Marlsbro House, Manchester: Visual timber strength grading of select floor beams

Site note 3 for 12 March 2026, job no. 213-34

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1 INTRODUCTION

1.1 AUTHORITY AND REFERENCES

Hutton + Rostron (A SOCOTEC COMPANY) carried out a site visit to Marlsbro House, Manchester on 12 March 2026 in accordance with instruction received by Matt Guirdham of MAKE on behalf of Aclo Assets Ltd. Drawings provided by ArchitectureM, reference 519 were used for the identification of structures. For purpose of orientation in this report, the elevation facing onto Newton Street was taken as facing north-west

1.2 AIM

The aim of this survey was to undertake visual strength grading of select timber beams so that a probable strength classification can be assigned by the Structural Engineer

2 STAFF ON SITE AND CONTACTS

2.1 H+R STAFF ON SITE

Chris Whitfield – Associate Director
Ethan Silvey – Intern Building Pathologist

2.2 PERSONNEL CONTACTED

James Bruce | Director | Civic Engineers

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3 OBSERVATIONS

See Figures 1-25 in the Schedule of Photographs at Attachment B. Photograph locations can be found on the Plans at Attachment C

3.1 DESCRIPTION

1 Attic floor: The Attic floor comprised of 15 no. softwood truss tie beams spanning north-west to south-east, each supported at midspan by a steel/cast-iron columns. The truss tie beam beams measured ~310mm (d) x 160mm (w) which was a significantly smaller cross-sectional area than the floor beams

2 Floor structures: The floor structures comprised softwood beams spanning north-west to south-east, each supported at midspan by a steel/cast-iron column. While 15 no. timber beams were present at third and second floor levels, internal alterations resulted in only 13 no. beams at first floor level and 14 no. at ground floor level. The beam cross-sectional dimensions increased progressively from 310mm (d) x 225mm (w) at Second floor level to 385mm (d) x 255 (w) at Basement level

3.2 TIMBER SPECIES

1 Methodology: Methodology: Small specimen samples were taken from representative timber members for timber species identification. The samples were examined visually with a x10 lens to determine their gross characteristics. Thin sections were cut from each sample and examined microscopically. The anatomical features of each sample were compared with published information and, where applicable, with reference timber sample

Ref.	Member	Location	Common name	Latin name
1	Truss tie beam	*Third floor (Fourth floor soffit)*	Scots Pine	*Pinus sylvestris*
2	Floor beam	*Second floor (Third floor soffit)*		
3	Floor beam	*First floor (Second floor soffit)*		
4	Floor beam	*First floor (Second floor soffit)*		
5	Floor beam	*Basement (Ground floor soffit)*	Eastern white pine	*Pinus strobus*

2 Scots Pine: Timber species information is available in BS EN 1912 2012 'Structural Timber – Strength Classes – Assignment of visual grades and species. *Pinus sylvestris* can achieve a strength class of C24 when graded to SS (Special Structural) and C16 when graded to GS (General Structural)

3 Eastern white pine: The timber species originates in North-eastern America and was highly valued as an export commodity during the 18th and 19th centuries. Its use in Manchester's 19th C industrial buildings is common but elsewhere in the UK its use appears to be less common. This species is no longer commercially imported for structural use in the UK due to the availability of other favourable softwood species and is therefore not included in Table 1 BS EN 1912. No European technical data has been produced (as far as we are aware). *Pinus strobus* can therefore not be assigned an EN 338 strength class. However, it is approximately 30% weaker in bending than *Pinus sylvestris* https://www.wood-database.com/eastern-white-pine/. When reviewing North American data, the mechanical properties of Eastern white pine are closer to, although very slightly lower than, Western red cedar *(Thuja plicata*)

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3.3 VISUAL STRENGTH GRADING

1 Methodology: Prior to visual strength grading, 10 no. beams were selected based on maximum visibility, choosing those with the least paint coverage and minimal obstruction to ensure accurate assessment. Timber beams were then visually inspected on the basis of exhibiting strength-reducing features such as knots, rate of growth, fissures, slope of grain, bowing and wane. A probable strength grade assessment of general structural (GS) grade, special structural (SS) grade or Reject (R) was made on the basis of measuring the features that were visible. The extent of strength reducing features that are permissible within strength grades are detailed in *BS 4978 Visual Strength Grading of Softwood*

2 Limitations: The Third floor truss tie beams were not assessed due to scaffolding obstructions. A large percentage of floor beams were also concealed by paint finishes, timber plates, plaster, walls, ceilings and there was widespread use of filler to fissures/splits. All of these factors impeded accurate assessment

3 Probable strength classification: The rate of growth, knots, slope of grain, fissures, and distortion in the 10 no. accessible truss tie beams and floor beams were within the permissible limits of the upper SS grade. On the balance of probability, the majority of the truss tie beams and floor beams are unlikely to be downgraded or rejected due to knots. However, fissures will be the most likely cause of downgrading or rejection, making it essential that filler is removed from fissures during the enabling works

Specific information for each beam is tabulated in Attachment A. Beam references are identified on the Plans at Attachment C

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4 RECOMMENDATIONS

4.1 TIE BEAMS AND FLOOR BEAMS

- Structural Engineer to consider the findings of this preliminary assessment of the beams, particularly with regard to the inclusion of *Pinus strobus*. H+R can provide further consultancy on appropriate remedial strategies and/or further testing, if required

- Allowance should be made for maximum exposure of all beams and for the removal of paint finishes and filler (to fissures) so that optimal visual strength grading of all beams can be accurately undertaken by H+R

- Due to the identification of *Pinus strobus*, consideration should be given to wider timber species identification specimen sampling. However, once paint finishes have been removed (and the gross characteristics of the beams exposed), visible differences in the timber species may become apparent. *Pinus sylvestris* tends to be reddish in appearance with a distinct grain pattern (earlywood and latewood), whereas *Pinus strobus* is generally paler with a more uniform grain

- Consideration should be given to removing previous structural steel repairs so that accurate visual strength grading of the beams can be undertaken at these locations. Structural Engineer to advise on necessary temporary propping etc. where required

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5 LIMITATIONS

5.1 GENERAL

The assessment of strength grade is based on visual observation of strength-reducing characteristics such as knots, rate of growth, fissures, wane distortions and bowing. The assessment of *in-situ* timbers therefore requires all faces to be examined. The technique is based on the judgement and experience of the grader and is inherently subjective. Properties such as density and notches, both of which have an important influence on the strength of a member, are not considered as part of the strength grading process but are reported on if these are known to be present. It was not possible to assess slope of grain, rate of growth, knots, and other strength reducing defects across the full length of the timber members due to retained paint finishes. In view of these limitations, the visual strength grading procedure cannot necessarily be 100 per cent reliable. Accordingly, in all the members inspected, the probable strength grade can only be deduced from the strength-reducing features visible on exposed faces

5.2 CDM

The recommendations in this report are included to advise and inform the design team appointed by the client. The contents of this report do not imply the adoption of the role of Principal Designer by H+R for the purposes of the Construction (Design and Management) (CDM) Regulations 2015

5.3 BUILDING SAFETY ACT AND BUILDING REGULATIONS

H+R should not be considered as a designer under the Building Safety Act 2022 or the Building Regulations as amended. The client and design team should ensure that appropriate arrangements have been made where the Building Regulations apply and that the appropriate duty holders are in place and applications are made for Building Regulations approval

5.4 FIRE SAFETY

H+R have not carried out any risk assessments, surveys, investigations or analysis of fire safety risk, including compartmentation and structural fire performance of materials. It is recommended that the client and design team seek the guidance of appropriately qualified fire engineers or fire risk assessors as applicable

5.5 PLANNING PERMISSION AND LISTED BUILDING CONSENT

Listed buildings have statutory protection and works or alterations that may include fabric removal, some repairs, extension and demolition will require listed building consent. It is the responsibility of the client to ensure listed building consent is obtained where this is necessary. Where works to any building, listed or otherwise, constitute development requiring planning permission it is the responsibility of the client to ensure planning permission is obtained where this is necessary

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Attachment A

SCHEDULE OF BEAMS – VISUAL STRENGTH GRADING OF SPECIFIC FLOOR BEAMS

BEAM REF.	PROBABLE STRENGTH GRADE	TIMBER SPECIES	PROBABLE STRENGTH CLASS	COMMENTS	PHOTO REF.	CLIENT COMMNETS
THIRD FLOOR (SHOWING FOURTH FLOOR SOFFIT)					Fig 1-2	
1				Obstructed by scaffold		
2				Obstructed by scaffold		
3				Obstructed by scaffold		
4				Obstructed by scaffold		
5				Obstructed by scaffold		
6				Obstructed by scaffold		
7				Obstructed by scaffold	Fig 3	
8				Obstructed by scaffold	Fig 5	
9				Obstructed by scaffold	Fig 4	
10				Obstructed by scaffold		
11				Obstructed by scaffold		
12				Obstructed by scaffold		
13	Reject-knots			Obstructed by scaffold	Fig 6-10	
14				Obstructed by scaffold		
15		Sample 1 - Scots Pine (Pinus sylvestris)		Obstructed by scaffold	Fig 11	
SECOND FLOOR (SHOWING THIRD FLOOR SOFFIT)					Fig 18	
1				Concealed by paint/wall		
2				Strength grading feasible		
3				Strength grading feasible		
4				Concealed by paint		
5				Restricted area due to asbestos		
6				Restricted area due to asbestos		
7				Strength grading feasible		
8				Concealed by steel		
9				Concealed by steel		
10				Concealed by steel		
11	SS	Sample 2 - Scots Pine (Pinus sylvestris)	C24	Strength grading feasible	Fig 12-13	
12	SS		C24	Strength grading feasible	Fig 14-17	

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BEAM REF.	PROBABLE STRENGTH GRADE	TIMBER SPECIES	PROBABLE STRENGTH CLASS	COMMENTS	PHOTO REF.	CLIENT COMMNETS
13				Concealed by steel		
14				Concealed by paint/wall		
15				Concealed by paint/wall		
FIRST FLOOR (SHOWING SECOND FLOOR SOFFIT)					Fig 19	
1				Concealed by paint		
2				Concealed by paint		
3				Concealed by paint/timber plate and charred		
4				Strength grading feasible		
5				Strength grading feasible		
6				Strength grading feasible		
7				Concealed by wall		
8				Concealed by wall		
9				Concealed by timber plate		
10				Strength grading feasible		
11	SS		C24	Strength grading feasible		
12	SS	Sample 3 - Scots Pine (Pinus sylvestris)	C24	Strength grading feasible		
13	SS		C24	Strength grading feasible		
14	SS	Sample 4 - Scots Pine (Pinus sylvestris)	C24	Strength grading feasible	Fig 20	
15	SS		C24	Strength grading feasible		
GROUND FLOOR (SHOWING FIRST FLOOR SOFFIT)					Fig 21	
1				Concealed by paint		
2				Concealed by paint		
3				Concealed by paint		
4				Concealed by paint		
5				Concealed by paint		
6				Concealed by paint		
7				Concealed by paint		
8				Concealed by paint		
9				Concealed by paint		
10				Concealed by paint		
11				Concealed by paint		
12				Concealed by paint		

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BEAM REF.	PROBABLE STRENGTH GRADE	TIMBER SPECIES	PROBABLE STRENGTH CLASS	COMMENTS	PHOTO REF.	CLIENT COMMNETS
13				Concealed by paint		
14				Concealed by paint		
15				Concealed by paint		
BASEMENT FLOOR (SHOWING GROUND FLOOR SOFFIT)						
1				Minimal section of original beam surviving		
2				Concealed by wall		
3				Concealed by wall/ceiling		
4				Concealed by wall	Fig 22	
5	SS		C24	Strength grading feasible	Fig 22	
6				Strength grading feasible		
7				Concealed by steel		
8				Concealed by timber plate		
9				Concealed by steel	Fig 25	
10	SS		C24	Chamfered for ~2m to south-east bearing	Fig 23-24	
11				Filler to fissures		
12	SS	Sample 5 – Eastern white pine (Pinus strobus)	C24	Strength grading feasible		
13				Wane		
14				Concealed by plaster		
15				Concealed within wall		

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Attachment B



Fig 1:

Third floor

Underside of the Attic/Fourth floor; showing scaffolding boards obstructing the tie beam ends, impeding accurate visual strength grading



Fig 2:

Underside of Fourth floor; showing a closer view of the scaffolding beneath the roof eaves, obstructing our view of the tie beams

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Fig 3:

Underside of Fourth floor, Beam 7; showing a timber plate fixed to the beam face, potentially concealing strength-reducing features (e.g. knots, fissures) and preventing accurate assessment



Fig 4:

Underside of Fourth floor, Beam 9; showing another timber plate fixed to the beam face and potentially concealing strength-reducing features

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Fig 5:

Underside of Fourth floor, Beam 8; showing the width between growth rings averaging less than ~2mm. This is well within the 6mm rate of growth permissible limits required for achieving the upper Special Structural (SS) strength grade



Fig 6:

Underside of Fourth floor, Beam 13; showing a steel structural repair that impeding accurate visual grading

This beam exhibited clusters of large knots that exceeded the permissible limits of even the lower General Structural (GS) strength grade. This was the probable reason for the steel repair

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Fig 7:

Underside of Fourth floor; showing measurement of the knot to the underside of the beam



Fig 8:

Underside of Fourth floor, Beam 13; showing measurement of the knot to the underside of the beam. A knot plot of this particular cluster of knots was produced (see Fig 9)

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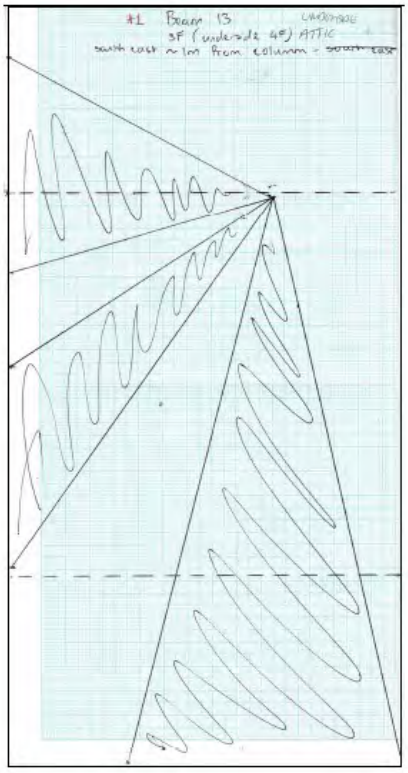


Fig 9:

Underside of Fourth floor, Beam 13; showing a ‘knot plot’ of a cluster of knots

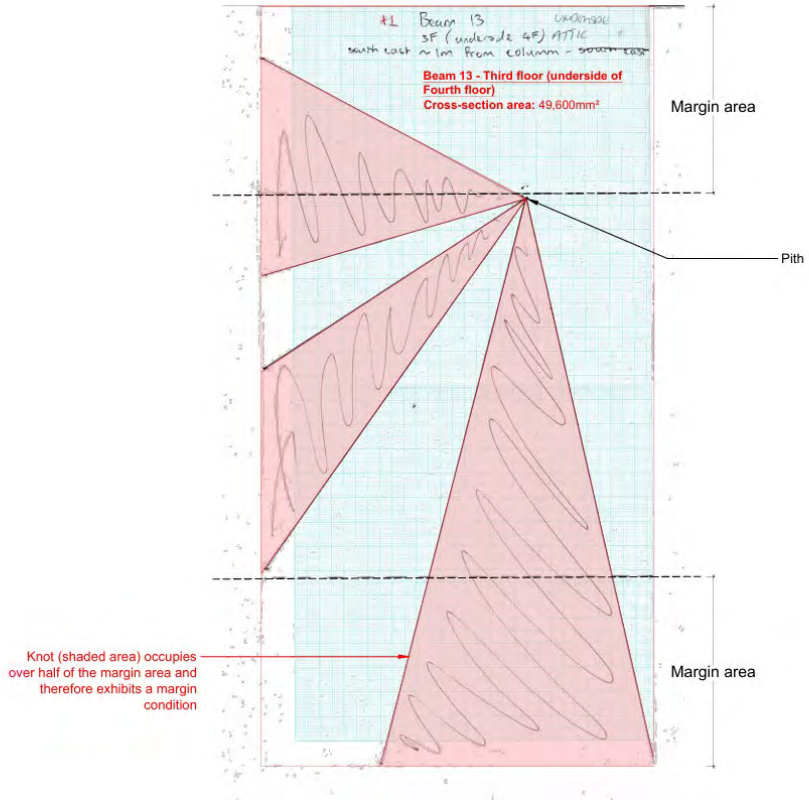


Fig 10:

Underside of Fourth floor, Beam 13; showing the knot plot in Fig 9 annotated in AutoCAD

The knots (highlighted in red) occupies over half the margin area and therefore exhibits a margin condition

In accordance with BS 4978:2007- Figure 2, Figure 3 and Table 1, the knot plot illustrates that the total knot area ratio exceeds more than a third of the cross-section of the beam. This beam cannot be assigned a strength grade

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Fig 11:

Underside of Fourth floor, Beam 15; showing an example of historical mechanical damage to the underside of the beam

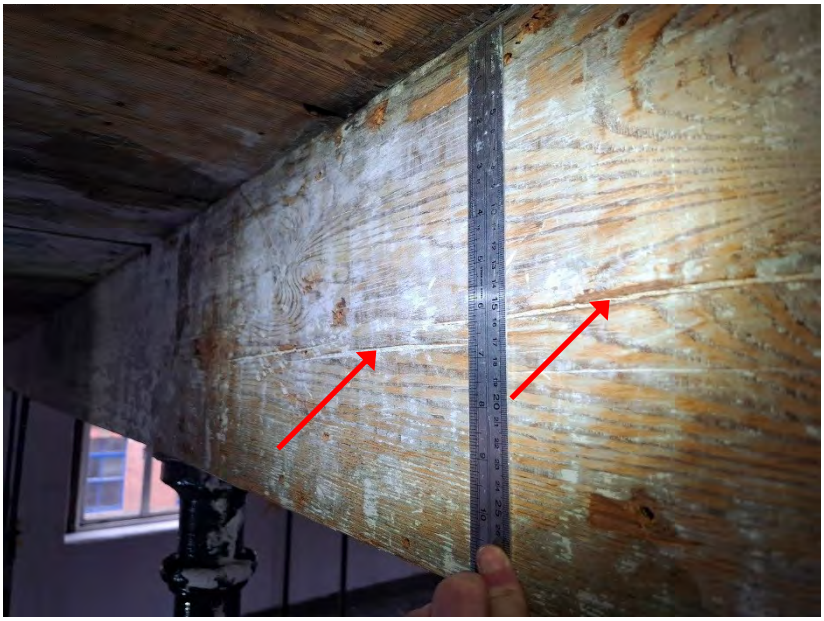


Fig 12:

Second floor

Underside of Third floor, Beam 11; showing measurement of a typical floor beam. This beam measured 310mm high x 225mm wide

The fissures (arrowed) were filled with filler and this inhibited accurate assessment of fissure depth

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Fig 13:

Underside of Third floor, Beam 11; showing an example of a fissure to the side of the beam. The filler was partially removed at this location to enable detailed measurement of fissure depth

The fissure was penetrated using a 0.3mm feeler gauge and the depth of the fissure was measured at ~160mm. This is over half the depth of the 225mm width. However, as the length of the fissure was only ~750mm, and less than 1m in length, the fissure was still within the permissible limits of the upper SS strength grade



Fig 14:

Underside of Third floor, Beam 12; showing assessment of a fissure using the 0.3mm feeler gauge

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Fig 15:

Underside of Third floor, Beam 12; showing that the fissure penetrated less than half the width (~225mm) of the beam. Fissures with depth less than half the thickness can be ignored and this fissure was within the permissible limits of the upper SS grade



Fig 16:

Underside of Third floor, Beam 12; showing the feeler gauge used as a visual aid to show that a fissure penetrated less than half the thickness

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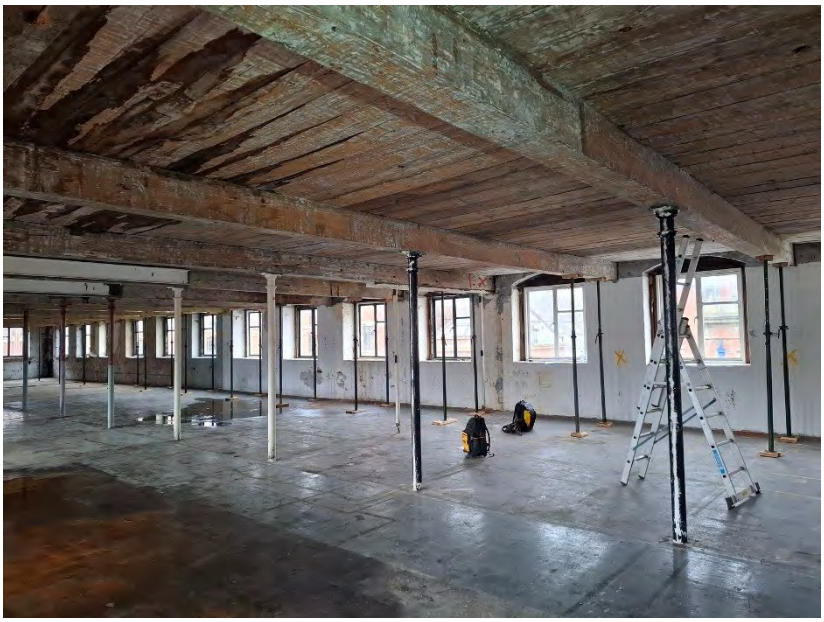


Fig 17:

Underside of Third floor; showing assessment of the underside of the floor beams

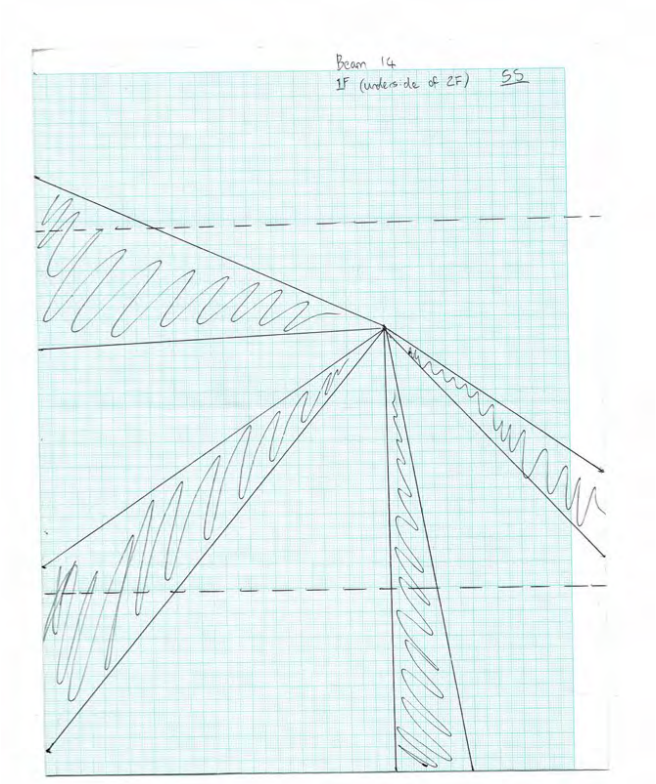


Fig 18:

Underside of Third floor, Beam 12; showing a ‘knot plot’ of a cluster of knots

There was no margin condition meaning the beam could achieve a SS grade

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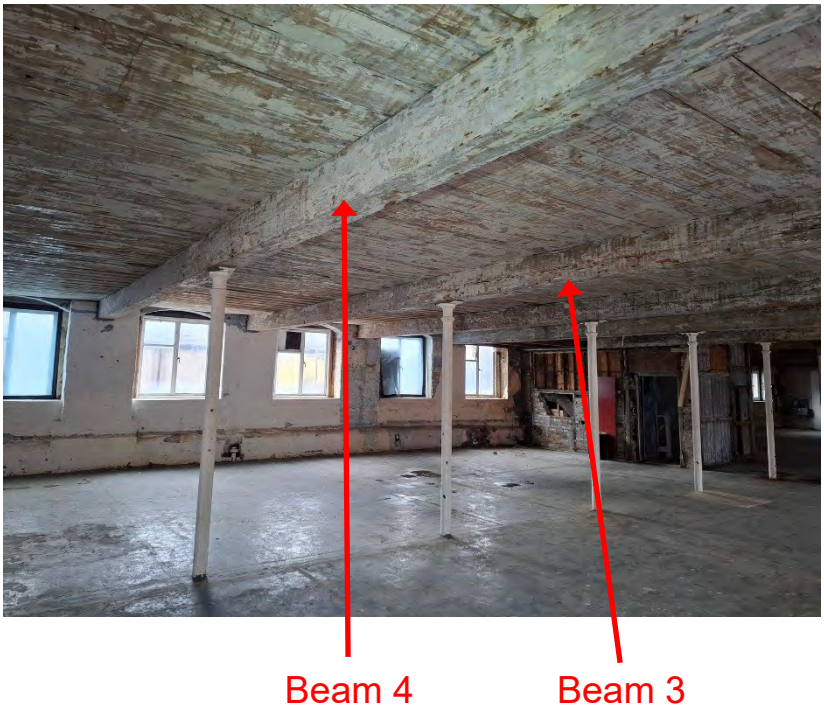


Fig 19:

First floor

Underside of Second floor; showing Beam 3 and 4 which both achieved the upper strength grade of SS

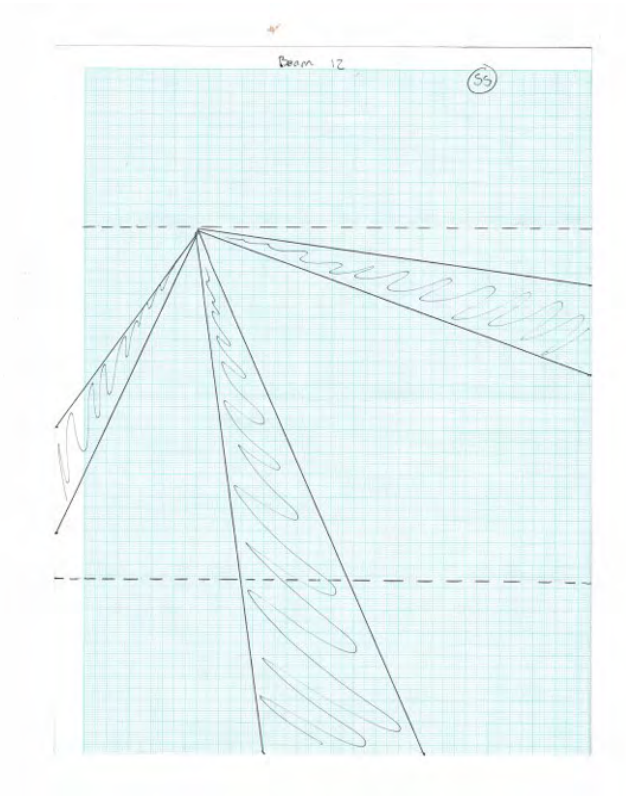


Fig 20:

Underside of Second floor, Beam 12; showing a ‘knot plot’ of a cluster of knots

There was no margin condition meaning the beam could achieve a SS grade

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Fig 21:

Ground floor

Underside of First floor; showing intact paint finish to the beams. The paint finishes concealed potential strength reducing characteristics. No visual strength grading was undertaken at this floor level



Fig 22:

Basement

Underside of Ground floor; showing Beam 5 which achieved the upper strength grade of SS

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Fig 23:

Underside of Ground floor, Beam 10; showing chamfer extending ~2m from its bearing. This had reduced the cross sectional area by ~6.3%



Fig 24:

Underside of Ground floor, Beam 10; showing an example of a fissure to the beam. However, this fissure penetrated less than half the width of the beam

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Fig 25:

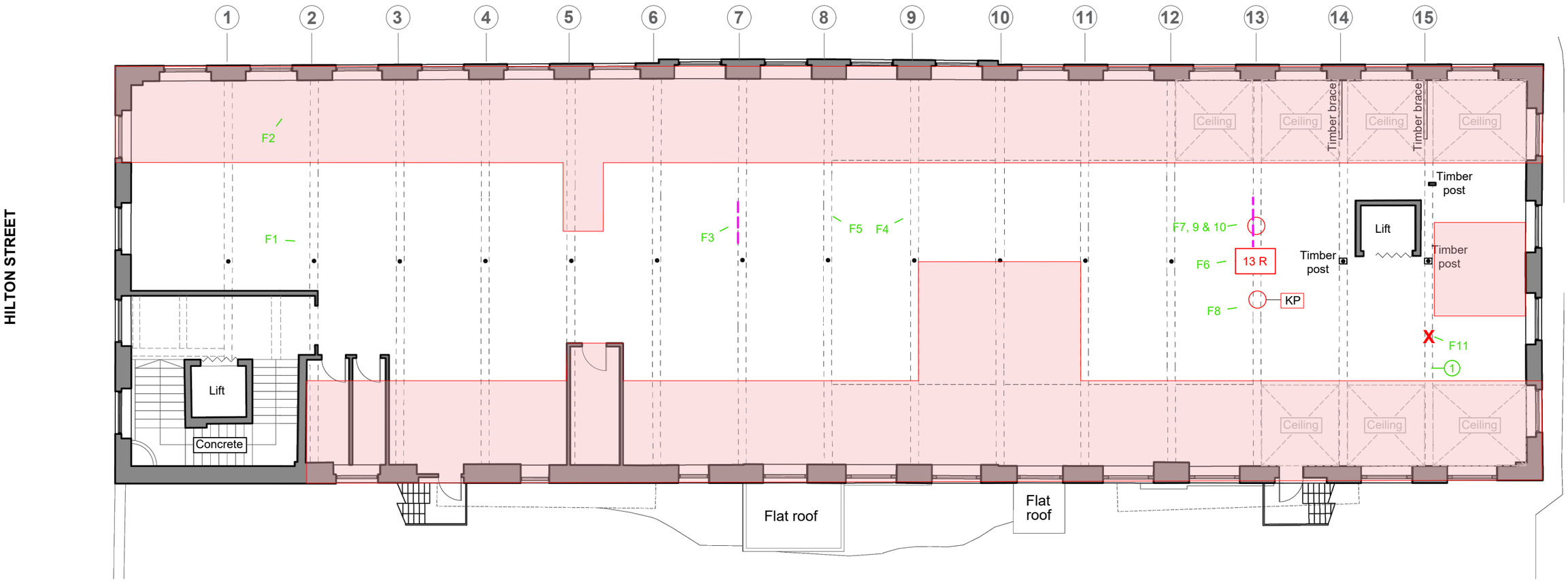
Underside of Ground floor; showing a general view of the underside of the beams and a steel repair to Beam 9. This rendered the beam ungradable as the steel may be concealing strength reducing features

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Attachment C

NEWTON STREET

All beams partly obstructed by scaffolding and inaccessible for strength grading



Key:

1	Beam reference	KP	Location of Knot Plot
X	Significant notch	R	Reject - no grade assigned
◯	Significant knot cluster		
F1-11	Photograph location		
	Face of beam inaccessible		
	Location of scaffolding restricting visual strength grading		
1	Timber species sample		

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Marlsbro House, Manchester - Third floor (showing Fourth floor soffit)

VISUAL STRENGTH GRADING OF SELECT FLOOR BEAMS

12 March 2026

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NEWTON STREET

HILTON STREET

FARADAY STREET

Beam 1
Length of beam concealed by paint and partially concealed by wall

Beam 4
Concealed by paint

Beam 7
Strength grading was feasible

Beam 10
Concealed by steel repair and filler to fissures

Beam 14
Length of beam concealed by paint and partially concealed by lift wall

Beam 15
Length of beam concealed by paint and partially concealed by lift wall

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

1 2

F14&15
F16
11 SS
12 SS
F12
F18
KP
F13
KP
F17
2

Lift
Lift
Concrete
Not accessed
Ceiling
Ceiling
Flat roof
Flat roof

Beam 2
Strength grading was feasible

Beam 3
Strength grading was feasible

Beam 5
In-accessible due to Asbestos

Beam 6
In-accessible due to Asbestos

Beam 8
Concealed by steel repair

Beam 9
Concealed by steel repair

Beam 9
Concealed by steel repair

Key:

1	Beam reference
1	Selected beam for visual strength grading
SS	Special Structural
	Face of beam inaccessible
F12-18	Photograph location
1	Timber species sample
KP	Location of Knot Plot

Marlsbro House, Manchester - Second floor (showing Third floor soffit)

VISUAL STRENGTH GRADING OF SELECT FLOOR BEAMS

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NEWTON STREET

HILTON STREET

FARADAY STREET

Beam 1
Length of beam concealed by paint

Beam 2
Length of beam concealed by paint

Beam 3
North-west section of beam concealed by paint and timber plate

Beam 4
Strength grading was feasible

Beam 5
Strength grading was feasible

Beam 6
Strength grading was feasible

Beam 9
Concealed by timber plate

Beam 11
Fissure less than half the depth

Beam 12
Fissure less than half the depth

Beam 15
Fissure less than half the depth

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

3 4 5 6 7

F19

F20

11 SS 12 SS 13 SS 14 SS 15 SS

Lift

Lift

Concrete

Not accessed

Ceiling

Flat roof

Flat roof

KP

Beam 3
South-east section of beam charred

Beam 7
Concealed by wall

Beam 8
Concealed by wall

Beam 10
Strength grading was feasible

Marlsbro House, Manchester - First floor (showing Second floor soffit)

VISUAL STRENGTH GRADING OF SELECT FLOOR BEAMS

12 March 2026

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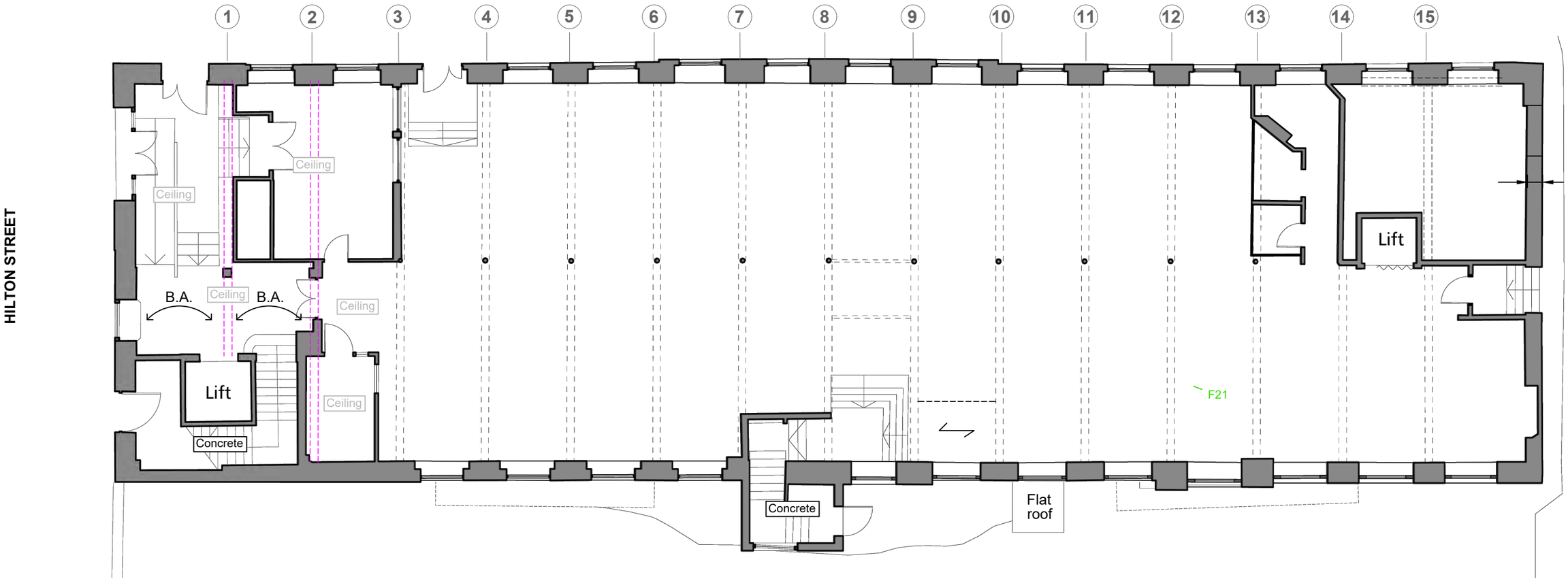
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Key:

- 1 — Beam reference
- 1 — Selected beam for visual strength grading
- SS — Special Structural
- Face of beam inaccessible
- F19-20 — Photograph location
- KP — Location of Knot Plot
- 1 — Timber species sample

NEWTON STREET

All beams concealed by paint and inaccessible for strength grading



Key:

1	Beam reference
F21	Photograph location
	Steel beam

Marlsbro House, Manchester - Ground floor (showing First floor soffit)

VISUAL STRENGTH GRADING OF SELECT FLOOR BEAMS

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NEWTON STREET

HILTON STREET

FARADAY STREET

Beam 2
Concealed by wall

Beam 3
Concealed by wall and ceiling

Beam 4
Concealed by wall

Beam 6
Strength grading was feasible

Beam 7
Concealed by steel

Beam 8
Concealed by timber

Beam 9
Concealed by steel

Beam 11
Filler in fissures

Beam 14
Concealed by plaster

8 9 10

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Concrete

Lift

Concrete

F22

F23

F24

F25

5 SS

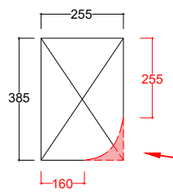
10 SS

12 SS

5

Lift

Concrete



Beam 10
Wane and chamfered for ~2m from bearing. This resulted in ~6.3% reduction in its cross-section

Beam 10
Fissures less than half the depth

Beam 13
Wane

Beam 13
Strength grading was feasible

Key:

1	Beam reference
1	Selected beam for visual strength grading
SS	Special Structural
	Face of beam inaccessible
F22-25	Photograph location
1	Timber species sample

Marlsbro House, Manchester - Basement (showing Ground floor soffit)

VISUAL STRENGTH GRADING OF SELECT FLOOR BEAMS

12 March 2026

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213-34 Site Note 3 -NOT TO SCALE- *All dimensions are approximate* © Copyright SOCOTEC UK 2026