



Department
for Education

Reinforced Autoclaved Aerated Concrete (RAAC): Identification guidance

August 2023

Document Control

Document Owner:

Deputy Director, Technical Standards, Department for Education

Document Originator:

Building Safety Team, Technical Standards, Department for Education

Document Properties:

File Name	GUIDE-DFE-XX-XX-T-X-9002-Reinforced Autoclaved Aerated Concrete Identification Guidance
File Description	Reinforced Autoclaved Aerated Concrete: Identification Guidance
Current Revision	C02
Current Status	A

Revision History

Revision	Status	Date	Author	Amendment
C01	A	2022-12-14	RRE	First issue of guidance
P02	S2	2023-08-29	RRE	Update to existing guidance
C02	A	2023-08-30	RRE	Removed reference to use of a 'hammer' in identification and layout updated

Contents

Summary	5	Appendix A: DfE Assessment Survey Programme for state-funded education settings:	17
Review date	5	Appendix B: Gather Information	18
Who is this publication for?	5	Appendix C: Access requirements:	19
Definitions	6	Image Credits	20
Introduction	7		
Why is RAAC a potential risk?	8		
Flowchart of guidance stages	9		
Stage 1A: Identifying RAAC	10		
Quick guide to identifying RAAC in buildings	11		
Where to look?	12		
Appearance & Texture	12		
Stage 1B: Appoint an appropriately qualified building surveyor or structural engineer	15		
Appointing a building surveyor	15		
Appointing a structural engineer	15		
Stage 2: Actions to be taken	16		
Actions to be taken by responsible bodies of state-funded education settings in England if RAAC is suspected or confirmed	16		

List of figures

Figure 1: Flowchart of guidance stages	9	Figure 7: Underside of a cracked RAAC panel.....	12
Figure 2: A fragment of RAAC showing its 'bubbly' appearance	10	Figure 8: Profile of RAAC panels	13
Figure 3: Example of RAAC in flat roofs and floors.....	12	Figure 9: V-shaped grooves at 600mm spacing.....	13
Figure 4: Example of RAAC in walls	12	Figure 10: Example of deflected RAAC panel.....	13
Figure 5: Example of RAAC on internal wall face	12	Figure 11: Example of deflected RAAC panel.....	13
Figure 6: Aerated appearance of RAAC	12		

Summary

This publication provides non-statutory guidance from the Department for Education (DfE). This guidance has been produced to help responsible bodies from the education sector (school, nursery and college leaders, staff and governing bodies) understand how to identify Reinforced Autoclaved Aerated Concrete (RAAC) and procure a building surveyor to confirm if RAAC is present in their settings.

Review date

This guidance will be reviewed no later than December 2024.

Who is this publication for?

This guidance is for:

- local authorities (for community, voluntary-controlled schools and maintained nurseries)
- academy trusts (for academies and free schools)
- governing bodies (for voluntary-aided schools)
- school/college leaders, staff and governing bodies in further education colleges, maintained schools, academies and free schools or other education settings
- building professionals (e.g., structural engineers and building surveyors) who have been commissioned to assist the above clients regarding the identification of RAAC.

Stage 1 of this guidance will be of use to the wider education sector.

Stage 2 of this guidance is specifically for state-funded education estates in England.

Definitions

Terms and acronyms you may come across with respect to RAAC are defined below.

Bearing - The width or distance that a RAAC element (panel or plank) sits on the support, measured from the edge of the support to edge of the panel.

Bending - The force within a structural system that causes deviation from a straight line to a curve.

Compression - The force within a structural system that pushes down or into an element.

Panel - The term to describe the individual RAAC element. May be referred to as 'plank' when considering horizontal elements.

RAAC - Reinforced autoclaved aerated concrete.

Span - The horizontal (or vertical) distance between supports, typically measured from the centreline of the supports. Clear span is often used to describe the distance between the faces of support.

Shear - The force within a structural system that causes slippage on a plane of failure, typically close to a support.

Introduction

This publication provides non-statutory guidance from the Department for Education (DfE). It has been produced to help estates' teams/site managers understand how to identify Reinforced Autoclaved Aerated Concrete (RAAC) panels in floors, walls, eaves and roofs (pitched and flat).

This publication replaces previous guidance issued by the DfE entitled 'Reinforced Autoclaved Aerated Concrete: Estates guidance' dated December 2022.

Why is RAAC a potential risk?

In December 2018, the Department for Education (DfE) and the Local Government Association (LGA) made building owners aware of a recent building component failure in a property constructed using RAAC. In May 2019, the Standing Committee on Structural Safety (SCOSS) raised an alert to emphasise the potential risks from such construction, highlighting the failure of a RAAC panel roof construction within an operational school. This collapse was sudden with no apparent warning.

Since then, we have been made aware of further sudden collapses of RAAC panels in roofs that appeared to be in good condition. It is therefore essential that all responsible bodies undertake work to identify any RAAC they have in their estate following the stages set out in this guidance.

Prior to this, in the 1990s, there had been other concerns raised relating to structural deficiencies in RAAC by both the Building Research Establishment and SCOSS. It was recognised that the in-service performance was poor with cracking, excessive displacements and durability all being raised as concerns.

Flowchart of guidance stages



Stage 1a
Initial RAAC identification

Use the 'Quick guide to identifying RAAC on pages 11-14 to see if you might have RAAC on your education estate

Stage 1a may be undertaken by someone who has responsibility for building or estate management as well as the day-to-day running of the school. Depending on experience, advice may be required from a building professional (see stage 1b).



Stage 1b
If unsure, or where RAAC is suspected, appoint a building surveyor or structural engineer

Refer to page 15 for advice on appointing a specialist consultant

Once RAAC has been suspected or if you are unsure, an appropriately qualified building surveyor or structural engineer should be appointed to confirm if RAAC is present in any of the buildings in your education estate.



Stage 2
For responsible bodies of state funded education estates
Actions to take if RAAC is suspected or confirmed and what happens next

Refer to page 16 and inform DfE if RAAC is confirmed

Log onto the RAAC Questionnaire and inform the Department for Education that you have identified RAAC panels in your education estate.

See Appendix A for information checklist and accessibility requirements

These forms should be undertaken by a person or team familiar with the day-to-day running of the school and with some knowledge of the buildings.

Figure 1: Flowchart of guidance stages

Stage 1A: Identifying RAAC



Figure 2: A fragment of RAAC showing its 'bubbly' appearance

Quick guide to identifying RAAC in buildings

What is RAAC?

The Department for Education is asking all Responsible Bodies (local authorities, academy trusts, dioceses, and college groups) to look for RAAC in their buildings.

RAAC is a lightweight, 'bubbly' form of concrete commonly used in construction between the 1950s and mid-1990s. It is predominantly found as precast panels in roofs (commonly flat roofs, sometimes pitched) and occasionally in floors and walls.

Identifying RAAC

This guide will help you identify where RAAC panels may be present in your buildings. In many cases, RAAC panels can easily be identified if a building's structure is not covered by finishes or decoration (such as ceilings). RAAC panels have some distinctive features as shown on pages 12-13. If you are able to view the structure and identify one or more of these, RAAC may be present in your building.

BE AWARE – if you need to look behind ceilings or finishes you should consult guidance about managing asbestos (see page 14) and the building's asbestos register beforehand.

RAAC Checklist

When looking directly at the structure, (i.e. with no finishes or decoration, can you see one or more of the following?

(See overleaf for photos)

- 1 600mm wide concrete panels (typically)
- 2 Distinctive V-shaped grooves at regularly spacing (normally 600mm in a floor, wall or ceiling)
- 3 Floors, walls or ceilings that are white or light-grey (where they have not been painted)
- 4 Drawings of your buildings that refer to RAAC or mention any of the following suppliers Siporex, Durox, Celcon, Hebel and Ytong

Where to look?

RAAC panels are most commonly found on flat roofs, they may also be found in pitched roofs, floors or walls.



Figure 3: Example of RAAC in flat roofs and floors



Figure 4: Example of RAAC in walls



Figure 5: Example of RAAC on internal wall face

Appearance & texture

RAAC panels are light-grey or white in appearance, the underside of the panels will appear smooth. The inside of the planks will appear bubbly, often described as looking like an Aero bar. Unlike traditional concrete, there will not be visible stones (aggregate) in the panels.



Figure 6: Aerated appearance of RAAC



Figure 77: Underside of a cracked RAAC panel

Stage 1A

Drawings

If you have drawings from the time the building was built or modified, you should review these. Common manufacturers of RAAC panels are Siporex, Durox, Celcon, Hebel and Ytong,

Panel Size & Profile

RAAC panels are typically 600mm (approximately 2 feet) wide although this has been known to vary. Their length will vary, typically up to 6 metres. RAAC panels typically have a chamfer along their edge meaning there is a distinctive V-shaped groove every 600mm in the surface of the roof, floor or wall.

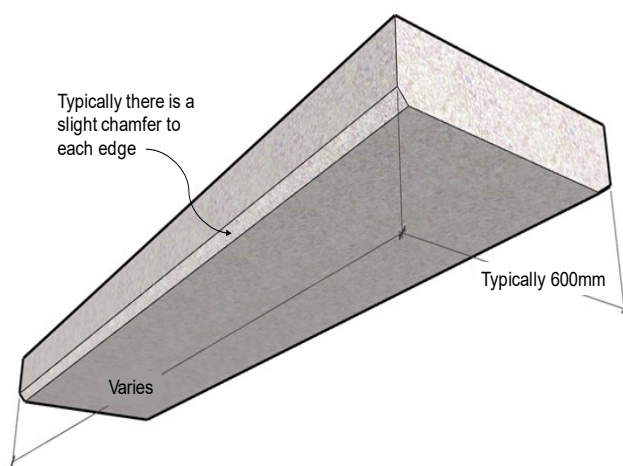


Figure 88: Profile of RAAC panels



Figure 99: V-shaped grooves at 600mm spacing

Softness

RAAC panels are very soft. If you press a screwdriver, screw or nail into the surface of a RAAC panel you will be able to make an indentation in them. **BE AWARE** – if there is a surface covering to the panels you should not try to make an indentation as the covering may contain asbestos.

Bowing / Deflection

RAAC panels may bow or deflect. From the underside of the roof or floor you may see a 'gap' between two adjacent panels.



Figure 1010: Example of deflected RAAC panel



Figure 1111: Example of deflected RAAC panel

Stage 1A

Further information

The following documents provide background about RAAC and give information on how you can safely identify RAAC panels in your buildings.

[Failure of reinforced autoclaved aerated concrete \(RAAC\) planks \(cross-safety.org\)](https://www.cross-safety.org/)

[Managing asbestos in your school or college - Guidance - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/managing-asbestos-in-your-school-or-college)

[Managing my asbestos \(hse.gov.uk\)](https://www.hse.gov.uk/management/management.htm)

[Safe use of ladders and stepladders: overview - HSE](https://www.hse.gov.uk/ladders/)

[Maintenance and Access into Suspended Ceilings - FIS \(thefis.org\)](https://www.thefis.org/)

If you have further queries, please email:

RAAC.Awareness@education.gov.uk

Stage 1B: Appoint an appropriately qualified building surveyor or structural engineer

Having identified that a premises may contain RAAC or if you are unsure, assistance should now be sought from an appropriately qualified building surveyor or structural engineer with experience of RAAC to confirm if RAAC is present in any of the buildings in your education estate. This section provides advice on appointing an appropriately qualified building surveyor or structural engineer.

Appointing a building surveyor

Building Surveyors (BS) for RAAC identification require:

- relevant degree e.g., BSc (Hons) Building Surveying
- 3 years relevant experience assessing building condition, this can be measured in the time elapsed since completion of an appropriate industry related degree or qualification, e.g. BSc (Hons) Building Surveying
- evidence of one-year minimum relevant RAAC project/commission experience

Not essential, but member of Royal Institution of Chartered Surveyors with Building surveyor designation.

Appointing a structural engineer

To ensure that the Structural Engineer has the appropriate qualifications, their credentials should be requested and include:

- Chartered Membership of the Institution of Structural Engineers (CEng MIStructE), and/or
- Chartered Membership of the Institution of Civil Engineers (CEng MICE).

Evidence of experience of the following:

- surveying, assessment and design/specification of remediation works to existing buildings
- visual inspection works and desk-study works
- physical inspection works, either specification and management or physical works
- management and post-completion evaluation of remedial works construction.

Evidence of RAAC experience is essential.

Members of The Institution of Structural Engineers may be found here: [Find an Engineer - The Institution of Structural Engineers \(istructe.org\)](http://istructe.org)

Stage 2: Actions to be taken

Actions to be taken by responsible bodies of state-funded education settings in England if RAAC is suspected or confirmed

This page outlines the actions you will need to take and what happens next.

Inform the Department for Education (DfE) immediately via the DfE Capital Portal

Responsible bodies of state-funded education estates in England who suspect RAAC might be present on any of their sites must:

1. immediately inform the Department for Education via the [DfE Capital Portal](#)
2. **for every site where you suspect RAAC you should answer “Yes” to Question 2.3 (Did the investigations identify RAAC panels being present?)**

To create a Portal account please complete this form [DfE Capital Portal Account Request \(office.com\)](#)

Should you have any difficulties logging onto the portal and informing the department, please email:

RAAC.Awareness@education.gov.uk

What happens next?

Department for Education Assessment Survey Programme

The Department for Education will add your education setting to the DfE Assessment Survey Programme for state-funded education settings in England.

Please email RAAC.Awareness@education.gov.uk with any questions.

Prior to further investigation by one of DfE’s contracted surveying companies, you are required to:

- gather and supply relevant information about your buildings
- list all spaces where additional measures will be required to enable the surveyors to see the surfaces clearly

Refer to the Appendices (pages 17-19) for more information.

Appendix A: DfE Assessment Survey Programme for state-funded education settings

Checklist of information required and access requirements

Prior to further investigation by one of DfE's contracted surveying companies, you are required to:

- gather and supply relevant information about your buildings (see appendix B)
- list all spaces where additional measures will be required to enable the surveyors to see the surfaces clearly (see appendix C)

These actions may be undertaken by someone who has responsibility for building or estate management as well as day-to-day running of the school. Depending on experience, you may decide to seek advice from a building professional.

Appendix B: Gather information

Index	Item	RB issued to DfE (Yes/No)	Notes
1	Construction dates for different blocks/parts of school, alterations, extensions or interventions: i.e., where RAAC panels may have been used, or an adaptation to RAAC panels within existing buildings. <i>Eg. from correspondence, drawn information (see below), LA planning or building control applications, aerial photos, historic maps.</i>		
2	Drawn information: Including historic building plans, sections and elevations together with any detailed construction drawings, re-roofing works, confirmation of any works that may have been undertaken and the reasons why e.g., ponding or leaking.		
3	Record photographs: Photographs during construction, rebuilding works, alterations, repairs etc.		
4	Specifications and/or reports: E.g., building specifications, condition, or investigation reports		
5	Building services systems and revisions: I.e., any adaptations that may have altered loading, required fixings into roof or floor systems, or altered internal environments within a space (humidity, temperature etc). E.g., PVs added to roof; conversion of upper floor to library/science lab; new kitchen.		
6	Asbestos register		
7	Evidence associated with any application for School Re-Building Programme		

Appendix C: Access requirements

List all spaces where access arrangements are needed to see the surface clearly

Room ID/name	Accessibility during term-time	Accessibility during school holidays	Height >3m	Surface concealed by covering or coating e.g. <ul style="list-style-type: none"> Covering: Suspended ceiling Covering: Plasterboard Coating: plaster Coating: asbestos Coating: unknown 	Asbestos register: notes	Roof access e.g., Staircase guard rails around perimeter	RB notes	Notes
e.g. 1 Sports Hall	Wednesday/Thursday 8-2pm	2-6 October 8-5pm	6.7m	n/a		Roof access via staircase, 1.1m guard rail	No scaffold tower	To provide mobile scaffold tower
e.g. 2 Entrance area	Before 8.30am and after 4pm	2-6 October 8-5pm	4m to underside suspended ceiling			n/a (ground floor of 3 storey block)	Caretaker can be available 8am to 5pm to remove tiles as required.	To provide mobile scaffold tower
e.g. 3 Class room 2A	Monday-Wednesday: before 8.30am, after 3.15pm Thurs-Friday: before 8.30am, after 1pm	2-6 October 8-5pm	3m to u/s soffit,	Unknown coating, no ceiling void	Not available		School risk assessment doesn't permit TA use of ladders	To provide ladders. Sample of coating tba*, and coating confirmed prior to visit date.

*Links to documents with information on how you can safely identify RAAC panels in your buildings are on page 16.

Image credits

Figure 1: DfE

Figures 2: Ove Arup and Partners Ltd

Figures 3: Mott Macdonald

Figure 4-6 (inclusive): Ove Arup and Partners Ltd

Figure 7 to 8 (inclusive): Ove Arup and Partners Ltd

Figure 9: David Robertson

Figure 10: Ove Arup and Partners Ltd

Figure 11: Mott Macdonald



Department
for Education

© Crown copyright 2023

This publication is licensed under the terms of the Open Government Licence v3.0 except where otherwise stated. To view this licence, visit nationalarchives.gov.uk/doc/open-government-licence/version/3.

Where we have identified any third-party copyright information you will need to obtain permission from the copyright holders concerned.

About this publication:

enquiries www.education.gov.uk/contactus

download www.gov.uk/government/publications



Follow us on Twitter:
[@educationgovuk](https://twitter.com/educationgovuk)



Like us on Facebook:
facebook.com/educationgovuk