

ACOUSTIC DESIGN NOTE

Project Reference: The Linx Building.

Our Reference: PC-25-0171- LT1.

SUBJECT: Sound Insulation Assessment of the proposed external walls.

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Document Status and Revision Schedule

Issue/Revision	Description/Comments	Date
-	Checked & Authorised	13/08/25
A	Densities kg/m ³ of the assessed materials included	14/08/25

1.0 Introduction.

- 1.1 Pace Consult Ltd was commissioned by Guildmore to carry out a sound insulation assessment of the proposed external walls/cladding system, which is going to replace the existing external walls/cladding at The Linx Building. This assessment aims to ensure that the acoustic performance of the building's facade is maintained or improved following the remediation works.
- 1.2 The build-up information of both the existing and proposed external facade elements, including detailed material specifications and layer thicknesses, has been provided by Guildmore to Pace Consult Ltd. This information forms the basis for the acoustic performance calculations.
- 1.3 The sound insulation performance (specifically, the weighted sound reduction index, R_w) provided by each relevant facade element (existing and proposed) has been calculated using INSUL Sound Insulation prediction software. This software employs established acoustic principles and algorithms to estimate the transmission loss characteristics of multi-layered building elements.

2.0 Objectives.

- 2.1 The primary objective of this technical note is to assess the acoustic performance implications of the proposed external cladding remediation works. Specifically, the assessment aims to:

- 2.1.1 Determine the predicted airborne sound insulation performance, expressed as the weighted sound reduction index (R_w), for both the existing and proposed cladding/external facade elements.
- 2.1.2 Conduct a direct comparative analysis between the calculated sound insulation performance of the existing facade elements and that of the proposed facade elements. This comparison will highlight any changes in acoustic performance resulting from the remediation works.
- 2.1.3 Evaluate the implications of the predicted sound insulation on internal noise levels within residential habitable spaces. It is a key consideration that if the sound insulation provided by the proposed facade elements offers higher or equivalent levels of sound reduction than the existing facade, the internal noise levels in residential habitable spaces are anticipated to remain compliant with, or improve upon, the criteria recommended by BS 8233:2014, Guidance on sound insulation and noise reduction for buildings.
- 2.2 The sound insulation performance for each existing and proposed cladding/external facade element will be quantitated using the noise metric R_w (weighted sound reduction index), expressed in decibels (dB). As a general principle, a higher R_w value signifies superior airborne sound insulation performance provided by the facade element.
- 2.3 The subsequent sections of this technical note will detail the acoustic assessment methodology, present the calculated sound insulation values, and provide a comprehensive comparison based on the material and build-up information provided in the reference drawings.

3.0 Assumptions for the noise insulation assessment.

- 3.1 The table below includes the densities of each material used in the acoustic assessment.

Material	Density kg/m ³
Plasterboard	640
mineral/glass wool	10
PIR Insulation board	40
cement particle board	1444
cedar wood cladding	560
Rockwool slab	33
calcium silicate board	1180
Hardie VL Plank	1300
Bitroc sheathing board	280
brickwork	1600
brick tile cladding system	1800

4.0 Sound Insulation Assessment.

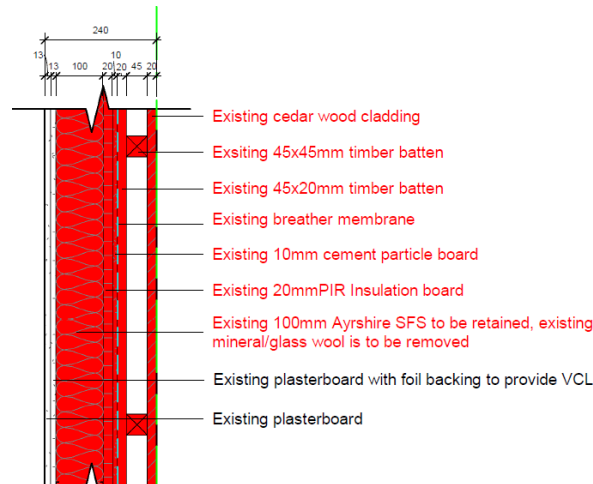
4.1 Assessment 1.

4.1.1 Exiting. WALL TYPE 01 Existing (WT01E)

WALL TYPE 01 **Existing** (WT01E)

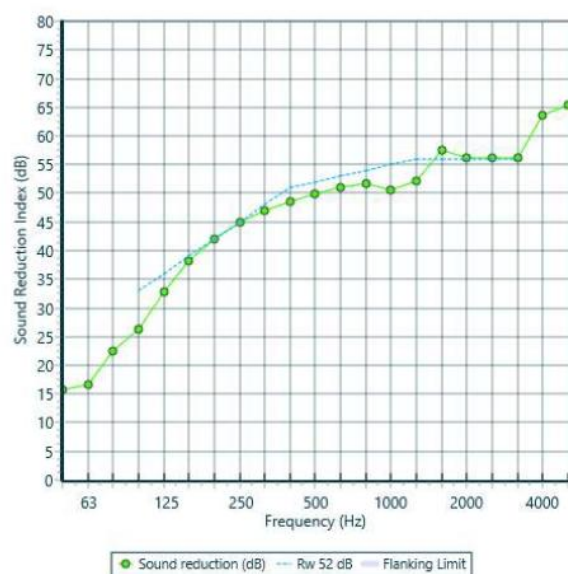
Vertical Cedar Wood Cladding -
Natural Finish

U-Value : 0.44 W/m².K

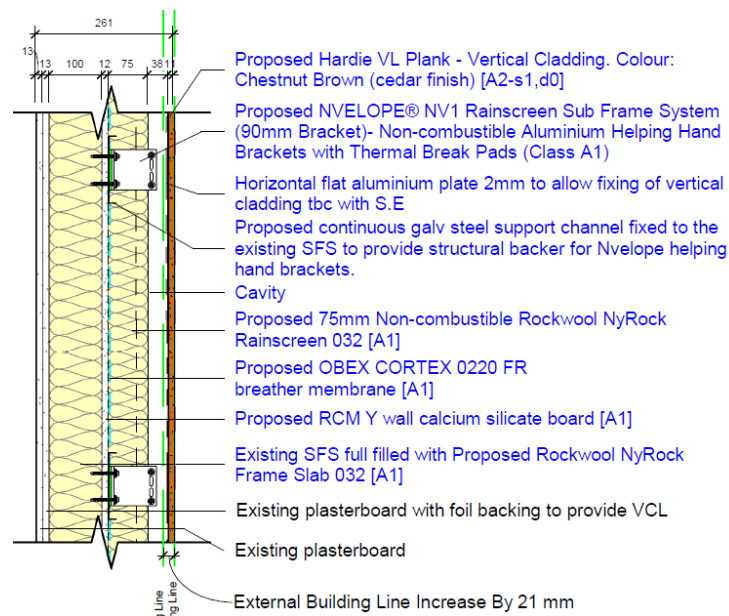


Using the build-up described above as input into INSUL software, the predicted airborne sound insulation performance for the existing facade element is R_w 52 dB. The full sound reduction index in 1/3 octave bands, along with the INSUL calculation output, is provided below

freq.(Hz)	R(dB)	R(dB)
50	16	
63	17	17
80	22	
100	26	
125	33	30
160	38	
200	42	
250	45	44
315	47	
400	49	
500	50	50
630	51	
800	52	
1000	51	51
1250	52	
1600	58	
2000	56	57
2500	56	
3150	56	
4000	64	60
5000	65	

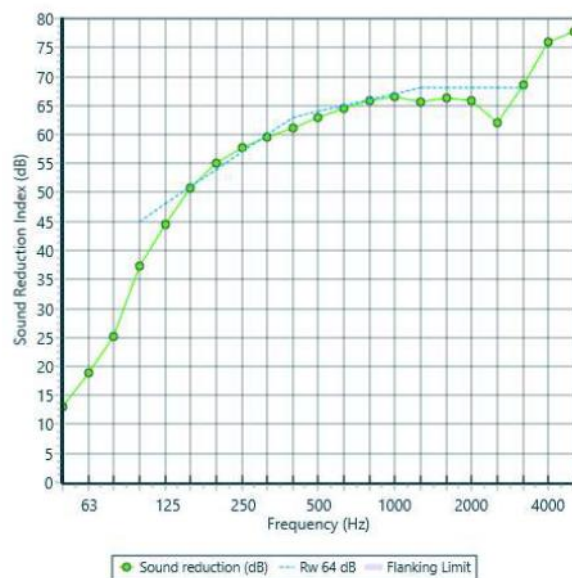


4.1.2 Proposed. WALL TYPE 01 Proposed (WT01)



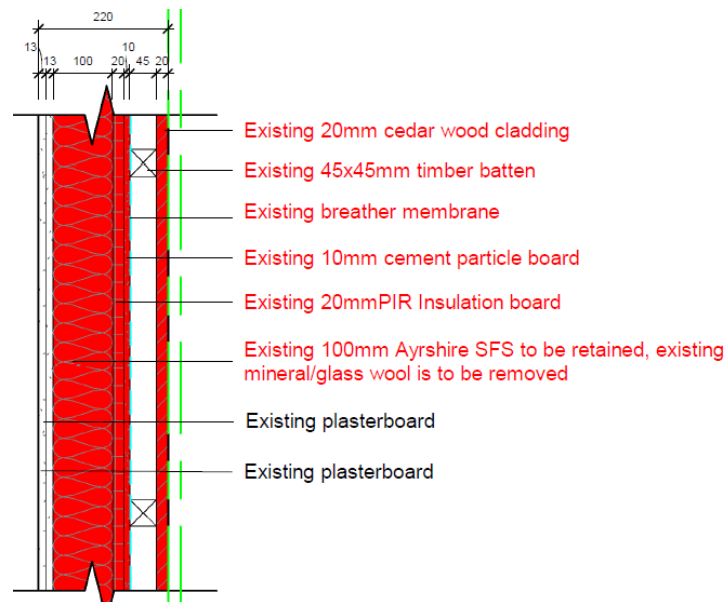
Using the build-up described above as input into INSUL software, the predicted airborne sound insulation performance for the proposed facade element is R_w 64 dB. The full sound reduction index in 1/3 octave bands, along with the INSUL calculation output, is provided below.

freq.(Hz)	R(dB)	R(dB)
50	13	
63	19	17
80	25	
100	37	
125	44	41
160	51	
200	55	
250	58	57
315	60	
400	61	
500	63	63
630	64	
800	66	
1000	66	66
1250	66	
1600	66	
2000	66	64
2500	62	
3150	69	
4000	76	72
5000	78	



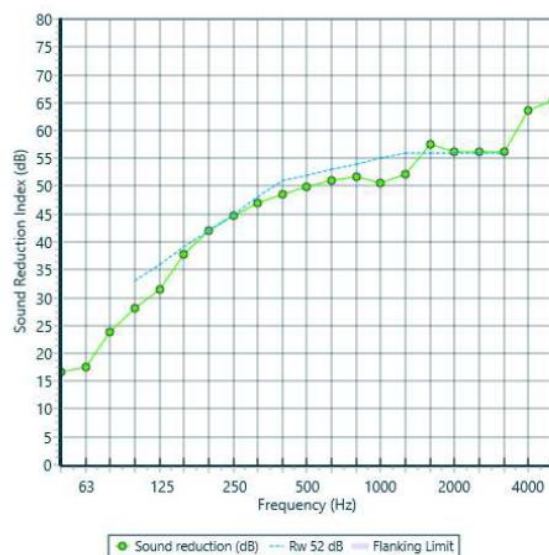
4.2 Assessment 2.

4.2.1 Existing. WALL TYPE 03b Existing (WT03bE)

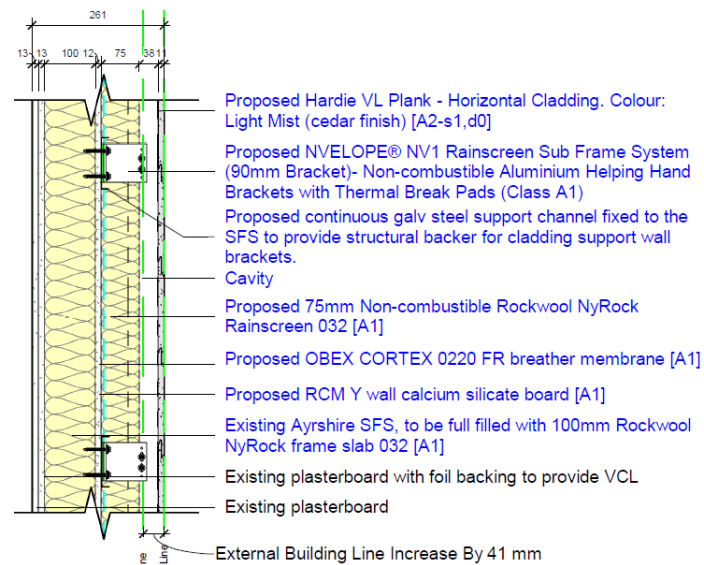


Using the build-up described above as input into INSUL software, the predicted airborne sound insulation performance for the existing facade element is R_w 52 dB. The full sound reduction index in 1/3 octave bands, along with the INSUL calculation output, is provided below.

freq.(Hz)	R(dB)	R(dB)
50	17	
63	17	18
80	24	
100	28	
125	31	31
160	38	
200	42	
250	45	44
315	47	
400	49	
500	50	50
630	51	
800	52	
1000	51	51
1250	52	
1600	58	
2000	56	57
2500	56	
3150	56	
4000	64	60
5000	65	

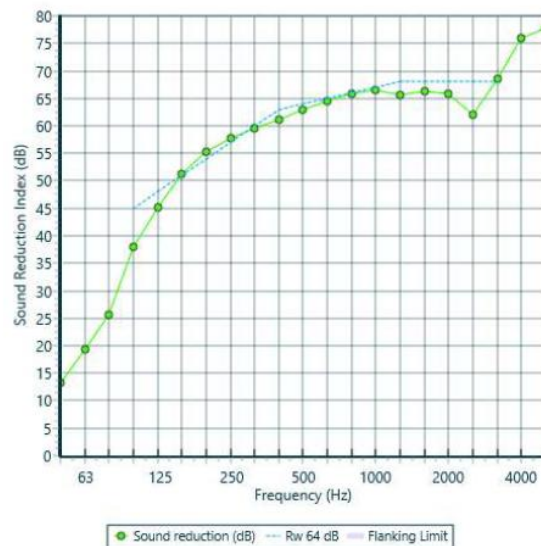


4.2.2 Proposed WALL TYPE 03b Proposed (WT03b)



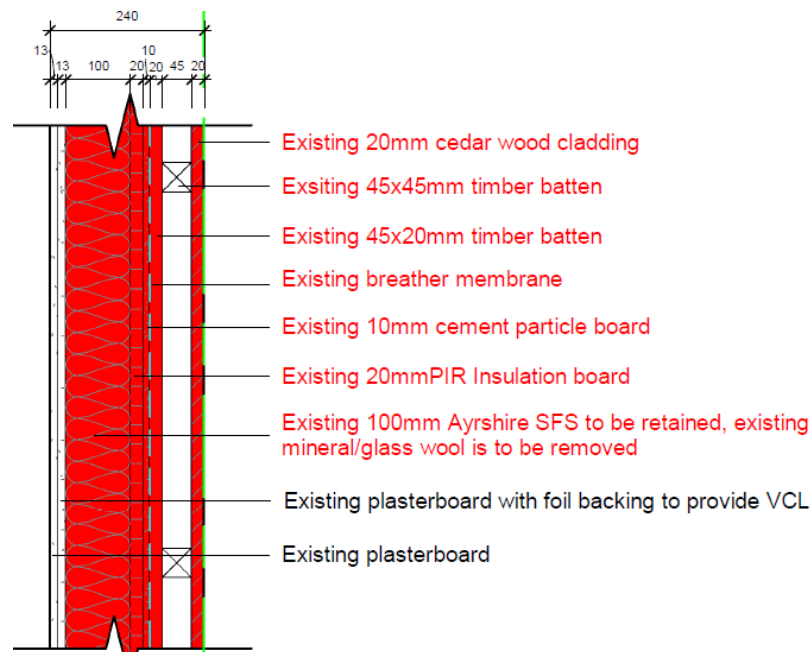
Using the build-up described above as input into INSUL software, the predicted airborne sound insulation performance for the proposed facade element is R_w 64 dB. The full sound reduction index in 1/3 octave bands, along with the INSUL calculation output, is provided below.

freq.(Hz)	R(dB)	R(dB)
50	13	
63	19	17
80	26	
100	38	
125	45	42
160	51	
200	55	
250	58	57
315	60	
400	61	
500	63	63
630	64	
800	66	
1000	66	66
1250	66	
1600	66	
2000	66	64
2500	62	
3150	69	
4000	76	72
5000	78	



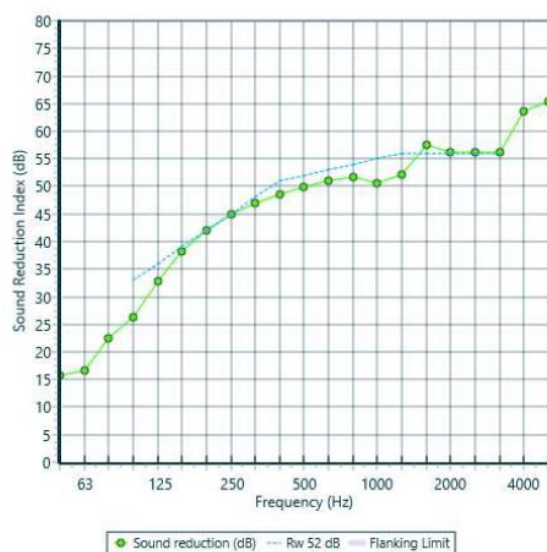
4.3 Assessment 3.

4.3.1 Existing. WALL TYPE 03a Existing (WT03aE)

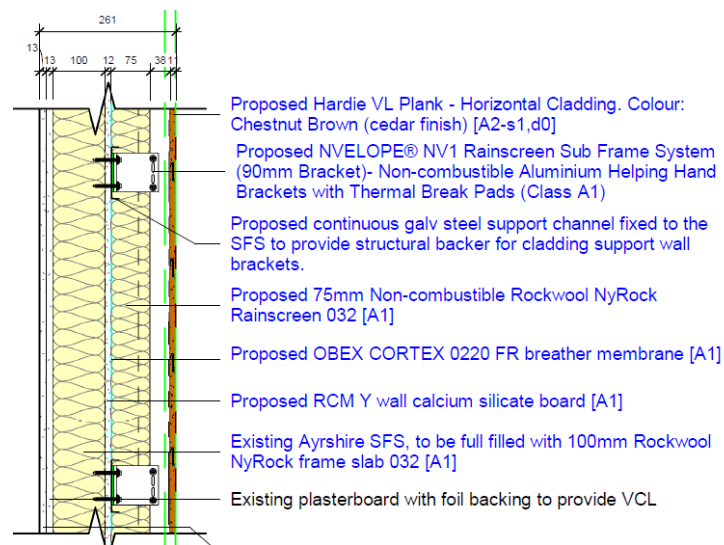


Using the build-up described above as input into INSUL software, the predicted airborne sound insulation performance for the existing facade element is R_w 52 dB. The full sound reduction index in 1/3 octave bands, along with the INSUL calculation output, is provided below.

freq.(Hz)	R(dB)	R(dB)
50	16	
63	17	17
80	22	
100	26	
125	33	30
160	38	
200	42	
250	45	44
315	47	
400	49	
500	50	50
630	51	
800	52	
1000	51	51
1250	52	
1600	58	
2000	56	57
2500	56	
3150	56	
4000	64	60
5000	65	

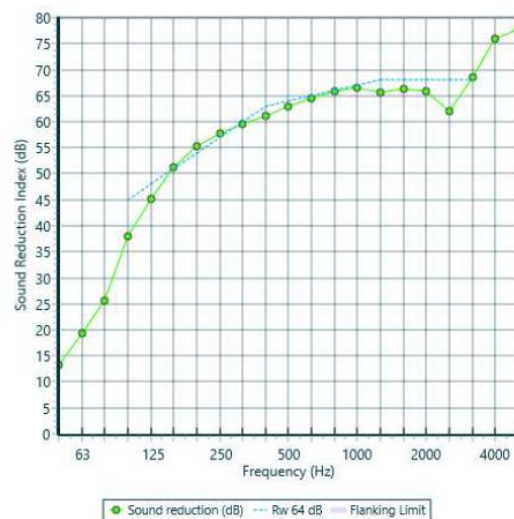


4.3.2 Proposed. WALL TYPE 03a Proposed (WT03a)



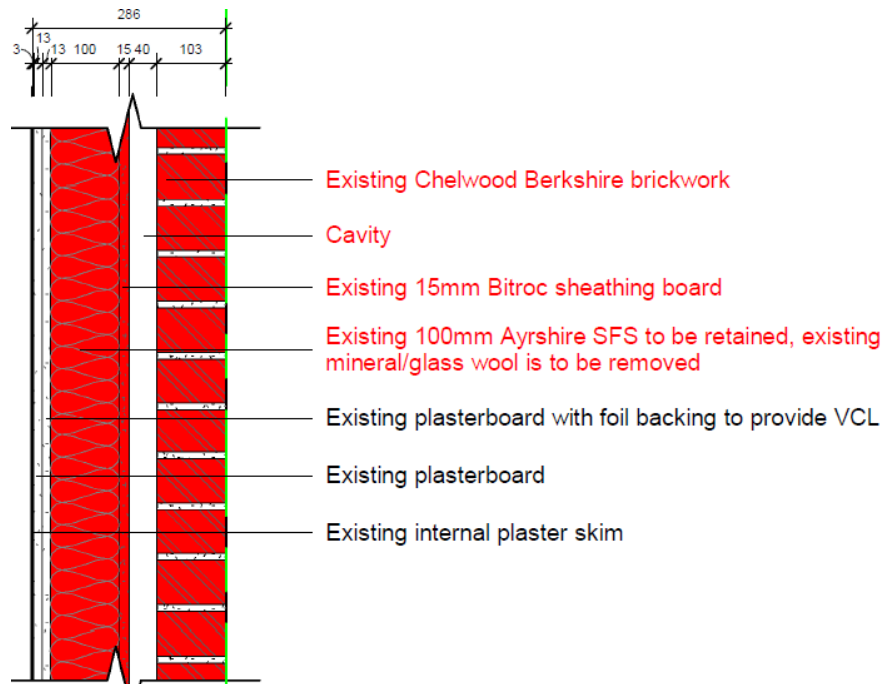
Using the build-up described above as input into INSUL software, the predicted airborne sound insulation performance for the proposed facade element is R_w 64 dB. The full sound reduction index in 1/3 octave bands, along with the INSUL calculation output, is provided below.

freq.(Hz)	R(dB)	R(dB)
50	13	
63	19	17
80	26	
100	38	
125	45	42
160	51	
200	55	
250	58	57
315	60	
400	61	
500	63	63
630	64	
800	66	
1000	66	66
1250	66	
1600	66	
2000	66	64
2500	62	
3150	69	
4000	76	72
5000	78	



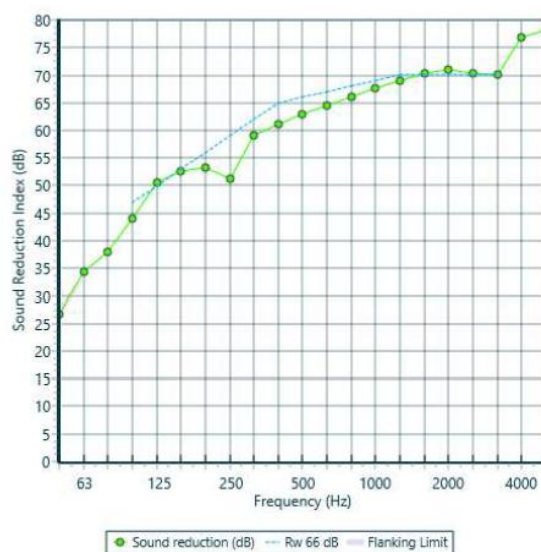
4.4 Assessment 4.

4.4.1 Existing. WALL TYPE 02d Existing (WT02dE)

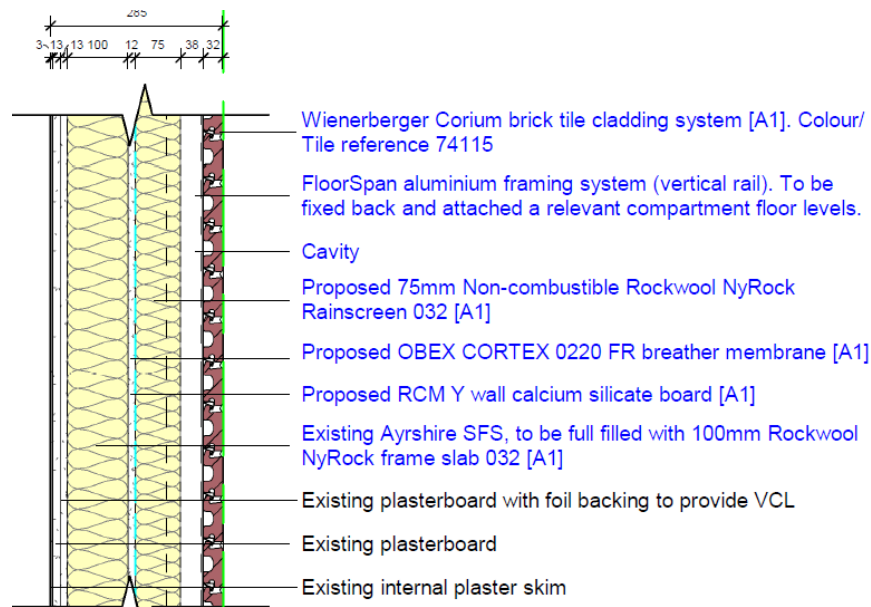


Using the build-up described above as input into INSUL software, the predicted airborne sound insulation performance for the existing facade element is R_w 66 dB. The full sound reduction index in 1/3 octave bands, along with the INSUL calculation output, is provided below.

freq.(Hz)	R(dB)	R(dB)
50	27	
63	34	31
80	38	
100	44	
125	51	48
160	53	
200	53	
250	51	53
315	59	
400	61	
500	63	63
630	65	
800	66	
1000	68	67
1250	69	
1600	70	
2000	71	71
2500	70	
3150	70	
4000	77	73
5000	78	

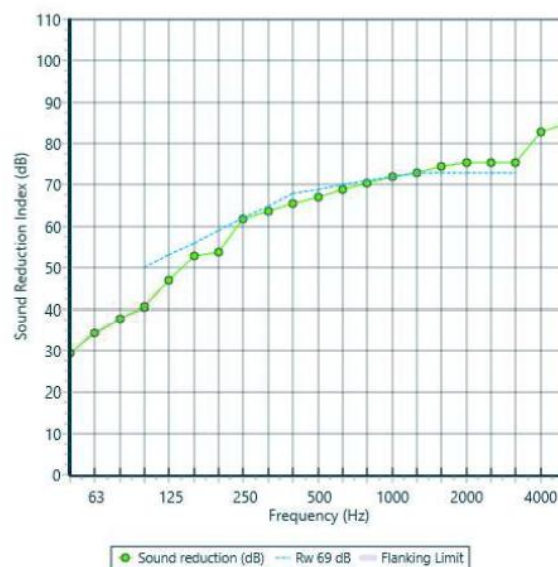


4.4.2 Proposed. WALL TYPE 02a Proposed WT02a)



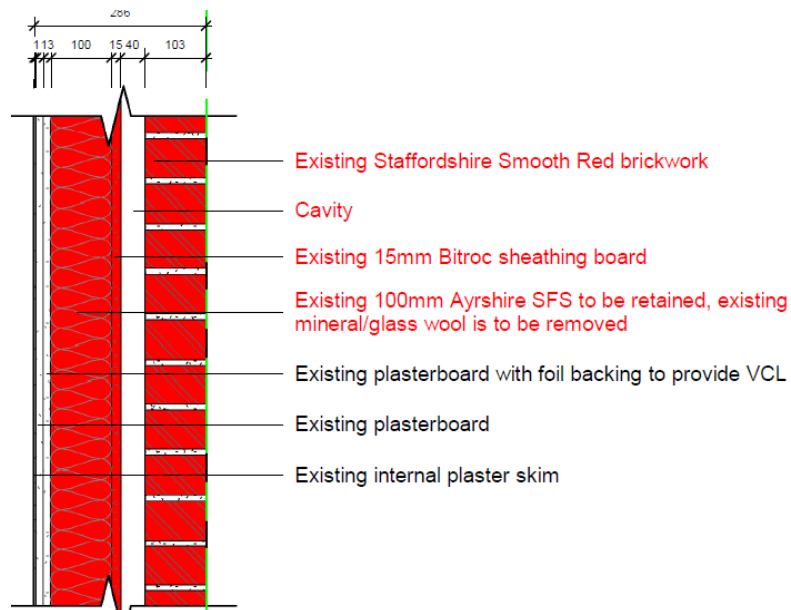
Using the build-up described above as input into INSUL software, the predicted airborne sound insulation performance for the proposed facade element is R_w 69 dB. The full sound reduction index in 1/3 octave bands, along with the INSUL calculation output, is provided below.

freq.(Hz)	R(dB)	R(dB)
50	29	
63	34	32
80	38	
100	40	
125	47	44
160	53	
200	54	
250	62	57
315	64	
400	65	
500	67	67
630	69	
800	70	
1000	72	72
1250	73	
1600	74	
2000	75	75
2500	75	
3150	75	
4000	83	79
5000	85	



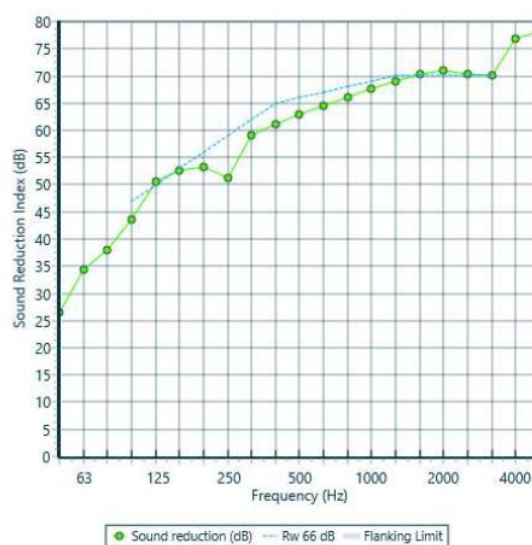
4.5 Assessment 5.

4.5.1 Existing WALL TYPE 02a Existing (WT02aE)

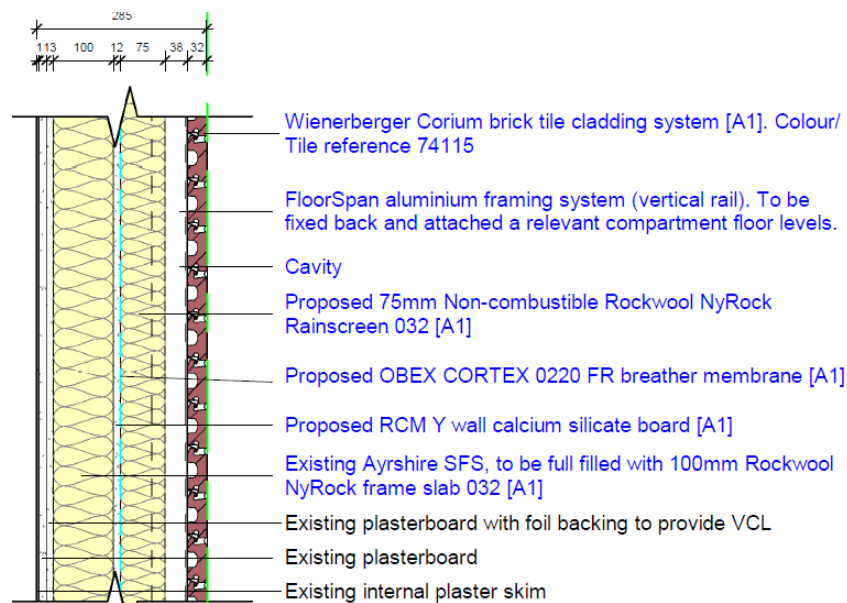


Using the build-up described above as input into INSUL software, the predicted airborne sound insulation performance for the existing facade element is R_w 66 dB. The full sound reduction index in 1/3 octave bands, along with the INSUL calculation output, is provided below.

freq.(Hz)	R(dB)	R(dB)
50	27	
63	34	30
80	38	
100	44	
125	51	47
160	53	
200	53	
250	51	53
315	59	
400	61	
500	63	63
630	65	
800	66	
1000	68	67
1250	69	
1600	70	
2000	71	71
2500	70	
3150	70	
4000	77	73
5000	78	

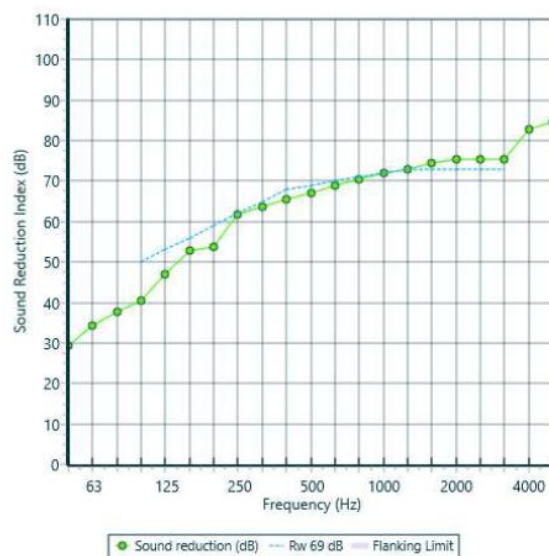


4.5.2 Proposed. WALL TYPE 02a Proposed WT02a)



Using the build-up described above as input into INSUL software, the predicted airborne sound insulation performance for the proposed facade element is R_w 69 dB. The full sound reduction index in 1/3 octave bands, along with the INSUL calculation output, is provided below.

freq.(Hz)	R(dB)	R(dB)
50	29	
63	34	32
80	38	
100	40	
125	47	44
160	53	
200	54	
250	62	57
315	64	
400	65	
500	67	67
630	69	
800	70	
1000	72	72
1250	73	
1600	74	
2000	75	75
2500	75	
3150	75	
4000	83	79
5000	85	



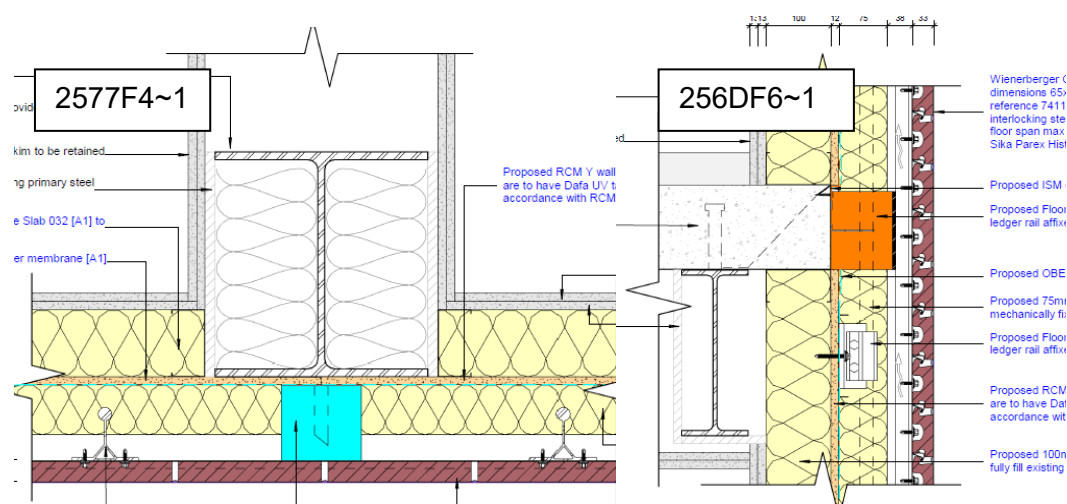
5.0 Summary.

5.1 The table below provides a summary of the calculated weighted sound reduction index (R_w) for each of the assessed existing (as-built) and proposed (replacement) external facade elements. Each "Assessment No." corresponds to a specific facade build-up evaluated within the project scope.

No Assessment	External wall Existing Calculated R_w dB.	External wall Proposed. Calculated R_w dB.
1	52	64
2	52	64
3	52	64
4	66	69
5	66	69

6.0 Flanking sound assessment.

6.1 The proposal to mitigate horizontal and vertical flanking is detailed in the images below.



6.2 Horizontal Flanking Sound Transmission

Drawing 2577F4~1.PDF illustrates a party wall detail designed to effectively minimise horizontal sound transmission between adjacent spaces. A key feature of this design is the penetration of the internal party wall through the internal lining of the external wall. This is a critical detail that disrupts the path for flanking sound, preventing it from travelling along the external wall leaf from one room to the next.

The specification of 100mm Rockwool NyRock Frame Slab 032 within the steel frame system (SFS) stud zone is a significant factor in enhancing acoustic performance. Rockwool is a high-density mineral wool insulation that provides

excellent sound absorption, reducing the transmission of airborne sound through the wall cavity.

Furthermore, the inclusion of a Paraflam SEB vertical cavity barrier at the compartment wall location serves a dual purpose. While its primary function is to prevent the spread of fire, it also acts as an effective acoustic barrier, closing off the cavity and preventing sound from flanking around the party wall.

6.3 Vertical Flanking Sound Transmission

Drawing 256DF6~1.PDF details the compartment floor, which incorporates several elements to mitigate vertical flanking sound transmission. The existing 130mm composite steel HOLORIB deck with concrete in-fill provides a solid foundation with inherent mass that helps to block airborne sound. The continuity of insulation is a critical factor in preventing flanking sound. The proposed detail shows 100mm Rockwool NyRock Frame Slab 032 fully filling the existing SFS stud zone, which will be adjacent to the floor slab. This ensures that there is no gap for sound to travel vertically through the external wall cavity

The use of a floor span max wind load bracket to support the vertical T-rail for the cladding system is also a considered detail. By attaching this to a steel ledger rail on the existing SFS, the number of direct connections to the primary structure is minimised, which can help to reduce the transmission of structure-borne sound.

6.4 Compliance with Manufacturer's Recommendations

The proposed details are in line with the principles outlined in the British Gypsum White Book, which provides comprehensive guidance on achieving high levels of sound insulation in buildings. The penetration of the party wall through the external wall lining is a classic example of a recommended detail to reduce horizontal flanking.

Similarly, the use of high-performance Rockwool insulation in both the wall and floor constructions aligns with the manufacturer's recommendations for acoustic control. Rockwool products are extensively tested and proven to be effective in reducing sound transmission.

7.0 Conclusions.

7.1 This technical note has presented a comprehensive assessment of the predicted airborne sound insulation performance of the existing and proposed external facade elements, using the weighted sound reduction index (R_w).

7.2 A direct comparison of the calculated R_w values, as summarised in Table 4.1, demonstrates that the proposed facade elements consistently offer significantly higher levels of airborne sound insulation compared to the corresponding existing facade elements.

- 7.3 Overall, the remediation works are anticipated to result in an acoustic improvement for the building's facade, creating a more acoustically comfortable internal environment for occupants.