

ACOUSTIC TECHNICAL NOTE



Reference:	13081.ATN02.COM.0
Revision:	1
Date:	3 September 2024
Project:	Richmond Royal Hospital – UKI Richmond
Subject:	Glazing Commissioning

1. INTRODUCTION

To fulfil the London Borough of Richmond Upon Thames' planning Condition NS22, commissioning measurements have been undertaken by RBA Acoustics of new glazing configurations installed at Richmond Royal Hospital.

This note presents the results of the testing undertaken, as well as commentary on the results in relation to the project criteria.

2. CRITERIA

Planning Condition U0065613 NS22: Noise Protection – Residential (1) states:

Specification details for the building façade, glazing and ventilation elements of the residential development to demonstrate that they achieve the sound attenuation requirements detailed in section 5 of the acoustic report submitted by Hoare Lea reference 1010416 dated 17/08/2018... A commissioning acoustic test and report to demonstrate that internal noise levels achieve those detailed within section 3 of the above report.

Section 3 of the planning stage acoustic report from Hoare Lea (Ref. 1010416, dated 17/08/2024) refers to the criteria set out in London Boroughs of Hillingdon, Hounslow & Richmond Upon Thames *Draft Supplementary Planning Document (SPD) 'Noise Sensitive & Noise Generating Development*, which is summarised below.

Table 1 – Noise Break-In Criteria

Applicable Area	Time Period	Parameter	Criteria
Bedrooms	07:00 – 23:00	$L_{Aeq,16hr}$	≤ 35 dB
	23:00 – 07:00	$L_{Aeq,8hr}$ L_{AFmax}	≤ 30 dB ≤ 45 dB*
Living Rooms	07:00 – 23:00	$L_{Aeq,16hr}$	≤ 40 dB
	23:00 – 07:00	$L_{Aeq,8hr}$	–

* Typical maximum level – not more than 10No. times a night.

Section 5 of the report suggest that a 5dB relaxation of the above criteria may be appropriate for listed areas of the development.

3. TESTING METHODOLOGY

To assess noise break-in, a pair of sound level meters was set up in each of 3No. locations representative of the various glazing configurations installed. One microphone was set up internally on a tripod, in the centre of the room, while the other was attached to an A-frame and set up externally* on the scaffolding. Flats were sealed for the duration of the survey period.

Simultaneous ambient noise level measurements were subsequently undertaken taken over the following period:

- 07:00 Friday 16 August to 07:00 Tuesday 20 August 2024.

Construction works were ongoing during certain times over the survey period, as such these time periods have been excluded from our analysis to ensure that only representative acoustic conditions were assessed. The affected periods are indicated on the attached Graphs 1-3 in green.

The planning stage acoustic report from Hoare Lea (Ref. 1010416, dated 17/08/2024) noted that aircraft passing over were the primary source of noise affecting the site. Heathrow's online xPlane tool shows 100% of operations were Westerly, with a total of 2674No. aircraft arrivals occurring within 1,500-2,500 ft above the development during the survey period. Thus, the survey positions are representative of the dominant / worst-case noise conditions experienced by the site as a whole.

*The external noise measurements were made to enable any unusual internal data to be checked to ensure it was due to external noise intrusion, i.e. showing up on both the internal and external data. Where unusual peaks were measured internally, but did not have corresponding external peaks, these events have been excluded from the analysis.

The measurement locations and glazing construction present are shown in Figure 1 below, and photos in Figure 2 and Figure 3. Information regarding aircraft movements is shown in Figure 4.

4. GLAZING CONFIGURATIONS

Testing has been undertaken based on information provided by Richmond UKI. We understand that the glazing configurations detailed below are representative of those used across the entire site. The general construction of the façade is noted, and illustrated in Figure 5 and Figure 6 below.

4.1 Position 1 – Glazing Configuration B (Secondary Glazing)

The façade surveyed at Position 2 is the refurbished existing façade, and understood to consist of:

- Existing solid brickwork wall
- 15mm minimum clear cavity
- 70|70 I-Studs at 600mm centres with 50mm Isover APR 12200 within the cavity
- VCL backing to plasterboards
- 2No Layers 12.5mm Gyproc SoundBloc

The existing sash windows have been refurbished, with secondary glazing installed, which is understood to consist of:

- Existing Glazing
- Minimum 100mm void between existing and secondary glazing
- Aluminium Frame
- 6.8mm Laminate Glass

This configuration is representative of windows across Block B, Block C, and Block D.

4.2 Position 2 – Glazing Configuration A (Velfac)

The façade surveyed at Position 1 is understood to consist of:

- External Brickwork
- 50mm Cavity minimum
- 150mm Rockwool Rainscreen Due-Slab Insulation
- Novia FR Breather Membrane
- 1No. Layer 12.5mm Siniat Weather Defence Board
- 120mm SFS fully filled with Rockwool Flexi insulation between studs
- Novia VC4000 FR Reflective Vapour Control Layer
- 1No. Layer 15mm Gyproc Soundbloc
- 1No. Layer 12.5mm Gyproc Habito Plasterboard
- 3mm Skim Plaster

Velfac glazing configurations have been installed consisting of the following build-ups:

Windows

- Aluminium frame
- Glazing consisting of:
 - 4mm Glass, 16mm Argon, 6.4mm Laminate Glass
 - 4mm Glass, 16mm Argon, 4mm Glass

Doors

- Aluminium frame
- 4mm Glass, 18 Argon, 4mm Glass, 16mm Argon, 6.8mm Laminated Glass

This configuration is representative of windows throughout Block F.

4.3 Position 3 – Glazing Configuration C (Mumford and Wood)

The new façade surveyed at Position 3 is understood to consist of:

- External Brickwork
- 50mm Cavity minimum
- 150mm Rockwool Rainscreen Due-Slab Insulation
- Breather Membrane
- 1No. Layer 12.5mm Siniat Weather Defence Board
- 120mm SFS fully filled with Rockwool Flexi insulation between studs
- VCL (lapped with breather membrane)
- 1No. Layer 15mm Gyproc Soundbloc
- 1No. Layer 12.5mm Gyproc Habito Plasterboard
- 3mm Skim Plaster

Mumford and Wood windows have been installed within this, and are understood to consist of:

- Timber frame
- 6.8mm Clear Laminated Glass, 14mm Argon, 4mm Glass

This configuration is representative of windows across Block E and Block A.

4.4 Glazing Configuration Summary

The surveyed positions are understood to correspond with the following glazing constructions:

- Position 1: Secondary Glazing over existing windows (representative of Block B, Block C, and Block D)
- Position 2: Velfac Windows (representative of Block F)
- Position 3: Mumford and Wood Windows (representative of Block A and Block E)

5. RESULTS

The results of the commissioning measurements are summarised in Table 2, and compared to project criteria. A time history of each measurement position, with construction hours indicated (excluded from analysis on the basis on not being representative of normal acoustic conditions), is included in Graph 1-3 below.

Table 2 – Measured Noise Break-In Levels

Position / Property	Time Period	External Ambient Levels (L_{Aeq})	Internal Levels		Worst-Case Criterion		Pass / Fail
			Ambient (L_{Aeq})	Maximum (L_{AFmax})	Ambient (L_{Aeq})	Maximum (L_{AFmax})	
1 – Flat UG14	07:00 – 23:00	59	32	–	≤ 40 dB*	–	Pass
	23:00 – 07:00	57	30	42	≤ 35 dB*	≤ 45 dB	Pass
2 – Flat 102	07:00 – 23:00	64	35	–	≤ 35 dB	–	Pass
	23:00 – 07:00	55	27	41	≤ 30 dB	≤ 45 dB	Pass
3 – Flat 116	07:00 – 23:00	60	32	–	≤ 35 dB	–	Pass
	23:00 – 07:00	56	26	41	≤ 30 dB	≤ 45 dB	Pass

* Criteria for listed area of building. More stringent criteria detailed in Table 1 also achieved.

All glazing configurations achieve the target criteria for Planning Condition U0065613 NS22: Noise Protection - Residential (1).

6. CONCLUSION

RBA Acoustics has undertaken commissioning measurements of new glazing configurations installed at Richmond Royal Hospital. All tested glazing configurations meet the requirements of the project criteria, and satisfy Planning Condition U0065613 NS22: Noise Protection - Residential (1).

Richmond Royal Hospital - UKI Richmond

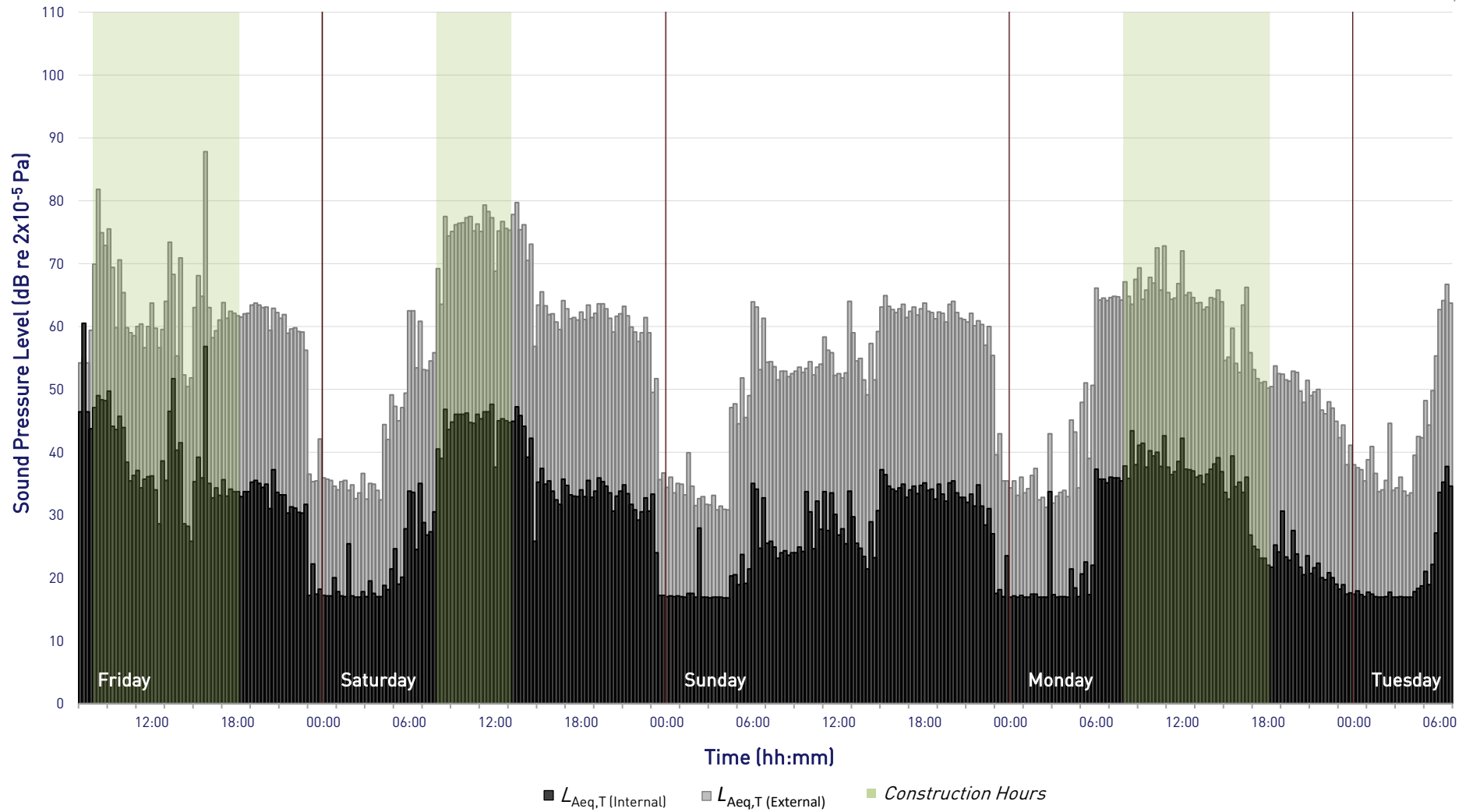
Measured Levels (15min Sample Periods)

Measurement Position 1, Internal / External Comparison - Friday 16 August to Tuesday 20 August, 2024



Project: 13081

Graph 1



Richmond Royal Hospital - UKI Richmond

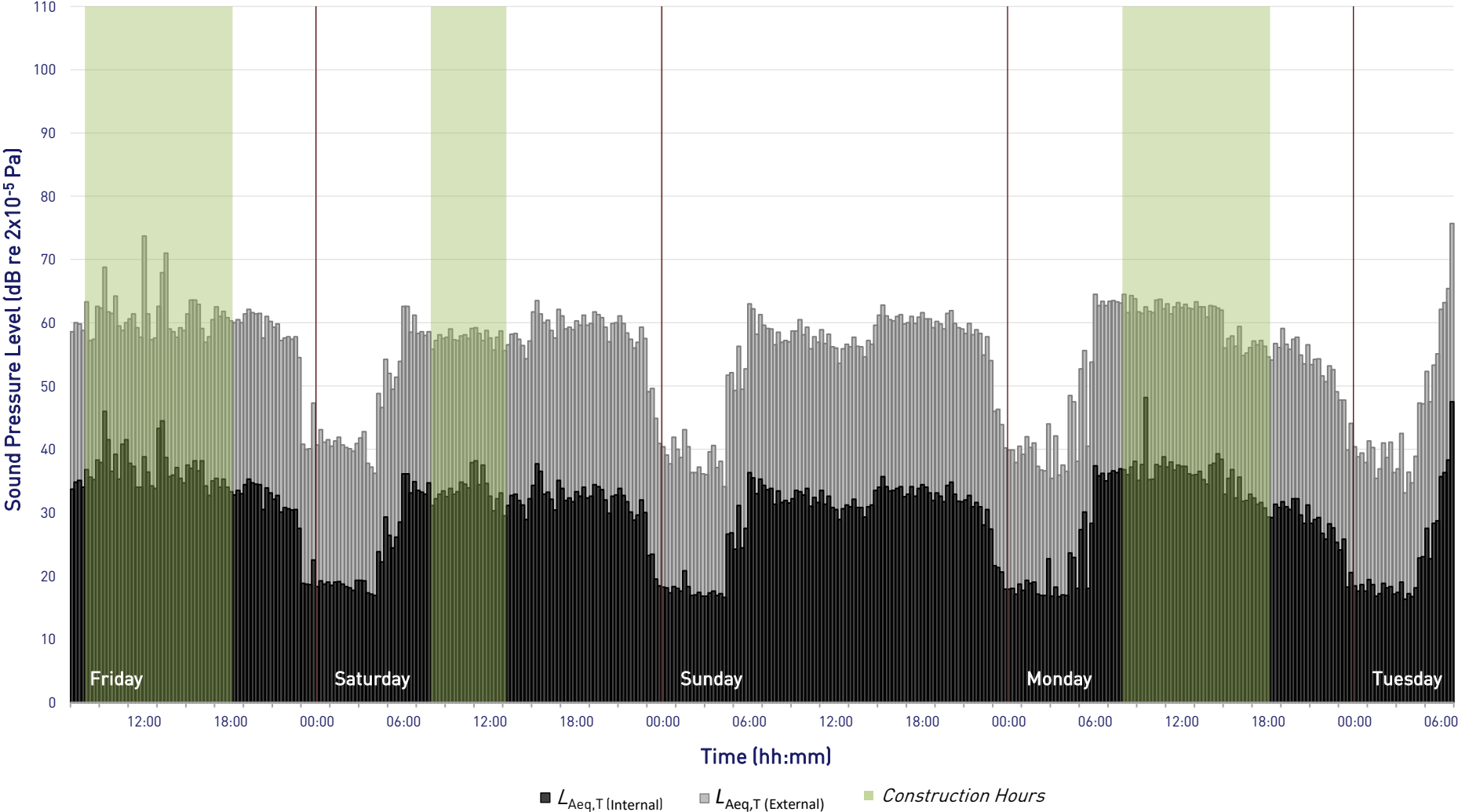
Measured Levels (15min Sample Periods)

Measurement Position 2, Internal / External Comparison - Friday 16 August to Tuesday 20 August, 2024



Project: 13081

Graph 2

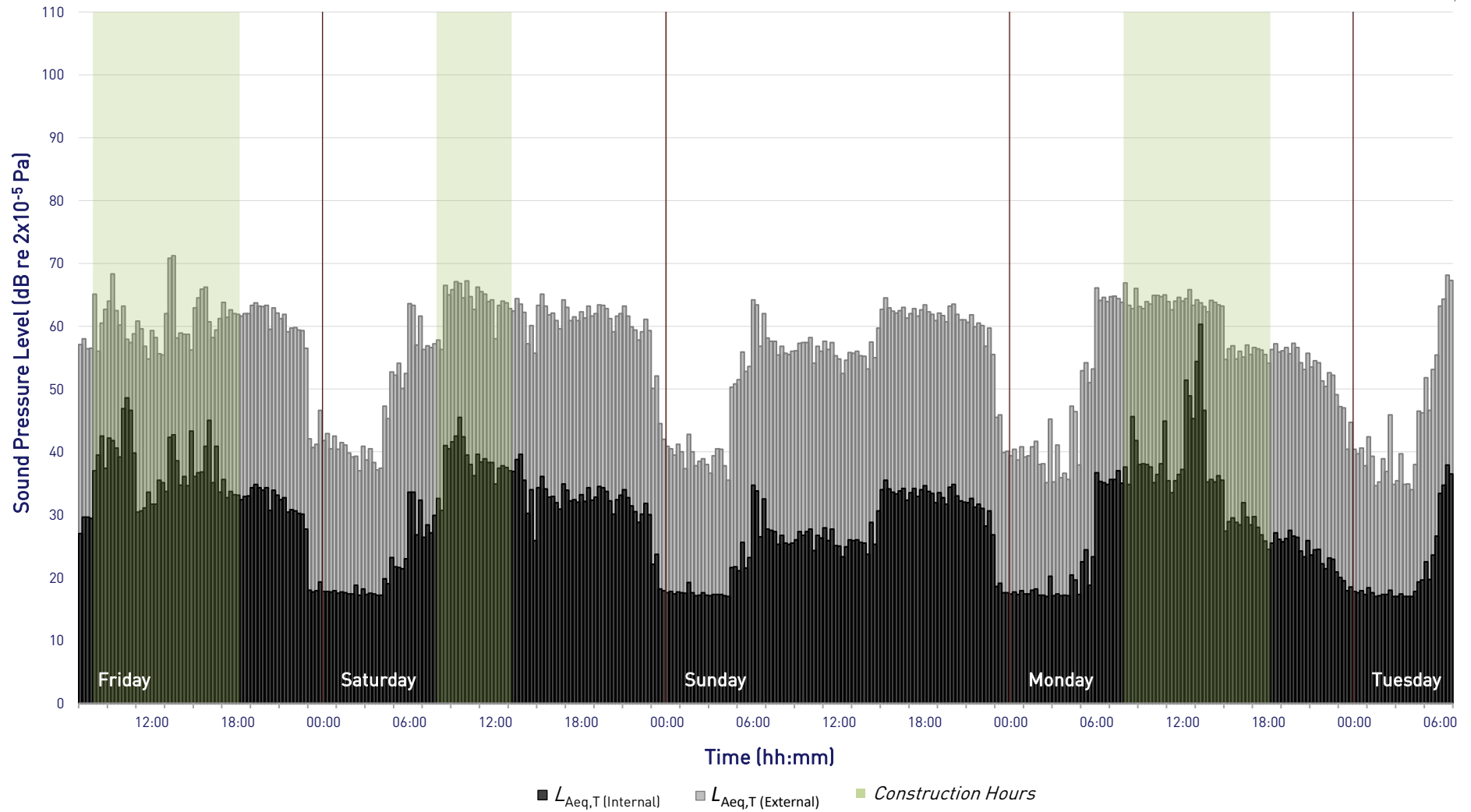


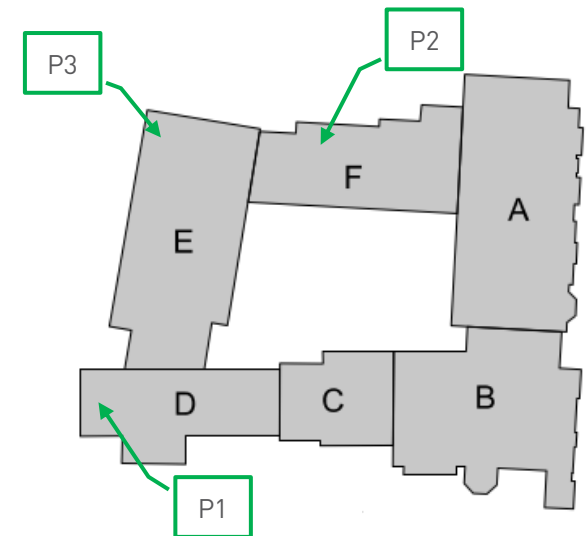
Richmond Royal Hospital - UKI Richmond
Measured Levels (15min Sample Periods)



Project: 13081
Graph 3

Measurement Position 3, Internal / External Comparison - Friday 16 August to Tuesday 20 August, 2024





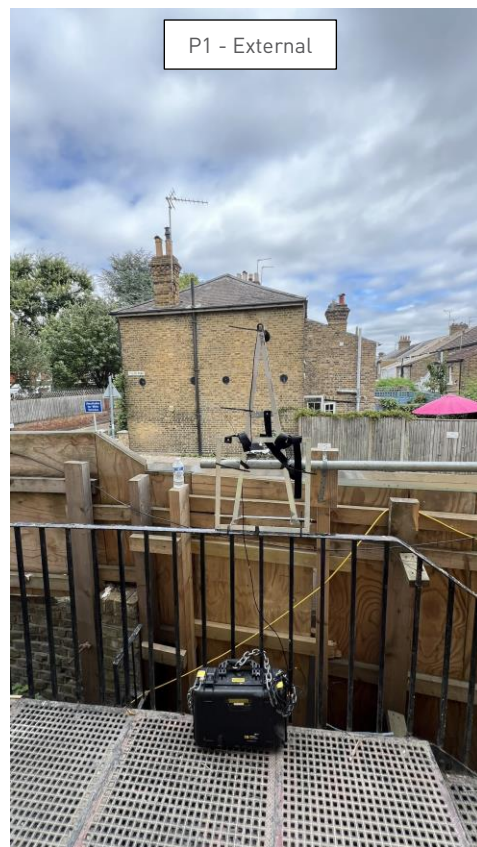
Richmond Royal Hospital – UKI Richmond
 Measurement Locations
 Project 13081

Figure 1
 3 September 2024
 Not to Scale





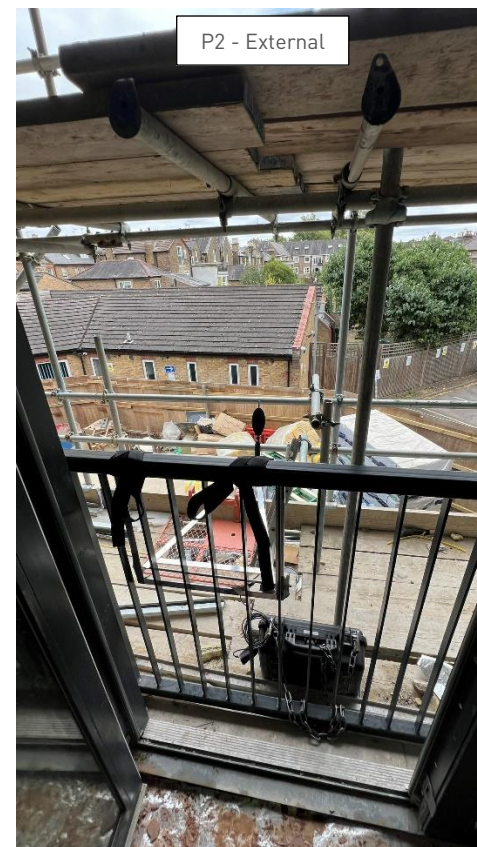
P1 - Internal



P1 - External



P2 - Internal



P2 - External

Richmond Royal Hospital – UKI Richmond
Photos of Measurement Locations
Project 13081

Figure 2
3 September 2024
Not to Scale

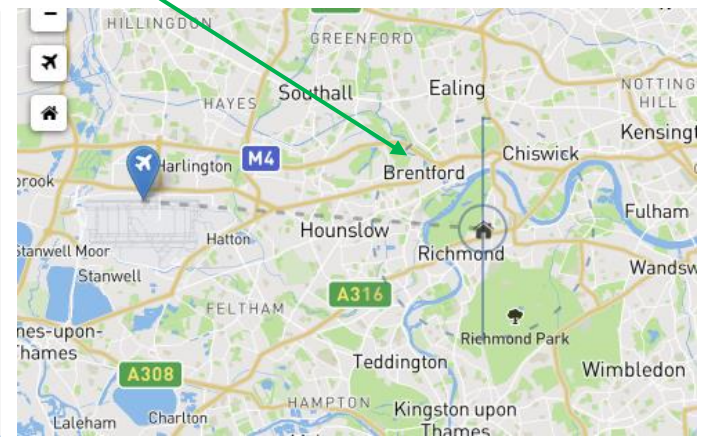
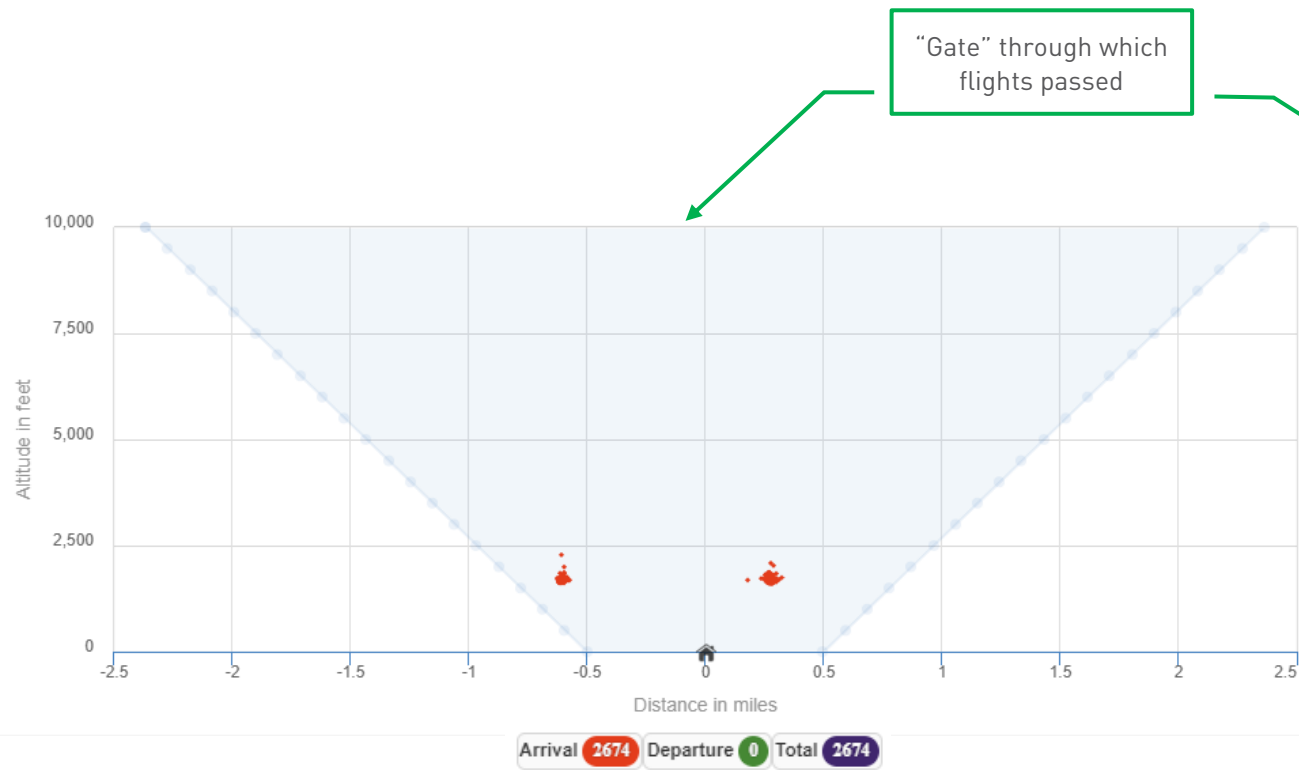




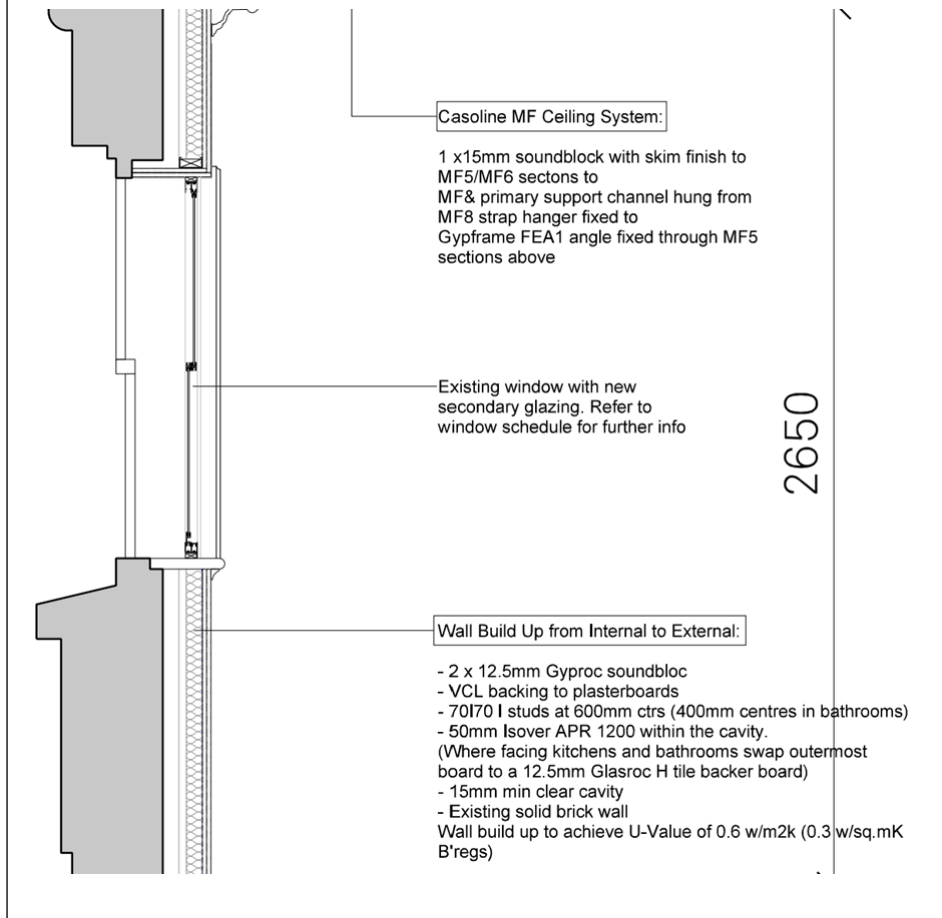
Richmond Royal Hospital – UKI Richmond
Photos of Measurement Locations
Project 13081

Figure 3
3 September 2024
Not to Scale

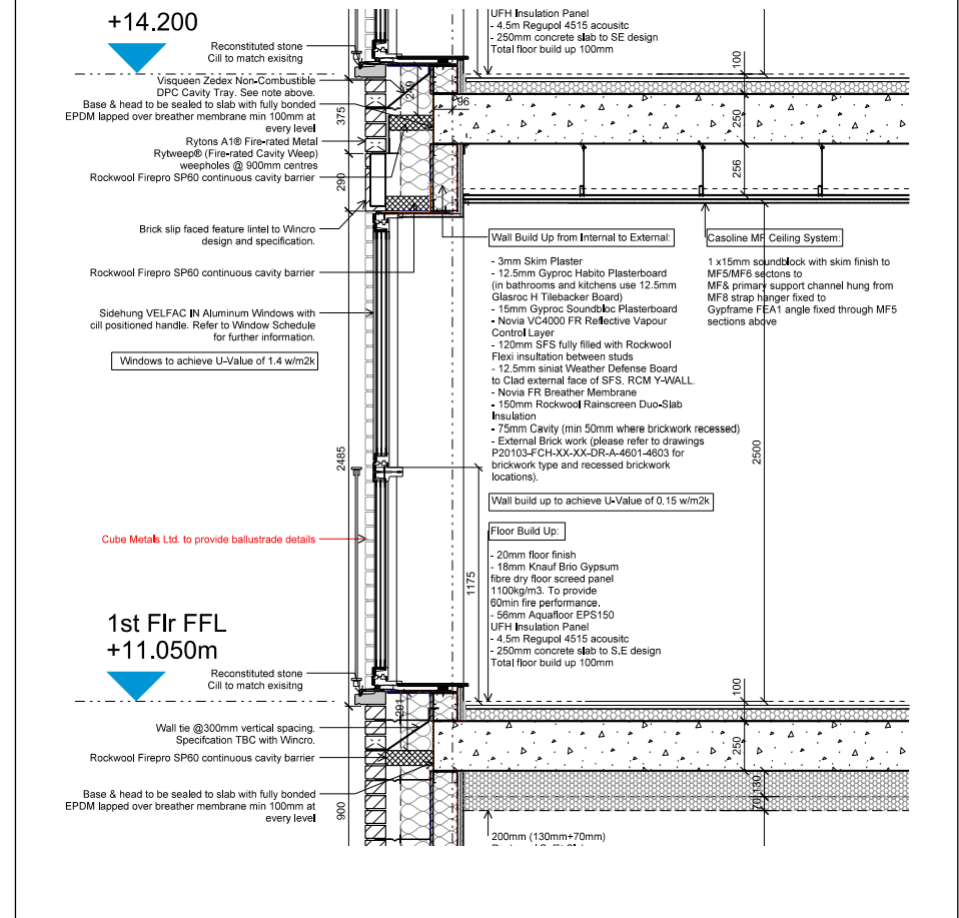




Glazing Configuration A



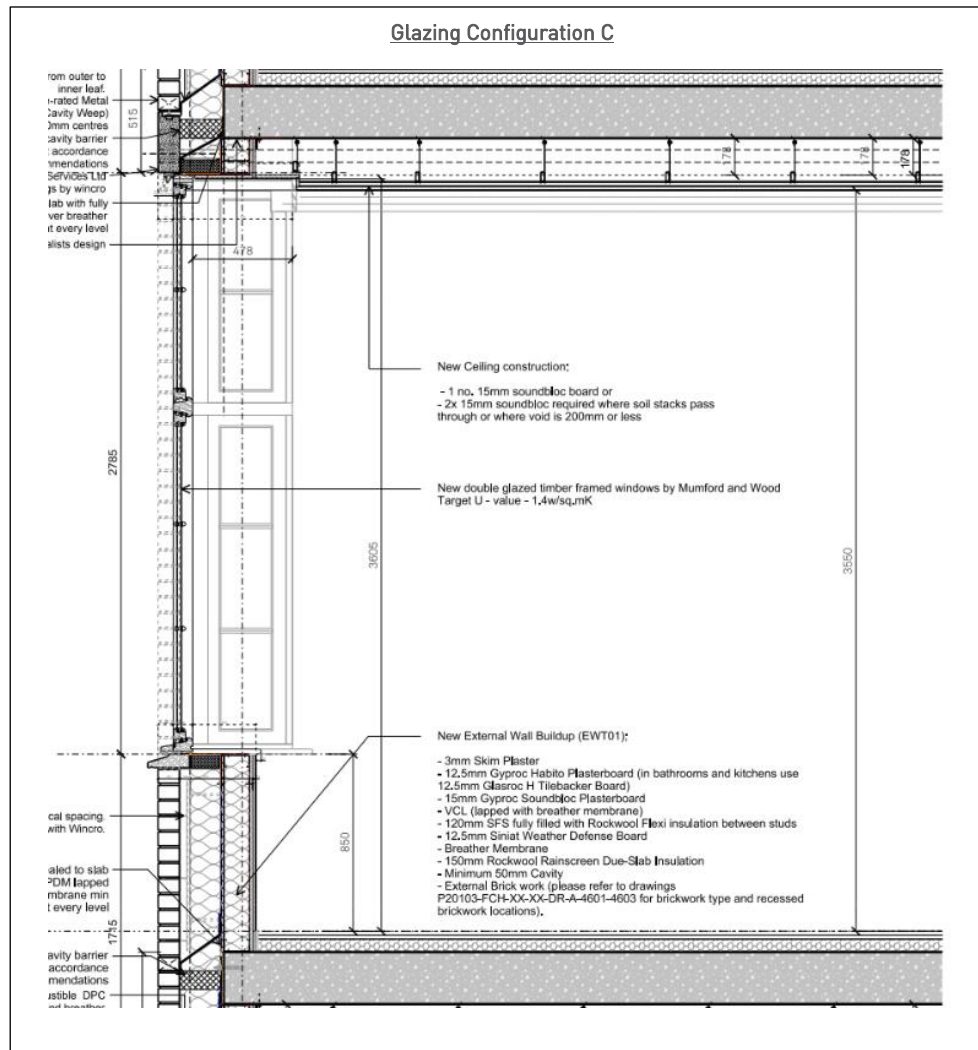
Glazing Configuration B



Richmond Royal Hospital – UKI Richmond
 Glazing Configuration A & Glazing Configuration B
 Project 13081

Figure 5
 3 September 2024
 Not to Scale





Richmond Royal Hospital – UKI Richmond
 Glazing Configuration C
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Figure 6
 3 September 2024
 Not to Scale

