

## APPENDIX A : Document 1

**Dissemination of guidance on Reinforced Autoclaved Aerated Concrete (RAAC) provided to local authorities via the Scottish Heads of Property Services and the Association of Directors of Education in Scotland networks.**

**From:** [Redact S38(1)(b)]

**Sent:** Thursday, May 11, 2023 3:51 PM

**To:** [Redact S38(1)(b)]

**Subject:** Reinforced Autoclaved Aerated Concrete (RAAC) - Note to SHOPS & ADES

Afternoon [Redact S38(1)(b)],

I would be grateful if you could disseminate the below background information and guidance regarding Reinforced Autoclaved Aerated Concrete (RAAC) materials in Scottish schools through the ADES and SHOPS networks?

We are aware that West Lothian Council has undertaken extensive work on its school estate in relation to RAAC and we are scheduled to meet with the Council next week for further discussions. However, are you aware of other authorities also undertaking work to identify RAAC within their school estate, and put appropriate monitoring and maintenance measures in place?

### **What is RAAC?:**

Reinforced Autoclaved Aerated Concrete (RAAC) is a lightweight construction material that was commonly used in construction between the 1960s and late 1980s. Although the use of RAAC for construction of new buildings was discontinued in the late 1980s, it is still found in many buildings across the UK. While RAAC may have had a number of advantages, planks are susceptible to moisture and water ingress which can promote corrosion of the embedded reinforcement. RAAC panels are usually within the structure of the roof, wall or floor so their condition and any deterioration can be hidden. This makes visible assessment of their condition less accessible which may increase the risk of catastrophic failure without warning.

### **Guidance:**

In 2019 the Standing Committee on Structural Safety (SCOSS) published a safety alert '[Failure of reinforced autoclaved aerated concrete \(RAAC\) planks \(cross-safety.org\)](#)' which identified concerns about the structural safety of this form of construction.

The Health & Safety Executive have produced an [Education e-bulletin](#) in order to reinforce these key messages. This also highlighted the need for duty holders to identify school buildings incorporating RAAC planks and take action where necessary, including the need for school buildings to be inspected, and their condition assessed to ensure that monitoring and maintenance arrangements are adequate.

Additionally, the Institution of Structural Engineers (IStructE) have published guidance titled '[Reinforced Autoclaved Aerated Concrete Panels – Investigation and Assessment](#)' and in April 2023 published [further guidance](#) on the critical risk factors associated with RAAC panel construction. It includes a proposed approach to the classification of these risk factors and how these may impact on the proposed remediation and management of RAAC.

In addition, please see the attached document produced by NHS Scotland Assure regarding their RAAC Survey Programme. NHS Scotland Assure are happy for this information to be disseminated to the ADES and SHOPS networks and would welcome the opportunity to meet with local authorities to discuss their work to date, and the methodology used across the NHS Estate. The contact is [Redact].

Regards,

**[Redact S38(1)(b)]**

**[Redact S38(1)(b)]** | School Funding, Infrastructure & Organisation Unit | Scottish Government

# Reinforced Autoclaved Aerated Concrete (RAAC) - Survey Programme

Meeting with Scottish  
Government  
26<sup>th</sup> April 2023

# Agenda

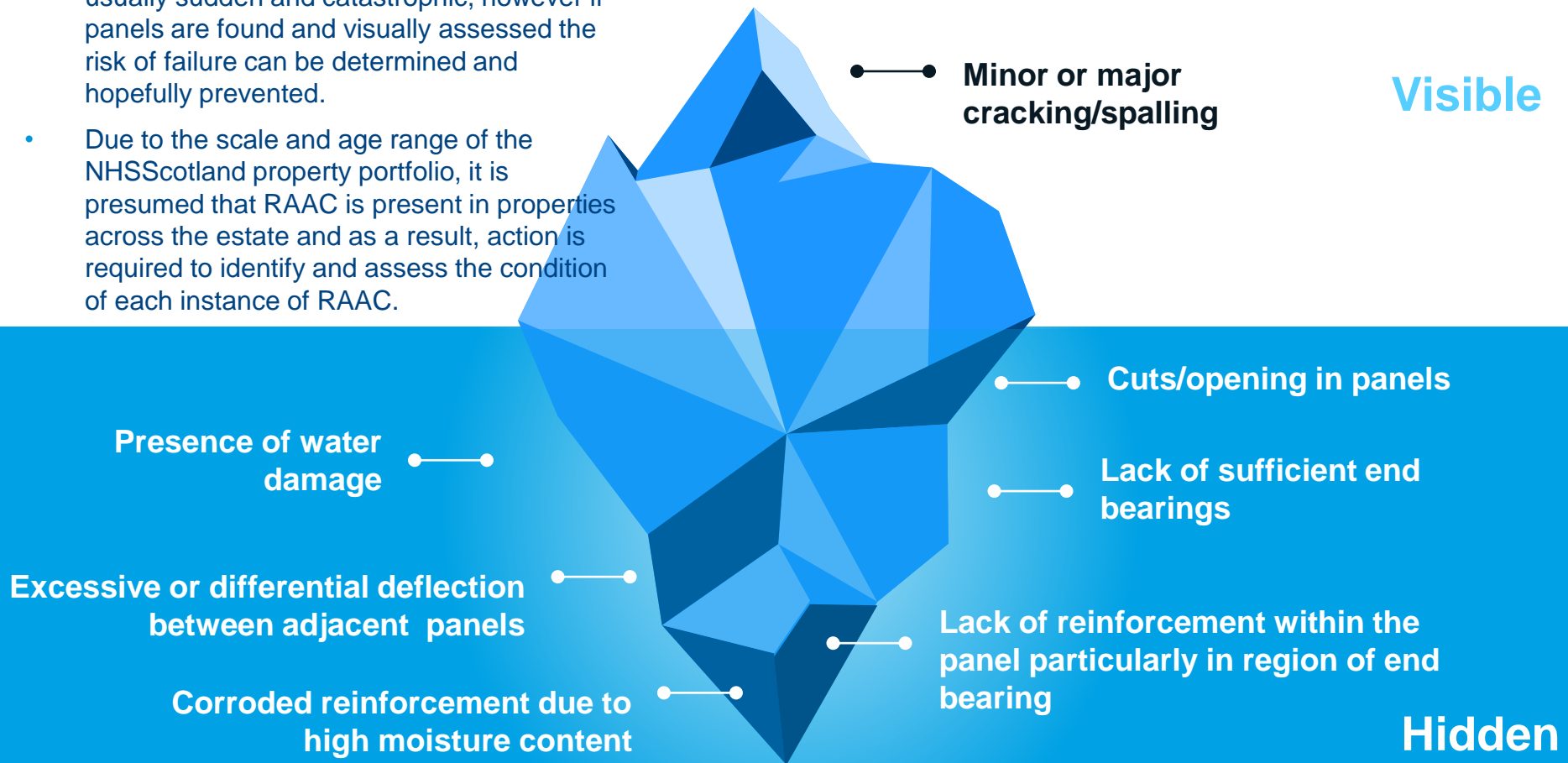
1. Reinforced Autoclaved Aerated Concrete (RAAC) – Background
2. RAAC - Defects
3. Journey to Date (High Level Information Packs (HLIPs))
4. Discovery Phase
5. Pilot Survey Outputs
6. In Summary – What will the surveys tell us?
7. Next Steps

# RAAC – Background

- RAAC is a lightweight prefabricated form of concrete used primarily in roof construction, commonly referred to as RAAC panels, which was used between the 1960s and 1980s typically on low rise buildings, however it can be found in buildings as late as the 1990's.
- RAAC panels can be present, not only in roofs, but in walls and floors also.
- RAAC panels act in the same way as precast slabs with some major differences:
  - There is no aggregate in the concrete mix
  - The form of concrete provides little protection to the corrosion of embedded steel (think of an aero chocolate bar)
  - bituminous or cement latex coating is applied to the reinforcement
- Experience of RAAC panel failure includes two roof failures in schools in England with little or no warning before collapse.

# RAAC – Defects

- The likelihood of failure is directly linked to the condition of the panel as RAAC has limited durability. The presence of any of the following defects increased the risk of collapse:
- The below defects are normally hidden behind finishes which is why failure is usually sudden and catastrophic, however if panels are found and visually assessed the risk of failure can be determined and hopefully prevented.
- Due to the scale and age range of the NHSScotland property portfolio, it is presumed that RAAC is present in properties across the estate and as a result, action is required to identify and assess the condition of each instance of RAAC.



# Journey to Date



[REDACTED - COMMERCIAL IN CONFIDENCE]

# Journey to Date



**STAGE 1**

REDACTED - COMMERCIAL IN CONFIDENCE]



# Journey to Date



**STAGE 2**

[REDACTED - COMMERCIAL IN CONFIDENCE]

# Journey to Date



**STAGE 3**

[REDACTED - COMMERCIAL IN CONFIDENCE]

# Journey to Date



**STAGE 3**

[REDACTED - COMMERCIAL IN CONFIDENCE]

# Journey to Date



**STAGE 4**

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# Discovery Phase



# Discovery Phase

## Desktop Study / Information Gathering

- The desktop study will be utilised to determine where the structure is to be surveyed during the visit with any finishes removal as required. The location of each of the proposed inspection areas are to be discussed by the Survey Partner.
- In the event the information to inform the desktop study is not forthcoming the Survey Partner should use their professional judgement / any publicly available documentation.
- Information gathered includes the following:
  - Site layouts
  - General building layout plans
  - Building structural drawings
  - Building elevation drawings
  - Asbestos registers



# Discovery Phase



## Prioritisation

- Each of the 402 properties are categorised based on the likelihood of them containing RAAC based on the presence of RAAC indicators picked up on during the desktop study.
- The categories are defined as:
  - High
  - Medium
  - Low
- Discovery Phase Surveys are then prioritised in terms of severity of risk and geographically to keep the programme as efficient as possible.

# Discovery Phase



## Pilot Surveys

- Purpose of pilot surveys is to determine the suitability of the scope of works for the remaining surveys.
- 3 Properties with high possibility of containing RAAC chosen as part of the pilot surveys.
- 2 out of 3 of the properties contained RAAC.
- No areas of concern however action required on a panel on one of the building elevations over a roller shutter door.



# Discovery Phase

## Discovery Phase Surveys

- Survey Partners will coordinate with the Boards to ascertain any access limitations etc.
- Areas suspected to contain RAAC that cannot be accessed will be noted and highlighted within reports and drawings to clearly show areas that may still be at risk for possible RAAC.
- All reasonable measures should be taken to ascertain the presence and visual condition of RAAC panels. This includes, but is not limited to:
  - assessment of roof condition by safe access to roofs not visible from the underside,
  - condition of flashings and waterproofing,
  - presence of vegetation etc.



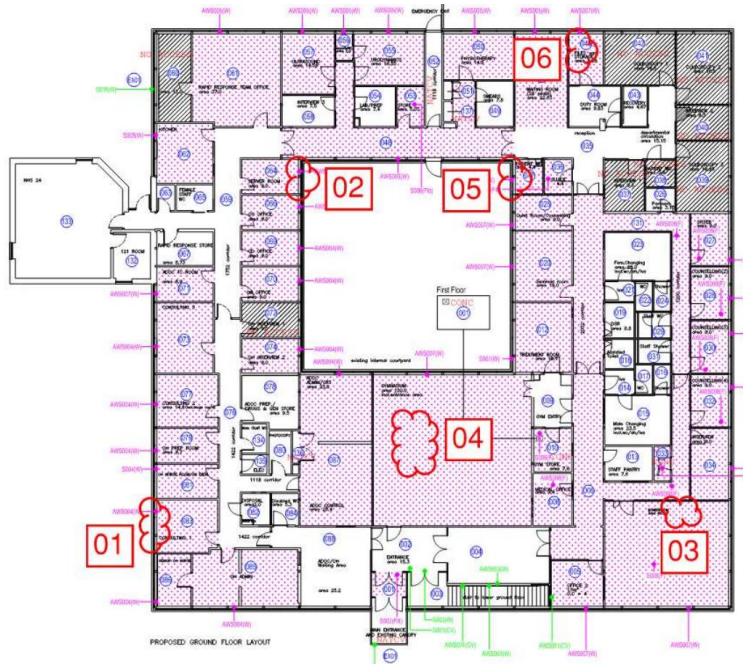
# Discovery Phase

## Discovery Phase Surveys

- Output for red panels: full details of any remedial actions necessary to secure the panel for a period up to 1 year..
- Output for amber panels: Detail reasoning for categorising panel as amber along with recommendation of timescale for future monitoring.
- The report will be a fully written Structural Report.
- All drawings accompanying reports should clearly highlight areas NOT ACCESSED.



# Pilot Survey Output



Location	Comments	Image
01	<p><b>RAAC observed</b> <span style="background-color: #90EE90;">Inspect in 5 years</span></p> <p>The external leaf of the façade is pre-cast concrete lined with polystyrene. It is bolted to the steel frame.</p> <p>The internal leaf is RAAC, rendered on the inside face, and vertically bolted to the steel frame.</p> <p>The roof is constructed with RAAC planks supported on steel trusses.</p> <p>Where exposed to view the RAAC is dry and free from distress</p>	
02	<p><b>RAAC observed</b> <span style="background-color: #90EE90;">Inspect in 5 years</span></p> <p>The external leaf of the façade is pre-cast concrete lined with polystyrene. It is bolted to the steel frame.</p> <p>The internal leaf is RAAC, rendered on the inside face, and vertically bolted to the steel frame.</p> <p>The roof is constructed with RAAC planks supported on steel trusses.</p> <p>Where exposed to view the RAAC is dry and free from distress</p>	

- Identify exact locations where survey was carried out within the property.
- Assess the condition of all RAAC found.
- Apply RAG Rating to RAAC found and provide overall RAG rating for property.
- Provide remedial / monitoring recommendations

MONITORING DECISION MATRIX A				
VISUAL CRITERIA WITH PRESENCE OF WATER				
		MAJOR CRACKING/ SPALLING	MINOR CRACKING/ SPALLING	NO VISIBLE DEFECT
LEVEL CRITERIA	SPAN/100 < DEFLECTION	REMEDIAL SOLUTION	REMEDIAL SOLUTION	REMEDIAL SOLUTION
	SPAN/200 < DEFLECTION < SPAN/100	REMEDIAL SOLUTION	REMEDIAL SOLUTION	REMEDIAL SOLUTION
	SPAN/250 < DEFLECTION < SPAN/200	REMEDIAL SOLUTION	VISUAL AND LEVEL SURVEY ANNUALLY	VISUAL AND LEVEL SURVEY ANNUALLY
	DEFLECTION < SPAN/250	REMEDIAL SOLUTION	VISUAL AND LEVEL SURVEY ANNUALLY	VISUAL AND LEVEL SURVEY ANNUALLY

MONITORING DECISION MATRIX B				
VISUAL CRITERIA WITHOUT PRESENCE OF WATER				
		MAJOR CRACKING/ SPALLING	MINOR CRACKING/ SPALLING	NO VISIBLE DEFECT
LEVEL CRITERIA	SPAN/100 < DEFLECTION	REMEDIAL SOLUTION	REMEDIAL SOLUTION	REMEDIAL SOLUTION
	SPAN/200 < DEFLECTION < SPAN/100	REMEDIAL SOLUTION	VISUAL AND LEVEL SURVEY ANNUALLY	VISUAL AND LEVEL SURVEY ANNUALLY
	SPAN/250 < DEFLECTION < SPAN/200	REMEDIAL SOLUTION	VISUAL AND LEVEL SURVEY EVERY 5 YEARS	VISUAL AND LEVEL SURVEY EVERY 5 YEARS
	DEFLECTION < SPAN/250	REMEDIAL SOLUTION	VISUAL AND LEVEL SURVEY EVERY 5 YEARS	VISUAL AND LEVEL SURVEY EVERY 5 YEARS

## In summary - what the surveys will tell us

- Confirmation of the presence or absence of RAAC for all properties deemed to be at risk of containing RAAC.
- Identification of RAAC panels found with appropriate RAG status.
- Clear recommendations for future work required to remediate or monitor RAAC panels found along with budget costs for recommended remedial works.



# Next Steps

- Conclude desktop survey & prioritisation
- Discovery phase proposal
- Commence discovery surveys & reporting
- Boards to implement any recommendations to monitor/maintain RAAC identified
- Determine next steps – potential for more intrusive surveys



# Questions?

## Contact Details:

[REDACTED]  
[REDACTED]

