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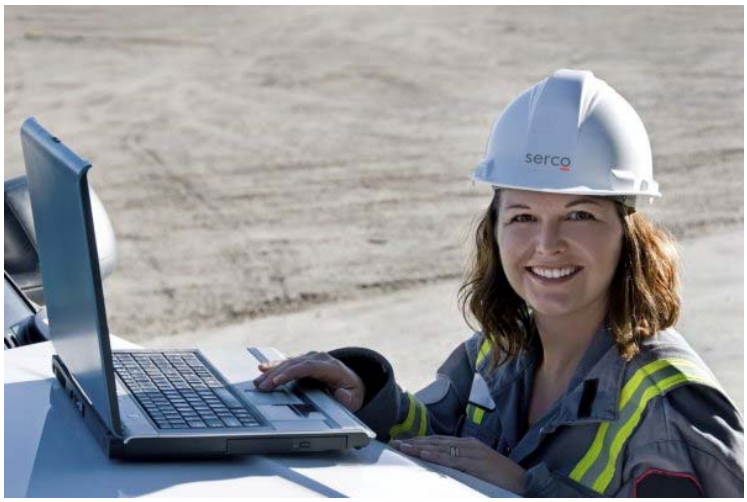
Radiation Survey of Attic Space above Rooms 2.62 & 2.63 Rutherford Building



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03 March 2010

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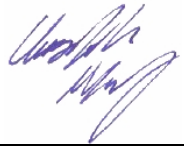
Reviewed by	C McKay		03 March 2010
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Executive Summary

A survey for radioactive contamination was undertaken in the attic space above rooms 2.62 and 2.63 in the Rutherford Building, Manchester University. This was undertaken using techniques suitable for those contaminants associated with this building. The survey identified four highly discrete areas of low-level contamination with a total activity in the order of 100 Bq (assuming the contaminant was Pb-210). Two areas of contamination were associated with dust and were easily removed and bagged, the other two being less easy to remove and were left in place. In the absence of any planned provision for radioactive waste, this waste was left within the attic.

In terms of the radiological significance of the activity identified, there is no significant external radiation risk associated with such a low activity whether that activity was either of the contaminants associated with the building (i.e. Pb-210 together with its decay products or Ra-226, with its decay products). In terms of internal radiation, if the whole activity was taken into the body of a single employee by inhalation, the committed effective dose received would be less than 2% of the annual limit, and below the level at which the risks would be considered to be occupationally significant. A further illustration of the low significance of the activity found is that it represents only 1 % of the activity which, if it were to be used by an employer for the first time, would require notification to the HSE under Regulation 6 of The Ionising Radiations Regulations 1999.

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 (Coupland 1) Refurbishment Area, all the dust and debris would need to be removed prior to a final systematic high-coverage survey.

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. In the absence of significant contamination being identified, airborne contamination monitoring was not undertaken on this occasion.

Contents

1 Introduction

1.1 Scope of Work

A non-intrusive investigation of the attic space above Rooms 2.62 & 2.63 in the Rutherford Building, Manchester University has been undertaken in order to obtain information on the possible contamination of the said space.

1.2 Site Location

The attic space is located above rooms 2.62 and 2.63 in the Rutherford building which forms part of Manchester University. The attic is accessed via a hatch in the ceiling of room 2.63. A floor plan of the space is shown in Figure 1.

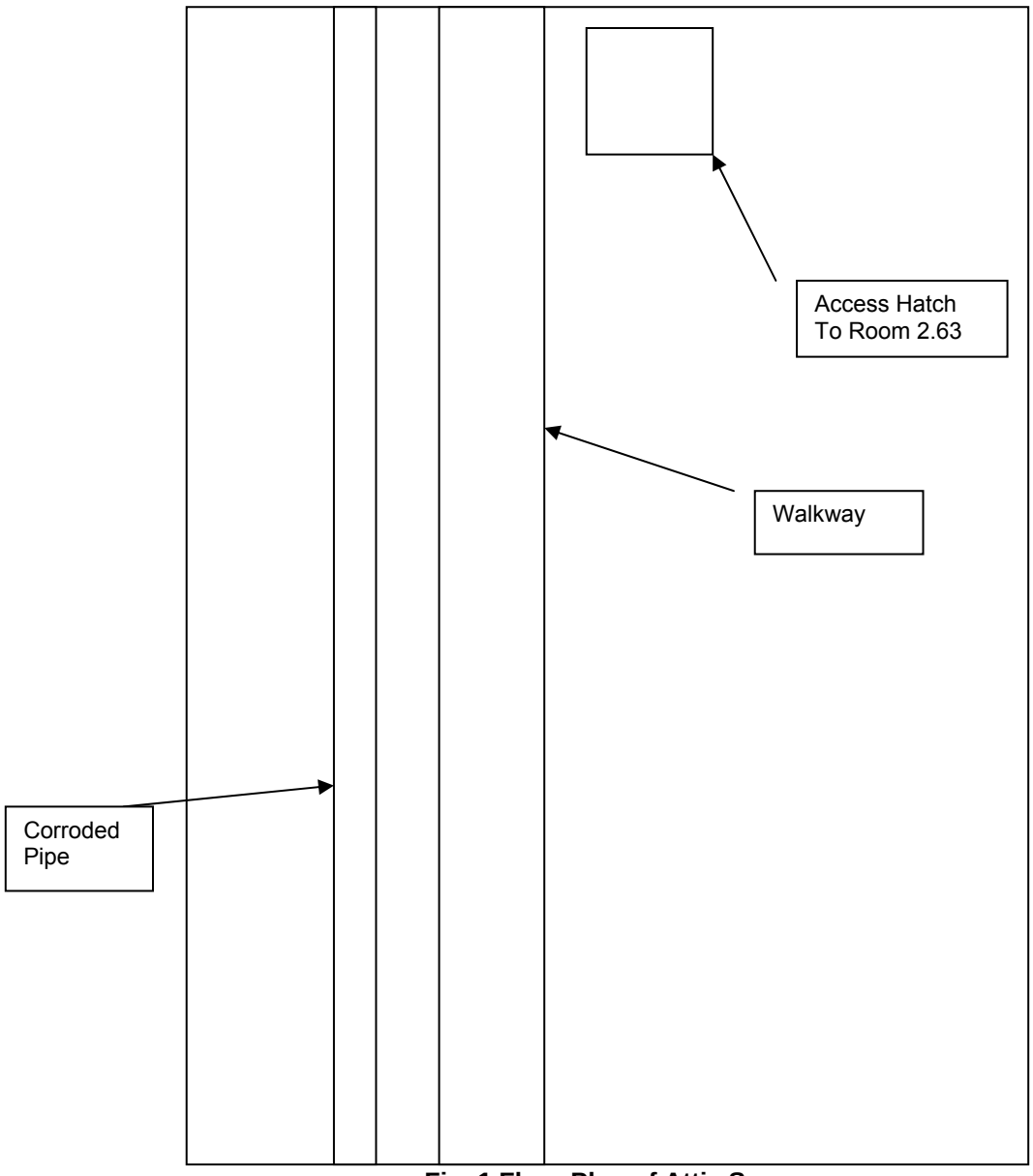


Fig. 1 Floor Plan of Attic Space.

1.3 Site Condition

The attic is approximately 3.5 metres wide by 8 metres long and is approximately 1.4 metres high at the centre. The floor of this space consists of wooden rafters with plaster in between. A safe walking area is provided by the central walkway. Upon inspection the attic appeared unused for some time. A layer of dust covered the floor which together with other debris may affect the sensitivity of measurement for the contaminants associated with the building.

2 Method

2.1 Contamination monitoring of the building fabric

A full survey of the walls and ceiling was carried out using Mini 900 type EP15 probe. These instruments use a halogen quenched Geiger-Muller tube with an end window of active area of 15 cm^2 and are particularly suitable for beta monitoring. Monitoring was carried out with the end cap removed, with any elevated readings being noted on a survey form along with the location.

2.2 Personal contamination and equipment monitoring

All personnel and equipment were thoroughly monitored upon exiting the attic space, again using Mini 900 type EP15 probe contamination monitors.

3 Results

3.1 Results of Survey

There were 4 discrete areas of contamination discovered in the attic space as detailed in the table below.

Location on Plan (Figure 2)	Contamination (cps)	Area of Contamination (cm^2)	Activity (Bq)*
1	30	<1	62.7
2	4	<1	8.36
3	20	<1	41.8
4	8	<1	16.72

Table 1 Details of Contamination.

* estimated on the basis that the contamination is Pb-210

The total activity detected in the attic space was of the order of 100 Bq (based on Pb 210).

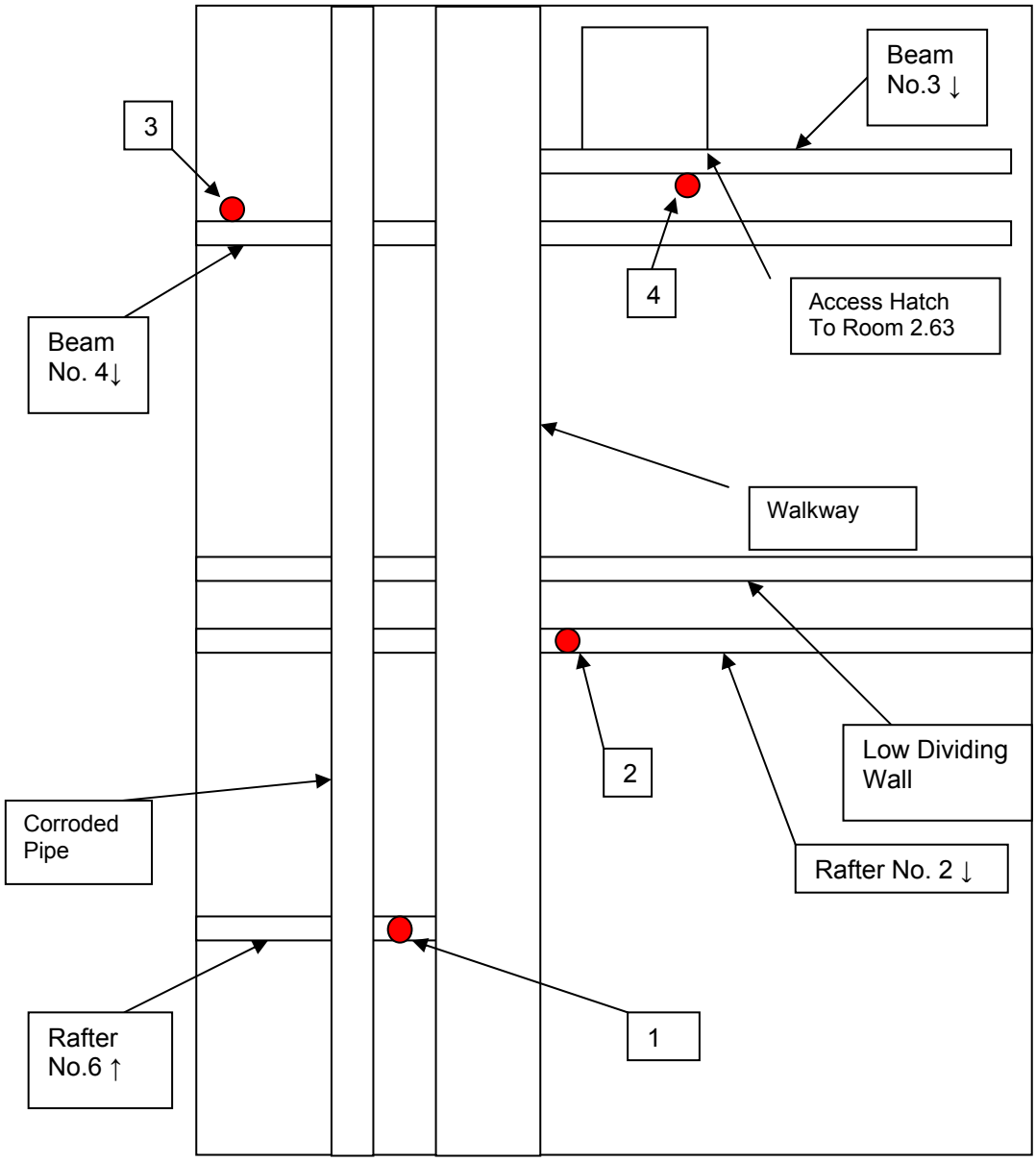


Fig. 2 Locations of Contamination

3.2 Personal contamination and equipment monitoring

All personnel and equipment were found to be free of detectable contamination.

4 Conclusions

The survey identified four highly discrete areas of contamination, each of which was of low level, and in total was of the order of 100 Bq (assuming the contaminant was Pb-210). Two areas of contamination were associated with dust and were easily removed and bagged, the other two being less easy to remove and were left in place. In the absence of any planned provision for radioactive waste, all the waste was left within the loft space.

In terms of the radiological significance of the activity identified, there is no significant external radiation risk associated with such a low activity whether that activity was either of the contaminants associated with the building (i.e. Pb-210 together with its decay products or Ra-226, with its decay products). In terms of internal radiation, if the whole activity was taken into the body of a single employee by inhalation, the committed effective dose received would be less than 2% of the annual limit, and below the level at which the risks would be considered to be occupationally significant. A further illustration of the low significance of the activity found is that it represents only 1 % of the activity which, if it were to be used by an employer for the first time, would require notification to the HSE under Regulation 6 of The Ionising Radiations Regulations 1999.

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 (Coupland 1) Refurbishment Area, all the dust and debris would need to be removed prior to a final systematic high-coverage survey.

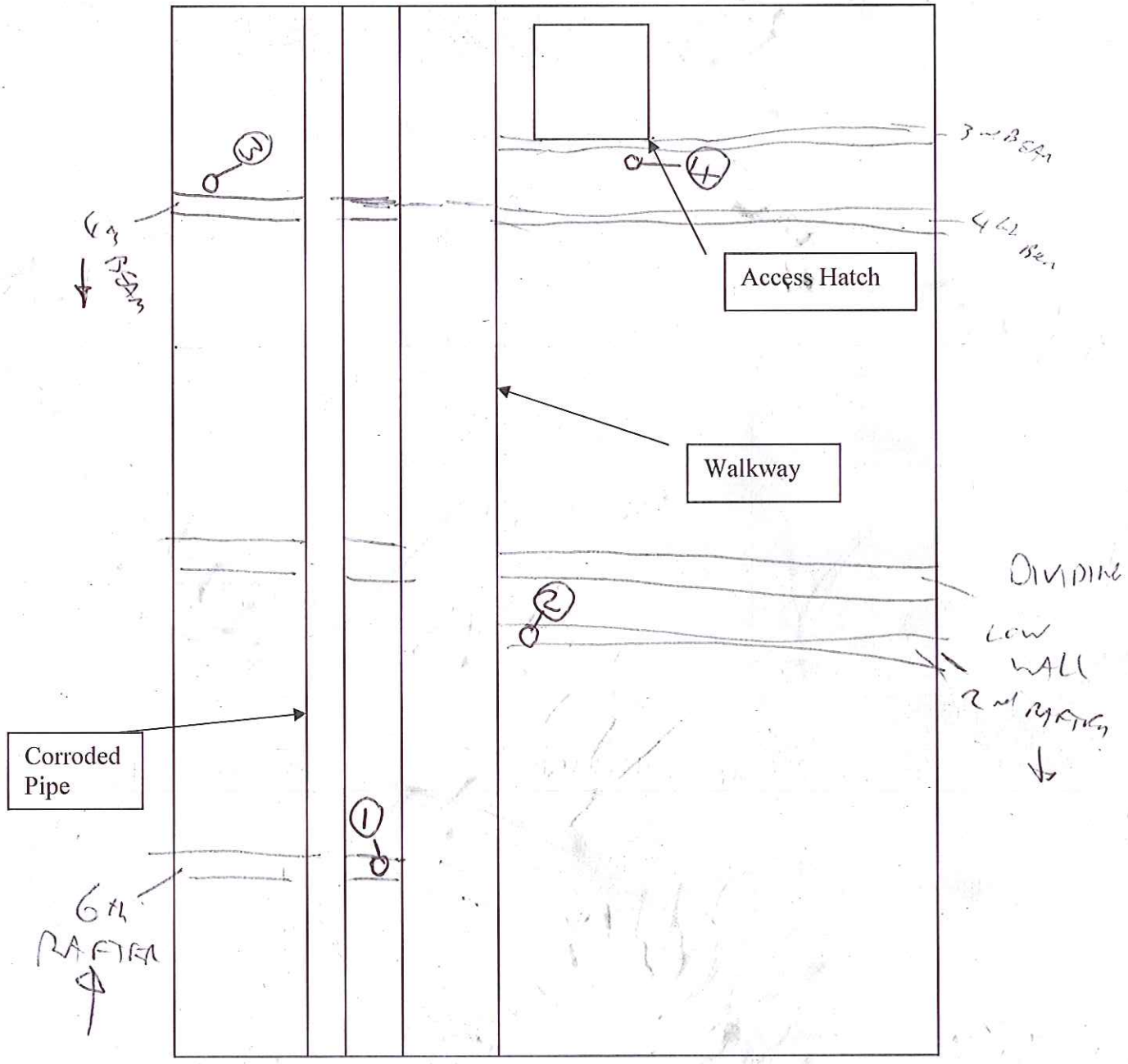
In addition, as part of the scope of work, Serco Radiation Services also ensured the radiological health and safety of those working in the attic. Personal contamination monitoring of those leaving the attic was undertaken, and confirmed the absence of radiologically significant levels. In the absence of significant contamination being identified, airborne contamination monitoring was not undertaken on this occasion.

Appendix A Survey Form

A copy of the survey form is appended on the following two pages.

Survey Sheet for Rutherford Building Attic space above rooms 2.57 & 2.58

Instrument Type	Serial No.	Background (cps)
Mini 900 EP15	1610	1
Mini 900 EP15	1646	1



Location on Map	Max Contamination (cps)	Mean Contamination (cps)	Area of Contamination cm^3
1	30	25	1
2	4	3	1
3	20	20	1
4	8	6	< 1
5			
6			
7			
8			
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Surveyed by: A. PLANT + R. PRICE Date: 18-2-10

Signed: .....