Chartered Building Consultancy

Acoustic South East

Assessment of Gym Acoustic Floor System

Site: **Mariners Point, Brighton Road, Shoreham. BN43 6DH**
Client: **Anytime Fitness UK**

Report by: Simon Barrett BSc(Hons) MSc MIOA
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Project: J3774/GymFloor
Issue 1

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Issue 1	10/07/2024	Initial Issue

1 Introduction

Acoustic South East have been appointed to undertake further acoustic assessment relating to the proposed introduction of a new gymnasium (ground floor) underneath residential flats at Mariners Point in Shoreham by Sea.

The purpose of THIS assessment relates to the testing of a Mason UK sprung floor system with various gym mats above in terms of its effectiveness of vibration isolation of free-weights.

Noise levels have been assessed in terms of and following the guidelines of the following documents:

- BS8233 (2014) Guidance on sound insulation and noise reduction for buildings
- ProPG Gym Acoustics Guidance (2023)

Measurements have shown that in order to achieve compliance with the Gym Acoustics Guidance G-Curves for daytime and night time periods, the following build-up is recommended for the area where free-weights are to be used:

- Mason UK Sprung Floor System (Layer 1 - bottom)
- Regufoam 270 (Layer 2)
- Regupol 40/80 (Layer 3)
- Everoll 43mm Weight Layer (Layer 4 – top)

The use of this system has shown compliance with the G-10 curve in Flat 73 and G-15 curve in Flat 103 Bedroom. Subjectively, the sound from the free-weight drops were almost completely in-audible in both flats and there was no “feeling or perception” of vibration at all.

The use of the above system should be installed in conjunction with an acoustically suspended plasterboard ceiling system (such as Gyproc GypCeiling MF with acoustic hangers 150mm void, 100mm mineral fibre and 2x 15mm Soundbloc) to further mitigate the 1/3 octave band frequencies in the 160Hz – 200Hz range.

All other areas of the gym should also utilise the Mason UK Sprung Floor but the matting can be chosen as appropriate in terms of the suitability for the equipment use (cardio machines, for example, have their own anti-vibration mounts, so the matting they sit on would typically be firmer for stability purposes).

It is also important to re-iterate that in signing up to membership with Anytime Fitness, members are strongly discouraged from dropping weights, but rather are told to place them gently back onto the flooring. Therefore, the above system is essentially full mitigation against the accidental dropping of free-weights.

2 Context, Noise Criteria & Noise Assessment Methodology

2.1 Context

Mariners Point is a new build residential development to the South of Brighton Road (79-81 Brighton Road) in Shoreham by Sea. The flats have been completed and inhabited for a few years now, however the ground floor area remains mainly vacant with the exception of a Dental Practice in the western-most section, which is compartmentalised from the remainder of the ground floor space.

To the South of the site is the River Adur, to the West is a dry boat yard and to the East is a commercial yard and offices. To the North is the A259, a busy arterial route transiting through Shoreham by Sea.

Anytime Fitness (AF) is a franchise gymnasium which operates 24/7 and is already established in Newland Road, Worthing (among many other sites nationwide – approximately 500). It is proposed to install a gym at the ground floor on the southern elevation of Mariners Point and accordingly, planning permission is sought for an “E” use class.

The AF franchise provides gym members with a key-fob and access may be granted 24/7 to the site, although it would normally only be manned around 08:00 to 20:00 hours, although there remains flexibility in the staffing arrangements. Whilst not specifically staffed outside of these hours, there is rigorous use of CCTV to review activities inside the gym space(s).

There will be no studio or classes and thus no music associated with zumba or spinning or aerobics etc.

Background music may be played in some areas.

2.2 The Proposed Gymnasium Layout

The Shoreham AF site is likely to differ slightly from other existing AF venues, as it is referred to as a second-generation layout and designed corporately with a more open plan approach. The proposed layout is seen below in Figure 1.

The entrance is via the double-doors to the north of the building (shown in bottom right of the figure below). Adjoining the “Strength” area on the right of the image is the existing Dental Practice. To the left of the free-weights area on the left, a new compartment wall will be constructed to separate the gym from the remaining ground floor area as an additional commercial premises outside the scope of this report.

The party wall to the dental practice is due to be upgraded as part of this scheme as well as an additional suspended ceiling to be introduced to further protect residents above from gym activity sound as well as making the gym space fit for purpose.

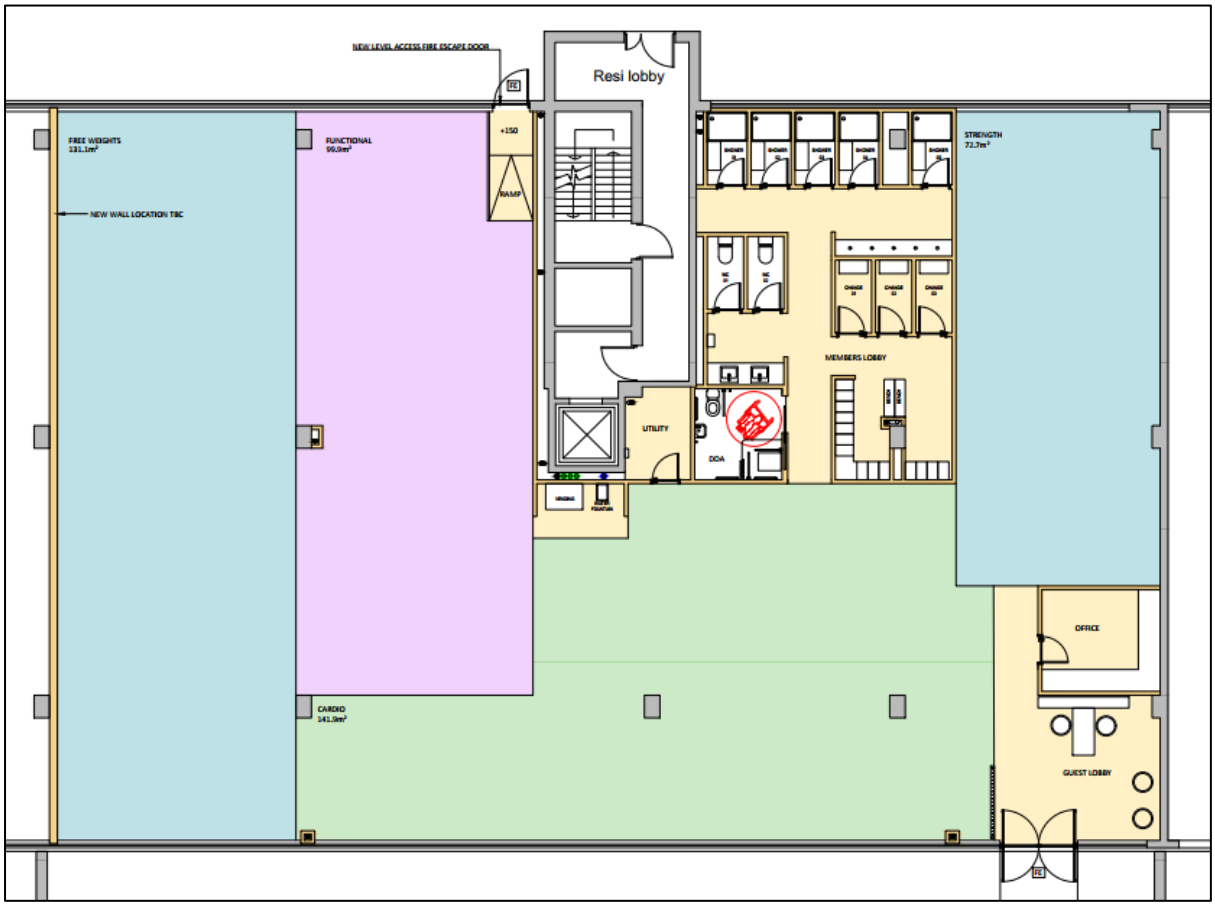


Figure 1. Proposed Gym Layout

Figure 2 below provides an illustration of the type of equipment likely to be found within the defined gym areas illustrated in Figure 1. No “Classes” (e.g. aerobics or spinning etc) are to take place.

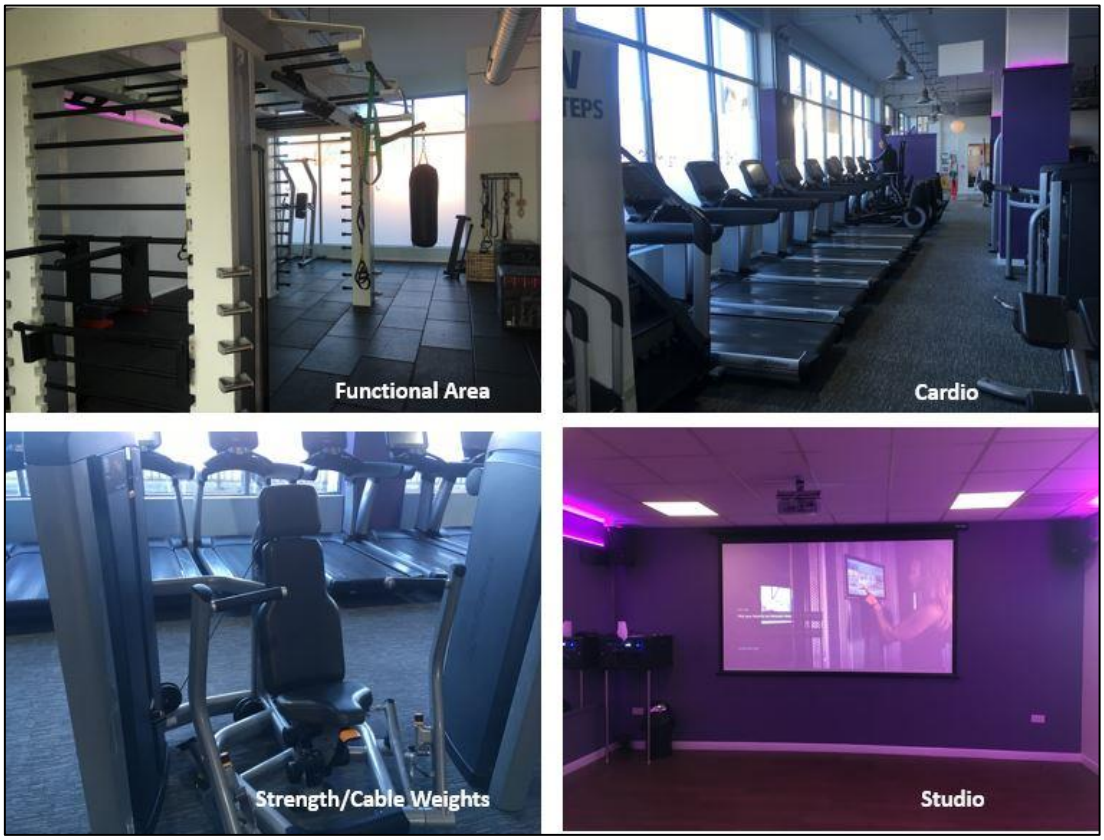


Figure 2. Gym Areas photographed from Worthing Anytime Fitness.

2.3 Soundscape

The dominant noises heard whilst on site setting up and decommissioning a Background Sound Survey, was that of gull noise and the rattling of masts and fabrics from the adjacent boat yard to the West. The difference in sound level and sound source is significant between the north and south of the building – To the north, is a busy A259 through-road, which is highly dominant, but once around the rear of the building to the south, this sound source is generally removed from the sound scape and the audible sound levels are significantly lower.

2.4 BS8233 Noise Criteria

Table 4 of BS8233 provides the following guideline values:

Activity	Location	Time period of day	
		07:00-23:00	23:00-07:00
Resting	Living Rooms	35dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hour}$	30dB $L_{Aeq,8hour}$

Table 1: BS8233 Criteria

It is worthy to note that the above standards are for continuous anonymous noise and so assessing anything with attention drawing characteristics should consider a more stringent approach (lowering the assessment time reference period or enhancing the criteria).

2.5 ProPG Gym Acoustics Guidance (2023)

The recent introduction of Gym Acoustics Guidance (GAG) introduces a new set of standards to assess against in terms of the sound emanating from the gym toward other parts of the same building. These are known as “G-Curves” and are similar to NR Curves in that they provide a curve against a frequency range between 31.5Hz – 8kHz, to which site-measurements are compared. Table 2 of the GAG document sets out guidance on these target values and said table is shown below: Particular note is made of the fact that the criteria is further reduced for overnight operations which have the potential to wake or impact those in other parts of the building where sleep might be expected.

Table 2: Guidance Internal Sound Target Criteria for Gym Activity – Residential & Other Areas

Receptor type	**Guide Criteria** (for third octave band values plots against the stated G curve - see Figure 2)	
	Airborne Sound (e.g., music) $L_{eq,T}$ (31.5Hz to 8kHz)	Heavy Impact Sound $L_{max,F}$ (31.5Hz to 8kHz)
Commercial Offices	G25-G35	G35-G45
Retail Areas	G30-G45	G35-G50
Residential Areas	G15-G25 (day) G10-G20 (night)	G20-G25 (day) G15-G20 (night)

Figure 3: G Curve target values

2.6 Scope and Methodology

For this assessment, a survey of the effectiveness of different gym floor systems has been carried out with a well-respected manufacturer present. With residential receptors located above the gymnasium, it is proposed to investigate and assess the effectiveness of the floor systems. These include the following:

1. Drop a 20/30kg Kettlebell on to various mats with them sitting directly on the concrete floor and record the results of each one, with a sound level meter operating in a residential dwelling on the floor directly above the gym. This approach is consistent with the ProPG GAG23 requirements.
2. Repeat part 1 with the same various mats but this time with the mats sitting on top of the Mason UK sprung floor system.
3. Measure the existing ambient and background sound levels within the same room in the same residential dwelling to account for any extraneous noise sources which may affect the readings of the weight drops.
4. Download the results and process the data to identify the times of the weight drops.
5. With the times of the weight drops recorded, analyse the 1/3 Octave Band data for the specific time stamps and plot on a graph against the G-Curve data.
6. Compare the graphs from the weight drops and find which G-Curve each weight drop scenario complies with.
7. Report the outcome of the above tests, discuss and conclude

3 Weight Drop Assessment

3.1 Introduction

Measurements were carried out on Monday 24th June 2024 between the time of 09:00 – 10:30hrs. The description and order of tests carried out was as follows

Test Number	Location	Description
Tests on concrete with 30kg Kettlebell – Flat 73 Bedroom 2		
1	Flat 73 Bedroom 2	Everoll 27mm Multitile
2	Flat 73 Bedroom 2	Everoll 43mm Weightlayer
3	Flat 73 Bedroom 2	Everoll 27mm Multitile + 40mm Regupol 40/80
4	Flat 73 Bedroom 2	Everoll 43mm Weightlayer + 40mm Regupol 40/80
5	Flat 73 Bedroom 2	Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270
Tests on Mason UK Floating Floor Test Rig with 30kg Kettlebell – Flat 73 Bedroom 2		
6	Flat 73 Bedroom 2	Everoll 27mm Multitile
7	Flat 73 Bedroom 2	Everoll 43mm Weightlayer
8	Flat 73 Bedroom 2	Everoll 27mm Multitile + 40mm Regupol 40/80
9	Flat 73 Bedroom 2	Everoll 43mm Weightlayer + 40mm Regupol 40/80
10	Flat 73 Bedroom 2	Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270
11	Flat 73 Bedroom 2	Everoll 43mm Weightlayer + 25mm Regufoam 270
Tests on Mason UK Floating Floor Test Rig with 30kg Kettlebell – Flat 103 Lounge		
12	Flat 103 Lounge	Everoll 43mm Weightlayer + 40mm Regupol 40/80
13	Flat 103 Lounge	Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270
Tests on Mason UK Floating Floor Test Rig with 20kg Kettlebell – Flat 103 Lounge		
14	Flat 103 Lounge	Everoll 43mm Weightlayer + 40mm Regupol 40/80
15	Flat 103 Lounge	Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270
Tests on Mason UK Floating Floor Test Rig with 30kg Kettlebell – Flat 103 Bedroom 1		
16	Flat 103 Bedroom 1	Everoll 43mm Weightlayer + 40mm Regupol 40/80
17	Flat 103 Bedroom 1	Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270
18	Flat 103 Bedroom 1	Everoll 27mm Multitile + 40mm Regupol 40/80 + 25mm Regufoam 270
Tests on Mason UK Floating Floor Test Rig with 20kg Kettlebell – Flat 103 Bedroom 1		
19	Flat 103 Bedroom 1	Everoll 43mm Weightlayer + 40mm Regupol 40/80
20	Flat 103 Bedroom 1	Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270
21	Flat 103 Bedroom 1	Everoll 27mm Multitile + 40mm Regupol 40/80 + 25mm Regufoam 270

Table 2: Weight Drop test order and descriptions

The Location of the measurements for the weight drops can be seen in the figure below:

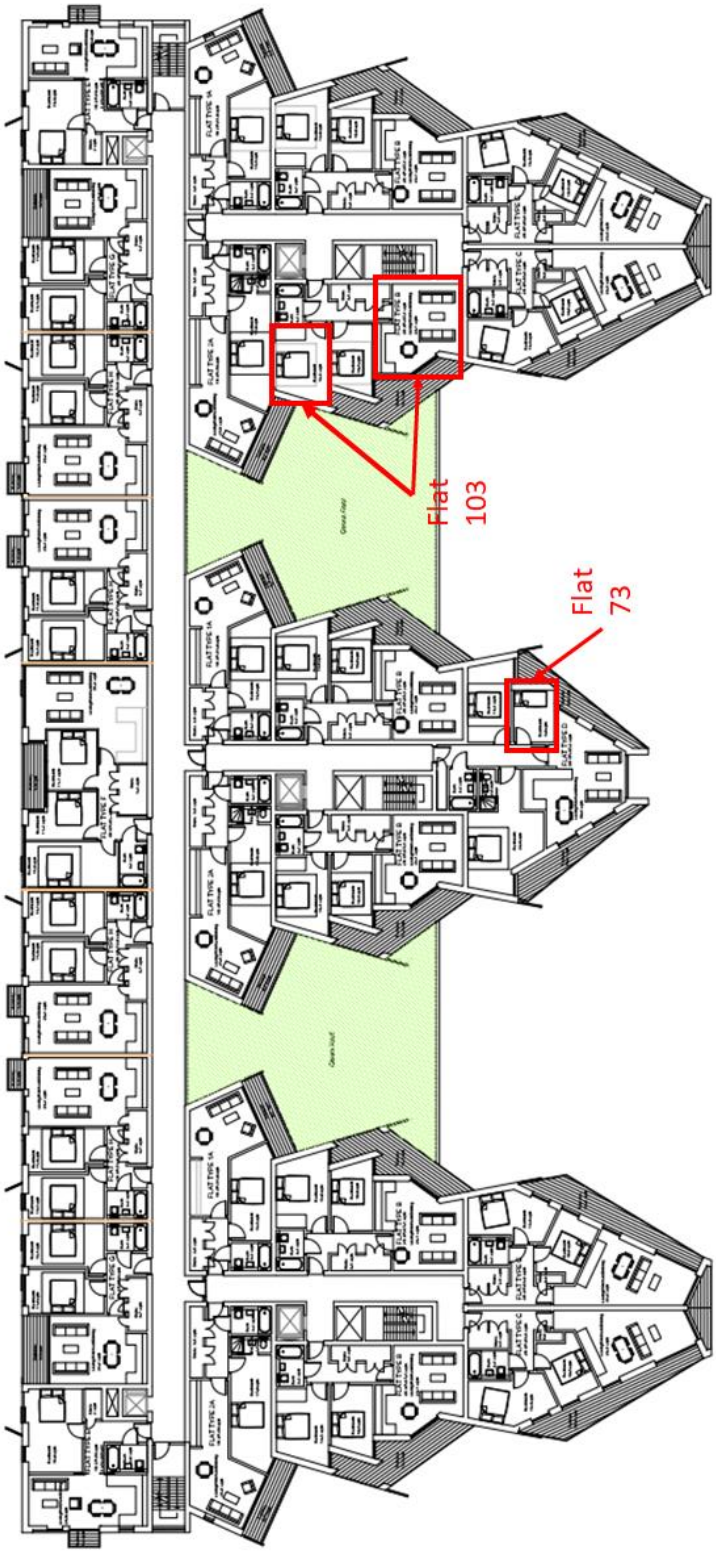


Figure 4. Measurement Locations for Free-Weight Drops for This Visit



Figure 5: Weight drop setups with and without the sprung floor

3.2 Weight Drop Results

The table below shows the G-Curve achieved for each test identified in table 2, above. The corresponding graphs can be found within the appendix of this report.

Test Number	Description	G-Curve
Tests on concrete with 30kg Kettlebell – Flat 73 Bedroom 2		
1	Everoll 27mm Multitile	G-45
2	Everoll 43mm Weightlayer	G-35
3	Everoll 27mm Multitile + 40mm Regupol 40/80	G-25
4	Everoll 43mm Weightlayer + 40mm Regupol 40/80	G-25
5	Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270	G-25
Tests on Mason UK Floating Floor Test Rig with 30kg Kettlebell – Flat 73 Bedroom 2		
6	Everoll 27mm Multitile	G-15
7	Everoll 43mm Weightlayer	G-20
8	Everoll 27mm Multitile + 40mm Regupol 40/80	G-15
9	Everoll 43mm Weightlayer + 40mm Regupol 40/80	G-15
10	Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270	G-10
11	Everoll 43mm Weightlayer + 25mm Regufoam 270	G-15
Tests on Mason UK Floating Floor Test Rig with 30kg Kettlebell – Flat 103 Lounge		
12	Everoll 43mm Weightlayer + 40mm Regupol 40/80	G-25
13	Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270	G-20
Tests on Mason UK Floating Floor Test Rig with 20kg Kettlebell – Flat 103 Lounge		
14	Everoll 43mm Weightlayer + 40mm Regupol 40/80	G-20
15	Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270	G-25
Tests on Mason UK Floating Floor Test Rig with 30kg Kettlebell – Flat 103 Bedroom 1		
16	Everoll 43mm Weightlayer + 40mm Regupol 40/80	G-15
17	Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270	G-15
18	Everoll 27mm Multitile + 40mm Regupol 40/80 + 25mm Regufoam 270	G-15
Tests on Mason UK Floating Floor Test Rig with 20kg Kettlebell – Flat 103 Bedroom 1		
19	Everoll 43mm Weightlayer + 40mm Regupol 40/80	G-15
20	Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270	G-20
21	Everoll 27mm Multitile + 40mm Regupol 40/80 + 25mm Regufoam 270	G-20

Table 3: Weight Drops with their respective G-Curve compliances

4 Discussion of Results

4.1 Free Weight Drops

As can be seen from the results there is a clear difference between the results of the gym matting layers when directly mounted on the building's concrete floor vs when they are mounted on top of the Mason UK Sprung floor system.

Once the Mason UK Sprung Floor system was in use, the G-Curves were in full compliance with the requirements for daytime AND night time periods: Test 10 (with a full build-up of Regufoam 270, Regupol 40/80 and Everoll Weightlayer 43mm above the sprung floor) showed compliance with G-10 in Flat 73. Additionally Test 17 (which was the same build-up) showed compliance with G-15 in Flat 103 Bedroom. (Flat 103 Lounge scored G-20, but only just).

These situations were carried out using a 30kg Kettlebell.

Objectively, looking at the graphs (in the appendix) there is a major reduction in low-frequency transfer into the flats above when using the sprung floor system in comparison to not using it.

Subjectively, it was almost completely inaudible in both Flat 73 and in Flat 103. Flat 103, (being more in line with the commercial unit than Flat 73) had slightly more noticeable impacts but still were only barely audible if one concentrated and the existing ambient noise level was very low.

It is considered that if the Mason UK Sprung Floor System plus the full build-up as detailed above, the building will comply comfortably with the Gym Acoustics Guidance for daytime and night time periods.

It is also important to note that whilst measurements of free-weight drops have been carried out, it is of course rare that weights are *actually* dropped. All members of the gym using free-weights are encouraged to place the weights gently on the floor and are strongly discouraged from dropping them from any height.

Further investigation of the graphs (in the appendix) show that the 1/3rd octave band frequency (for impacts) is shifted higher (to around the 160Hz - 200Hz region) once the sprung floor system is in place. This would need to be mitigated by a suspended plasterboard ceiling on an MF Grid ceiling with acoustic hangers, installed in the whole of the allocated ground floor space to be used by Anytime Fitness, as outlined in the previous report. This would also attenuate other airborne sounds generated within the space from voices or background music.

4.2 Other Considerations

Whilst the sprung floor system has been tested in relation to free-weight drops, it is recommended that the sprung floor system is used throughout the gym, especially so, where any weight machines are to be used – it is understood that these machines often have their own anti-vibration pads within them but this building does transfer vibration effectively and thus the sprung floor adds necessary mitigation to provide peace-of-mind.

It is wise also for the sprung floor to be used where any machines such as treadmills are to be used to mitigate the bounce from the synchronous vibration these machines generate into the structure. However, a more suitable (firmer) gym matting can be used to ensure stability.

Finally, from a future-proofing perspective it is recommended that the sprung floor is installed throughout, to allow re-modelling in future if layout changes are ever required.

5 Conclusion

Measurements of the effectiveness of a Mason UK sprung floor system in conjunction with a multi-layer matting system have been carried out on site in the location where the free-weights are likely to be placed (according to the proposed internal layout seen in Figure 1 of this report).

Measurements have shown that in order to achieve compliance with the Gym Acoustics Guidance G-Curves for daytime and night time periods, the following build-up is recommended for the area where free-weights are to be used:

- Mason UK Sprung Floor System (Layer 1 – bottom)
- Regufoam 270 (Layer 2)
- Regupol 40/80 (Layer 3)
- Everoll 43mm Weight Layer (Layer 4 – Top)

The use of this system has shown compliance with G-10 in Flat 73 and G-15 in Flat 103 Bedroom. Subjectively, the sound from the free-weight drops were almost completely in-audible in both flats and there was no “feeling” of vibration at all.

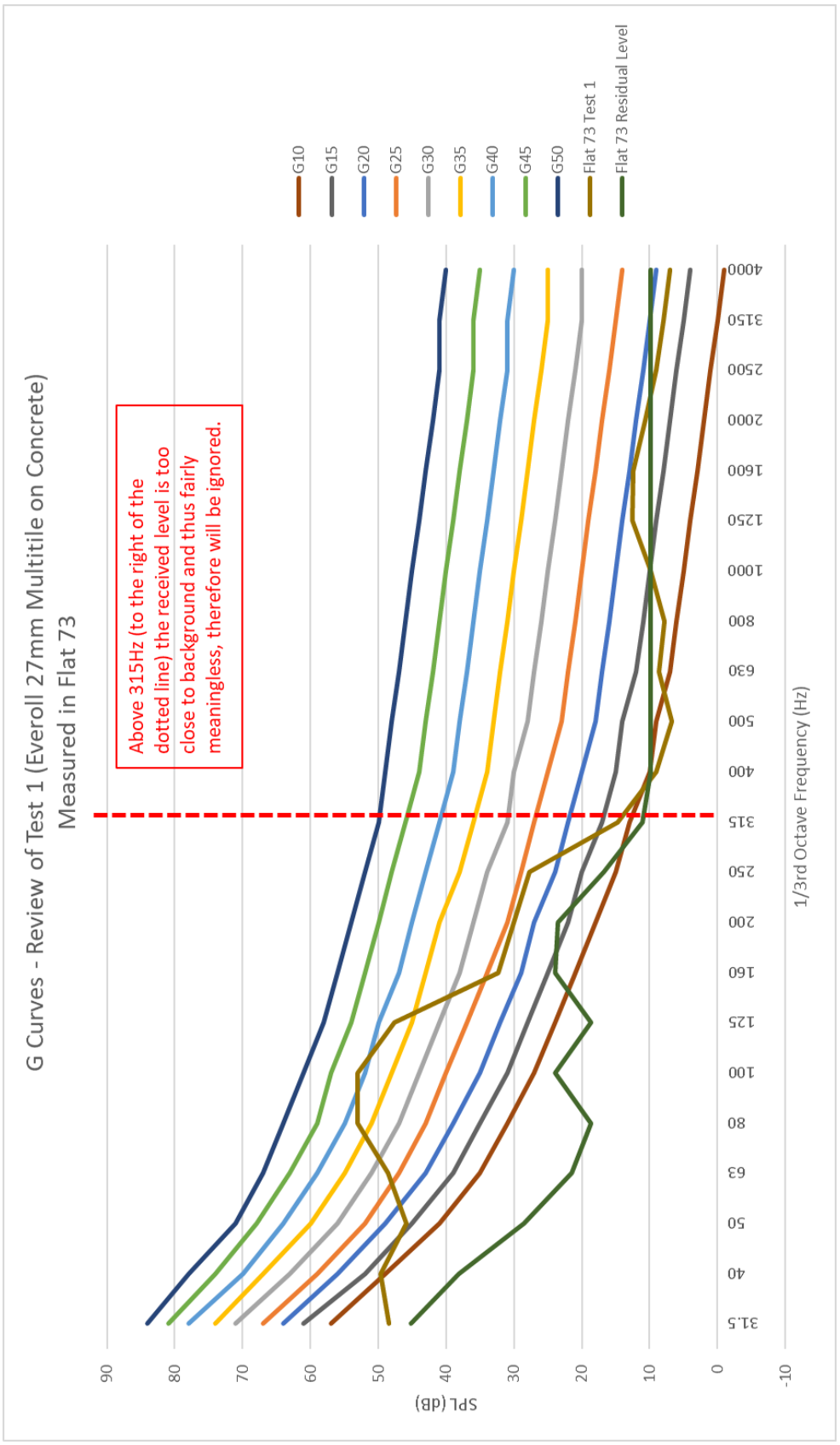
The use of the above system should be installed in conjunction with an acoustically suspended plasterboard ceiling system (such as Gyproc Casoline MF with acoustic hangers, mineral fibre and 2x 15mm Soundbloc) to further mitigate the 1/3 octave band frequencies in the 160Hz – 200Hz range.

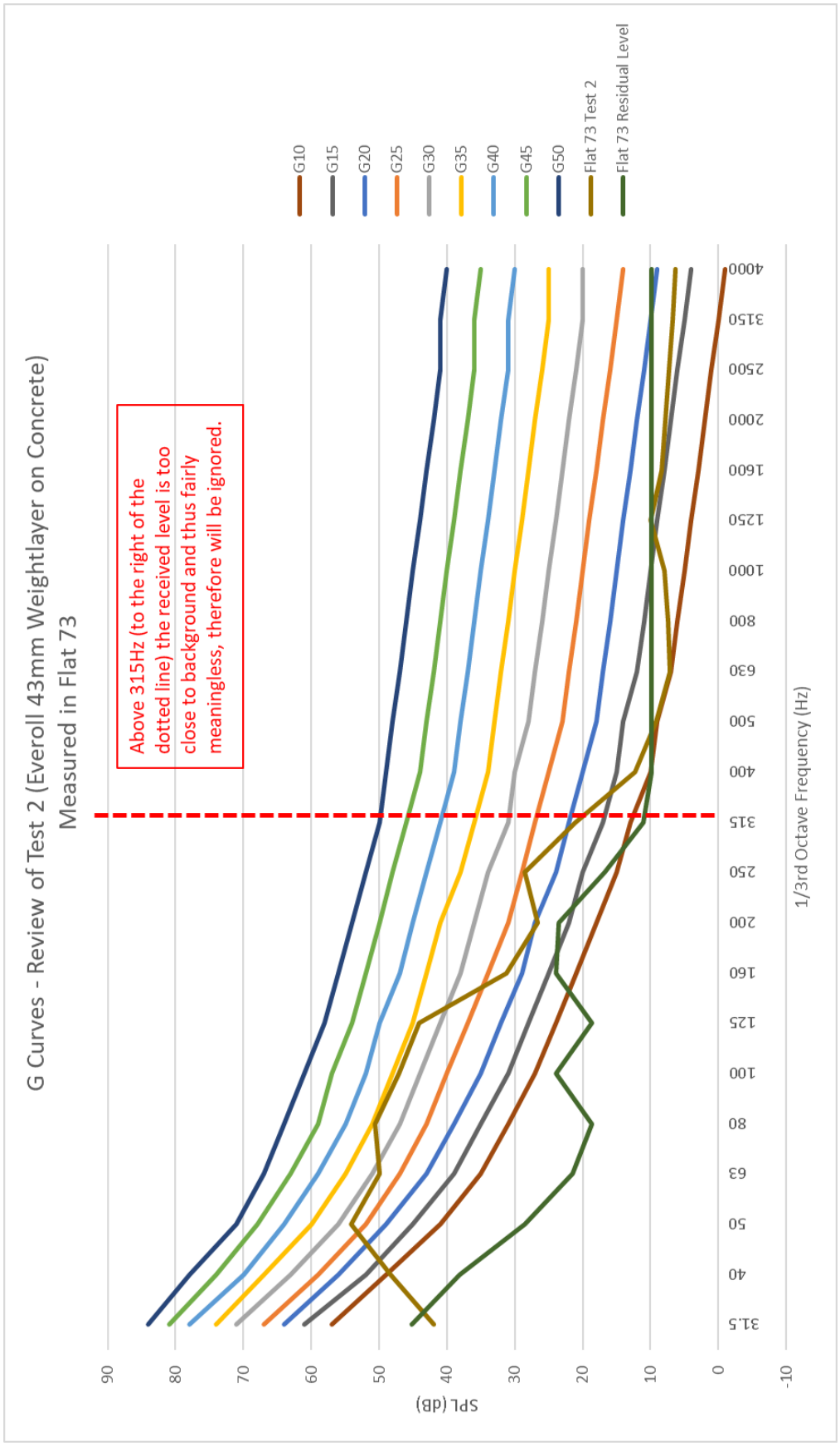
All other areas of the gym should also utilise the Mason UK Sprung Floor but the matting can be chosen as appropriate in terms of the suitability for the equipment use (cardio machines, for example, have their own anti-vibration mounts, so the matting they sit on would typically be firmer for stability purposes).

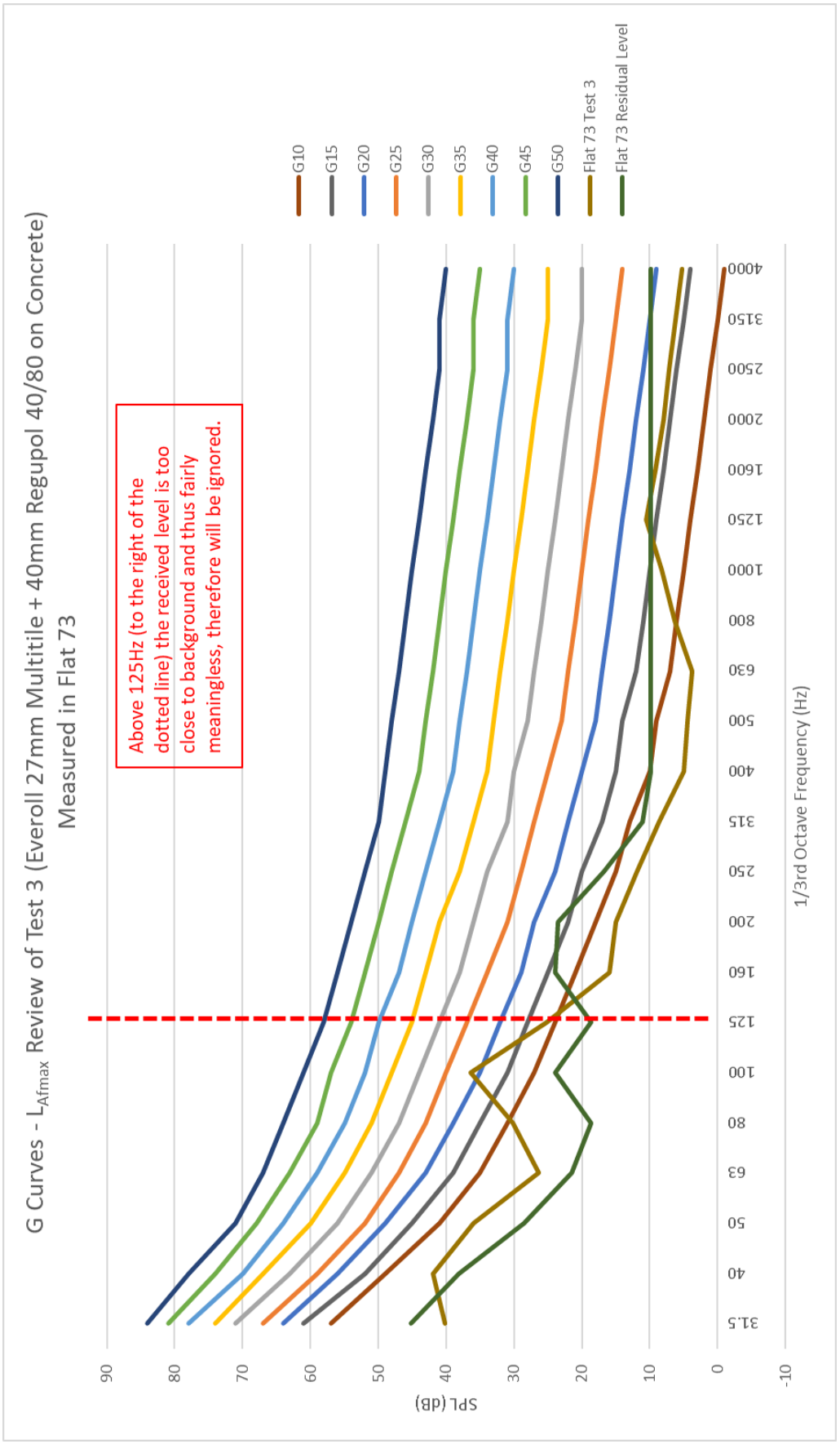
It is also important to re-iterate that in signing up to membership with Anytime Fitness, members are strongly discouraged from dropping weights, but rather are told to place them gently back onto the flooring. Therefore, the above system is essentially full mitigation against the accidental dropping of free-weights.

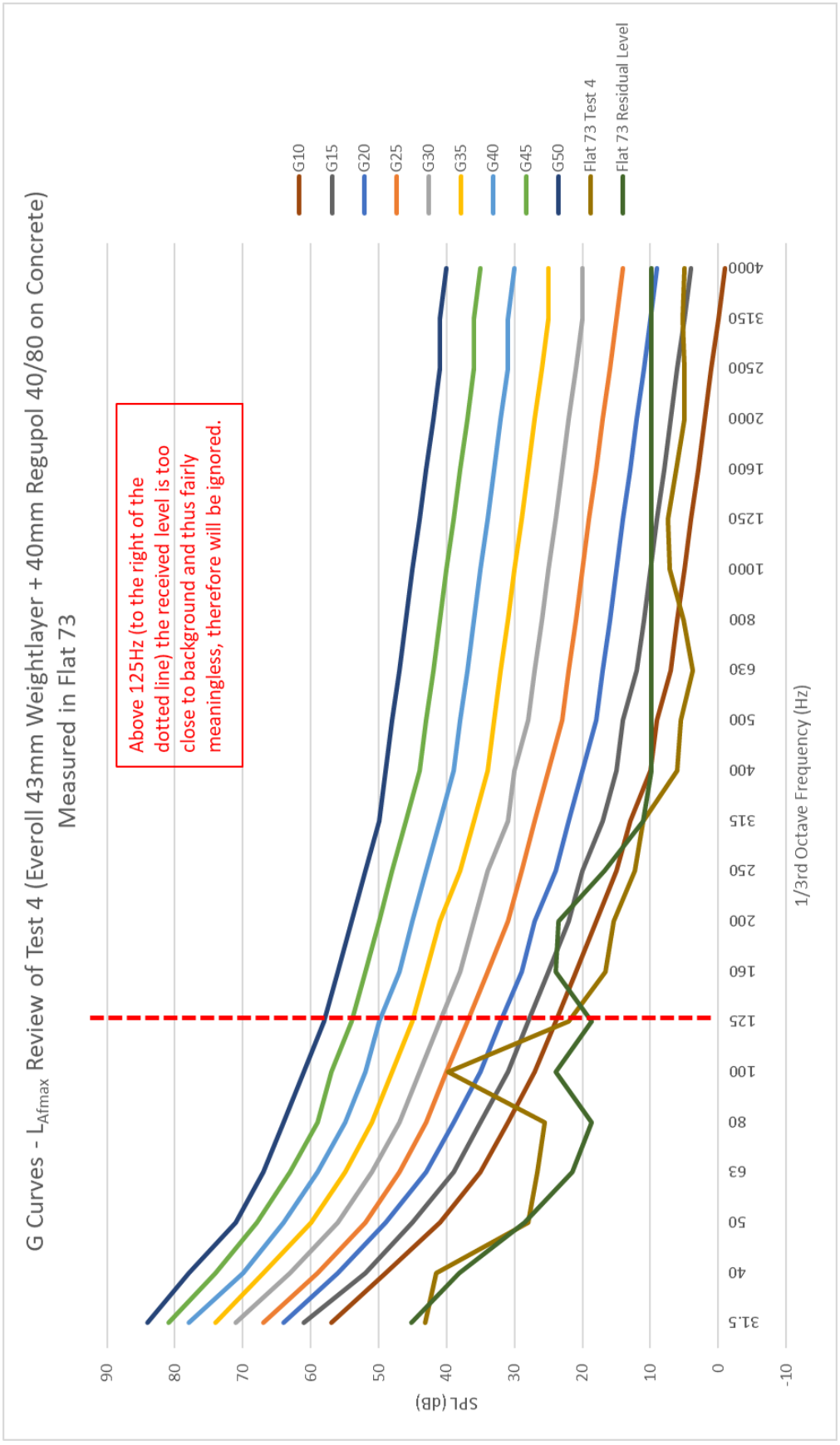
It is important to state that all assessment and advice within this report relate only to acoustics. It remains the responsibility of the client to ensure any acoustic advice complies with their fire-officer and structural engineer requirements for the building.

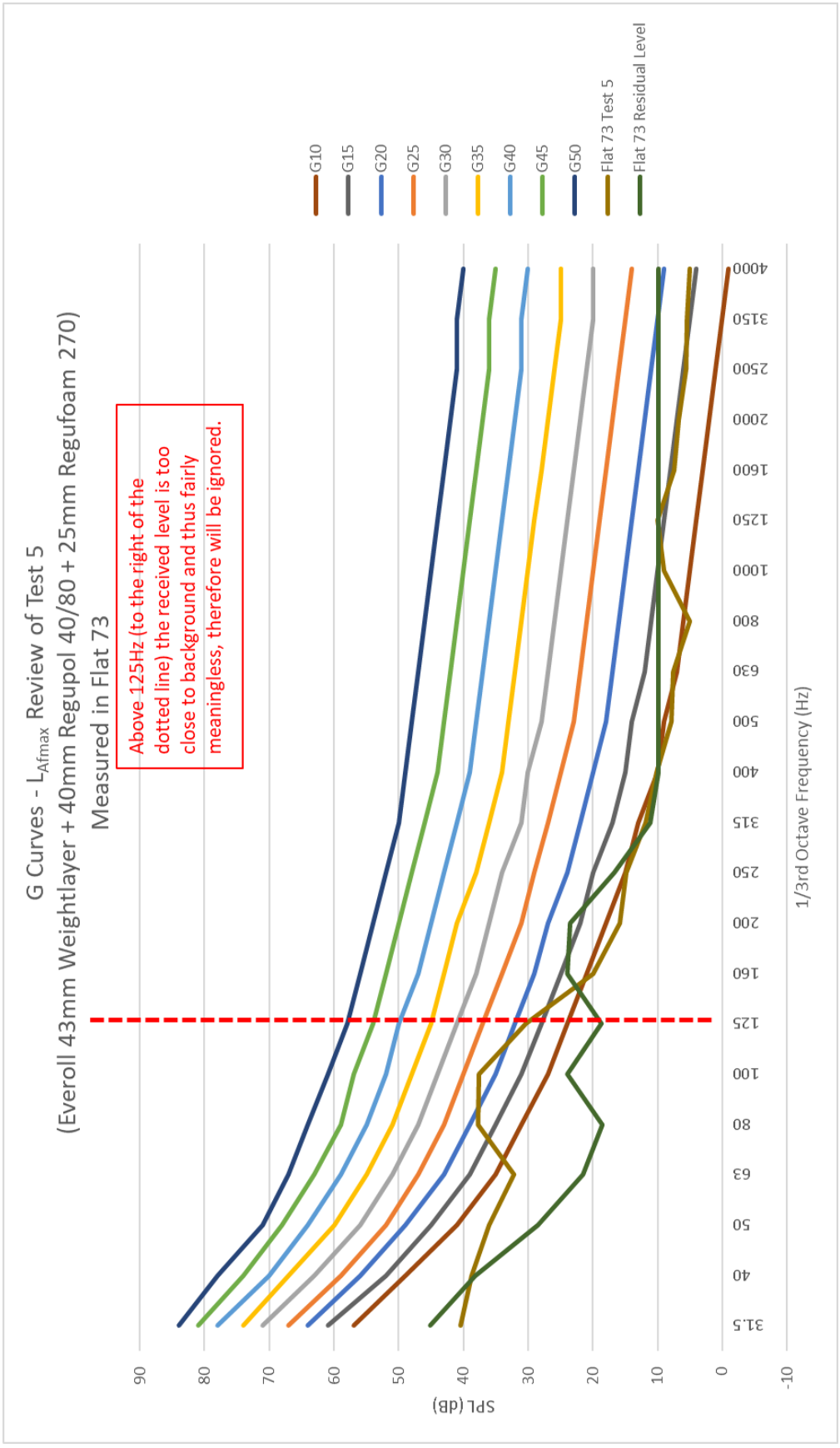
Appendix A – G-Curve Analysis

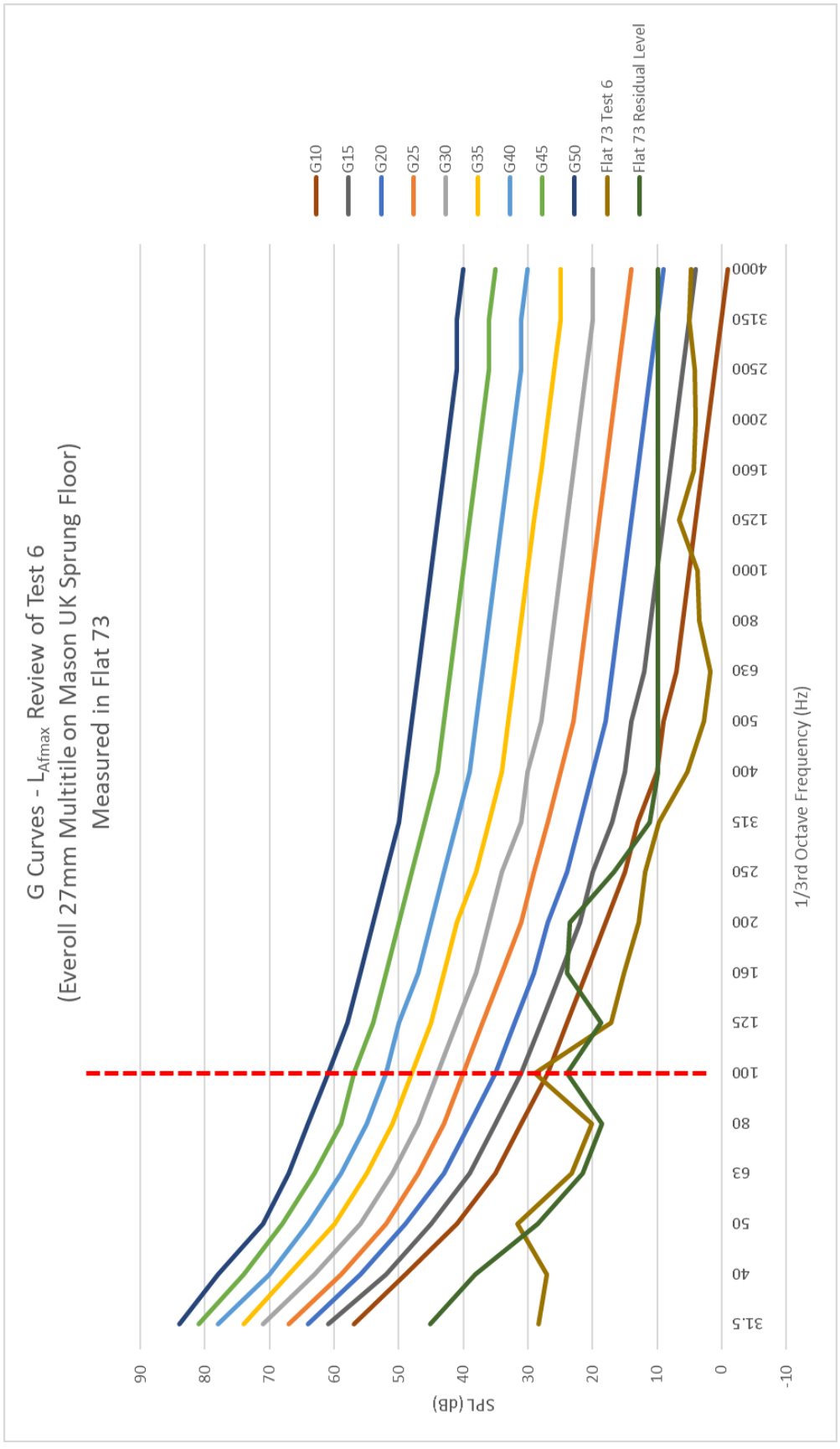


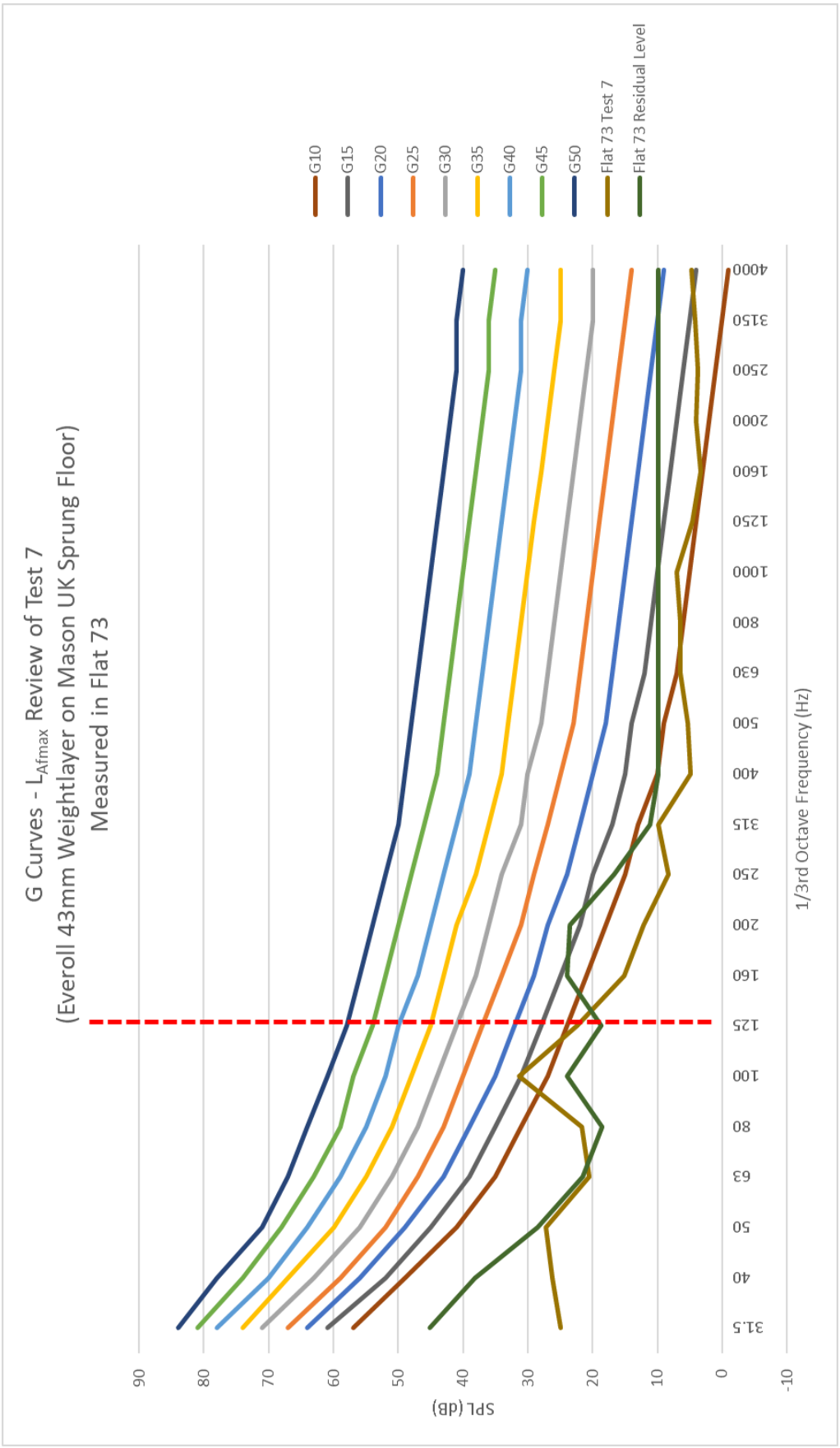

G Curves - Review of Test 2 (Everoll 43mm Weightlayer on Concrete)
Measured in Flat 73
Above 315Hz (to the right of the dotted line) the received level is too close to background and thus fairly meaningless, therefore will be ignored.
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 73 Test 2
Flat 73 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
31.5
40
50
63
80
100
125
160
200
250
315
400
500
630
800
1000
1250
1600
2000
2500
3150
4000

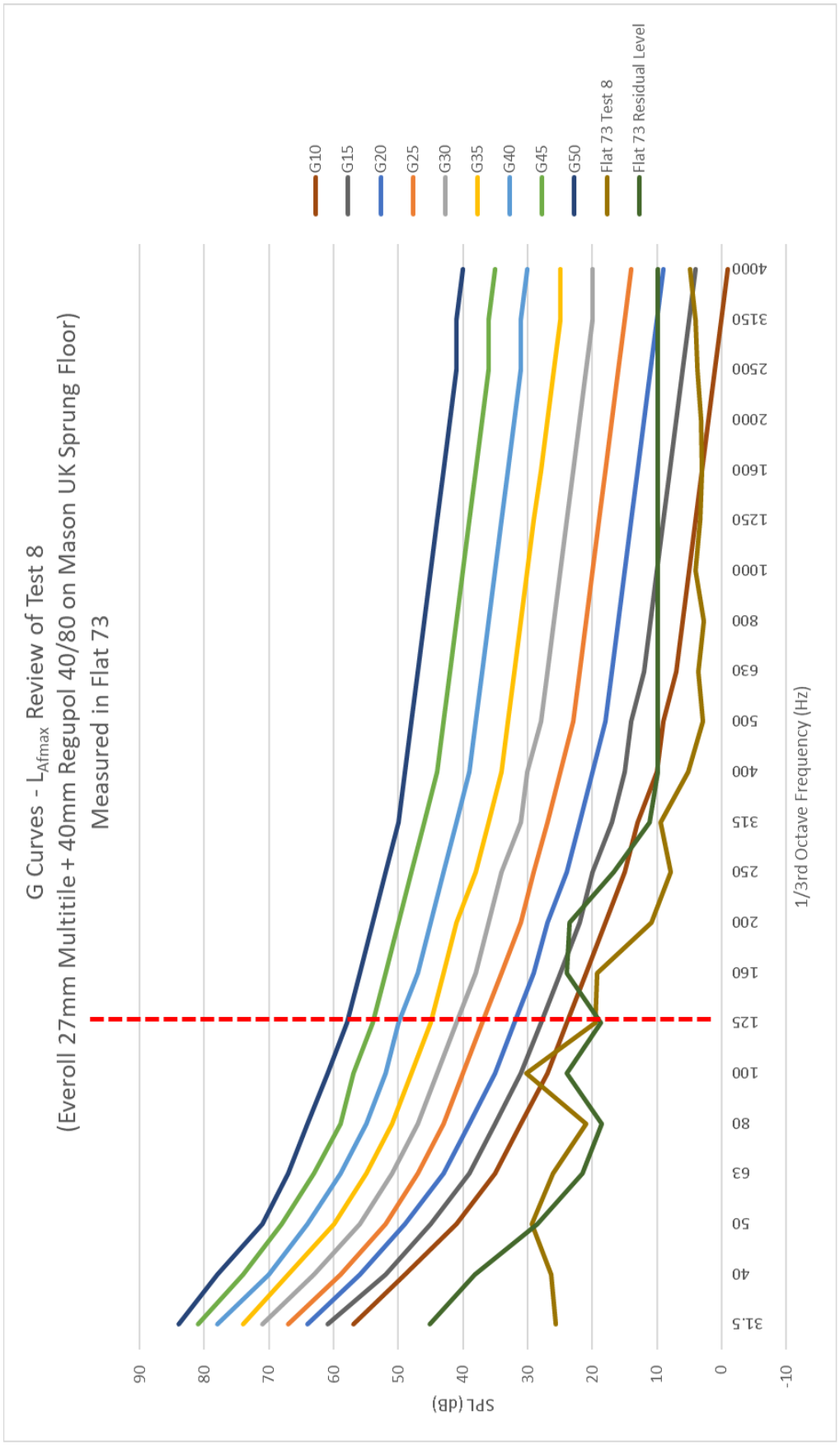

G Curves - L_{Afmax} Review of Test 3 (Everoll 27mm Multitile + 40mm Regupol 40/80 on Concrete)
Measured in Flat 73
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 73 Test 3
Flat 73 Residual Level
Above 125Hz (to the right of the dotted line) the received level is too close to background and thus fairly meaningless, therefore will be ignored.
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5

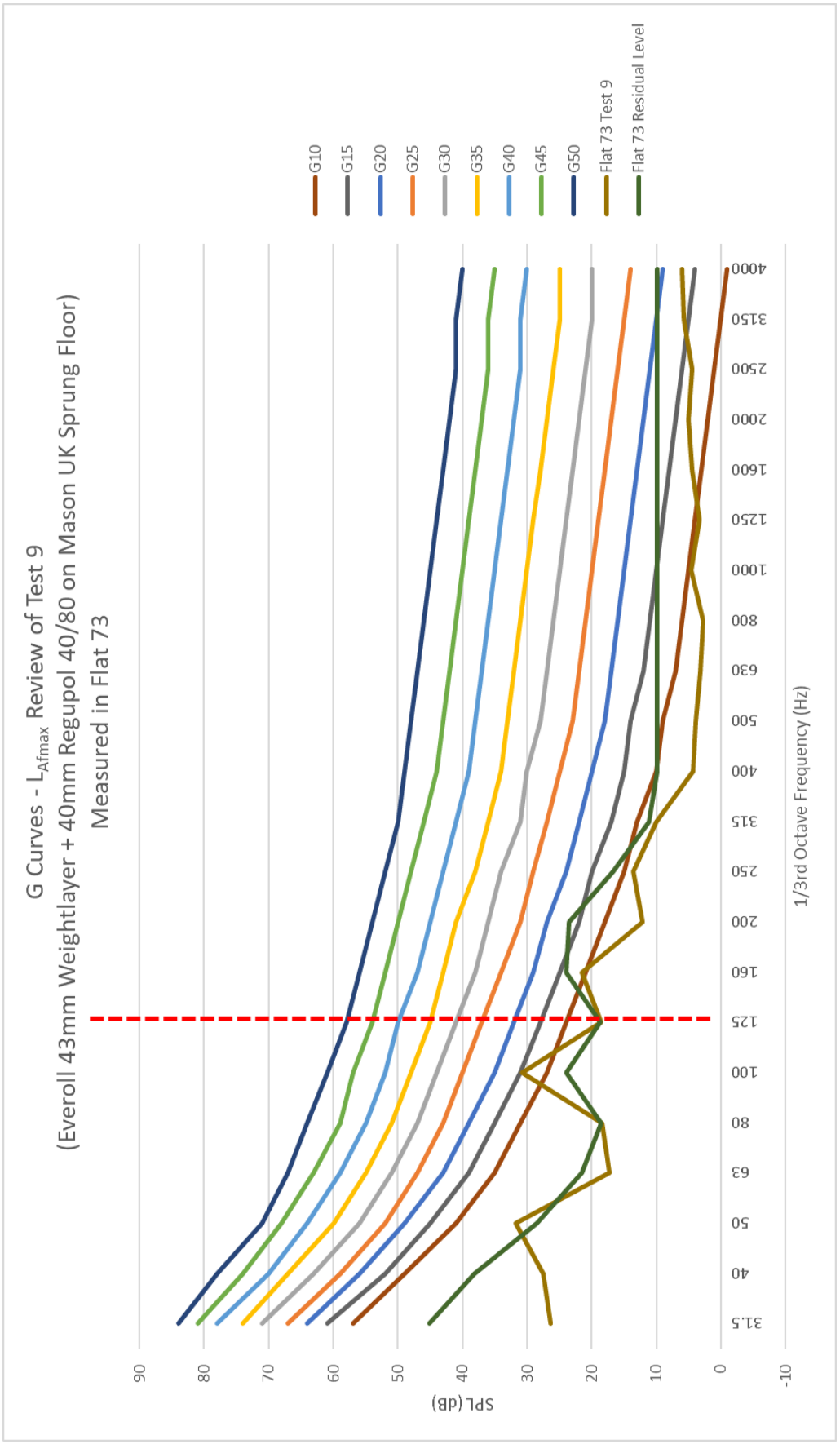

G Curves - L_{Afmax} Review of Test 4 (Everoll 43mm Weightlayer + 40mm Regupol 40/80 on Concrete)
Measured in Flat 73
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 73 Test 4
Flat 73 Residual Level
Above 125Hz (to the right of the dotted line) the received level is too close to background and thus fairly meaningless, therefore will be ignored.
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
31.5
40
50
63
80
100
125
160
200
250
315
400
500
630
800
1000
1250
1600
2000
2500
3150
4000

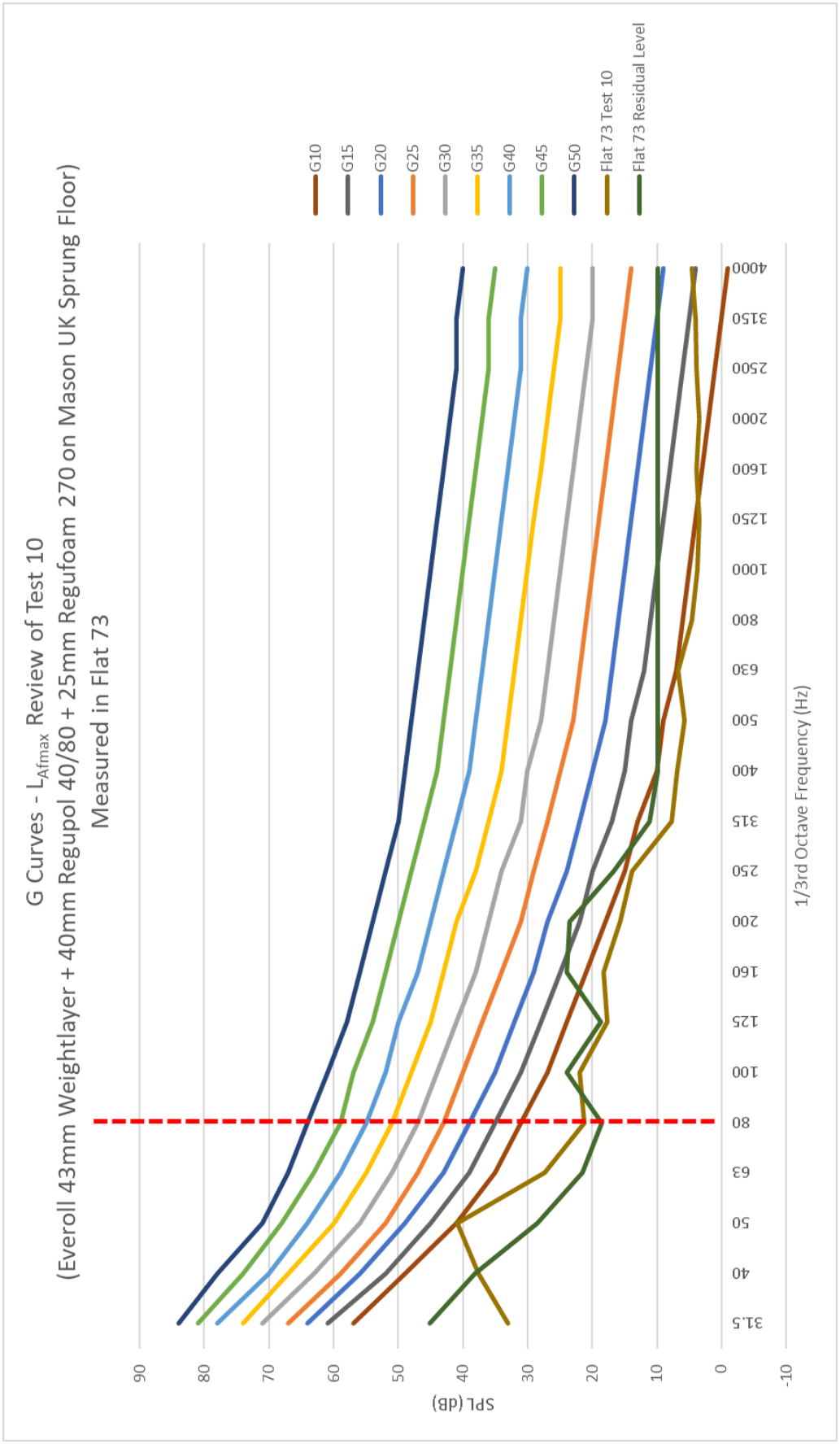

G Curves - L_{Afmax} Review of Test 5
(Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270)
Measured in Flat 73
Above 125Hz (to the right of the dotted line) the received level is too close to background and thus fairly meaningless, therefore will be ignored.
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 73 Test 5
Flat 73 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
31.5
40
50
63
80
100
125
160
200
250
315
400
500
630
800
1000
1250
1600
2000
2500
3150
4000

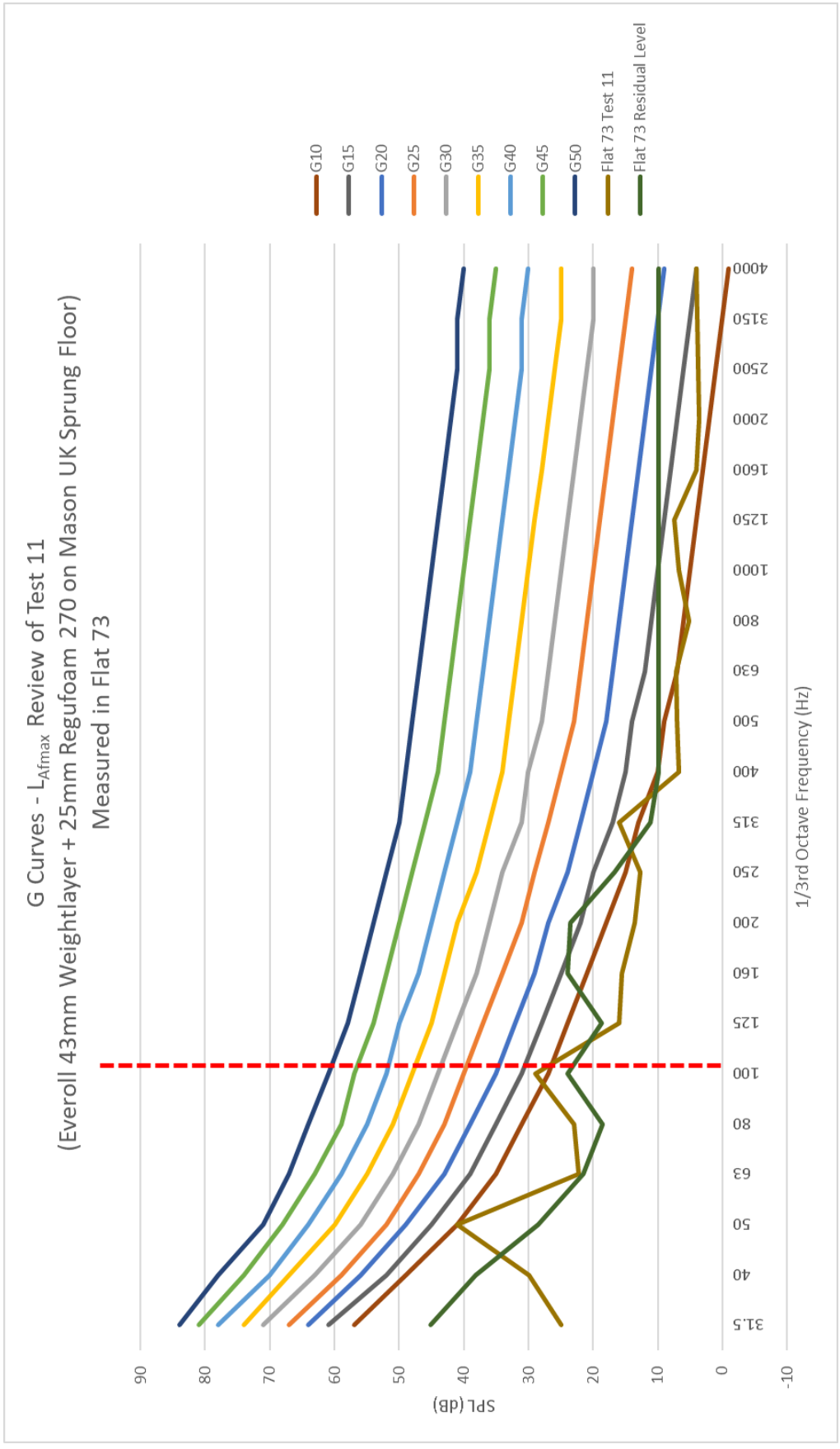

G Curves - L_{Afmax} Review of Test 6
(Everoll 27mm Multitile on Mason UK Sprung Floor)
Measured in Flat 73
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 73 Test 6
Flat 73 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5

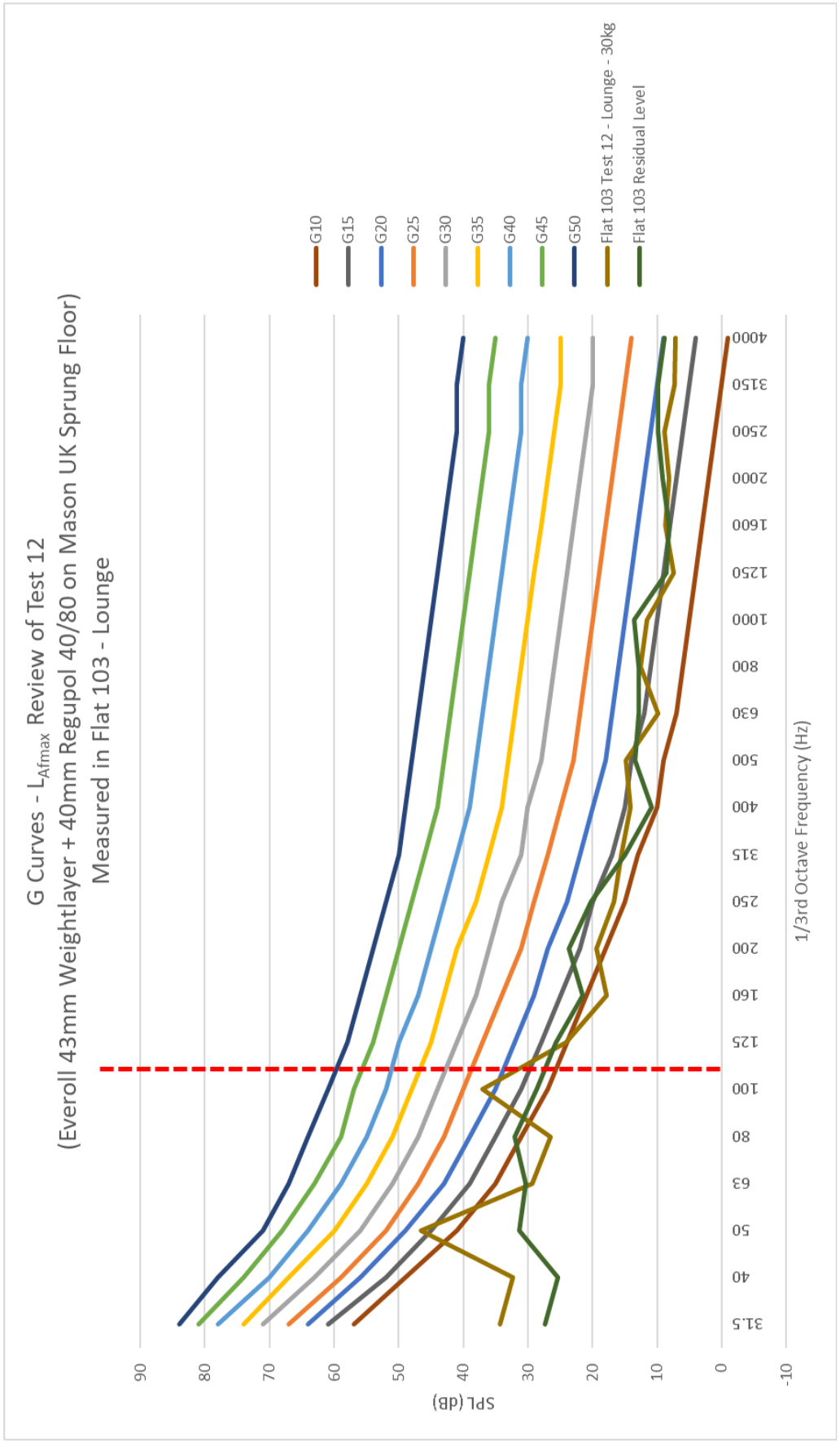

G Curves - L_{Afmax} Review of Test 7
(Everoll 43mm Weightlayer on Mason UK Sprung Floor)
Measured in Flat 73
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 73 Test 7
Flat 73 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5

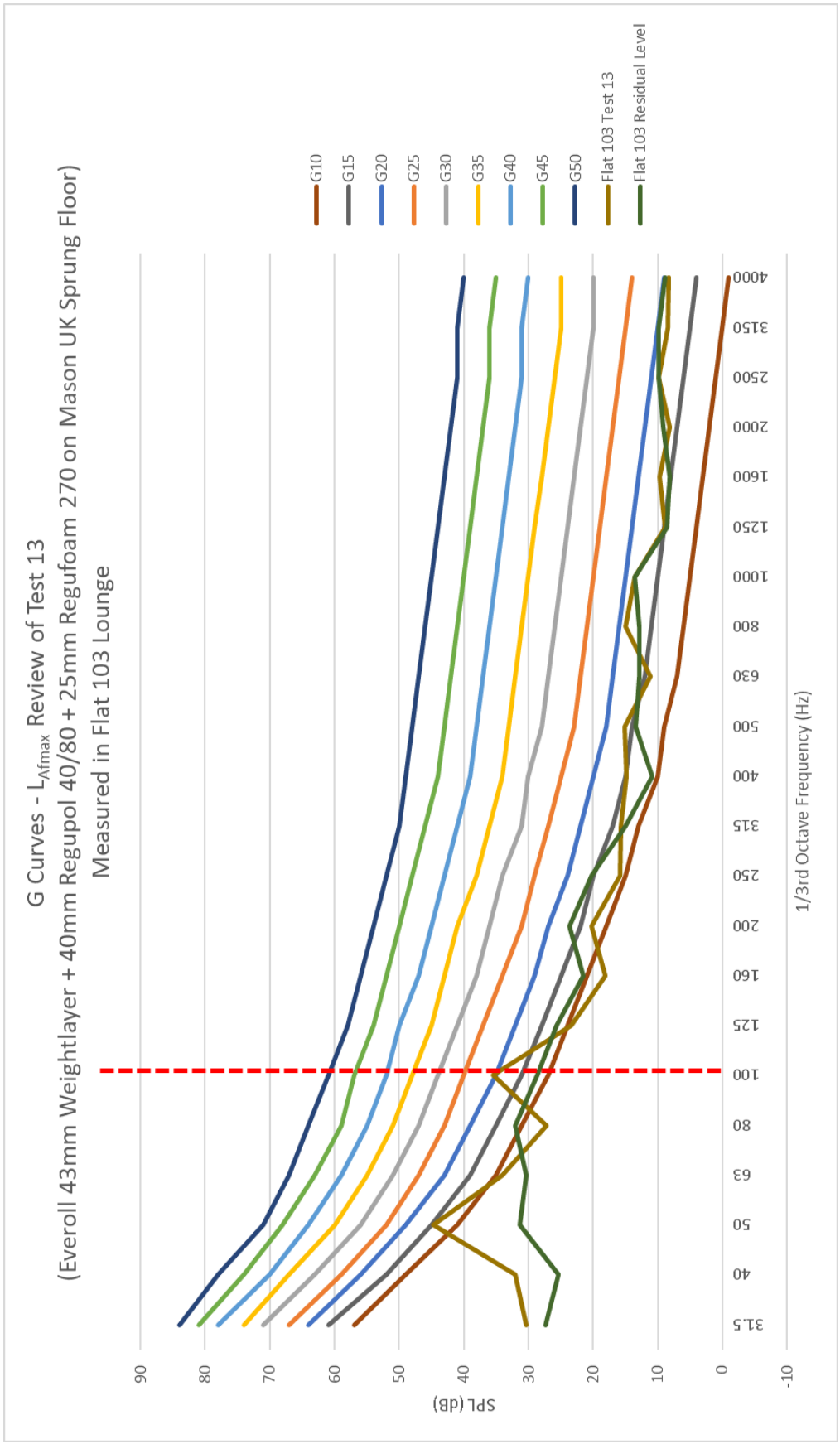

G Curves - L_{Afmax} Review of Test 8
(Everoll 27mm Multitile + 40mm Regupol 40/80 on Mason UK Sprung Floor)
Measured in Flat 73
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 73 Test 8
Flat 73 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5

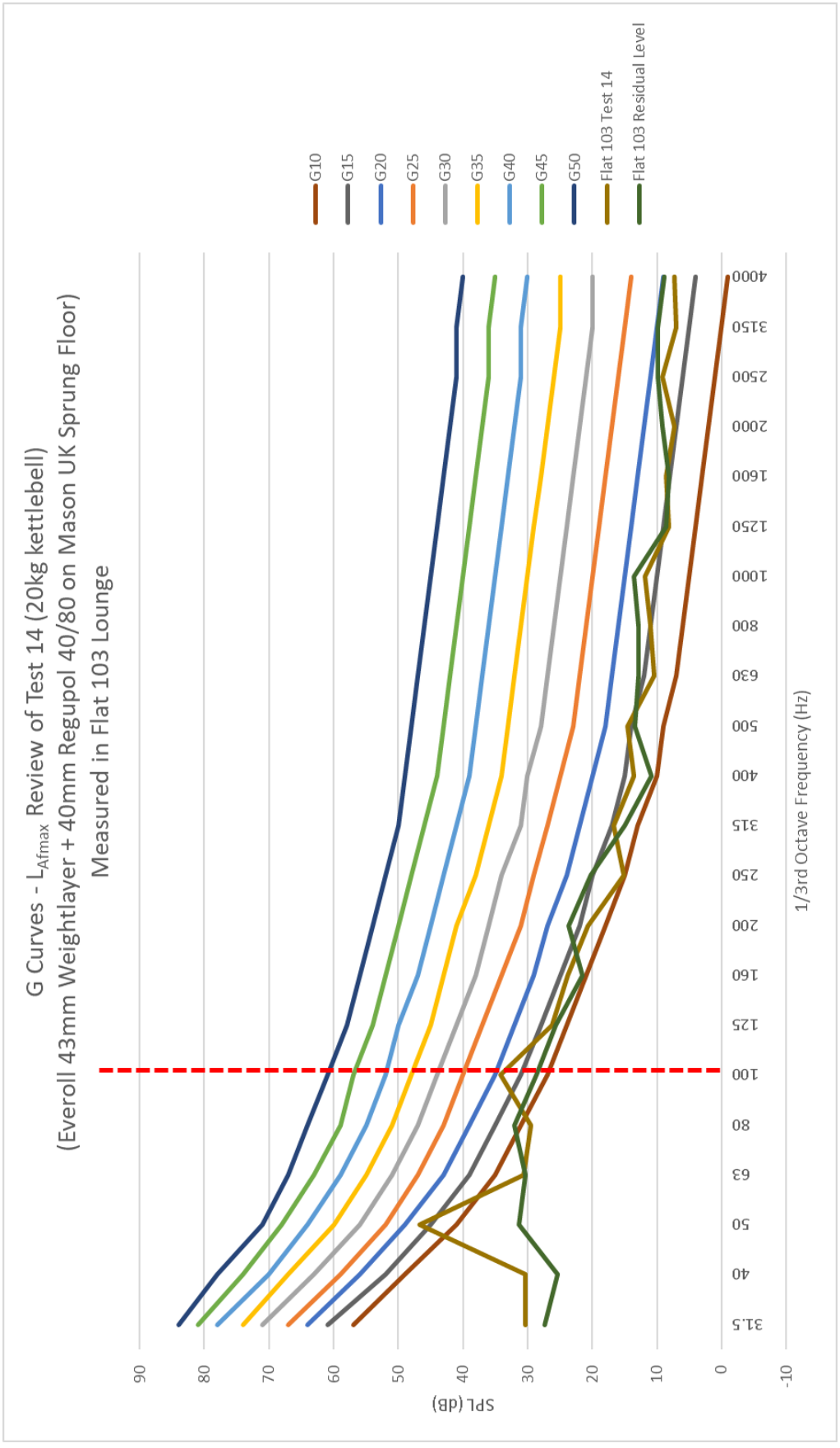

G Curves - L_{Afmax} Review of Test 9
(Everoll 43mm Weightlayer + 40mm Regupol 40/80 on Mason UK Sprung Floor)
Measured in Flat 73
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 73 Test 9
Flat 73 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5

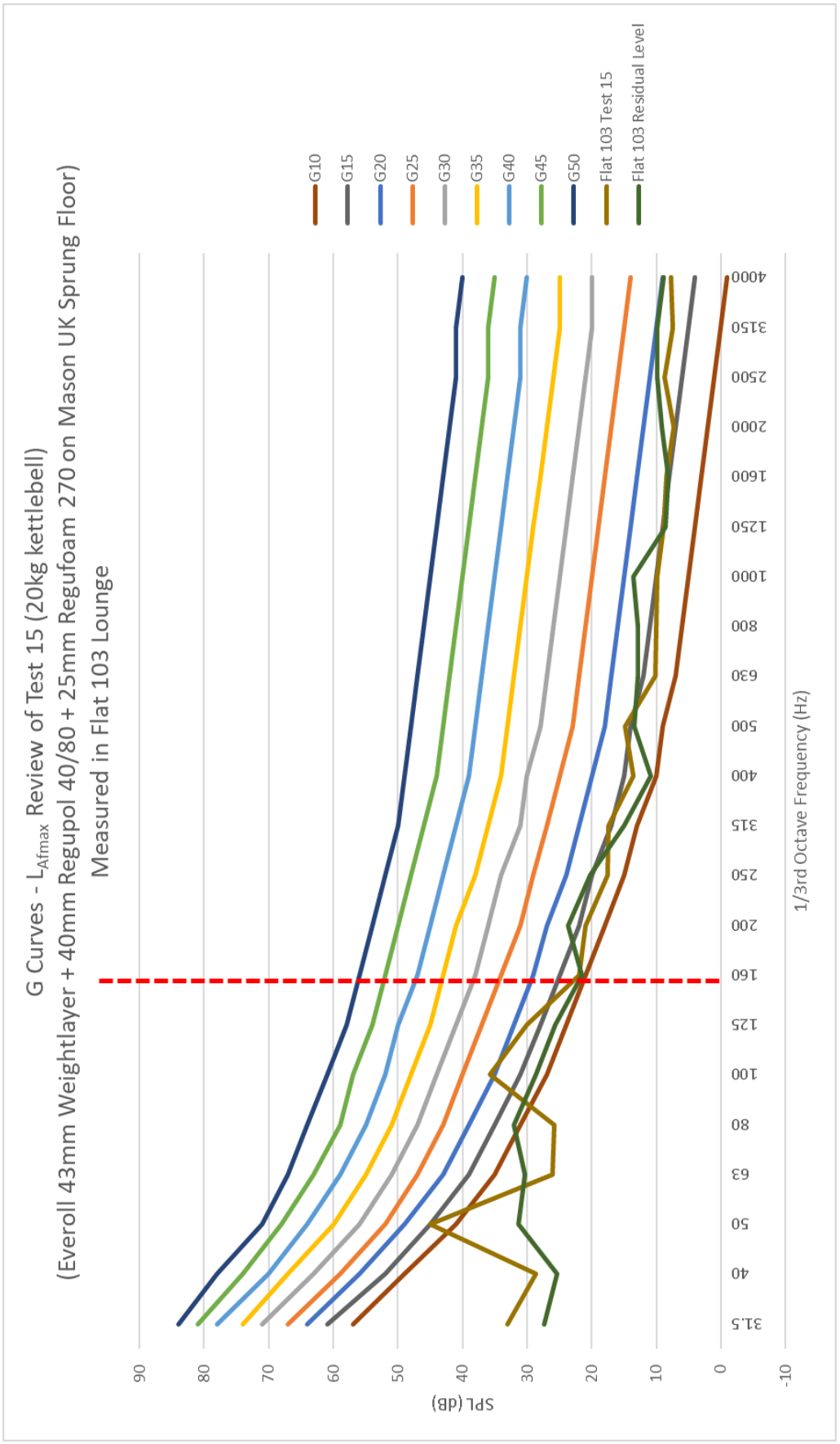

G Curves - L_{Afmax} Review of Test 10
(Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270 on Mason UK Sprung Floor)
Measured in Flat 73
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 73 Test 10
Flat 73 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5

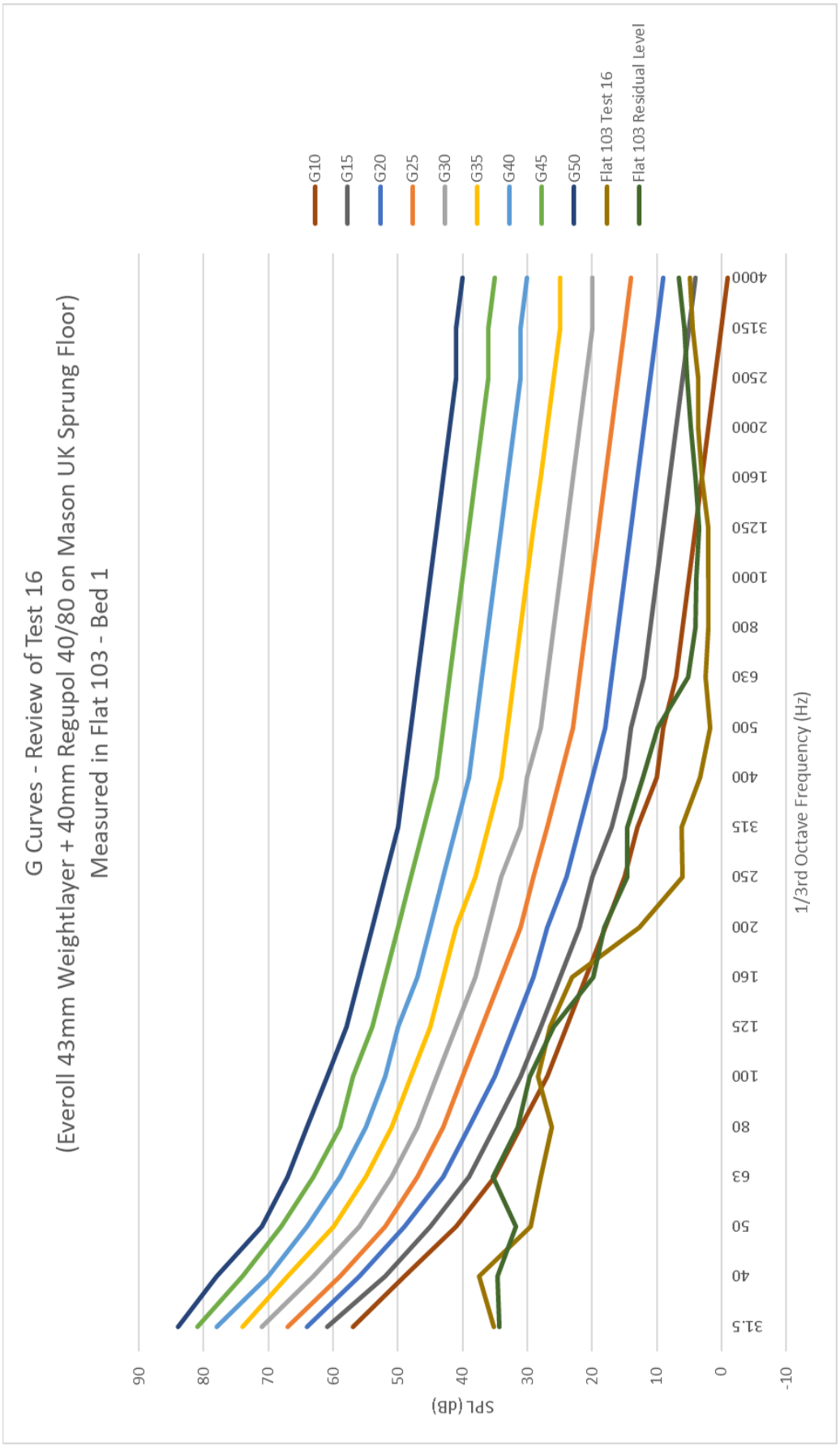

G Curves - L_{Afmax} Review of Test 11
(Everoll 43mm Weightlayer + 25mm Regufoam 270 on Mason UK Sprung Floor)
Measured in Flat 73
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 73 Test 11
Flat 73 Residual Level
1/3rd Octave Frequency (Hz)
SPL (dB)

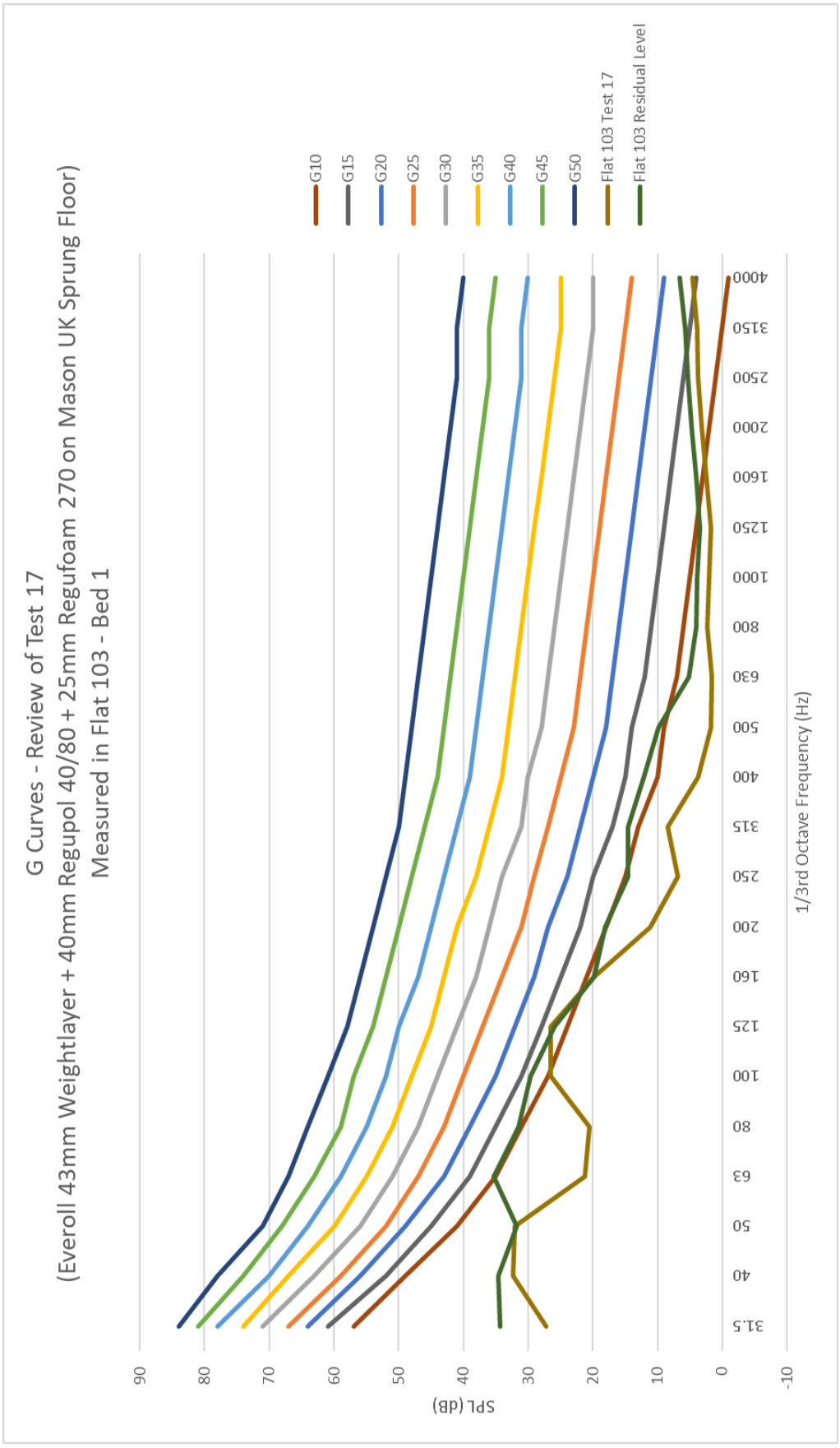

G Curves - L_{Afmax} Review of Test 12
(Everoll 43mm Weightlayer + 40mm Regupol 40/80 on Mason UK Sprung Floor)
Measured in Flat 103 - Lounge
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 103 Test 12 - Lounge - 30kg
Flat 103 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
31.5
40
50
63
80
100
125
160
200
250
315
400
500
630
800
1000
1250
1600
2000
2500
3150
4000

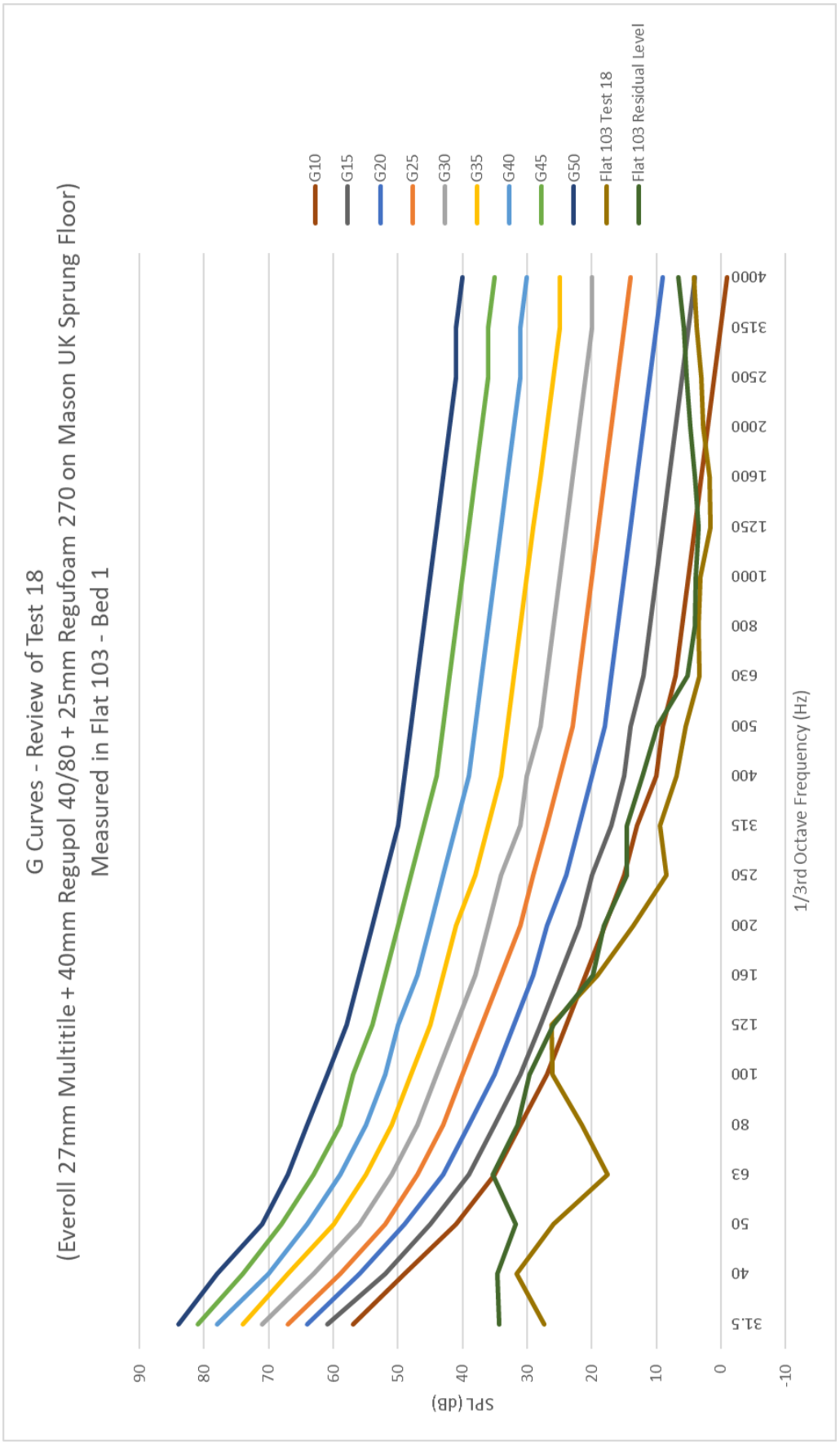

G Curves - L_{Afmax} Review of Test 13
(Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270 on Mason UK Sprung Floor)
Measured in Flat 103 Lounge
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 103 Test 13
Flat 103 Residual Level
1/3rd Octave Frequency (Hz)
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5

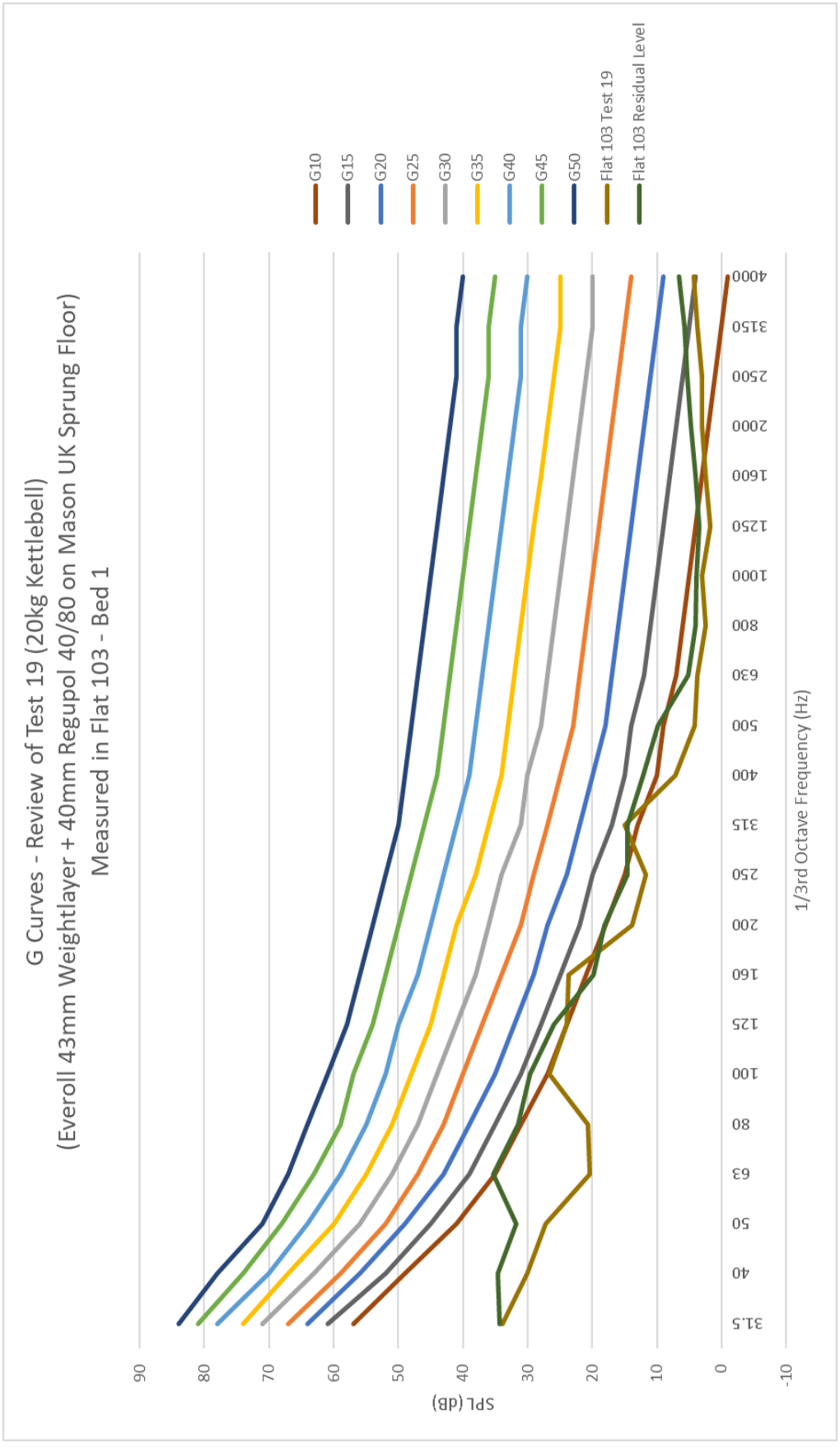

G Curves - L_{Afmax} Review of Test 14 (20kg kettlebell)
(Everoll 43mm Weightlayer + 40mm Regupol 40/80 on Mason UK Sprung Floor)
Measured in Flat 103 Lounge
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 103 Test 14
Flat 103 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5

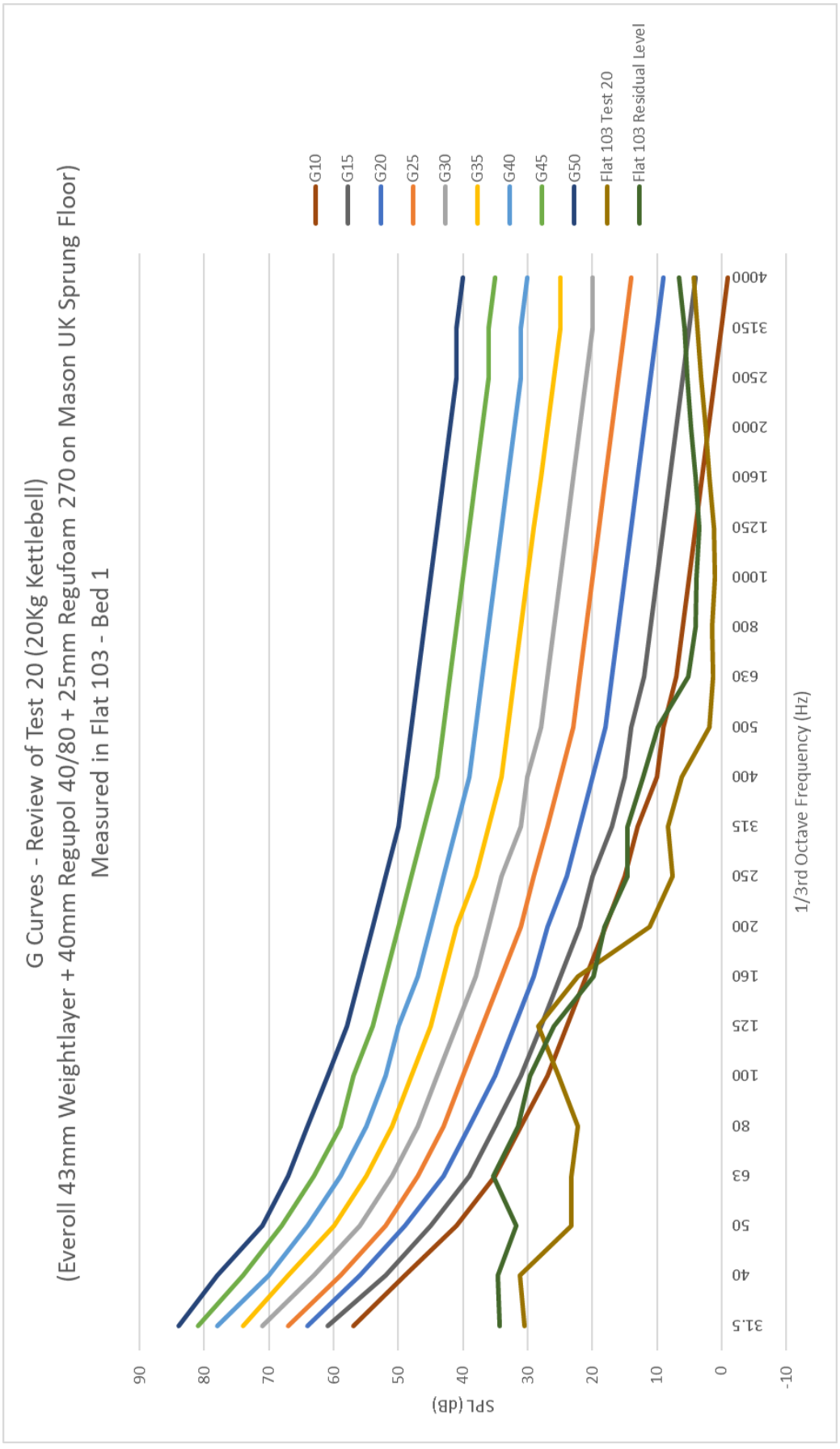

G Curves - L_{Afmax} Review of Test 15 (20kg kettlebell)
(Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270 on Mason UK Sprung Floor)
Measured in Flat 103 Lounge
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 103 Test 15
Flat 103 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5

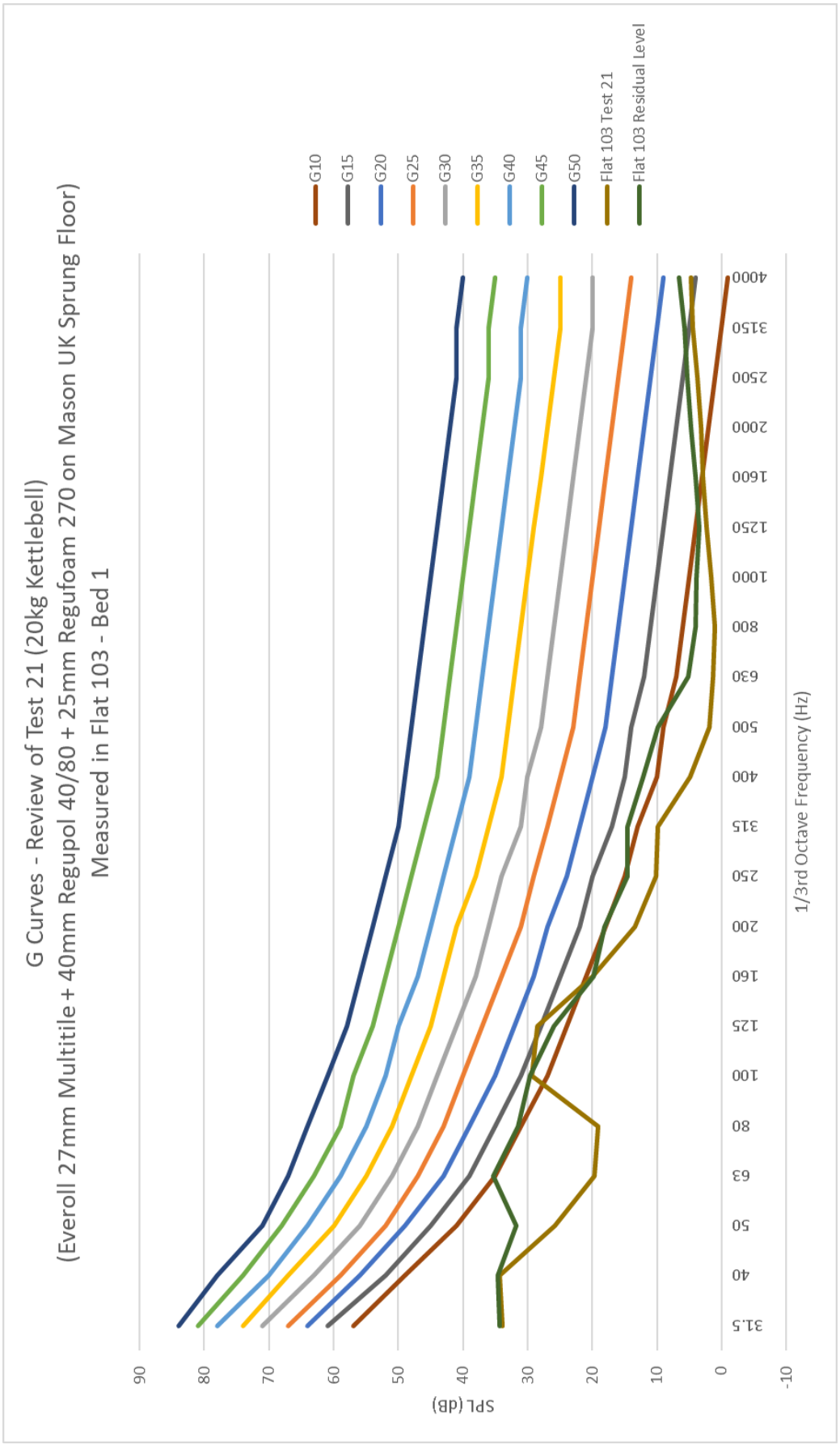

G Curves - Review of Test 16
(Everoll 43mm Weightlayer + 40mm Regupol 40/80 on Mason UK Sprung Floor)
Measured in Flat 103 - Bed 1
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 103 Test 16
Flat 103 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5


G Curves - Review of Test 17
(Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270 on Mason UK Sprung Floor)
Measured in Flat 103 - Bed 1
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 103 Test 17
Flat 103 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5


G Curves - Review of Test 18
(Everoll 27mm Multitile + 40mm Regupol 40/80 + 25mm Regufoam 270 on Mason UK Sprung Floor)
Measured in Flat 103 - Bed 1
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 103 Test 18
Flat 103 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5


G Curves - Review of Test 19 (20kg Kettlebell)
(Everoll 43mm Weightlayer + 40mm Regupol 40/80 on Mason UK Sprung Floor)
Measured in Flat 103 - Bed 1
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 103 Test 19
Flat 103 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5


G Curves - Review of Test 20 (20Kg Kettlebell)
(Everoll 43mm Weightlayer + 40mm Regupol 40/80 + 25mm Regufoam 270 on Mason UK Sprung Floor)
Measured in Flat 103 - Bed 1
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 103 Test 20
Flat 103 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5


G Curves - Review of Test 21 (20kg Kettlebell)
(Everoll 27mm Multitile + 40mm Regupol 40/80 + 25mm Regufoam 270 on Mason UK Sprung Floor)
Measured in Flat 103 - Bed 1
G10
G15
G20
G25
G30
G35
G40
G45
G50
Flat 103 Test 21
Flat 103 Residual Level
SPL (dB)
90
80
70
60
50
40
30
20
10
0
-10
1/3rd Octave Frequency (Hz)
4000
3150
2500
2000
1600
1250
1000
800
630
500
400
315
250
200
160
125
100
80
63
50
40
31.5