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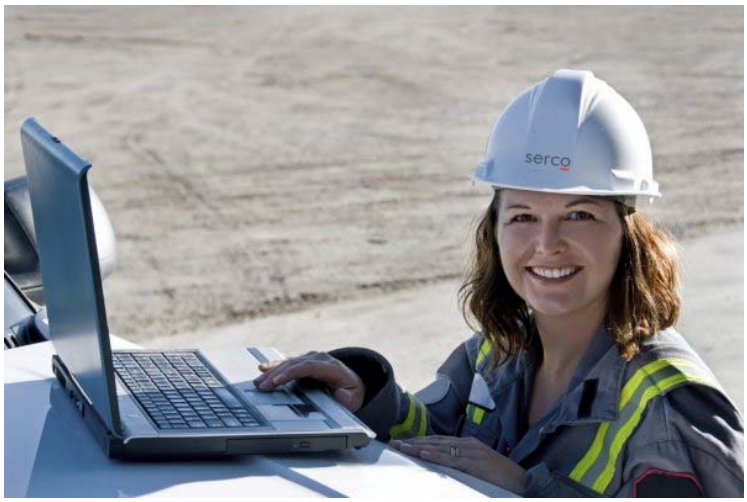
Preliminary Contamination Survey

Rutherford Building Lecture Theatre and Other Lofts



Prepared for	C&D Industrial Services
Prepared by	Serco
Your Reference	PO 69976
Our Reference	SERCO/TS/SRS/P7369.3 R4 Issue 02
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24th September 2010

Design | Advise | Integrate | Deliver

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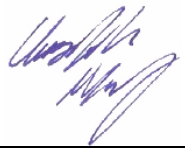
Author(s)	C McKay		24/09/2010
Reviewed by	R W Price		24/09/2010
Approved by	N Reeves		24/09/2010

Executive Summary

Preliminary radiation contamination surveys were conducted of the following locations:

- Lecture Theatre Loft
- Rm M2.002 Loft
- Rm 2.054 Loft
- Rm 2.053 Loft
- Rm 2.052 Loft

This survey identified a total of eight discrete locations at which elevated count rates were observed. Five of these were located within the Lecture Theatre Loft, one within Rm 2.054 Loft, Rm 2.053 Loft and one within Rm 2.052 Loft.

None of these are expected to exceed the levels at which the contaminated materials would be classified as radioactive waste.

Contents

History Sheet

Revision	Date	Description of Modification
Issue 1	04.08.2010	First Issue- Draft for Comment
Issue 2	24.09.2010	Second Issue- Incorporating Client Comments

Introduction

1.1 Scope of Work

A non-intrusive investigation of the attic space above the lecture theatre and the lofts above rooms 2.052, 2.053 and 2.054 in the Rutherford Building, Manchester University, has been undertaken. This is in order to obtain information on the possible contamination of the said space. A building plan has been included in Appendix A to help identify the areas surveyed.

1.2 Site Location

1.2.1 Lecture Theatre loft

The lecture theatre loft is a generally unoccupied area directly above the Lecture Theatre in the Rutherford Building. The majority of the floor area is covered by raised plywood flooring, which has obviously been installed after construction of the building. The loft area is split in four sections by the main supporting roof joists, with the entry area being within section 1.

Figure 1. View of AC ducts Looking from Section 1 into Section 2

Figure 2. View of Section 4 of Lecture theatre loft

1.2.2 Other Lofts

The attic space rooms M2.002, 2.054, 2.053 and 2.052 are unused spaces above those rooms. Each attic space has a central wooden walkway below which is the ceiling of the room below, with no insulating material. Figure 3 shows the typical condition of these lofts.

Figure 3. Rm 2.054 Loft

2 Method

Using a Mini 900 with EP15 probe the area was surveyed to identify any areas of elevated contamination. The following areas were surveyed:

- Lecture Theatre Loft
- Rm M2.002 Loft
- Rm 2.054 loft
- Rm 2.053 loft
- Rm 2.052 loft

The survey was conducted over all accessible areas and included flooring, underside of roof, gable ends and roof beams.

As much of the Lecture Theatre Loft floor was covered by raised plywood flooring, it was not accessible for monitoring. The lecture theatre loft also contains air conditioning, a ventilation systems for the lecture theatre below, and has a number of passive ventilation ports allowing circulation of air between the lecture theatre and the attic space.

The other loft spaces had only a central wooden walkway. Again contamination monitoring could not be conducted beneath this walkway.

In addition, as part of the scope of work, Serco Radiation Services also ensured the radiological health and safety of those working in the attic. Personal contamination monitoring of those leaving the attic was undertaken, and confirmed the absence of radiologically significant levels. Air sampling was undertaken throughout the work to enable assessment of any airborne contamination generated as a result.

3 Results

A copy of the radiation survey forms completed by the Health Physicist is contained within Appendix A. The contamination survey found five highly localised areas of elevated counts rate. These locations are listed in Table 1.

Table 1

Location	Survey Sheet Ref. (Appendix A)	EP15 Reading (cps)	Activity (Bq)*	Description of Location
Lecture Theatre Loft	Point 1 (Sheet 4)	10	20.9	On top of Wooden Beam
Lecture Theatre Loft	Point 2 (Sheet 4)	20	41.8	On top of Wooden Beam
Lecture Theatre Loft	Point 3 (Sheet 5)	25	52.3	On top of Wooden Beam
Lecture Theatre Loft	Point 4 (Sheet 8)	7	14.6	On top of Wooden Beam
Lecture Theatre Loft	Point 5 (Sheet 10)	20	41.8	Plywood Floor
2.054 Loft	Point 1 (Sheet 1)	10	20.9	Wooden Floor Joist

Location	Survey Sheet Ref. (Appendix A)	EP15 Reading (cps)	Activity (Bq)*	Description of Location
2.053 Loft	Point 1 (Sheet 1)	30	62.7	Wooden Roof Joist
2.052 Loft	Point 1 (Sheet 1)	5	10.5	Wooden Roof Joist

* Assuming activity is Pb-210 (and short lived daughter products)

It should be noted that whist these locations have contamination resulting in clearly detectable readings above background, it is unlikely that the activity concentration exceeds levels at which, for regulatory purposes, it would be considered either radioactive material or radioactive waste. Nor do they represent a significant radiological hazard.

Surveys of all other surfaces and areas found no readings above background. No contamination was identified within the M2.9002 Loft.

However, the dusty nature of the surfaces can obscure low-energy beta radiation and alpha radiation from the detector, making it impossible to confirm that there is no further contamination.

4 Conclusions

The survey identified highly discrete areas of contamination within the following areas:

- 5 locations within the Lecture Theatre Loft
- 1 location within the 2.054 Loft
- 1 location within the 2.053 Loft
- 1 location within the 2052 Loft

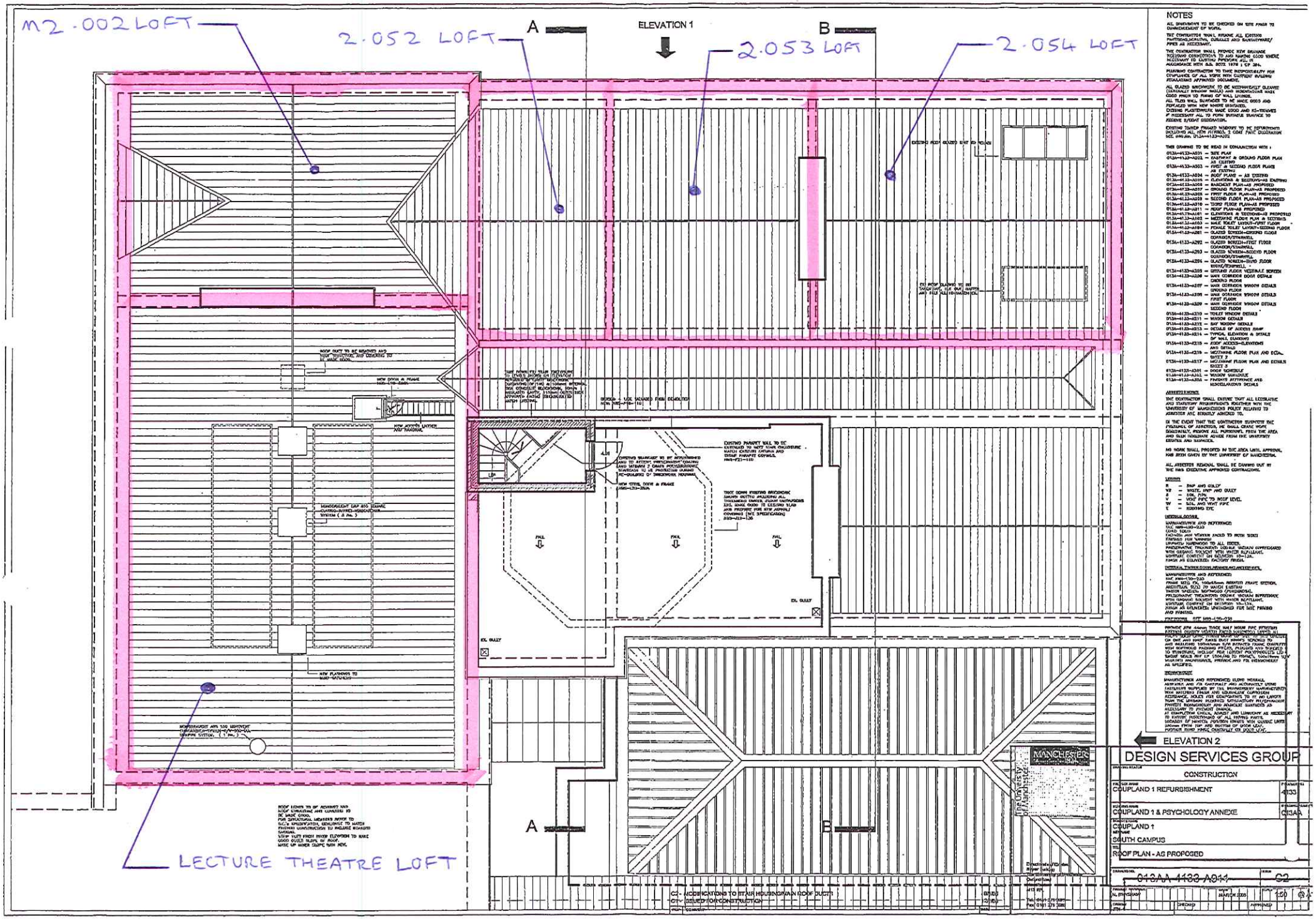
The total activity identified was of the order of 300Bq and each of the identified spots of contamination is unlikely to exceed the levels above which the contaminated material would be classified as radioactive waste.

There is no significant external radiation risk associated with such a low activity.

With the presence of dust and debris, the presence of further contamination cannot be ruled out. Should the University require this area to be decontaminated and cleared to the same standard as that employed for the Rutherford Building Refurbishment Area, all the dust and debris would need to be removed prior to a final systematic high-coverage survey. It should be noted that this was subsequently carried out as a separate piece of work. The work task reported here comprised the initial survey to identify contamination and assess any potential radiological hazards.

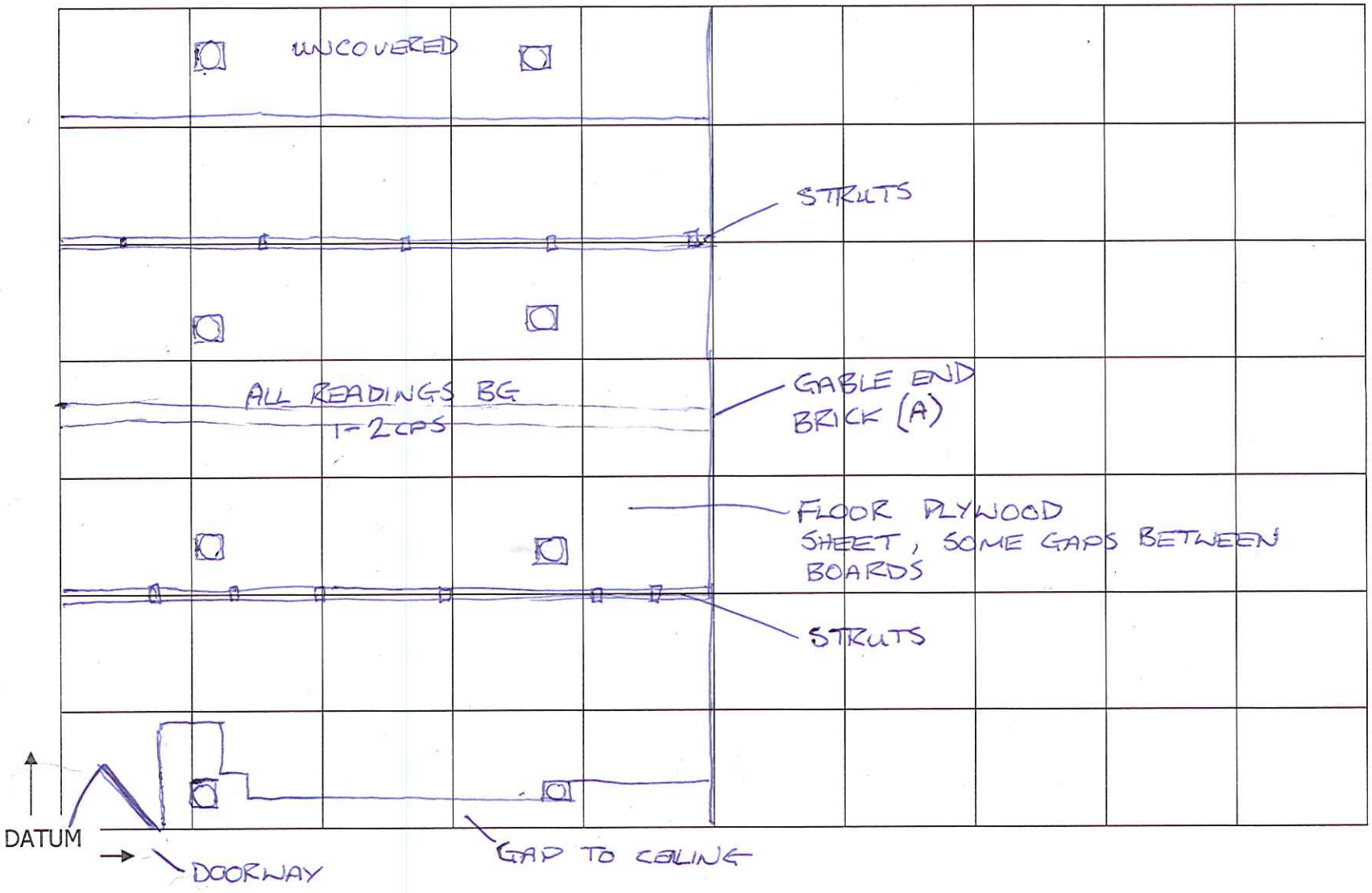
Appendix I
Health Physics Survey Forms

Contents


M2.002 LOFT
2.052 LOFT
2.053 LOFT
2.054 LOFT
ELEVATION 1
A
B
LECTURE THEATRE LOFT
ELEVATION 2
NOTES
DESIGN SERVICES GROUP
CONSTRUCTION
COUPLAND 1 REFURBISHMENT
COUPLAND 1 & PSYCHOLOGY ANNEXE
COUPLAND 1
SOUTH CAMPUS
ROOF PLAN - AS PROPOSED
MANCHESTER 1824
C2 - MODIFICATIONS TO STAIR HOUSING/RAIN ROOF DUCT
C1 - ISSUED FOR CONSTRUCTION

HPMC GRID SURVEY Monitor Type: EP15

ROOM REF: LECTURE THEATRE LOFT SURFACE: FLOOR (FIRST SECTION) SHEET 1 OF 13



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HPMC GRID SURVEY Monitor Type: EP15

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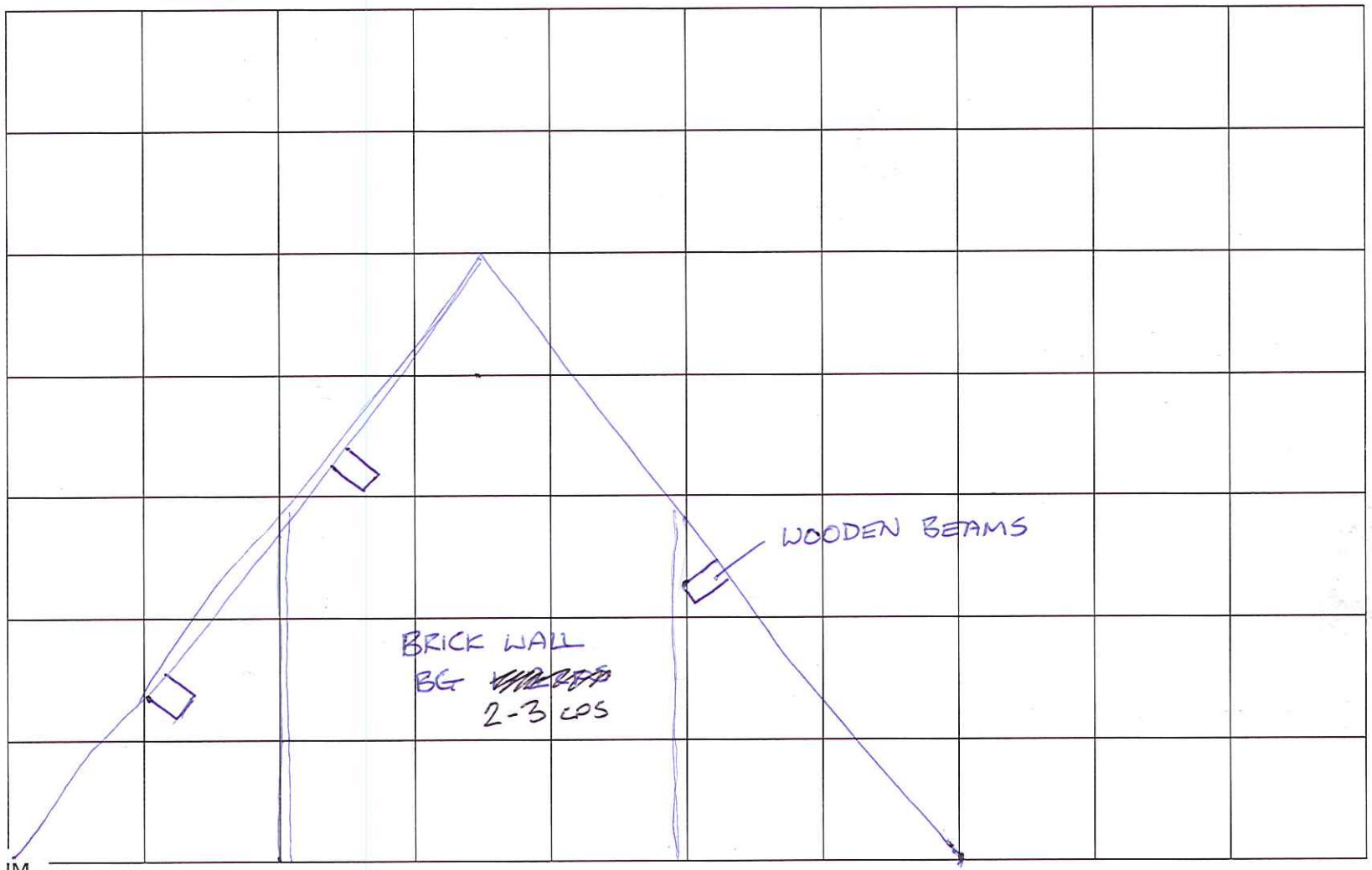
ROOM REF: LECTURE THEATRE LOFT SURFACE: GABLE END (A) SHEET 2 OF 13



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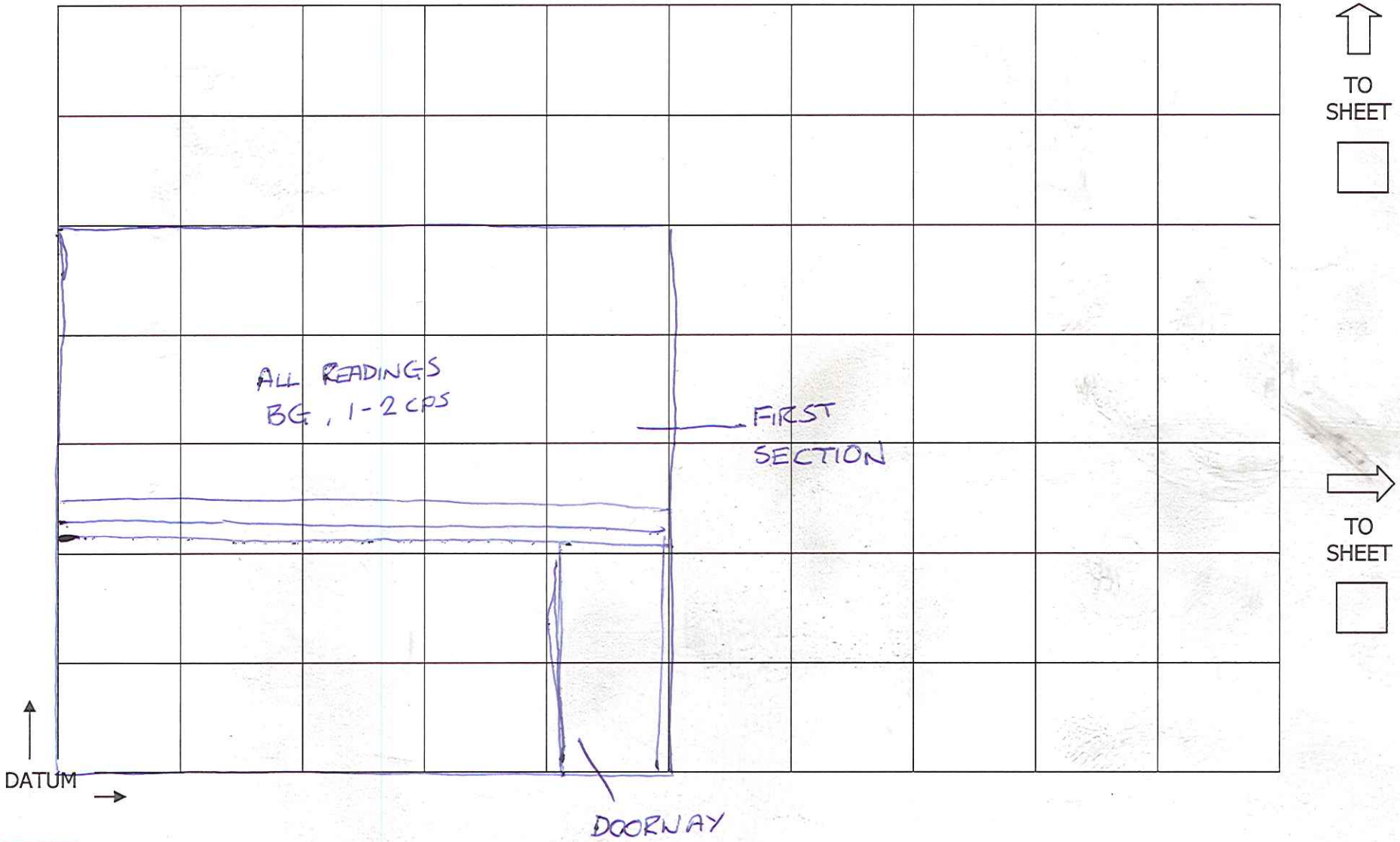
ROOM REF: LECTURE THEATRE LOFT SURFACE: ROOF UNDERSIDE SHEET 3 OF 13



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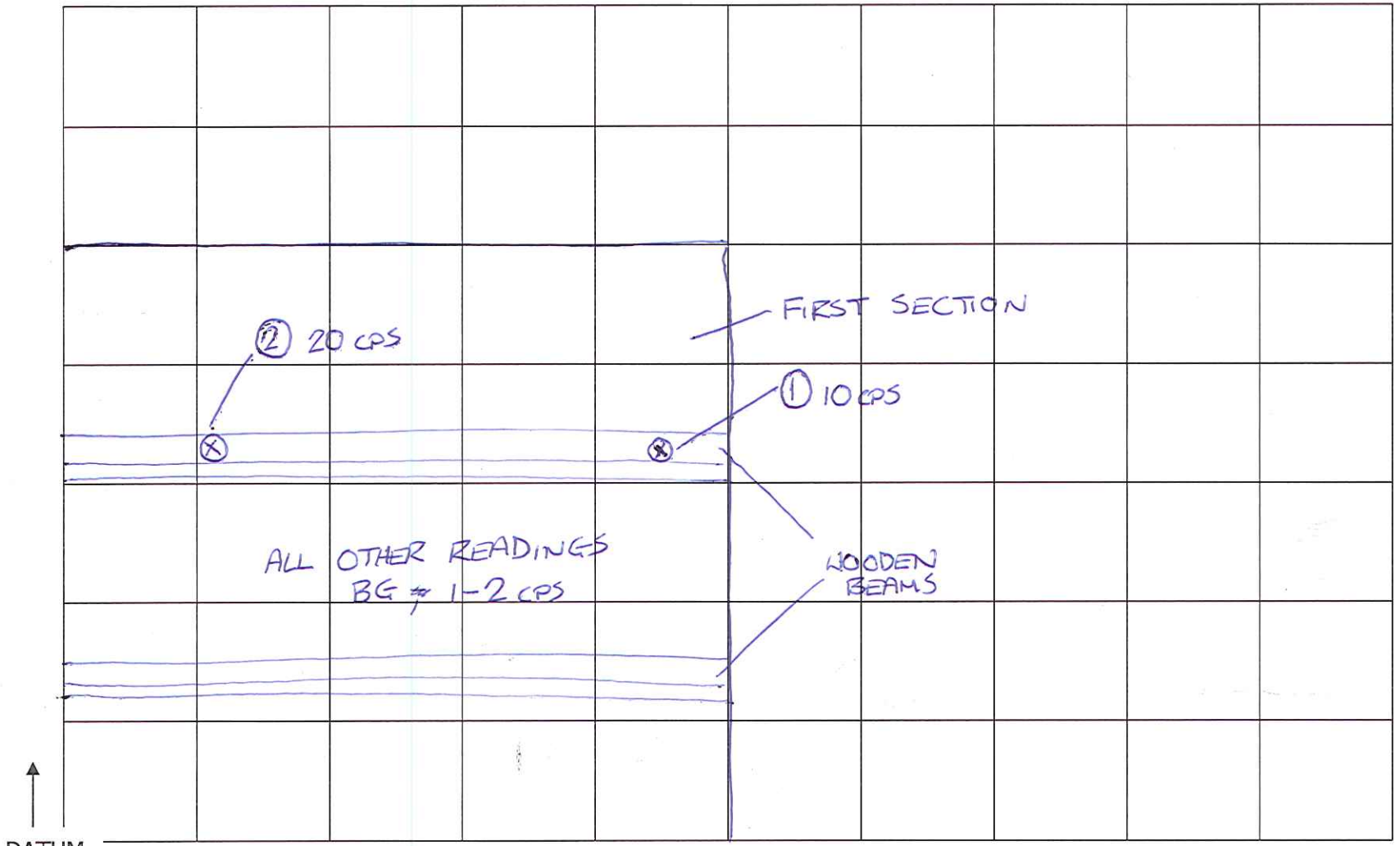

HPMC GRID SURVEY Monitor Type: EP15

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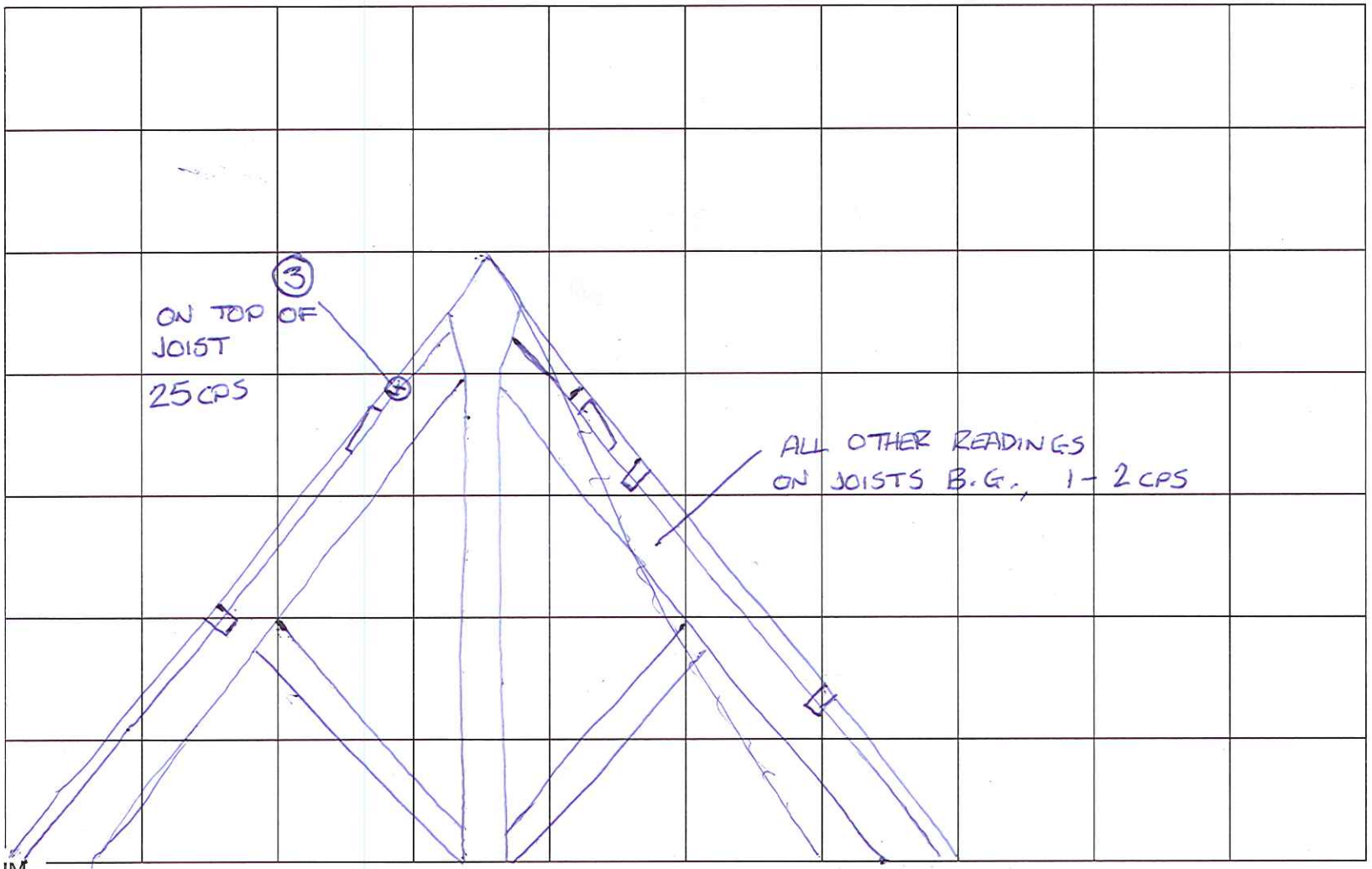
ROOM REF: LECTURE THEATRE LOFT SURFACE: DIVIDING JOISTS (1ST & 2ND) SHEET 5 OF 13



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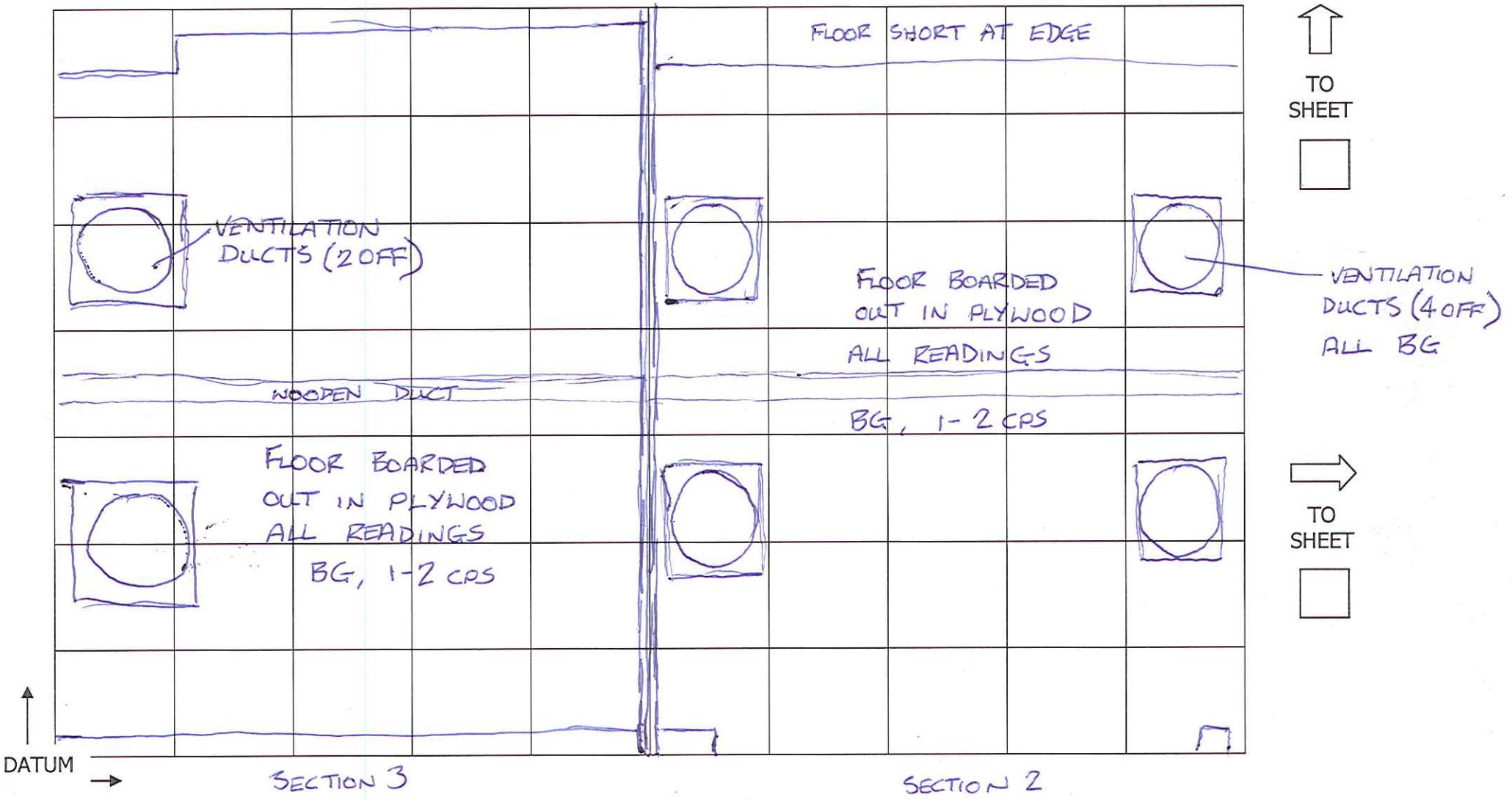

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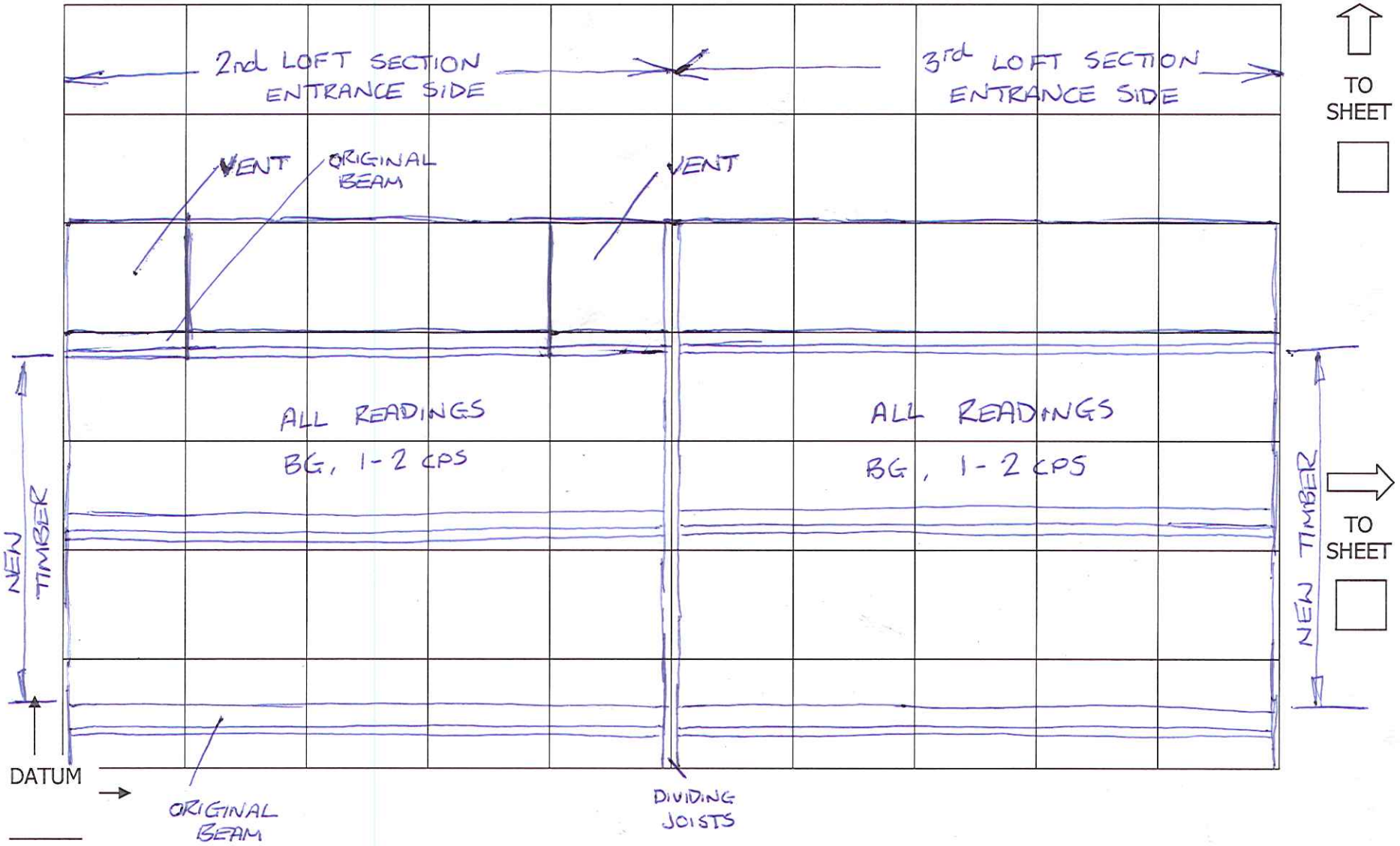

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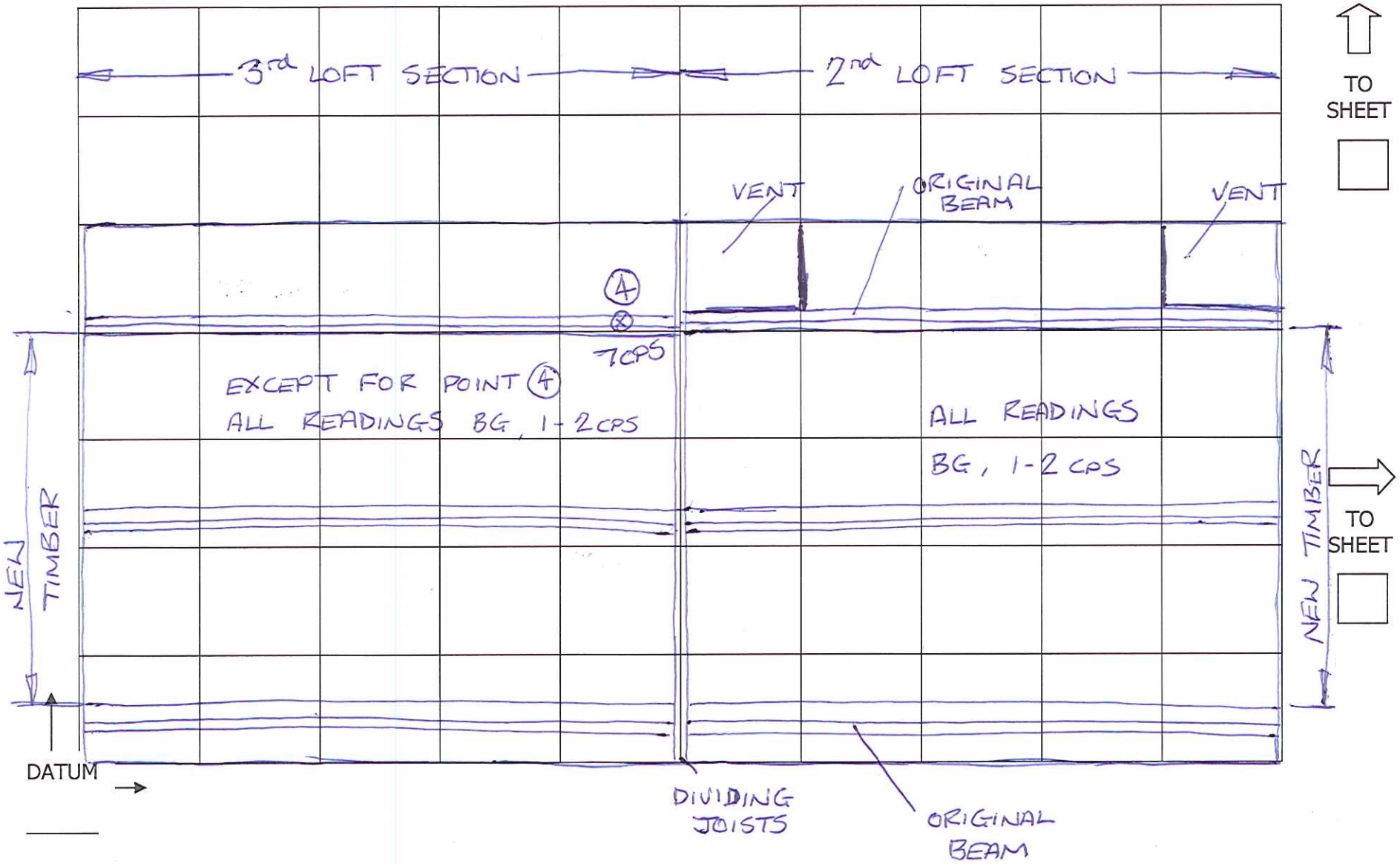

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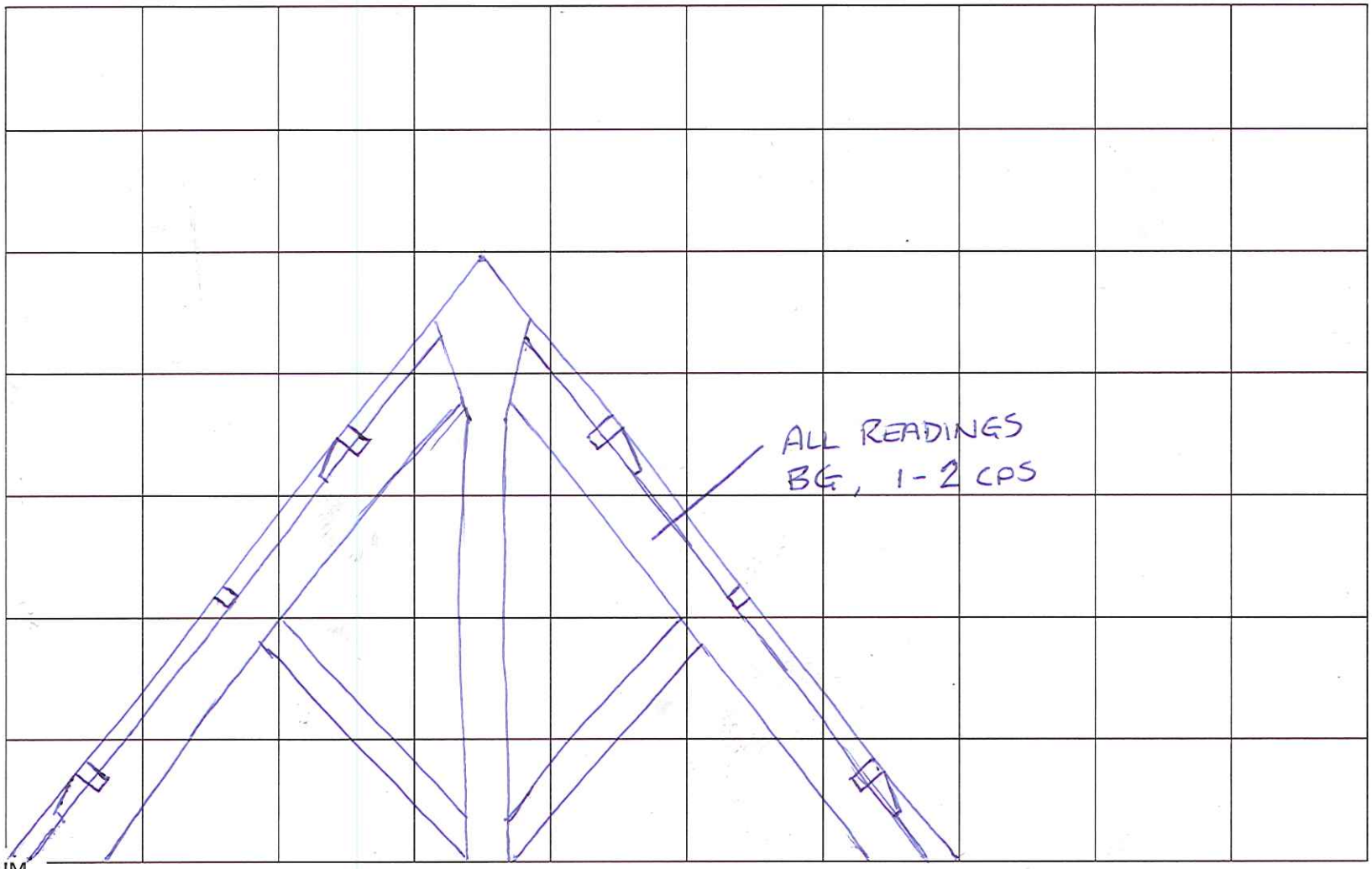
ROOM REF: LECTURE THEATRE LOFT SURFACE: DIVIDING JOISTS 2ND & 3RD SECTION SHEET 9 OF 13



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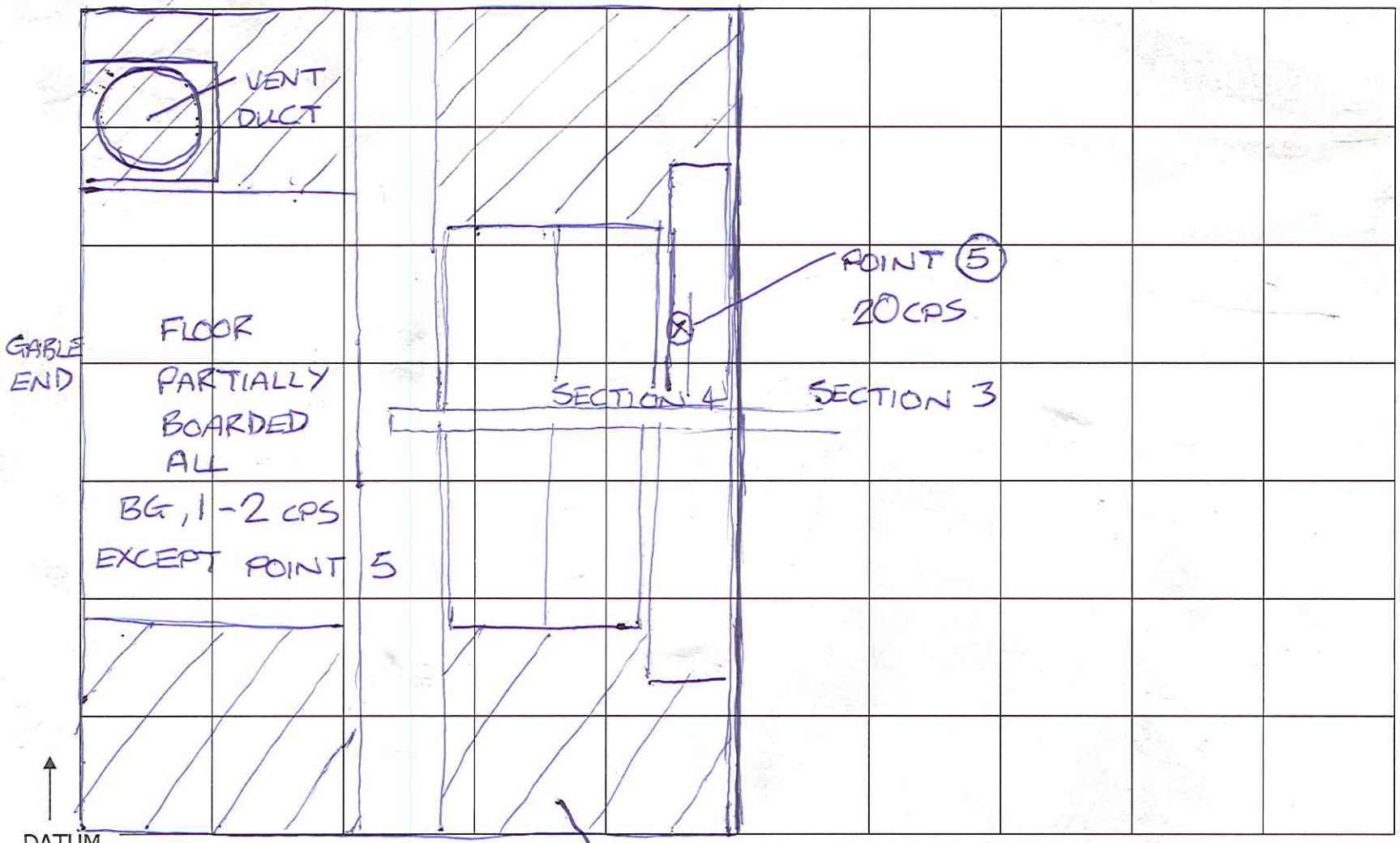
ROOM REF: LECTURE THEATRE LOFT SURFACE: FLOOR SHEET 10 OF 13



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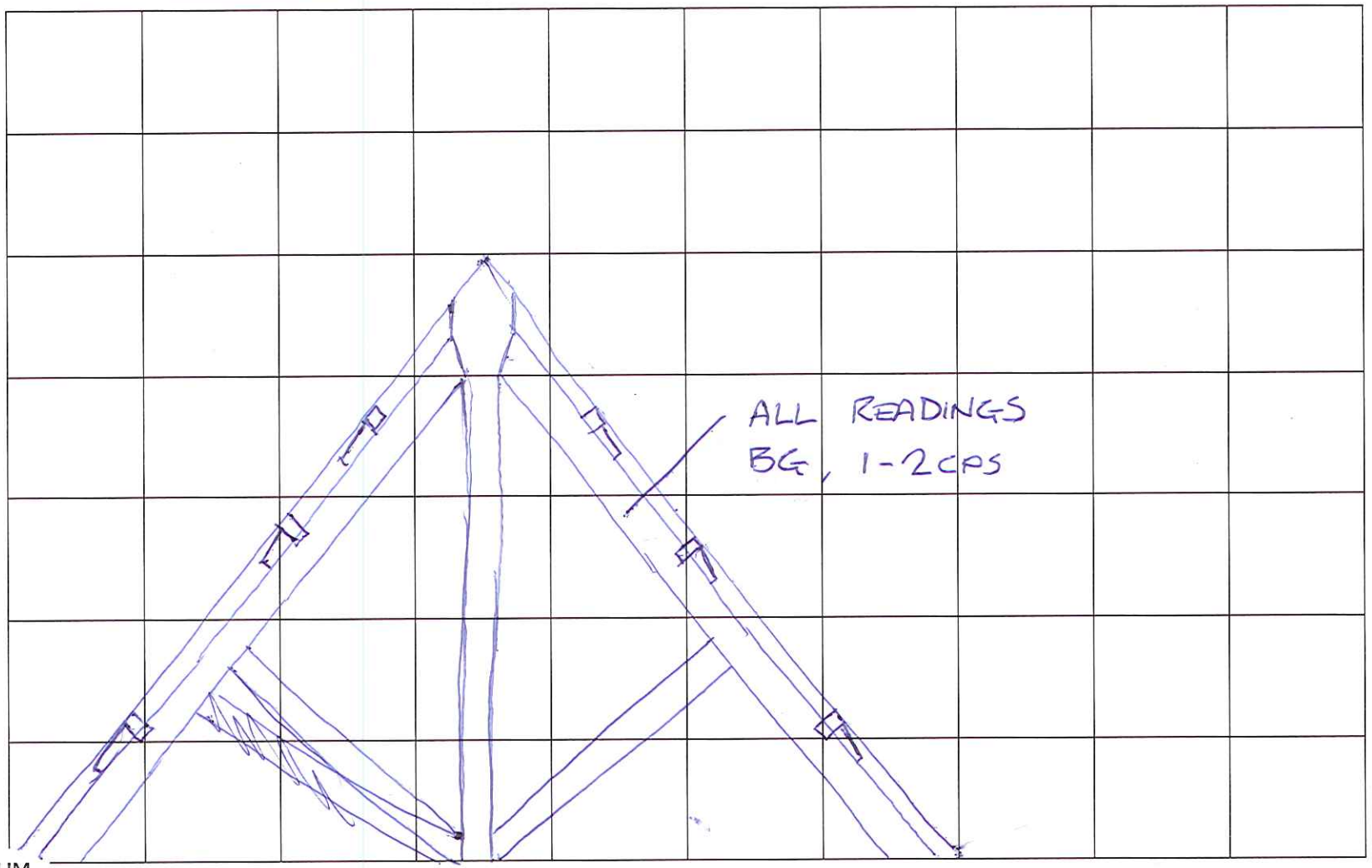

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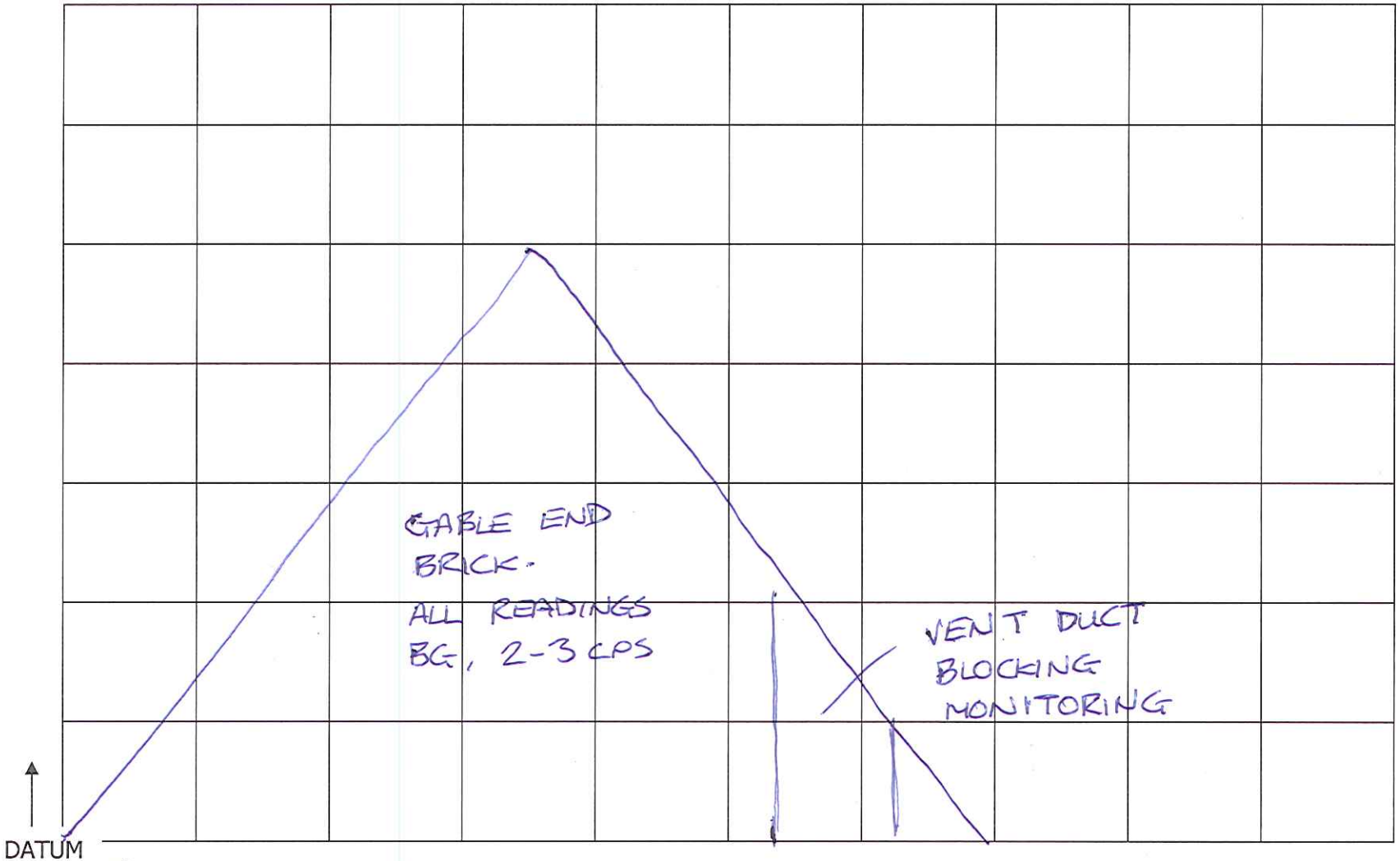

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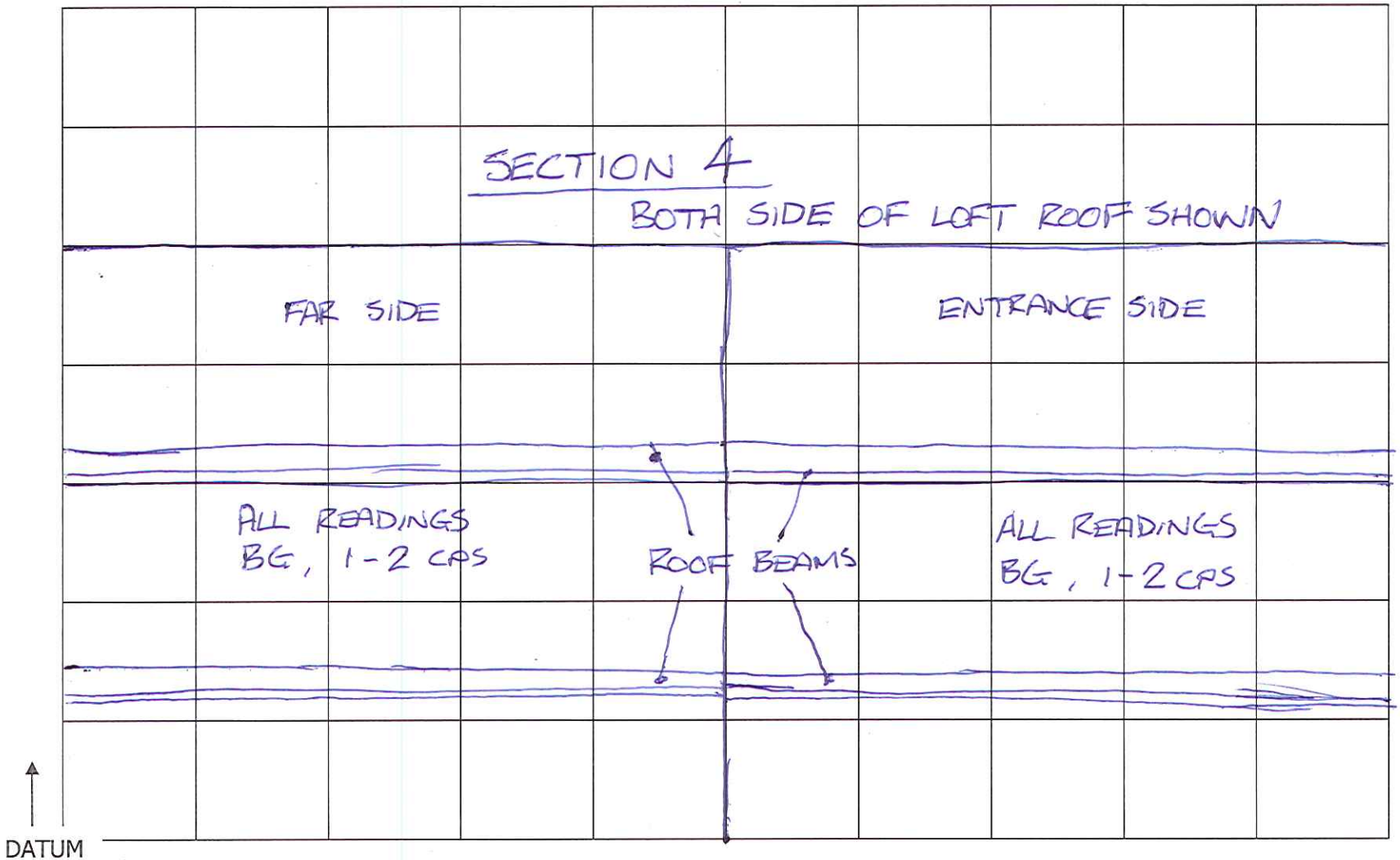
ROOM REF: LECTURE THEATRE LOFT SURFACE: ROOF UNDERSIDES SHEET 13 OF 13



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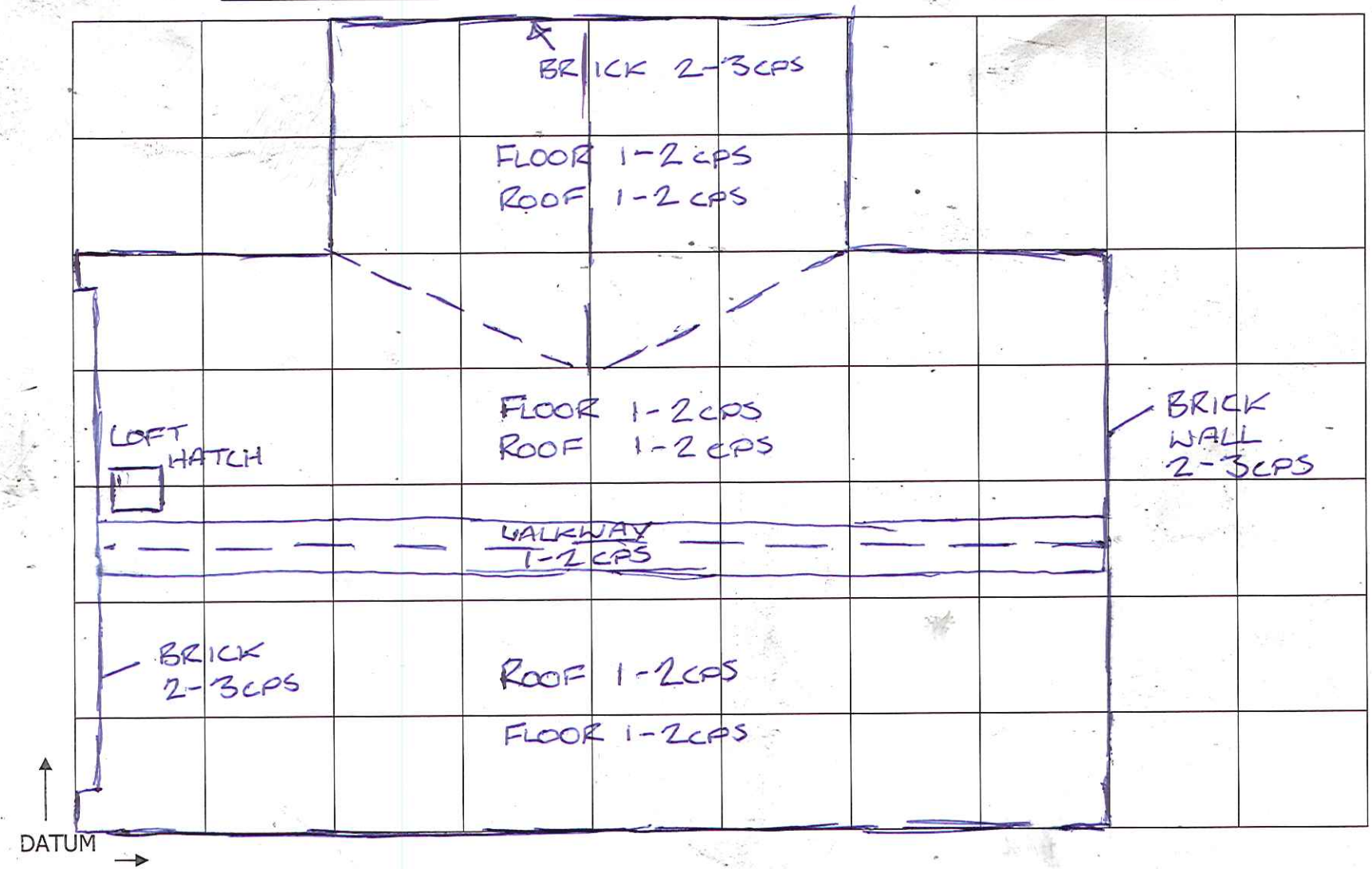
HPMC GRID SURVEY Monitor Type: EP15

ROOM REF: M2.002 LOFT SURFACE: ALL SHEET 1 OF 1



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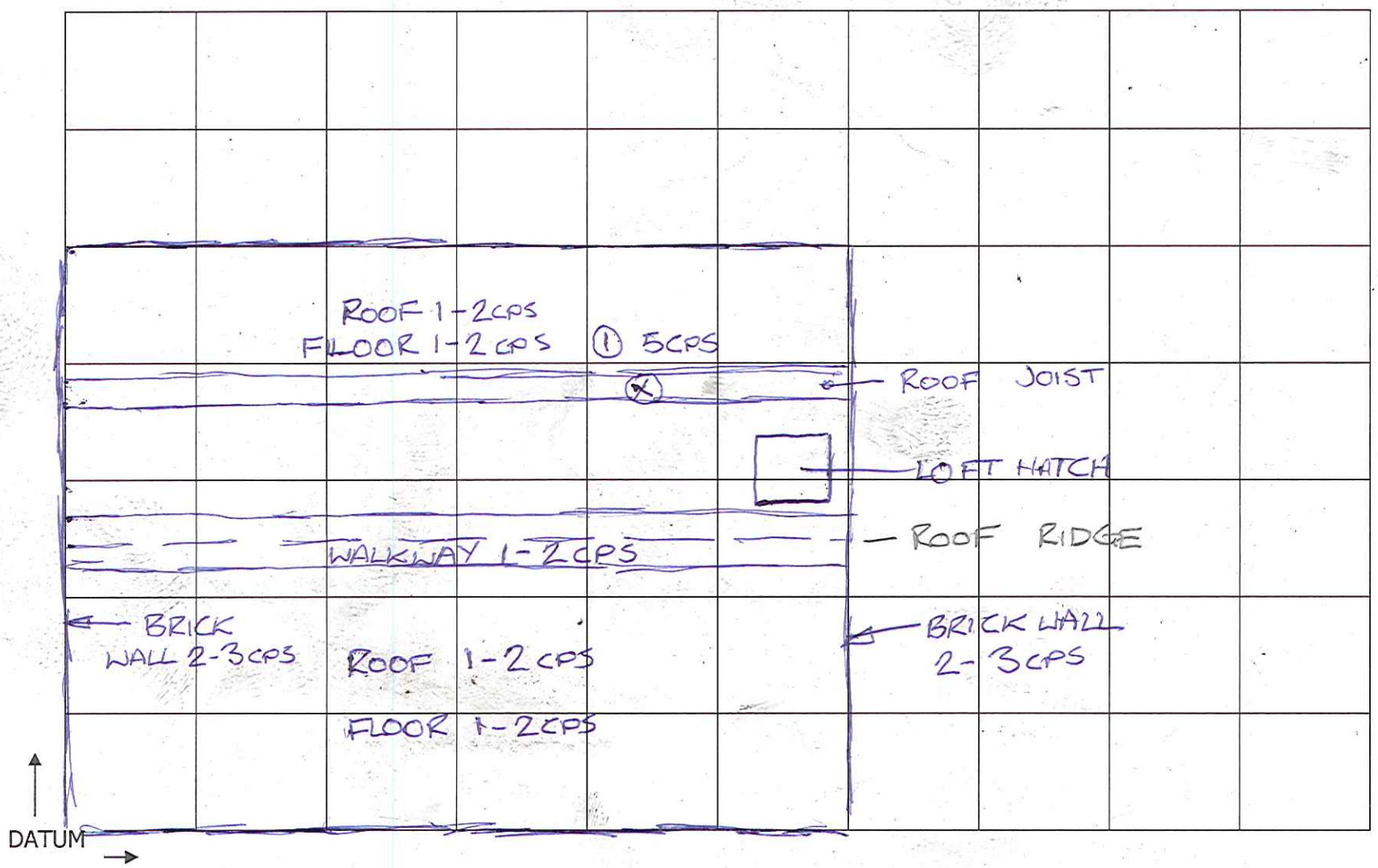
ROOM REF: 2.052 SMALL LOFT SURFACE: ALL SHEET 1 OF 1



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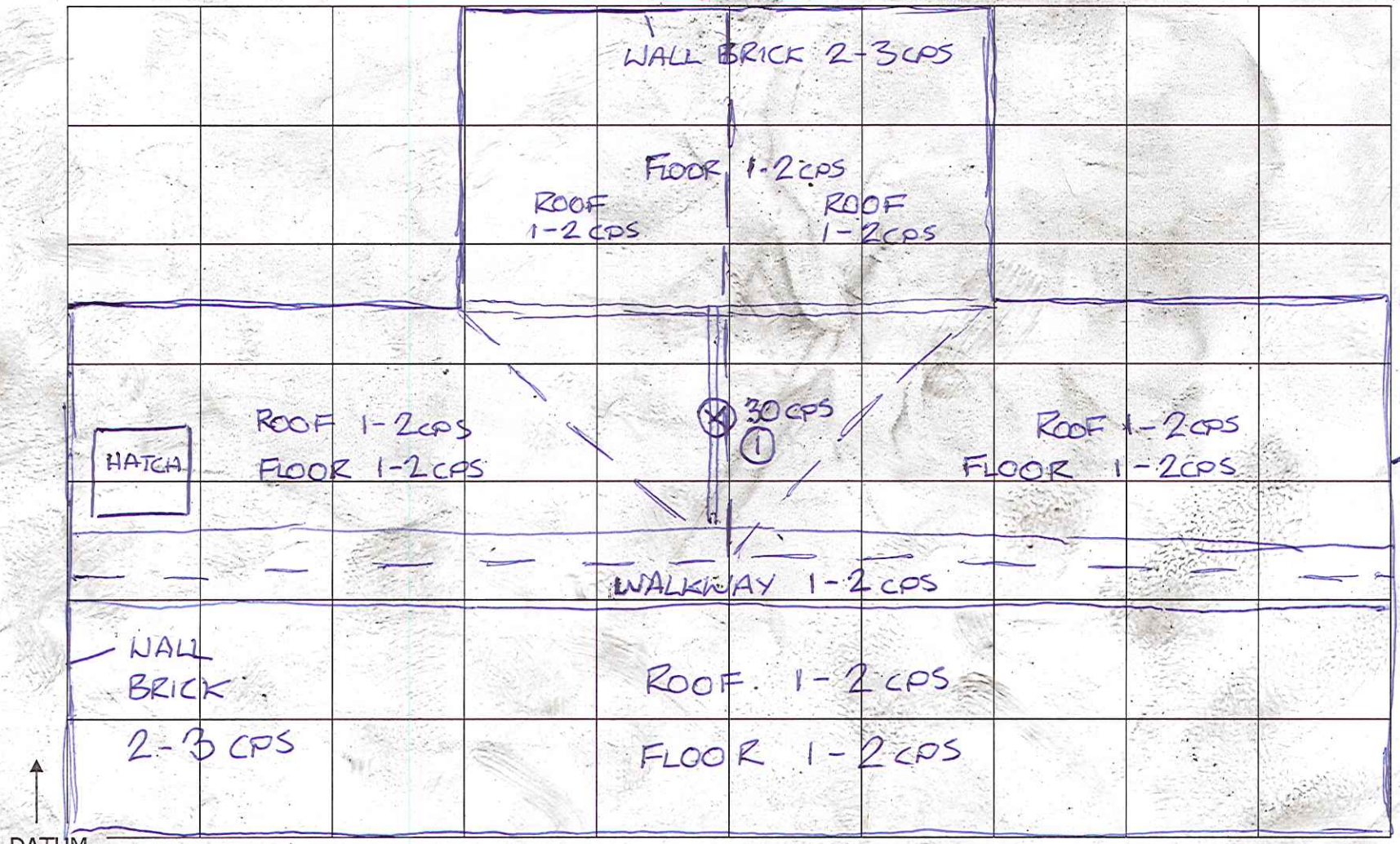
ROOM REF: LOFT ABOVE ROOM 2.053 SURFACE: ALL SHEET 1 OF 1



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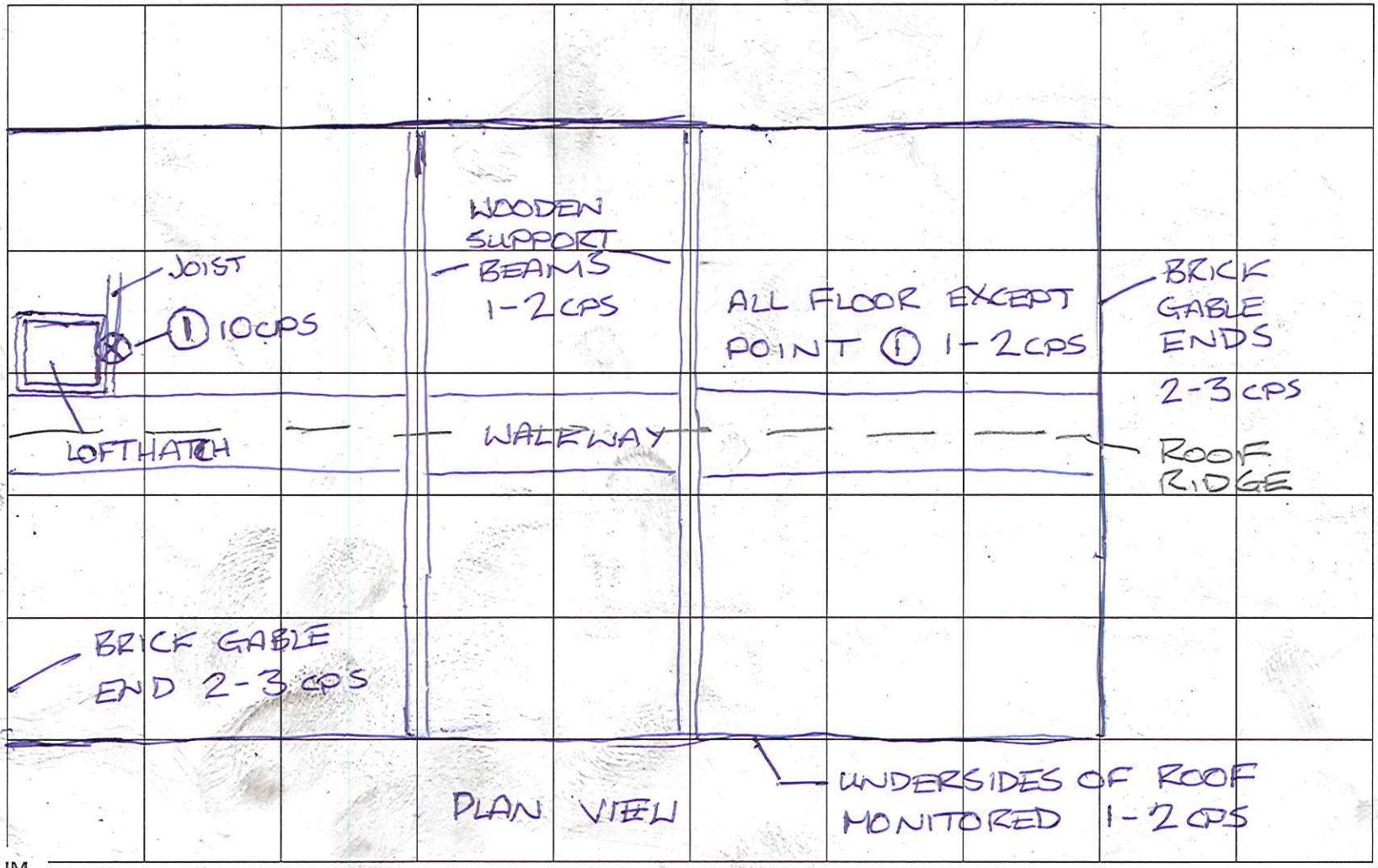

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