PICK EVERARD

Joint Valuation Board Offices
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RAAC Visual Assessment Report

Client: Dunbartonshire and Argyll & Bute Valuation Joint Board

Date of Survey 26 February 2025

Date of Report 28 February 2025

Document Number

AMA-DIA-250148-Joint Valuation Board Office

RAAC Confirmed	Yes
Further Visit Required	Yes

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Joint Valuation Board Offices

RAAC Visual Assessment Report

Document Revision

Rev	Purpose	Checked	Approved
P01	First Issue	Yes	Yes
P02	Revised Issue	Yes	Yes

Information Class : Confidential

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Joint Valuation Board Offices

Executive Summary

RAAC Visual Assessment Report

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Executive Summary
A site visit was undertaken on: *26 February 2025*
The visit was undertaken on behalf of the Dunbartonshire and Argyll & Bute Valuation Joint Board.
The following observations were made in relation to the presence of RAAC at the site. Where critical actions have been highlighted, these should be reviewed by the site management in conjunction with the Dunbartonshire and Argyll & Bute Valuation Joint Board. The report should be read in full to understand the wider context.

Block	RAAC Present	Further Visit Recommended
Block A	Confirmed	Recommended

Further Visit Required Yes

Further Visit Reason
Our visual inspection has confirmed the presence of RAAC within the building's construction. Further investigations are essential to evaluate the condition of the material, that will aid the remedial actions required and future management of the site

Source: Site Plan

	SITE PLAN KEY
1	RAAC evident or firmly suspected (RED)
2	RAAC to be confirmed (AMBER)
3	Confirmed no RAAC evident (GREEN)
4	RAAC evident but with structural mitigation in place (either temporary or permanent works) (BLUE)

Introduction

Pick Everard has been appointed on behalf of the Dunbartonshire and Argyll & Bute Valuation Joint Board to provide a visual inspection of the existing buildings at the above site to determine the presence of Reinforced Autoclaved Aerated Concrete Panels (RAAC).

This report provides a summary of the inspection, commentary on the findings and recommendations for further actions where appropriate. It is ordered in to the following sections for ease of navigation.

Site description – illustrates the extent of the site and the associated Block References. Block names used locally are included in the Block by Block Findings for ease of reference.

Desk study – summary findings from our review of information made available prior to the visit. The purpose of the desk study is to plan a safe visit and to determine whether a visual inspection is required.

Site Wide Summary – provides a high level overview of the location of RAAC across all blocks.

Block by Block Findings – for each Block the findings are presented as follows:

- Overall summary - covers the form of construction, extent of inspection, general observations, presence of RAAC and any requirements for a return visit.
- Photographs – grouped by those that illustrate the form of construction and those that show any areas of significant concern.

Appendices

- Background of RAAC

Limitations

The report has been produced with the following limitations:

- The visual survey is limited by areas accessible at the time of the visit and should not be considered as exhaustive;
- No inspection of roof finishes or condition has been undertaken;
- The presence of water-leaks has not been confirmed and is based on visual observations and/or anecdotal evidence from discussions during the visit;
- No review of weatherproofing of the building fabric, rainwater goods, drainage systems or services has been undertaken;
- Proposed management, remedial works and risk assessments are outside the scope of this report.
- This report does not comment on the risk ratings where RAAC is found. This should be risk assessed by a suitably qualified and experienced structural engineer in accordance with the latest guidance.

Aerial photograph of site Google Maps (2023)

Joint Valuation Board Offices

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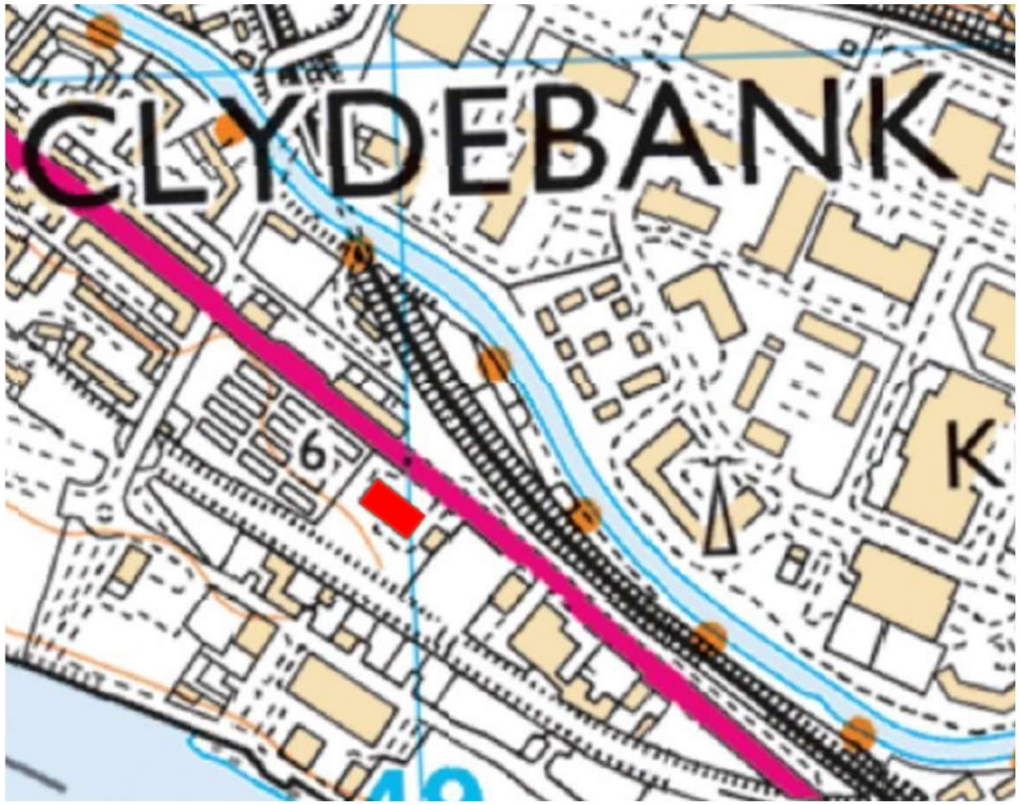
Summary of Site

Site Description

Owned and operated by the Joint Valuation Board, the offices are located on Dumbarton Road, situated midway between the main town of Clydebank and Dalmuir.

Set on a slight gradient, the building consists of a single, two storey property with flat roof design. The basement level houses the plant rooms that serve the building with heating and power requirements, while ground and first floor levels provide a mixture of document libraries and office accommodation.

The building (Block A) comprises a concrete frame construction and is estimated to have been built circa. 1966



Plan showing site location

Previous information review

The following information has been reviewed prior to the site visit.

- Property Asset Management Plans (dated 14th March 2008)

Asbestos

Asbestos register not provided prior to survey taking place on site.

Requires site visit

Yes

Reason for no visit

N/A

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Summary of Site Visit

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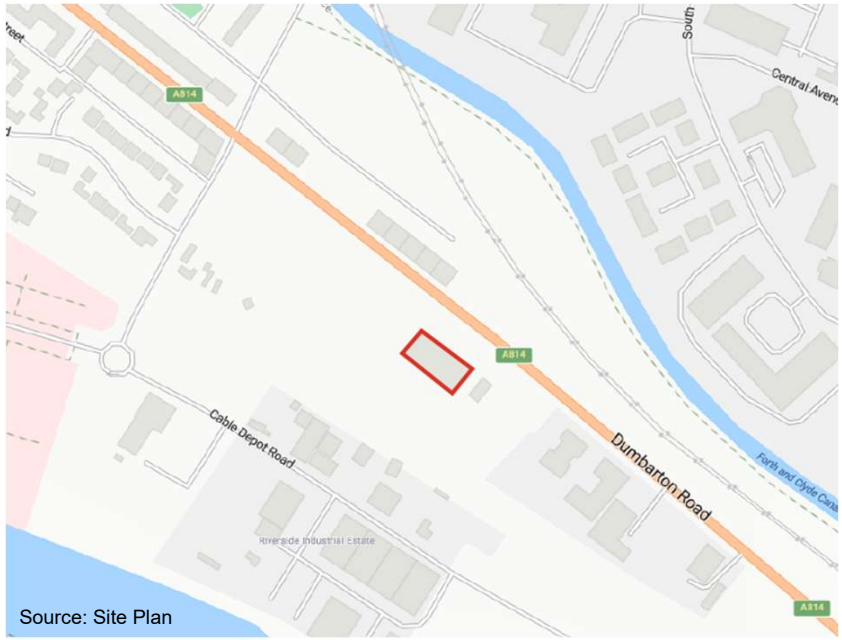
Site visit

The following section summarises the block by block inspection for RAAC.

Date of Inspection: 26 February 2025
Weather at time of inspection: Heavy rain, wet
Roles of those met on site: Caroline Shaw (Office Secretary)

General commentary on site visit including general access granted

Full access to all rooms was made available during our site visit. Our inspection was non-destructive and consequently we were unable to access above several ceilings to inspect beyond without irreparable damage to the finishes



Source: Site Plan

Block	RAAC Present	Further Visit Recommended	Any other areas of concern
Block A	**Yes**	**Additional visit required**	**None**

Joint Valuation Board Offices

RAAC Visual Assessment Report

Block Assessment: Offices (Block A)

Block Summary

Site Data

Block Reference: Block A

Block Age : Circa 1966

Block Age Other : -

Number of Storeys: Two

Suspended Ceilings Present: A number of different finishes noted. The majority of the offices and circulation areas comprised suspended ceiling with concealed grid. The main foyer and entrance included shiplap timber cladding

Extent of Inspection

Full access to the building was provided during our site visit

Form of Construction

Concrete frame structure with brick infill walls. Flat roof design has a single-ply membrane weather proofing application.

General Observations

Concrete floor construction noted.

RAAC Present

(with high degree of confidence)

Yes

Any other areas of significant concern observed

The site visits completed were only to consider the presence and the condition of RAAC panels, however, if other areas of significant concern were noted during the visit, these are recorded below:

Our inspection noted several areas where water ingress has resulted in the failing of some of the ceiling tiles. Additionally, we noted extensive evidence of water staining to tiles due to water ingress from the roof.

This fact, increases the risk with reference to RAAC and its poor performance and its possible subsequent failure when exposed to rainwater.

Return Visit Recommended

Yes

Reason for Return Visit

Not all areas could be inspected to gain enough confidence on the condition of RAAC as identified.
Please refer to page 9 for the focus areas of the visit and actions required to be carried out by the responsible body.

Source: Site Plan

Source: Pick Everard

Joint Valuation Board Offices

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Block Assessment: Offices (Block A)

Return Areas of Focus

Focus Area of Return Visit

The Institution of Structural Engineers (ICE) estimates that the useful life of this type of roof plank is around 30 years, the existing roof deck is now twice that, approaching 60 years in age. In May 2019, the ICE, in collaboration with the Health & Safety Executive, issued a Standing Committee on Structural Safety (SCOSS) Alert concerning RAAC planks. The alert stated that planks installed before 1980 have surpassed their expected service life and should be considered for replacement.

Given the age of the RAAC planks, the roof area should be treated as 'fragile'. A thorough individual risk assessment must be conducted before accessing any roof area or making use of MEWPs, crawl boards, or independent fall arrest systems for any roof repair work.

Although RAAC planks should be managed until a permanent solution is determined, the risk of failure cannot be fully mitigated during this period. Until a detailed investigation into the condition of the RAAC is conducted, we are unable to advise the most appropriate course of action for the building's future use.

RAAC Layout Plan

The adjacent plan shows the principles of the requirement of the return visit.

Key

Red areas indicate locations RAAC has been identified
Grey areas indicate concrete slab
Orange indicates No Access, without damage to the finishes

Block 1
First Floor

Form of Construction Photo 1

Concrete frame with brick infill, aluminium single glaze windows to the buildings side and rear

Form of Construction Photo 3

Polycarbonate roof lights with single-ply membrane roof weather covering

Form of Construction Photo 5

Concrete internal stairs at main entrance

Form of Construction Photo 7

Suspended ceiling finish with concealed grid system

Form of Construction Photo 2

Concrete frame with brick infill, uPVC double glaze windows to the building's front elevation

Form of Construction Photo 4

Single-ply membrane roof weather covering

Form of Construction Photo 6

Shiplap cladding ceiling finish

Form of Construction Photo 8

Lift motor room, Timber structure and timber roof deck

Structural Areas of Concern Photo 1

Water-stained and damaged / missing ceiling tiles resulting from water ingress

Structural Areas of Concern Photo 3

Water-stained and damaged / missing ceiling finish through water ingress

Structural Areas of Concern Photo 5

Water-stained and missing ceiling tiles from excess water ingress

Structural Areas of Concern Photo 7

Water-stained and missing ceiling finish through water ingress

Structural Areas of Concern Photo 2

Water-stained and damaged ceiling finish through water ingress

Structural Areas of Concern Photo 4

Water damaged ceiling finish through water ingress

Structural Areas of Concern Photo 6

Water stained and damaged ceiling and wall finish at roof lights

Structural Areas of Concern Photo 8

Damaged ceiling finish through water ingress

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Block Assessment: Block A

Photographs: RAAC Observation

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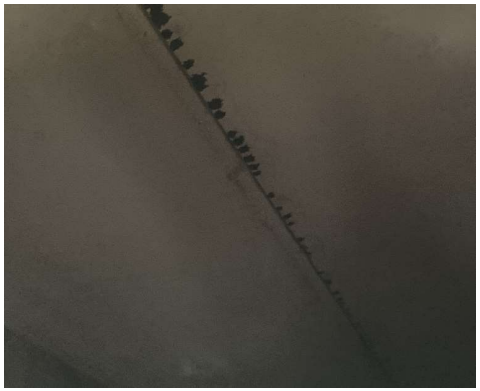

RAAC Observation Photo 1

Hairline cracking noted along chamfer of slab

RAAC Observation Photo 3

Penetration through slab, evidence of water ingress at slab edge

RAAC Observation Photo 5

Extensive water-stained noted throughout

RAAC Observation Photo 7

Suspended grid and services fixed to slab underside

RAAC Observation Photo 2

Water-stained noted at slab edge

RAAC Observation Photo 4

Penetration through slab

RAAC Observation Photo 6

Failed fixings noted to the slab

RAAC Observation Photo 8

Minimal coverage of reinforcement with evidence of its location on the surface

Appendix 1
RAAC Background

Why is the presence of RAAC important?

Historic RAAC panel failures have included significant collapses of whole roof structures, occurring suddenly with very little warning. This is typical of shear failures in cementitious materials. An example (extracted from the 2018 SCOSS report) is shown bottom right.

The presence of RAAC panels is an important health and safety issue, even when they visually appear to be in good condition.

Background

Reinforced Autoclaved Aerated Concrete (RAAC) panels are formed using Autoclaved Aerated Concrete (AAC). This form of concrete is less dense that traditional non-aerated concrete as the matrix uses finer cements and chemicals within the casting process to form gas bubbles.

RAAC elements were most commonly used in roofs but examples also exist in floors or façade panels.

AAC is weaker than traditionally formed concrete and due to the concrete aerated matrix created, has a lower bond capacity to embedded reinforcement and offers lower protection to that reinforcement. Typical characteristics of RAAC panels are described below:

- Compressive strength: Compressive strength, as well as flexural, shear and tensile strengths, are much lower than traditional concrete.
- Reinforcement anchorage: Due to the aerated nature of the material, the AAC will not form adequate bond strength with the reinforcement. The reinforcement used in RAAC panels was often smooth and not ribbed.
- Permeability: The aerated material is highly permeable, so cover to the reinforcement does not protect against environmental conditions in the same way as with traditional concrete. Prior to manufacture, the reinforcement was typically coated to protect it against corrosion.
- Elasticity and Creep: The aerated nature and lack of coarse aggregate means that RAAC panels experience a greater degree of creep and long-term deflection when compared to traditional concrete.

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Development of RAAC understanding and Guidance

Concern regarding the structural adequacy of AAC / RAAC elements was raised in the early 1990's. Surveys undertaken by the **Building Research Establishment (BRE)** at this time identified excessive and progressive displacements of roof panels formed using RAAC; causing water-ponding and failure of roof finishes. This failure of the waterproofing layer gives potential for future degradation of embedded reinforcement. This resulted in the BRE information paper in 1996 highlighting the risks of such panels. Following significant collapse of a school roof in 2017 / 2018, further concerns related to the adequacy of bearings for RAAC panels were raised.

In May 2019 the **Standing Committee for Structure Safety (SCOSS)** issued an alert highlighting the risks associated with RAAC elements 'Failure of Reinforced Autoclaved Aerated Concrete (RAAC) Planks'.

In February 2022, the **Institution of Structural Engineers (IStructE)** published supporting guidance to help with the assessment of RAAC Panels. It identified the following concerns:

- Rusting of embedded reinforcement leading to cracking and spalling of the AAC cover.
- Cracking, of varying degrees of severity related to thermal, creep and movements in the planks.
- Excessive deflections that may impact on bearing stresses
- In some cases, the deflections had become appreciable, with span-to-deflection ratios in the order of 100. This led to potential for ponding of rainwater, the associated imposed loading increase, distress to certain types of waterproof membrane and associated finishes, and water penetration sufficient to promote corrosion of the embedded reinforcement.
- Reduced bearing widths impacting on shear stresses and potential for brittle failure.

In December 2022 the **Department for Education** published Reinforced Autoclaved Aerated Concrete (RAAC) Estates Guidance. It presented a 5 stage approach to the identification and management of RAAC in educational buildings which outlines steps that should be taken by those responsible for management of educational buildings and how to procure building professional's services when specialist advice is needed.

The **IStructE RAAC Study Group** have continued to develop guidance on critical risk factors and their impact on assessment, remediation and management of RAAC. Updated guidance was published in April 2023, the guidance has informed both the assessment methodology and the information provided in this report.

Terms of Reference

- The brief for visual appraisal has been defined in agreement with Dunbartonshire and Argyll & Bute Valuation Joint Board as follows:
- Request background information for specific buildings (RAAC survey response, any previous engineering reports etc) and review where provided in advance of the survey.
- Carry out desktop study to ascertain age of buildings where possible.
- Attend site and undertake visual inspection
- Identify presence of RAAC within buildings
- Confirm any limitations of visual inspection works

Reference Documentation

Our visual inspection has drawn upon the following published guidance documentation:

- CP 114:1957- The structural use of reinforced concrete in buildings
- CP3: 1952 - Code of functional requirements of buildings; Chapter V; Loading
- IStructE (October 2010), Appraisal of Existing Structures – Third Edition, IStructE, London.
- Black, W et al (1987), CIRIA Guide 111, Structural renovation of traditional buildings, CIRIA, London
- Concrete Society (2009), Technical Report 70; Historical Approaches to the Design of Concrete Buildings and Structures, CCIP, London
- BISRIA (1999), Guidance Note 8/99; Refurbishment of Concrete Buildings – Structural & Services Options, BISRIA, London
- BRE (1996), IP10/96 Reinforced autoclaved aerated concrete planks designed before 1980, BRE, London
- BRE (2002), IP7/02 Reinforced autoclaved aerated concrete panels: test results, assessment and design, BRE, London
- Department of Education (2021), Reinforced Autoclaved Aerated Concrete (RAAC) Estates guidance, 2022, DfE, London
- Institution of Structural Engineers (April 2023) Reinforced Autoclaved Aerated Concrete (RAAC) Panels Investigation and Assessment, ISE, London
- Siporex (1972) Siporex Autoclaved Aerated Concrete Building Products.