Reinforced Autoclaved Aerated Concrete (RAAC) - guidance summary

Whether your Reinforced Autoclaved Aerated Concrete (RAAC) concerns relate to health and safety, dilapidations, service charges, tenant alterations, due diligence or project work, Hollis are here to help.

What is RAAC?

- Autoclaved Aerated Concrete (AAC) is a lightweight cementitious material developed in Sweden in the 1920's and introduced into the UK in the 1950's.
- AAC was originally used to form lightweight thermal blocks but was subsequently reinforced to create larger RAAC planks.
- RAAC planks are aerated and contain no coarse aggregate, meaning the material properties and structural behaviour differ significantly from traditional concrete. On the one hand it is lightweight and has good thermal properties, but it is also weaker and more permeable.
- RAAC planks have a projected service life of 30 years, and many installations will therefore be life-expired. However, it is important to note that such installations can perform adequately, and safely, beyond this period if the planks themselves, and protective installations such as waterproof coverings, have been well designed and maintained.

Where is it found?

- Most of the talk in the media has been about public sector buildings – schools and hospitals in particular – but RAAC was also used by the private sector.
- RAAC was most commonly used as precast roof planks in flat roof construction but occasionally in pitched roofs, floors, and wall panels in both loadbearing and non-loadbearing arrangements.
- RAAC was mainly used in buildings up until the mid-1990's, and it is this period of buildings that is under scrutiny.

Why is it a concern?

- The industry has had concerns about RAAC for some time; however, it was previously thought that the mode of failure would be general deterioration rather than sudden failure.
- Things changed in late 2018 when a flat roof to part of a school collapsed suddenly. The roof was formed from RAAC planks, and the mode of failure was found to be a more fundamental issue with a lack of reinforcement over the end bearing support leading to shear failure.
- The Standing Committee on Structural Safety (SCOSS) subsequently issued an alert, setting out their concerns with the material, and providing advice as to how

to identify, risk assess, and manage/remediate it. You can also visit their Theme/ knowledge sharing page here.

- More recently the Institution of Structural Engineers (ISE) have produced guidance notes, with the latest dated April 2023, and experts at Loughborough University are currently conducting further research/investigations.
- Findings from the 2018 incident, combined with both historic and more recent research, identified a number of concerns with RAAC planks and how they were used:
    - Inadequacies in the design and construction of the planks, their reinforcement, and the end bearing support leading to excessive deflection, cracking, and in limited cases sudden failure.
    - Corrosion of the reinforcement as a result of roof leaks, service leaks, interstitial condensation, and changes in the internal environment.
    - Alterations completed during or post-construction such as trimming of planks and formation of service penetrations, in turn affecting the structural integrity of the planks.
    - Addition of unanticipated loads, for example plant located on top of, or suspended from, the roof.
    - Cracking to the planks as a result of the above and also due to significant thermal changes.

What needs to be done?

- Establish whether RAAC is present in your buildings:
    - Buildings constructed prior to the mid-1950's and after the mid-1990's are less likely to contain RAAC, and unless there is evidence to suggest otherwise they can be discounted.
    - Not all buildings built between the mid-1950's to mid-1990's will contain RAAC, but it is important to identify those that do. A desktop exercise should initially be completed followed by a site-based inspection.
    - A guide has been created by the Department for Education (DFE) to enable managers of educational buildings to identify if their buildings have RAAC, though appropriately experienced chartered surveyors or structural engineers are better placed to undertake this work.
- Undertake a structural assessment of any RAAC identified:
    - Once identified, a structural engineer will need to plan and complete a structural assessment, incorporating specialist and/or intrusive investigations as deemed necessary.
    - The ISE has set out a procedure to be followed in their most recent publication on the subject detailing the required survey methodology, risk factors to be assessed, and the approach to determining overall risk.
    - The nature of the risks found will determine their remedial recommendations.
- Plan and complete recommended remedial works:
    - The scope of required remedial works will depend on the findings of the assessment; however, it could include the addition of secondary end

bearing supports, more comprehensive support structures, removal and replacement of individual RAAC planks, or replacement of the entire RAAC system.

How can Hollis help?

- We have a large team of technical surveyors across the UK and Europe who can undertake the desktop and site-based assessments to locate RAAC within buildings and provide a brief to the structural engineer.
- We have teamed up with several structural engineering firms to ensure a streamlined process from identification through to investigation, reporting, and remedial works.
- We have specialists in health and safety, dilapidations, service charges, tenant alterations, due diligence, project work and more, and can provide you with high quality advice regardless of your situation.

Get in touch

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