



SHOALTER AUTOMATION

RETAIL 01A, THE CASTINGS, M1 2DY

ACOUSTIC REVIEW

R2336-REP01D-SJW

10 January 2025

REPORT DETAILS

Project	Shoalter Automation, Retail 01A, The Castings, M1 2DY
Client	Shoalter Automation
Document Reference	R2336-REP01D-SJW
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Signed	
Checked by	Johnathan Whittle BSc (Hons), Pg. Dip. IOA AMIOA MCIEH
Signed	

OUTLINE MITIGATION

Vibration Isolation of the Replenishment Curtain & Associated Fixings

To minimise impact the following measures should be considered for the replenishment curtain:

- Fixing of any guide rails and motor housing on resilient pads or springs with a maximum natural frequency of 15 Hz and provision of all screws/bolts with rubber or neoprene sleeves.
- Fitting of resilient sleeves to all connections, including cabling and pipework, which pass through or are attached to walls, beams or floors and sealing of all gaps with acoustic mastic.
- Fitting of a rubber or neoprene strip to the bottom of the door to reduce impact noise on closure.
- Fitting the motor unit with an acoustic enclosure.

More detailed proposals will be assessed by Red Acoustics further to a review of the operation of the replenishment curtain.

All walls within Unit 01A should be lined with:

12.5mm Wallboard fixed using a GypLyner wall lining system with 25mm insulation in the cavity

The soffit within Unit 01A should be lined with:

12.5mm Wallboard fixed using an MF Support system with 100mm insulation in the cavity

The base of the partition to Unit 01 requires fully sealing with non setting mastic

A review of the external plant noise is not required as no externally mounted plant is proposed.

A review of noise egress is outside the scope of this internal noise and vibration transfer review. Any noise egress targets will be set by any planning limitations associated with operation of Unit 01A.

Consideration should however be given to internally lining the lightweight infill panels above the glazed elements.

1.0 INTRODUCTION

Red Acoustics has been commissioned by Shoalter Automation to provide an assessment of noise impact relating to the proposed Shoalter Automation retail unit at Retail 01A, The Castings, M1 2DY.

Red Acoustics has been commissioned by Shoalter Automation to conduct the following assessments:

- Measure the airborne sound insulation between the proposed retail space and the adjacent spaces and provide guidance on internal noise transfer for compliance with project specific criteria.
- Measure vibration transfer between the proposed retail space and the adjacent spaces and provide guidance on internal vibration transfer for compliance with project specific criteria.

This report presents the results of the sound insulation and vibration transfer tests and identifies the existing level of internal noise transfer from the proposed retail unit into the adjacent spaces and identifies any remedial measures that may be necessary to minimise disturbance from operation of the proposed retail space and associated equipment.

2.0 DESCRIPTION OF THE SITE & RETAIL LAYOUT

The proposed retail unit is located at Retail 01A, The Castings, M1 2DY. The retail space is to be located at ground floor level within a commercial unit lying adjacent to residential spaces at ground floor and first floor above.

Opening Times

It is anticipated that the retail unit will operate 24hrs.

The layout of the ground floor Retail Unit 01A and associated adjacent spaces at ground and first floor levels is shown inn Figure 2.1 below.

Figure 2.1: Floor Plans



3.0 TARGET ACOUSTIC CRITERIA

Planning Conditions

Reference is made to the following planning conditions which are applicable for this site:

Acoustic Insulation Scheme & Verification Report - Externally Mounted Ancillary Equipment

"Prior to occupation of

(a) The residential accommodation; and

(b) The ground floor commercial units

a scheme for the acoustic insulation of any externally mounted ancillary equipment associated with the development to ensure that it achieves a background noise level of 5dB below the existing background (La90) at the nearest noise sensitive location shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the equipment. The approved scheme shall be completed before the premises is occupied and a verification report submitted for approval by the City Council as local planning authority and any non compliance suitably mitigated in accordance with an agreed scheme prior to occupation. The approved scheme shall remain operational thereafter."

Acoustic Insulation Scheme & Verification Report - Ground Floor Commercial Unit

"136521/NMC/2023 Changes to condition 17 are a result work to specify the ground floor glazing to the ground floor commercial units and amended City Council requirements in relation to and the acoustic performance required within the commercial units in terms entertainment noise;

17) Before the development commences a scheme for acoustically insulating the ground floor commercial to ensure that there is no unacceptable level of noise transfer from the ground floor uses to the residential accommodation above shall be submitted to and approved in writing by the City Council as local planning authority.

"136521/NMC/2023 Changes to condition 17 are a result work to specify the ground floor glazing to the ground floor commercial units and amended City Council requirements in relation to and the acoustic performance required within the commercial units in terms entertainment noise;

Where entertainment noise is proposed the LAeq (entertainment noise) shall be controlled to 5dB below the LA90 (without entertainment noise) in each octave band at the facade of the nearest noise sensitive location, and internal noise levels at structurally adjoined residential properties in the 63HZ and 125Hz octave frequency bands shall be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (Leq,5min), respectively.

The approved noise insulation scheme shall be completed before any of the approved uses commence.

Prior to occupation a post completion report to verify that all of the recommended mitigation measures have been installed and effectively mitigate any potential adverse noise impacts in adjacent residential accommodation arising directly from the proposed development shall be submitted and agreed in writing by the City Council as local planning authority. Prior to occupation any non compliance shall be suitably mitigated in accordance with an agreed scheme."

Target Criterion

As the proposal comprises a non entertainment noise space and In lieu of any specific target acoustic criteria for residual noise levels in the residential spaces, reference is made to the existing ambient noise level inside the adjacent spaces and the subjective assessments undertaken during the tests.

It is recommend that the following target acoustic criterion are considered as targets to provide a good amenity in the adjacent areas when operational between 06:00hrs and 23:00hrs. Residual noise impacting from the retail unit should ideally not exceed the following limits when operating within normal parameters:

Adjacent Residential Habitable Space's $\leq$ NR10 Lfeq (including short term 500ms Leq noise spectra in lieu of maximum noise data being provided)

Adjacent Restaurant Unit $\leq$ NR30 Lfeq

Adjacent Gym Unit Yoga Studio $\leq$ NR25 Lfeq

At this stage a noise impact assessment has not been undertaken for the proposed plant items. If, based on the proposed plant layout and required for compliance with the planning condition referenced above, this will be issued under separate cover.

4.0 DETERMINATION OF OPERATING NOISE & VIBRATION LEVELS

In order to establish typical and worst case operating activity noise and vibration levels within the Shoalter Automation retail unit, reference is made to measured activity spectral noise and vibration data . Details of typical activity noise levels are presented in Figures 1 and 2 below for various operating conditions as well as specific impact noise events when measured as short term noise events in the absence of available LfMax noise spectra.

Figure 1: Shoalter Automation Activity Leq Noise Spectra

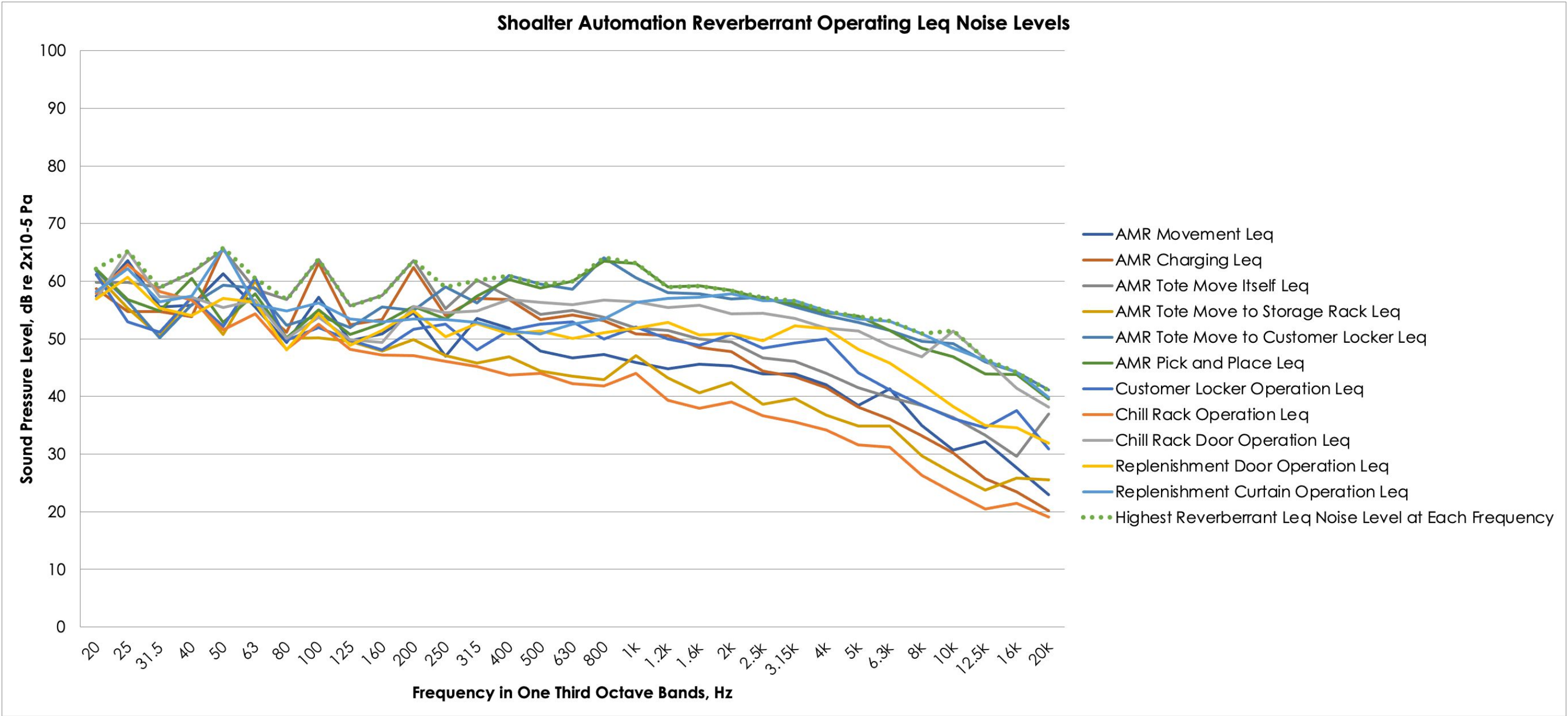
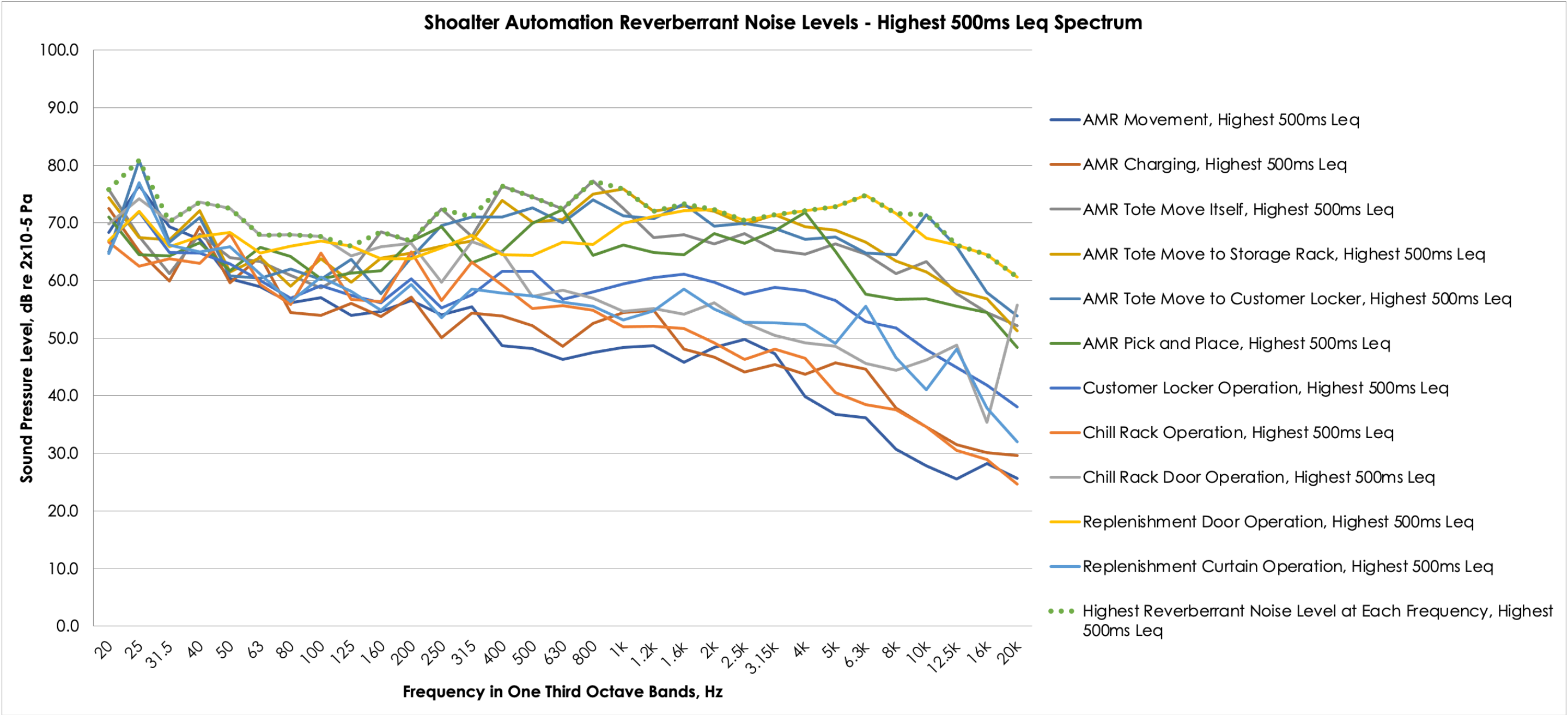
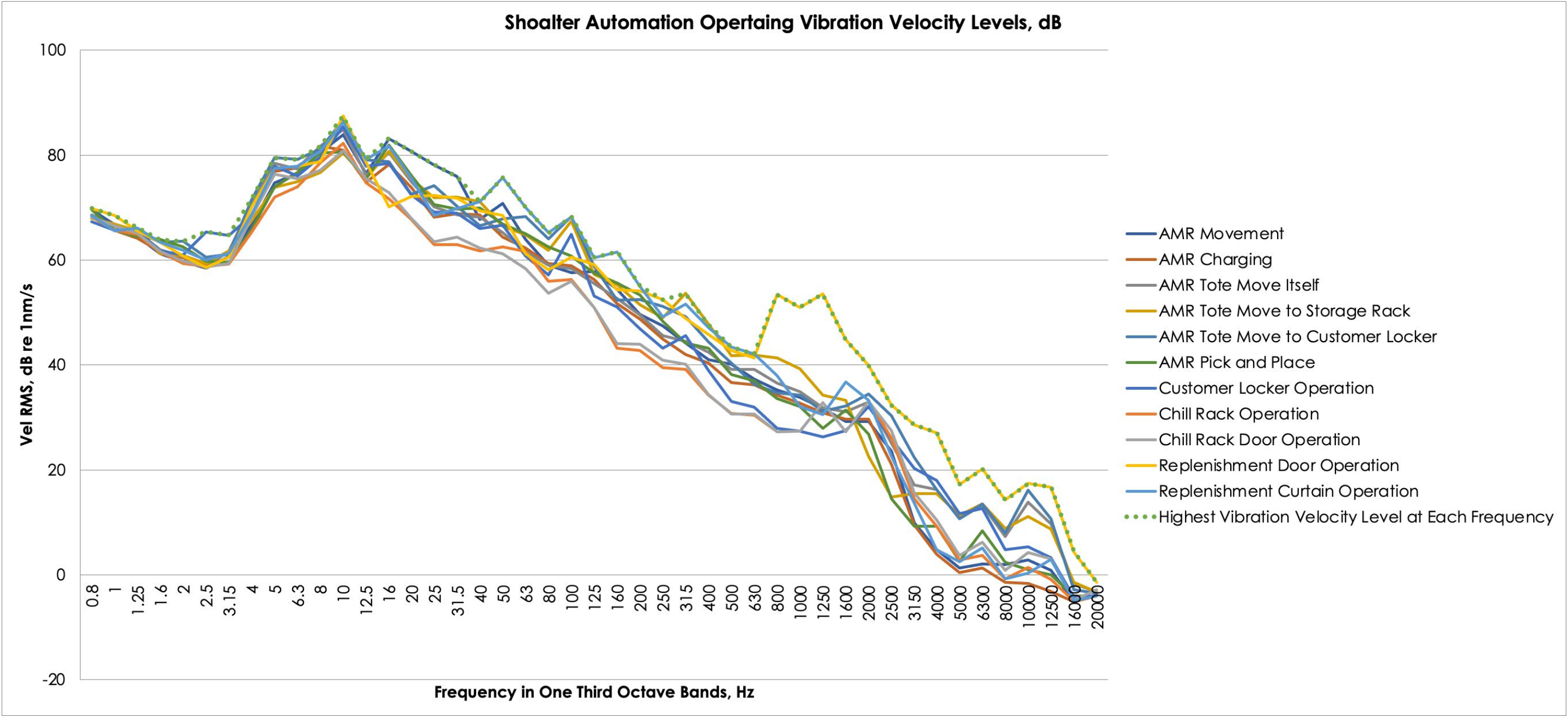


Figure 2: Shoalter Automation Activity Highest Leq_500ms Noise Spectra



Details of typical activity vibration levels are also presented in Figure 4 below for various operating conditions and specific impact noise events.

Figure 4: Shoalter Automation Activity Vibration Spectra



5.0 INTERNAL TRANSFER TEST PROCEDURE & SUMMARY

Test Procedure

Appendix A provides details of the test procedures undertaken on site.

Test Summary

Table 1 below summarises the tests undertaken on site to assess the transmission of noise and vibration the proposed unit to the adjacent noise sensitive spaces. For testing access was provided to all adjacent spaces. All tests were conducted during a quite daytime period.

Table 1: Noise Transfer Measurements

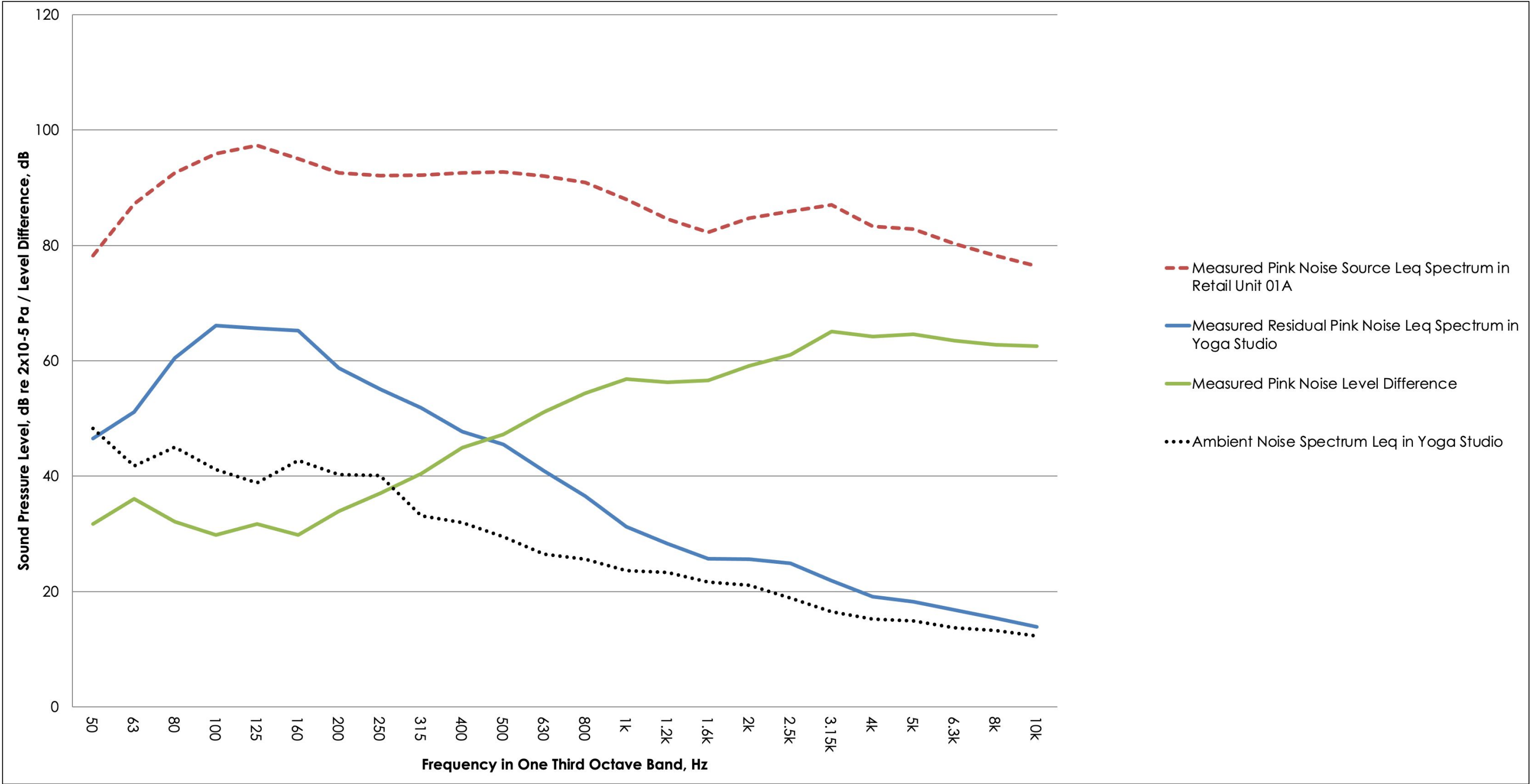
Test No.	Source Room	Receiving Space	Source Type
1	Retail Unit 01A	Ground Floor Yoga Studio	Pink Noise Transfer
2	Retail Unit 01A	Ground Floor Yoga Studio	Vibration Transfer
3	Retail Unit 01A	Retail Unit 01 (Restaurant Shell)	Pink Noise Transfer
4	Retail Unit 01A	Retail Unit 01 (Restaurant Shell)	Vibration Transfer
5	Retail Unit 01A	Apartment 1.08 Bedroom	Pink Noise Transfer
6	Retail Unit 01A	Apartment 1.08 Bedroom	Vibration Transfer
7	Retail Unit 01A	Apartment 1.08 Living Room	Pink Noise Transfer
8	Retail Unit 01A	Apartment 1.08 Living Room	Vibration Transfer
9	Retail Unit 01A	Apartment 1.09 Bedroom	Pink Noise Transfer
10	Retail Unit 01A	Apartment 1.09 Bedroom	Vibration Transfer
11	Retail Unit 01A	Apartment 1.09 Living Room	Pink Noise Transfer
12	Retail Unit 01A	Apartment 1.09 Living Room	Vibration Transfer

To assess impact from normal operation of the retail unit a noise transfer assessment has been undertaken by Red Acoustics based on the following information:

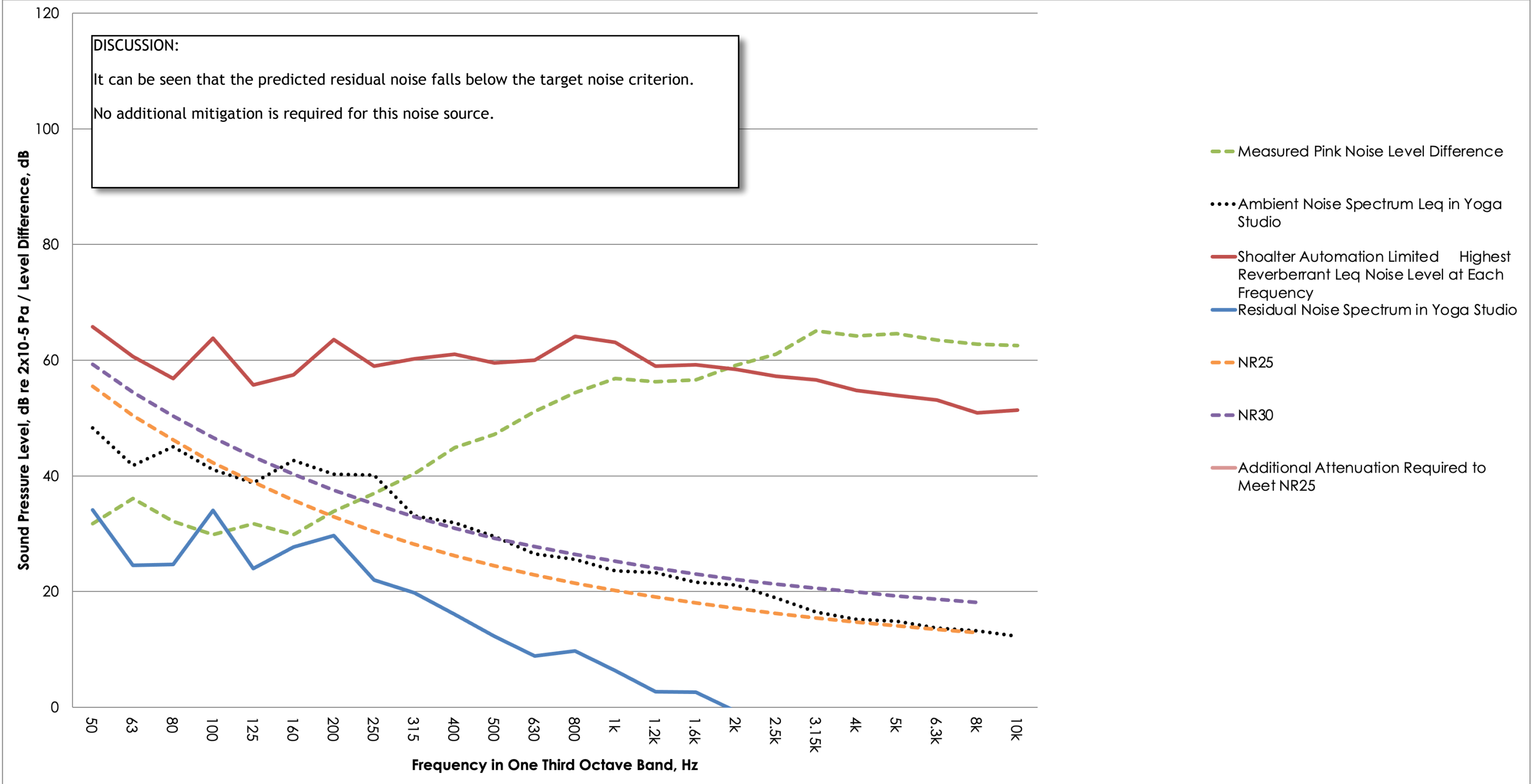
- Noise transfer measurements taken on site between the shell unit and adjacent noise sensitive spaces
- Knowledge of existing separating and flanking structures
- Worst case source noise and vibration levels within the retail space

6.0 GRAPHICAL TEST RESULTS & SUMMARY ASSESSMENT

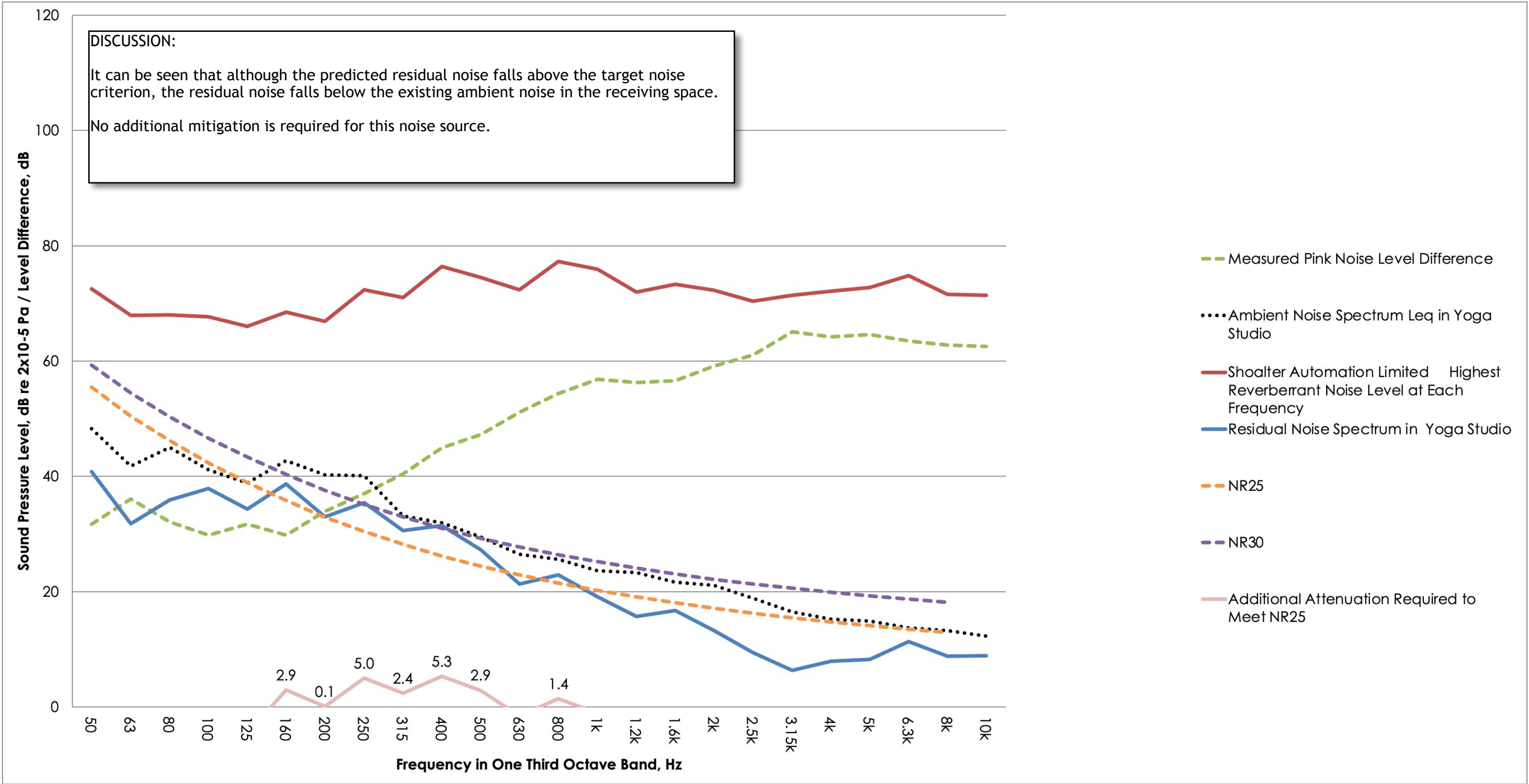
Test 1 - Retail Unit 01A to Ground Floor Yoga Studio: **Pink Noise Transfer & Measured Level Difference**



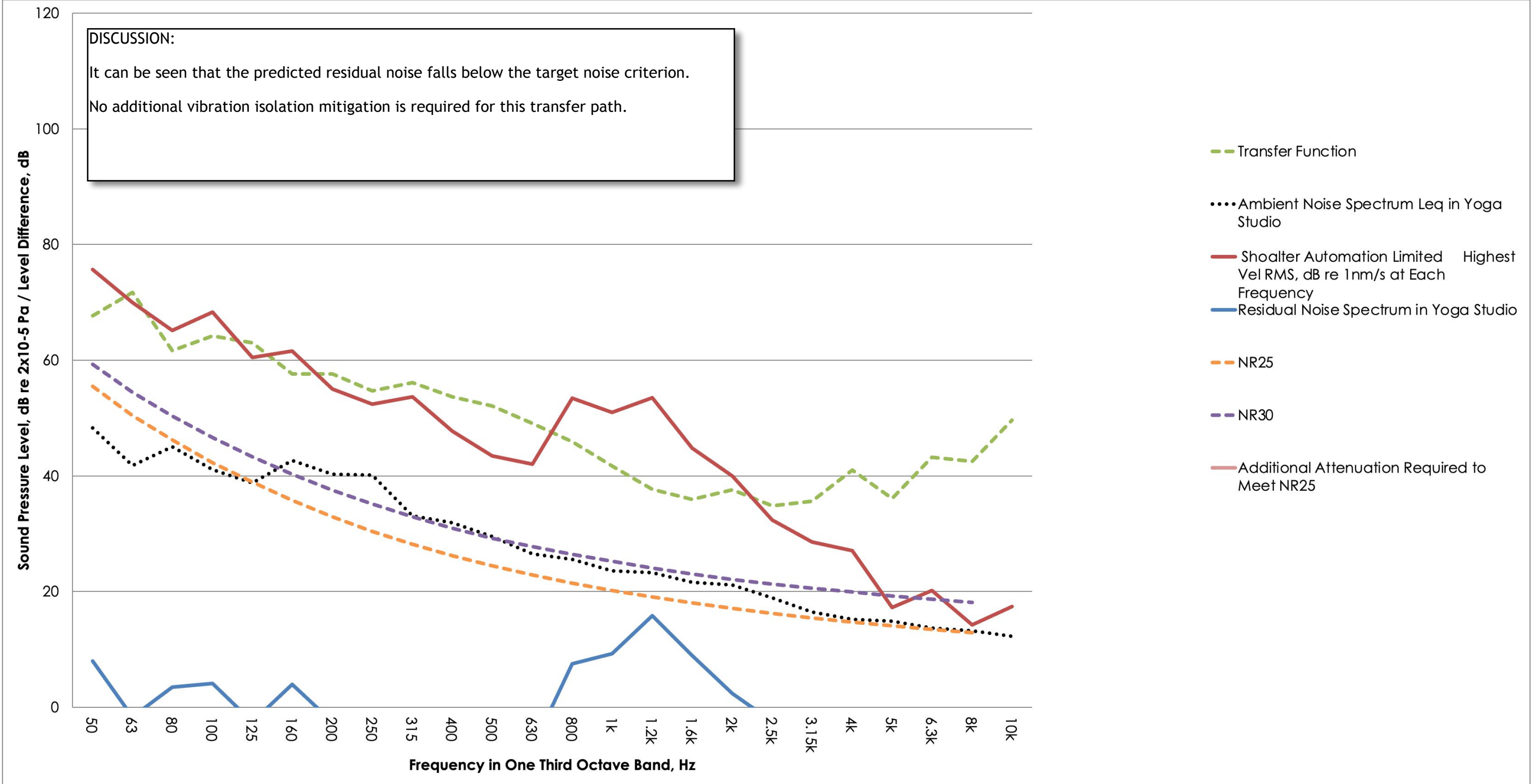
Assessment 1a - Retail Unit 01A to Ground Floor Yoga Studio: Predicted Operational Leq Noise Transfer



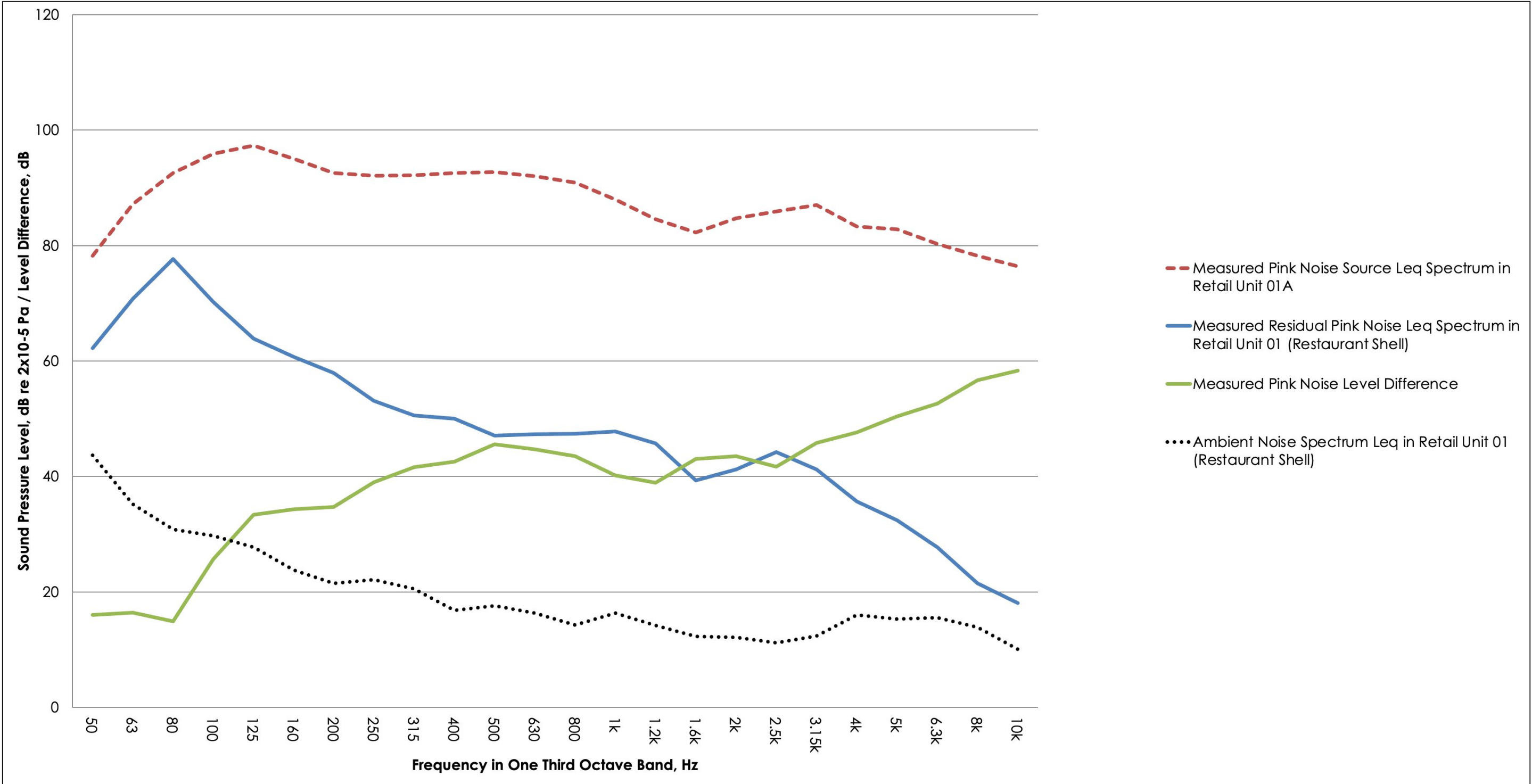
Assessment 1b - Retail Unit 01A to Ground Floor Yoga Studio: Predicted Operational Leq_500ms Noise Transfer



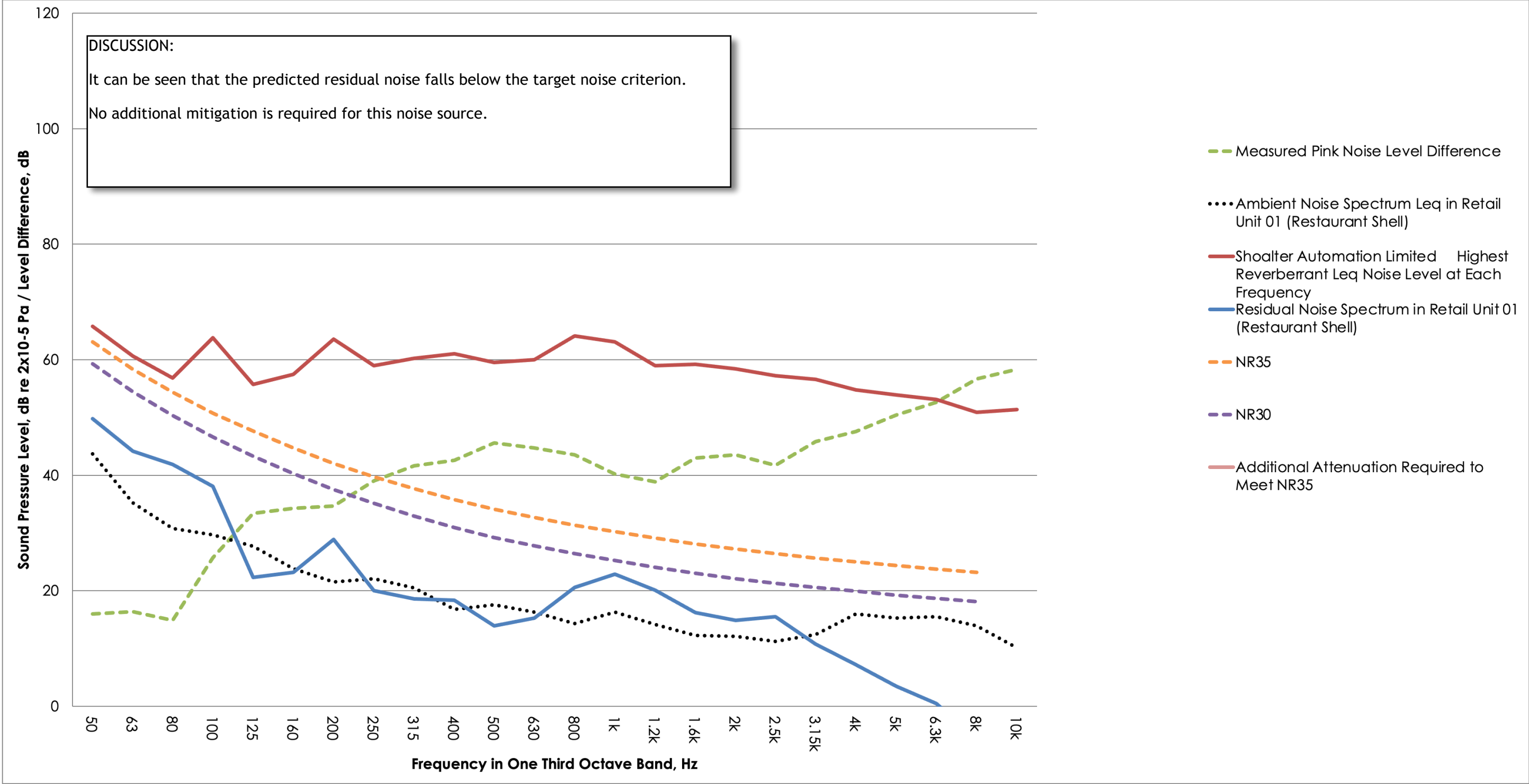
Assessment 1c - Retail Unit 01A to Ground Floor Yoga Studio: Predicted Vibration Impact Noise Transfer



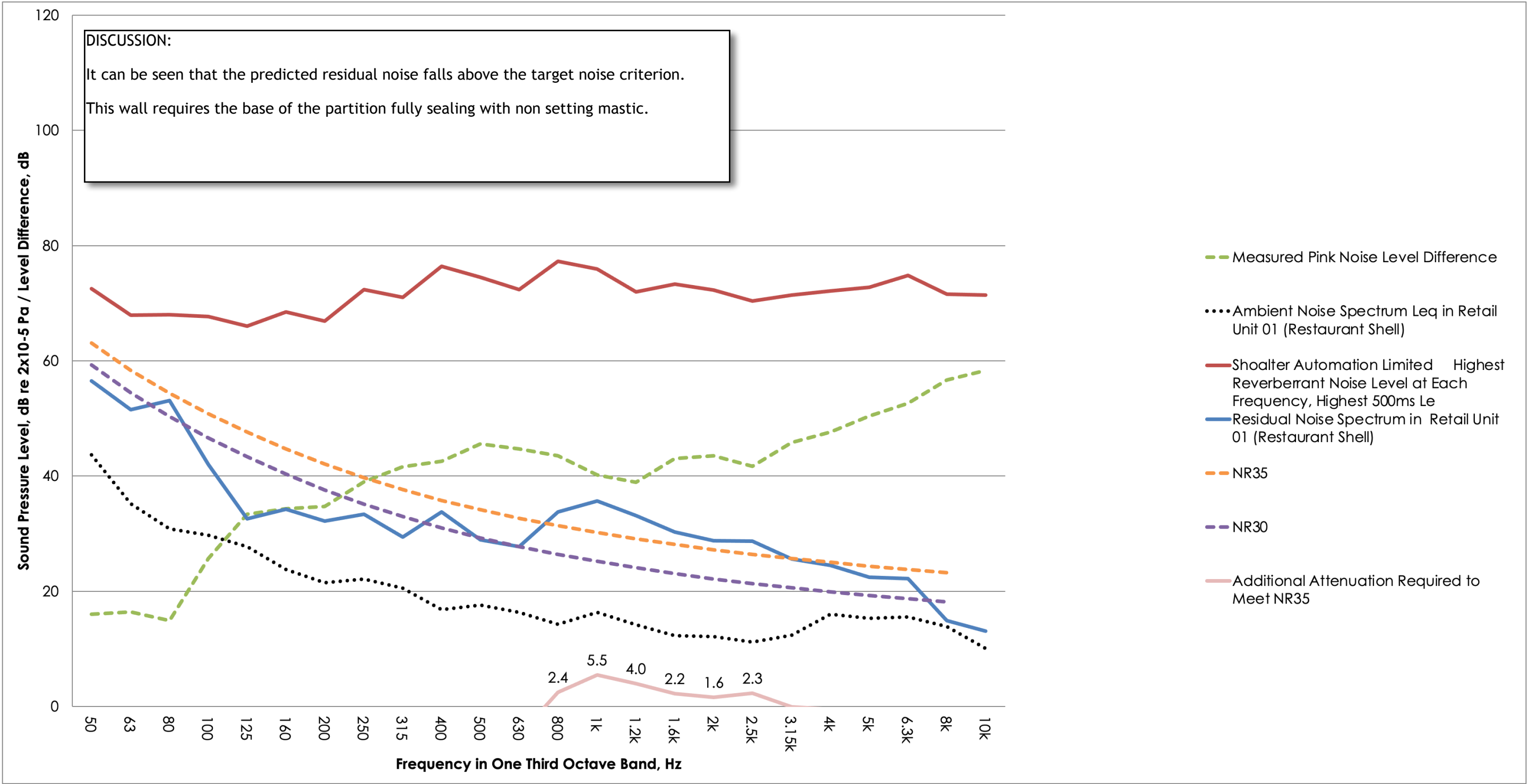
Test 2 - Retail Unit 01A to Ground Floor Retail Unit 01: **Pink Noise Transfer & Measured Level Difference**



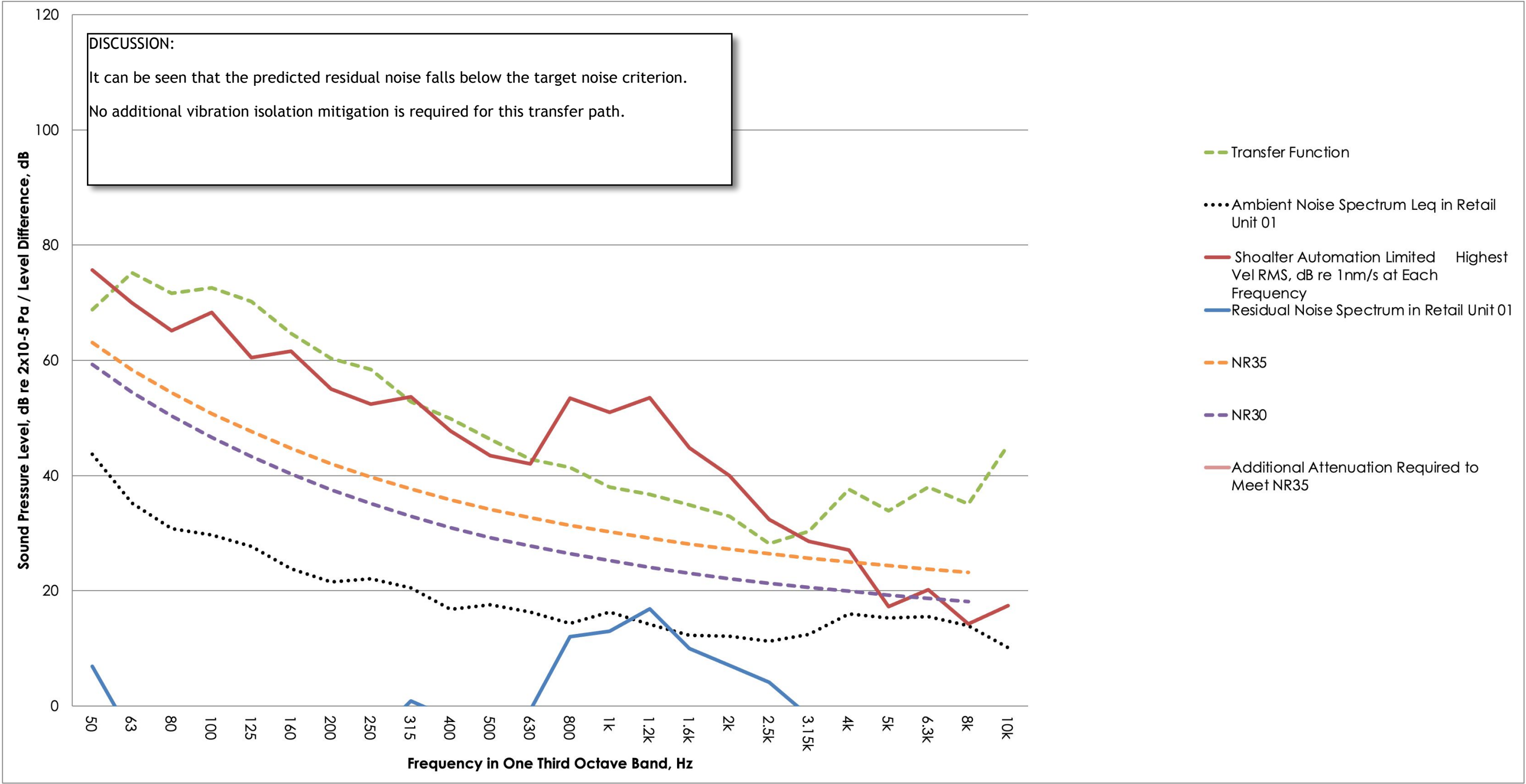
Assessment 2a - Retail Unit 01A to Ground Floor Retail Unit 01: Predicted Operational Leq Noise Transfer



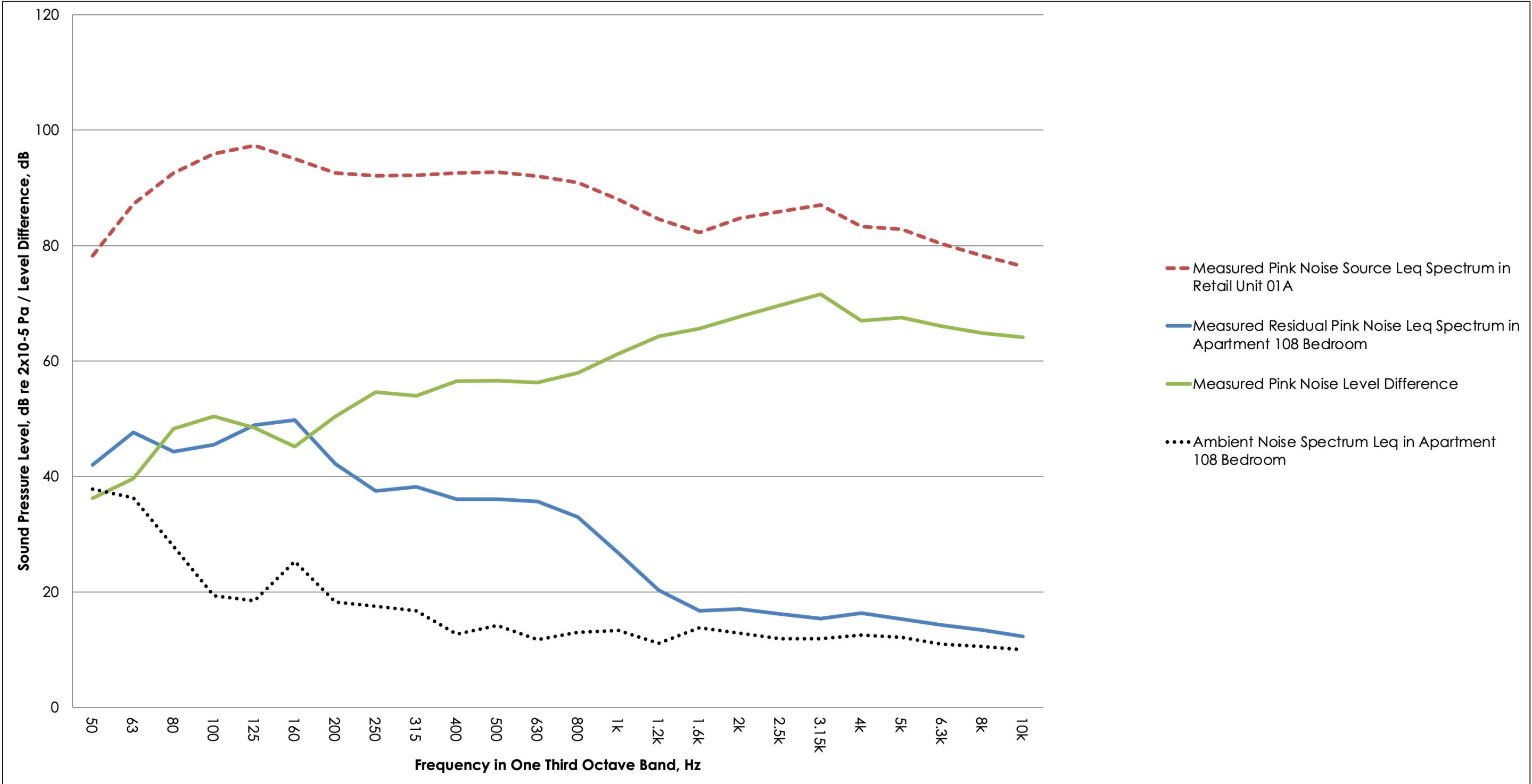
Assessment 2b - Retail Unit 01A to Ground Floor Retail Unit 01: Predicted Operational Leq_500ms Noise Transfer



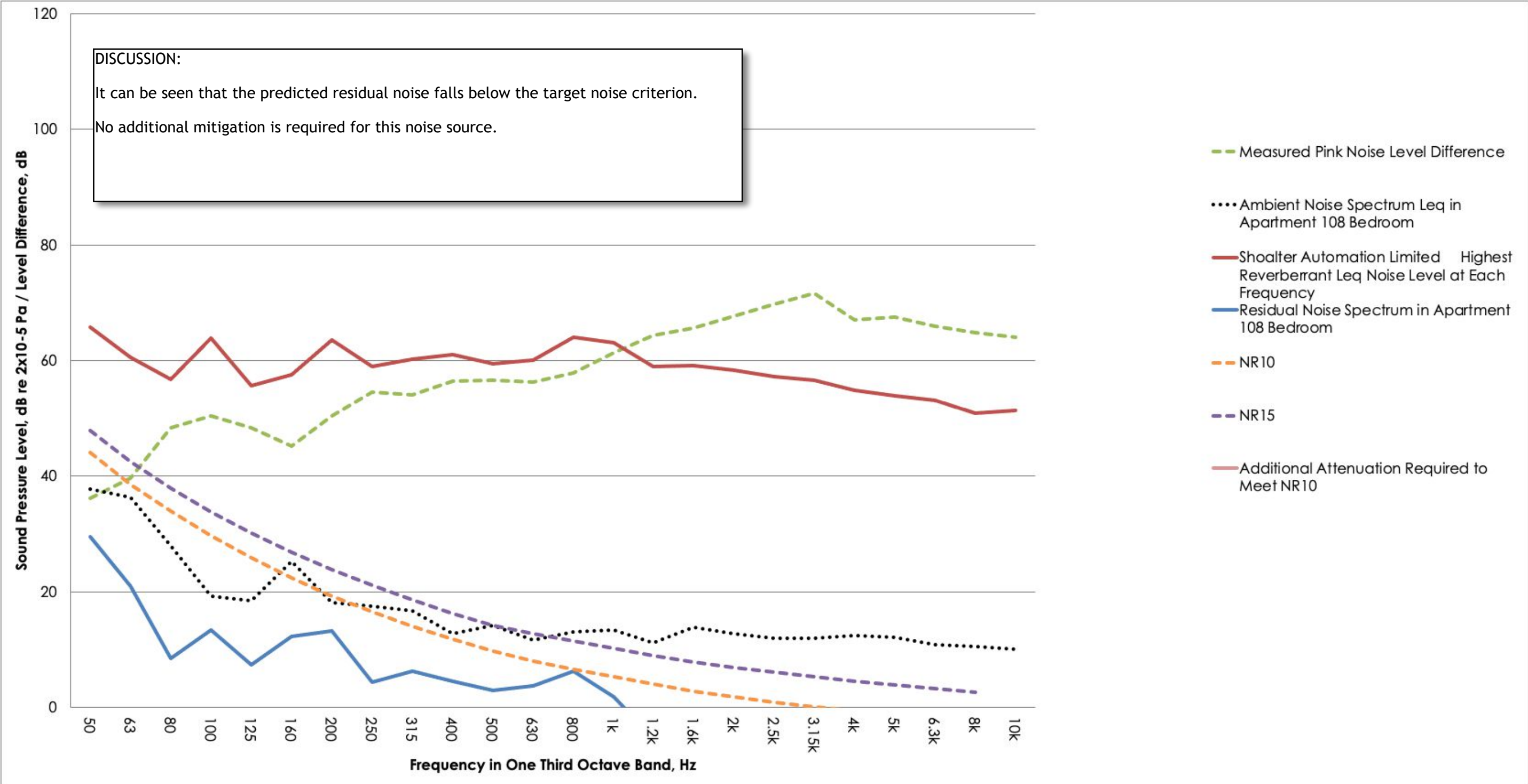
Assessment 2c - Retail Unit 01A to Ground Floor Retail Unit 01: Predicted Vibration Impact Noise Transfer



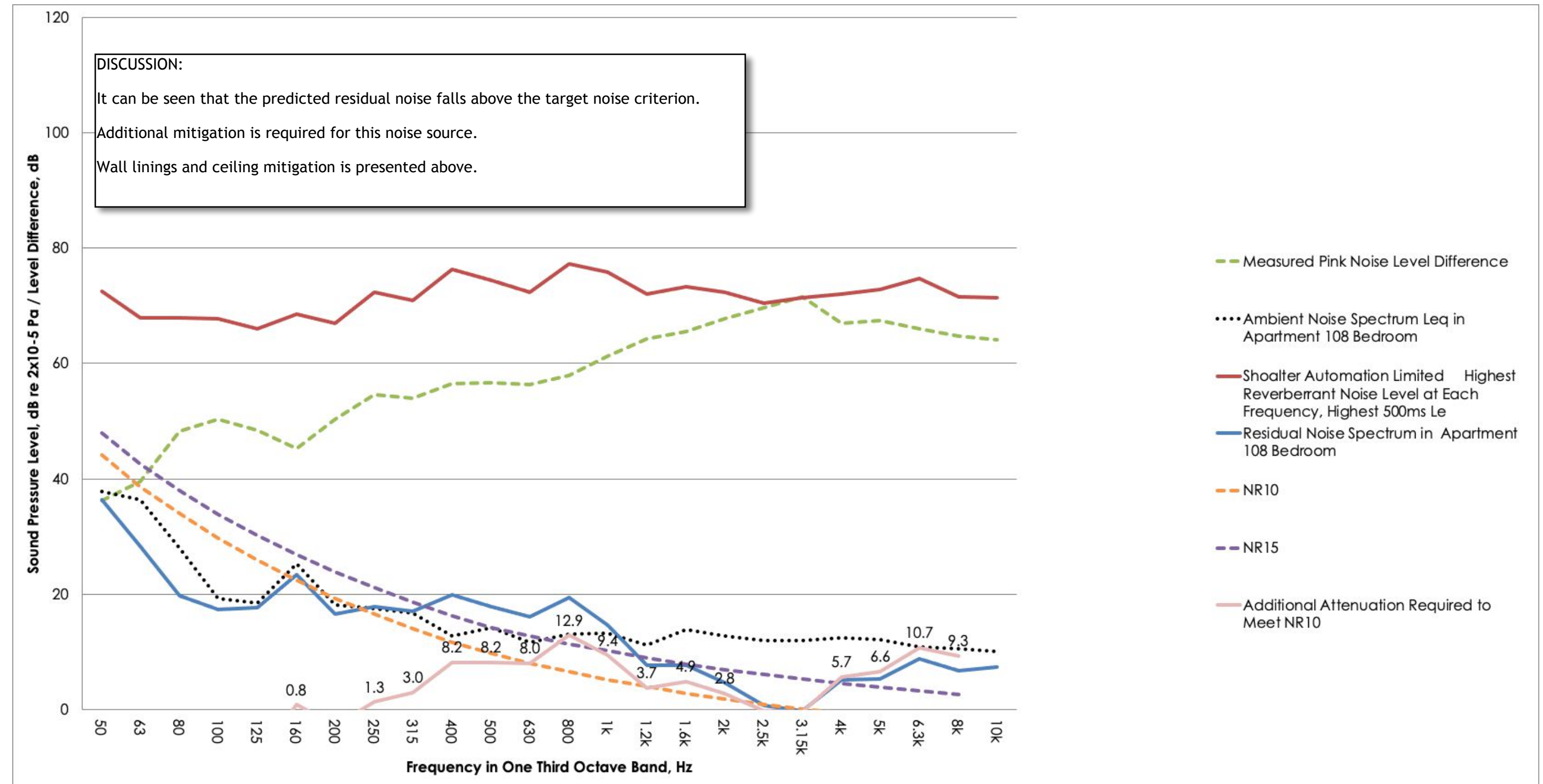
Test 3 - Retail Unit 01A to First Floor Apartment 1.08 Bedroom: Pink Noise Transfer & Measured Level Difference



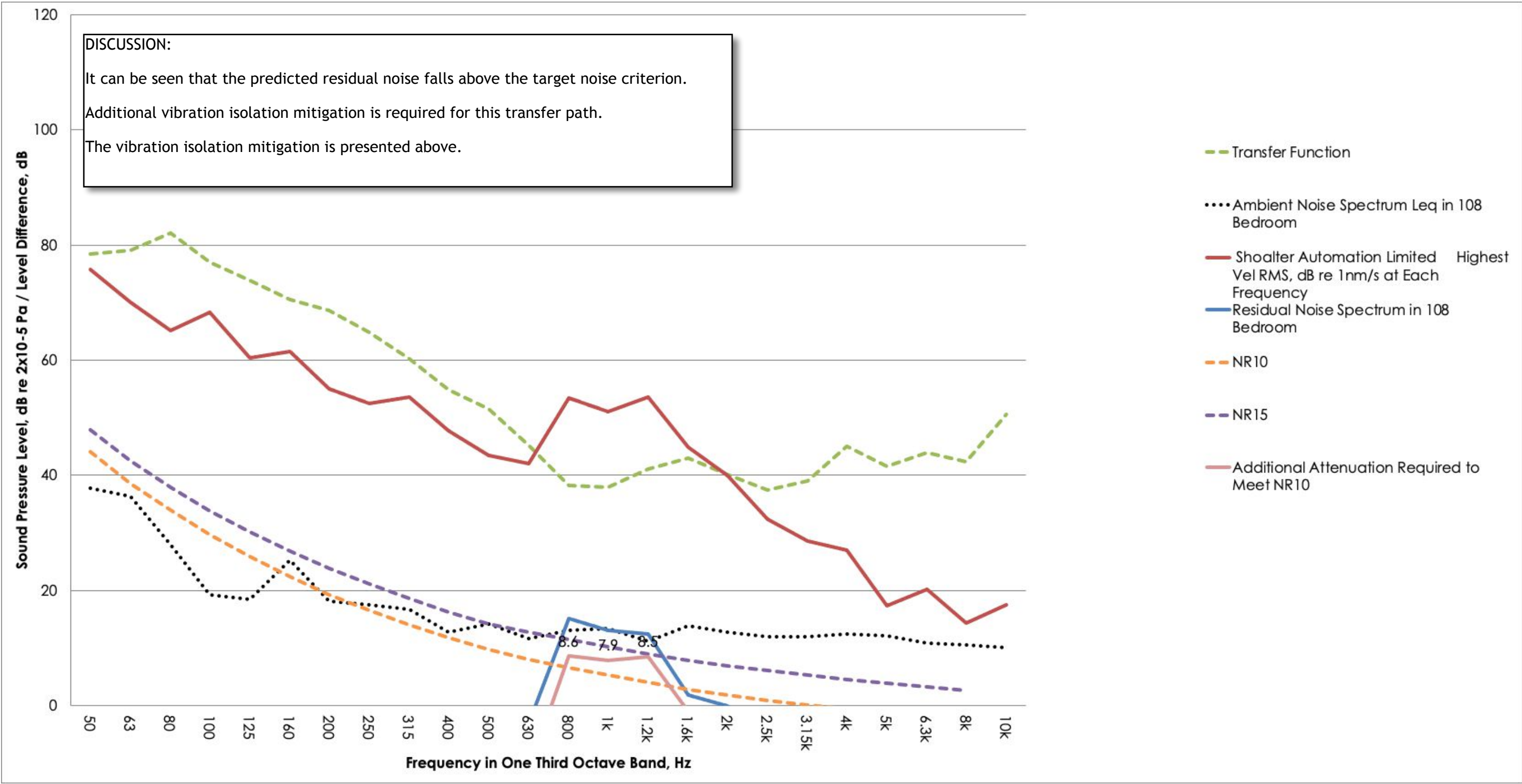
Assessment 3a - Retail Unit 01A to First Floor Apartment 1.08 Bedroom: Predicted Operational Leq Noise Transfer



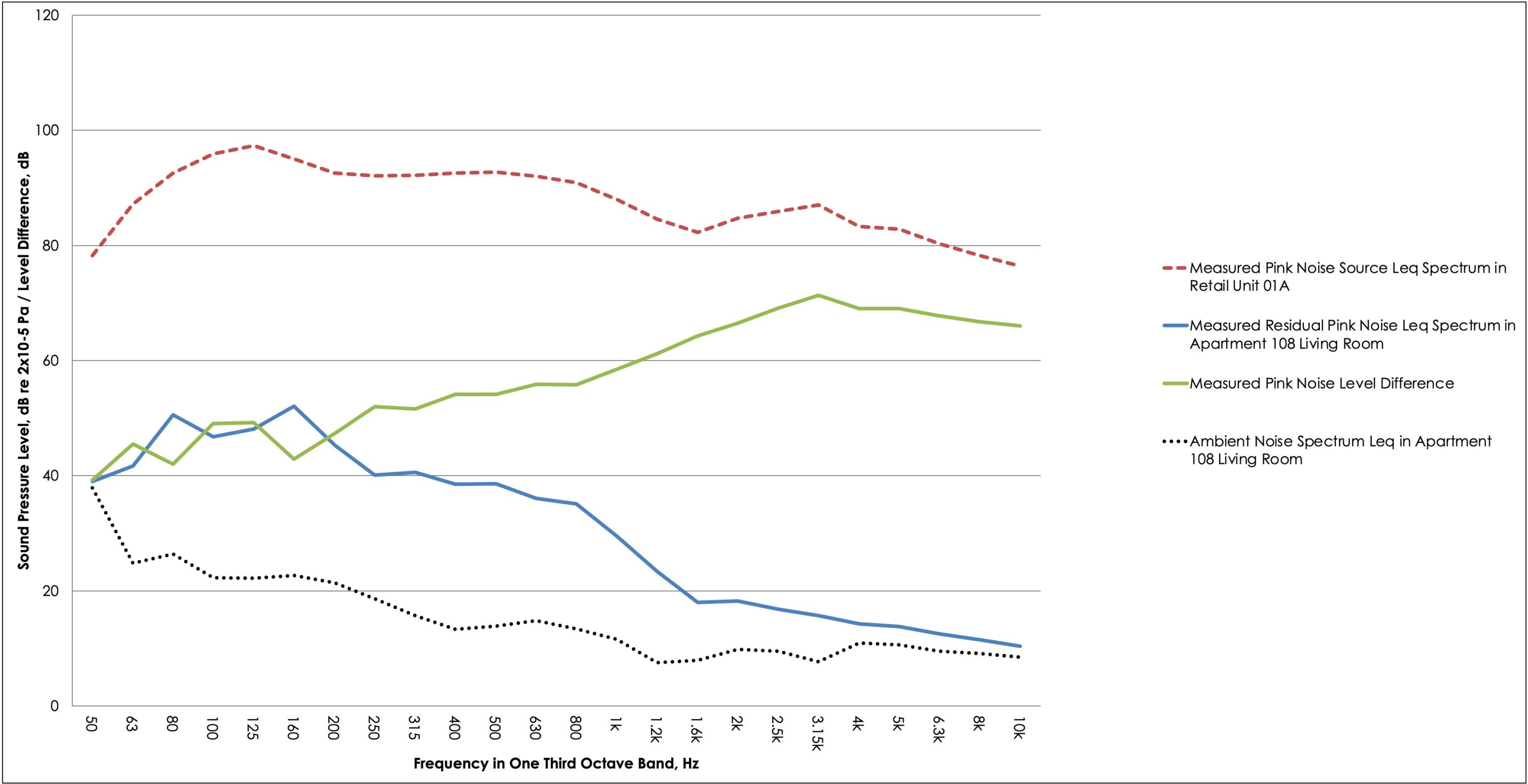
Assessment 3b - Retail Unit 01A to First Floor Apartment 1.08 Bedroom: Predicted Operational Leq_500ms Noise Transfer



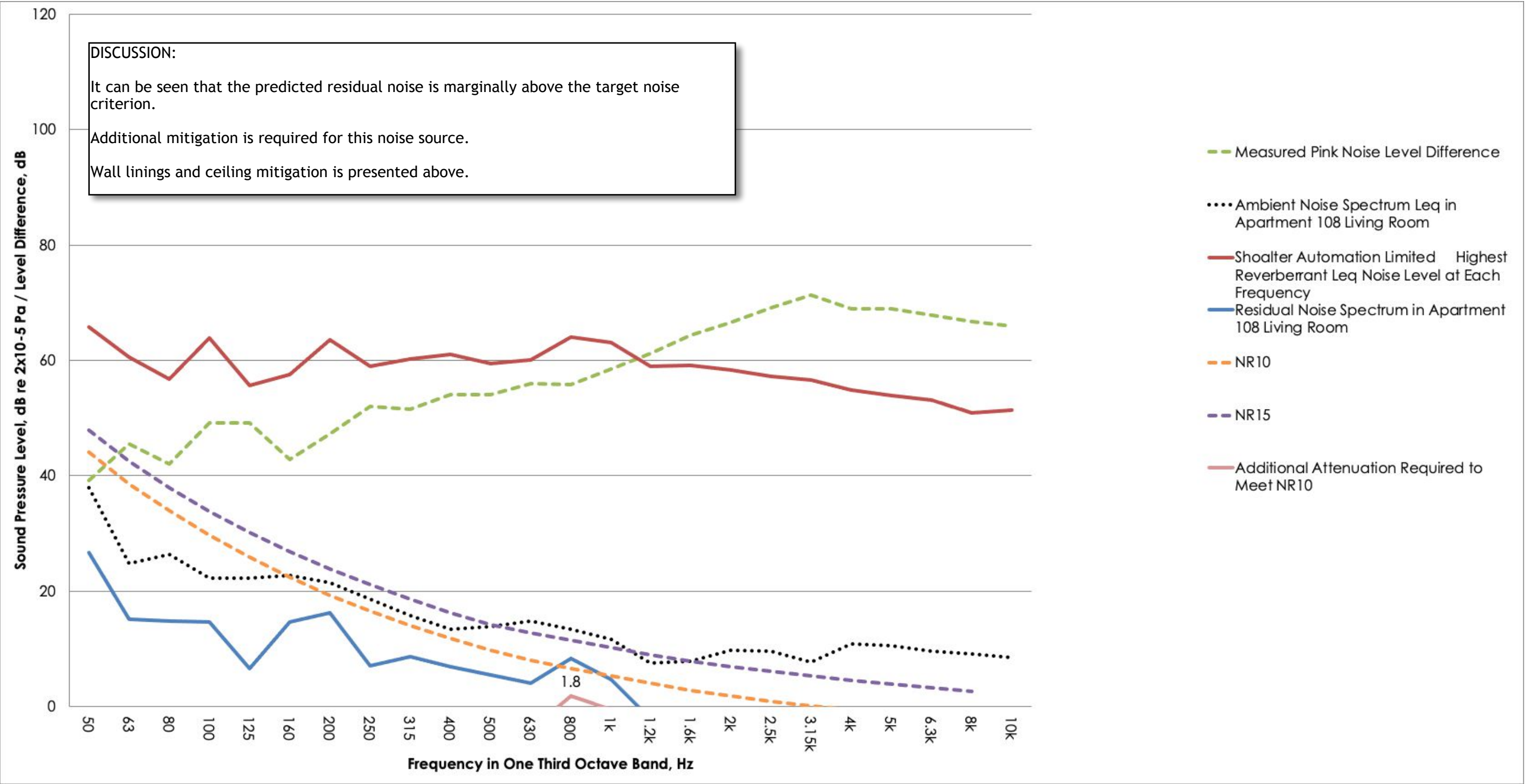
Assessment 3c - Retail Unit 01A to First Floor Apartment 1.08 Bedroom: Predicted Vibration Impact Noise Transfer



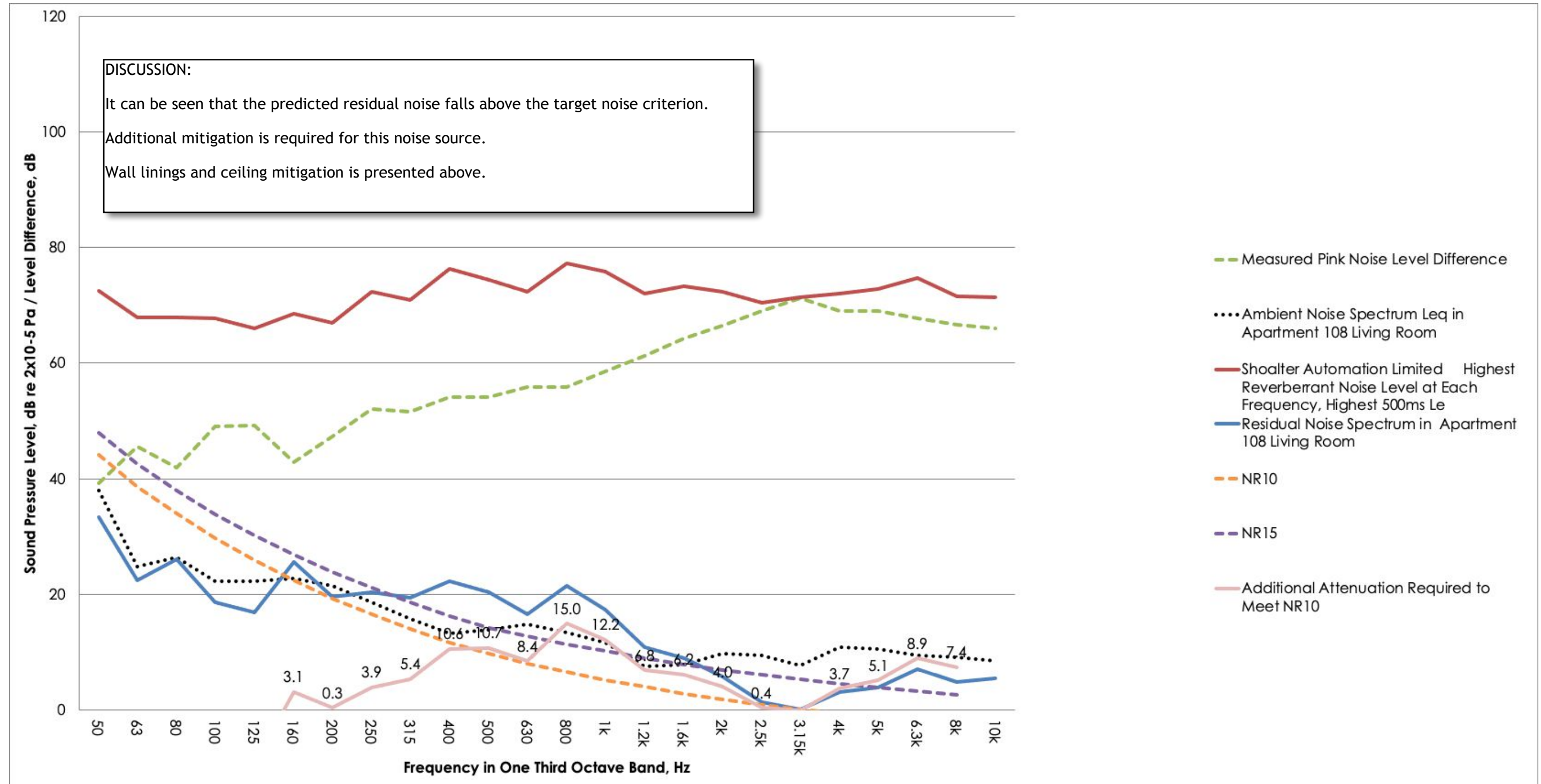
Test 4 - Retail Unit 01A to First Floor Apartment 1.08 Living Room: Pink Noise Transfer & Measured Level Difference



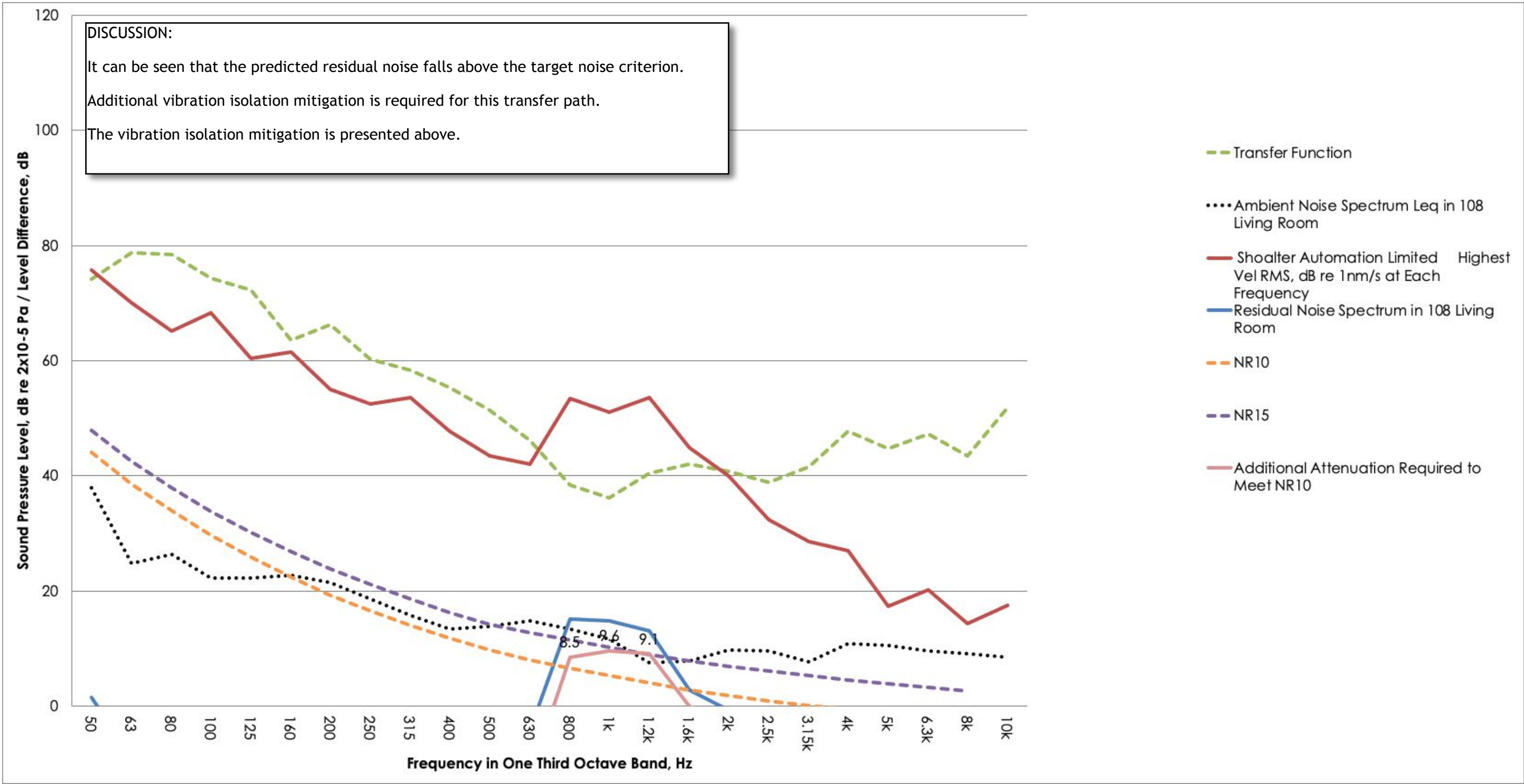
Assessment 4a - Retail Unit 01A to First Floor Apartment 1.08 Living Room: Predicted Operational Leq Noise Transfer



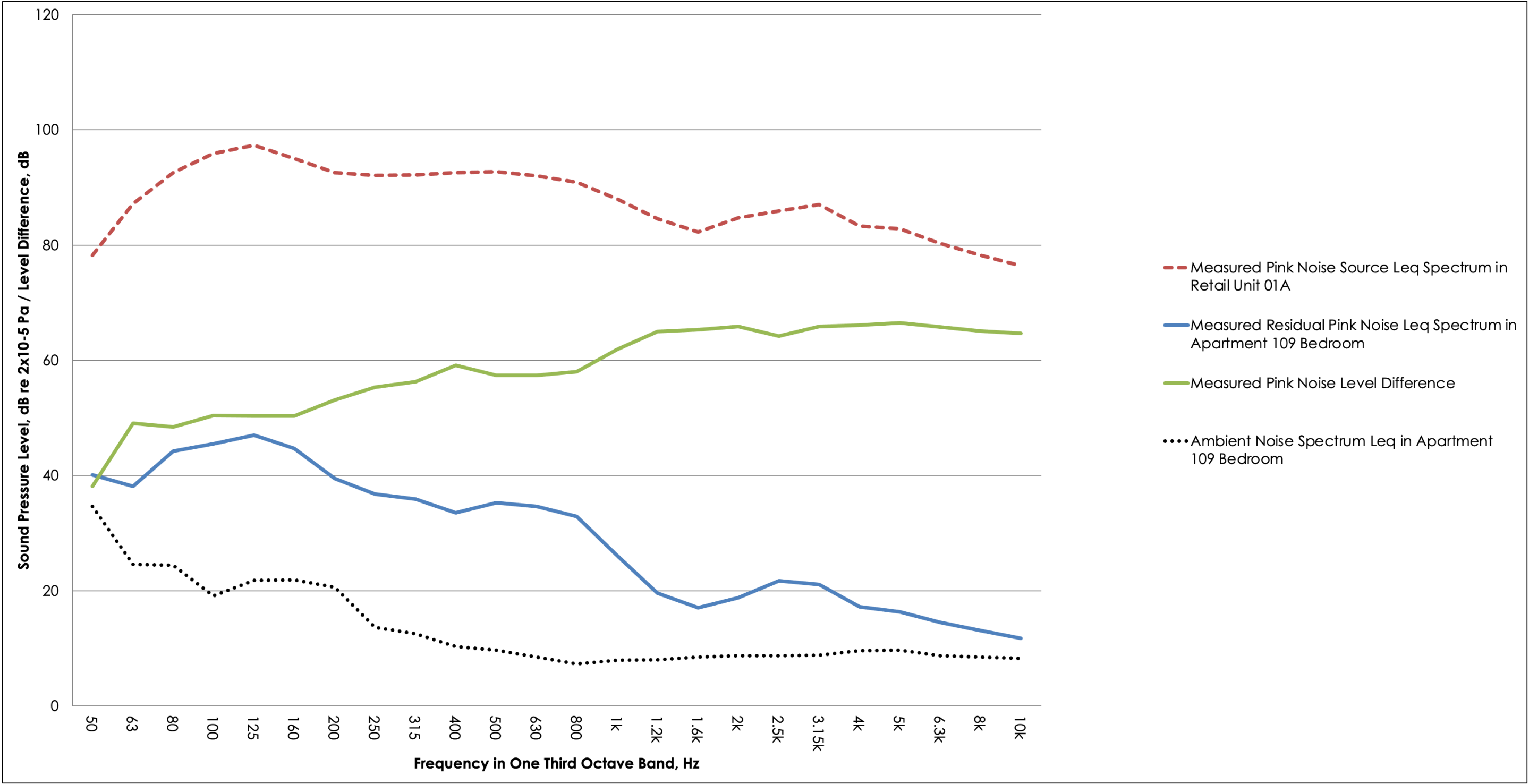
Assessment 4b - Retail Unit 01A to First Floor Apartment 1.08 Living Room: Predicted Operational Leq_500ms Noise Transfer



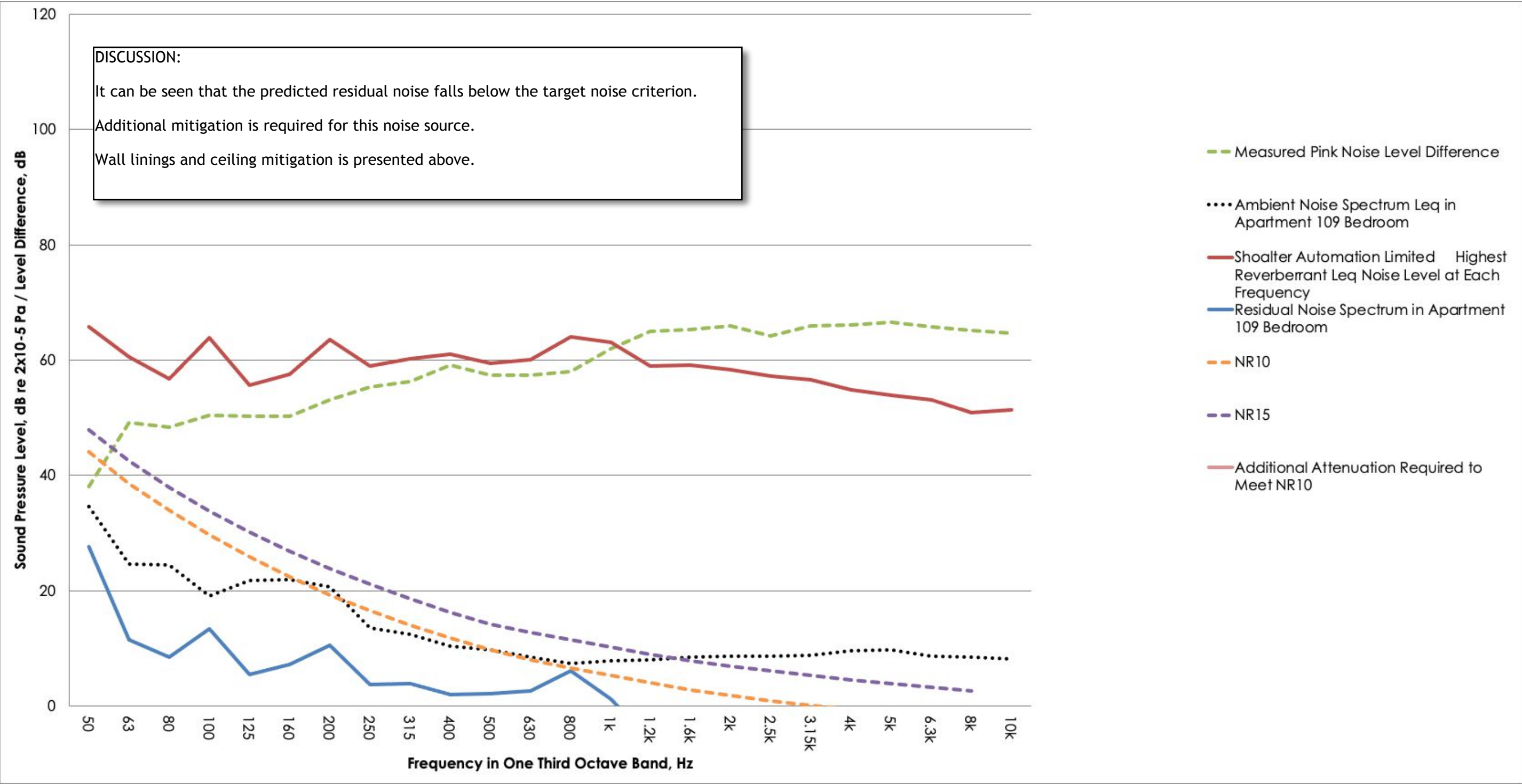
Assessment 4c - Retail Unit 01A to First Floor Apartment 1.08 Living Room: Predicted Vibration Impact Noise Transfer



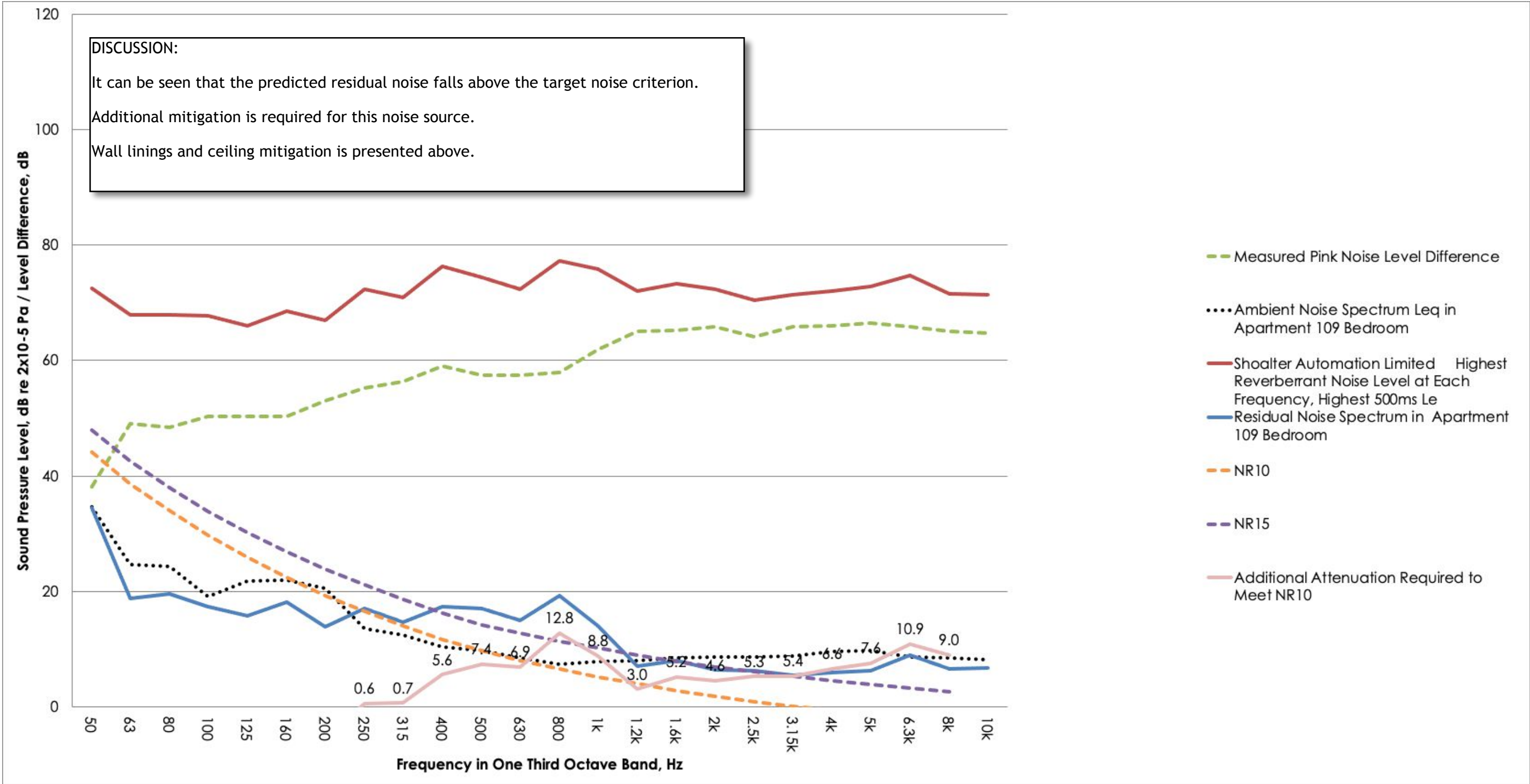
Test 5 - Retail Unit 01A to First Floor Apartment 1.09 Bedroom: **Pink Noise Transfer & Measured Level Difference**



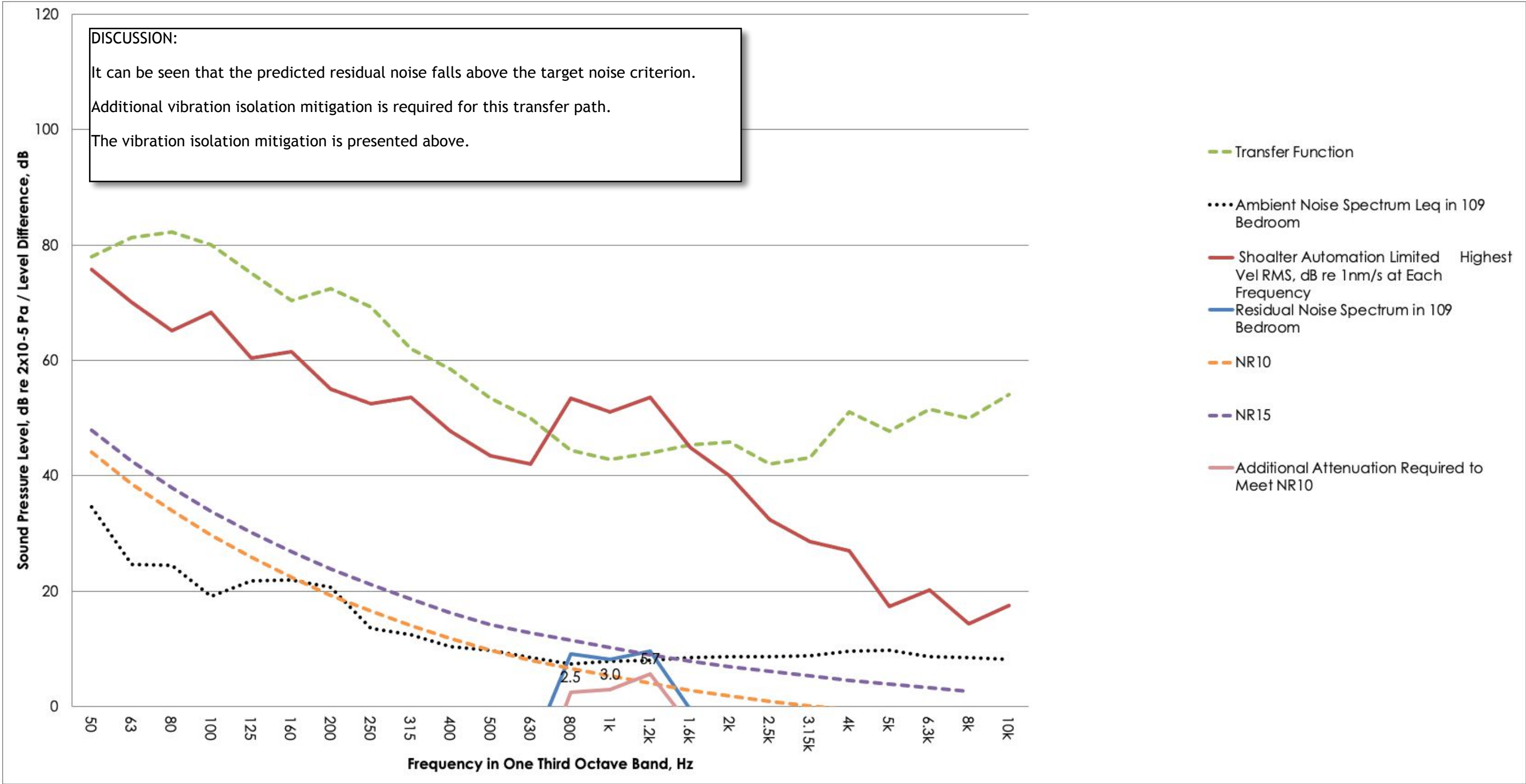
Assessment 5a - Retail Unit 01A to First Floor Apartment 1.09 Bedroom: Predicted Operational Leq Noise Transfer



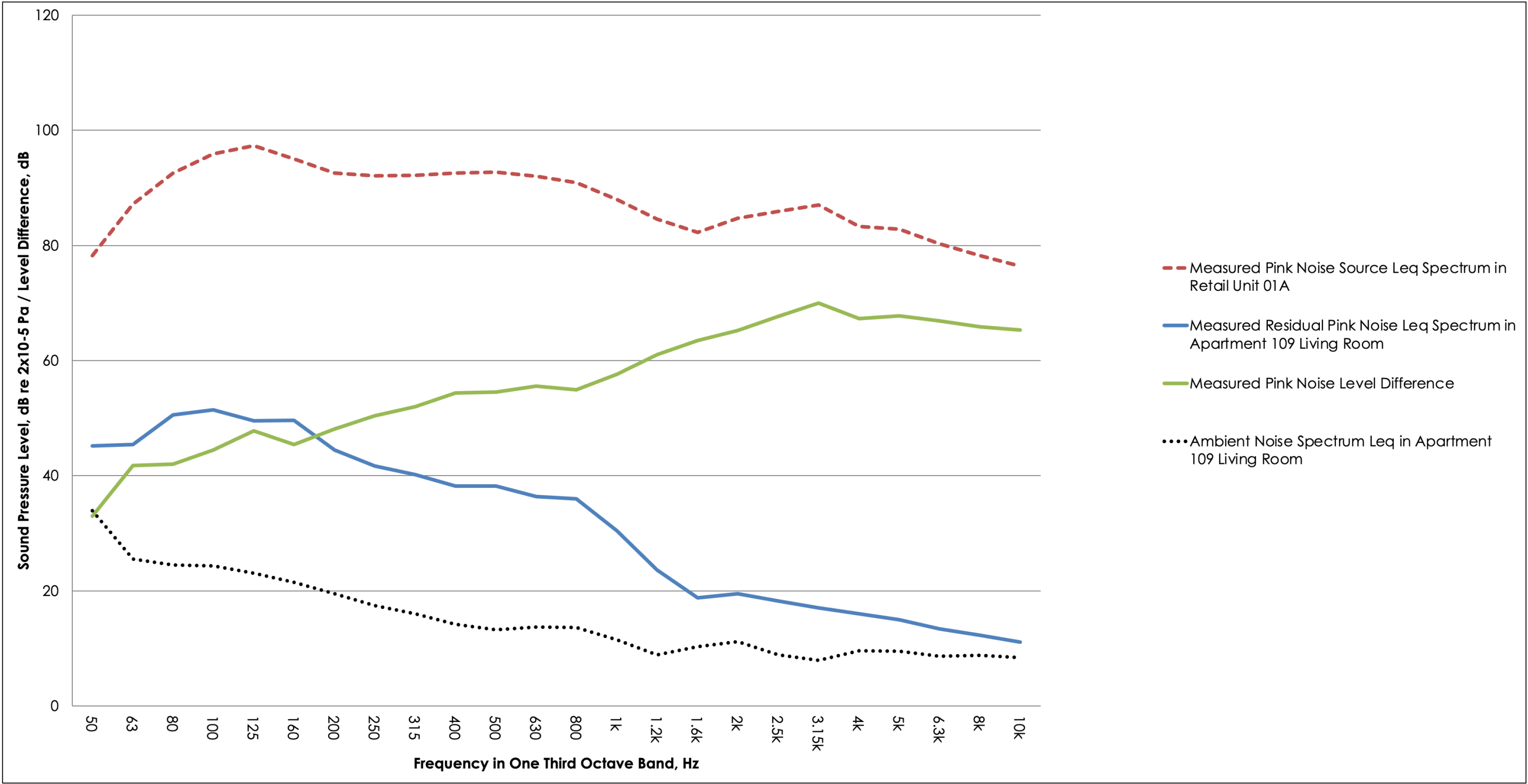
Assessment 5b - Retail Unit 01A to First Floor Apartment 1.09 Bedroom: Predicted Operational Leq_500ms Noise Transfer



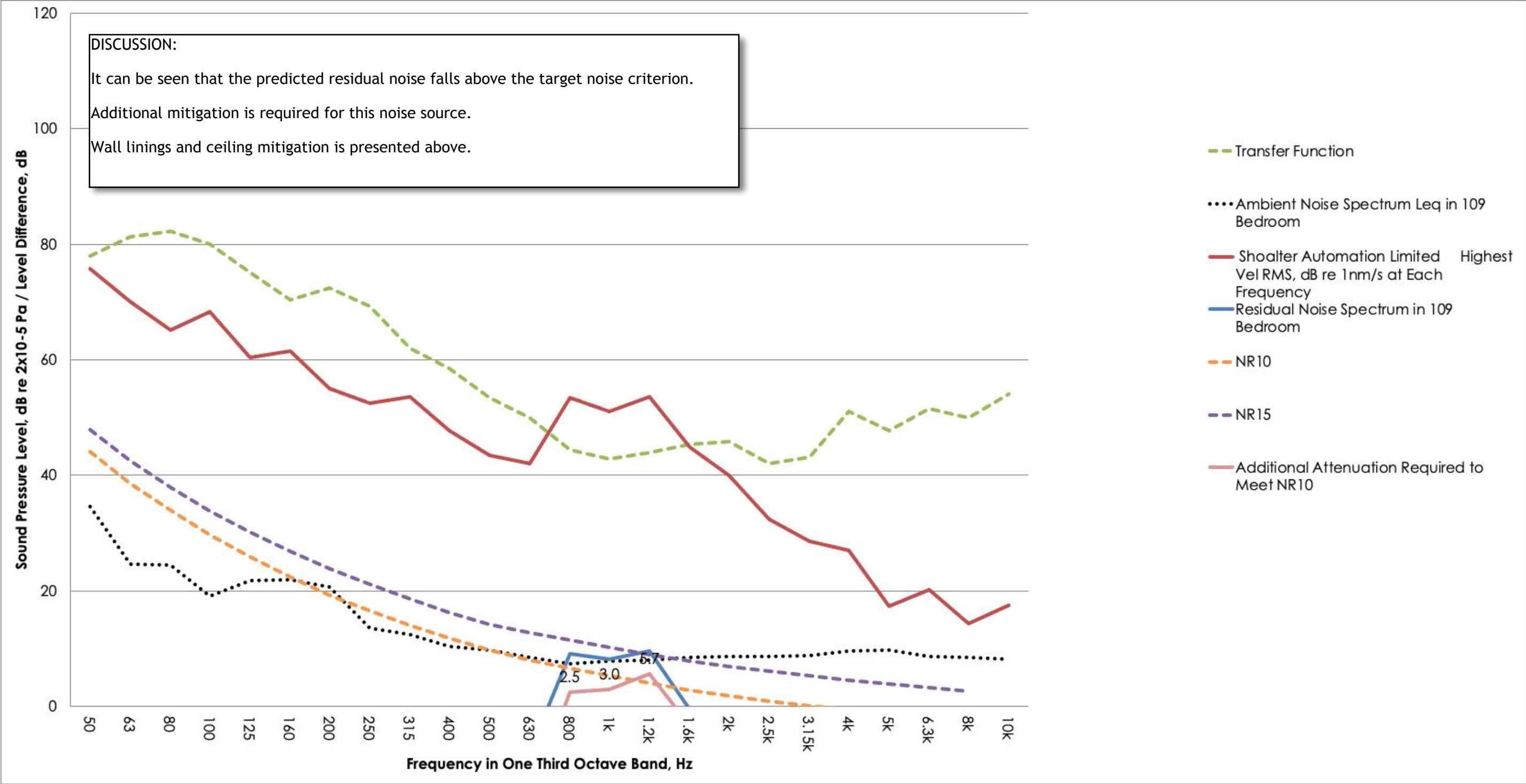
Assessment 5c - Retail Unit 01A to First Floor Apartment 1.09 Bedroom: Predicted Vibration Impact Noise Transfer



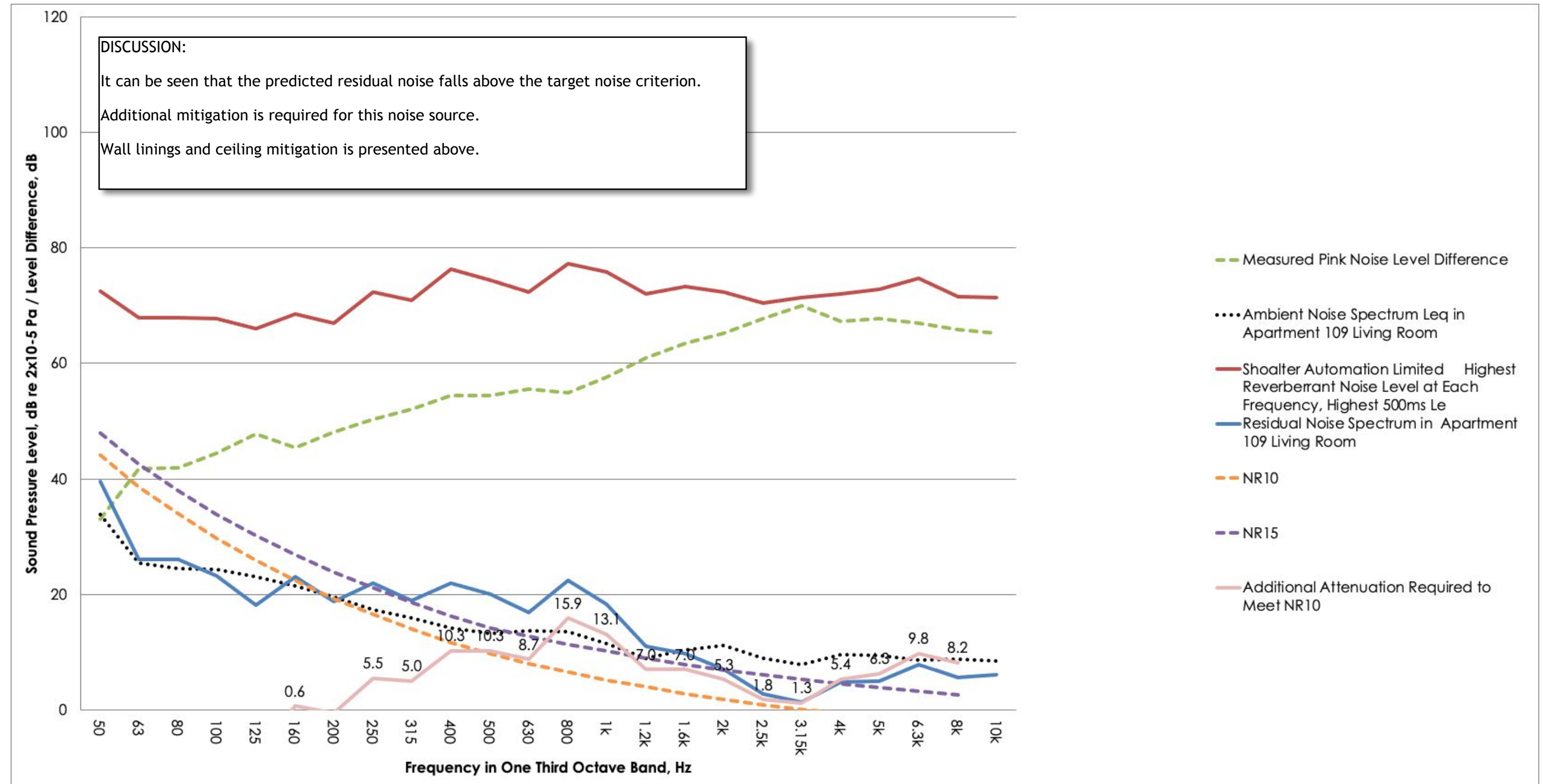
Test 6 - Retail Unit 01A to First Floor Apartment 1.09 Living Room: **Pink Noise Transfer & Measured Level Difference**



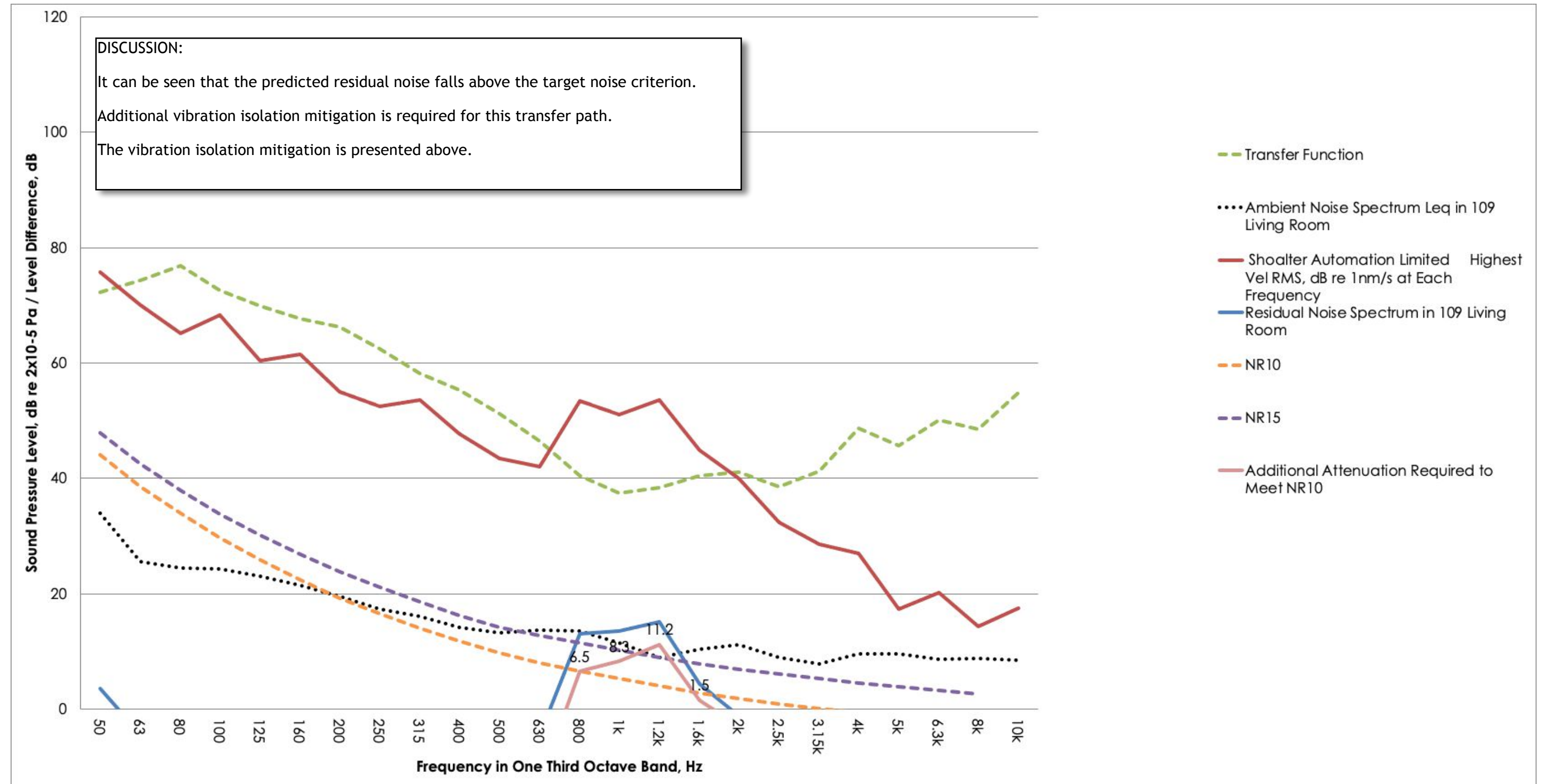
Assessment 6a - Retail Unit 01A to First Floor Apartment 1.09 Living Room: Predicted Operational Leq Noise Transfer



Assessment 6b - Retail Unit 01A to First Floor Apartment 1.09 Living Room: Predicted Operational Leq_500ms Noise Transfer



Assessment 6c - Retail Unit 01A to First Floor Apartment 1.09 Living Room: Predicted Vibration Impact Noise Transfer



APPENDIX A: SOUND INSULATION TEST PROCEDURE

Airborne - Pink Noise Transfer Test

Where practical, airborne sound insulation testing was carried out in accordance with the requirements of the BS EN ISO 140-4:1998: “Field Measurements of Airborne Sound Insulation between Rooms” in order to determine the level difference, D, between the proposed retail unit and the existing residential spaces. Where

$$D = L_1 - L_2$$

and

- L₁ is the average sound pressure level in the source room
- L₂ is the average sound pressure level in the receiving room

To conduct airborne sound insulation tests, a noise source is placed in the “source room” and the resultant noise level (L_{eq}) in this room is measured at fixed positions. The room on the other side of the party construction is the “receiver room” and the noise transmitted to this room is measured at fixed positions.

The background / ambient (L_{eq}) noise levels were recorded in the receiver room with the sound source turned off and during lulls in external traffic activity or other environmental sources.

All of the above measurements were made over the one-third octave bands from 50 Hz to an extended frequency of 10,000 Hz inclusive.

The differences between source and receiver third octave band noise levels were then calculated in accordance with BS EN ISO 140-4: “Field Measurements of airborne sound insulation between rooms” and corrected for background noise.

Assessments using a music noise source were also undertaken to subjectively assess potential impact from music noise transfer.

Where applicable, reverberation time measurements were also undertaken to enable the RT60 corrections to be applied in accordance with the target acoustic specification.

Airborne Sound Insulation

Airborne sound insulation testing was carried out in accordance with the requirements of the BS EN ISO 140-4:1998: “Field Measurements of Airborne Sound Insulation between Rooms”.

If the rooms are of different volumes, the larger one should be chosen as the source room when the standardised level difference is to be evaluated and no contradictory procedure is agreed upon.

To conduct airborne sound insulation tests, a pink noise source is placed in the “source room” and the resultant noise level ($L_{eq,30secs}$) in this room is measured using a moving microphone with a sweep radius of at least 0.7 m. The plane of the traverse is inclined in order to cover a large proportion of the space permitted for measurement. The plane of traverse shall not lie within 10° of any plane of the room (wall, floor, ceiling). The duration of the traverse period is minimum of 30 seconds. The room on the other side of the party construction is the “receiver room” and the noise transmitted to this room is measured using a moving microphone as described above.

The numbers of microphone and loudspeaker positions is determined from the floor area of the source and receiving rooms in accordance with the requirements of the BS EN ISO 140-4:1998: “Field Measurements of Airborne Sound Insulation between Rooms” and BS EN ISO 140-14:2004: “Measurement of Sound Insulation in Buildings and of Building Elements”. Two sets of source and receiving room measurements were required, with the loudspeaker moved between sets of measurements. This gives at least two level differences, which are then averaged arithmetically.

The background ($L_{eq,30secs}$) noise level in the receiver room with the noise source turned off is measured in accordance with BS EN ISO 140-4:1998: “Field Measurements of Airborne Sound Insulation between Rooms” and BS EN ISO 140-14:2004: “Measurement of Sound Insulation in Buildings and of Building Elements” where the resultant background noise level ($L_{eq,30secs}$) in this room is measured using a moving microphone with a sweep radius of at least 0.7 m. The plane of the traverse is inclined in order to cover a large proportion of the space permitted for measurement. The plane of traverse shall not lie within 10° of any plane of the room (wall, floor, ceiling). The duration of the traverse period is minimum of 30 seconds.

APPENDIX B: TEST DETAILS & CALIBRATION CERTIFICATES

Location

Retail 01A, The Castings, M1 2DY

Date of Tests

25 September 2024
1 September 2022 - Source Noise & Vibration Survey
XXXXX - Source Noise & Vibration Survey (Hong Kong - by others)

Tests Conducted By

Simon Webster BEng(Hons) MIOA
Red Acoustics Limited, Unit 8 Cable Court, Pittman Way, Preston, PR2 9YW
Associate Members of the Association of Noise Consultants
Accredited Test Organisation Number 180



Instrumentation

Table B1: List of Instrumentation Used

Equipment Description	Type Number	Manufacturer	Serial Number	Date of Last Calibration	Calibration Certificate Number
Sound Level Meter	Type 118 IEC 60651 Type 1	Norsonic	30560	01/05/2024	47687
Preamplifier	Nor 1206	Norsonic	30247	01/05/2024	47686
Microphone Capsule	Nor 1225	Norsonic	25117	01/05/2024	47686
Sound Calibrator	Type 1251 Class 1	Norsonic	34390	01-May-24	47685
4 Channel Sound and Vibration Analyser	SVAN 958 Type 1	SVANTEK	20894	22-Nov-23	1507206-1S
Preamplifier	SVAN SV12L	SVANTEK	25323	15-Nov-21	1507206-1S
Microphone Capsule	377B02	PCB	LW132377	15-Nov-21	1507206-1S
Triaxial Acceleromter A	PCB 356B18	PCB	113409	22-Nov-23	1507206-1V

Methodology

Before and after the measurements the sound level meters were check calibrated to an accuracy of ±0.3dB using the Type 1 Calibrator. The calibrator produces a sound pressure level of 114 dB re 2x10-5 Pa @ 1kHz.