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Reinforced Autoclave Aerated Concrete (RAAC) – Q+A

Background

What is Reinforced Autoclave Aerated Concrete or RAAC?

Reinforced Autoclave Aerated Concrete (RAAC) is a lightweight prefabricated form of concrete. Commonly referred to as RAAC panels, it was used between the late 1950's and 1980's, typically on low rise buildings, however it can be found in buildings as late as the 1990's, it was quicker to produce and easier to install. Despite its name, it is very different to traditional concrete although, externally, it looks similar. It is aerated, with no aggregate in the concrete mix, which gives a 'bubbly' appearance - like a sponge - and is therefore less durable than traditional concrete.

Where is RAAC commonly found?

RAAC was used in a wide range of schools, colleges, hospitals and other public buildings and whilst used primarily in flat roofing, it is also evident in some pitched roofs, floors and walls.

Why is RAAC a potential risk?

RAAC can be susceptible to failure when exposed to moisture. The 'bubbles' can allow water to enter the material. This moisture can also cause decay in any reinforcement steel present in the material. In addition, the end bearing of planks is often insufficient, by comparison to modern standards.

In February 2022, a report was published by the Institution of Structural Engineers RAAC Group following an incident in England in 2018 and an initial safety alert in 2019 issued by the Standing Committee on Structural Safety (SCOSS). Further guidance was published by the Institution of Structural Engineers in April 2023.

It is now recognised that RAAC panels have material and construction deficiencies making them less robust than traditional concrete.

Current assessment guidelines

The Institution of Structural Engineers has published supporting guidance on the investigation and assessment of RAAC panels both in February 2022 and April 2023. This guidance highlights a number of risk factors to be considered as part of the assessment process i.e. end bearing; anchorage reinforcement; cut panels; cracking; builders work/modifications; water ingress; deflection and loading changes.

The outcome of the assessment process establishes a risk classification of the panels/building with these being;

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- **Critical risk** - Requires urgent remedial works which may include taking out of use or temporary propping to allow the safe ongoing use of a building.
- **High risk** - Requires remedial action as soon as possible.
- **Medium risk** - Requires inspection and assessment on a regular basis, e.g., annually.
- **Low risk** - Requires inspection and assessment occasionally, say 3-year period depending on condition.

RAAC in Aberdeenshire

What steps did Aberdeenshire initially take?

In response to initial SCOSS alert in 2019, officers reviewed all Aberdeenshire Schools constructed 1950's – early 1990's. This was by way of a desktop assessment of roof construction through review of record construction details. Review is continuing across the remainder of the property portfolio to identify the presence of RAAC.

Does Aberdeenshire have any public buildings with RAAC?

As part of the initial desktop assessment, one site was identified as having RAAC, with this being in two locations at Mackie Academy (above the, then, Swimming Pool, and Music Rooms) whilst a number of other properties meriting further investigation as part of scheduled condition surveys with this due to limited information, rather than of any particular concern. As part of that wider assessment a further school with RAAC was subsequently identified at Westhill Academy (small Music Block which was a single storey extension from 1980's). Additionally, review has also identified presence of RAAC to the roof of the Members Building at Woodhill House.

What further action has Aberdeenshire taken?

Following identification of RAAC at Mackie Academy, area at former Swimming Pool was subject to an intrusive investigation by Structural Engineers in February 2021 in advance of planned works in this area. The investigation, and assessment, was undertaken in-line with guidance in place at that time. This investigation concluded that **no remedial action was required to the roof RAAC** or to the prestressed concrete rafters.

Notwithstanding the above, previously inspected installation at Mackie is to be re-visited, and inspected, in September along with Music rooms with these intrusive investigations to be in-line with current guidance as published April 2023.

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Identified installation at Westhill was previously visually inspected by a Building Surveyor and Structural Engineer, with the condition of the installation raising **no immediate safety concerns**. However, the installation was subject to intrusive investigation and assessment on 7 September 2023 to establish end bearing lengths, reinforcement arrangements, and measure actual deflection. Initial assessment notes that end bearings are a minimum of 75mm with longitudinal and transverse reinforcement extending over end bearing, with any deflection in panels being calculated. **No remedial works are required at this time**. Installation will be subject to regular inspection as outlined in the Institution of Structural Engineers guidance.

Identified installation within Members Building at Woodhill House has also been visually inspected by a Building Surveyor and Structural Engineer, with the condition of the installation raising **no immediate safety concerns**. However, the installation will be subject to intrusive investigation and assessment in September.

All investigations are being undertaken in-line with the Institution of Structural Engineers guidance for the assessment of RAAC and are required to fully assess the condition of the installation and to inform future activities.

What happens next?

Review is continuing across the remainder of the property portfolio to identify the presence of RAAC with this progressing in addition to an ongoing programme of survey works. Any subsequently identified installations of RAAC will be investigated and assessed by Structural Engineers, and, subject to condition, will be regularly monitored and inspected, or any remedial work found to be necessary will be undertaken.

While all pertinent professional guidance has been followed to date, we will continue to ensure we comply with any further guidance coming from government and/or relevant professional bodies.

Is council housing affected?

Initial desktop analysis, and review of previous assessments of “non-standard” construction house types, does not indicate presence of RAAC.

Are private and commercial buildings affected?

The Institution of Structural Engineering advises that any private owner with properties constructed between the mid-1950s and mid-1990s should conduct a survey of the building to identify or eliminate the possibility of RAAC within the fabric where necessary and assess whether remedial work is required.