



# **Great Synagogue**

Condition Assessment

June 2020



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# Great Synagogue

## Condition Assessment

June 2020



# Issue and Revision Record

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# Contents

1	Introduction	1
1.1	Building Description	1
1.2	Findings and Discussion	1
2	Schedule of Defects	3
A.	Defect Reference Plans	11
B.	Defect Photos	19

# 1 Introduction

Mott MacDonald has been commissioned by Ethos Urban to carry out a condition assessment of the Great Synagogue, opposite Hyde Park in Sydney. The purpose of this report is to document the current state of the building, noting any relevant structural defects and whether they require further analysis, strengthening, or repair. Structural engineers Alison Naimo and Annemarie McElveney inspected the building on the 26<sup>th</sup> of May 2020. The inspection was visual only and no access was provided to inspect the roof, kitchen or archive rooms.

## 1.1 Building Description

Construction of the Great Synagogue was completed in 1878, fronting Elizabeth and Castlereagh Street. It is of state heritage significance as the earliest surviving synagogue in NSW still in use and is one of the most elaborately decorated Victorian buildings in Sydney. The Great Synagogue consists of two main sections: the original synagogue at the Elizabeth Street end, and a five storey extension at the Castlereagh Street end behind the façade of the original Beadle's residence. The Elizabeth frontage and towers are of Pyrmont stone, and the remainder of the original structure is of brick with cast-iron columns and timber floors with a slate roof. The 1980's modern addition, is of reinforced concrete construction, housing offices, classrooms, meeting rooms, toilets, lifts and fire stairs.

## 1.2 Findings and Discussion

At the time of inspection, the building was overall in very good condition with some very minor cracking and water ingress. The cracking found throughout the building indicates some movement has occurred, however, these cracks are common in buildings of this age and do not present any immediate structural issues.

Rainwater goods were observed to be in varying condition around the building. Some downpipes are embedded within the masonry, some penetrate through masonry walls and some are fixed to the face of the walls. Poor rainwater goods can contribute to building degradation including fretting of brickwork and decay of timber. If water is not directed away from the building it can also cause ground softening and settlement issues.

Evidence of water ingress has been found along the northern and southern edges, possibly due to blockages in the box gutters. The gutters should be regularly cleaned to prevent water backing up. If leakages continue, further investigations should be undertaken to confirm the source of leaks.

From the northern tower platform, it appears that stones may be dislodged towards the top. Further investigations should be undertaken with access higher up the tower, to closely inspect the condition of the stones and severity of dislodgement. If the stones are considered to be at risk of falling, seek the advice of a structural engineer on the safe removal and replacement.

External photographs are provided in Figure 1 and Figure 2 on the following page. A schedule of the defects can be found in Section 2, with associated defect location plans and defect photos in Appendix A and B respectively.



**Figure 1: The Great Synagogue External Photo, Elizabeth Street**



**Figure 2: The Great Synagogue External Photo, Castlereagh Street**



## 2 Schedule of Defects

Table 2-1 below summarises the defects found on the day of the inspection.

Where “N/A” is noted in the “Action Required” column, this indicates that the defect is not structurally significant and that no remediation action is enquire at this time.

Where “Monitor” is noted in the “Action Required” column, the defect should be monitored every 2 years to check whether the defect has worsened, and if so, at what rate. If any defects are found to worsen rapidly, investigations should be undertaken to determine the cause, and a structural engineer consulted to determine the structural implications.

**Table 2-1: Defects Summary**

Defect No.	Location	Defect Description	Discussion	Action Required
1	Castlereagh Street façade, second storey southern window	Minor cracking beside and above window opening	<ul style="list-style-type: none"> <li>Cracks do not appear to be active, and have been there for quite some time</li> </ul>	Monitor
2	Castlereagh Street façade, third storey southern window	Minor cracking above window arch		Monitor
3	Castlereagh Street façade, second and third storey northern windows	Minor cracking above window arches		Monitor
4	Elizabeth Street façade stone arch entrance	Minor spalling of stone at top of arch	<ul style="list-style-type: none"> <li>Spalling seems to have been there for quite some time and offers no imminent threat to the structural integrity of the arch.</li> </ul>	N/A
5 Typical photo provided	Synagogue Men's Floor south side	Paint bubbling above archways	<ul style="list-style-type: none"> <li>Paint bubbling is very minor and appears to have formed over a long period of time.</li> <li>Mostly likely a result of water ingress from blockages in the box gutters above.</li> <li>Ground movement and/or general ageing of the building could also have formed cracks which would have increased water ingress.</li> </ul>	Monitor, ensure box gutters cleared regularly
6 Typical photo provided	Synagogue Men's Floor north side	Paint bubbling above archways	<ul style="list-style-type: none"> <li>Discussions with the building manager indicate the gutters are regularly cleared and maintained.</li> </ul>	Monitor, ensure box gutters cleared regularly

Defect No.	Location	Defect Description	Discussion	Action Required
			<ul style="list-style-type: none"> <li>Minor water ingress of this nature does not pose a threat to the structural integrity of the building. If paint bubbling worsens rapidly, investigations should be undertaken to confirm the source of the leak.</li> </ul>	
7	Fire stairs from the Museum up to Elizabeth Street	Minor spalling of concrete and cracking	<ul style="list-style-type: none"> <li>Cracks appear to have formed over a long period of time, and do not pose a threat to the structural integrity of the building</li> </ul>	Monitor
8	Fire stairs from the Museum up to Elizabeth Street	Minor cracking		Monitor
9	Museum wall pier	Hairline cracking in wall pier	<ul style="list-style-type: none"> <li>Very minor crack which appears to have formed over a long period of time, and does not pose a threat to the structural integrity of the building</li> </ul>	N/A
10	Along windowsill in the Succah	Minor spalling of render	<ul style="list-style-type: none"> <li>Spalling is very localised. Most likely caused by water tracking under the sills</li> <li>Does not pose a threat to the structural integrity of the building</li> </ul>	N/A
11	Along windowsill in the Succah	Minor spalling of render		N/A
12	Ladies Gallery Southern wall between first and second arch	Bubbling of paint and minor decay of timber	<ul style="list-style-type: none"> <li>Most likely a result of water ingress. This may be caused from blockages in the box gutters above.</li> <li>Does not pose a threat to the structural integrity of the building</li> </ul>	Monitor, ensure box gutters cleared regularly
13	Ladies Gallery Western wall	Bubbling of paint and minor decay of timber		Monitor, ensure box gutters cleared regularly

Defect No.	Location	Defect Description	Discussion	Action Required
14	Ladies Gallery Southern Wall third archway	Minor spalling of cornice	<ul style="list-style-type: none"> <li>Spalling seems to be fairly recent but is quite localised.</li> <li>Does not pose a threat to the structural integrity of the cornice.</li> </ul>	N/A
15	Ladies Gallery corner of Southern and Eastern walls	Minor cracking	<ul style="list-style-type: none"> <li>Most likely a result of water ingress. This may be caused from blockages in the box gutters above.</li> <li>Cracks may also relate to the junction between main building and towers.</li> <li>Cracks appear to have formed over a long period of time, and do not pose a threat to the structural integrity of the building</li> </ul>	Monitor
16	Ladies Gallery Northern Wall	Hairline cracks from air vent to ceiling rose	<ul style="list-style-type: none"> <li>Cracks appear to be active, but have formed over a long period of time, and do not pose a threat to the structural integrity of the building</li> <li>Cracks may be formed from differential settlement between the northern brick wall and the timber framing of the gallery</li> </ul>	Monitor
17	Ladies Gallery Northern Wall	Hairline cracks from air vent to ceiling rose		Monitor
18	Ladies Gallery Northern Wall	Hairline cracks from air vent to ceiling rose		Monitor
19	Ladies Gallery northern side, western door	Minor cracking at top of doorway arch	<ul style="list-style-type: none"> <li>Cracks do not appear to be active, and have been there for quite some time</li> <li>Does not pose a threat to the structural integrity of the building</li> </ul>	Monitor

Defect No.	Location	Defect Description	Discussion	Action Required
20	Stairway up to Tower Platform, Southern side	Moderate cracking in exposed stone wall	<ul style="list-style-type: none"> <li>• Cracks appear to be active, but have been growing slowly over quite a prolonged period of time</li> <li>• Possibly due to localised settlement as a result of ground movement and/or the weight of the towers</li> <li>• The cracks do not pose a threat to the structural integrity of the building</li> </ul>	Monitor
21	End of first flight of stairs down from the Ladies Gallery, Southern tower	Moderate cracking in rendered stone wall, crack extends from the Ladies Gallery level up to the tower platform (over 3m long)	<ul style="list-style-type: none"> <li>• Cracks appear to be active, as they appear to have worsened since it was last painted</li> <li>• Possibly due to localised settlement or as a result of ground movement and/or the weight of the towers</li> <li>• The cracks do not pose a threat to the structural integrity of the building, but should be monitored</li> </ul>	Monitor
22	Southern tower, Ladies Gallery	Minor cracking in top of archway above door	<ul style="list-style-type: none"> <li>• Cracks do not appear to be active, and have been there for quite some time</li> <li>• Possibly a result of ground movement and/or localised settlement or as a result of ground movement and/or the weight of the towers</li> <li>• Does not pose a threat to the structural integrity of the building</li> </ul>	N/A

Defect No.	Location	Defect Description	Discussion	Action Required
23	Ladies Gallery, below Eastern Rose window	Minor cracking below window	<ul style="list-style-type: none"> <li>Cracks do not appear to be active, and have been there for quite some time</li> <li>Possibly a result of changes to the original design loads with the addition of reinforced concrete beams for blast protection</li> <li>Does not pose a threat to the structural integrity of the building</li> </ul>	N/A
24	Southern tower, stairs up from Men's Floor, beside stain glass window	Minor horizontal crack	<ul style="list-style-type: none"> <li>Crack does not appear to be active, and has been there for quite some time</li> <li>Possibly a result of ground movement, which is expected in buildings of this age</li> <li>Does not pose a threat to the structural integrity of the building</li> </ul>	Monitor
25	Southern Tower, Ladies Gallery	Paint bubbling above doorway	<ul style="list-style-type: none"> <li>Paint bubbling appears to have formed over a long period of time.</li> <li>Mostly likely a result of water ingress from blockages in the box gutters above or internal pipes.</li> <li>Discussions with the building manager indicate the gutters are regularly cleared.</li> <li>Minor water ingress of this nature does not pose a threat to the structural integrity of the building. If paint bubbling worsens rapidly, investigations should be undertaken to confirm the source of the leak.</li> </ul>	Monitor, investigate source of leakage

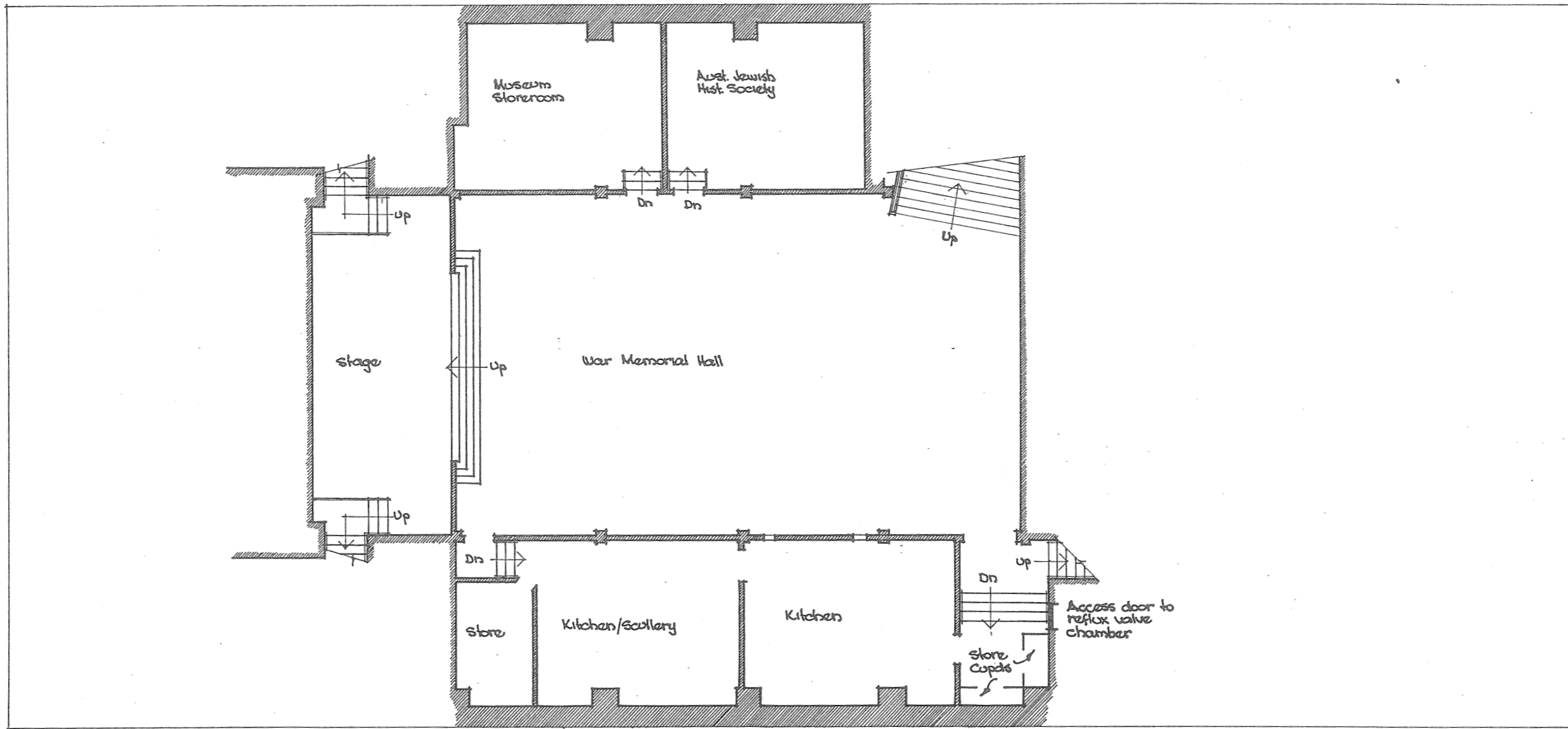
Defect No.	Location	Defect Description	Discussion	Action Required
26	Northern Tower, doorway into Ladies Gallery	Moderate crack from top of arch to ceiling	<ul style="list-style-type: none"> <li>Crack does not appear to be active, and has been there for quite some time</li> <li>Possibly a result of ground movement</li> <li>Does not pose a threat to the structural integrity of the building</li> </ul>	Monitor
27	Northern Tower, entryway into Ladies Gallery	Minor cracking in ceiling	<ul style="list-style-type: none"> <li>Cracks do not appear to be active, and have been there for quite some time</li> <li>Possibly a result of ground movement and/or localised settlement or as a result of ground movement and/or the weight of the towers.</li> <li>Does not pose a threat to the structural integrity of the building</li> </ul>	Monitor
28	Northern Tower, single stain glass window	Minor cracking at top of window	<ul style="list-style-type: none"> <li>Cracks do not appear to be active, and have been there for quite some time</li> <li>Possibly a result of ground movement and/or the weight of the towers</li> <li>Does not pose a threat to the structural integrity of the building</li> </ul>	Monitor
29	Northern Tower pair of stain glass windows	Minor cracking at top of one window		Monitor
30	Stairway up to Tower Platform, Northern side	Minor cracking in exposed stone wall		Monitor
31	Tower Platform, Northern side	Stones dislodged Water ingress	<ul style="list-style-type: none"> <li>Water ingress appears to have been occurring for quite some time, and a tarp has been placed on the tower platform to capture water.</li> <li>Stones at the top of the tower appear to have shifted out of place, though appears to be stable at this time, this should be further investigated</li> </ul>	<p>Access the top of the tower space to check the condition of the top stones and the severity of the dislodgement.</p> <p>If the stones are considered to be at risk of falling, consult structural engineer on the safe removal and replacement</p>

Defect No.	Location	Defect Description	Discussion	Action Required
			<ul style="list-style-type: none"> <li>• Difficult to ascertain the severity of the stone displacement without having access higher up the tower.</li> <li>• Water ingress can cause timber decay and mortar erosion etc. over time</li> </ul>	
32	Classroom on Choir Level	Minor cracking	<ul style="list-style-type: none"> <li>• Cracks do not appear to be active, and have been there for quite some time</li> </ul>	Monitor
33	Wall outside Vestry, facing the boardroom	Minor cracking in top of wall	<ul style="list-style-type: none"> <li>• Most likely due to movement at the building joint between the original building and the extension</li> </ul>	Monitor
34	Wall outside Vestry, facing the classroom	Minor horizontal cracking	<ul style="list-style-type: none"> <li>• Does not pose a threat to the structural integrity of the building</li> </ul>	Monitor
35	Elizabeth Street Façade, Stone around Rose window	Evidence of stone slipping out of alignment	<ul style="list-style-type: none"> <li>• Stone movement does not appear to be active and has been set in its current position for quite some time.</li> <li>• Possibly a result of changes to the original design loads with the addition of reinforced concrete beams for blast protection</li> <li>• Does not pose a threat to the structural integrity of the building</li> </ul>	Monitor



## **A. Defect Reference Plans**

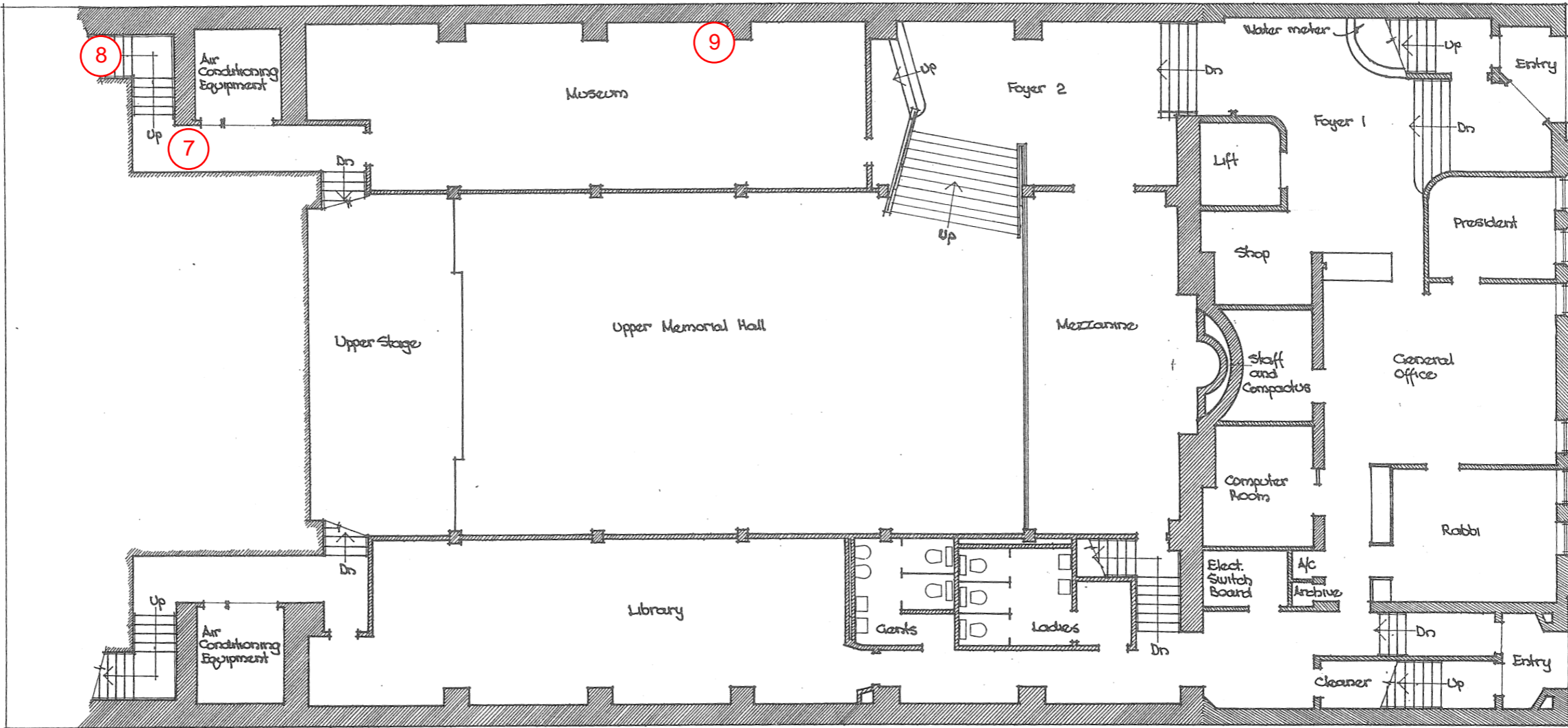
LEGEND  
 (X) DEFECT NUMBER



THE GREAT SYNAGOGUE, 166 CASTLEREACH ST SYDNEY  
 LEVEL 1  
 HALL

Scale: 1:100	Date: August 1989
For accurate dimensions measure on site	ORWELL & PETER PHILLIPS ARCHITECTS
Drawn: A1	Job No. 8917
Checked:	SUITE 401 ROMA HOUSE 541 GEORGE STREET SYDNEY 2000 TEL 261 3733 FAX 283 1930
	Dwg No. 1

LEGEND  
 (X) DEFECT NUMBER



ELIZABETH STREET

CASTLEREACH STREET



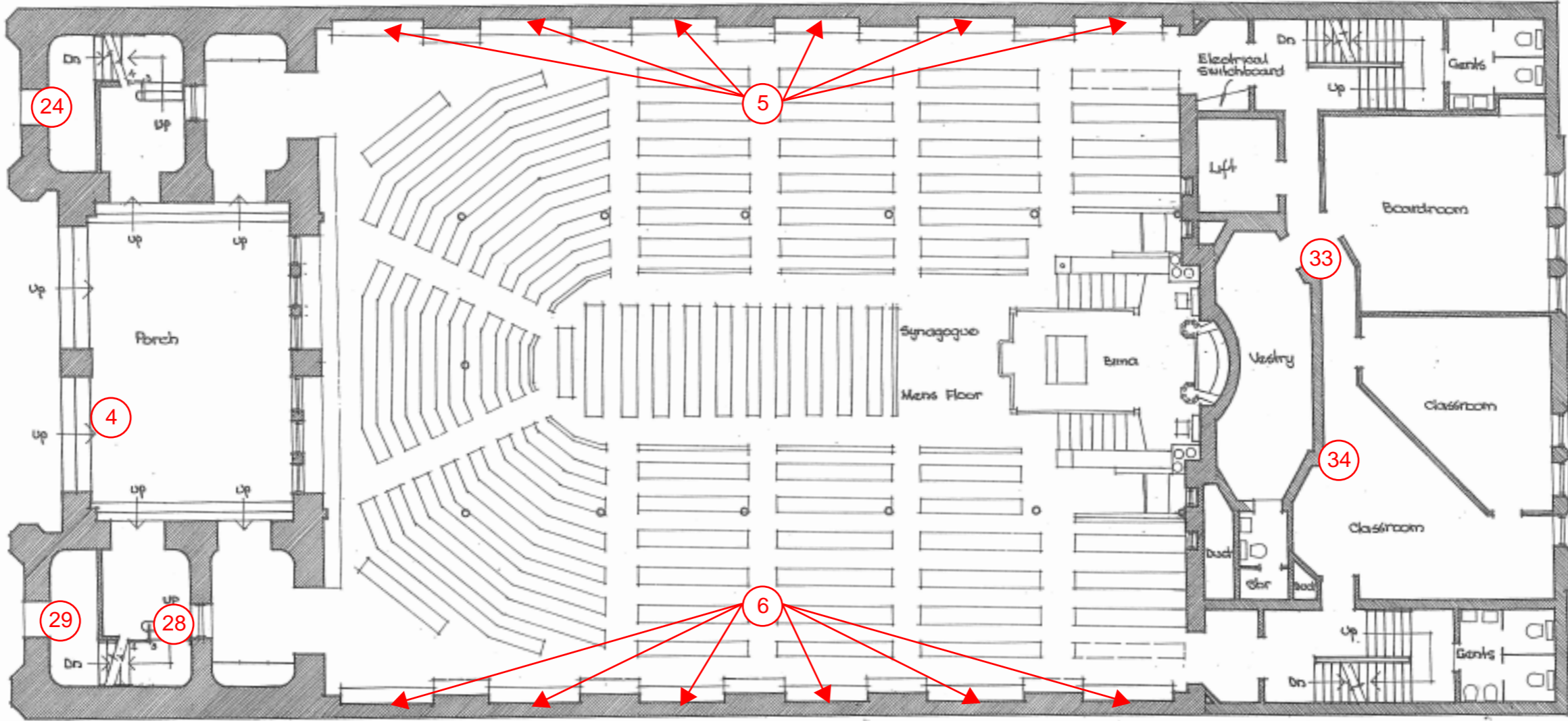
THE GREAT SYNAGOGUE, 166 CASTLEREACH ST SYDNEY  
 LEVEL 2  
 UPPER HALL & CASTLEREACH ST ENTRANCE

Scale	1:100	Date	August 1989
For accurate dimensions	measure on site	Job No.	8917
Drawn	Checked	SUIE 401 ROMA HOUSE 541 GEORGE STREET SYDNEY 2000 TEL 261 3733 FAX 283 1930	
AI		Dwg No.	2

LEGEND  
 (X) DEFECT NUMBER

ELIZABETH STREET

CASTLEREACH STREET



THE GREAT SYNAGOGUE, 166 CASTLEREACH ST SYDNEY  
 LEVEL 3  
 MEN'S FLOOR & ELIZABETH ST ENTRANCE

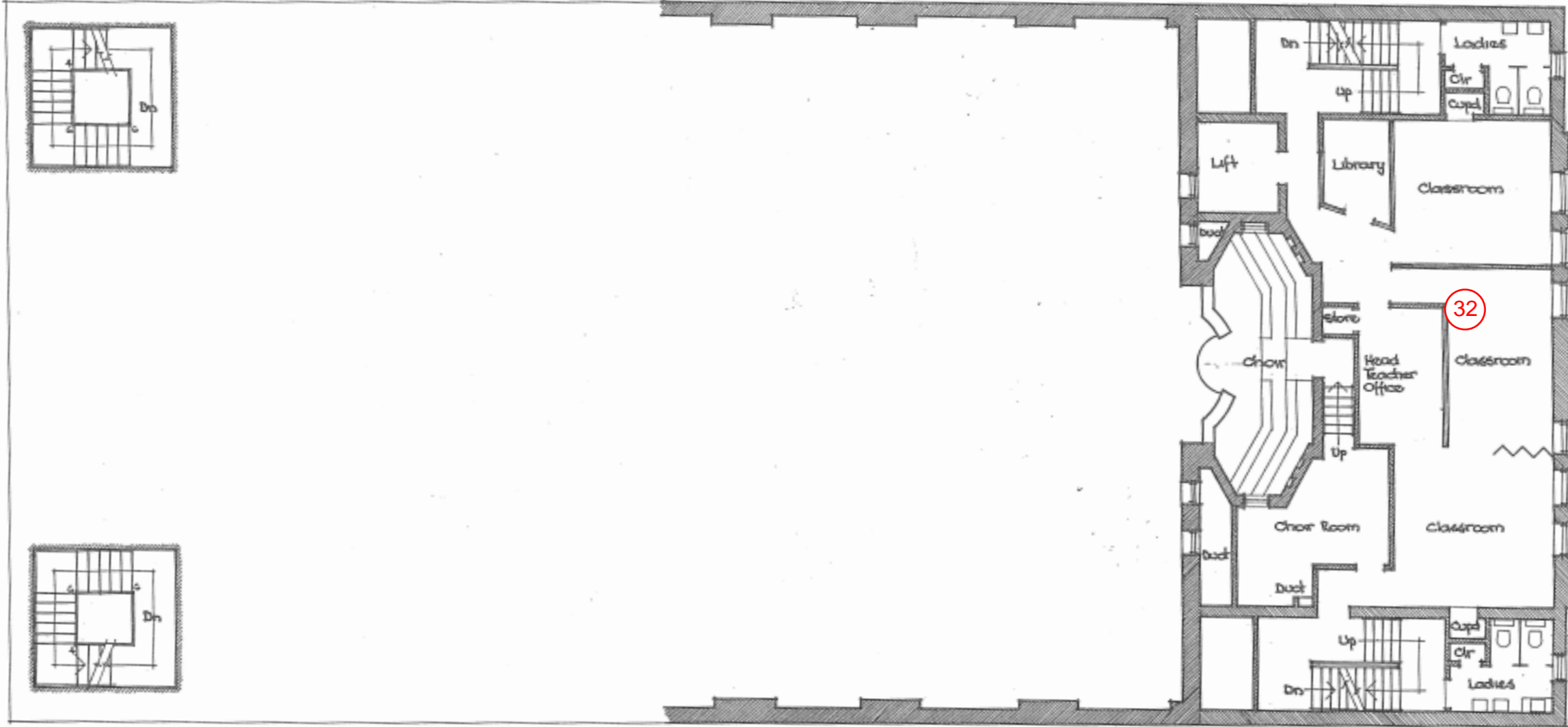
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For accurate dimensions measure on site	SUITE 401 ROMA HOUSE 541 GEORGE STREET SYDNEY 2000	Job No. 8917
Drawn Checked	TEL 261 3733 FAX 283 1930	Dwg No. 3

No.	Date	Amendment/Issue	By

LEGEND  
 (X) DEFECT NUMBER

ELIZABETH STREET

CASTLEREAGH STREET

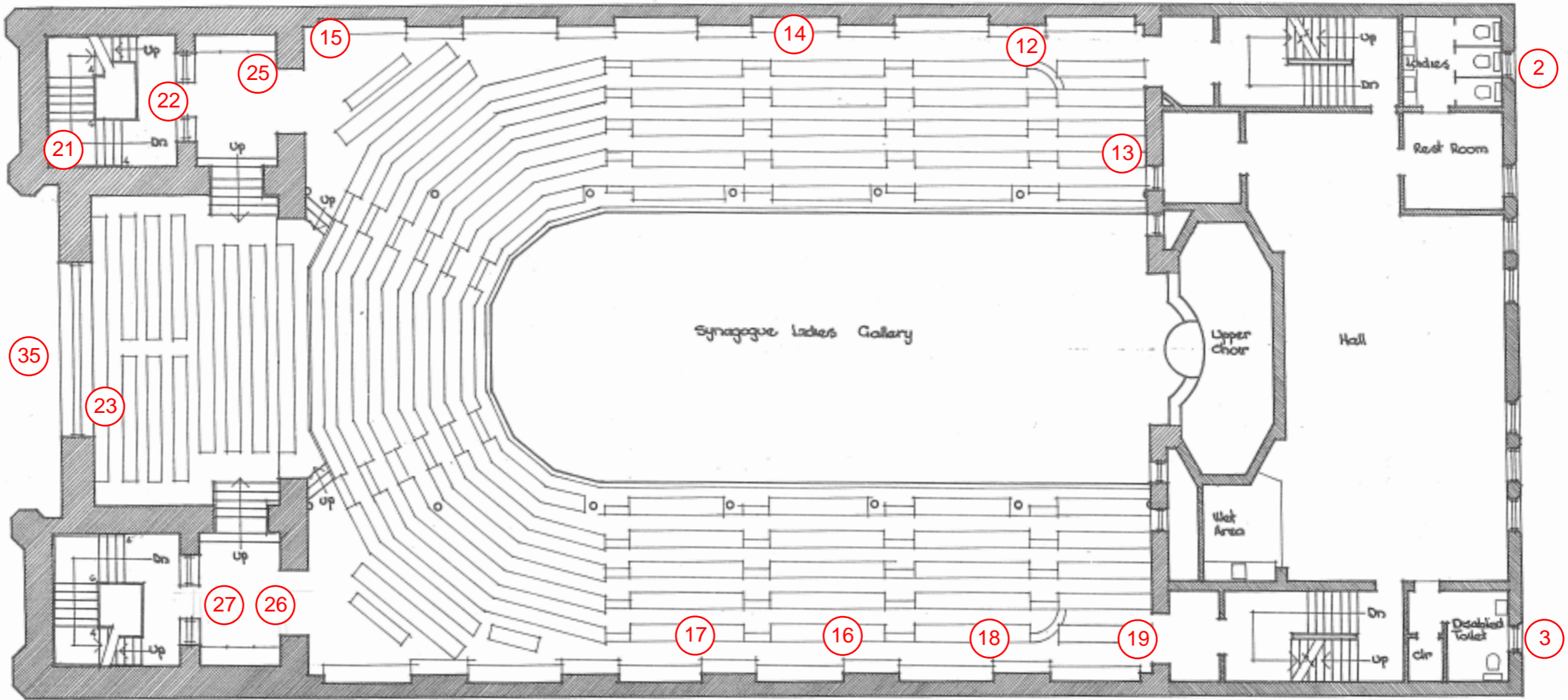


THE GREAT SYNAGOGUE, 166 CASTLEREAGH ST SYDNEY  
 LEVEL 4  
 SECOND FLOOR PLAN

Scale	1:100	Date	August 1989
For accurate dimensions measure on site.		ORWELL & PETER PHILLIPS ARCHITECTS	Job No. 8917
Drawn	Checked	SUITE 401 ROMA HOUSE 541 GEORGE STREET SYDNEY 2000	Dwg No. 4
AI		TEL 261 3733 FAX 283 1930	

LEGEND  
 (X) DEFECT NUMBER

ELIZABETH STREET



CASTLEREAGH STREET

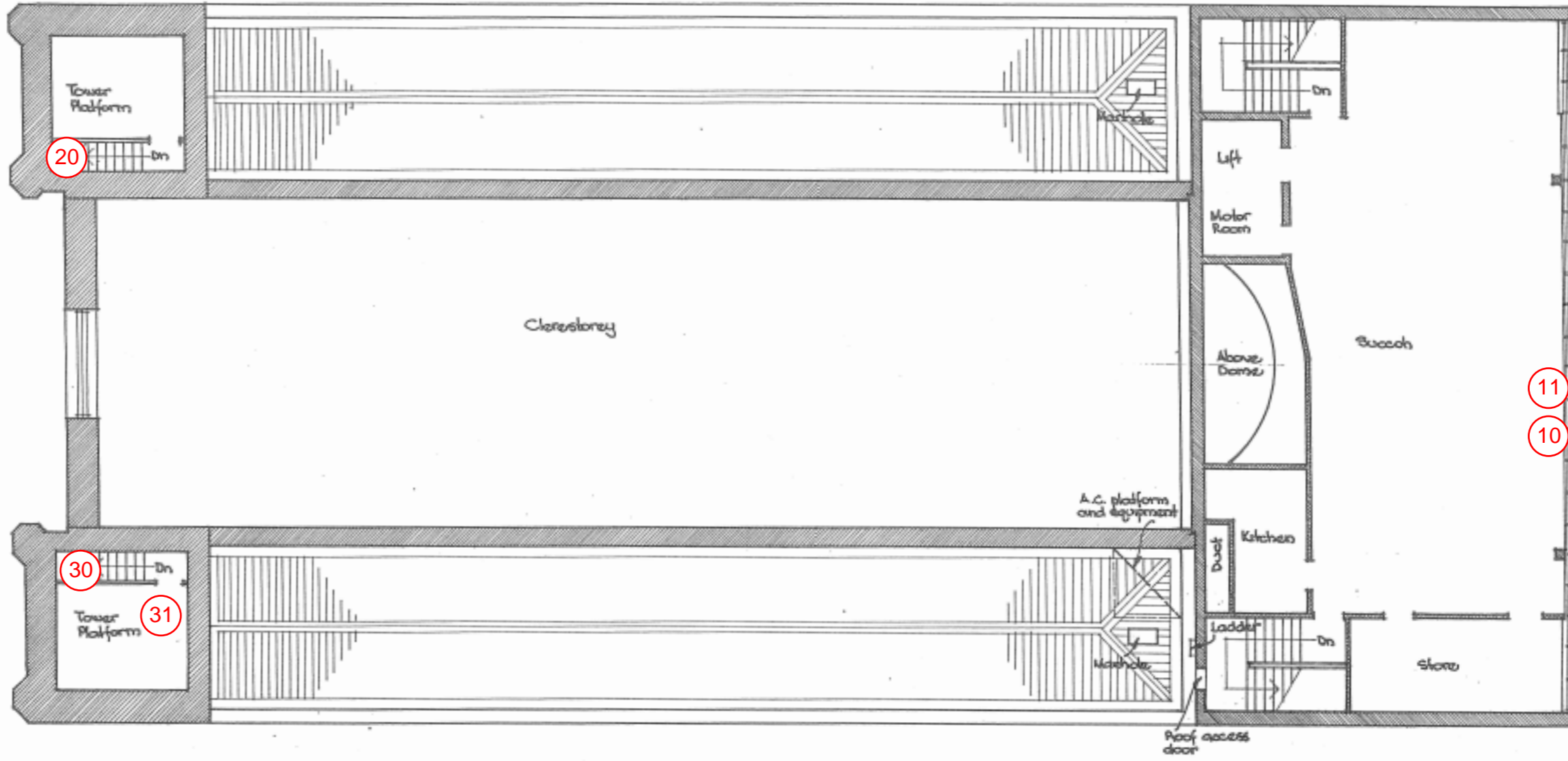


THE GREAT SYNAGOGUE, 166 CASTLEREAGH ST SYDNEY  
 LEVEL 5  
 LADIES GALLERY

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For accurate dimensions measure on site	Job No. 8917
Drawn: AH	Dwg No. 5
Checked:	
ORWELL & PETER PHILLIPS ARCHITECTS SUITE 401 ROMA HOUSE 541 GEORGE STREET SYDNEY 2000 TEL 261 3733 FAX 283 1930	

LEGEND  
 (X) DEFECT NUMBER

ELIZABETH STREET



CASTLEREAGH STREET

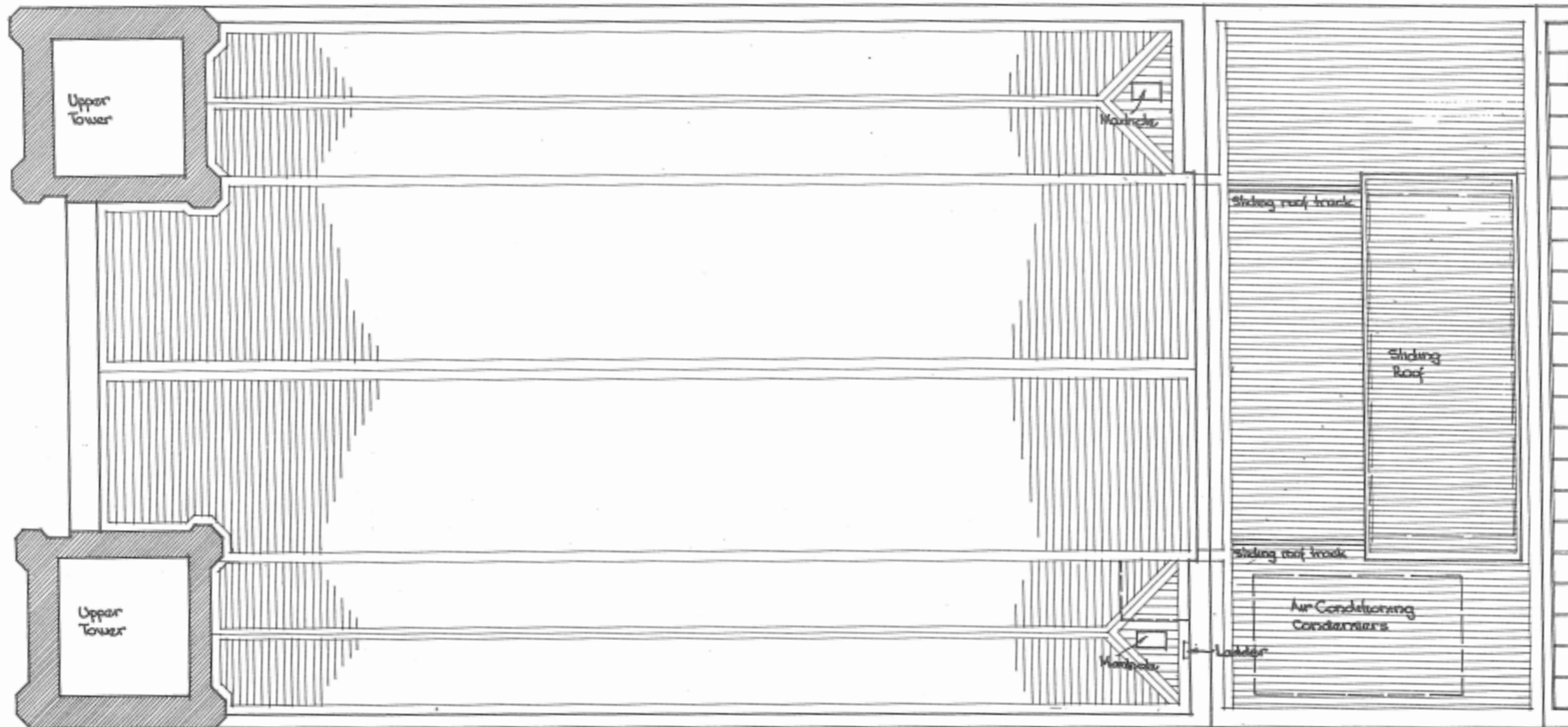


THE GREAT SYNAGOGUE, 166 CASTLEREAGH ST SYDNEY  
 LEVEL 6  
 CLERESTOREY & FOURTH FLOOR

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Drawn: [blank]	541 GEORGE STREET SYDNEY 2000	Dwg No. 6
Checked: [blank]	TEL 261 3733 FAX 283 1930	

LEGEND  
 (X) DEFECT NUMBER

ELIZABETH STREET



CASTLEREAGH STREET



THE GREAT SYNAGOGUE, 166 CASTLEREAGH ST SYDNEY  
 LEVEL 7  
 ROOF PLAN

Scale	1:100	Date	August 1989
For accurate dimensions measure on site		ORWELL & PETER PHILLIPS ARCHITECTS	Job No. 8917
Drawn	Checked	SUITE 401 ROMA HOUSE 541 GEORGE STREET SYDNEY 2000 TEL 261 3733 FAX 283 1930	Dwg No. 7
AI			



## B. Defect Photos

### Defect 1



Source: Mott MacDonald

### Defect 2



Source: Mott MacDonald

**Defect 3**



Source: Mott MacDonald

**Defect 4**



Source: Mott MacDonald

**Defect 5**



Source: Mott MacDonald

**Defect 6**



Source: Mott MacDonald

**Defect 7**



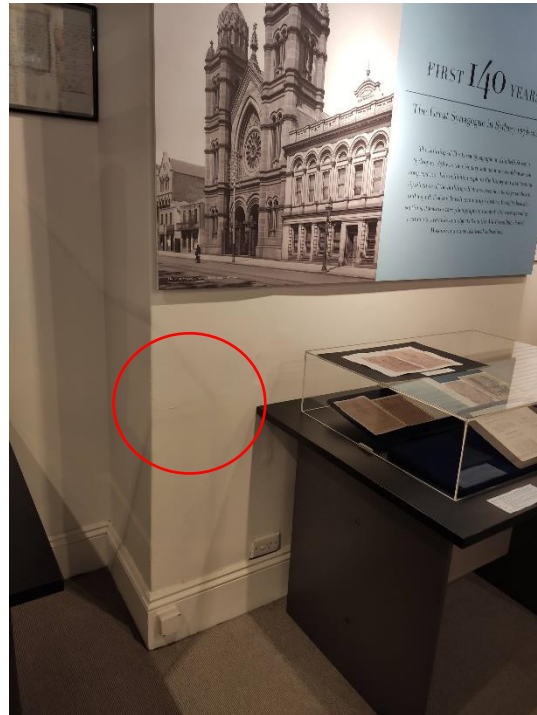
Source: Mott MacDonald

**Defect 8**



Source: Mott MacDonald

**Defect 9**



Source: Mott MacDonald

**Defect 10**



Source: Mott MacDonald

**Defect 11**



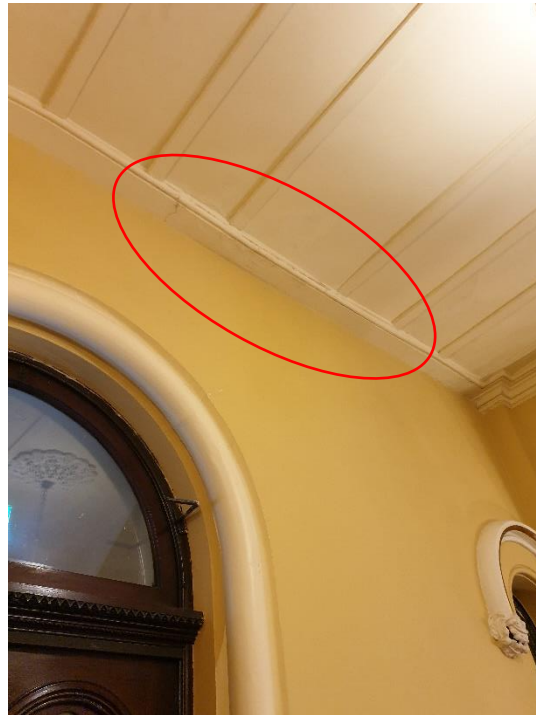
**Source: Mott MacDonald**

**Defect 12**



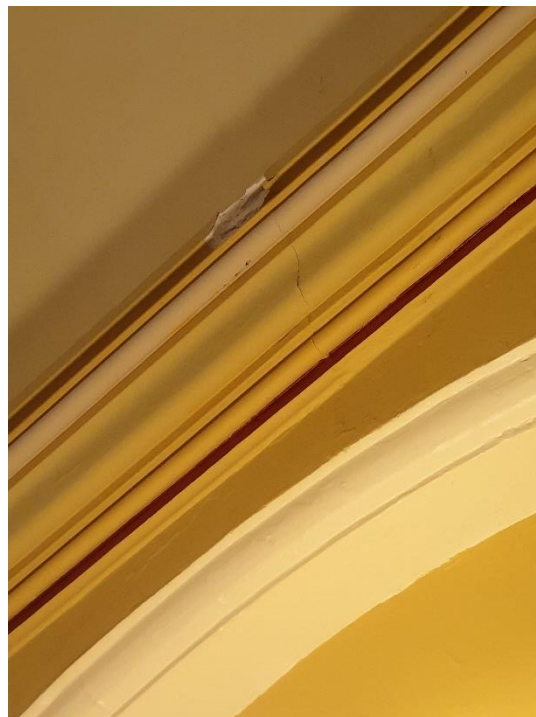
**Source: Mott MacDonald**

**Defect 13**



**Source: Mott MacDonald**

**Defect 14**



**Source: Mott MacDonald**

**Defect 15**



Source: Mott MacDonald

**Defect 16**



Source: Mott MacDonald



**Defect 17**



**Source: Mott MacDonald**

**Defect 18**



**Source: Mott MacDonald**

**Defect 19**



**Source: Mott MacDonald**

**Defect 20**



**Source: Mott MacDonald**

**Defect 21**



**Source: Mott MacDonald**

**Defect 22**



**Source: Mott MacDonald**

**Defect 23**



Source: Mott MacDonald

**Defect 24**



Source: Mott MacDonald

**Defect 25**



Source: Mott MacDonald

**Defect 26**



Source: Mott MacDonald

**Defect 27**



Source: Mott MacDonald

**Defect 28**



Source: Mott MacDonald

**Defect 29**



Source: Mott MacDonald

**Defect 30**



Source: Mott MacDonald

**Defect 31**



Source: Mott MacDonald

**Defect 32**



Source: Mott MacDonald



**Defect 33**



Source: Mott MacDonald

**Defect 34**



Source: Mott MacDonald

**Defect 35**



**Source: Mott MacDonald**

