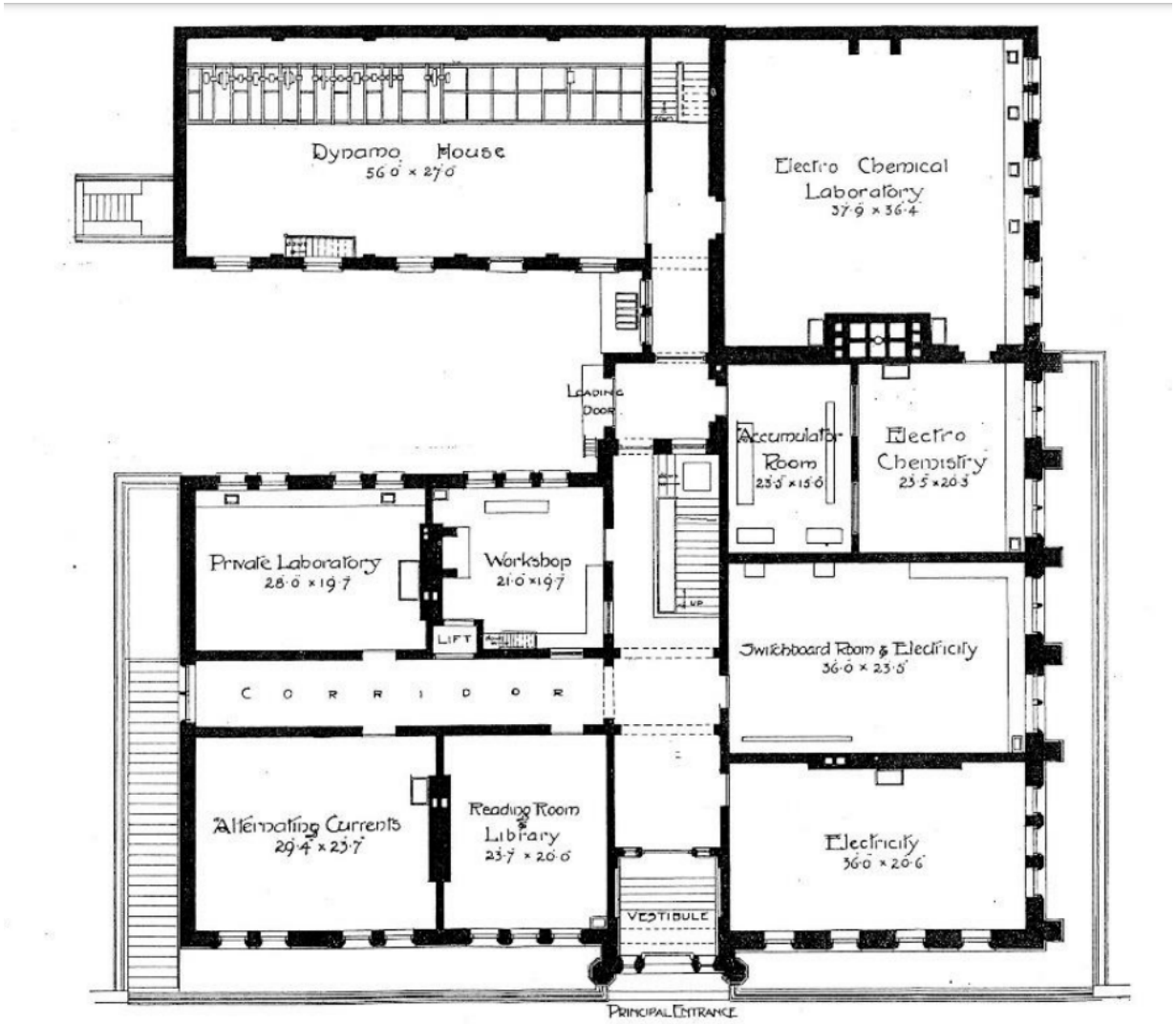
This floor contained the lower level of the **Dynamo House** in the northwest, with a **Photographic Room** (divided into several darkrooms), a workshop and various Research spaces, some expressly dedicated to **Spectroscopic Research**, **Liquid Air & Research** (experiments with Liquid Air) and **Gas Compressor & Research.** Although not expressly named in the plans, there was also a room for research requiring constant temperatures, another (perhaps the workshop to be used for standardising equipment and a photometry space.

21 Descriptions of the floors use information from Hartog (1900).



2.3.4 *Basement, undated plan, c.1900*

Ground floor **[Plate 2.3.5]**
Plans indicate that with the exception of the entrance vestibule and the Reading Room & Library the ground floor was given over to teaching and research connected to electricity, in a mixture of **Electrochemistry** and **Electrotechnical Physics** (or Electrical Engineering), both under **Dr Beattie**. The north end of the floor was occupied by the sunken **Dynamo House** and adjacent **Electrochemical Laboratory** (for the study of the magnetic properties of iron), these rooms (both lit by large roof lanterns) and the intervening corridor (containing stairs to the basement) and lobby (with its loading door) being single-storey. The Dynamo House, named after John Hopkinson, was used for students' investigations into electricity and currents and, consequently, would sometimes also be referred to as the **John Hopkinson Laboratory [Plate 2.3.6]**. A **Switchboard Room** was included to provide the large quantities of electricity running through the building, whilst the **Private Laboratory** was presumably for Beattie's use **[Plate 2.3.7]**.



2.3.5 *Ground floor plan, undated, c.1900*

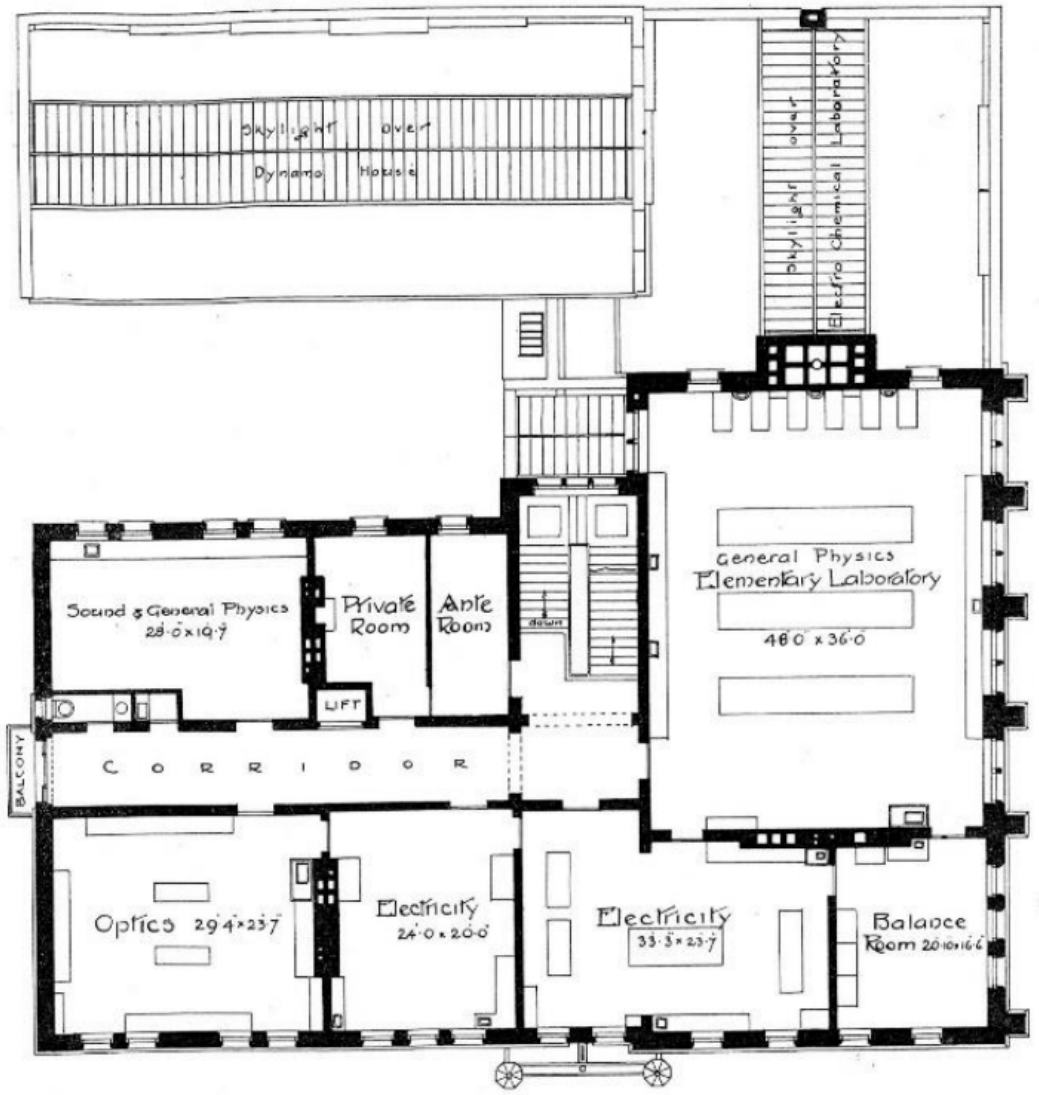


2.3.6 *Dynamo House (ground floor), 1906*



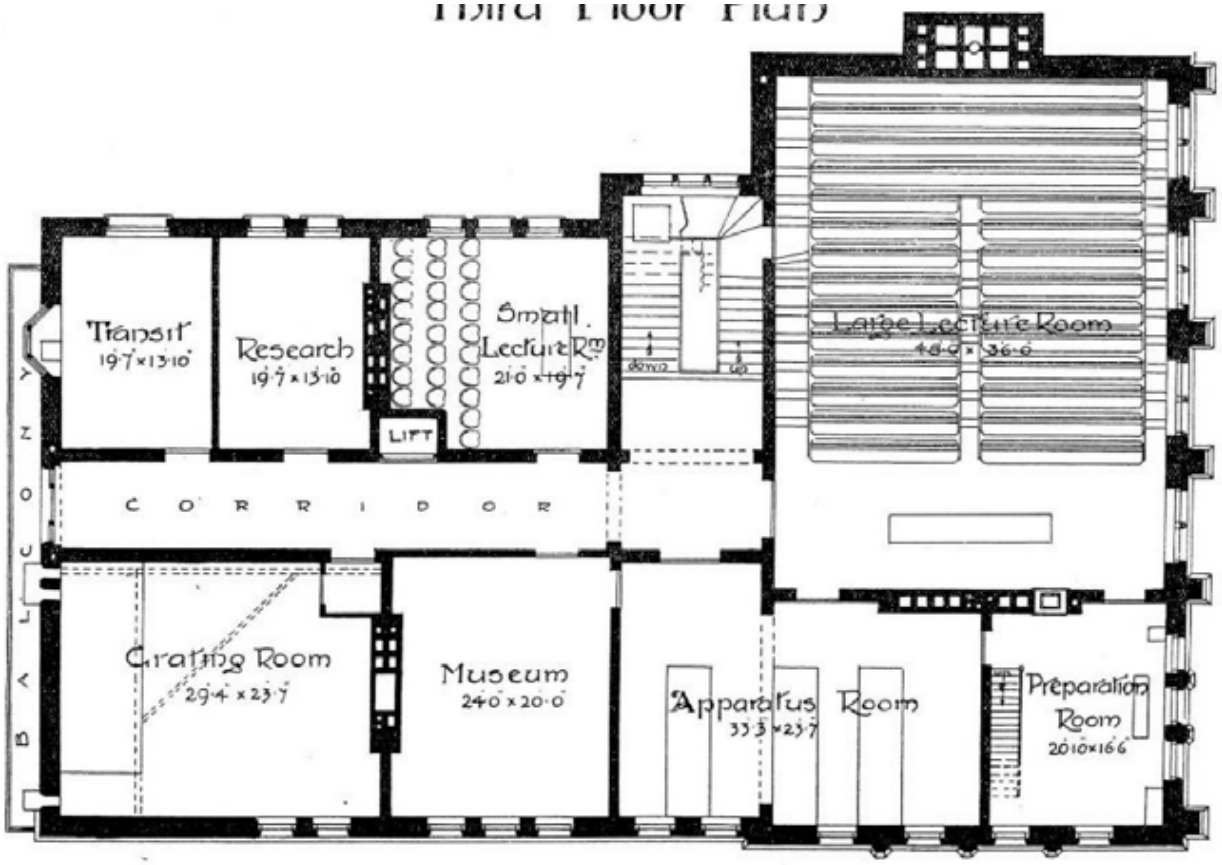
2.3.7 *Switchboard (ground floor), 1906*

First floor **[Plate 2.3.8]**
The same basic layout was replicated on the floors above. On the first floor were rooms for other facets of Physics, a staff WC, a **Private Room with Ante Room** for the **Langworthy Professor (at the time Schuster**) and a large Elementary Laboratory for the teaching of 'General Physics'. There were also two more rooms dedicated, as on the ground floor, to electrical experiments. Much of this floor seems to have been intended for undergraduate tuition in practical physics (light and sound), with teaching laboratories for electricity, optics and acoustics and a **Balance Room** (containing the analytical balances, or scales) adjoining the large laboratory. Externally, a short balcony was situated on the west elevation at the end of the second corridor (probably intended for adjusting telescopes or practising with the sextant).



2.3.8 *First floor plan, undated, c.1900*

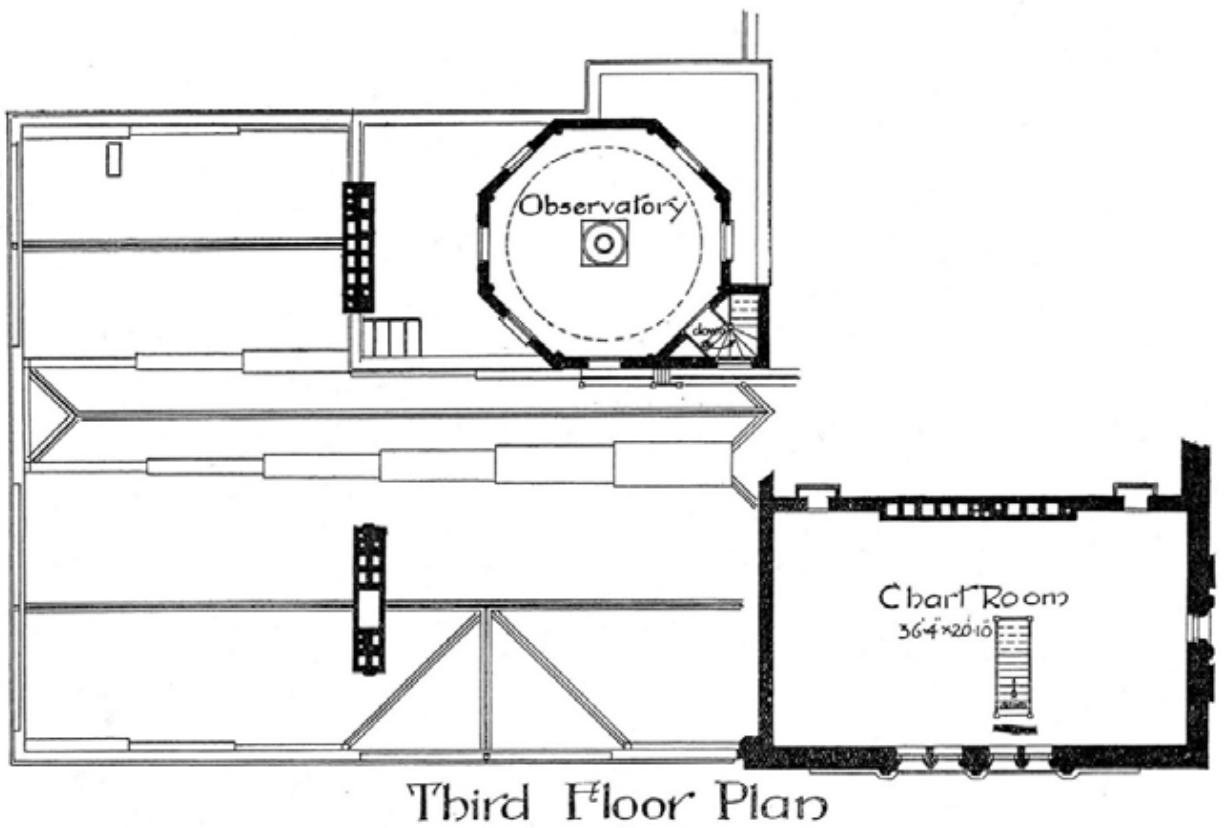
Second floor **[Plate 2.3.9]**
The second floor followed a similar plan but was more varied in its use, having a 'lofty' **Large Lecture Room** seating 200 in its northeast and a **Small Lecture Room** (for advanced students, seating 25) on the opposite side of the stairwell. The **Apparatus Room and Preparation Room** connected with the Large Lecture Room and were for use of technicians, the latter room being *'for the preparation of lecture experiments'* and also containing the stairs to the **Observatory** (whether actual or intended at this date). This floor also contained a **Museum** for historic apparatus and, intended for advanced students, a **Transit** room (housing a transit instrument, for astronomic transit research) and a small research laboratory. The western section of the Apparatus Room may also have originally been intended as a senior research room. The **Grating Room**, a dark space, was for use for with the Rowland's Grating (for spectroscopic research) and for experiments on physical optics, small openings in the wall allowing beams of sunlight to enter via helioscopes situated on the projecting stone ledge of the long balcony that ran the full length of the west elevation.



2.3.9 *Second floor plan, undated, c.1900*

Third floor **[Plate 2.3.10]**
Situated above the second floor Small Lecture Room and the adjacent stairwell was the (intended) octagonal **Observatory,** accessed from below by stairs in its southwest corner. The **Chart Room** was situated in the southwest of the building, above the Preparation Room and part of the adjacent Apparatus Room, accessed via a central flight of stairs and with two doorways that looked out across the Large Lecture Room.[22]

22 See also the description in Anon. (1899).

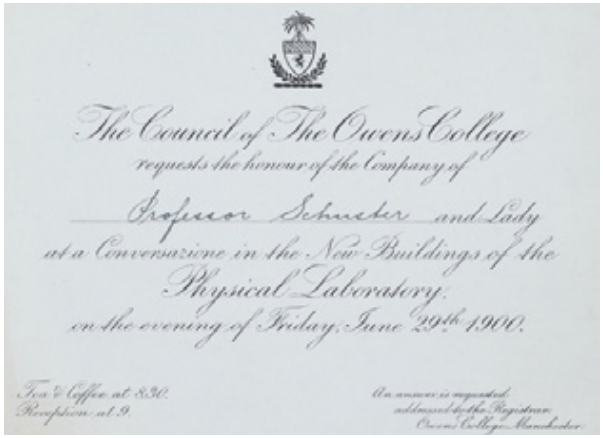


2.3.10 *Third floor plan, undated, c.1900*

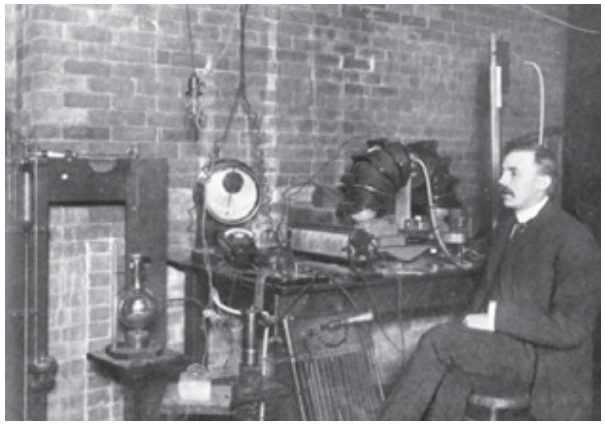
2.3.2 Use of the 'Physical Laboratories' under Schuster, 1900-1906

The building was opened to great fanfare by **Lord Rayleigh** on 24 June 1900, with an associated publication recounting the history of the Physics Department and the origins of the new 'Physical Laboratories' **[Plate 2.3.11]**. Now completely fitted out, it was claimed to be *'the most up-to-date in the country'*.[23] Contemporary photographs confirm what to modern eyes would appear the comparatively basic nature of many university Physics laboratories both at this time and in immediately subsequent years **[Plates 2.3.12-2.3.15]**.

23 See Peters (2020).


The Council of The Owens College
requests the honour of the Company of
Professor Schuster and Lady
at a Conversazione in the New Buildings of the
Physical Laboratory,
on the evening of Friday, June 29th 1900.

2.3.11 *Arthur Schuster's invitation to the opening of the new Physical Laboratory on 28 June, 1900 (University of Manchester)*



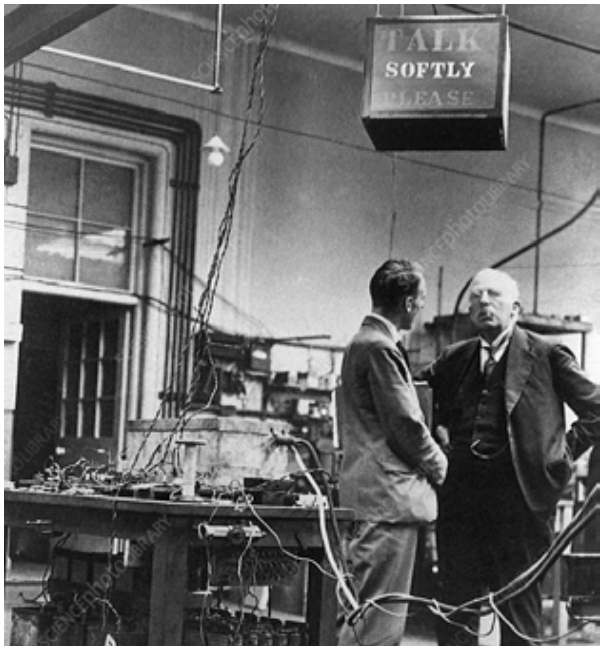
2.3.12 *Ernest Rutherford in the basement of the Macdonald Laboratory, McGill University, 1905 (National Library of Medicine)*



2.3.13 *UMIST Adavanced Physical Laboratory, c.1902-1910 (University of Manchester)*



2.3.14 *Ernest Rutherford's Research room on the ground floor of the Cavendish Laboratory, University of Cambridge (Science & Society)*



2.3.15 *Ernest Rutherford in the Cavendish Laboratory, University of Cambridge, undated (Science Photo Library)*

A small number of photographs show the new building in the first years of its use. Visible in many of the rooms are the glazed bricks, insisted on by Schuster as being easy to clean.[24] At first floor, the **Elementary Laboratory** for undergraduate students has glazed brickwork in two colours to the walls, a floor of indeterminate type and various large workbenches with stools (as recorded in the first floor plan). A single wooden-framed window is visible in the northwest corner, adjacent to the doors that led onto the stairwell **[Plate 2.3.16]**.

On the floor above, the advanced **Lecture Room** is shown with the demonstration bench at the front and student bench seating to the rear, the walls lined with panelling to the base and glazed brick above. In the front of the room a sliding door opens into the apparatus cell enclosed within the wall, adjacent to the door leading into the Preparation Room used by the technicians who supported the demonstrations. Above, at third floor or mezzanine level, were doors (with balustrades) opening off the Chart Room, perhaps to allow supervision of lectures from a distance. Between these, a wooden frame attached to the brickwork provides a means of displaying instructional sheets **[Plate 2.3.17]**. As in the lecture room below, all joinery is darkly coloured.

Externally, there are no photographs of the main entrance but the courtyard (with loading door) at the immediate south of the Dynamo House is included in a photograph of Schuster's "jubilee" celebrations (1906) **[Plate 2.3.18]**. In later years this location was also often chosen as the typical location for graduation photos. Externally, the map of 1908 shows the footprint as depicted in the plans, complete with the southern lightwell and railings on the steps leading up to the Dynamo House. There is no indication as to the use of the two buildings to the immediate west, which were not included in the plans, although they may have served an ancillary or supporting function (whether for Physics specifically or the various departmental laboratories as a whole). One features in a photograph of 1908, as a flat roofed structure located adjacent to the gates providing access into the site. As the map confirms, houses still lay to the immediate west, east and north of the site **[Plates 2.3.19-2.3.20]**.

The building was named the **Schuster Laboratory** at an unknown date, perhaps soon after construction (or, alternatively, on his retirement).

24 Sumner (2013), p. 709.



2.3.16 *Elementary Laboratory (first floor), 1906*



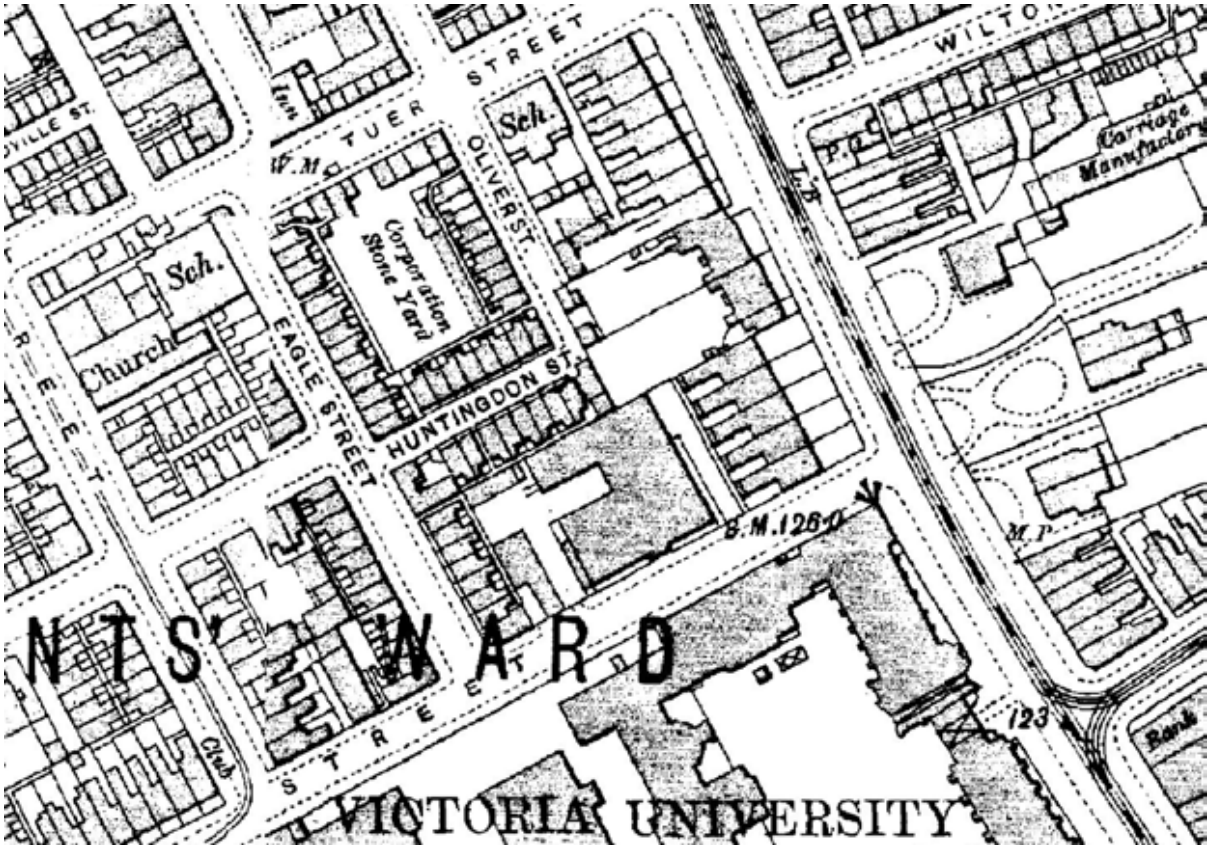
2.3.17 *Large Lecture Room (second floor), 1906*



2.3.18 *West courtyard of the Physical Laboratories, Schuster's Jubilee Fest, 1906*



2.3.20 *Physical Laboratories with an addition at the west, 1908 (Univeristy of Manchester)*



2.3.19 *Rutherford Building, 1908 OS (Promap)*

2.3.3 Use of the Physical Laboratory under Rutherford, 1907-1917

Under Rutherford the Physic Department's research and teaching became much more heavily focused upon atomic physics. In recent years, the university has celebrated the investigations carried out by Ernest Rutherford and his team of staff and students in the years from 1907 to 1919. Their experiments into the disintegration of nitrogen have received particular attention, with the Professor's **Private Laboratory** on the ground floor (now known as the "Rutherford Room") often celebrated as the site of the investigations.

Recent work by Neil Todd has sought to identify the activities taking place in different parts of the building at this time. It should be noted that there was a prevalent concern that "emanation" escaping from the stored radium, and from the radium as it was being prepared, would contaminate the rest of the building and the equipment, distorting the results of experiments. By storing the radium on the second floor and carrying out the investigations in the most distant part of the building, the basement, it was hoped to minimise these effects.

It should also be noted that the exact location of the experiments leading to "the splitting of the atom" is unconfirmed, with William Kay (technician to Rutherford) later identifying the basement as their site. Indeed, 'trying to identify "the room where the disintegration experiments happened" may necessarily involve some oversimplification of a spatially distributed operation.'[25]

25 Sumner (2013), p.714.

Basement

As before, the basement laboratories remained the focal point of the staff research. However, their focus was now nuclear investigation, housing student John Nuttall, whose investigations culminated in the 1912 Geiger-Nuttall law, Ernest Marsden and Oxford graduate Henry Moseley. In addition, Hans Geiger seems to have occupied the **Liquid Air & Research Room** (where in c.1909 an electrical method for counting radioactive decays was invented, paving the way to the Geiger Counter) **[Plates 2.3.21a-2.3.21b]**.[26]

Rutherford himself used one of the basement rooms abutting the Boiler House for his study of α-rays. This was remembered as being traversed by hot water pipes and is likely to have been the **Spectroscopic Research Room**.[27] A large water tank was installed in the basement during the First World War used in his Admiralty experiments in submarine detection.

26 Todd (2008), p, 38.

27 Todd (2008), p. 34.



2.3.21a *Hans Geiger and Ernest Rutherford in Geiger's basement laboratory (Liquid Air & Research Room), 1912*



2.3.21b *Closeup of Ernest Rutherford in Geiger's basement laboratory, 1914 (PA Images)*

Ground floor

There are only very occasional references to a research room on the ground floor being used for investigations with radioactivity, and nothing specific to Rutherford. The basement was seemingly the preferred option, being more distant from the second floor "radium room", where the "emanation rays" were produced. The Electrotechnical Laboratories vacated the ground floor in 1912 (see below, Section 2.3.4) but there is no record of how these rooms, or the adjacent Electrochemical Laboratory, were used subsequently **[Plate 2.3.22]**.



2.3.22 *Electrochemical Laboratory (ground floor), 1912*

First floor

Rutherford also turned one of the rooms into a **training laboratory**, used for introductory courses in the experimental methods of radioactive research. This seems to have also functioned as the **departmental tearoom** and may have been situated in the first floor Electricity Room above the principal entrance.

Second floor

Although Schuster had also brought radium to the university for research it was now used in vast quantities, Rutherford devising a way of obtaining "emanation" by heating the radium in a quartz tube, aided by a mercury pump.

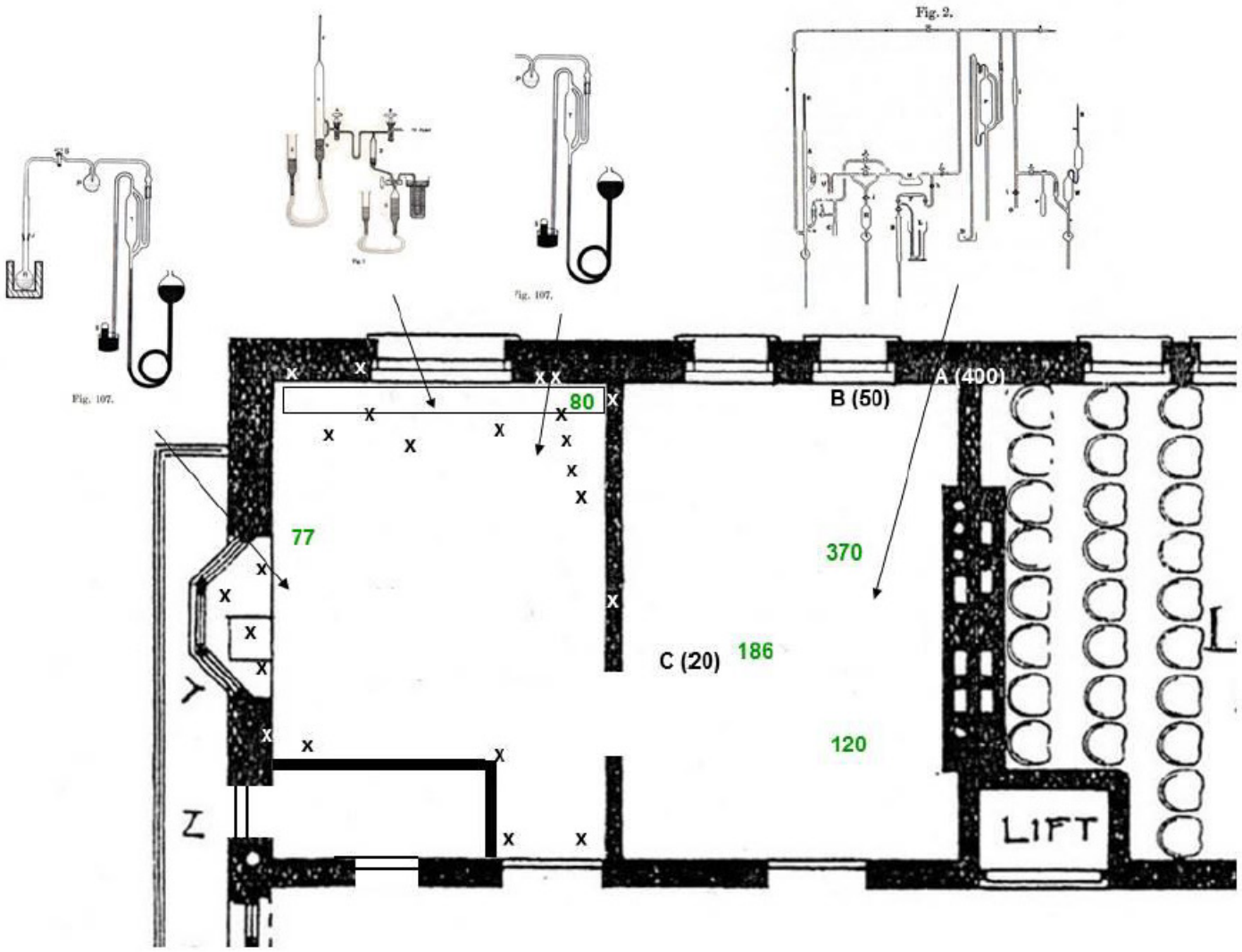
The **Transit Room** in the northwest corner of the second floor (now 2.057) became the **"radium room",** possibly retaining this role until 1919 (occupied by Radium Technician or Laboratory Assistant Walter Lantsberry). The use of an upper floor room to store the radium, prepare radioactive sources for use in experiments and isolate the associated apparatus was by this date becoming commonplace in the belief that escaping "emanation" (radiation) could be vented out via the windows, thereby preventing the contamination of the building and its instruments.[28] This room, situated on the top floor and having two windows, would have appeared ideal. It thus became *'the inner sanctum of the laboratory making possible all of the experiments which Rutherford and his school carried out'*.[29] Here, a Toepler pump (probably situated in the bay window) and various secondary apparatus, including a mercury pump (likely placed in the smaller window) was used to produce and purify the radium "emanation", in a process involving large quantities of mercury. The glass apparatus used in the process was also stored in this room. The prepared radioactive sources, now releasing "emanation-rays", were then carried down the stairs and into the laboratories (primarily situated in the basement).

It was also in this room that in 1908 Rutherford and student Thomas Royds built on the work of Soddy and Ramsay to determine the **helium nature of the alpha particle**, demonstrating that alpha-particles are ionised atoms of helium (the apparatus that they use now displayed at the Cavendish Museum, Cambridge). It was also the room in which the glass apparatus was stored.[30]

High levels of mercury contamination indicate that these activities also extended into the adjacent **Research Room** (2.058), with the opening between the two rooms perhaps made at this time **[Plate 2.3.23]**.

The **Preparation Room** in the southeast corner became the workspace of Laboratory Steward William Kay, who during the First World War used this space to prepare the **radioactive source preparation** for Rutherford's research.[31] It is not known whether the "radium room" also remained in use for this purpose.

28 Todd (2021), p. 24.
29 Todd (2021), p. 26.
30 Todd (2021), pp. 44-45.
31 Todd (2021), pp. 25-26.



2.3.23 *Second floor Transit Room and Research Room, showing areas of radioactive contamination (X) and mercury contmination (green) and probable sites of apparatus during the Rutherford era (Todd)*

Third floor

The phrasing of many retrospective accounts is unclear, with references to Rutherford using an "attic" room as a radium store and laboratory. This may refer to the "radium room" but could also indicate use of the **Chart Room** situated above the Preparation Room.

A pamphlet published in 1912 (on the completion of the extension) found much to praise at the Physical Laboratories. The equipment was 'unusually complete' in a number of areas, light research, for example, having an echelon spectroscope, a quart spectrograph and 'a large Rowland grating admirably mounted'. There were also 'several high-potential batteries, numerous electrometers, electroscopes and other instruments of measurement', which had allowed Manchester to become 'one of the chief centres of research in Europe on Radioactivity and allied subjects', conducting large-scale radium experiments using the 450mg of radium bromide provided by the Vienna Academy of Sciences. For experiments requiring high pressure or temperatures, the Dynamo House provided pressures up to 1,000 amps, whilst the Electrochemical Laboratory contained several high-pressure furnaces. Further pressure furnaces, and a high-pressure pump, had been donated by Professor Petavel, whilst basic equipment could be produced (and repaired) in the Steward's workshop. For more complex equipment, the nearby University Engineering Works was on hand.

2.3.4 The John Hopkinson Annexe, 1912

Context and design

The original plans of 1900 had included an 'annexe' in memoriam to **Sir John Hopkinson**, dedicated to what was at that time the **Electrotechnical** section of the Department of Physics. As early as 1908 Rutherford was reporting a shortage of space for research and training and requesting the reallocation of the ground floor. As expressed by Rutherford, the building's equipment, research provision and reputation as a centre for original research was attracting a growing number of advanced students, creating increasing pressure. Simultaneously, the amount of space available for teaching had fallen, not least because of the creation of a radiation training laboratory for the advanced classes. The problem of contamination was believed to be substantial, some researchers having commandeered the teaching laboratories in an effort to create a greater distance between those using radioactive substances and others taking measurements that the "y waves" were believed to be distorting. Background contamination was believed to be an even greater problem, The existing building, it was believed, was so contaminated by radioactive "emanations" that experimental results were distorted. Any work needing precision could be carried out only in brand new laboratories, free of and (at a distance from) the existing contamination.

Discussions proper began in 1910, when it was decided to erect the annexe on either side of the Dynamo House, and to relocate the Electrotechnical staff from the ground floor of the main building. Again, much of the funds were raised through bequests and donations.

Beaumont was again commissioned as the architect, with input from Rutherford and Beattie. The plot was now extended over Huntingdon Street, reaching as far north as Bridge (Bridgeford) Street. By this time the houses to the west of the building had been replaced by university buildings, built over the former side street. To the east, further houses had been demolished and the large Dental Hospital now ran along the southern side of Bridgeford (Bridge) Street (1908, Grade II).

Construction **[Plates 2.3.24-2.3.25]**
The structures to the west of the building were demolished in 1912. Construction of the annexe began in spring 1911 and involved the addition of two new connected wings abutting the existing Dynamo House, the **north wing** also being joined to the main building at the end of its spine corridor. The southern elevation of the west wing contained the principal entrance to the annexe and, consequently, was more elaborate, both wings being faced in red Ruabon brick with stone details. This created a self-contained annexe, incorporating the existing Dynamo House, that was renamed in its entirety the **John Hopkinson Building.**

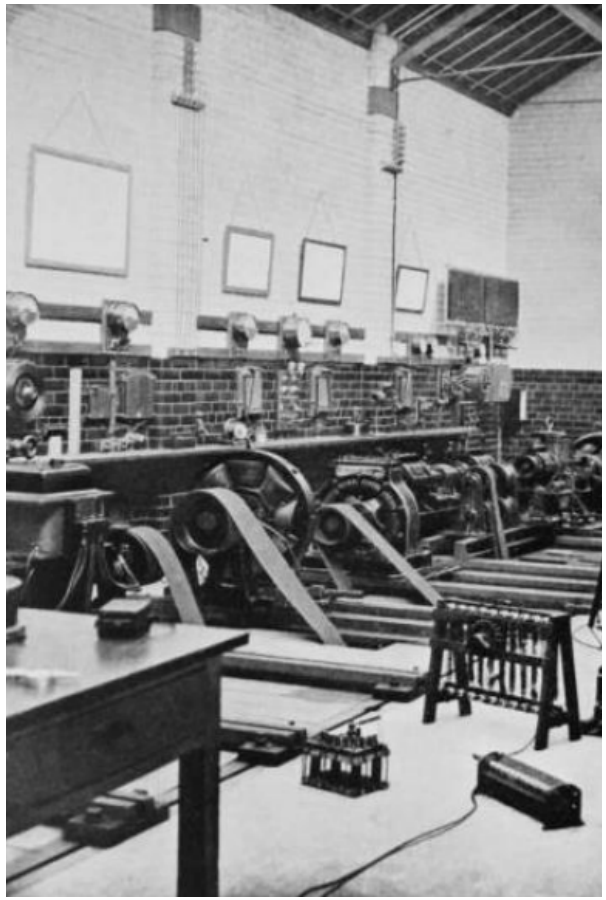
Fit out
The new annexe was fitted out to the instructions of Dr Beattie, with extensive use of **white glazed brick**, although the Dynamo House appears to have remained unchanged **[Plate 2.3.26]**. £725 was bequeathed by friends and family of Hopkinson for equipment and Messrs Vaughan and Son donated the **2-ton gantry and lifting gear.**



2.3.24 *1912 John Hopkinson annexe north wing, viewed from the north (Bridge Street) 1912*



2.3.25 *1912 John Hopkinson annexe west wing, viewed from the south (approached from Coupland Street), 1912*



2.3.26 *Dynamo House, 1912*

Use of the annexe: Electrotechnics **[Plates 2.3.27-2.3.28]**
Much of the annexe was allocated to the **Electrotechnics** team (later increasingly known as Electrical Engineering) under Dr Beattie. At ground floor, the Dynamo House was at the functional and now physical heart of the team. At its immediate north, in the north wing, were the interconnected **Direct Current** and **Alternating Current Rooms**, used for the instruction of elementary students in the testing and working of electrical equipment before they progressed to investigations on the larger machines in the Dynamo House. Brick dividing walls in the Direct Current Room increased the amount of space available for benches and wall-mounted instruments. A **Drawing Room/Library** sat to their west whilst to the north, beyond the central corridor, were the **Standardising Room**, **Workshop, Switch Room** (controlling the substantial flow of electricity through the building) and **Magnetic Testing Room**, plus the staircase.

In the west wing, the **Battery Room** (a gas turbine engine room) sat adjacent to the Dynamo House, with stairs, WCs and Beattie's own private study and laboratory.

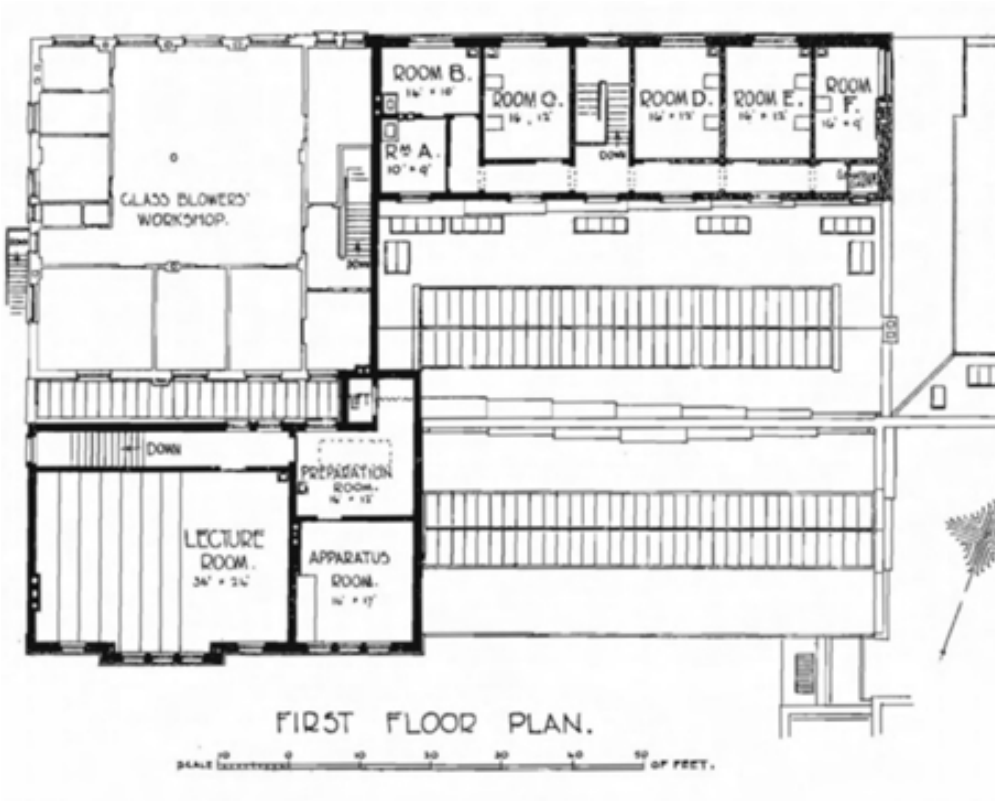
At first floor, a **Lecture Room** for 100 students**,** served by **Preparation and Apparatus Rooms** (as in the main building) occupied the west wing. Attached to its walls were various large-scale electrical instruments, which could be connected to the apparatus on the demonstrating table, making the results visible to the entire class. There were no rooms at first floor in the south of the north wing, and those in the north were allocated to Physics (see below).

There also appears to have been a basement beneath the north wing, containing a store and a **Photometric Room.**

Over 50 students were typically attending its lectures by 1912 and Electrotechnics (also known as Electrical Engineering) now gained a new academic status, a Chair of Electrotechnics (held by Beattie) and a Demonstrator post being created and its study now elevated to a qualifying subject for accreditation. This in effect established a separate department. Research focused upon alternating current measurements and magnetism.



2.3.27 *1912 extension, ground floor, undated, c.1910*



2.3.28 *1912 extension, first floor, undated, c.1910*

Use of the annexe: Physics

The north wing of the annexe was also designed to include provision for other parts of the Physics Department. At ground floor, the spine corridor from the main building continued towards a single-storey offshoot of the north wing where an outdoor **Chemical Laboratory** for chemists working on radioactive substances had been positioned outside in an effort to prevent the radiation from affecting the Physics experiments taking place inside the building. It contained a draught cupboard and is believed to have been the laboratory in which later in the decade *the radio-chemist **A. S. Russell** carried out the investigations that allowed him to first state the* β-ray displacement law. At its side, in the same enclosed yard, was a small shed for open-air electrochemical experiments, plus stores **[Plates 2.3.29-2.3.30]**.

Upstairs, above the north wing proper, six **Physical Research Rooms** were allocated to Physics for experiments with radioactivity and the conduction of electricity through gases, the annexe being believed to be beyond '*the range of penetrating radiations*' from the radium store in the main building and from the contamination believed to have infected the main building as a whole. Each of these six rooms had electricity, gas, water, compressed air and fixed benches and slate slabs (attached to the walls), smaller offices (some of which could be darkened where required) offering workspaces free of disturbance. There is no record of how the Physics Department used these rooms.



2.3.29 *A. S. Russell, probably in the John Hopkinson annexe Chemical Laboratory, undated (Todd)*



2.3.30 *John Hopkinson annexe Chemical Shed, showing Geiger, Boltwood and others, 1912 (Todd)*

The plans also included a two-storey workshop for the university **tinsmith and glassmaker**, who provided the finer and more complicated apparatus that was beyond the capabilities of the departmental Steward. The Ordnance Survey map suggests that this was built adjoining, and possibly as part of, the west wing **[Plate 2.3.31]**.



2.3.31 *Rutherford Building and John Hopkinson annexe, 1922 OS, revised 1915-16 (NLS)*

2.3.5 Use of the Extended Building after Rutherford, 1919-1964

When Rutherford left in 1919 he took with him his radium supply, a large amount of apparatus and the majority of the glassware from the "radium room". Under his successor, W. L. Braggs (Chair in 1919-37), the focus now shifted to X-ray crystallography.

Main building

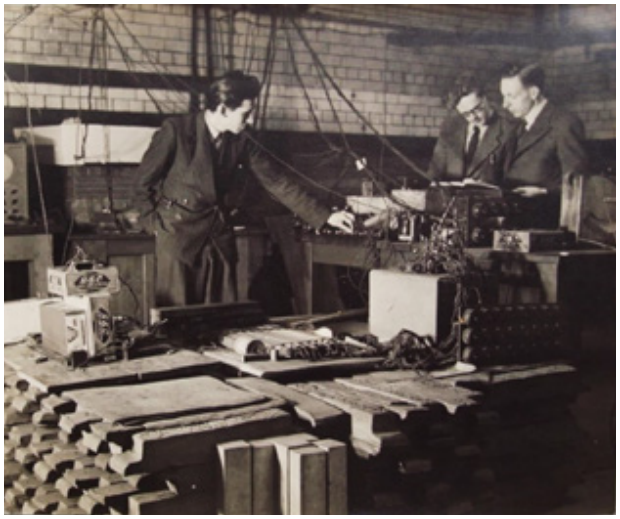
The rooms in the main building of 1900 were unsuitable for X-ray crystallography (the radioactive contamination causing photography to fog) and were put to other uses. The **Liquid Air & Research Room** in the basement (previously used by Geiger) housed a **differential analyser** from 1935 onwards whilst Moseley's basement room was occupied by the **spectroscopy** researcher Samuel Tolansky **[Plate 2.3.32]**. The **"radium room"** on the second floor was now the **tearoom**, whilst various other rooms were adapted for use by final-year undergraduate students. It was later reported by the assistant Bernard Lovell, that in the late-1930s his Geiger counters had shown the "radium room" and many other rooms to be



2.3.32 *Liquid Air & Research Room now housing the differential analyser, undated, 1935 or later (Todd)*

Patrick Maynard Stuart *Blackett* replaced Bragg as Langworthy Chair in 1937 (serving until 1952) and the Electrochemistry Laboratory at the east of the Dynamo House was adopted for cosmic ray research **[Plate 2.3.33]**. A major reconfiguration of the main building occurred during this period and William Kay was finally removed from the Preparation Room and installed in the ground floor Workshop.

In the 1960s the basement was used for third-year undergraduate teaching, although the Photographic Room remained a darkroom (probably still partitioned). On the ground floor the Electrochemistry Laboratory became an electronics workshop and "the Rutherford Room" an electronics workshop. The second floor "radium room" remained the tearoom.



2.3.33 *Cosmic ray research in the former Electrochemistry Laboratory, undated, c.1940 (Todd)*

John Hopkinson annexe

In the **north wing** of the **John Hopkinson Extension**, in the **Magnet Testing Room**, what was known as the **Royal Society Computer Laboratory** was established in 1948. It subsequently expanded into Room E or D above, this makeshift accommodation requiring 'the revolutionary data-transfer process incorporated, for a time, an element of "running to the bottom of the stairs and shouting"; the architectural milieu was "late lavatorial" [due to the white glazed tiles], a phrase seized upon gleefully by subsequent authors'.[32]

Further additions

In 1920 an **extension** was added, on the site of the courtyard to the west of the Dynamo House, to cater for the increase in students that accompanied demobilisation at the end of the war. A third extension (later known as the **Bragg Building**) was built in the southeast corner of the 1909 Whitworth Engineering Laboratories in 1932 and was opened by Rutherford **[Plates 2.3.34-2.3.36]**.

A detached building was added sometime in the 1950s, situated between the main building and the extension of 1931/32 (since demolished). Another extension, running along the east of the main building, housed the **Theoretical Physics Group** and was probably added in the same decade **[Plate 2.2.37]**.

32 Sumner (2013), p. 709.

Bu 1960 a small **Van de Graaff accelerator** was housed at the immediate south to the Theoretical Physics Group extension, abutting the main building (with a larger one on Ackers Street and a heavy ion linear accelerator on Oxford Road).[33]

33 Todd (2021), p. 40.



2.3.34 *Main building and John Hopkinson annexe, c.1925 (University of Manchester)*



2.3.35 *Rutherford Building and John Hopkinson annexe, 1935 OS, revised 1933 (NLS)*



2.3.37 *Physics buildings and surroundings as they existed in 1950, also showing buildings since demolished (hashed line) and principal later additions (shaded) (Sumner)*



2.3.36 *Rutherford Building, 1937 (Britain From Above)*

2.3.6 Changing Use, 1964-1999

In 1964 the John Hopkinson annexe was vacated by what had by this time been renamed the Electrical Engineering Department (incorporating the Computing Group). A new purpose-built Physics building (now the Schuster Building) was also constructed in 1967 and the bulk of the Physics Department relocated, although it is possible that some members of staff remained in the building as late as 1970.

Some or all of vacated spaces were for a short time occupied by the **Physiology Department**.

In 1972 the **Psychology Department** moved into the John Hopkinson annexe, the first 1950s extension and most of the ground, first and second floors of the main building, these areas together being renamed the **Coupland I Building**. On the second floor, the Lecture Room became the Cohen Lecture Theatre and the "radium room" (formerly the Transit Room) a staff room (presumably an office). Wiring for a computer system was added in the 1990s, causing loss of some historic fabric to the walls.

In the main building, all of the basement and some of the east rooms of the ground and first floors passed to the **Museum**.

At an unrecorded date it was discovered that the main building was affected both by **radioactive contamination** and by contamination from the **mercury** that had been used in the pumps and apparatus used to manipulate radium emanation. The part of the Psychology Department occupying the main building was moved out in 1999, initially temporarily, whilst a programme of remediation was delivered. However, its relocation to the 1954 Electrical Engineering building (now known as the Zochonis Building) proved to be permanent.

2.3.7 Changing Use and Continued Works, 2000-2022

By the early 2000s the buildings between Coupland Street and Bridgeford (formerly Bridge) Street had lost their distinct identities, overspanning, infill, extensions and glassing-in creating a dense mass of inter-connected structures. There are few photographs of the interior of the building at this time. One shows the ground floor Private Research Room (today **"Rutherford's Room"**) with cream-painted walls with a darker skirting below, and a covered floor **[Plate 2.3.38]**. The second floor **"radium room" (Transit Room)** is shown with a similar scheme to the walls, the floor covering stripped to reveal the floorboards below, the door to the corridor glazed and being surrounded by a moulded architrave **[Plate 2.3.39]**. The doorframe to the adjacent Research Room, being a later addition, is visibly much plainer. Both photographs were probably taken during preparations for the remediation works. Various rooms had been subdivided and partition walls in the basement Liquid Air Room and in **"Rutherford's Room"** were now removed.

<u>Remediation and refurbishment of the main building</u>
In 1999 the university's Radiological Protection Service identified elevated levels of radon still surviving in the ground floor Private Research Room (today **"Rutherford's Room"**), the first floor **"radium room" (Transit Room)** and two other rooms within the main building, resulting in remediation works (completed in



2.3.38 *Ground floor Private Research Room with Rutherford's desk, c.2000 (Todd)*

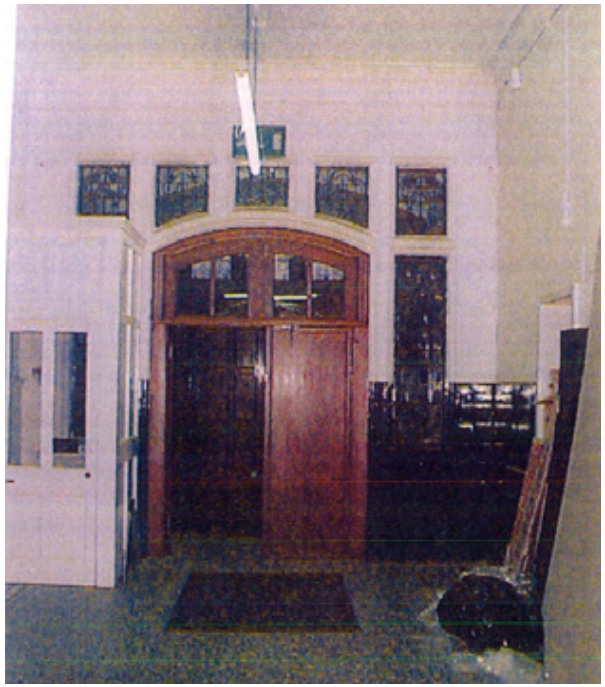


2.3.39 *Transit Room, undated, c.2000 Todd)*

2002). However, tests of 2002 showed high levels of radon contamination in several other rooms, including the second floor **Large Lecture Room**.

In the main building, another programme of **remediation** was completed in 2004 and the subsequent refurbishment in 2006. In the principal entrance vestibule, an inserted porter's room was removed whilst damaged tiling was replaced using replicas sourced from the original manufacturer, Maw & Co. of Burlsem **[Plate 2.3.40]**. In **"Rutherford's Room"** the paintwork was removed and the glazed bricks re-exposed, with the floor covering also stripped (and Rutherford's bench, being heavily contaminated, sandblasted). Above, in the first floor **(Transit) "radium room"**, the paintwork was stripped on the west wall to expose the glazed bricks and a new colour scheme was introduced to the wooden panelling around the bay window **[Plates 2.3.41-2.3.42]**. On the second floor, the large Lecture Room and its Preparation and Apparatus Rooms, still intact at this time, were also stripped out.[34] Across the building as a whole, new doors and screens were added at the entrances to the stairwell and fluorescent tube lighting was installed. Further minor contamination was also removed prior to the building being reoccupied. Various further programmes of remediation appear to have been carried out in subsequent years, including lowering the floor in the **"radium room"** (2010).

On the ground floor, by the early 2010s the side door was the main entrance into the building and the principal entrance had been taken out of use **[Plate 2.3.43]**. Subsequent works (approved in 2012 and 2013) concluded that the corridors throughout the building had non-original plastering above the dado line whilst the grouting to the tiling had been affected by cable routing and was also a later replacement. A frameless glass doorset and screen had added in the ground floor west corridor by 2012 (and was subsequently replaced to allow automation). As part of proposals to reinstate the principal entrance, a former doorway (plastered and tiled over, perhaps in 2006) was opened up and converted into a window-sized opening. This was designed to serve a new reception, which was to be relocated from the southwest corner of the building (not executed). Associated proposals to create a surrounding draught lobby were not executed.



2.3.40 *Main entrance with porter's lodge, undated, c.2003 (University of Manchester)*

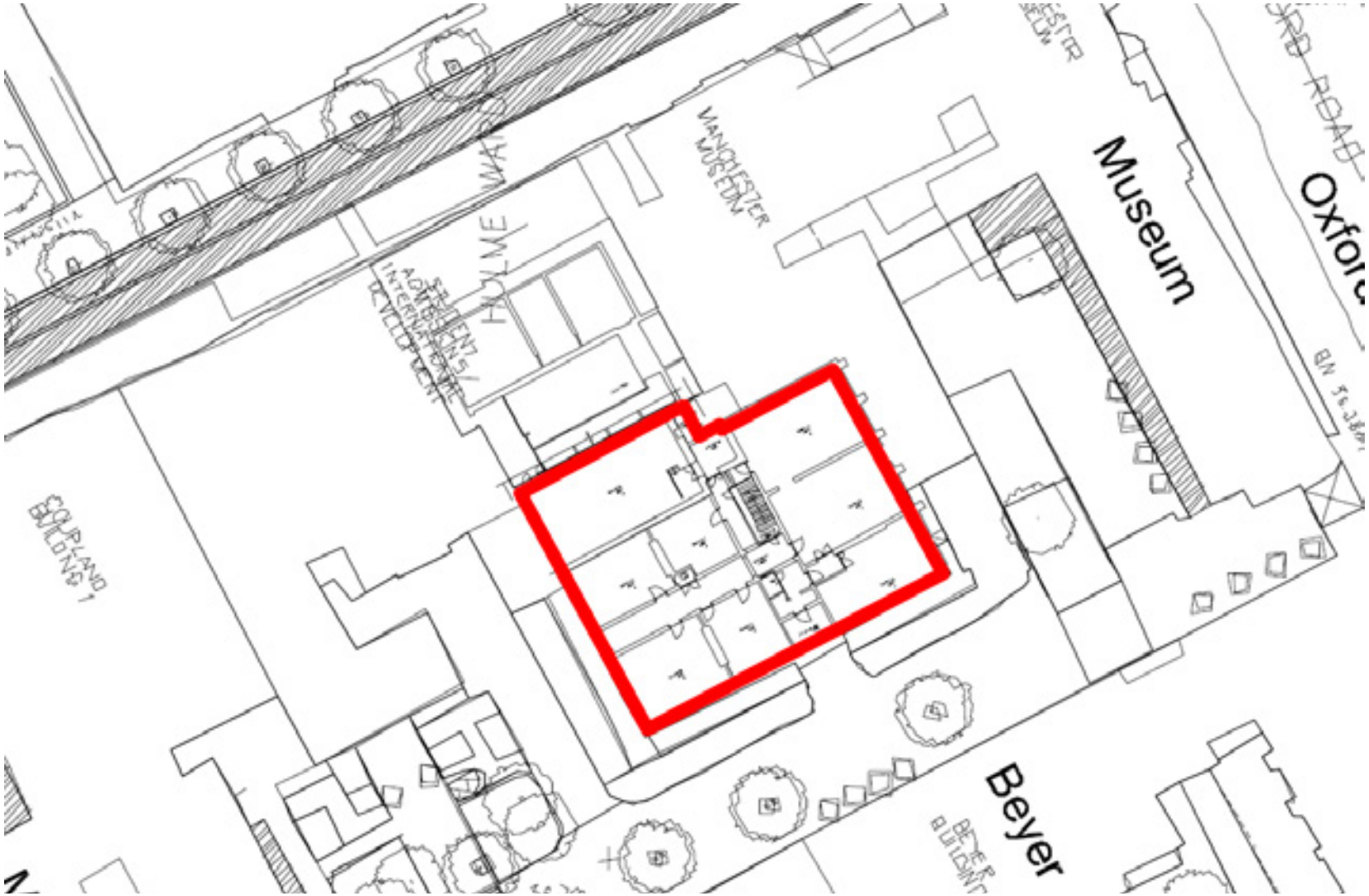


2.3.41 *Ground floor Private Research Room and Rutherford's desk after refurbishment works, c.2008 (Todd)*



2.3.42 *Transit Room before (c.2000) and after (c.2008) refurbishment(Todd)*

34 Todd (2008), p. 4.



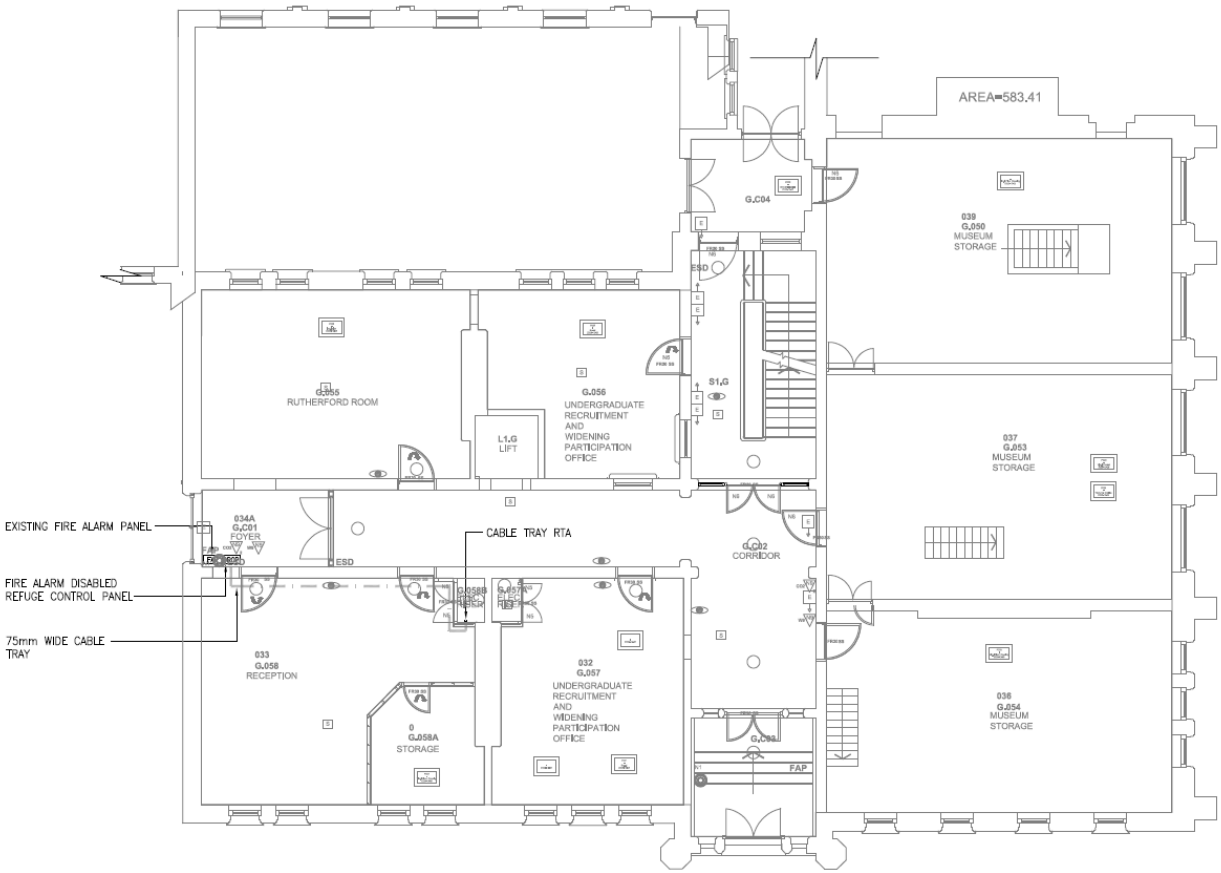
2.3.43 *Rutherford Building, 2013 (Wilson and Mason)*

Occupants

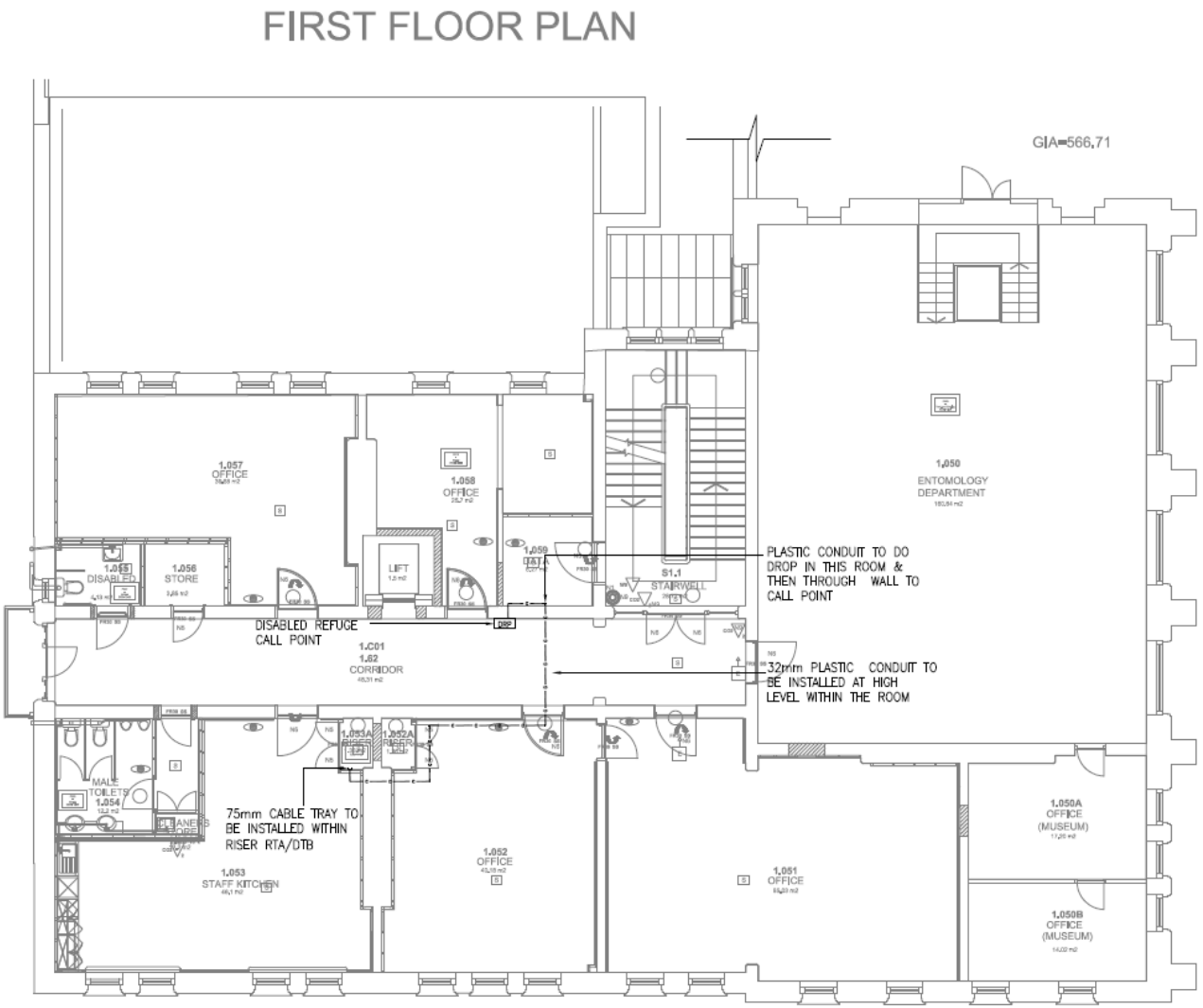
As part of the university's celebration of its scientific heritage and past Nobel-prize winners, in 2006 the main building was renamed the **Rutherford Building** and "Rutherford's Room" (G.055) officially opened by Rutherford's granddaughter.

The John Hopkinson annexe is still occupied by the Psychology Department and, with the first 1950s extension, is still known as the **Coupland I Building.** The Dynamo House has since been converted to a common room whilst the Battery Room is occupied by the Museum. The outdoor Chemistry Laboratory was demolished at an unknown date.

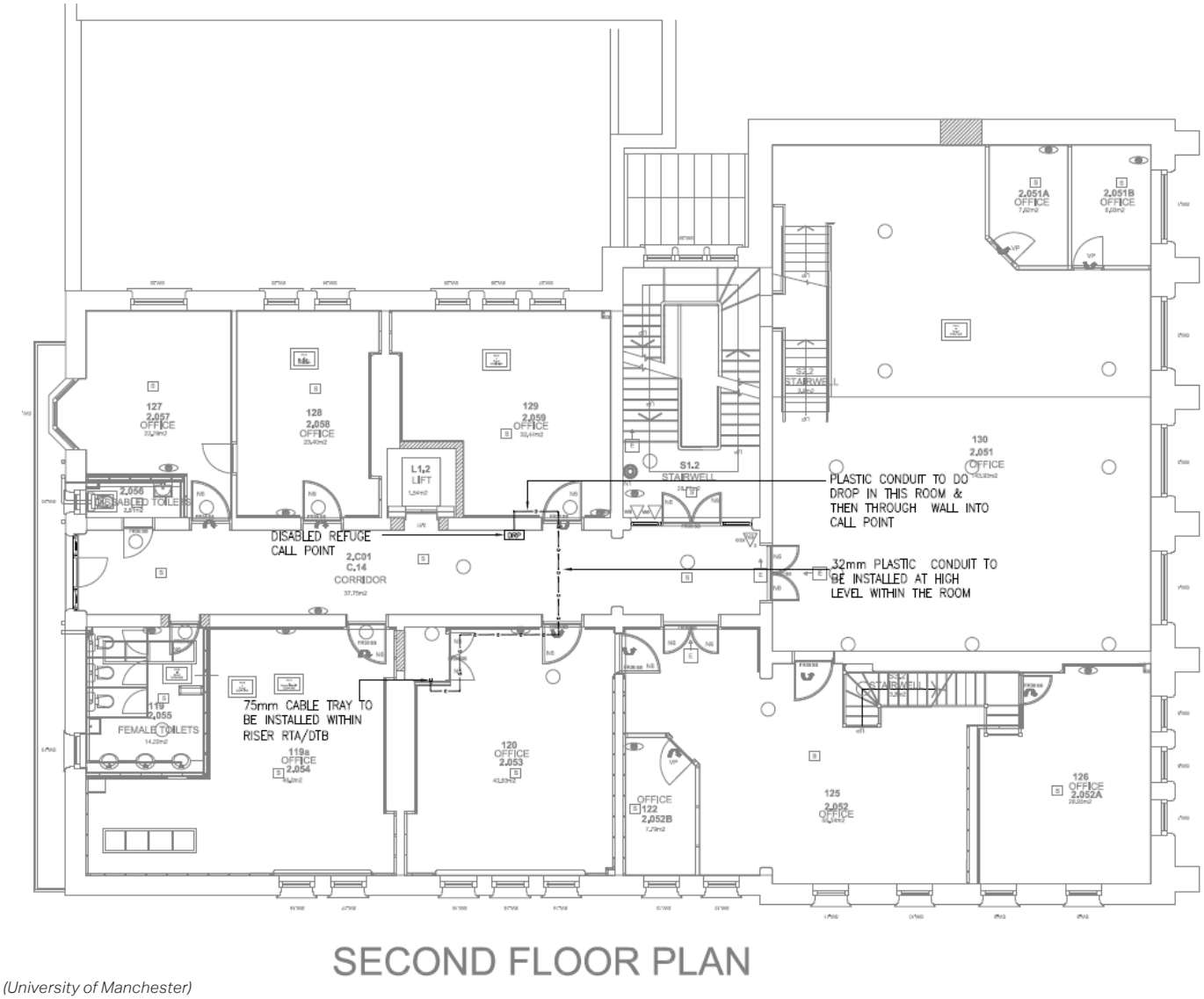
By 2009 the main building was occupied by Students Admissions & Widening Participation and the International Development Team. It was listed at Grade II in 2011. The building as it existed at this time (excluding the basement) is recorded in a set of plans of 2012 **[Plates 2.3.44-2.3.46]**.



2.3.44 *Ground floor, 2012 (University of Manchester)*



2.3.45 *First floor, 2012 (University of Manchester)*



2.3.46 *Second floor, 2012 (University of Manchester)*

The main building today

The 1950s Theoretical Physics Group extension on the east elevation was removed as part of the programme of works at the Museum carried out in 1996-2003 **[Plate 2.3.47]**. As part of recent works to the (extended) Museum the east elevation has recently undergone a programme of spot repairs (approved in 2017).

To the north, the historic integrity of the building and its annexe of 1912 has been obscured by overspanning and infill from adjacent buildings **[Plate 2.3.48]**.There is, however, some evidence of the building's past use on the west elevation, in the ledges for mounting the heliostat retained outside the **Grating Room**. The bay window in the **"radium room" (Transit Room)** is a reminder of the Transit instrument (now displayed in the Schuster Building) that was once located inside the window. Internally, a wooden bracket still surviving to the side of the window may have been part of the Toepler pump apparatus.





2.3.48 *Rutherford Building and abutting buildings, c.2022 (Historic England)*



2.3.47 *1950s extension along the east elevation, undated, c. late-20th century (Purcell)*

2.4 Relevant Planning History

Manchester City Council lists the following relevant applications on its online planning portal.

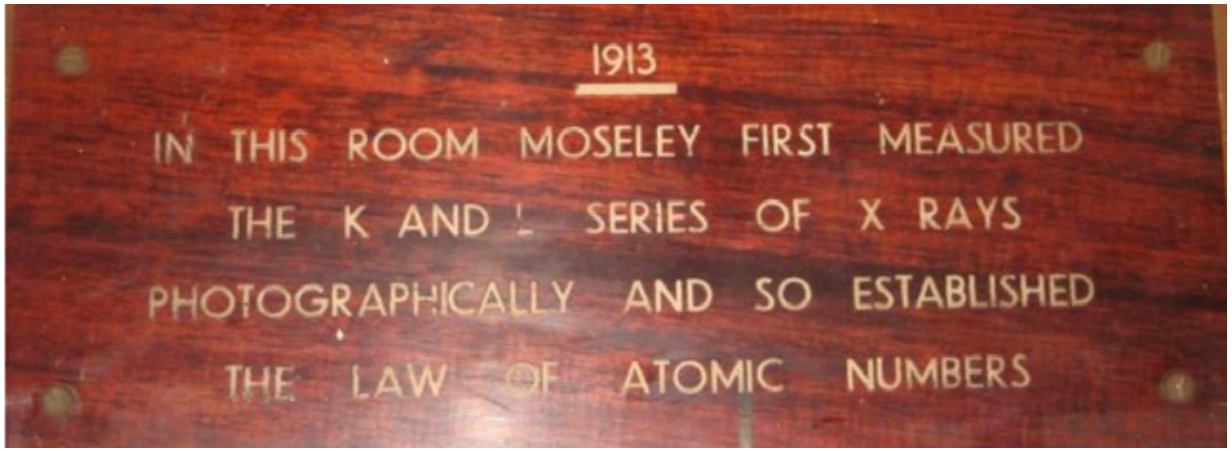
118413/LO/2017; 2017-18; Approved
Listed building consent for works to the Rutherford Building associated with the construction of a two storey extension to house two new galleries, Special Exhibition Gallery (temporary exhibition) & South Asia Gallery (housing permanent collection) and associated ancillary space, escape stair and bridge link. Alteration and refurbishment of existing ground floor, relocation shop and reception, provision of new WCs and refurbishment of cafe/kitchen. New entrance and canopy to Bridgford Street and new signage totem

108895/LO/2015/C1; 2015; Approved
Listed building consent for internal alterations to subdivide a first floor office.

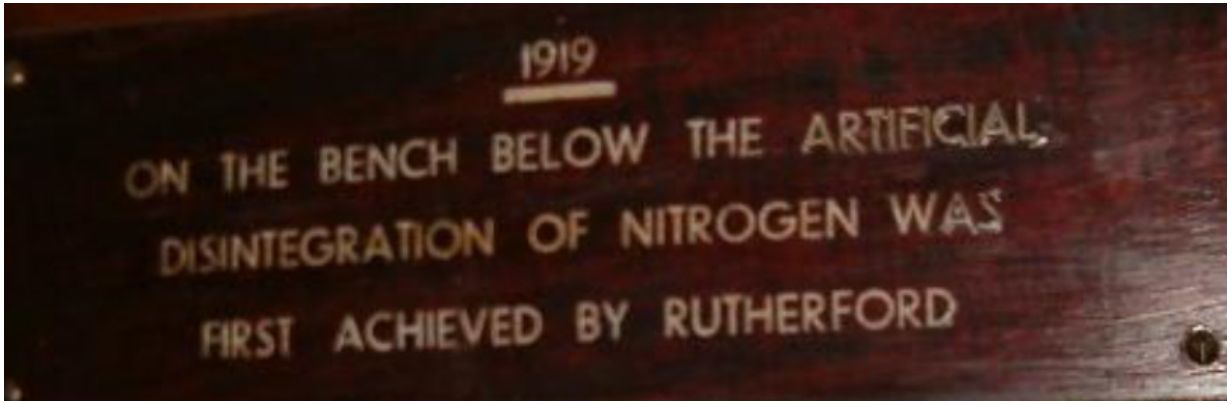
106421/LO/2014/C1; 2014; Approved
Listed building consent for internal alterations to include Installation of glazed screen and doors, re-forming an existing opening to create a new reception area, removal and replacement of modern partition

103111/LO/2013/C1; 2013; Approved
Listed building consent for works in association with the installation of a disabled refuge communications system within the 1st and 2nd floor corridors and communications receiver within ground floor lobby

101115/LO/2012/C1; 2012; Approved
Listed building consent for the installation of new internal doors and the automation of existing doors



2.4.1 *Basement Research Room plaque, since lost (Todd)*



2.4.2 *Ground floor Private Research Room plaque, since lost (Todd)*

2.5 Bibliography of Principal Sources for the Rutherford Building and its Predecessors

Primary Sources

Historic Images

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9. The Manchester University Physical and Electro-Technical Laboratories staff and research students, 1912. L to R: front row: R. Rossi, H. G. J. Moseley, J. N. Pring, H. Gerrard, E. Marsden; row 2: H. Geiger, W. Makower, A. Schuster, E. Rutherford, R. Beattie, H. Stansfield, E. J. Evans; row 3: C. G. Darwin, J. A. Gray, D. C. H. Florance, Margaret White, May Leslie, H. R. Robinson, A. S. Russell, H. Schrader, Y. Tuomikoski; row 4: J. M. Nuttall, W. Kay, H. P. Walmsley, J. Chadwick. Courtesy of Kasimir Fajans.

2.5.1 *Physical and Electrotechnical Laboratories staff and research students, John Hopkinson annexe entrance, 1912 (Todd)*

Appendix B Heritage Impact Assessment Vol.2

3.0 Site Survey Descriptions

The site incorporates several distinct elements that make up the 'listed building', though they are now in separate usage and only part is subject to the current proposal. In its entirety, based on the Historic England listing map **[Plates 3.00-3.01]** the listed building incorporates the core building fronting Coupland Street with the adjoining north-south wing, part in use by the Museum, as well as the former Dynamo House and the frontage of the Hopkinson Memorial Wing along Bridgeford Street. The modern entrance block to the museum on Oxford Road, adjoining the Hopkinson Memorial Wing, is explicitly excluded in the listing entry. Only the main block on Coupland Street, including the third floor of the north-south wing, are subject to the proposals.



Modern Ordnance Survey mapping: © Crown Copyright and database right 2018. All rights reserved. Ordnance Survey Licence number 100024900.

This is an A4 sized map and should be printed full size at A4 with no page scaling set.

Name: Manchester University Rutherford Building and Hopkinson Memorial Wing

3.00 Map from the National Heritage List *(Historic England)*

Heritage Category: Listing
List Entry No : 1402635
Grade: II

County:
District: Manchester
Parish: Non Civil Parish

For all entries pre-dating 4 April 2011 maps and national grid references do not form part of the official record of a listed building. In such cases the map here and the national grid reference are generated from the list entry in the official record and added later to aid identification of the principal listed building or buildings.

For all list entries made on or after 4 April 2011 the map here and the national grid reference do form part of the official record. In such cases the map and the national grid reference are to aid identification of the principal listed building or buildings only and must be read in conjunction with other information in the record.

Any object or structure fixed to the principal building or buildings and any object or structure within the curtilage of the building, which, although not fixed to the building, forms part of the land and has done so since before 1st July, 1948 is by law to be treated as part of the listed building.

This map was delivered electronically and when printed may not be to scale and may be subject to distortions.

List Entry NGR: SJ8450896622
Map Scale: 1:1250
Print Date: 8 February 2023

Historic England
HistoricEngland.org.uk



3.01 *3D Aerial (Google Maps)*

3.1 The Setting of the Building

3.1.1 The Wider Setting

The building is situated within the University of Manchester campus, off the primary axis of Oxford Road, an eclectic mix of historic and contemporary buildings dating from the late 19th century onwards many of which were purpose-built for the university, lending a sense of functional coherence. This long linear spine is anchored by the dominant presence of the central collection of buildings around the Old Quadrangle, including the museum and Whitworth Hall, an exceptional example of a 19th century institutional architectural composition, in a neo gothic style, which establishes and orientates the academic-focused townscape.

3.1.2 The Immediate Setting

The Hopkinson Memorial wing fronts Bridgeford Street, a route well-integrated into the university's public realm. This road is flanked with an eclectic mix of 19th, 20th and 21st century buildings drawing a functional coherence from their university usage. This begins with the contrast between the heavily embellished Edwardian Baroque former Department of Metallurgy Building (Grade II) and the smaller-scale red brick visually restrained former townhouses at 176-188 Waterloo Place (Grade II), the only remaining fragments of the earlier domestic townscape in this area (dating to the 1830s).

The southern frontage is more continuous, including the Hopkinson memorial wing, a relatively restrained red brick frontage, with brick and stone banding, articulated vertically by four gablets topped with finials, and finished with a series of transom and mullioned windows inset under segmented arched headers and a central recessed bay. This adjoins an expressed, lower, gabled bay with larger arched opening with inset window below and a recessed section of four bays with hipped roof.

This is contrasted to the northern side of the road by a series of larger, singular, buildings including the 20th century Humanities Building which by virtue of its design and relationship to the surrounding public realm positively contrasts with the continuous frontage of the earlier buildings, representing an evolution in the planning and execution of institutional buildings. **[Plates 3.1.1-3.1.4]**.



3.1.1 *Waterloo Place, Oxford Road*



3.1.2 *Southern frontage of Bridgeford Street*



3.1.3 *Frontage of the Hopkinson Memorial Wing on Bridgeford Street*



3.1.4 *Northern side of Bridgeford Street (right)*

The main block of the Rutherford Building fronts Coupland Street. It is set away from Oxford Road behind an arch and bridge within the museum frontage, and as such is experienced more as part of an enclosed enclave. The area is dominated by the neogothic composition of the Beyer Building and Coupland Building 3, complemented by the more restrained interwar classicism of the red brick Whitworth Laboratory, the austere brick frontage of the mid-20th century part of Coupland 1, and contemporary extension to the museum. **[Plates 3.1.5-3.1.7]**. Set behind the main frontage, adjoined by a flat roofed one storey red brick extension, is the original entrance to the Hopkinson Wing, now part of Coupland 1 **[Plate 3.1.8]**. It echoes much of the architectural character of the main buildings – red brick with stone detailing including stone banding and window surrounds, with the frontage expressed as a gable.



3.1.6 *Eastern end of Coupland Street*



3.1.7 *1950s part of Coupland Building 1 with Hopkinson Wing behind*



3.1.5 *Coupland Street looking East towards the site*



3.1.8 *Hopkinson Wing, now part of Coupland 1*

3.2 The Building

3.3 The Building Externally

3.3.1 Front Elevation

The core of the front elevation is four bays wide, accentuated by a stepped gable over the third bay (left to right) with stone bands and topped with a finial. Fenestration is formed from a series of moulded white painted timber casements set into stone surrounds with hoods. Generally set into pairs, the gabled bay is accentuated with a collection of three windows. The façade is tied together with stone detailing, including lintel banding at ground and third floors, cill banding at first floor, and banding continuing the line of the transoms on the first floor, and finished with decorative cast iron downpipes with hoppers. The fourth bay includes the main entrance, expressed with a large stone porch and stone steps incorporating a triangular pediment, with a relief caving of the Universities' coat of arms and motto, octagonal columns, and cupolas, inset with a timber door and leaded windows **[Plates 3.3.1-3.3.3]**.

The remainder of the front elevation is the adjoining north-south wing, a further four bays wide, stepping up to a larger gable, again topped with finial. This frontage continues much of the detailing of the remainder of the elevation, including the lintel, cill and transom level stone banding, and echoes the banding on the gable at a larger scale, though windows are generally singular rather than set into pairs. There is a heavier level of embellishment, however, to the second floor and above with windows, becoming smaller above the third floor, set into a double height stepped stone surround tied together by continuous mullions. To the gable is also visible two sets of paired gothic niches **[Plate 3.3.4]**.



3.3.1 *Front Elevation*



3.3.2 *Front porch*



3.3.3 *Front elevation of the adjoining wing*



3.3.4 *Indicative window example*

3.3.2 Rear Elevation

The rear, north elevation is visibly plainer with rougher brick, visible only to its upper portion from the west but characterised by a fenestration pattern of timber casements set into smoother brick reveals under segmented headers. Stone transom and mullioned surrounds are evident at the staircore to the eastern end of the elevation, and stone transoms to the first floor. The elevation also incorporates a cast iron downpipe with decorative hopper. The rear elevation of the adjoining wing is almost wholly obscured to the exterior by the modern extension to the museum, with only the upper brick gable visible **[Plate 3.3.5]**.



3.3.5 *Rear elevation*

3.3.3 Return Elevations

The east return elevation is the adjoining wing and is wholly obscured from the exterior by the modern extension to the museum up to the first floor. Above this is visible a series of stone and brick buttresses between which are pairs of transom and mullioned casement windows in stone surrounds. The southernmost bay is expressed with a gabled dormer, aligned with the front pitch of the main core of the building, and echoes the stepped window surround on the frontage at a smaller scale.

The west return elevation is fronted by a modern ramp leading to a timber and glazed access door set into a stone surround with plain lights above. This elevation is formed from three primary bays, with the outer two bays gabled, topped with finials, and decorated with banding, demarcating the pitched roofs behind. The stone banding from the front elevation continues only to the southern half of the elevation.

The central bay is defined by a series of French doors, which appear more modern, in stone surrounds on each floor. The first floor leads out to a small balcony, with a small single window in a stone surround, and the second floor leads out to a larger balcony, spanning the three bays, both with decorative railings and supported by stone corbels.

To the northern bay at the second floor a bay window, within a large stone surround, with a smaller one light casement window to the southern bay, again in a stone surround but incorporating a hood. A further small window is set next to the central French doors, with a much simpler lintel and cill. The elevation also incorporates cast iron downpipes and flues with decorative detailing.

Adjoining the door on the north side are two small apertures with a projecting stone ledge, and a further single aperture with stone ledge set further along the northern bay. These, as part of the building's original design, enabled sunlight to enter the room beyond which originally housed a spectrograph **[Plates 3.3.6-3.3.10]**.



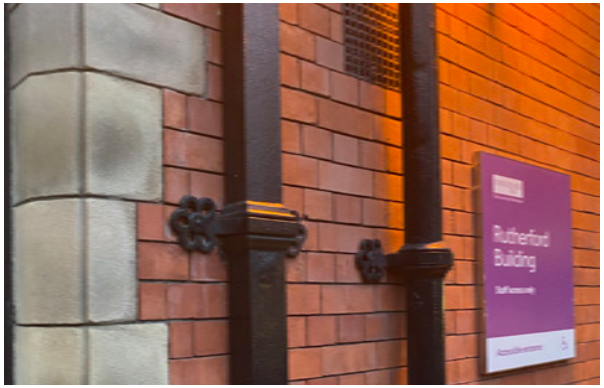
3.3.6 *West return elevation*



3.3.7 *Ramp leading up to west return elevation*



3.3.8 *West return elevation as it meets the rear elevation*



3.3.9 *Downpipes and flues*



3.3.10 *Closeup of the stone ledges (above the balcony) and apertures used for light experiments*



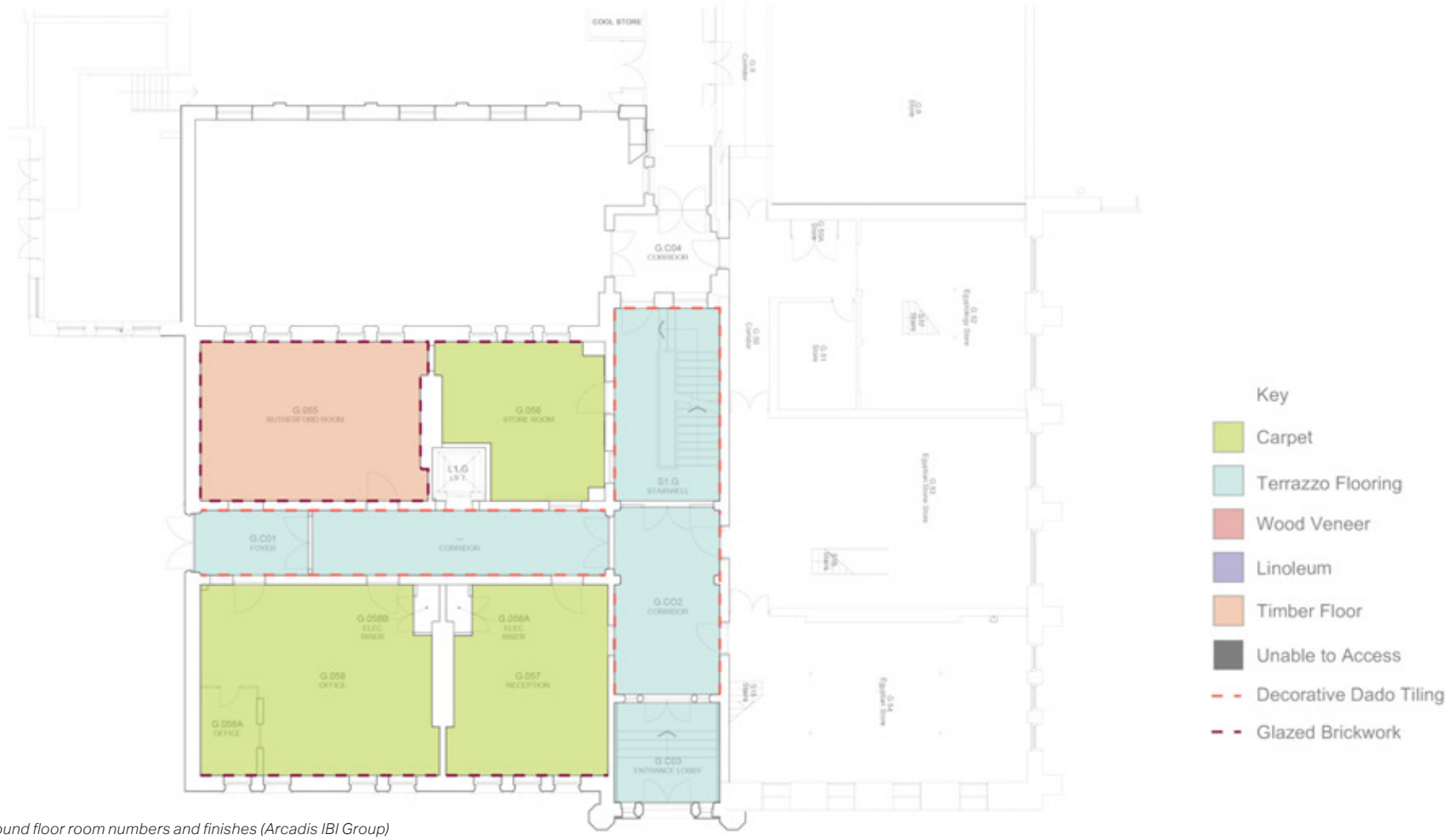
3.3.11 *View of the roofscape along Bridgeford Street from University Green*

3.3.4 Roof

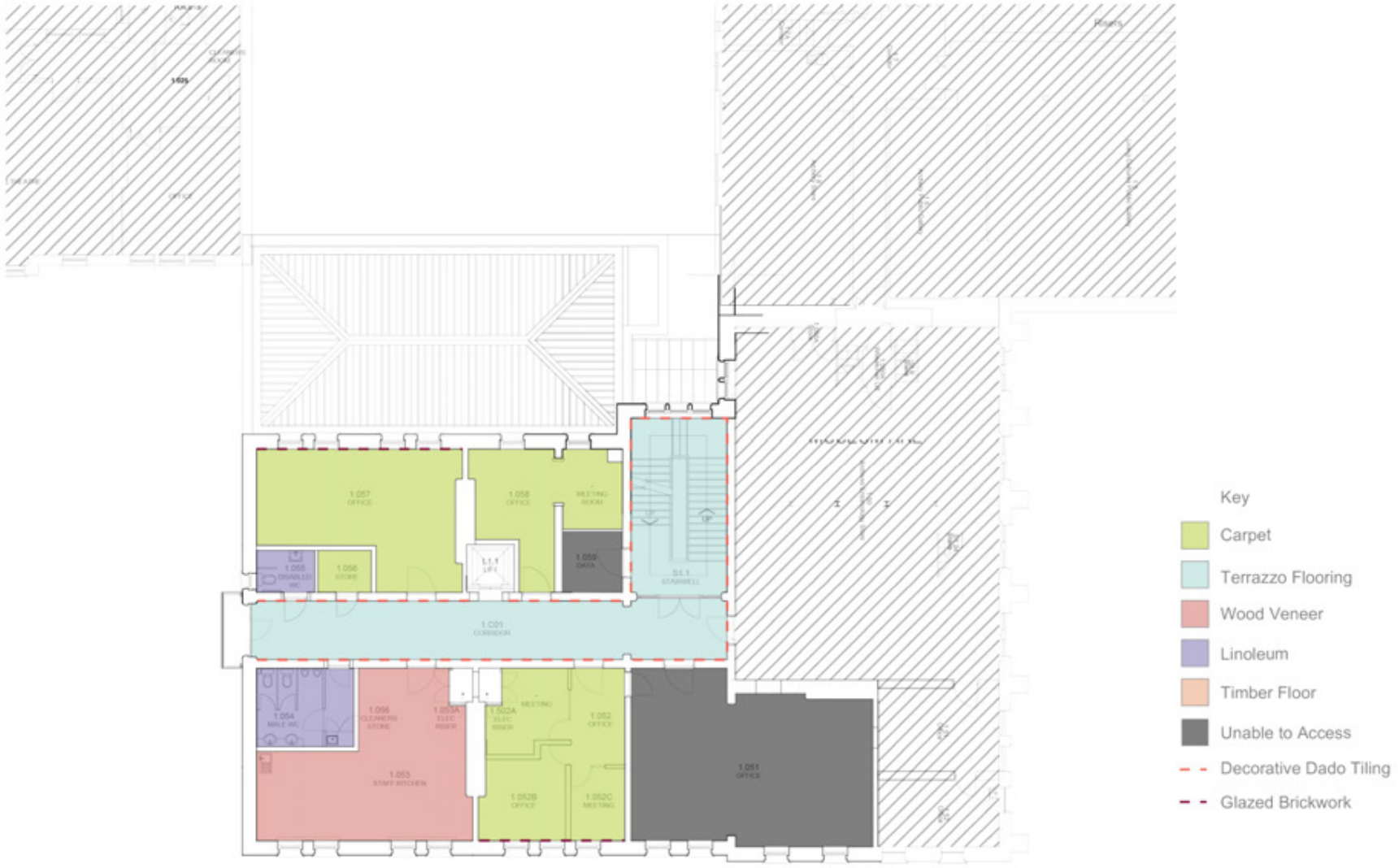
To the core of the building, two primary double pitched roofs–- incorporating a chimney stack to each–- with a smaller central pitched roof within the valley demarcating the central corridor with flanking rooms either side below. The rear pitch incorporates a stepped-up flat-roofed area to the northeast corner, originally intended for use as an observatory with an octagonal dome (no longer extant). Roofs are set behind a stone parapet. The valley gutter leads to an access ladder to the adjoining wing with small flat-roofed access door. The adjoining wing is a continuous double pitched roof broken only by a single large brick chimney stack and a series of ventilation towers / windcatchers, and the dormer aligning with the main north-south range. Roofs are finished with clay tiles. The roofs, given scale and enclosure, are generally shielded from the wider townscape. The parapet to the rear elevation and gable end of the adjoining wing can be seen from the surrounding area as an amalgamated part of the university townscape, though the roofscape is dominated by the Beyer Building **[Plate 3.3.11]**.

3.4 The Building Internally

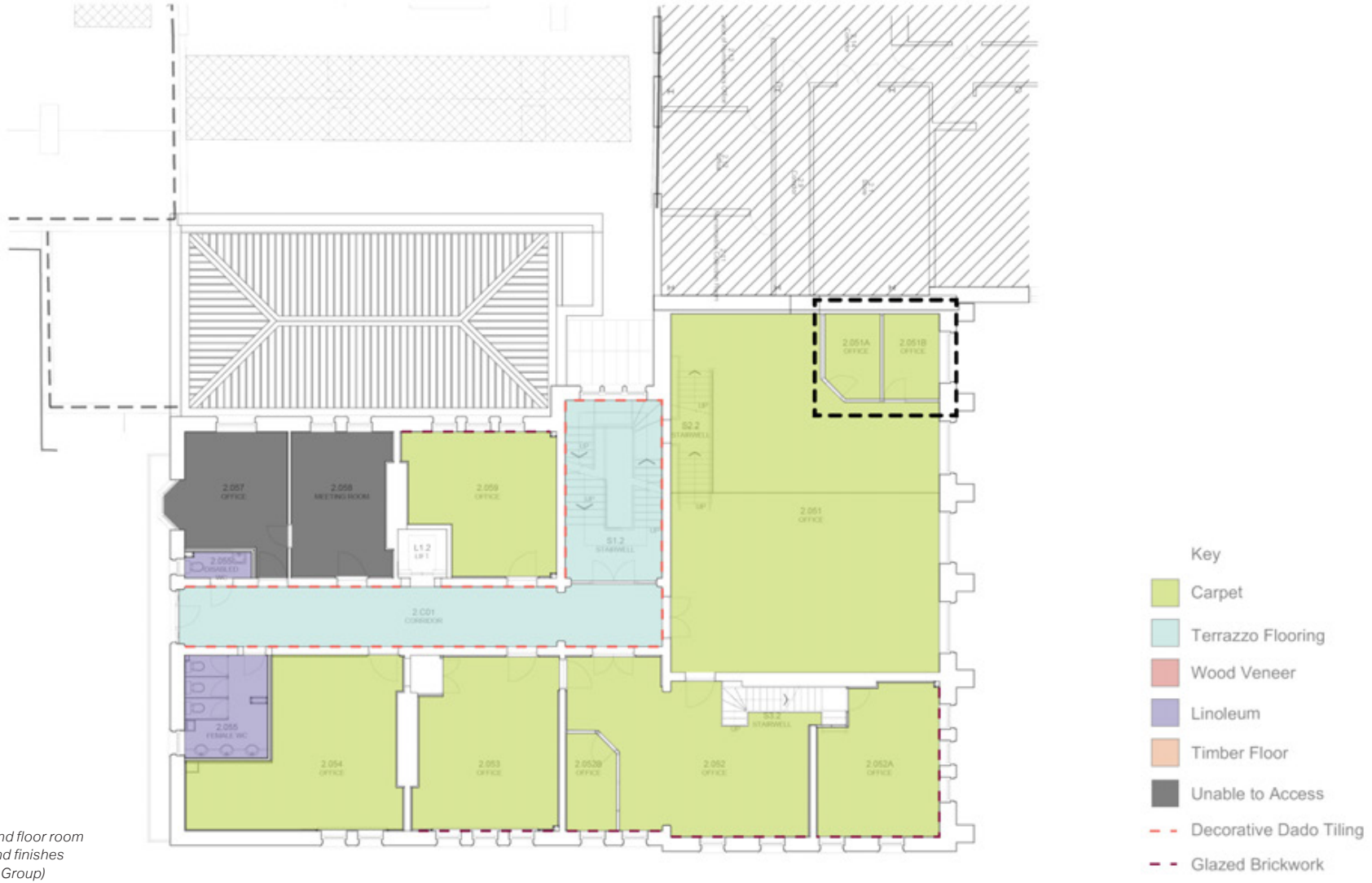
N.B. Room numbers and finish schedule are shown on Plates [3.4.1-3.4.4].



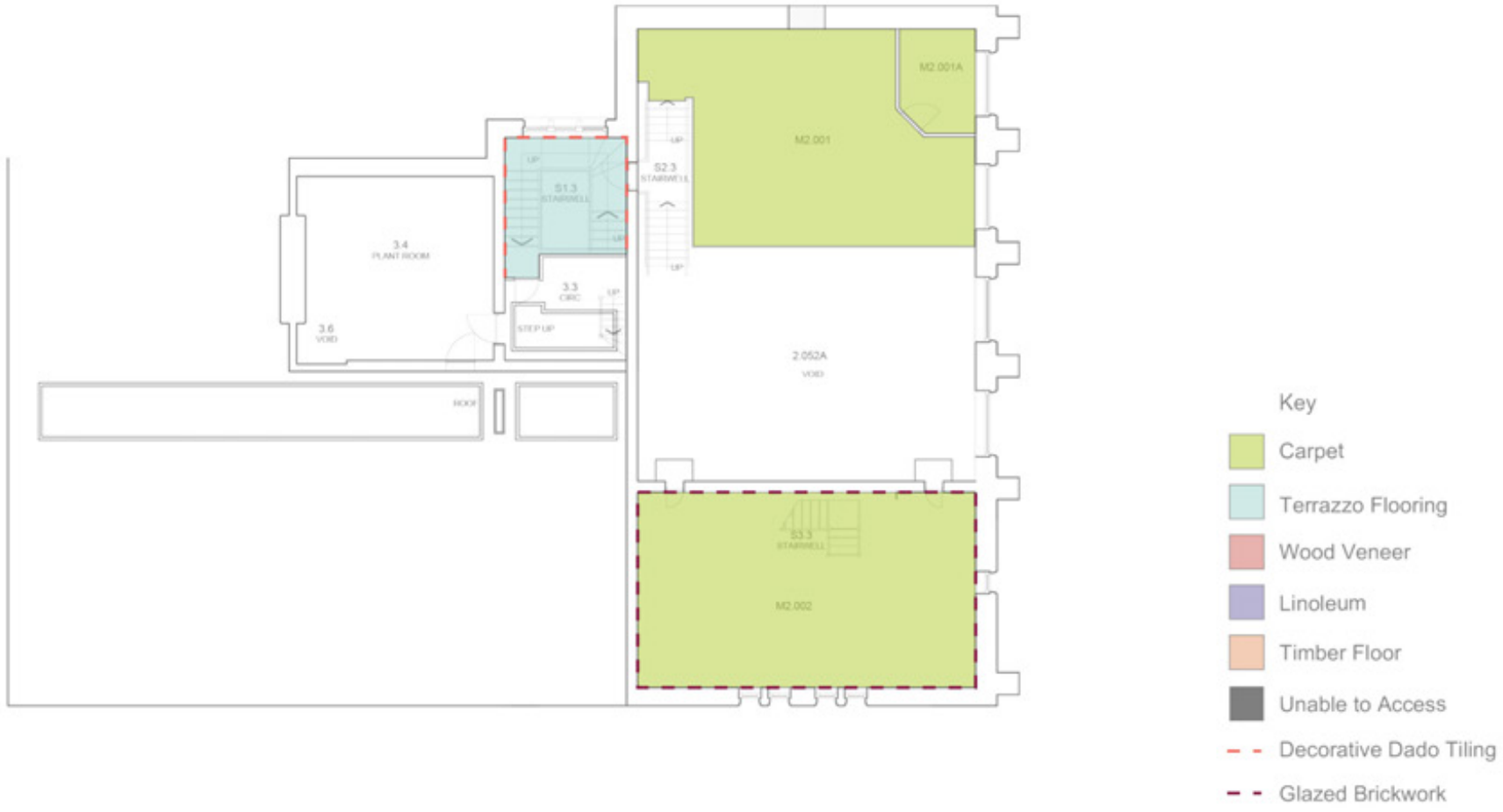
3.4.1 *Ground floor room numbers and finishes (Arcadis IBI Group)*



3.4.2 *First floor room numbers and finishes (Arcadis IBI Group)*



3.4.3 *Second floor room numbers and finishes (Arcadis IBI Group)*



3.4.4 *Third floor and Mezzanine room numbers and finishes (Arcadis IBI Group)*

3.4.1 General arrangement and detailing

There is a common spatial arrangement and decorative scheme throughout the main wing with two principal rooms either side of an east-west corridor, separated by a spine wall with chimney stack (lacking chimneypieces) though there is some variation (see below) relating either to specific original uses or later insertions and where the main building extends into the adjoining north-south wing.

Throughout, the decorative scheme comprises a combination of moulded ceiling beams, cornices, and walls lined with glazed brick. The brick is either wholly cream or, in other areas and more commonly, a mix of cream above the dado level, dark brown at dado rail and skirting level with a lighter brown in between. In some areas, particularly in the corridors, exposed bricks lack glazing and are either red or buff. However, in most areas these bricks have been plastered over, with timber skirting boards applied below, with bricks only left partially exposed around doorways and either along the entirety of the outer walls or else around the window reveals.

Windows are white painted timber casements, generally, incorporating modern brass window furniture and plastic closers and plain machined glass. Doors to the principal rooms are a mix of four and six panelled timber set within moulded architraves with brass kick plates and more modern brass door furniture and a mix of brass and plastic closers. Separating the corridors from the stairwell, and lobby to the ground floor, are later composite screens and glazed doors. Throughout, modern office fixtures and fittings have been added, including trunking, a mix of strip and pendant lights as well as radiators. Floors to principal rooms are generally either carpeted, finished in vinyl, or engineered wood veneer, but some floorboards are exposed (outlined below).

3.4.2 Entrance lobby

The entrance lobby (**G.C03**) leads through from the stone porch and is highly decorative with a barrel-vaulted ceiling, lined with terracotta and a terrazzo floor leading up to a terracotta screen incorporating art nouveau leaded lights, inset with a later glazed timber door. This leads through to a north-south corridor, with a terrazzo floor and lined with blue glazed tiles at dado level with floral pattern; radiators are modern. The ceiling is panelled but inset with pendant lights. The walls have largely been plastered, though cream non-glazed brick is evident around three archways, two of which lead off to the stairwell (north) and main corridor (west) inset with later composite screens and doors. Entrances to the adjoining wing are evident along the east wall, one with a panelled timber door, the other plain, though both are set into architraves. A small double light timber window is inset into the west wall into the reception area (later) **[Plates 3.4.5-3.4.7]**.



3.4.6 *Exposed brick around arches in the entrance corridor*



3.4.5 *Teracotta screen in lobby*



3.4.7 *Door leading west to the main corridor*

3.4.3 East-west corridors

At the ground, first and second floors the central east-west corridors (**G.C01, 1.C01 and 2.C01**) run from the staircore, accessed through later composite fire screen doors set between cream brick arches, to glazed timber doors in the west return elevation leading out to the access ramp on the ground floor and balconies above. The ground floor is partitioned to its western end to create a lobby area, dating to the 2010s. The corridors have terrazzo floors with cream walls incorporating glazed blue tiles with floral pattern at dado level into which signs, door and lift controls have been placed in certain areas, as well as exposed cream-colored brick archways. The ceilings have cornices, painted blue to the first and second floors, with trunking and pendant lights added. A lift is positioned to the center of the corridors along its north side, with a stainless-steel finish **[Plates 3.4.8-3.4.12]**.



3.4.8 *Ground floor lobby*



3.4.9 *First-floor*



3.4.10 *Ground floor*



3.4.11 *Second floor*



3.4.12 *Third floor*

3.4.4 Stairwell

The principal stairwell, leading off the lobby to the north, rises from the basement to third floors (**S1.G, S1.1, S1.2** and **S1.3**). The dogleg staircase, supported via iron girders, incorporates decorative iron balustrading and a moulded timber handrail. The risers and treads are concrete, with the main landings floored in terrazzo, the pattern of which is replicated at the quarter landings. Large casement windows under segmented headers are positioned at the quarter landings. The decorative scheme in the staircore echoes the principal corridors, but with cream glazed brick above the dado level, including blue glazed tiles with floral pattern below. The undersides of the stair flights are panelled and finished with cornices, painted blue. Lighting is via strip lights **[Plates 3.4.13-3.4.16]**.



3.4.13 *Ground floor stairwell*



3.4.14 *Ground to basement*



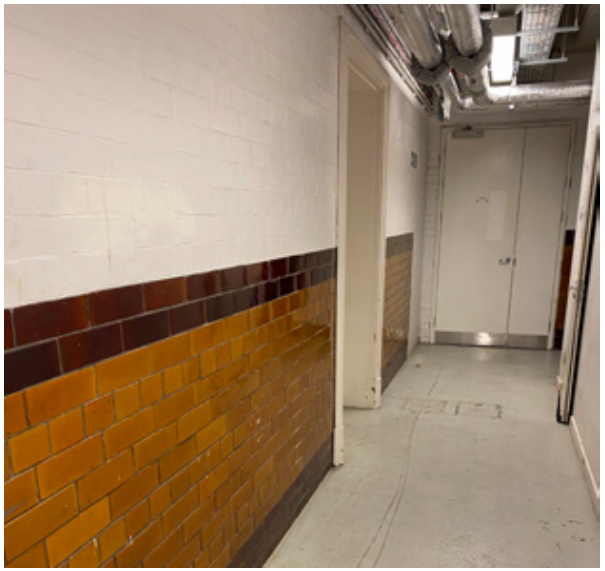
3.4.15 *Second floor landing*



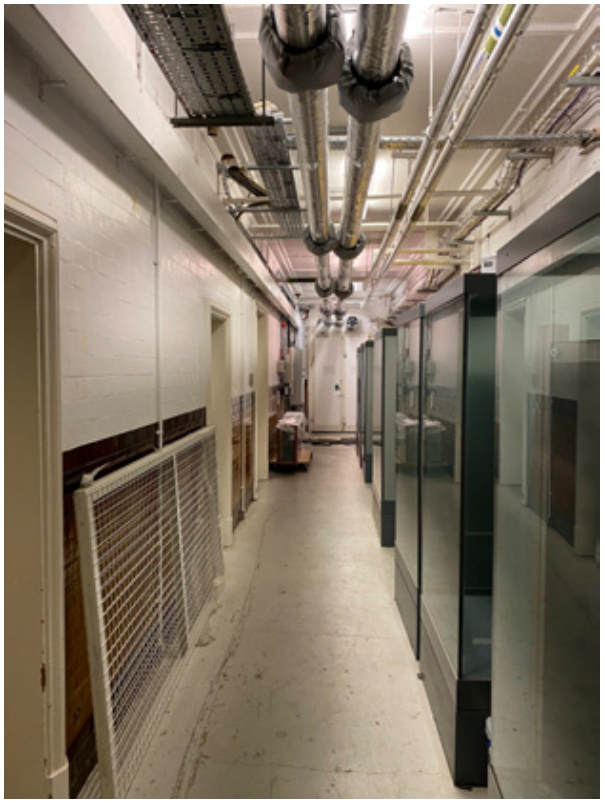
3.4.16 *View from the third floor down the stair flights*

3.4.5 Basement

The basement area is currently in use by the museum for collections storage, and not associated with the use above. This area generally sits outside of the proposals, other than minor works for services. The basement echoes the spatial arrangement above, though appears to have a concrete floor with no terrazzo, and walls are lined with glazed bricks leading to cellular spaces via historic timber doors, though there are greater levels of services at ceiling level. Adjoining the corridor is a north-south corridor with glazed roof, visible from the ramp above, believed to provide subterranean access to other campus buildings. Cellular rooms have not been accessed, but are understood to have parquet flooring and ceiling molding. **[Plates 3.4.17-.4.19]**.



3.4.17 *Basement corridor*



3.4.18 *Basement corridor*



3.4.19 *Cornice to the basement corridor ceiling*

3.4.6 Ground floor

The ground floor is laid out with the north-south entrance hall adjoining an east-west corridor. To the north of the corridor is **G.055 and G.056** separated by the spine wall, with **G.057 and G.058** to the south. **G.055,** the Rutherford Room, is one of the only remaining spaces with its glazed brick and timber floorboards exposed, revealed as part of remediation works, and Rutherford's desk and original joinery benches line the wall. A vent is evident in the chimney stack. **G.056, G.057 and G.058** are plastered with glazed brick only revealed in select places. The lift shaft partially truncates the chimney stack to **G.056**, and a small office partition is positioned to the southwest corner of **G.058**, though the original proportions of the room can be read, accentuated by the continuation of the bricks along the outer wall. **G.056** is accessed only via the staircore, with a timber window overlooking the corridor (the opening is historic, but frame and glass appear later) and **G.057** incorporates a later reception window overlooking the entrance lobby. Here, the mouldings have been truncated by an enlarged shift shaft. Risers, projecting forward of the niches, have been added to the chimney stack to the rooms along the south of the corridor, with timber doors **[Plates 3.4.20-3.4.28]**.



3.4.20 *Entrance to G.055*



3.4.21 *G.055 (Rutherford Room) with floorboards and Rutherford's desk*



3.4.22 *G.055 (Rutherford Room) chimney stack*



3.4.23 *G.056 window to corridor*



3.4.24 *G.056*



3.4.25 *Glazed tiles to outer wall of G.057, with window detailing*



3.4.26 *Ceiling detail to G.057*



3.4.27 *Room G.058 with partition to far corner*



3.4.28a *Riser joinery to G.057*



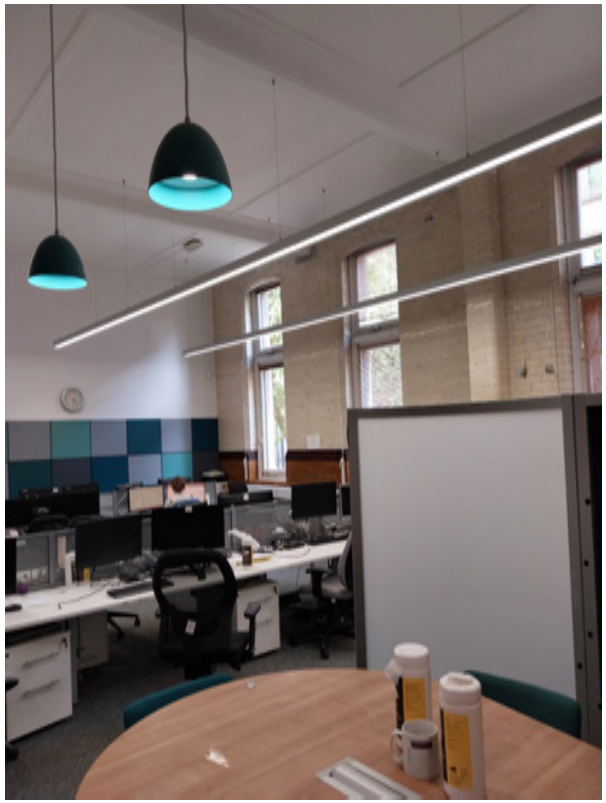
3.4.28b *Riser joinery to G.058*

3.4.7 First floor

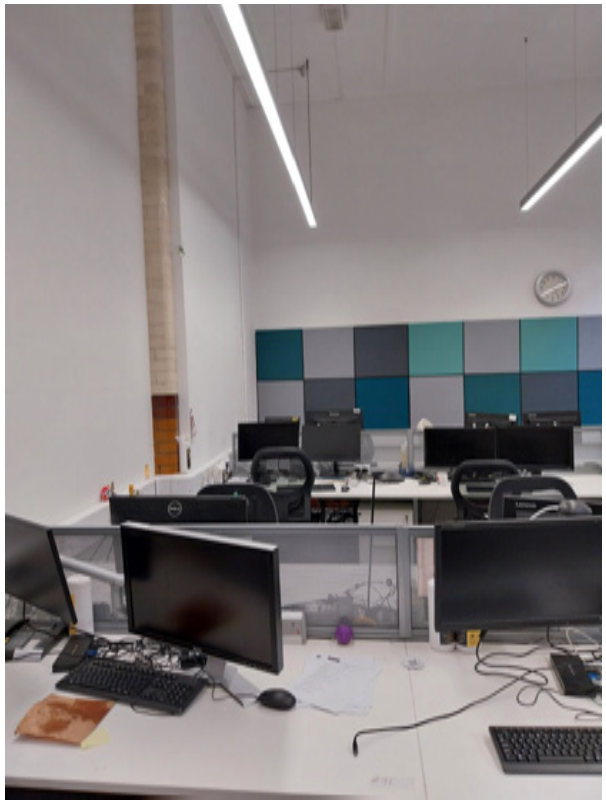
The first floor is a similar spatial arrangement to ground, however there is a greater level of variation.

South of the corridor, **1.052** has been partitioned into four smaller office and meeting spaces, generally with plaster and glazed partition walls To the western end of the corridor are two WCs and a storeroom with suspended ceilings. These project into the office and kitchen spaces in **1.057** and **1.056.** The kitchen has exposed unglazed red brick, and historic benches, but is otherwise heavily impacted by modern kitchen units and wood veneer flooring. 1.051 maintains greater spatial integrity, as an open-plan L-shaped office space with exposed glazed brick along the outer wall.

1.058 is split into an adjoined office and meeting room, with a narrow hallway leading from the door along the outer wall of the lift shaft, positioned awkwardly against the door aperture, into an office space. The southernmost cornice has been heavily truncated by the lift shaft. A black painted picture rail has been added running partially around the room. The office is partitioned from a meeting room via an open flat arch with timber joinery. In this room, the cornice to the south of the central moulded beam is truncated by a later partition leading to the data room beyond (the data room has not been investigated onsite). **[Plates 3.4.29-3.4.48]**.



3.4.29 *1.051 Main space (IBI)*



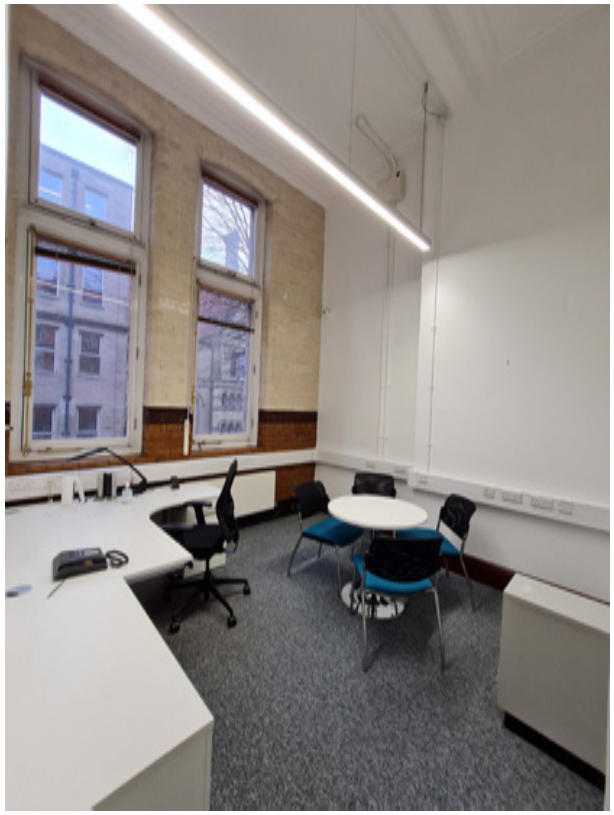
3.4.30 *1.051 Main space (IBI)*



3.4.31 *1.051 Doorway (IBI)*



3.4.32 *1.052 partitioned office circulation (IBI)*



3.4.33 *1.052 partitioned office along the outer wall (IBI)*



3.4.34 *1.052 Ceiling detail*



3.4.35 *Brick detailing around the door in 1.053*



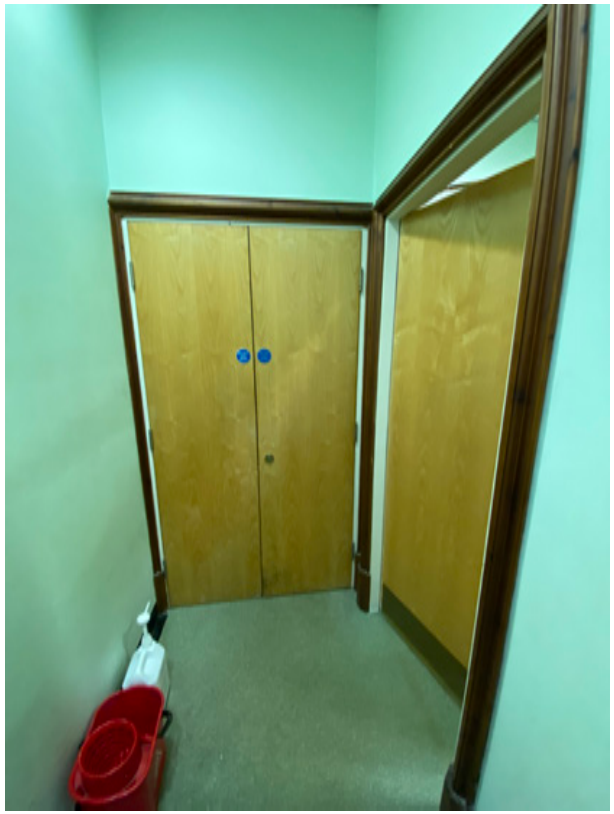
3.4.36 *Brick detailing around the windows in 1.053*



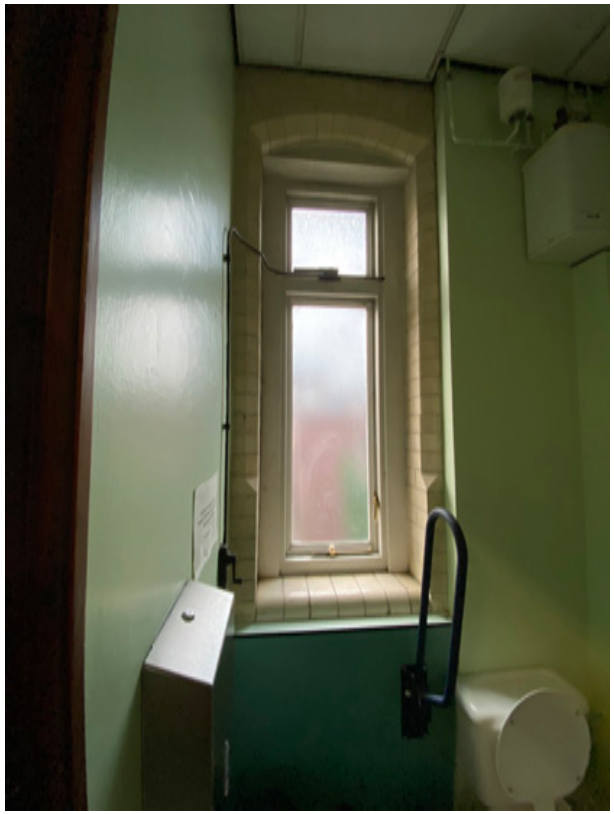
3.4.37 *Historic benches moved to 1.053*



3.4.38 *Room 1.053*



3.4.39 *Entrance to 1.054, male wc*



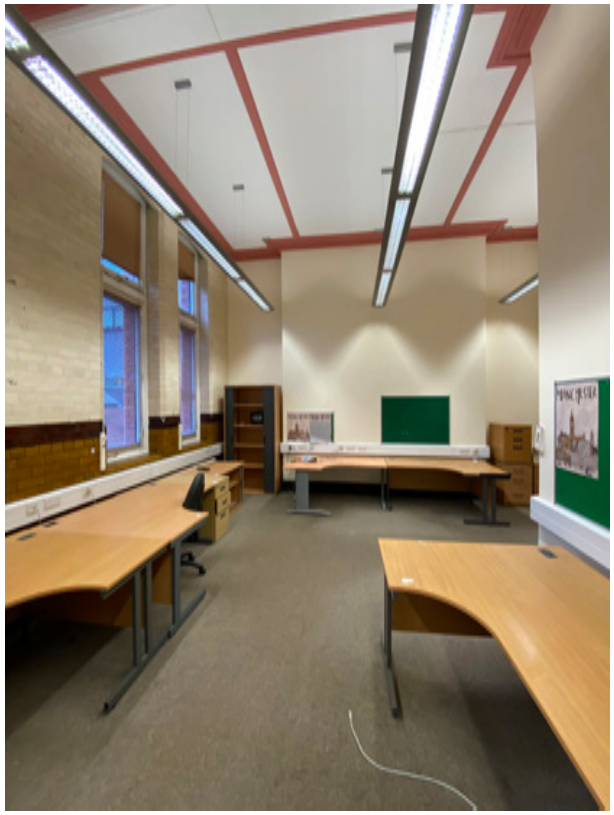
3.4.40 *Glazed bricks around the window in 1.055*



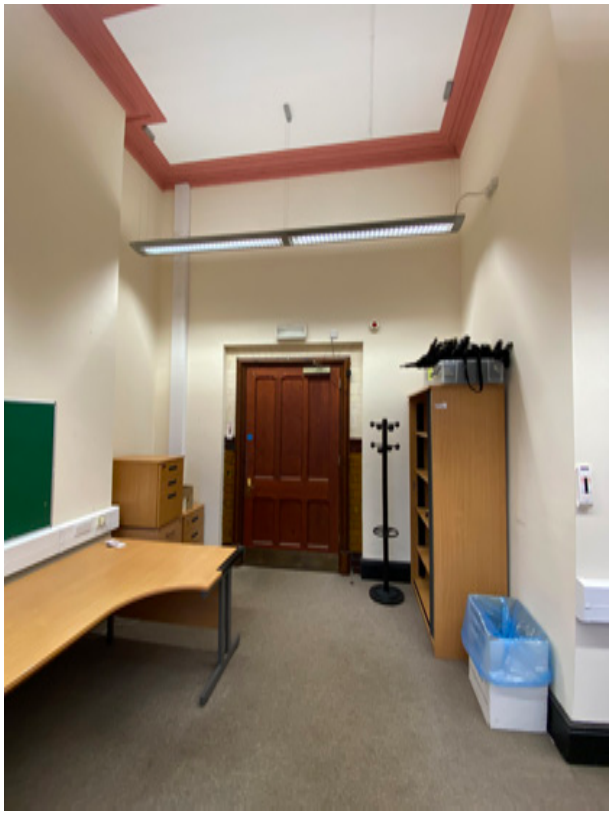
3.4.41 *Suspended ceiling in 1.056*



3.4.42 *Skirting and door joinery to 1.056*



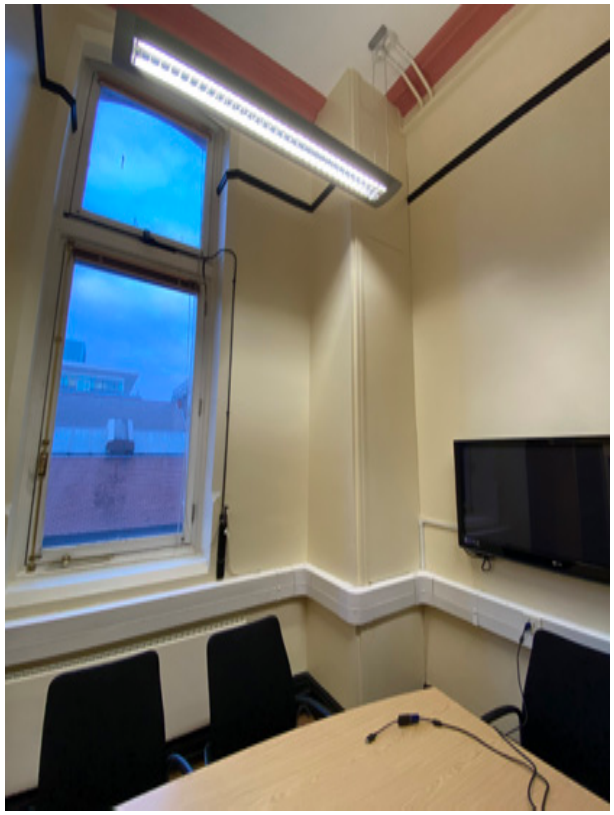
3.4.43 *Room 1.057 showing glazed bricks along the outer wall*



3.4.44 *Room 1.057 with cornice wrapping around partition to 1.056 (storeroom)*



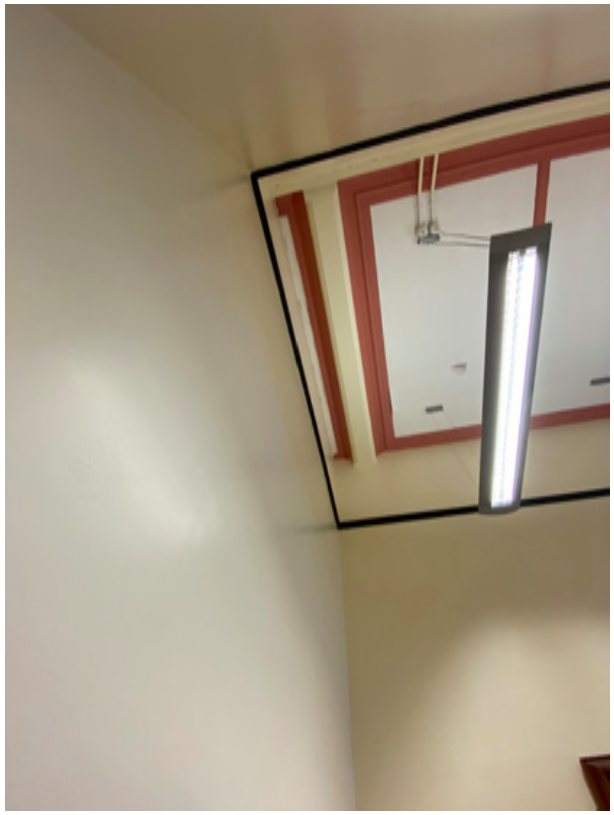
3.4.45 *Ceiling of Room 1.058 truncated by the lift shaft*



3.4.46 *Room 1.058*



3.4.47 *Open arch in Room 1.058*



3.4.48 *Ceiling truncated by the partition to the data room in 1.058*

3.4.8 Second floor

The eastern end of the corridor leads into the adjoining north-south wing. **2.051** is a large double height space, a former lecture room now in use as an office. A modern mezzanine has been added with a double height partitioned office to the northeast corner. A timber four panelled door leads off to the stairwell halfway up the modern mezzanine staircase, with architrave and segmented brick header above. Walls are white painted brick, with blue painted tongue and groove cladding up to the dado level, above skirting, onto which trunking has been applied. Large transom and mullioned windows are evident to the east wall. Floors are carpeted. The high ceiling has wooden trusses and is panelled, with inset ventilation panels, supported by iron brackets. Strip lights have been added. Two observation balconies, accessed via timber doors, are set at mezzanine level along the south wall.

South of **2.051** is an office space (**2.052**) projecting from the main building to the adjoining wing, though also connected via doors to **2.051** and **2.053**. This contains a staircase (**S3.2**), with simple metal balustrading and a timber handrail with risers clad in timber, up to mezzanine level and is partitioned from a smaller office space to the eastern extent of the building (**2.052A**). A smaller, modern, partition is evident to the southwest corner. Of the main cellular spaces off the east-west corridor, **2.053** and **2.058** are quite narrow and, along with **2.054** incorporate part of the roof pitch and lack decorative mouldings to the ceiling (though 2.058 and 2.054 have a small cornice runs above the windows). **2.054** is particularly notable for its large, embellished timber trusses. **2.059** is a larger room and has full decorative ceiling mouldings. **2.057** also has a bay window overlooking the west elevation, and is connected to **2.058** by a door in the central partition.

The floor also incorporates two WCs (**2.055 and 2.056**) with suspended ceilings. **2.055** is in poor condition with paint and plaster spalling along the outer wall. Both project into the cellular spaces beyond; that to **2.054** is particularly detrimental to appreciation of the historic space, sitting awkwardly against the roof beams, and presumably enclosing the historic light aperture visible to the exterior. **[Plates 3.4.49-3.4.70]**



3.4.49 *Room 2.051, former lecture theatre, with mezzanine*



3.4.50 *Paneling to 2.051*



3.4.51 *Door to stairwell off mezzanine stairs in 2.051*



3.4.52 *Extant doorway between 2.051 former lecture theatre, and 2.052, former preparation rooms*



3.4.53 *Observation balcony in Room 2.051*



3.4.54 *Ceiling detailing in Room 2.051*



3.4.55 *Detailing in room 2.051*



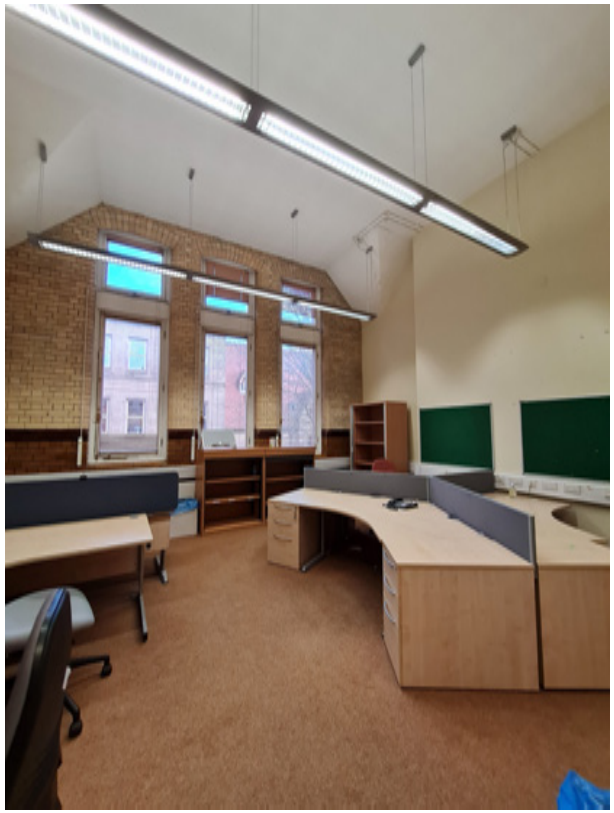
3.4.56 *Room 2.052 showing partition*



3.4.57 *Later staircase in 2.052*



3.4.58 *Room 2.052a with east elevation windows and door into 2.051*



3.4.59 *Room 2.053 outer wall (IBI)*



3.4.60 *Room 2.053 (IBI)*



3.4.61 *2.054 former grating room with later WC partition*



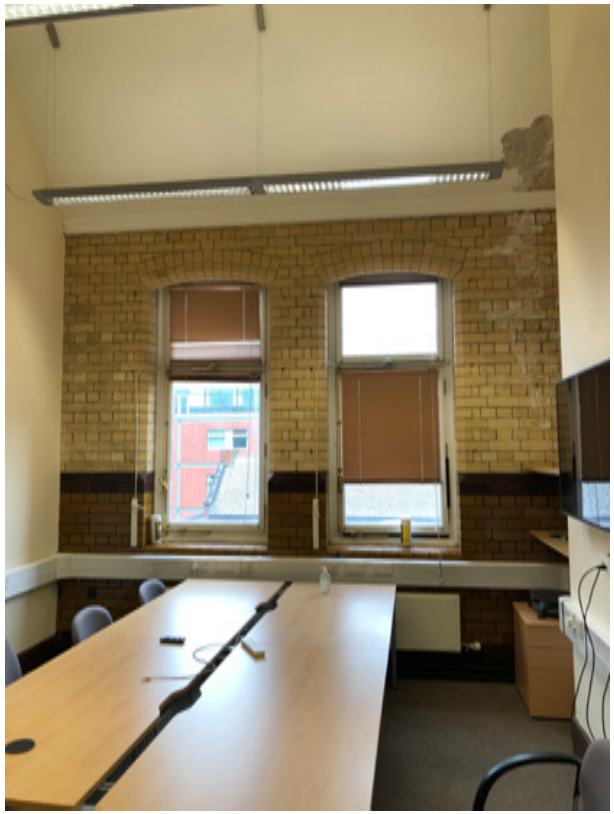
3.4.62 *2.054 with later WC partition*



3.4.63 *Room 2.055, women's WC, partition extending into 2.054*



3.4.64 *Room 2.056 disabled WC, projecting into 2.057*



3.4.65 *2.058 (IBI)*



3.4.66 *2.058 chimney stack (IBI)*



3.4.67 *2.058 Ceiling detail (IBI)*



3.4.68 *2.058 partition door to 2.057 (IBI)*



3.4.69 *2.059 main space and outer wall (IBI)*



3.4.70 *2.059 doorway (IBI)*

3.4.9 Third floor and mezzanine

To the third floor is part of the space originally intended for use as an observatory (**3.3**). This is accessed via a screen from the stairwell and continues the glazed blue and cream tiles and brick of the main stairwell and has a simple timber staircase, though with moulded handrail and newel post, leading to the plant room (not inspected given issues of access). It also has moulded ceiling beams and cornices, painted blue.

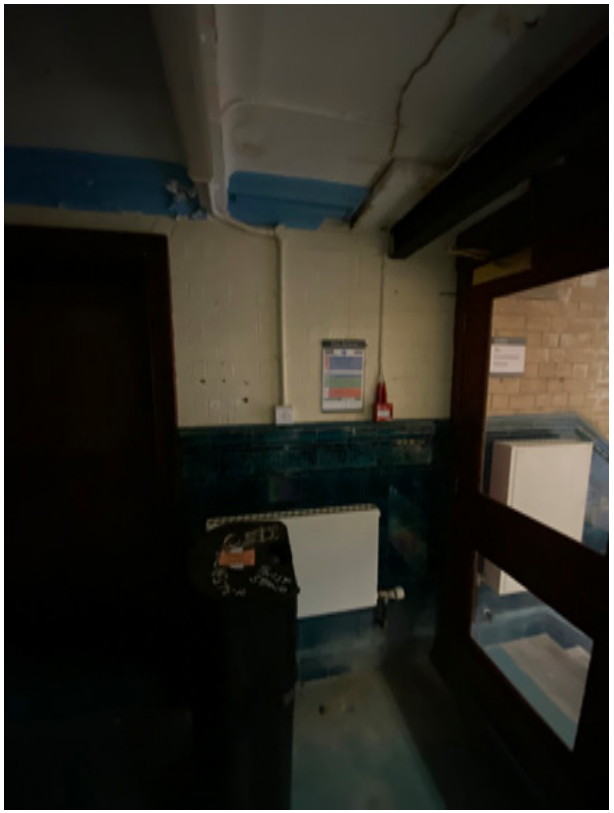
Leading from the simple timber stairwell (**S3.3**) in **2.052**, is a mezzanine level (**M2.002**) in the adjoining north-south wing within the eaves. This space incorporates the cream and brown glazed brick evident throughout the building. Of particular interest are two small timber doors that lead out to the observation balconies overlooking **2.052 [Plates 3.4.71-3.4.74]**.



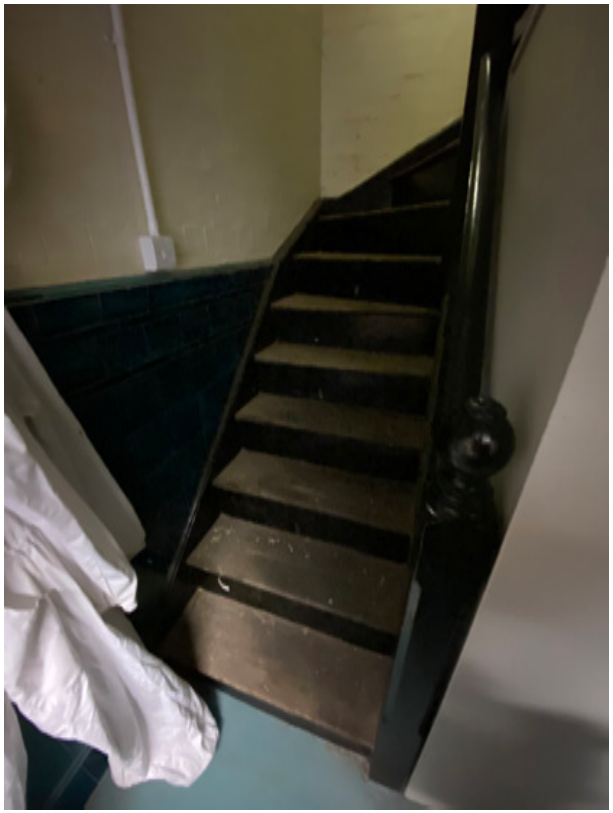
3.4.71 *Room M2.002*



3.4.72 *Room M2.002 Door to observation balcony (20.51)*



3.4.73 *Room 3.3*



3.4.74 *Small staircase in Room 3.3*

3.5 Floor Construction

The floor construction throughout the building can be summarised as follows.

- The corridors, circulation spaces and plant room are concrete with a terrazzo covering.
- Floor coverings to the cellular spaces are generally carpet over modern chipboard; the exceptions are M2.002, where chipboard overlay floorboards, and G.055 (the 'Rutherford Room') where floorboards are exposed.
- The construction of the floors in the cellular spaces were generally a hybrid structure of softwood joists notched onto rolled steel beams with modern mineral wool insulation; the exceptions being Rooms 2.057 and 2.058 where the joists and steels were largely replaced (with a steel beam retained in each) during previous remediation works (2010). Some earlier cotton insulation remains.
- The ceilings were found to be plaster, a mix of animal hair, lime and sand, on expanded metal laths.

The joists, beams, expanded metal lath / plaster and floorboards that were extant are generally considered to be original to the building's construction.

3.6 Roof Construction

The roof construction can be summarised as follows.

- Roofs are generally of softwood construction, with use of pitch pine as the principal material, with a mix of scots pine and spruce as secondary materials. Some steel sections (likely later repairs) are also evident. The roofs are largely covered in clay tiles and ridge tiles with lead gutters.
- There are 3 no. historic pitched roofs over the second floor (e.g., over the front and rear cellular spaces and central corridor), and one pitch over the third floor (e.g., over the double height 2.052). These are generally purlin and rafter roofs, though there are some king posts in areas such as above 2.051 and 2.054 and rolled steel joists over M2.002. There is evidence for late 20th century repairs in areas such as above 2.051, with sections of sarking boards, purlins and rafters replaced as well as later interventions such as venting units. There is also an impermeable bituminous felt on sarking boards over 2.054 and M2.002.
- There is a flat concrete roof over the central staircase and plant room (3rd floor), with a separate softwood pitched roof over small staircase (later additions).

As such, with the exception of the flat and later pitched roof over the stairs and plant rooms, much of the roof structure is likely original, though with later alterations and repairs.

3.7 Summary

Comparing the modern floor plans to those believed to date c.1900 the following observations can be made:

- **Ground floor:** the structure of each room, as well as the circulation between spaces remains intact. The primary extant changes are the insertion of a small partition to the corner of G.058, the creation of the lobby (with additional door into G.058), the enlargement of the lift shaft (with replacement lift) and insertion of reception window, all of which are legibly contemporary additions.
- **First-floor**: the primary extant changes to the first floor have been insertion of WCs to the south the corridor (1.054). The WC and store to the north (1.055 and 1.056) were part of the original layout, but it is understood these have been enlarged, and the walls reconstructed, and the current suspended ceilings and decorative treatments are poor. Further changes include the partitioning of 1.052. 1.058 was partitioned as part of the original layout to create an anteroom leading to private study (understood to be the office of the Langworthy Professor of Physics), however this has been further subdivided to create the data room (1.059) with re-alignment of the arch between the two rooms. An early partition has been removed in 1.051.

- **Second-floor:** alterations to the second floor are largely through insertion of toilets either side of the corridor (2.055) to the west end of the building. Here the toilets to the south of the corridor appear to have blocked the apertures on the exterior that allowed light into the grating room for experimentation (2.054). A further key change has been the repositioning, and replacement, of the staircase to the mezzanine and corner partitions in 2.052. The main change in the adjoining wing (2.051) has been insertion of the mezzanine, however retained is a door halfway up the space that now leads off the modern mezzanine stairs out into the stairwell, but is likely to have historically provided access to the higher levels of the tiered lecture seating.
- **Mezzanine and third floor**: M2.002 is intact, with only the staircase re-aligned and replaced, historically used as a chart room leading onto the observation balconies. The overall floorplan of the observatory remains, though the octagonal dome shown on the map (and in photographs – see plate 2.3.24) has been lost.

4.0 Assessment of Significance

4.1 Introduction

The purpose of this section is to provide an assessment of significance of the Rutherford Building so that the proposals for change to the building are fully informed as to its significance and so that the effect of the proposals on that significance can be evaluated.

The assessment begins with a general summary of the building's history and significance; then the various elements of the building are assessed according to a sliding scale of significance, reflecting the extent to which they contribute to the listed building's special architectural and historical interest.

This assessment responds to the requirement of the National Planning Policy Framework to 'recognise that heritage assets are an irreplaceable resource and conserve them in a manner appropriate to their significance'. The NPPF defines significance as;

> *'The value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological (potential to yield evidence about the past), architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting'.*

4.2 Assessment of Significance

4.2.1 Historic Context

The building was initially designed by architect William Henry Beaumont between 1898 and 1900 in close collaboration with Arthur Schuster, Langworthy Professor of Physics at the University. They endeavoured to create a renowned physics laboratory that could, through its spatial arrangement and provision of facilities, build upon the university's use of Germanic practices of student participation in research.

Opening in 1900, the early building brought together research, lecturing and study spaces for a range of topics within the rapidly expanding discipline, reflecting significant recent discoveries such as x-rays, under the tutelage of Schuster, resulting in one of the largest and well-appointed university laboratories in the world.

The early layout included the main building along Coupland Street, the adjoining north-south wing, and a dynamo house to the rear with early extensions in 1912 for the Hopkinson Wing, focused primarily on electrotechnical research with later uses including the development of the Royal Society Computer Laboratory in 1948, and further expanded with extensions in 1920, 1932 and the 1950s.

Vacating the premises between 1967-1970 for the purpose-built Schuster Building, the Physics Department was replaced by the Psychology Department who occupied the building until 1999. Throughout the latter stages of the 20th century the components of the building have fallen into various uses, though all under the auspices of the university, including as part of the museum, with infilling, oversailing and extension. A period of remediation of refurbishment of the main building, including removal of paintwork from glazed bricks and removal of partitions, was undertaken in the 2000s.

4.2.2 Summary of Significance

The building is a fine example of late-Victorian institutional design, sited near a range of 19th, 20th and 21st century buildings which draw a functional coherence, as university buildings, whilst exhibiting an evolution in styles. However, of arguably greater importance is its historic interest, associated as it is with the growth and development of physical science research, following significant innovations in the late-Victorian period, adaptation of collaborative ways of teaching in the early 20th century, and the contribution this research has made, through figures such as Schuster, Rutherford, and Geiger, to the course of human history.

The building embodies the following values which contribute to its overall significance.

Historic

The building draws significant value from its association with:

- The evolution of the country's first civic university (Victoria University), and specifically development of the universities' prominent focus on scientific research as reflected in

the growing demand for dedicated spaces to accommodate instruction in the broad range of the new, expanded, physics discipline drawing together research on a range of recently discovered aspects of study. This resulted in one of the largest and best equipped laboratories in the world.

- Directly adapting and bringing forward, through the influence of figures such as Schuster, Germanic methods of active participation of students in research and experimentation, moving beyond the more traditional, passive, lecturing model.
- The continued innovation in the discipline, building on Manchester's significant scientific focus, through Schuster's successors, including Rutherford and his cohort shifting focus to atomic physics.
- Renowned figures such as Schuster, Rutherford, Bohr and Geiger (to name a few), the impact of whose research has gone beyond the confines of their discipline, making a significant, potentially the primary, contribution to the development of the modern physics, and more broadly reflecting the significant influence the development of atomic physics had on the course of human history throughout the 20th century and beyond.
- James William Beaumont, a prominent Victorian and Edwardian architect.

Architectural

- The building is a well-detailed example of late-Victorian institutional architecture, purpose built for a university, expressed particularly through its brick and stone detailing, strong bay structure accentuated by gables, and the use of institution-specific decoration on the prominent stone porch which all combine to create a design that embodies a sense of pride in the institution and its commitment to the advancement of knowledge.
- Internally, the building retains significant examples of late-Victorian design and craftsmanship through its decorative schemes including joinery, mouldings, brickwork and tiling.

Communal

- The building has communal importance as part of the broader Manchester University campus and as key part of the earlier development of a culture of research, engagement, and participation in academic advancement.

This special interest is manifest in the fabric and form of the building.

Of particular importance are:

- Retention of Schuster's spatial arrangement
- Early adaptations by successors such as Rutherford for specific types of physics research
- Retention of Beaumont's original external design scheme.
- Indicators of the specific uses of its spaces as a physics laboratory.
- Internal decorative schemes as examples of late 19th/early 20th century design and craftsmanship.
- Continued use of the building by the University, though the original use as physics laboratories is no longer evident.

4.2.3 Internal hierarchy of significance

Based on the above factors, the building has the following hierarchy of significance internally:

Of **high significance**, and particularly sensitive to change are:

- **Internal decorative scheme, and structure,** including, most notably:
  - Glazed bricks / tile
  - Moulded ceilings and cornices, with expanded metal laths
  - Four and six panelled timber doors and architraves
  - Terrazzo and timber floors
  - Terracotta lobby
  - Floor structure of hybrid timber and steel construction, using historic wool insulation in places
  - Primary staircase
  - Decorative roof finishes and panelling to the lecture hall (2.051).

However, the floor and wall materials have been significantly impacted by later plastering and modern fixtures and fittings.

Of high significance is also the **survival of the early spatial arrangement**. As the building has evolved the original uses of each room have all changed with loss of the associated fixtures and fittings and the addition of elements such as WCs and an enlarged lift shaft. However, perception of the early layout through the retained volume of spaces is highly legible, accentuated by remediation works to both the layout and finishes in the 1990s and 2000s.

Perception of the original uses of each room in the built fabric is now mostly obscured following removal of equipment and changing uses over the last century. However, there are areas where this is still perceptible, and these are of high significance including:

- The large lecture theatre in 2.051 through retention of the observation balconies, the size of the space, and door halfway up the staircase (hinting at the former lecture seating). Physical connection to the former apparatus room remains (2.051), showing the functional relationship between the two spaces, but the doorway to the preparation room (2.052A) has been blocked up eroding legibility of those elements.
- The grating room (2.054) given survival of the apertures to the exterior that allowed light through for experimentation, though this has been undermined to the interior given partitioning and the introduction of the WC.
- The survival of the bay window in 2.057, which may be the place were a Toepler Pump was positioned to support venting of radium, though this is theorised.
- Perception of the comparative size of spaces given over to study, reading, storage, lecturing, and laboratory work or experimentation.

Of **low-moderate significance,** and therefore less sensitive to change are:

- The timber casement windows. The windows were originally considered historic. However, further inspection by the architectural team indicates design discrepancies in units across the façade leading to the conclusion there is in fact mix of historic and modern additions. Whilst some are original, and all incorporate moulded profiles, they are relatively inconspicuous and instead defer to the powerful and striking stone and brick detailing which better underpin the building's institutional aesthetic. The glass is of more limited significance, as it is plain.
- The roof structure, as it retains much of the original timber with elements of higher-quality king truss post design. However, it appears to lack some of the innovations in the ceiling and floor structure.

Of **neutral significance, neither contributing nor detracting from the significance** of the whole and therefore a clear opportunity for change are:

- Office partitions, by virtue of the fact the original volume of the rooms is legible, particularly through continuation of the historic decoration behind.
- Colour schemes, e.g., blue, and red paint to mouldings which are later, but subjective in their aesthetic quality.
- Brass door and window furniture, as they are likely later additions but reasonably well-detailed.
- Skirting boards. Given the original glazed tiling included specific colours at skirting level these are later, further evidenced as they sit on and wrap around the later plasterwork. Most are reasonably well-moulded and well-detailed (though some are simple profile, and where this is evident detract) and are inoffensive in themselves.

Factors which are **negative and detract from the building's significance** and offer an opportunity for enhancement are:

- Plaster walls. Whilst inoffensive, the plaster has specifically overlaid the glazed brick and key features such as the light apertures on the west elevation internally.
- Modern fixtures and fittings, including carpets, vinyl, and wood veneer, particularly given they likely overlay historic timber floorboards, as well as radiators, strip lights, pendant lights, and trunking given their largely generic appearance, and the visual clutter brought by the trunking.
- Suspended ceilings, e.g., in the WCs.
- Condition of certain areas, including the WCs.
- General fixtures including signs and controls bolted or cut into glazed bricks.
- Lift and lift shaft. Whilst historic maps indicate a lift was in this location in the 1900s, reflecting Schuster's modernising efforts, the current lift is modern with a poor-quality stainless-steel finish. It is, furthermore, larger than the original

lift shaft and visually truncates cornices and chimney stacks.

- Composite fire screen doors, as they are visually heavy and of lower quality than the historic joinery.
- Modern mezzanine insertion, as it is visually and physically intrusive.

4.2.4 External hierarchy of significance

Externally, the building has the following hierarchy of significance:

Of **high significance**, and particularly sensitive to change are:

- The overall architectural composition of the front and return elevations, with retention of key detailing including the stone dressings, porch and buttresses.
- Elements that evidence the original uses of the building including the balconies and apertures on the west return elevation used for light experiments and calibrating telescopes / sextants.

Of **moderate significance,** and therefore less sensitive to change are:

- The rear, north, elevation given the more restrained, though well-considered architectural detailing.

Factors which are **negative and detract from the building's significance** and offer an opportunity for enhancement are:

- The access ramp on the west return elevation, given its footprint, poor-quality materials, and visual complexity.

4.2.5 Setting

As outlined above, the part of the building subject of this scheme of works is situated in an area both setback and screened from the main spine of Oxford Road via an arch in the museum. This creates a more **enclosed streetscape** and from this the building's setting contributes particularly to its significance through:

- **Linear views** to its front and side elevations, accentuated by the open space in front of Coupland 1, which highlights its **strong institutional design** and specific **aspects of the building that reflect former uses**, such as the balconies, light apertures, etc.
- A **spatial and experiential proximity** to several other university buildings which exhibit a range of architectural styles and collectively underpin and illustrate the **university's contribution to research** over the course of its history as undertaken by internationally renowned figures such as Alan Turing.

5.0 Commentary on the Proposals

5.1 Description of the Proposals and their Impact on the Listed Building

The proposed works are outlined in detail in the plans and Design and Access Statement (DAS) by Arcadis IBI and broadly seeks to fully refurbish the building to enable, and make sustainable, its continued and longer-term use for academic and postgraduate study at the University. They should be understood in conjunction with a series of enabling and repair works to the internal floor and ceiling structures (currently under consideration, RN: 138277/LO/2023). The works subject to this application represent the broader refurbishment scheme, involving:

- **External**: conservation repairs to masonry and other historic elements, insertion of discrete ventilation grilles, and replacement of signage and west elevation door, alongside re-cladding the modern access ramp.
- **Internal**: select reconfiguration of the layout to provide useable office and research spaces, coinciding with a rationalisation of internal services, changes to finishes and upgrades to doors and screens that focus on stripping back modern finishes to the historic fabric.
- **Retrofit:** measures to significantly enhance the thermal efficiency of the building including replacement of window glass and casements (retaining frames) as well as insertion of insulation into the roof voids.

The approach is outlined in the DAS, but key principles that have underpinned the proposal include.

- **Enhancement**: actively exploring where it is possible to enhance the buildings interest, including revealing historic surfaces, removing later additions, and rationalising services.
- **Reversibility**: focused on, for example, the use of freestanding furniture and meeting pods to limit physical impact.
- **Upgrade:** seeking ways to improve the useability of spaces, including thermal comfort, and balanced against the significance of finishes, spaces, and design philosophy.

5.1.1 External

External works are minimal and have been primarily proposed where necessary to facilitate the scheme or enhance the building's longevity. The scheme allows for repairs to historic fabric such as external masonry, including a conservation approach to the stonework on the highly significant entrance porch, of evident benefit. Furthermore, changes to the interior layout necessitate the addition of ventilation grilles to the west and north elevations, providing air into proposed partitioned spaces. These are designed to be discrete, draw on the existing pattern and placement of grilles to the south elevation and use a like-for like appearance and materiality and as such would have a neutral impact on the building's interest. Building on this, coinciding with the overall approach to creating higher quality finishes throughout the building, and improving the user experience, it is proposed to enhance the approach to the building on the west elevation including replacement of the modern entrance door with a more appropriate solid double door, and re-cladding the access ramp in ashlar stone, both higher quality in its finish and more akin to materiality elsewhere on the university estate.

5.1.2.1 Layout

The proposed layout has been planned to provide spaces for academics, researchers, and postgraduate students, all of which have varied requirements for space and privacy. The Design and Access statement should be reviewed for broader rationale, but the works would result in the following;
Removal

It is proposed to remove the following internal partition walls (the room numbers below are those shown on plates 3.4.1-3.4.4):

- **G.058, 1.052, 2.051,** and **2.052**. These are modern glazed partitions, so their removal will enhance appreciation of the space.
- **1.053:** This is a modern heavy partition, installed to create toilets, themselves in poor condition and of poor visual quality. Its removal will significantly enhance appreciation of the historic volume.
- **1.057:** This was the historic location for a WC and storage room; however, the walls have been replaced and the space enlarged. As such, their removal will impact legibility of a small part of the historic plan (leading to a low level of less than substantial harm), but the WC provision is poor, as are finishes (including suspended ceilings), and providing appropriate services is

considered necessary to ensure the building's use longer-term (the 'proposed layout' section considers the benefits of moving the WCs).

- **1.058 / 1.059:** This is a modern heavyweight partition for a server room. Historically an anteroom to the Head of Physic's office, its removal will reinstate historic proportions (to be retained in the proposed layout) and reinstate the original door location.
- **2.054**: This is a modern heavyweight partition for WCs, themselves in poor condition. Their removal will significantly enhance appreciation of a space with high architectural interest, the former grating room (as well as appreciation of its decorative roof beams).
- **2.055**: This is a later heavyweight partition for a WC, and its removal will enhance appreciation of the historic volume.
- **2.057 and 2.056**: This space was historically divided, into the transit and research rooms, but the current wall (in its historic position) was replaced in the 2000s. As such, this will impact perception of the original layout, leading to a low level of less than substantial harm, but no loss of historic fabric. This is considered a necessary change to provide adequate socialisation spaces close to areas of highest occupancy and the legibility of the space will be retained through a down-stand beam.
- **2.052 / 2.053A:** This is a historic dividing wall between an apparatus and preparation room adjoining the lecture theatre. Its removal will cause less than substantial harm through loss of fabric and perception of layout. However, it is considered necessary to provide appropriate space when considering the wider uses and layout across the building. This harm is also mitigated by the insertion of a wellbeing room to the northern part of this space, which reinstates a historic, now blocked, door opening from the lecture room. This will enhance legibility of the lost historic connection between the lecture room and preparation space – a key historic relationship.

Proposed layout

The spatial strategy has considered the requirements for different users of the building, including where private meeting or workspaces are needed (the numbers below use those outlined on the Arcadis IBI Proposal drawings, accounting for new rooms).

- **G.055 and 2.051:** The significant 'Rutherford Room', which retains historic wall and floor coverings and aids legibility of the building's history through interpretation boards, and the large historic lecture theatre are to remain open spaces, preserving their critical contribution to the building through the quality of finishes and perception of historic use.
- **G.057 and G.058:** These are required for meeting spaces and as such will involve installation of glazed partitions. This is considered, however, a neutral addition as the lightweight nature of the design will enable legibility of the historic volume, enhanced by key elements such as the glazed brickwork.
- **1.051, 1.052, 1.053, 1.057, 2.053, 2.054:** These, following removal of modern partitions, will remain as large historic volumes. Meeting spaces are achieved using small freestanding, and reversible, pods. As such, the historic volume of these spaces, enhanced through removal works, are preserved.
- **Corridors:** It is proposed to add meeting rooms to the east-west corridors at first and second floor. This has a small degree of impact on perception of the historic volume, though is mitigated given the partitions are glazed with discrete frames, and further reinforced by retention of the doors into the historic volumes beyond. The historic balconies will also remain accessible.
- **3.01**: This is currently a modern plant room and is to be partitioned for a server room. This will enable removal of the server room from the first floor where it has divided the historic anteroom to the Head of Physics' office (allowing reinstatement).
- **North-east rooms**: These spaces, historically single, open volumes (other than the first floor, separated between an anteroom and office for the Head of Physics) are proposed to house new WC and service spaces, requiring a higher level of partitioning in historic volumes. This is considered necessary as the current toilet provision, primarily to the west side of the building is inadequate and much is in poor visual and physical condition. Moving them to the north-east corner creates a rationalised and adequate provision whilst limiting additional penetrations, given siting, through historic fabric to four additional vertical stacks (causing a low level of less than substantial harm through historic ceiling and floor structures) leading into the basement. Furthermore, the impact on the historic volume is mitigated through use of

part height WCs, with the historic volume of the space appreciated in the circulation spaces. Furthermore, to the first-floor, reorientation of this space has allowed reinstatement of the volume of the historic anteroom to the Head of Physics' Office (proposed as a tea point), including the doorway location. Creation of the WC at ground floor, will require opening a doorway into the corridor (where there is currently a modern interior window, in a historic location), given the existing doorway leads off the staircase (leading to fire safety concerns). Legibility of this space is still evident through retention of this door to the staircase side (boarded to the interior for fire and acoustics). Furthermore, the current tiles, whilst visually high-quality, are later repairs and their broader influence on the space is retained given only a small proportion are to be removed. As such, whilst having a low level of less than substantial harm through alteration to the layout, and loss of wall fabric, this is necessary given the need for WC provision and is mitigated through retention of the historic door.

5.1.2.2 Services and Finishes

Throughout the building, the intention is to significantly enhance and pare back the interior to something more akin to the original internal design of the historic spaces. Of critical importance, is the intention, where possible, to remove later plasterboard to reveal the historic glazed brickwork beneath. The extent of this will be subject to further investigation (and dependent on whether mechanical or adhesive fixings were used, due to the techniques that will be needed to remove them). This will be of substantial benefit in all spaces it can be undertaken.

The proposal, further, includes:

- **Colour palette and finish:** A colour and soft furnishings palette has been designed to draw on the historic hues of the interior. As an example of creating a more appropriate aesthetic, the tongue and groove panelling in 2.052 is to be stripped of its modern, blue paint, and varnished, bringing it back to the original aesthetic. Similarly, the architrave of the stainless-steel lift shaft, visually prominent, will be lined with tiles to match the historic blue tiles in the corridors. Furthermore, the circulation spaces in the new WCs will draw on the precedent of corridors with new terrazzo.
- **Skirtings:** The skirting boards throughout the building are modern, and they are proposed for removal, paring back to simple timber or vinyl coving.
- **Historic doors:** The proposal will retain historic doors, with sensitive fire upgrades. Doors in new partitioned spaces will be retained to one side, and boarded to the other for fire safety and acoustics.
- **Screens:** Throughout the stair core, modern screens have been inserted. These are clunky and visually poor. It is proposed to replace these with a more visually discrete set of screens to the staircase and corridors (the latter a new addition, but preserving appreciation of the volume through their discrete design) to enhance fire compartmentalisation.
- **Mezzanine (2.052)** and **Staircase (2.053):** The mezzanine in 2.052 is a later addition and its visually poor. The intention is to introduce new cladding, stair coverings and balustrading, drawing on the design of historic joinery in the space – including the observation balconies. Similarly, the staircase in 2.053 is a later addition, and this is also proposed to be upgraded visually.
- **Services:** Throughout the building, there is a high level of visually and physically intrusive services including plastic dado trunking and high-level trunking to corridors below, and impacting appreciation of, historic cornices. These will be carefully removed. Concurrently, an approach has been developed to limit new provision, such as exploring use of task lighting in desk furniture. Furthermore, investigation and repairs to the floors have revealed it is possible to create spaces for services in the floor voids. This will dramatically decrease the extent of visually and physically intrusive services. Where required to exit the floor, services will be undertaken using vertical drops – a style reminiscent of the building's original interior as shown on historic photographs in the sections above.
- **Acoustic baffles:** The tall height of the historic volume of the spaces, and hard wall surfaces (tiles), require use of acoustic baffles to minimise the poor sound quality of the spaces. Rather than lowering ceilings, baffles would be affixed to the ceilings. While these have the potential to impact appreciation of the volume of the space, they are less intrusive than suspended ceilings, and have a very minor physical impact on the

ceiling through affixing. They are considered necessary for usability of the space, and have been designed as sensitively as possible – running perpendicular to the corridor walls to ensure legibility of the volume on entering rooms.

Approach to the interior: the balance

Some aspects of the proposals would cause *'less than substantial'* harm to the building's significance, principally removal of one historic wall and two modern walls from historic locations, the higher levels of partitioning in service areas including the WCs, additional partitions in select areas (such as meeting rooms), and to a lesser degree the visibility of the historic doors in certain room interiors. However, these works need to be considered in relation to the overarching usability of the building and the way in which this supports its longer-term conservation and use, with areas such as the WCs a key and necessary amenity, as well as required upgrades for aspects such as fire safety and acoustic comfort. Careful attention has been given to mitigating this impact where possible through good design, freestanding furnishings, partial height WCs, and scribing around moldings where necessary. However, more critically this harm should further be balanced against the myriad of aesthetic improvements and rationalisations to the interior, including better revealing the proportions of certain rooms, addressing the visual impact of modern services and aspects of the proposal such as reinstatement of a doorway from the former lecture theatre, and revealing previously covered internal glazed brick. Overall, when balancing the isolated instances of harm with the holistic heritage benefits, this assessment finds that there will be no harm to heritage significance.

5.1.3 Retrofit

A critical part of the building's refurbishment is the careful consideration given to thermal upgrade and enhancing efficiency of the building longer term. This aligns with the legal requirement to meet carbon reduction targets in the UK, and national planning policy that supports development that contributes to radical reductions in greenhouse gas emissions (NPPF:152). Specifically, the proposal seeks to take a holistic approach and deal concurrently with the windows and roof.

5.1.3.1 Windows and External Doors

Whilst initially considered original, further inspection by the architectural team has indicated there is a mix of historic and later casement windows (though the outer frames, built into the masonry, are historic), with generally plain glass across the façade. Evaluation indicates that approx. 70% are later (with historic casements concentrated primarily on the stair core). Whilst there is some interest, given the retention of earlier frames, this is generally limited, with greater architectural interest in the overarching architectural pattern and masonry details which surround. It is proposed to replace the glass with vacuum-sealed units and replace the surrounding casements on a like-for-like basis, retaining the surrounding frame to both preserve fabric and avoid any physical impact on the highly significant glazed tiles and surrounding masonry detail.

There are some windows that would not be replaced, given they are in separate use by the museum. Those to the east elevation are fully encapsulated within a later extension, so would not have a direct visual relationship, but a small portion of the south frontage windows would remain as existing. This, however, is unlikely to result in a perceptible variance across the façade given the intention to match the casements like-for-like, and the limited visual difference between the types of glazing, which would have low reflectivity.

The works would result in a low level of 'less than substantial' harm through the removal some earlier fabric, and some potential variations in windows across the façade given ownership division. However, this should be balanced against the significant improvements the works would bring to the thermal efficiency of the building going forward (when considered also in relation to the proposed roof works). Various options were considered during the design process ranging from draught-stripping to wholesale replacement, as well as the installation of secondary glazing. In this instance the solution presented the least harmful means of achieving the maximum thermal benefits; secondary glazing and the wholesale removal of the windows both likely resulting in damage to the highly significant exposed glazed bricks to the interior and fine masonry detailing.

5.1.3.2 Roof

Coinciding with the window proposals, there is a need to improve the thermal performance of the original roof structure, which is currently uninsulated. Options have been explored to consider how best to install roof insulation without harming the historic ceilings and roof coverings. The chosen approach is to retain the early metal-lath ceilings in situ and insert insulation above this, effectively resulting in a raised roof profile of 54mm. This proposal would result in a degree of physical and visual change to the building. For example, the existing clay roof tiles (considered historic, although relating to the advent of mass production and of no unique design) would need to be lifted (retained for reinstatement) and the sarking boards and battens replaced, which would result in 'less than substantial' harm through the removal of some historic fabric – although not beyond that would which occur through the periodic renewal of a building. Furthermore, the primary elements, such as king posts, would be retained, whilst the works would allow elements of later reworking to the roofs, such as the vapor impermeable bituminous felt layer to several areas, to be removed. Similarly, the profile of would roof will need to be raised by 54mm; this would have a largely imperceptible impact on the external appearance of the roofscape or the building more widely, whilst careful consideration has been given to how this change would interact with verges, chimneys, and other detailing (outlined in the accompanying drawings) with the connection achieved through provision of flashing rather than a course of tiles, the impact being limited to a small level of additional covering of material largely obscured by the existing parapets. The innovative and early use of metal laths in the ceiling will be unaffected by this solution, allowing architectural and historic interest to be preserved.

5.2 Justification of the Proposals

The Rutherford Building is at a critical point in its history. The University are keen to invest in the building to enable and ensure its longer-term use for academic and postgraduate research, continuing and perpetuating the building's contribution to academic collaboration. To achieve this a series of works are required which would either result in enhancements to heritage significance, or cause 'less than substantial harm' to isolated areas - primarily through some loss of internal and external fabric (e.g., walls, windows, and roof) and partitioning of historic spaces where necessary. On balance, these heritage benefits and harmful impacts are considered to result in an overall benefit to heritage significance.

As explained in Section 1.2, Section 38(6) of the Planning and Compulsory Purchase Act 2004 requires planning applications to be determined in accordance with the development plan, unless material considerations indicate otherwise. The development plan applicable to the building comprises **The Core Strategy (2012)** and saved policies from the **Unitary Development Plan (1995)**. **Policy EN3 Heritage in the Core Strategy** establishes a presumption in favour of *'development that complements and takes advantage of the distinct historic and heritage features of its districts and neighbourhoods, including those of the city centre'* and that *'proposals which enable the re-use of heritage assets will be encouraged where they are considered consistent with the significance of the heritage asset'*. Similarly, **Policy 19 Listed Buildings of the UDP** indicates the *'council will have regard to the desirability of securing the retention, restoration, maintenance and continued use of such buildings'*...provided *'in its opinion, there would be an adverse effect on its architectural historic character'*. The proposals are considered to part meet these policies. Specifically, the proposals seek to ensure reuse of the building in the longer-term with an approach that balances its interest with usability through managed change. However, elements of the proposals, as outlined above, would lead to 'less than substantial' harm.

Weighing this harm, however, with public benefits is a key factor in the **NPPF**. As noted above, the courts have previously held that a decision-maker that properly works its way through the relevant paragraphs of the NPPF will typically have satisfied its statutory duties under the Town and Country Planning (Listed Buildings and Conservation Areas) Act 1990 (see Mordue v Secretary of State for Communities and Local Government (2015)). Paragraph 199 of the NPPF makes clear that great weight should be given to the conservation of designated heritage assets, irrespective of whether the harm amounts to substantial harm, total loss or less than substantial harm to its significance. As outlined in detail above, it is considered that the proposals would cause some 'less than substantial' harm to the significance of the listed building, principally through the loss of historic fabric and alterations to plan form, in accordance with the terminology of the NPPF. Paragraph 202 of the NPPF states that any 'less than substantial' harm to the

significance of a designated heritage asset should be weighed against the public benefits of the proposal. It is considered that in this case, the 'less than substantial' harm resulting from the proposals would be outweighed by the degree to which the proposals would directly lead to heritage-focused public benefits. Specifically, this includes the overarching benefit of securing its longer-term use consistent with the purpose and philosophy in which it was designed, continuing the spirit of academic collaboration at the heart of its origins, through the provision of spaces for academic research and study, which requires a certain level of amenity, as well as improvements to thermal performance. This is further reinforced by specific elements of the proposal including enhancement to the visual aesthetic of the building's, i.e., through works to the internal and external spaces and fabric, including removing and rationalising poor later services such as trunking, enhancements to the ramp, and revealing the earlier glazed brickwork.

It is therefore the conclusion of this report that the proposals would meet the statutory duties of the Town and Country Planning (Listed Buildings and Conservation Areas) Act 1990, the policy requirements of the Local Plan and the tests for sustainable development outlined in the NPPF insofar as they relate to the historic environment.

Appendix I - Statutory List Description

Manchester University Rutherford Building, Coupland Street, Off Oxford Road, Manchester
Grade: II
List Entry Number: 1402635
Date first listed: 19th October 2011

Summary

University physics laboratory, now administrative offices. 1898-1901 by James William Beaumont in collaboration with Professor Arthur Schuster over the interior arrangements.

Reasons for Designation

The Rutherford Building and Hopkinson memorial wing (formerly the Physical Laboratories and John Hopkinson Electrotechnical Laboratory) of 1898-1901 by James William Beaumont is designated at Grade II for the following principal reasons: * Architect: Designed by James William Beaumont, a prominent Manchester architect, with a number of listed buildings to his name, in collaboration with the Professor of Physics, Arthur Schuster, resulting in a well thought-out bespoke university science laboratory building * Historic interest: Ernest Rutherford led the Manchester physics laboratories between 1907 and 1919, and it was in this specific building that he carried out ground-breaking research resulting in his discovery of the nuclear atom in 1911, subsequent splitting of the atom in 1917, and initiation of the field of nuclear physics * Design: The building, which was one of the largest physical laboratories in the world when built, combined the practicalities required to provide first-class teaching facilities covering electrical engineering, electro-chemistry, practical physics, and research, with a judicious use of more elaborate detailing to the building, concentrated on the main entrance which incorporates the university coat of arms and motto, manifesting a sense of civic pride in the provision of this dedicated science building at a provincial university. * Interiors: Much of the original layout survives and the rooms retain their original glazed brick linings which, although more costly, were used to facilitate the cleaning and brightness of the rooms. Other original features include the decorative dado tiling and terrazzo flooring to the wide corridors, original staircases, panelled doors, moulded architraves, moulded cornices, observation balconies, panelled ceiling and wooden roof trusses in the large lecture room. * Group Value: The Rutherford Building forms an important component of the development of the science faculty at the University of Manchester and is located close to a number of other listed university buildings including the Main Quadrangle (Grade II*), the Museum Extensions (Grade II) and Former Department of Metallurgy (Grade II), both on Oxford Road, and the Pharmacy Department, formerly the Medical School, Coupland Road (Grade II).

History

The Rutherford Building was originally known as the Physical Laboratories. Work commenced in 1898, and the building was formally opened in 1901. It was built to designs by James William Beaumont in collaboration with Professor Arthur Schuster over the interior arrangements. When built they were amongst the largest and best-equipped physical laboratories in the world. The building was partially funded by anonymous donations totalling £17,000, thought by some to have come from Schuster himself. To the rear of the main building is a contemporary wing referred to on a stone plaque as The John Hopkinson Electrotechnical Laboratory which was erected and equipped in 1899 in memory of Dr John Hopkinson FRS by his parents, relatives and friends. (Hopkinson was an eminent electrical engineer born in Manchester who had studied as a student at Owens College and died in 1898 in an Alpine climbing accident.)

James William Beaumont was a leading Manchester architect of the late C19 and early C20, whose designs include the Whitworth Art Gallery, Manchester (Grade II), Pendlebury Hall, Stockport (Grade II), Winters Buildings, 28-32 St Ann Street, Manchester (Grade II), a former packing warehouse on Tariff Street, Manchester (Grade II), and Hyde Town Hall (Grade II).

Arthur Schuster had moved as a child to Manchester from Germany in 1869 after the family textile business transferred there. After attending Henry Roscoe's evening classes in science at Owens College, he determined to study physics. He was subsequently appointed professor of applied mathematics at Owens College in 1881, which in the previous year had become the first college of the new Victoria University, and in 1888 became professor of physics. From 1903-5 Schuster was dean of the faculty of science before resigning his chair in 1907, due in part to ill health, having first ensured Ernest Rutherford would become his successor. He also left the laboratory his personal assistant, Hans Geiger, who went on to work closely with Rutherford. Ernest Rutherford led the Manchester laboratory from 1907 to 1919, before leaving to work in

Cambridge. It was whilst he was working in Manchester that he discovered the nuclear atom (1911), split the atom (1917), and initiated the field of nuclear physics. In 2006 the University of Manchester renamed the building the Rutherford Building in honour of its most famous former resident.

A contemporary report stated that Beaumont was sent to visit the principal modern laboratories in Germany by the Council of Owens College before drawing up the plans for the building. It also reported that Professor Schuster advocated an internal arrangement with rooms sufficiently large to accommodate at least several students rather than individual rooms for single students (which was the tendency in some contemporary continental laboratories) as experience had taught him the educational value of mixing senior and junior students together. There was a carefully planned system of ventilation designed to exclude dust as far as possible from all the rooms and especially from instrument cases, and many rooms were supplied with water, gas, steam for experimental purposes, and compressed air, conveyed by a series of pipes coloured differently to enable them to be easily distinguished. A 1906 publication describes the building as being arranged so that the ground floor was devoted to electrical engineering and electro-chemistry; the first floor to general instruction in practical physics; and the second floor and basement mainly to research purposes. A large lecture theatre, seating 200, and a smaller lecture room, seating 25, were also situated on the second floor. On the roof was a small astronomical observatory. The Hopkinson memorial wing contained a dynamo house containing seventeen examples of types of direct and alternating-current generators and motors, an accumulator room, photometer room, and the electro-chemical laboratory. It is visible to the rear on a drawing of the building by Beaumont.

Details

PLAN: L-shaped building of two and three storeys over a raised basement. East range, running north-south, contains largest laboratory and lecture room; west range, running east-west, contains two parallel series of rooms separated by wide spine corridors. The ground floor was devoted to electrical engineering and electro-chemistry, the first floor to general instruction in practical physics, and the second floor and basement mainly to research purposes. There is a flat platform on the roof of the west range, which originally housed an observatory. Attached to north end of east range is a single-storey range over a raised basement which was formerly a dynamo house for the Hopkinson memorial wing; it contained seventeen examples of direct and alternating-current generators and motors.

EXTERIOR: The front, south elevation is of eight bays with a gable over the third bay, the main entrance in the fourth bay, and a slightly projecting wide, four-bay gable to the right. Stone window surrounds with heavy stone mullions and thinner stone transoms with lintel bands to basement and ground floors, and sill bands to first and second floors, which carry round onto the east side elevation: bays one and two have four-light mullion and transom windows on the ground and first floors; the second-floor of bay one is blind with a two-light mullion window in bay two; bay three has six-light windows on ground, first and second floors; bay four has a four-light window on the first floor and two-light mullion window on the second floor; bays five to eight have four two-light transom windows on the ground and first floors. The windows on the second and third storeys are set in a stepped stone panel, with four widely spaced single-light windows on the second floor and four closely spaced single light windows on the third floor. The main entrance has a stone fronted porch with stone steps leading up to a wide, depressed arch doorway with panelled double doors, narrow side lights and five square overlights, all with Art Nouveau leaded glass, flanked by two octagonal columns with cupolas. A triangular pediment over the doorway has a relief carving of the University of Manchester's coat of arms and motto (ARDUUS AD SOLEM). The area in front of the building has low brick walls with moulded stone coping and decorative iron railings. At ground-floor level between bays one and two is a circular blue plaque commemorating Ernest Rutherford's achievements within the building; between bays five and six is a circular blue plaque commemorating Alison Uttley, children's author and Physics graduate of the university in 1906.

The west side elevation is of three bays with symmetrical gables over the outer bays. The central bay has a wide doorway with double, part-glazed doors and a mullioned overlight; in front are modern steps and a ramp. Above, on the first floor is a doorway set in a segmental-arched glazed screen, which opens onto a small stone balcony with decorative iron railings (originally used to adjust telescopes and practice using a sextant). Immediately to the left is a narrow single-light window. On the second floor is a similar central doorway set in a segmental-arched

screen, which opens onto a wide stone balcony with decorative iron railings running almost the entire width of the façade. To the immediate left of the doorway is a small window and to the immediate right are two small apertures with a projecting stone ledge, with a similar single aperture and ledge towards the right corner (the room to the rear contained a Rowland concave grating (spectrograph) and the apertures enabled sunlight to enter via helioscopes placed on the ledges). The left bay has a stone segmental-arched window frame containing a wooden canted bay window. The right bay has a single-light window.

The east side elevation is of five bays defined by buttresses. The left bay is wider with a gablet over; it has six-light mullion and transom windows on the ground and first floors, three single-light windows on the second floor set in a stepped stone panel with a single-light window above in the gablet. The remaining bays have four-light mullion and transom windows on the ground, first and second floors.

INTERIOR: The main entrance opens into a porch with barrel-vaulted and panelled ceiling, orange terracotta screen with double doors, and side and overlights, the upper lights with Art Nouveau leaded glass. Beyond is an open space with two wide segmental arches of cream-coloured brick; the arch to the rear (now with an inserted glazed screen containing double doors) opens onto a stairwell containing the main staircase and a corridor through to the lobby of the Hopkinson memorial wing; the left arch opens onto the wide spine corridor. The open well staircase has concrete steps and half landings supported on iron girders, decorative iron balusters with a moulded wooden handrail and blue tile dado. Features of note include corridors with terrazzo flooring with black and white border bands, blue glazed tiling to dado height with Art Nouveau floral border, and moulded cornices. Rutherford's personal laboratory is located on the ground floor in the north-west corner of the building; along with many other rooms the room is lined with glazed brick, with an orange brick dado with dark brown border and cream bricks above (in some rooms the glazed bricks are covered with plasterboard and some are painted). All rooms have moulded cornices, wide ground-floor doorways have six-panelled doors, with four-panelled doors on the upper floors. The east range contains a large former lecture room on the second floor which rises through to an open roof with wooden roof trusses and panelled ceiling. High on either side of the south wall is an individual observation balcony. A modern mezzanine floor has been inserted in part of the room.

The Hopkinson memorial wing has a stone wall plaque in the east wall of the corridor inscribed 'THE JOHN HOPKINSON ELECTROTECHNICAL LABORATORY / This portion of the building / was erected and equipped in the year 1899 / in memory of / Dr JOHN HOPKINSON F.R.S./ by his parents relatives and friends'. The lobby and corridor have glazed brown and cream bricks; the bricks in the dynamo room have been painted blue. The dynamo room has iron roof trusses; Perspex sheeting has been inserted beneath the original skylights to each side of the ridge. Attached to the west gable wall is a metal relief portrait of John Hopkinson.

The modern entrance block to the museum extension on Oxford Road which is attached to the north-east corner of the Rutherford Building is not of special interest.

Appendix II - Planning Policy and Guidance

Planning (Listed Buildings and Conservation Areas) Act 1990

The Act is legislative basis for decision making on applications that relate to the historic environment.

Sections 16 and 66 of the Act impose a statutory duty upon local planning authorities to consider the impact of proposals upon listed buildings.

Section 16 of the Planning (Listed Buildings and Conservation Areas) Act 1990 states that:

> *[...] in considering whether to grant listed building consent for any works the local planning authority or the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses.*

Similarly, section 66 of the above Act states that:

> *In considering whether to grant permission for development which affects a listed building or its setting, the local planning authority, or as the case may be the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses.*

Local Policy

Manchester City Council's Core Strategy (2012)

Policy EN 3 Heritage

Throughout the City, the Council will encourage development that complements and takes advantage of the distinct historic and heritage features of its districts and neighbourhoods, including those of the City Centre.

New developments must be designed so as to support the Council in preserving or, where possible, enhancing the historic environment, the character, setting and accessibility of areas and buildings of acknowledged importance, including scheduled ancient monuments, listed buildings, registered parks and gardens, conservation areas and archaeological remains.

Proposals which enable the re-use of heritage assets will be encouraged where they are considered consistent with the significance of the heritage asset.

The Unitary Development Plan (1995)

19. LISTED BUILDINGS

DC19.1 *In determining applications for listed building consent or planning applications for development involving or having an impact on buildings of Special Architectural or Historic Interest, the Council will have regard to the desirability of securing the retention, restoration, maintenance and continued use of such buildings and to protecting their general setting.* In giving effect to this policy, the Council will:

a. Not grant Listed building consent for the demolition of a listed building other than in the most exceptional circumstances, and in any case, not unless it is satisfied that every possible effort has been made to continue the present use or to find a suitable alternative use;

b. Not permit a change of use of a listed building, where it would have a detrimental effect on the character or appearance of the building;

c. Not permit any external or internal alteration or addition to a Listed building where, in its opinion, there would be an adverse effect on its architectural or historic character;

d. Seek to preserve and enhance the settings of listed buildings by appropriate control over the design of new development in their vicinity, control over the use of adjacent land, and where appropriate, by the preservation of trees and landscape features;

e. Permit demolition only where there are approved detailed plans for redevelopment and where there is evidence of a firm building contract;

f. Not permit alterations to a listed building which would prevent the future use of any part of the building, in particular upper floors or basements, or where poor maintenance is likely to result.

National Planning Policy Framework

Any proposals for consent relating to heritage assets are subject to the policies of the NPPF (July 2021). This sets out the Government's planning policies for England and how these are expected to be applied. With regard to 'Conserving and enhancing the historic environment', the framework requires proposals relating to heritage assets to be justified and an explanation of their effect on the heritage asset's significance provided.

Paragraph 7 of the Framework states that the purpose of the planning system is to 'contribute to the achievement of sustainable development' and that, at a very high level, 'the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs'.

At paragraph 8, the document expands on this as follows:

> *Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives:*
>
> *a) an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;*
>
> *b) a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and*
>
> *c) an environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.*

and notes at paragraph 10:

> *10. So that sustainable development is pursued in a positive way, at the heart of the Framework is a presumption in favour of sustainable development (paragraph 11).*

With regard to the significance of a heritage asset, the framework contains the following policies:

> *195. Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal.*

In determining applications local planning authorities are required to take account of significance, viability, sustainability and local character and distinctiveness. Paragraph 197 of the NPPF identifies the following criteria in relation to this:

> *the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;*
>
> *b) the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and*
>
> *c) the desirability of new development making a positive contribution to local character and distinctiveness*

With regard to potential 'harm' to the significance designated heritage asset, in paragraph 199 the framework states the following:

...great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.

The Framework goes on to state at paragraph 200 that:

Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification.

With regard to 'less than substantial harm' to the significance of a designated heritage asset, paragraph 202 of the NPPF states the following;

202. Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use.

National Planning Practice Guidance

The National Planning Practice Guidance (NPPG) was published on 23 July 2019 to support the National Planning Policy Framework (NPPF) and the planning system. It includes particular guidance on matters relating to protecting the historic environment in the section: Conserving and Enhancing the Historic Environment.

The relevant guidance is as follows:

Paragraph 2: What is meant by the conservation and enhancement of the historic environment?

Conservation is an active process of maintenance and managing change. It requires a flexible and thoughtful approach to get the best out of assets as diverse as listed buildings in every day use and as yet undiscovered, undesignated buried remains of archaeological interest.

In the case of buildings, generally the risks of neglect and decay of heritage assets are best addressed through ensuring that they remain in active use that is consistent with their conservation. Ensuring such heritage assets remain used and valued is likely to require sympathetic changes to be made from time to time. In the case of archaeological sites, many have no active use, and so for those kinds of sites, periodic changes may not be necessary, though on-going management remains important.

Where changes are proposed, the National Planning Policy Framework sets out a clear framework for both plan-making and decision-making in respect of applications for planning permission and listed building consent to ensure that heritage assets are conserved, and where appropriate enhanced, in a manner that is consistent with their significance and thereby achieving sustainable development. Heritage assets are either designated heritage assets or non-designated heritage assets.

Part of the public value of heritage assets is the contribution that they can make to understanding and interpreting our past. So where the complete or partial loss of a heritage asset is justified (noting that the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted), the aim then is to:

- capture and record the evidence of the asset's significance which is to be lost
- interpret its contribution to the understanding of our past; and
- make that publicly available (National Planning Policy Framework paragraph 199)

Paragraph 6: What is "significance"?

'Significance' in terms of heritage-related planning policy is defined in the Glossary of the National Planning Policy Framework as the value of a heritage asset to this and future generations because of its heritage interest. Significance derives not only from a heritage asset's physical presence, but also from its setting.

The National Planning Policy Framework definition further states that in the planning context heritage interest may be archaeological, architectural, artistic or historic. This can be interpreted as follows:

- **archaeological interest**: As defined in the Glossary to the National Planning Policy Framework, there will be archaeological interest in a heritage asset if it holds, or potentially holds, evidence of past human activity worthy of expert investigation at some point.

- **architectural and artistic interest**: These are interests in the design and general aesthetics of a place. They can arise from conscious design or fortuitously from the way the heritage asset has evolved. More specifically, architectural interest is an interest in the art or science of the design, construction, craftsmanship and decoration of buildings and structures of all types. Artistic interest is an interest in other human creative skill, like sculpture.
- **historic interest**: An interest in past lives and events (including pre-historic). Heritage assets can illustrate or be associated with them. Heritage assets with historic interest not only provide a material record of our nation's history, but can also provide meaning for communities derived from their collective experience of a place and can symbolise wider values such as faith and cultural identity.

In legislation and designation criteria, the terms 'special architectural or historic interest' of a listed building and the 'national importance' of a scheduled monument are used to describe all or part of what, in planning terms, is referred to as the identified heritage asset's significance.

Paragraph 7: Why is 'significance' important in decision-taking?

Heritage assets may be affected by direct physical change or by change in their setting. Being able to properly assess the nature, extent and importance of the significance of a heritage asset, and the contribution of its setting, is very important to understanding the potential impact and acceptability of development proposals.

Paragraph 13: What is the setting of a heritage asset and how should it be taken into account?

The setting of a heritage asset is defined in the Glossary of the National Planning Policy Framework.

All heritage assets have a setting, irrespective of the form in which they survive and whether they are designated or not. The setting of a heritage asset and the asset's curtilage may not have the same extent.

The extent and importance of setting is often expressed by reference to the visual relationship between the asset and the proposed development and associated visual/physical considerations. Although views of or from an asset will play an important part in the assessment of impacts on setting, the way in which we experience an asset in its setting is also influenced by other environmental factors such as noise, dust, smell and vibration from other land uses in the vicinity, and by our understanding of the historic relationship between places. For example, buildings that are in close proximity but are not visible from each other may have a historic or aesthetic connection that amplifies the experience of the significance of each.

The contribution that setting makes to the significance of the heritage asset does not depend on there being public rights of way or an ability to otherwise access or experience that setting. The contribution may vary over time.

When assessing any application which may affect the setting of a heritage asset, local planning authorities may need to consider the implications of cumulative change. They may also need to consider the fact that developments which materially detract from the asset's significance may also damage its economic viability now, or in the future, thereby threatening its ongoing conservation.

Paragraph 15: What is the optimum viable use for a heritage asset and how is it taken into account in planning decisions?

The vast majority of heritage assets are in private hands. Thus, sustaining heritage assets in the long term often requires an incentive for their active conservation. Putting heritage assets to a viable use is likely to lead to the investment in their maintenance necessary for their long-term conservation.

By their nature, some heritage assets have limited or even no economic end use. A scheduled monument in a rural area may preclude any use of the land other than as a pasture, whereas a listed building may potentially have a variety of alternative uses such as residential, commercial and leisure.

In a small number of cases a heritage asset may be capable of active use in theory but be so important and sensitive to change that alterations to accommodate a viable use would lead to an unacceptable loss of significance.

It is important that any use is viable, not just for the owner, but also for the future conservation of the asset: a series of failed ventures could result in a number of unnecessary harmful changes being made to the asset.

If there is only one viable use, that use is the optimum viable use. If there is a range of alternative economically viable uses, the optimum viable use is the one likely to cause the least harm to the significance of the asset, not just through necessary initial changes, but also as a result of subsequent wear and tear and likely future changes. The optimum viable use may not necessarily be the most economically viable one. Nor need it be the original use. However, if from a conservation point of view there is no real difference between alternative economically viable uses, then the choice of use is a decision for the owner, subject of course to obtaining any necessary consents.

Harmful development may sometimes be justified in the interests of realising the optimum viable use of an asset, notwithstanding the loss of significance caused, and provided the harm is minimised. The policy on addressing substantial and less than substantial harm is set out in paragraphs 199-203 of the National Planning Policy Framework.

Paragraph 18: How can the possibility of harm to a heritage asset be assessed?

What matters in assessing whether a proposal might cause harm is the impact on the significance of the heritage asset. As the National Planning Policy Framework makes clear, significance derives not only from a heritage asset's physical presence, but also from its setting.

Proposed development affecting a heritage asset may have no impact on its significance or may enhance its significance and therefore cause no harm to the heritage asset. Where potential harm to designated heritage assets is identified, it needs to be categorised as either less than substantial harm or substantial harm (which includes total loss) in order to identify which policies in the National Planning Policy Framework (paragraphs 199-203) apply.

Within each category of harm (which category applies should be explicitly identified), the extent of the harm may vary and should be clearly articulated.

Whether a proposal causes substantial harm will be a judgment for the decision-maker, having regard to the circumstances of the case and the policy in the National Planning Policy Framework. In general terms, substantial harm is a high test, so it may not arise in many cases. For example, in determining whether works to a listed building constitute substantial harm, an important consideration would be whether the adverse impact seriously affects a key element of its special architectural or historic interest. It is the degree of harm to the asset's significance rather than the scale of the development that is to be assessed. The harm may arise from works to the asset or from development within its setting.

While the impact of destruction is obvious, partial destruction is likely to have a considerable impact but, depending on the circumstances, it may still be less than substantial harm or conceivably not harmful at all, for example, when removing later additions to historic buildings where those additions are inappropriate and harm the buildings' significance. Similarly, works that are moderate or minor in scale are likely to cause less than substantial harm or no harm at all. However, even minor works have the potential to cause substantial harm, depending on the nature of their impact on the asset and its setting.

The National Planning Policy Framework confirms that when considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). It also makes clear that any harm to a designated heritage asset requires clear and convincing justification and sets out certain assets in respect of which harm should be exceptional/wholly exceptional (see National Planning Policy Framework, paragraph 200).

Paragraph 20: What is meant by the term public benefits?

The National Planning Policy Framework requires any harm to designated heritage assets to be weighed against the public benefits of the proposal.

Public benefits may follow from many developments and could be anything that delivers economic, social or environmental objectives as described in the National

Planning Policy Framework (paragraph 8). Public benefits should flow from the proposed development. They should be of a nature or scale to be of benefit to the public at large and not just be a private benefit. However, benefits do not always have to be visible or accessible to the public in order to be genuine public benefits, for example, works to a listed private dwelling which secure its future as a designated heritage asset could be a public benefit.

Examples of heritage benefits may include:

- sustaining or enhancing the significance of a heritage asset and the contribution of its setting
- reducing or removing risks to a heritage asset
- securing the optimum viable use of a heritage asset in support of its long term conservation

Other Relevant Policy Documents

Historic England: Historic Environment Good Practice Advice in Planning (March 2015)

Historic England: Conservation Principles and Assessment (2008)

Appendix III - Commemorative Plaques

Commemorative Plaques[35]

Henry Moseley
A plaque commemorating Moseley was unveiled by Rutherford in the early-1920s and was situated on one of the landings of the main building. It was removed to the new Schuster Building in 1967 and erected in the Moseley Lecture Theatre.

Rutherfordian Commemorative Plaques
Various small plaques recognising the importance of the discoveries made in the department were installed in the main building at an unknown date after Rutherford's departure, probably in the 1950s or early 1960s. Six are known to have existed, those with photographs still being in situ in 1999 and presumably removed during the subsequent remediation works.

1. Basement, Research Room: "*1913. In this room Moseley first measured the K and L series of X-rays photographically and so established the law of atomic numbers*"

2. Basement, Liquid Air Room (1): "*1909 - Here alpha-particles were first counted by an electrical method by Geiger and Rutherford"/*

3. Basement, Photographic Room: *"1909 - Geiger and Marsden discovered large angle scattering of alpha-particles here, and later made the accurate measurements which verified Rutherford's scattering law"*.

4. Ground floor, Private Research Room (now known as "Rutherford's Room" (1): "*1919. On the bench below the artificial disintegration of nitrogen was first achieved by Rutherford*"

5. Ground floor, Private Research Room (now known as "Rutherford's Room" (2): "*1919 - From 1907 – 1919 Rutherford carried out many of his important researches in this room; notably the determination of e/m for alpha-particles in 1912 and the first successful experiments on the disintegration of light nuclei in 1919*".

6. Second Floor, Transit Room: "*1908 – In this room Rutherford and Royds first collected helium from alpha particles and photographed the spectrum*"

35 See Todd (2021), pp. 37-49.

Appendix IV - Associated Figures

Architect
James William Beaumont (1848-1931) FRIBA

Manchester-born Beaumont trained as an apprentice under Sir James Allanson Picton of Liverpool in 1865-69 and worked as assistant to Corson & Aitken (Manchester) in 1870-71. He established a practice in Manchester in 1873 and later entered partnerships with A. H. Davies Colley (c.1875-78) and Richard F. Beaumont (his brother, c.1886-1894). A new partnership with J. W.'s son William Somerville Beaumont – J. W. Beaumont & Son – was commenced in 1900, with William's brother John Somerville Beaumont joining in 1919 (at which point the firm was renamed J. W. Beaumont & Sons). J. W. Beaumont remained in the partnership until his retirement in 1930.

Beaumont's works included a number of public and municipal buildings. In Greater Manchester, he was responsible for the Whitworth Art Gallery, the Pendlebury Hall and Orphanage (Stockport), Hyde Town Hall and Municipal Buildings, Denton's Working Lads' Club, the Openshaw and Gorton libraries, Pavilion Firs Athletic Ground (Fallowfield), the Chorlton-on-Medlock Free Church Sunday School, Hyde Public Baths, Stockport' Memorial Buildings, the Ancoats hydraulic pumping station and the Albert Square fountain. His commissions for private customers included the Cannon Street Chambers (Manchester), the Ducie Avenue Schools and the Greenheys Board School, the Richard Howard & Co. warehouse, the Peal Assurance Building (St Ann Stret) and the Winter's Building on St Ann's Square. In Lancashire, he designed the Municipal Buildings at Bacup and the Colne Town Hall.

Beaumont was a Fellow of the Manchester Society of Architects and served as President in 1903-1905. At the time of the construction and extension of the Rutherford Building the practice was based at 10 St James's Square.

In memoriam
John Hopkinson (1849-1898)

Hopkinson was the son of a Manchester mechanical engineer. After preparatory studies at Owens College he studied maths at Trinity College, Cambridge and was also awarded a BSc from the University of London. After a short time at his father's company he was appointed an engineering manager at the Chance Brothers optical works (Birmingham), before settling in London as an electrical-engineering consultant.

Hopkinson remained a keen physicist, experimenting in magnetism and electricity, applying James Clerk Maxwell's theory of electromagnetism to problems of electrostatic capacity and residual charge, inventing the three-wire system for electricity distribution (patented in 1882) and developing several means of improving dynamos (i.e. electric generators). With his brother, he developed the general theory of alternating current and mathematically demonstrated that it was possible to operate two alternating current generators in parallel. Studying magnetic permeabiity at high temperature, he also discovered what would later be known as the Hopkinson peak effect.

Hopkinson was elected a Fellow of the Royal Society in 1878. He declined the post of Professor of Mechanism and Applied Mechanics at Cambridge but did accept the position of Professor of Electrical Engineering at King's College London (1890), where he oversaw the new Siemens Laboratory. He twice served as the President of the Institution of Electrical Engineers and in 1897 became Major in Command of the newly formed Volunteer Corps of Electrical Engineers.

Hopkinson was killed, with three of his children, in 1898. In his memory, his widow bequeathed funds for the extension of the engineering laboratory at Cambridge University and, presumably, also for the new Physical Laboratories at Manchester.

Proponent of the 1900 building
Sir Arthur Schuster (1851-1934) FRSA

Born in Germany, Schuster studied in Geneva before moving to England in 1870 to join the Manchester branch of Schuster Brothers, the family textile business. He worked for the company for a year whilst attending evening classes at Owens College, before joining the college as a full-time mathematics study. He later completed his doctoral studies at the University of Heidelberg (1871-73), before returning to Manchester and working as an unpaid demonstrator for Balfour Stewart, Professor of Physics. He then returned to Germany to Europe to study in Gottingen and Berlin, spent another year in Manchester as honorary demonstrator (also delivering a course of lectures) and from 1875 to 1880 researched electricity in the Cavendish Laboratory in Cambridge.

Schuster was appointed to the Beyer Chair of Applied Mathematics at Victoria University in 1881, taking up post in Manchester and spending seven years specialising in physics. He succeeded Balfour Stewart

as the Langworthy Professor of Physics on Stewart's death in 1888. During this decade he was actively involved in spectrum analysis research, alongside his work on earthquakes, magnetism, electricity, solar eclipses and atmospheric electricity.

Although retiring in 1907, Schuster remained an Honorary Professor of Physics, provided the laboratory with his personal assistant, Hans Geiger, and endowed a readership in mathematical physics (filled by Harry Bateman, Charles G. Darwin and Niels Bohr). Having been elected a Fellow in 1879, he was also active in the Royal Society, serving, variously, as Secretary, Vice-President and Foreign Secretary in 1919-1924. He was knighted in 1920.

Rutherford and his "boys"

Lord Ernest Rutherford (1871-1937)

Rutherford was born in New Zealand and arrived in England in 1895 to study at Cambridge under J. J. Tomlinson (one-time student of Owens College and the trailblazer in the study of electromagnetic phenomenon). In 1898 he moved to McGill University in Montreal as a Macdonald Professor of Physics, investigating the radioactivity of thorium, developing the theory of emanation and advancing the work of Henri Becquerel and Marie Curie to show that radiation is comprised of alpha, beta and gamma rays,

Rutherford returned to England in 1907, succeeding Schuster as Langworthy Professor of Physics (as had been Schuster's intention), and in 1908 received the Nobel Prize (in chemistry) for his research into *'the disintegration of the elements, and the chemistry of radioactive substances'*.

It was here that student Ernest Marsden, assisted by Geiger, conducted the "gold foil" experiments that led Rutherford to develop the theory of the nuclear atom – today regarded as Rutherford's greatest achievement. In 1911 Rutherford then developed the nuclear atom model (suggesting that that atoms are comprised of nuclei surrounded by orbiting electrons), which was further developed by Niels Bohr who moved to the university in 1912. Rutherford was knighted in 1914 and his reputation attracted many international researchers, students and radiochemists to the university. His team "split the atom" (or, rather, achieved nuclear fission) in 1917, initiating an artificial nuclear reaction by firing naturally occurring alpha particles into nitrogen gas.

Rutherford left Manchester in 1919 for Cambridge, where he had been offered the Cavendish Chair, taking with him his laboratory deputy James Chadwick. He continued to build on his earlier work, in 1920 suggesting that hydrogen nuclei (protons) are the building blocks of all matter. He was created 1st Baron Rutherford of Nelson in 1931, the year before his students performed the first fully controlled experiment to split the nucleus.

John Cockroft, in the 1953 Rutherford Memorial Lecture, remarked that *'[t]he history of Nuclear Physics is very largely the history of Rutherford and his schools'*. Rutherford is today regarded as "the father of modern physics" and a recent study summarises the importance of his time at Manchester as thus:

Ernest Rutherford was probably the most significant experimental physicist in the first half of the twentieth century, both for his own discoveries and for those made by others in the laboratories he directed. He took the newly discovered phenomenon of radioactivity and made it the instrument of the most penetrating investigation of the nature of matter before the advent of particle accelerators. Although he made major discoveries at all of the institutions where he worked, a very significant part of his most important work was accomplished during the twelve years when he was Langworthy Professor of Physics at Manchester, from 1907 to 1919, where his colleagues and students included Moseley, Bohr, Geiger, Marsden, Chadwick, Hevesy, Russell, Boltwood, Nuttall, Makower, Andrade, Lantsberry and Kay, to name only the most outstanding of many. This period culminated in the achievement of artificial nuclear transmutation, as revealed in a tetralogy of papers in 1919[36]

36 Todd, Rowlands and Cooper (2021), p. 4.

Lawrence Bragg (1890-1971)
Bragg held the Langworthy Professorship from 1919 to 1937.

With his father, Bragg was awarded a Nobel Prize in 1915 for 'services in the analysis of crystal structure by means of X-rays', having developed X-ray crystallography. He remains the youngest-ever recipient of a Nobel Prize for Physics.

Patrick Maynard Stuart *Blackett*, Baron *Blackett* (1897-1974)
Blackett succeeded Bragg as the Langworthy Professor in 1937. He was awarded the Nobel Prize for Physics in 1948 in recognition of *'his development of the Wilson cloud chamber method, and his discoveries therewith in the fields of nuclear physics and cosmic radiation'*. His work in cosmic rays and geomagnetism is regarded as having paved the way to radio astronomy.

Schuster, Rutherford, Bragg and Blackett are commemorated in the names of lecture theatres in the Schuster Building.

Niels Bohr (1885-1962)
Born in Denmark, Bohr completed a doctorate in Copenhagen and subsequently studied at Cambridge under J. J. Thomson. Having visited the Manchester Physical Laboratories in 1912 he returned as an employee in 1914-16, under Rutherford, continuing the work that would later culminate in the conception of the periodic table as governed by atomic number (rather than weight). He subsequently became a Professor of Physics at Copenhagen.

Bohrs was the first scientist to apply the quantum concept to the problem of atomic and molecular structure and his work on single-electron atoms led to a Nobel Prize in Physics (1922).

James Chadwick (1891-1974)
Born in Bollington (Macclesfield), Chadwick studied under Rutherford at Manchester, completing first undergraduate studies and then an MSc. Recommended for a scholarship by Rutherford, by 1914 Chadwick was researching in Berlin, supervised by Geiger. Released from an internment camp at the end of the First World War, Chadwick returned to England to work for Rutherford, initially in Manchester and subsequently in Cambridge. With Rutherford, Chadwick hypothesized the existence of the neutron and in 1932 he carried out the experiments that proved its existence. He was awarded a Nobel Prize in Physics in 1935.

Hans Geiger (1882-1945)
The German Hans Geiger was employed as Schuster's assistant in 1906, continuing in this role under Rutherford. Here, he developed the first version of the particle counter, paving the way to the identification of the alpha particle as the nucleus of the helium atom. This made possible Rutherford's hypothesis that the nucleus occupies a small volume at the centre of an atom. By 1912, when he returned to Germany, Geiger was a recognised authority on measurements of radioactivity.

Geiger and Walther Bothe introduced the method of coincidence measurement in 1924-25, Bothe later being awarded a Nobel Prize (after Geiger's death) for their study of the Compton effect. With his assistant, Walther Müller, Geiger subsequently developed a particle detector measuring ionising radiation (now known as the Geiger-Müller counter).

Ernest Marsden (1889-1970)
Born in Rishton, Marsden won a scholarship to the university and in is final year was assigned to assist Geiger in experiments on the particles emitted during radioactive decay. The findings (published in 1909) led Rutherford to develop the nuclear model of the atom and are regarded as one of the most fundamental scientific experiments of 20th-century physics.

Marsden graduated in 1909 and moved to the University of London as a lecturer, returning to Manchester in 1912 to replace Geiger as Rutherford's assistant. Working with Rutherford and their students in the new field of atomic physics, he was awarded a doctorate in 1913 and on Rutherford's recommendation was appointed Professor of Physics at Victoria University College (New Zealand) in 1915.

Henry Gwyn Jeffreys Moseley (1887-1915)
Employed as a demonstrator for Rutherford in 1910, Moseley used his spare time to work with C. G. Darwin in researching the X-ray spectra of the elements.

Moseley moved to Oxford in 1913/14, continuing his earlier work to establish a new physical basis for the order of the periodic table. He was killed at the Front in 1915 and commemorated in a memorial tablet erected inside the Rutherford Building.

Donald Insall Associates