

FILE NOTE

JOB No: 2066

PROJECT: SONA

DATE: 25.01.2024



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2066-ABWA-XX-XX-FN-A-(01)-0022 – Vents justification

As can be seen in the proposed elevations, a small number of vents have been introduced within the external walls at levels one to five, both in the brickwork and Cembrit panels.

The purpose of the vents is to provide a terminal for the MVHR system to intake fresh and exhaust stale air. An MVHR system has been utilised in the scheme to reduce energy consumption whilst providing comfortable living conditions for future occupants. Also, the proximity of the scheme to the O2 Apollo has resulted in the acoustic report concluding that openable windows are not permitted, therefore the mechanical system is paramount for achieving compliance with the Building Regulations.

The number of vents within the external walls has been minimised as much as possible, in order to reduce the visibility of the building's services on the main façade.

As previously discussed, the vents serving the acoustic air bricks, which are required for purge ventilation and sit within the apartments at a height that is accessible for manual use, have been removed completely from the façade. In one previous drawing revision, a vent was placed within the Cembrit panel next to the window. This was subsequently removed due to LPA feedback, and a perforated option was explored to allow for sufficient ventilation to the air brick, without having visible services sitting on the façade. Further review of the ventilation requirements has resulted in the wholesale removal of *all* acoustic air brick vents on the façade, due to the open nature of the cladding system. Please see contained within this response a drawing illustrating the free area achieved through the cladding system.

Similarly, MVHR intake vents can sit behind the panels and still draw in the required amount of air. However, exhaust vents are still required in these areas in order to safely rid the system of warm, stale air without detriment to the building fabric. Where a vent in the Cembrit panel is required, it is to be colour matched in the RAL colour equivalent to reduce its visual impact.

In the areas of brickwork, the air bricks are mainly found on the Polygon Street elevation, with four additional on the end of the Stockport Road elevation. These vents are serving the corner apartments within the scheme.

Each system requires an intake and exhaust, which need to be positioned a set distance apart in order to avoid drawing in stale air. The ductwork and vents serving the apartment also need to remain within the apartment's compartment for fire safety purposes.

All other apartments within the 'brickwork' area of the building are able to have both the intake and exhaust vents positioned within the courtyard, meaning that there is no impact on the main façade. This is due to the length of external wall on the courtyard side, so the set distances required are achieved. Some apartments also require purge vents due to the size of the system, which can also be positioned within the courtyard.

The exception to this is the corner apartments. Only a very small part of the apartment fronts the courtyard due to the shape and size, meaning that only one vent can be positioned on this side to avoid passing over into neighbouring apartments. The vents on the Stockport Road elevation are the intake ducts for the corner apartments at the Stockport / Brunswick edge, and the vents on the Polygon Street elevation are the exhaust and purge ducts for the corner apartments on the Polygon / Stockport edge.

Please see contained within this response the latest ventilation drawing indicating intake / exhaust / purge vent positions, to assist with the understanding of the above.

The system requires a vent with a specific free area in order to safely discharge stale air – this is 18,720mm². When considering the type of air brick for the brickwork façade, as well as ensuring the suitability of the material and its appearance, the building's structure has informed its size and position.

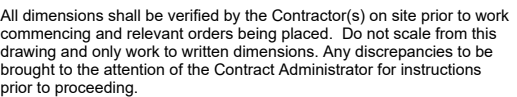
As the building is timber frame, it is not possible to pass through the main structural frame in the same way that a steel beam could be cored to allow services to pass through. A timber ringbeam sits at each level, and a series of timber studs make up the external wall structure.

To achieve continuity in the type of vent used, we have considered the 'worst case scenario'. The majority of the external facing vents are found on Polygon Street. Using the timber frame drawings, we have illustrated the positions of the primary structure within the context of the GA elevation so that the proximity of the frame to the fenestration and vents is clear.

Please see contained within this response a drawing illustrating the challenges of positioning the vent and ductwork.

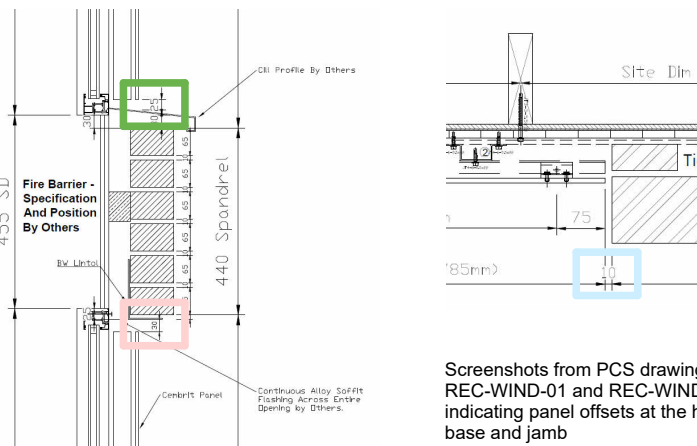
The drawing shows in section and elevation the amount of structure that cannot be compromised. The fire compartmentation line is also an element that cannot be adjusted. The drawing indicates that there is a very small area that can contain the services without detriment to the apartment, and the nature of the external wall and facing material also means that the area for the air brick is limited. Whilst a series of smaller, brick-sized air bricks would have been preferred, it is unfortunately physically not possible to provide this. Doing so would result in clashes with the compartmentation line and structure.

We believe that the steps taken to reduce the number of vents within the façade, and the materiality of those that are being used, have greatly reduced the visual impact.

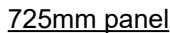


This drawing illustrates the 'worst case' scenario for the free area around the Cembrit panels, and is based on the panel widths outlined in PCS drawing REC-WIND-04, window heights provided in the May 2022 PCS survey, and the panel offsets outlined in PCS drawings REC-WIND-01 and REC-WIND-02

-  30mm offset to head of panel
-  10mm offset to brickwork side of panel
-  25mm offset to base of panel



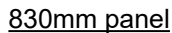
Screenshots from PCS drawings
REC-WIND-01 and REC-WIND-02
indicating panel offsets at the head,
base and jamb



Free area required
2500mm² / 0.0025m²

Free area acheived by panel offsets
61,000mm² / 0.061m²

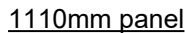
24x in excess of requirement



Free area required
2500mm² / 0.0025m²

Free area achieved by panel offsets
67,000mm² / 0.067m²

26x in excess of requirement



Free area required
2500mm² / 0.0025m²

Free area acheived by panel offsets
83,000mm² / 0.083m²

33x in excess of requirement

Table 1. Examples of walls with different ventilation openings.

ventilation	Size of ventilation, $A_v(\text{cm}^2/\text{m})$	Structure
Non or poorly ventilated	$A_v \leq 5$	Exterior walls without ventilation or walls with plates; materials with sealed/tightened joints such as rendered cement fibre plates, slabs of concrete or glass facades. Slabs of concrete and cement fibre sheets.
Ventilated	$5 \leq A_v \leq 300$	Exterior walls as above with low degree of ventilation. Most walls are placed here. Nordic walls.
Intensively ventilated	$300 < A_v \leq 400$	Curtain wall with ventilation openings $\leq 400 \text{ cm}^2/\text{m}$
Very intensively ventilated	$A_v > 400$	Curtain wall with ventilation openings $> 400 \text{ cm}^2/\text{m}$ with multiple openings.

THE PRINCIPLES OF THE VENTILATED PANEL DESIGN

The following are a series of instances conducive to background ventilation openings to the rear of rainscreen

The ventilation openings in the facade control the degree of ventilation Table 1 shows different types of wall insulation systems based on the size of the openings around panels. A_v is the ventilation achieved per panel $A_v(\text{mm}^2/\text{m})$.

1. Proposed panel utilising base of panel only = 25,000 mm²/m
2. Proposed panel utilising head of panel only = 30,000 mm²/m
3. Proposed panel utilising jambs of panel only = 10,000 mm²/m
4. Minimum total ventilation per panel = **65,000 mm²/m or 650 cm²/m**

IT IS CONSIDERED "VERY INTENSIVELY VENTILATED"

The wall constitutes ventilation openings permitted $> 400 \text{ cm}^2/\text{m}$ with multiple openings, as such the ventilation to rear of the panel is **greater** than the requirement of the vent.

REV	DATE	COMMENT
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CLIENT:
GGC POLYGON MANCHESTER LIMITED

PROJECT:
SONA

DRAWING:

Cembrit free area sketch

DRAWING N°:

2066-ABWA-Z1-ZZ-DR-A-(12)-0104

REV:	STATUS	SCALE: 1:20	CHECKED: GW	DRAWN: JT
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SCALE:	CHECKED:	DRAWN:
1 : 20	GW	LT

SHEET:	DATE:
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A2	22.09.2023
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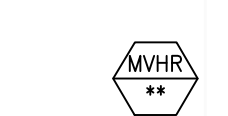
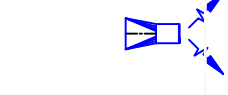
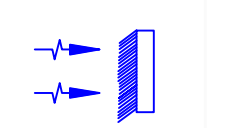
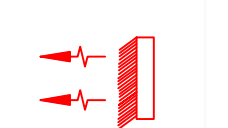
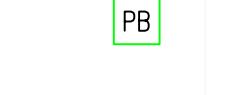
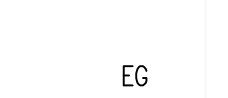
AUDERIEBW
ARCHITECTS

- Notes:
1. This drawing is subject to copyright and is not to be reproduced in part or whole without approval.
 2. Do not scale this drawing - check all dimensions on site.
 3. This drawing shall be read in conjunction with the project specifications and all other contract documentation.
 4. All dimensions are in millimetres unless otherwise stated.

VENTILATION NOTES:-

1. ALL DUCTWORK SHALL BE MANUFACTURED & INSTALLED IN ACCORDANCE WITH BESA DW154
2. FIRE DAMPERS/FIRE COLLARS OR WRAPS SHALL BE PROVIDED WHERE DUCTWORK PASSES THROUGH ANY FIRE RATED STRUCTURE INCLUDING FLOORS.
3. FIRE AND SMOKE DAMPERS SHALL BE PROVIDED WHERE DUCTWORK PASSES THROUGH COMPARTMENT WALLS AND FLOORS.
4. FLEXIBLE DUCTWORK SHALL BE USED FOR FINAL CONNECTIONS ONLY. NO FLEXIBLE DUCTWORK SHALL BE MORE THAN 500mm IN LENGTH.
5. THERMAL INSULATION SHALL BE APPLIED TO THE FOLLOWING AREAS: UNTREATED FRESH AIR DUCTWORK WITHIN THE BUILDING EXHAUST DUCTWORK WITHIN THE BUILDING.
6. BATHROOM/WC DOORS SHALL BE UNDERCUT TO PROVIDE VENTILATION AIR PATH ROUTES.
7. WHERE APARTMENT NORMAL VENTILATION RATES (BASED ON FLOOR AREA) ARE EQUAL TO THE MINIMUM HIGH VENTILATION RATES, A 20% MARGIN IS TO BE APPLIED TO HIGH RATE FIGURES.
8. OPENABLE WINDOWS TO PROVIDE SHORT PERIODS OF PURGE VENTILATION TO REMOVE ODOURS, EXCESS HUMIDITY AND REDUCE TEMPERATURES IN APARTMENTS ON THE POLYGON STREET ELEVATION.
9. ALL INTAKE AND EXTRACT LOUVRES SHALL BE FIRE RATED DOUBLE AIR BRICKS AS RYTONS SQUARE HOLED AT FIRE RATED DUCTING KITS OR EQUAL AND APPROVED COLOUR MATCHED TO MATCH THE FACADE AS AGREED WITH THE ARCHITECT.
10. ALL ACOUSTIC AIR BRICKS SHALL BE GREENWOOD A&B ACOUSTIC AIRBRICK WITH HIT AND MISS INTERNAL VENT OR EQUAL AND APPROVED WITH POWDER COATED EXTERNAL GRILLE MATCHED TO THE FACADE COLOUR AS AGREED WITH THE ARCHITECT.

LEGEND

-  MECHANICAL HEAT & VENTILATION RECOVERY UNIT c/w FLEXIBLE DUCTING.
-  NOISE ATTENUATOR
-  BULKHEAD MOUNTED SUPPLY VALVE.
-  RYTONS SQUARE HOLED DOUBLE AIR BRICK AND DUCTING KIT AT FIRE RATED OR EQUAL AND APPROVED INTAKE LOUVER IN EXTERNAL BRICK WALL COLOUR MATCHED TO SUIT.
-  CEILING MOUNTED SUPPLY AND EXTRACT GRILLE.
-  RYTONS SQUARE HOLED DOUBLE AIR BRICK AND DUCTING KIT AT FIRE RATED OR EQUAL AND APPROVED EXHAUST LOUVER IN EXTERNAL BRICK WALL COLOUR MATCHED TO SUIT.
-  MHR BOOST BUTTON
-  PURGE FAN BUTTON
-  FIRE COLLARS / SLEEVES
-  FIRE AND SMOKE DAMPER C/W POWER SUPPLY AND FIRE ALARM INTERFACE LINKED TO APARTMENT FIRE ALARM
-  ACOUSTIC AIR BRICK MOUNTED IN CEMBRIT PANELS- GREENWOOD A&B OR EQUAL AND APPROVED
-  SUPPLY GRILLE
-  FIRE RATED SUPPLY GRILLE
-  EXTRACT GRILLE
-  FIRE RATED EXTRACT GRILLE
-  400x400 ACCESS HATCH FOR DAMPERS
-  600x600 ACCESS HATCH FOR PURGE FAN

C6 04.04.23 CONSTRUCTION ISSUE access hatches included	M.H.
C5 03.03.23 CONSTRUCTION ISSUE	M.H.
C4 27.10.22 CONSTRUCTION ISSUE	M.H.
C3 24.10.22 CONSTRUCTION ISSUE	M.H.
C2 10.07.22 CONSTRUCTION ISSUE	G.M.
C1 01.06.22 CONSTRUCTION ISSUE	G.M.
Rev: Date: Status/Amendments: By:	

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M15 4PT
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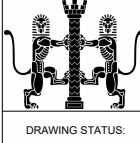


Client:
Daisy Mill Technologies

Project:
SONA, Brunswick
Manchester

Drawing Title:
MECHANICAL SERVICES
FOURTH FLOOR
VENTILATION
SERVICES LAYOUT

Engineer: G.M.	Checked By: C.W.	Cad By: G.M.
Scale: 1:50	Paper Size: A0	Date Created: DEC 2021
Drawing Number: 3327-KIN-ZZ-04-DR-M-5704	Drawing Revision: C6	



All dimensions shall be verified by the Contractor(s) on site prior to work commencing and relevant orders being placed. Do not scale from this drawing and only work to written dimensions. Any discrepancies to be brought to the attention of the Contract Administrator for instructions prior to proceeding.

SKETCH



Timber ringbeam - primary structure



Timber studs within external wall - primary structure



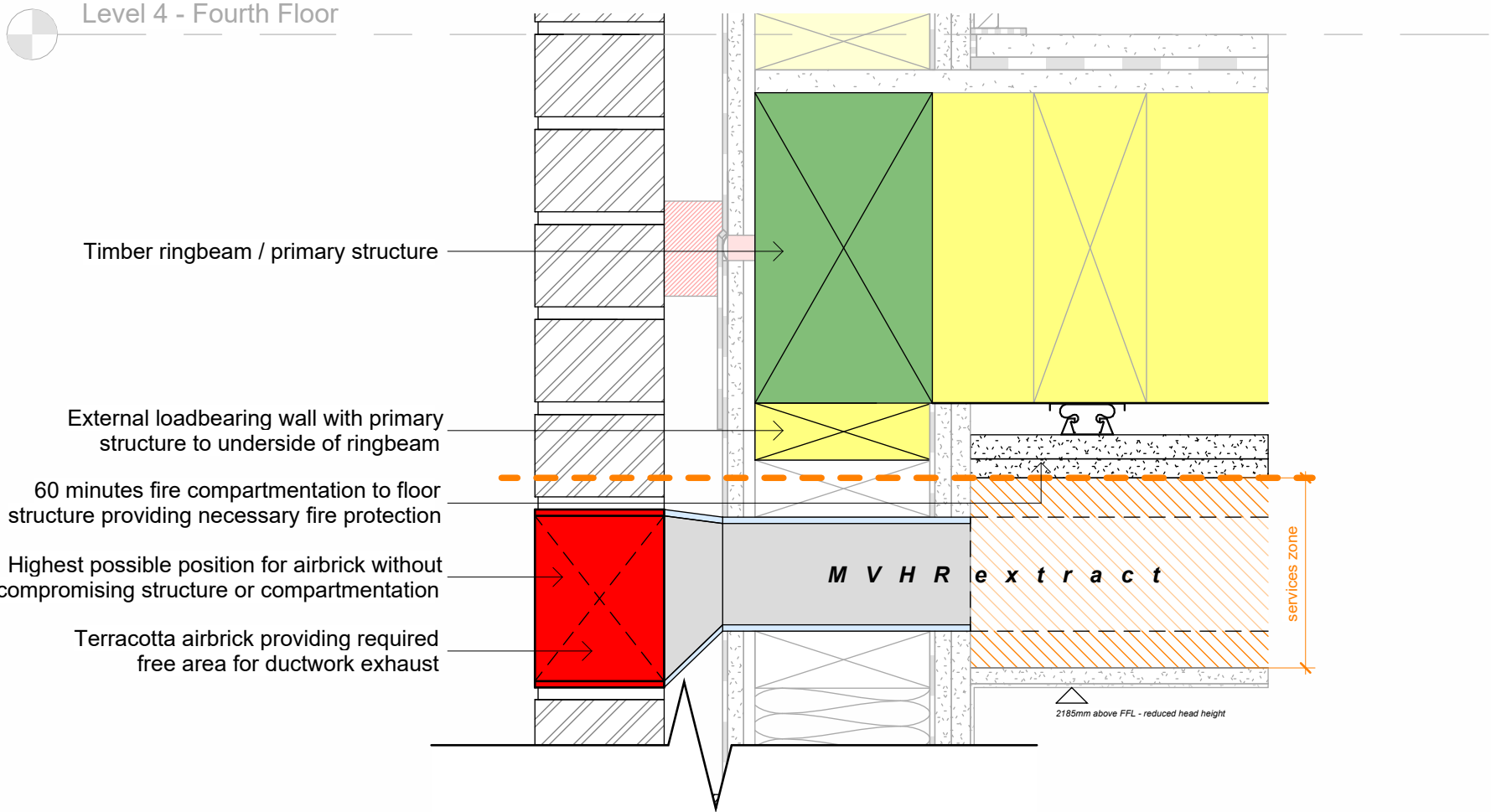
Services zone



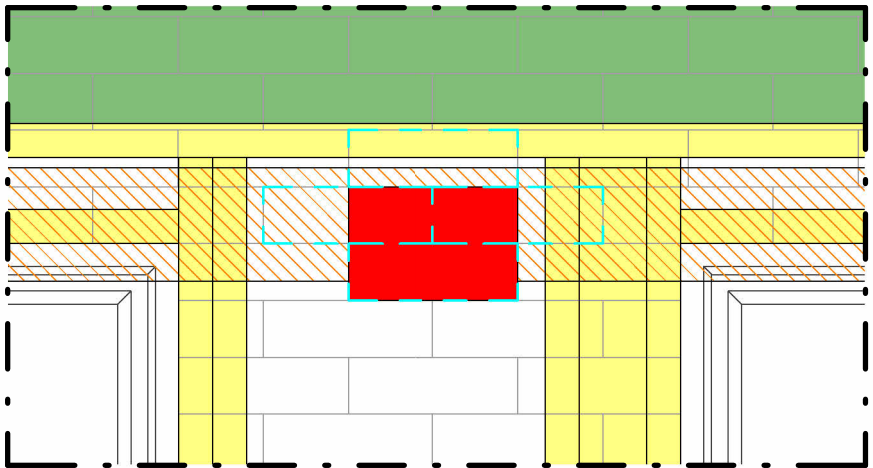
Vent providing 18,720mm² free area



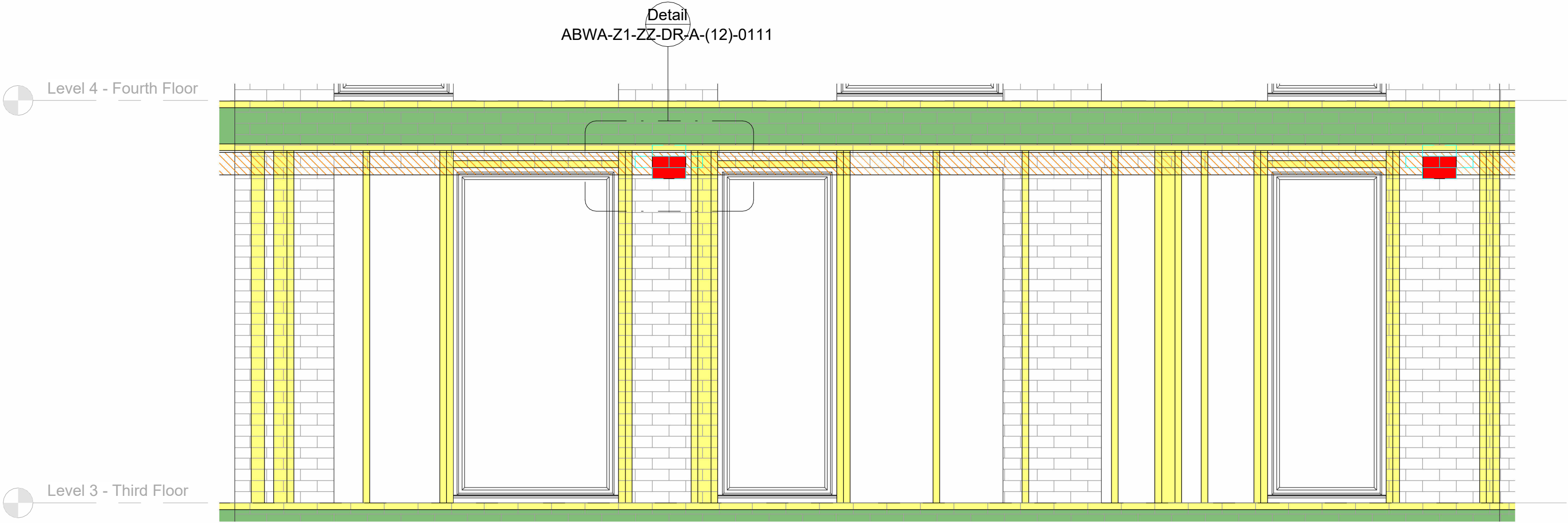
Position of individual, brick-size vents



Position of vent within brickwork - section
1 : 5



Detail
1 : 10



Typical elevational constraints
1 : 25

REV	DATE	COMMENT
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CLIENT: GGC POLYGON MANCHESTER LIMITED		
PROJECT: SONA		
DRAWING: Typical position of vents in the facade		
DRAWING N°: 2066-ABWA-Z1-ZZ-DR-A-(12)-0111	REV:	STATUS
SCALE: As indicated	CHECKED: GW	DRAWN: LT
SHEET: A2	DATE: 25.01.2024	