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Site Visit Report

Project:	**Scarborough Hospital Pathology**	**Job No:**	
Produced By:	**JN**	**Date:**	**20-12-2021**
Date of Site Visit:	**09-12-2021**	**Time of Site Visit:**	**10:00 am**
Visit By:	**JN**	**Weather:**	**Dry/Overcast**

Our instructions were received from:

YTHFM LLP – Ross Chamberlain – Building Services Manager - Scarborough Hospital Pathology

Purpose of Site Visit:

To visit Scarborough Hospital Pathology department to review the reported reinforced autoclaved aerated concrete (RAAC), foamed concrete plank roof construction.

Observations

Following a roof survey carried out by Sika of the Pathology Lab roof, it was discovered to be of Reinforced autoclaved aerated concrete (RAAC) plank construction. RAAC is a lightweight form of concrete used primarily for roofs from the mid-fifties to the mid-eighties. The limited durability of RAAC roofs has long been recognised; however recent experience (which includes two roof failures with little or no warning) suggests the problem may be more serious than previously appreciated.

The roofing contractor Sika have refused to carry out the refurbishment of the roof / replacement of the asphalt covering with a Sika 20 year guaranteed liquid roofing system. Sika have requested that the roof should be inspected by a structural engineer in order to determine if re-covering the roof is viable.

Curtins have been instructed to carry out a review of the roof structure and advise the next appropriate steps. Scarborough Pathology is a busy laboratory with all floor spaces in constant use by hospital staff. Consequently, to minimise disruption it was only possible to view two areas of the roof planks soffit, area 1 in the Autoclave room and area 2 in the central corridor area. The ceiling tiles are difficult to remove for access due to the slot and slide support track system however a ceiling tile was removed in both area 1 and 2. The distance between the ceiling and the soffit of the slab is only approximately 200 to 400mm making it difficult to see much of the

underside as only small, localised sections of slab can be adequately seen from the removal of one tile.

Photograph 1. Showing the roof of the Pathology Lab building. The numbers indicate the approximate locations of access to the u/s of the roof slab.


Photograph 2. (Location 1 in the Autoclave room), shows a spalled section of roof plank. Debris from the spalling could not be seen on the ceiling tiles. The aerated core of the lightweight concrete plank can be clearly seen to the damaged area, confirming that that the planks are reinforced autoclaved aerated concrete (RAAC).

Photograph 3. (Location 1 in the Autoclave room), shows the soffit of the roof planks and some redundant pipe supports.

Photograph 4. (Location 1 in the Autoclave room), shows the soffit of the roof planks and some redundant pipe supports can also be seen screwed to the planks.

Photograph 5. (Location 2 in the central corridor area), shows the soffit of the roof planks.

Photograph 6. (Location 1 in the central corridor area), shows the rough surface of the soffit of some roof planks. Some brown staining possibly from corroding reinforcement can be seen.

Photograph 7. (Location 1 in the central corridor area), shows the soffit of the roof and interface with a concrete wall.

Photograph 8. (Location 1 in the central corridor area), shows the soffit of the roof

Photograph 9. (Location 1 in the central corridor area), shows the interface with a concrete column.

Photograph 10. (Location 1 in the central corridor area), shows the soffit of the roof with restricted space above the ceiling and numerous services / insulation etc.

Discussion

Initial inspection of the underside of the reinforced autoclaved aerated concrete (RAAC) planks and review of the photographs did not reveal any major problems however, due to the restricted view and very limited access it is not possible to draw any realistic or considered conclusions with regard to the condition of the RAAC concrete planks.

To carry out an adequate and satisfactory structural survey of the RAAC concrete plank roof we would have to conduct the following as a minimum to obtain sufficient information to be able to make a judgment on the current condition of the roof slab.

1) Sufficient and adequate access would be required to be able to clearly view 40 to 50% of the roof slab soffit. Several sections of ceiling tiles would need to be removed in numerous pre-selected locations to achieve this.
2) The soffit would initially be inspected to review and measure deflection of the RAAC units, checking for excessive deflection or differential deflection between individual units.
3) The soffit is to be checked for water ingress, water staining or damage.
4) The soffit would be checked for signs of cracking on the surface of the concrete planks.
5) A suitable and adequate cover meter is to be used to check and confirm the presence of transverse and longitudinal reinforcement.
6) Check the soffit for rust staining and spalling concrete, checking for signs of corroded reinforcement.
7) The supports / bearings of the RAAC units is also a common area of failure, the concrete panels need to be inspected in the area around the supports for signs of cracking, rainwater penetration, reinforcement corrosion and general inconsistencies between the adjacent panels.
8) Some intrusive / breaking out works will also likely be required to expose the reinforcement in several locations on the planks for examination, to be selected during the inspection.
9) Some breaking out works will also be required to inspect, review and measure the plank bearings at several locations.

The ongoing frequency of future necessary inspections can be determined following the findings of an initial full survey of the type described above.

Asbestos is known to be present in the building and in order to carry out the above intrusive survey works safely; a specialist asbestos removal contractor may have to be brought in to clean and remove any asbestos within the ceiling space and the soffit of the concrete planks.

It is likely that the necessary survey works will be very intrusive and cause disruption to the Pathology staff

The BRE conducted tests and their report concluded that RAAC planks gave adequate warning through visual deterioration before failing. However, two recent failures have shown that this can no longer be relied upon, and it is therefore necessary to conduct a full and intrusive survey to determine the condition of the RAAC units.

Recommendations

The roof units are reinforced autoclaved aerated concrete (RAAC) planks and we therefore recommend, a full structural and intrusive survey should be carried out, generally as described above in order to determine the current condition of the aerated concrete units.

Following the results of the structural survey, it should be possible to determine the current condition of the roof planks and any future inspection regime can be determined.

A competent asbestos removal contractor should be engaged to inspect and remove as required any asbestos within the ceiling void and roof soffit to allow safe inspection and intrusive works to be undertaken.

Summary

A full structural survey should be carried out, as described in discussion section above[JN1].

A future inspection regime should be determined.

Inspect and remove as required any asbestos within the ceiling void and roof soffit.

Information required:

N/A

Health and Safety

Asbestos is known to be in the Pathology building, appropriate action may be required.

Signatory

This report has been prepared on the basis of visual observations made during our inspection and without the benefit of any site investigations or monitoring, nor any tests on drains or other services. Our report is provided for the sole use of the named client and is confidential to the client and his professional advisors. All parts of the property that were covered, unexposed or inaccessible were not inspected and therefore we are unable to report that such parts are free from rot, beetle attack, insect infestation or other defects.

John Newby

John Newby
For and on behalf of
Curtins Consulting Ltd

Distribution: **Ross Chamberlain – Building Services Manager**