BB93 ACOUSTIC COMPLIANCE TESTING REPORT

AT
Netley Street School, Netley Street Development, Everton Building, off Stanhope Street, London, NW1 3RY

REPORT REFERENCE: 115451 AC 4v1

Authorised by:	Position:	Date:
Owen Downey MIOA Signed: 	Senior Acoustic Consultant	25.07.2014

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UKAS TESTING 2587

Air Tightness Consultancy & Testing | Energy - SAP, EPC, DEC & SBEM | BREEAM & Code for Sustainable Homes

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1.0 INTRODUCTION

HRS Services Ltd. (HRS) has been commissioned by BAM Construct UK Ltd to undertake acoustic compliance testing at Netley Street School, part of the Netley Street Development This document has been prepared for the sole use, benefit and information of BAM Construct UK Ltd. The liability of HRS in respect of the information contained herein will not extend to any third party.

It is understood that the development is required to comply with Requirement E4 of Approved Document E (2003 edition incorporating 2004 & 2010 amendments). The normal way of satisfying this requirement is to comply with the acoustic specifications as set out in Building Bulletin 93: Acoustic Design of Schools (BB93).

It is recommended that prior to the implementation of any information contained within this report; clarification is sought as to the proposed BB93 room classifications used by HRS.

All measurements were carried out using a UKAS calibrated Brüel and Kjær 2250 or 2260 Investigator Type 1 integrating sound level meter. A calibration check was carried out before and after with no variance in calibration levels observed.

2.0 TEST AND RESULTS SUMMARY

Section 0.4 of Approved Document E *'Resistance to the passage of sound'* (2003 edition incorporating 2004 & 2010 amendments) states that sound insulation testing should preferably be carried out by a body with UKAS accreditation. HRS Services Ltd are accredited to BS EN ISO/IEC 17025:2005 *'General requirements for the competence of testing and calibration laboratories'* by the United Kingdom Accreditation Service (UKAS), and as such are deemed competent to carry out testing in accordance with Annex B of Approved Document E (2003 Edition incorporating 2004 & 2010 amendments); BS EN ISO 140-4:1998; BS EN ISO 717-1:2013; BS EN ISO 140-7:1998; BS EN ISO 717-2:2013 (UKAS Testing Laboratory No. 2587)

Table 1: Testing Laboratory and Test Site Details

Permanent Address of Testing Laboratory:	HRS Services Ltd. 81 Burton Road, Sheffield, S3 8BZ
Authorised Tester(s):	James Blakeley AMIOA
Report Compiler:	James Blakeley AMIAO
Name of Client:	BAM Construct UK Ltd
Site Address:	Netley Street School, Netley Street Development, Everton Building, off Stanhope Street, London, NW1 3RY
Build:	Purpose Built
Type:	Primary School

Table 2: Summary of Test Results

	Airborne wall	Airborne floor	Impact floor	Reverberation Time	Internal Ambient Noise Level
No. Tested	6	3	4	6	6
No. Passed	2	3	4	4	6
No. Failed	4	0	0	2	0

N.B All results in this report relate only to the specific elements tested.

3.0 RELEVANT STANDARDS AND CRITERIA

Table 3: Test Standards and Criteria

Test Standards	• Approved Document E '*Resistance to the passage of sound*' (2003 edition incorporating 2004 & 2010 amendments). • BS EN ISO 140-4:1998 "*Acoustics – Measurement of Sound Insulation in Buildings and of Building Elements – Part 4: Field Measurements of Airborne Sound Insulation between Rooms*". • BS EN ISO 717-1:2013 "*Acoustics – Rating of Sound Insulation in Buildings and of Building Elements – Part 1: Airborne Sound Insulation*". • BS EN ISO 140-7:1998 "*Acoustics – Measurement of Sound Insulation in Buildings and of Building Elements – Part 7: Field Measurements of Impact sound insulation of floors*". • BS EN ISO 717-2:2013 "*Acoustics – Rating of Sound Insulation in Buildings and of Building Elements – Part 2: Impact Sound Insulation"*. • Building Bulletin 93: Acoustic Design of Schools.
Relevant Criteria	The assessment of required performance with regard to sound insulation of internal partitions, reverberation times and indoor ambient noise levels in unoccupied spaces has been based on the acoustic design performance standards as set out in BB93 and the WSP acoustic design report referenced 21893.spr.dsg.002.rl or, where applicable, on previously agreed alternative performance standards.

4.0 AIRBORNE TEST RESULT

Airborne sound insulation has been assessed against the performance standards as set out in BB93, or, where applicable, against previously agreed alternative performance standards. Measurements of airborne sound insulation were made in accordance with BS EN ISO 140-4:1998 and the additional guidance in Approved Document E Annex B, paragraphs B2.3 – B2.8. Performance is rated in accordance with BS EN ISO 717-1:2013.

Table 4: Airborne Sound Insulation

Date Tested	Test No.	Source Room	Receiving Room	Measured $D_{nT(Tmf,max),w}$ (dB)	BB93 Criteria $D_{nT(Tmf,max),w}$ (dB)	Compliance	Separating Element
21.07.14	115451-SI-1	PR-022 Classroom	PR-021 Classroom	***57***	≥ 45	**PASS**	Wall
21.07.14	115451-SI-2	PR-022 Classroom	PR-115 Art Room	***62***	≥ 45	**PASS**	Floor
21.07.14	115451-SI-3	PR-018 Classroom	PR-020 Quiet Room	***39***	≥ 45	**FAIL**	Wall
21.07.14	115451-SI-4	PR-018 Classroom	PR-112 Office	***60***	≥ 45	**PASS**	Floor
21.07.14	115451-SI-5	PR-021 Classroom	PR-019 Quiet Room	***41***	≥ 45	**FAIL**	Wall
21.07.14	115451-SI-6	PR-021 Classroom	PR-113 Therapy Room	***62***	≥ 45	**PASS**	Floor
21.07.14	115451-SI-7	PR-112 Office	PR-113 Therapy Room	***53***	≥ 45	**PASS**	Wall

22.07.14	115451-SI-8	PR-014 Group Room	PR-016 Group Room	***38***	≥ 45	**FAIL**	Wall
22.07.14	115451-SI-10	PR-020 Quiet Room	PR-019 Quiet Room	***36***	≥ 45	**FAIL**	Wall

5.0 IMPACT FLOOR TEST RESULTS

The assessment of impact sound insulation is based on the performance standards as set out in Table 1.4 of BB93. Measurements of impact sound insulation were made in accordance with BS EN ISO 140-7:1998 and the additional guidance in Approved Document E Annex B, paragraph B2.9. Performance is rated in accordance with BS EN ISO 717-2:2013.

Table 5: Impact Floor Sound Insulation

Date Tested	Test No.	Source Room	Receiving Room	Measured $L'_{nT(Tmf,max),w}$ (dB)	BB93 Criteria $L'_{nT(Tmf,max),w}$ (dB)	Compliance
21.7.14	115451-SI-11	PR-115 Art Room	PR-022 Classroom	37	≤ 60	**PASS**
21.7.14	115451-SI-12	PR-112 Office	PR-018 Classroom	31	≤ 60	**PASS**
21.7.14	115451-SI-13	PR-113 Therapy	PR-021 Classroom	42	≤ 60	**PASS**
21.7.14	115451-SI-14	PL-001 Office	PR-016 Group Room	39	≤ 60	**PASS**

6.0 REVERBERATION TIMES

Reverberation times have been assessed against the performance standards as set out in BB93, or, where applicable, on previously agreed alternative performance standards. Measurements were carried out in accordance with BS EN ISO 140-4:1998. All rooms tested contained some amount of building materials / storage boxes / furniture.

Table 6: Measured mid-frequency reverberation times (T_{mf})

Date Tested	Test Room	Measured T_{mf} (seconds)	Design Criteria T_{mf} (seconds)	Compliance
21.07.14	PR-021 Classroom	0.61	< 0.6	**FAIL**
21.07.14	PR-018 Classroom	0.62	< 0.6	**FAIL**
21.07.14	PR-016 Group Room	0.55	< 0.6	**PASS**
21.07.14	PR-115 Art Room/Diner	0.64	< 0.8	**PASS**
21.07.14	PR-020 Quiet Room	0.51	< 0.6	**PASS**
21.07.14	Main Hall	0.58	0.8-1.2	**PASS**[1]

Notes

[1]Below the lower limit of the stipulated BB93 range. HRS interpretation is that this is of suitable performance.

7.0 INDOOR AMBIENT NOISE LEVELS

The assessment of internal noise levels in unoccupied spaces is based on the performance standards as set out in BB93. Measurements were carried out at 3 locations within the test space over 5-10 minute sample periods. Measurements undertaken in accordance with BB93 section 1.3.3 "Indoor ambient noise levels in unoccupied spaces".

Table 7: Measured indoor ambient noise levels in unoccupied spaces

Date	Test Room	Measured $L_{Aeq,30min}$ (dB)	Design Criteria $L_{Aeq,30min}$ (dB)	Compliance	Comments
21.07.14	Main Hall	34.7[1]	< 35	**PASS**	Mechanically ventilated
21.07.14	PR-115 Art / Dining Room	39.6[2]	< 40	**PASS**	Naturally ventilated
21.07.14	PR-112 Office	34.9	< 40	**PASS**	Naturally ventilated
21.07.14	PR-113 Therapy Room	28.8[1]	< 30	**PASS**	Mechanically ventilated
21.07.14	PR-022 Classroom	34.4[2]	< 35	**PASS**	Mechanically ventilated
21.07.14	PR-020 Quiet Room	29.4	< 35	**PASS**	Mechanically ventilated
21.07.14	PR-114 Calm Room	31.8[2]	< 35	**PASS**	Mechanically ventilated
21.07.14	PR-102 Family / Carer / Parent Room	34.2	< 35	**PASS**	Mechanically ventilated

Notes

[1] L_{A90} parameter used due to extraneous site noise
[2] Increased level due to extraneous site noise

8.0 EQUIPMENT

Equipment used to carry out testing is calibrated accordingly to fulfil the requirements of the UKAS publication LAB 23 '*Traceability for Equipment Used in Acoustical Testing'.* Current calibration certificates are available upon request.

Table 8: Testing Equipment Used

Sound Level Meter	Brüel & Kjaer 2250
Microphone	Brüel & Kjaer Type 4189
Calibrator	Brüel & Kjaer Type 4231
Tapping Machine	Norsonic NOR 277
Signal Generator	Mobile Phone
Power Amplifier	Wharfedale Titan 12
Sound Source	Wharfedale Titan 12

9.0 TEST METHODOLOGY

Table 9: Test Methodology

Test Conditions	All test rooms essentially complete and unfurnished. All doors and windows shut including ventilators where applicable. All cupboard/en-suite doors open where applicable
Sound Field Sampling Method	Fixed Microphone Positions
Frequency Range of Measurement	100 Hz – 3150 Hz
Sound Level Meter Sensitivity Variation	No Significant variation in sensitivity levels observed between start and end check or with periodic calibration sensitivity

REVERBERATION TIME MEASUREMENT	
Measurement Method	Interrupted
Source Positions	2 No. Minimum
Microphone Positions	3 No. Minimum per speaker position (taking an ensemble average of minimum 3 No. Measurements per microphone position)
Evaluation Range	20dB (T_{20})
Reference Reverberation Time (T_0)	As per relevant T_{mf} criterion

BACKGROUND NOISE MEASUREMENT	
Measurement Method	1 No. fixed microphone position minimum. Duration as appropriate

MEASUREMENT OF AIRBORNE SOUND INSULATION	
Measurement Duration	6 seconds minimum
Source Positions	2 No. Minimum
Microphone Positions	5 No. Minimum per source position

MEASUREMENT OF IMPACT SOUND INSULATION	
Floor Finish	As detailed on chart sheet
Measurement Duration	6 Seconds Minimum
Tapping Machine Positions	4 No. minimum
Microphone Positions	2 No. minimum per tapping machine position

10.0 APPENDIX – TEST CERTIFICATES

Standardised level difference according to Approved Document E (2003 inc. 2004 & 2010 Amendments)
Field measurements of sound insulation for the purposes of Building Regulations 41 & 20(1 & 5)

Client: BAM Construct UK Ltd

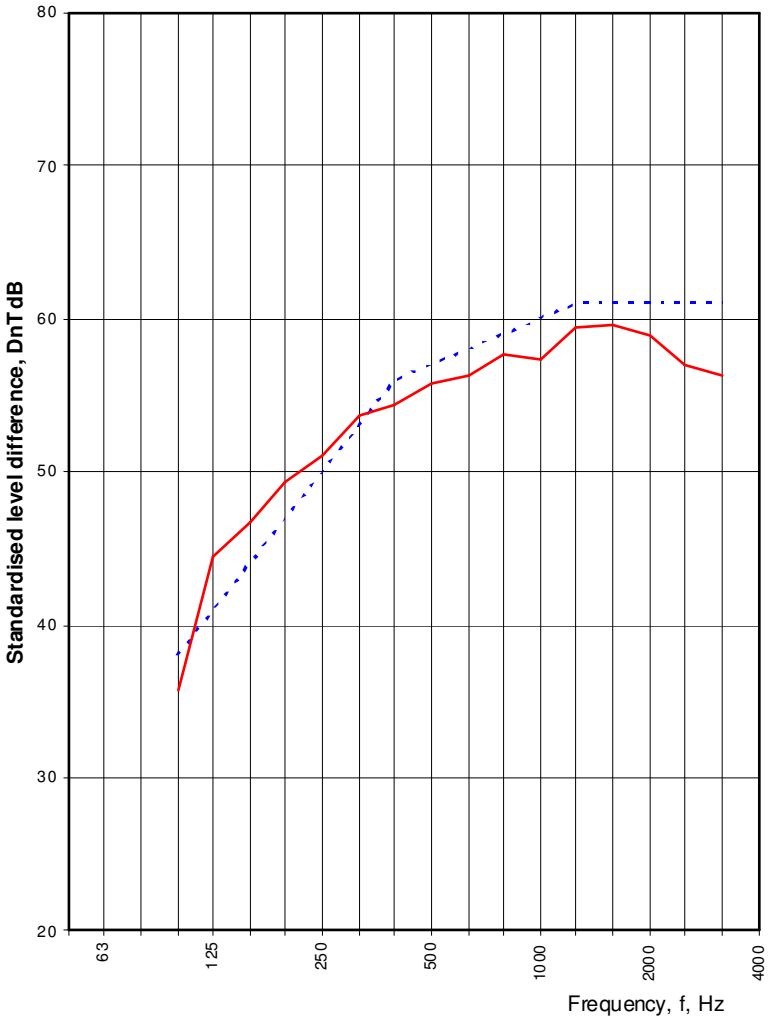
Site: Netley Street School

HRS test reference: 115451-SI-1
Date of test: 21.07.14
Test Details: Airborne Wall test from PR-022 Classroom to PR-021 Classroom

Source room volume: > 25 m^3
Receiver room volume: > 25 m^3

Frequency f Hz	D_{nT} (one-third octave) dB	
50		
63		
80		
100	35.8	
125	44.4	
160	46.8	
200	49.4	b
250	51.1	
315	53.6	
400	54.3	b
500	55.7	
630	56.3	b
800	57.7	
1000	57.4	
1250	59.5	B
1600	59.6	b
2000	58.8	
2500	57.0	
3150	56.3	
4000		
5000		

b or B Indicates background noise or max. background noise correction applied respectively



Rating according to ISO 717-1 **$D_{nT,w}$ ($C;C_{tr}$) = 57 (-1 ; -4) dB**

Evaluation based on field measurement results obtained by an engineering method

HRS Job Ref: 115451
Date: 24.7.14

Name of test institute: HRS Services Ltd
Signature:

Chart created with: *AcDoc011 BREW Airborne SI Sheet for BK 2250 - Issue 1 07 11 11 115451.xls &*

Standardised level difference according to Approved Document E (2003 inc. 2004 & 2010 Amendments)
Field measurements of sound insulation for the purposes of Building Regulations 41 & 20(1 & 5)

Client: BAM Construct UK Ltd

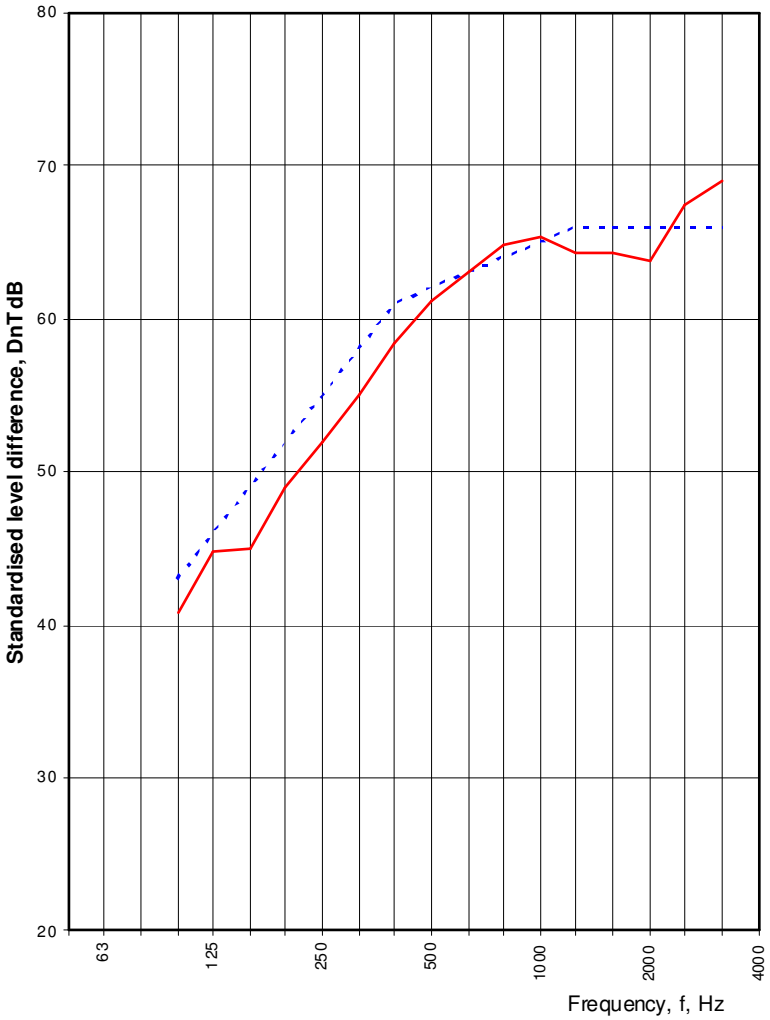
Site: Netley Street School

HRS test reference: 115451-SI-2
Date of test: 21.07.14
Test Details: Airborne Floor test from PR-022 Classroom to PR-115 Art Room

Source room volume: > 25 m^3
Receiver room volume: > 25 m^3

Frequency f Hz	D_{nT} (one-third octave) dB	
50		
63		
80		
100	40.8	
125	44.8	
160	44.9	
200	49.0	
250	52.0	
315	55.0	
400	58.4	b
500	61.1	b
630	63.1	B
800	64.8	b
1000	65.4	B
1250	64.3	B
1600	64.3	B
2000	63.7	B
2500	67.4	B
3150	69.0	B
4000		
5000		

b or B Indicates background noise or max. background noise correction applied respectively



Rating according to ISO 717-1	$D_{nT,w}$ $(C;C_{tr})$ = 62 (-2 ; -6) dB
Evaluation based on field measurement results obtained by an engineering method	

HRS Job Ref: 115451
Date: 24.7.14

Name of test institute: HRS Services Ltd
Signature:

Chart created with: *AcDoc011 BREW Airborne SI Sheet for BK 2250 - Issue 1 07 11 11 115451.xls &*

Standardised level difference according to Approved Document E (2003 inc. 2004 & 2010 Amendments)
Field measurements of sound insulation for the purposes of Building Regulations 41 & 20(1 & 5)

Client: BAM Construct UK Ltd

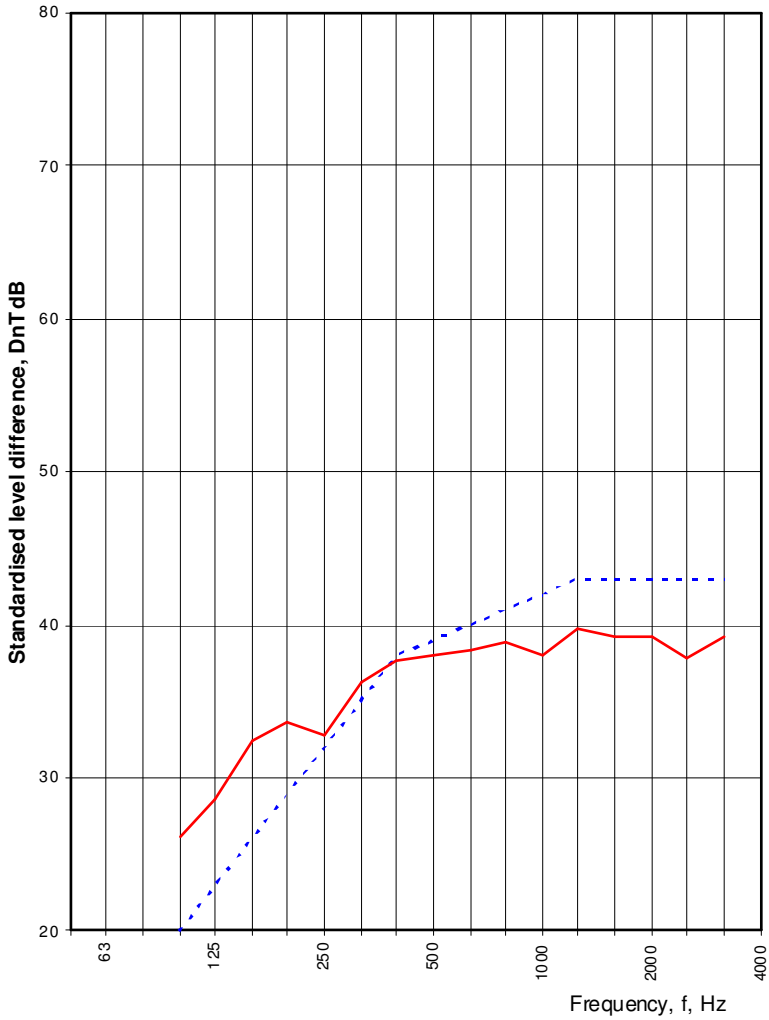
Site: Netley Street School

HRS test reference: 115451-SI-3
Date of test: 21.07.14
Test Details: Airborne Wall test from PR-018 Classroom to PR-020 Quiet Room

Source room volume: > 25 m^3
Receiver room volume: > 25 m^3

Frequency f Hz	D_{nT} (one-third octave) dB
50	
63	
80	
100	26.1
125	28.7
160	32.5
200	33.6
250	32.8
315	36.3
400	37.7
500	38.0
630	38.4
800	38.9
1000	38.0
1250	39.8
1600	39.3
2000	39.2
2500	37.8
3150	39.2
4000	
5000	

b or B Indicates background noise or max. background noise correction applied respectively



Rating according to ISO 717-1 **$D_{nT,w}$ $(C;C_{tr})$ = 39 (-1 ; -2) dB**

Evaluation based on field measurement results obtained by an engineering method

HRS Job Ref: 115451
Date: 24.7.14

Name of test institute: HRS Services Ltd
Signature:

Chart created with: *AcDoc011 BREW Airborne SI Sheet for BK 2250 - Issue 1 07 11 11 115451.xls &*

Standardised level difference according to Approved Document E (2003 inc. 2004 & 2010 Amendments)
Field measurements of sound insulation for the purposes of Building Regulations 41 & 20(1 & 5)

Client: BAM Construct UK Ltd

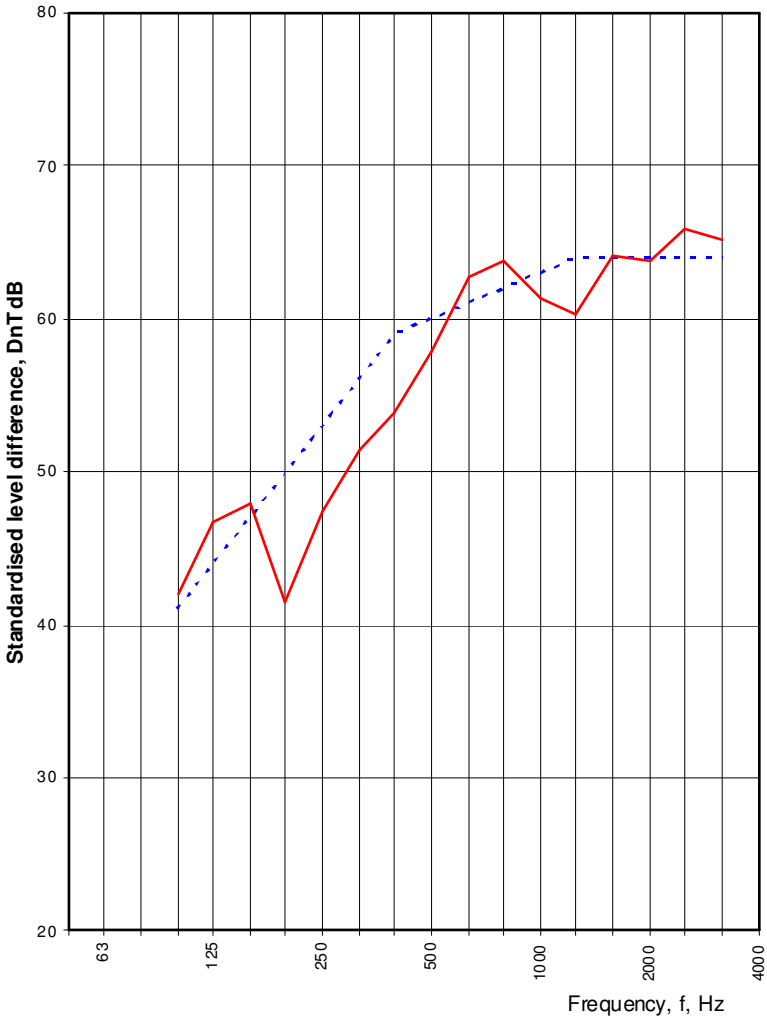
Site: Netley Street School

HRS test reference: 115451-SI-4
Date of test: 21.07.14
Test Details: Airborne Floor test from PR-018 Classroom to PR-112 Office

Source room volume: > 25 m^3
Receiver room volume: > 25 m^3

Frequency f Hz	D_{nT} (one-third octave) dB	
50		
63		
80		
100	42.0	B
125	46.7	b
160	48.0	B
200	41.5	B
250	47.4	B
315	51.5	B
400	53.8	B
500	57.8	B
630	62.7	B
800	63.8	B
1000	61.3	B
1250	60.2	B
1600	64.1	B
2000	63.7	B
2500	65.9	B
3150	65.1	b
4000		
5000		

b or B Indicates background noise or max. background noise correction applied respectively



Rating according to ISO 717-1 **$D_{nT,w}$ ($C;C_{tr}$) = 60 (-3 ; -7) dB**

Evaluation based on field measurement results obtained by an engineering method

HRS Job Ref: 115451
Date: 24.7.14

Name of test institute: HRS Services Ltd
Signature:

Chart created with: *AcDoc011 BREW Airborne SI Sheet for BK 2250 - Issue 1 07 11 11 115451.xls &*

Standardised level difference according to Approved Document E (2003 inc. 2004 & 2010 Amendments)
Field measurements of sound insulation for the purposes of Building Regulations 41 & 20(1 & 5)

Client: BAM Construct UK Ltd

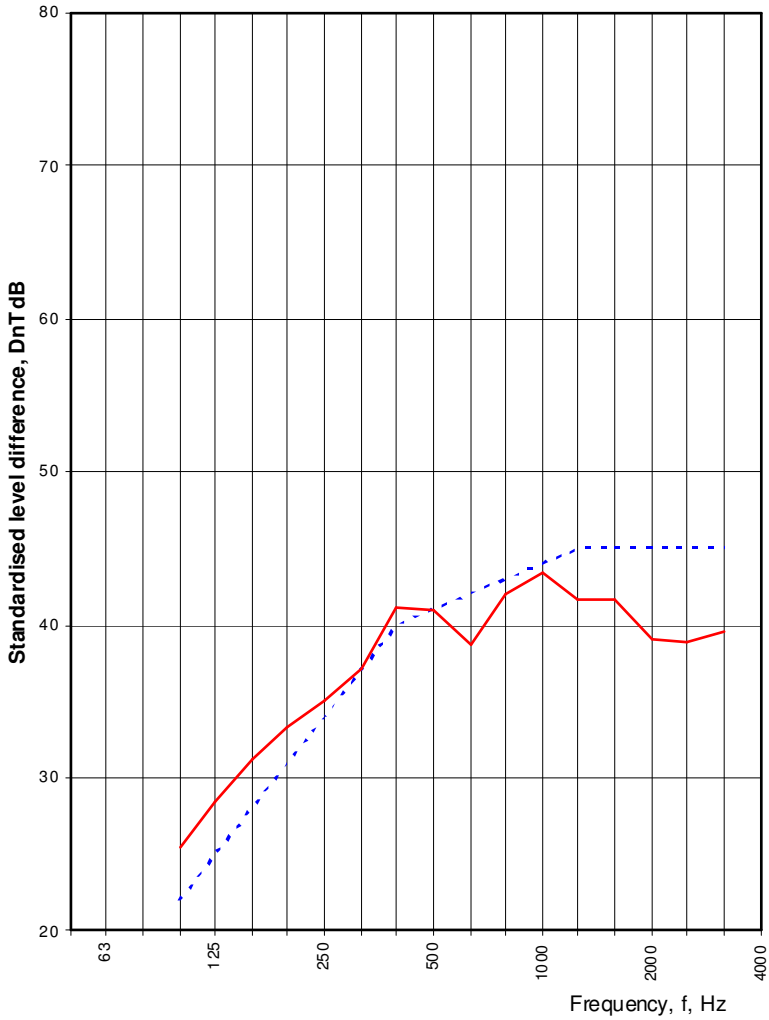
Site: Netley Street School

HRS test reference: 115451-SI-5
Date of test: 21.07.14
Test Details: Airborne Wall test from PR-021 Classroom to PR-019 Quiet Room

Source room volume: > 25 m^3
Receiver room volume: > 25 m^3

Frequency f Hz	D_{nT} (one-third octave) dB	
50		
63		
80		
100	25.5	
125	28.4	
160	31.2	
200	33.4	b
250	35.1	B
315	37.1	b
400	41.2	
500	40.9	
630	38.7	
800	42.1	
1000	43.4	
1250	41.7	
1600	41.7	
2000	39.1	
2500	38.8	
3150	39.5	
4000		
5000		

b or B Indicates background noise or max. background noise correction applied respectively



Rating according to ISO 717-1	$D_{nT,w}$ $(C;C_{tr})$ = 41 (-1 ; -3) dB
Evaluation based on field measurement results obtained by an engineering method	

HRS Job Ref: 115451
Date: 24.7.14

Name of test institute: HRS Services Ltd
Signature:

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Standardised level difference according to Approved Document E (2003 inc. 2004 & 2010 Amendments)
Field measurements of sound insulation for the purposes of Building Regulations 41 & 20(1 & 5)

Client: BAM Construct UK Ltd

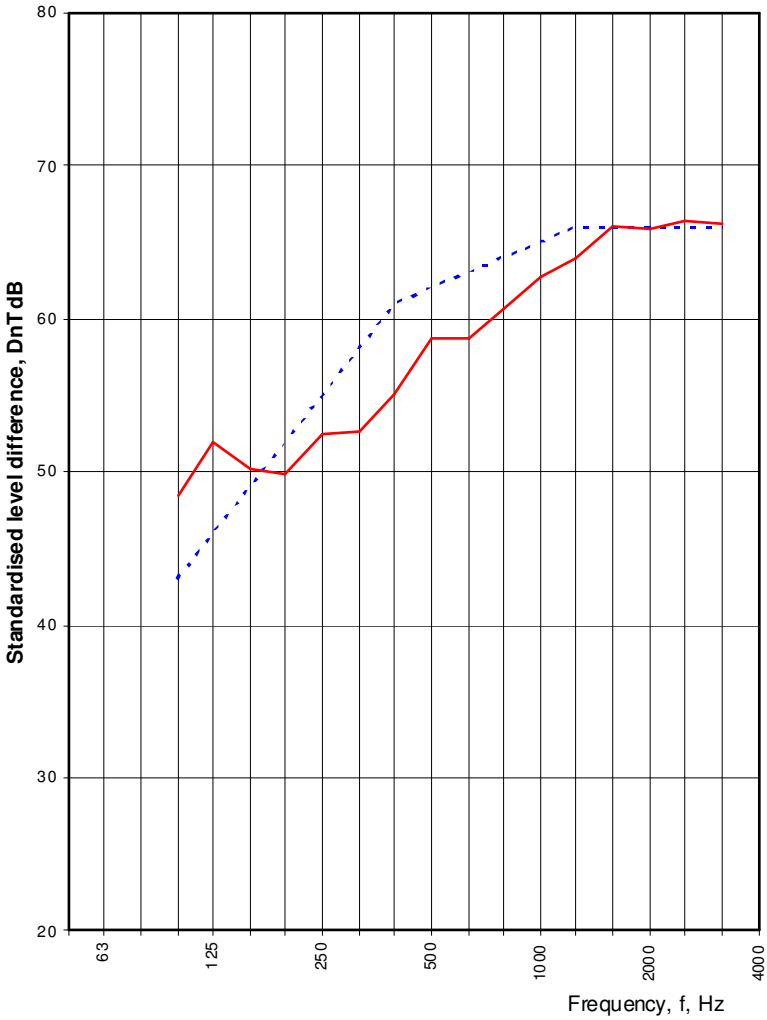
Site: Netley Street School

HRS test reference: 115451-SI-6
Date of test: 21.07.14
Test Details: Airborne Floor test from PR-021 Classroom to PR-113 Therapy Room

Source room volume: > 25 m^3
Receiver room volume: > 25 m^3

Frequency f Hz	D_{nT} (one-third octave) dB	
50		
63		
80		
100	48.5	B
125	52.0	B
160	50.2	B
200	49.8	B
250	52.5	B
315	52.6	B
400	55.1	B
500	58.7	B
630	58.7	B
800	60.6	B
1000	62.8	B
1250	63.9	B
1600	66.0	B
2000	65.8	B
2500	66.4	B
3150	66.2	B
4000		
5000		

b or B Indicates background noise or max. background noise correction applied respectively



Rating according to ISO 717-1 **$D_{nT,w}$ ($C;C_{tr}$) = 62 (-2 ; -4) dB**

Evaluation based on field measurement results obtained by an engineering method

HRS Job Ref: 115451
Date: 24.7.14

Name of test institute: HRS Services Ltd
Signature:

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Standardised level difference according to Approved Document E (2003 inc. 2004 & 2010 Amendments)
Field measurements of sound insulation for the purposes of Building Regulations 41 & 20(1 & 5)

Client: BAM Construct UK Ltd

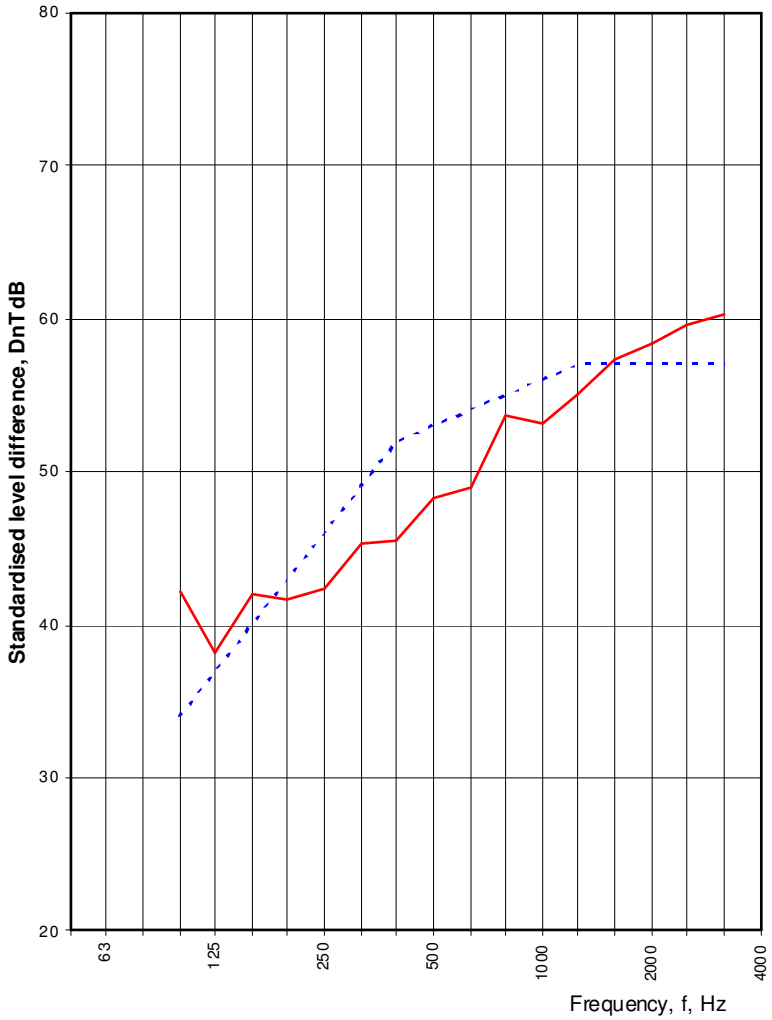
Site: Netley Street School

HRS test reference: 115451-SI-7
Date of test: 21.07.14
Test Details: Airborne Wall test from PR-112 Office to PR-113 Therapy Room

Source room volume: > 25 m^3
Receiver room volume: > 25 m^3

Frequency f Hz	D_{nT} (one-third octave) dB	
50		
63		
80		
100	42.2	B
125	38.2	b
160	42.1	B
200	41.7	B
250	42.4	B
315	45.4	b
400	45.5	
500	48.2	b
630	49.0	
800	53.7	B
1000	53.2	B
1250	55.1	B
1600	57.4	B
2000	58.3	b
2500	59.6	b
3150	60.3	b
4000		
5000		

b or B Indicates background noise or max. background noise correction applied respectively



Rating according to ISO 717-1 **$D_{nT,w}$ ($C;C_{tr}$) = 53 (-1 ; -4) dB**

Evaluation based on field measurement results obtained by an engineering method

HRS Job Ref: 115451
Date: 24.7.14

Name of test institute: HRS Services Ltd
Signature:

Chart created with: *AcDoc011 BREW Airborne SI Sheet for BK 2250 - Issue 1 07 11 11 115451.xls &*

Standardised level difference according to Approved Document E (2003 inc. 2004 & 2010 Amendments)
Field measurements of sound insulation for the purposes of Building Regulations 41 & 20(1 & 5)

Client: BAM Construct UK Ltd

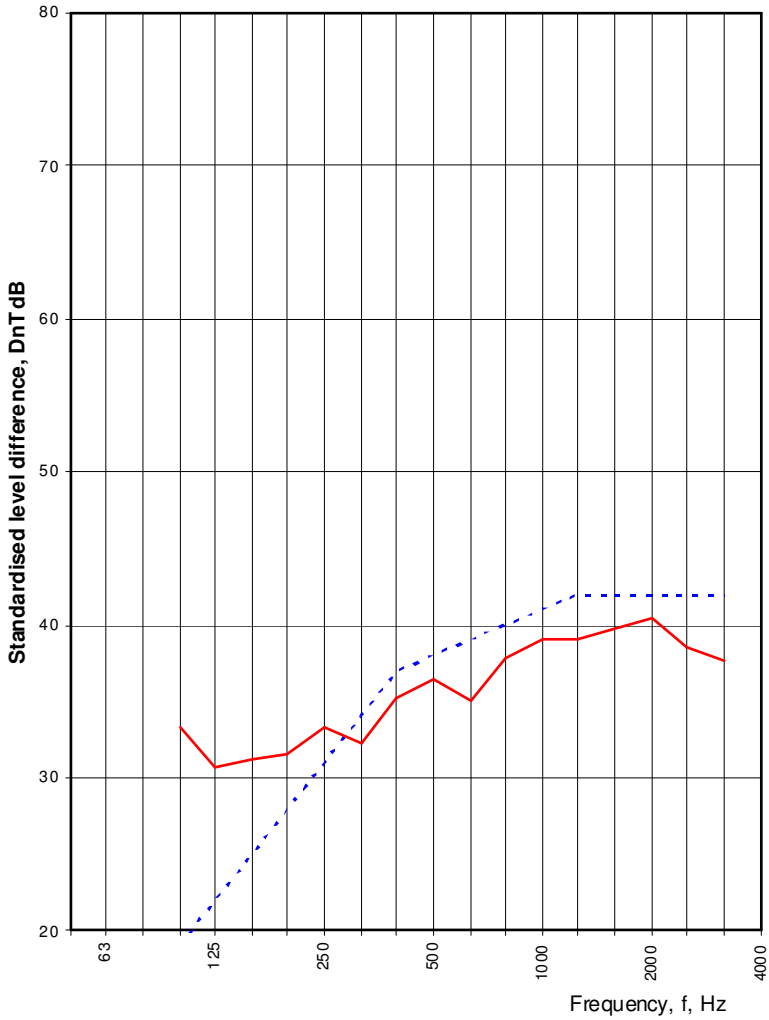
Site: Netley Street School

HRS test reference: 115451-SI-8
Date of test: 22.07.14
Test Details: Airborne Wall test from PR-014 Group Room to PR-016 Group Room

Source room volume: > 25 m^3
Receiver room volume: > 25 m^3

Frequency f Hz	D_{nT} (one-third octave) dB
50	
63	
80	
100	33.3
125	30.7
160	31.3
200	31.6
250	33.4
315	32.3
400	35.2
500	36.5
630	35.1
800	37.9
1000	39.0
1250	39.1
1600	39.8
2000	40.4
2500	38.6
3150	37.7
4000	
5000	

b or B Indicates background noise or max. background noise correction applied respectively



Rating according to ISO 717-1 **$D_{nT,w}$ ($C;C_{tr}$) = 38 (0 ; -1) dB**

Evaluation based on field measurement results obtained by an engineering method

HRS Job Ref: 115451
Date: 24.7.14

Name of test institute: HRS Services Ltd
Signature:

Chart created with: *AcDoc011 BREW Airborne SI Sheet for BK 2250 - Issue 1 07 11 11 115451.xls &*

Standardised level difference according to Approved Document E (2003 inc. 2004 & 2010 Amendments)
Field measurements of sound insulation for the purposes of Building Regulations 41 & 20(1 & 5)

Client: BAM Construct UK Ltd

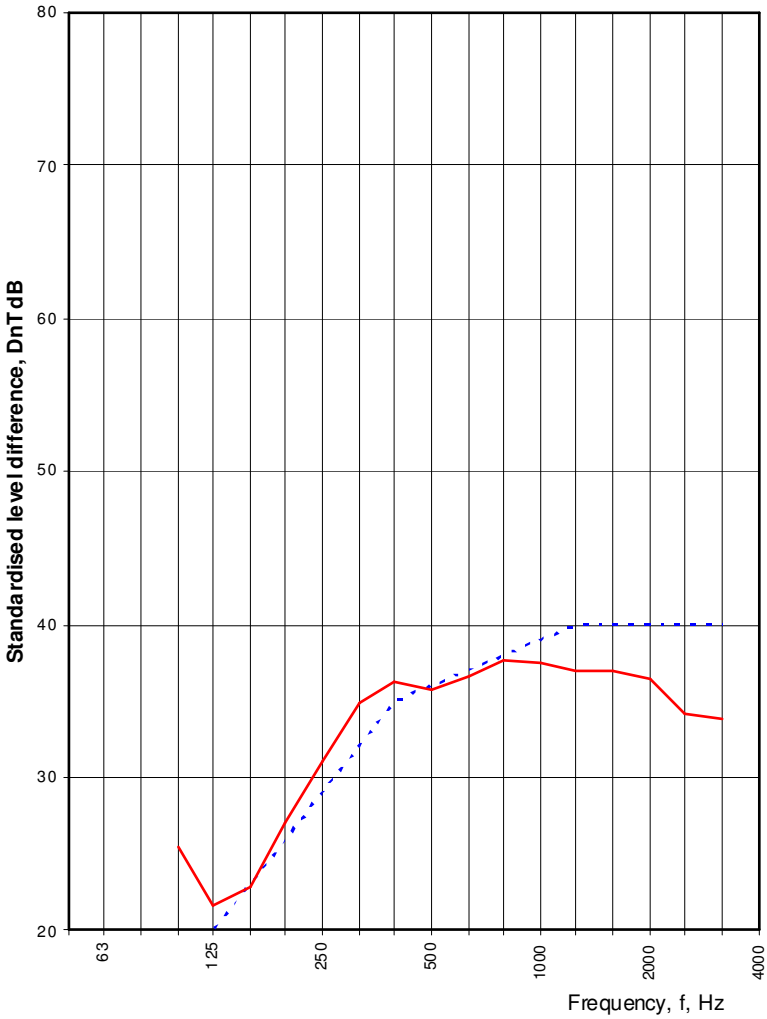
Site: Netley Street School

HRS test reference: 115451-SI-10
Date of test: 22.07.14
Test Details: Airborne Wall test from PR-020 Quiet Room to PR-019 Quiet Room

Source room volume: > 25 m^3
Receiver room volume: > 25 m^3

Frequency f Hz	D_{nT} (one-third octave) dB
50	
63	
80	
100	25.5
125	21.7
160	22.9
200	27.1
250	31.1
315	34.9
400	36.2
500	35.8
630	36.7
800	37.7
1000	37.4
1250	37.0
1600	36.9
2000	36.4
2500	34.2
3150	33.9
4000	
5000	

b or B Indicates background noise or max. background noise correction applied respectively



Rating according to ISO 717-1	$D_{nT,w}$ $(C;C_{tr})$ = 36 (-1 ; -3) dB
Evaluation based on field measurement results obtained by an engineering method	

HRS Job Ref: 115451
Date: 24.7.14

Name of test institute: HRS Services Ltd
Signature:

Chart created with: *AcDoc011 BREW Airborne SI Sheet for BK 2250 - Issue 1 07 11 11 115451.xls &*

Standardised impact sound pressure levels according to BS EN ISO 140-7:1998
Field measurements of sound insulation for the purposes of Building Regulations 41 & 20(1 & 5)

Client: BAM Construct UK Ltd

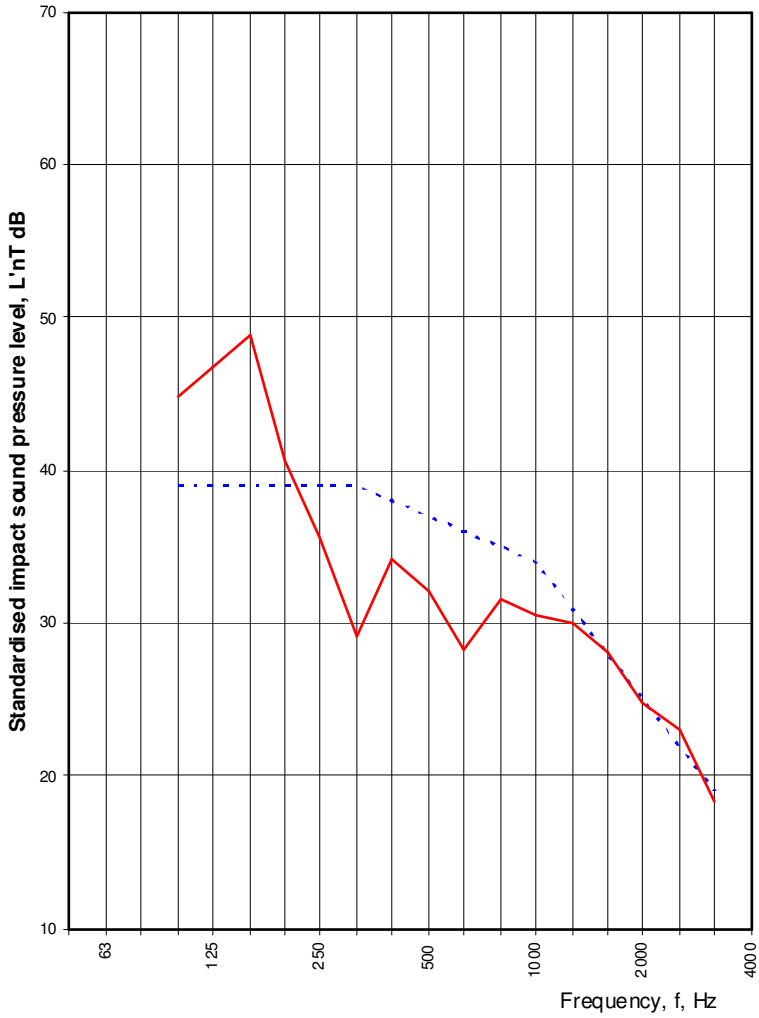
Site: Netley Street School

HRS test reference: 115451-SI-11
Date of test: 21.7.14
Test details: Impact floor test from PR-115 Art Room to PR-022 Classroom
Floor finish: Resin

Receiver room volume: > 25 m^3

Frequency f Hz	L'_{nT} (one-third octave) dB	
50		
63		
80		
100	44.8	b
125	46.8	
160	48.9	
200	40.6	
250	35.6	
315	29.1	B
400	34.2	b
500	32.1	
630	28.2	b
800	31.6	
1000	30.6	
1250	30.0	B
1600	28.1	
2000	24.7	
2500	23.1	
3150	18.4	b
4000		
5000		

b or B Indicates background noise **or** max. background noise correction applied respectively



Rating according to ISO 717-2	**L'nT,w (C1)**	**37 (1)**	**dB**
Evaluation based on field measurement results obtained by an engineering method			

HRS Job Ref: 115451
Date: 24.7.14

Name of test institute: HRS Services Ltd
Signature:

Chart created with: *AcDoc012 ISO Impact SI Sheet - Issue 1(c).xls & X:\Acoustics General Info\AcDocuments\AcHRSDocuments\AcControlledHRSDocs*

Standardised impact sound pressure levels according to BS EN ISO 140-7:1998
Field measurements of sound insulation for the purposes of Building Regulations 41 & 20(1 & 5)

Client: BAM Construct UK Ltd

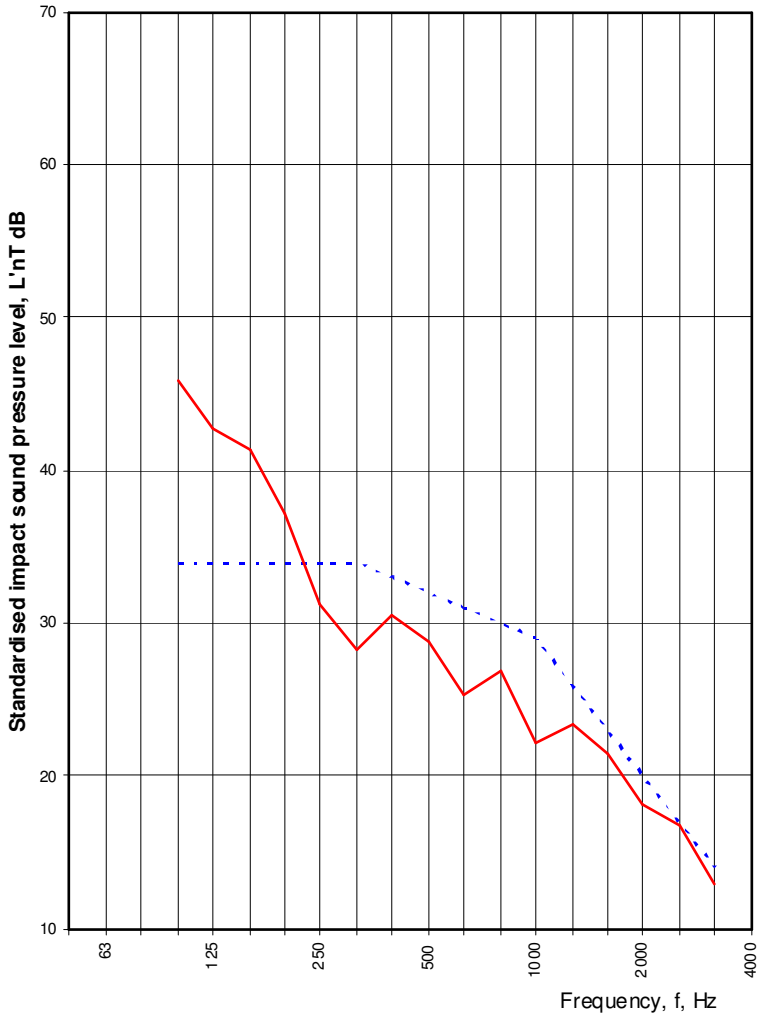
Site: Netley Street School

HRS test reference: 115451-SI-12
Date of test: 21.7.14
Test details: Impact floor test from PR-112 Office to PR-018 Classroom
Floor finish: Carpet

Receiver room volume: > 25 m^3

Frequency f Hz	L'_{nT} (one-third octave) dB	
50		
63		
80		
100	45.9	b
125	42.7	
160	41.4	
200	37.1	
250	31.2	b
315	28.2	B
400	30.6	b
500	28.8	b
630	25.4	B
800	26.8	
1000	22.1	b
1250	23.4	
1600	21.4	
2000	18.1	b
2500	16.7	b
3150	12.9	B
4000		
5000		

b or B Indicates background noise **or** max. background noise correction applied respectively



Rating according to ISO 717-2	**L'nT,w (C1)**	**32 (2)**	**dB**
Evaluation based on field measurement results obtained by an engineering method			

HRS Job Ref: 115451
Date: 24.7.14

Name of test institute: HRS Services Ltd
Signature:

Chart created with: *AcDoc012 ISO Impact SI Sheet - Issue 1(c).xls & X:\Acoustics General Info\AcDocuments\AcHRSDocuments\AcControlledHRSDocs*

Standardised impact sound pressure levels according to BS EN ISO 140-7:1998
Field measurements of sound insulation for the purposes of Building Regulations 41 & 20(1 & 5)

Client: BAM Construct UK Ltd

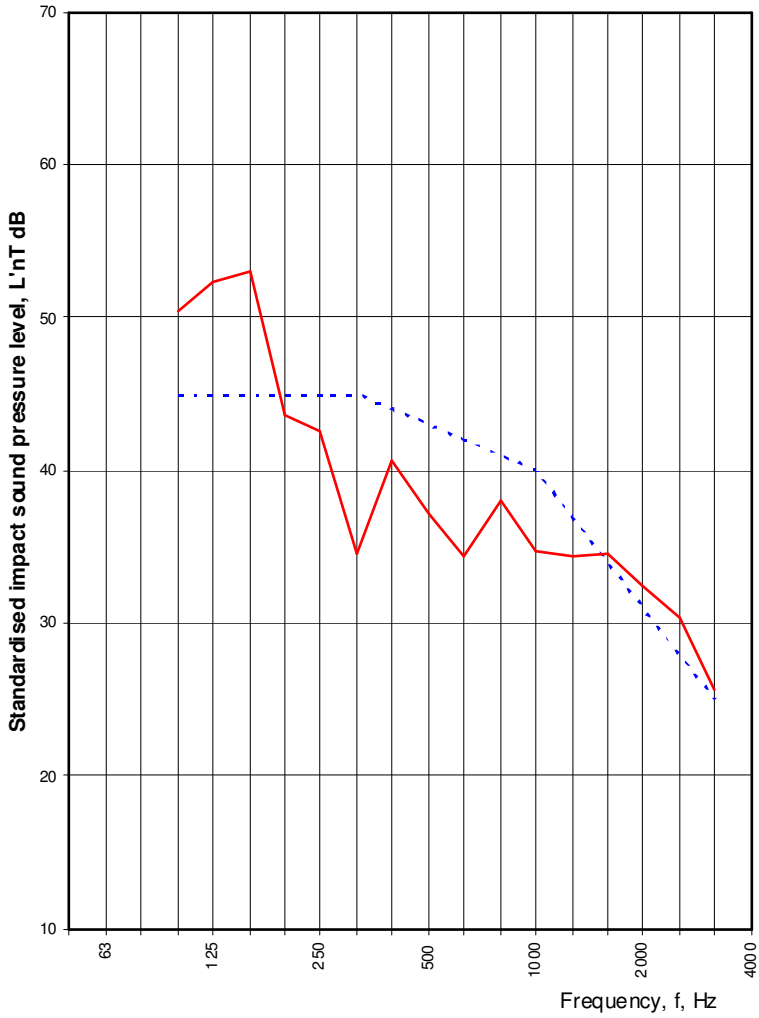
Site: Netley Street School

HRS test reference: 115451-SI-13
Date of test: 21.7.14
Test details: Impact floor test from PR-113 Therapy to PR-021 Classroom
Floor finish: Resin

Receiver room volume: > 25 m^3

Frequency f Hz	L'_{nT} (one-third octave) dB	
50		
63		
80		
100	50.5	
125	52.3	
160	53.0	
200	43.6	
250	42.6	
315	34.5	b
400	40.7	
500	37.2	
630	34.3	
800	38.1	
1000	34.8	
1250	34.4	b
1600	34.6	
2000	32.4	
2500	30.3	
3150	25.6	
4000		
5000		

b or B Indicates background noise **or** max. background noise correction applied respectively



Rating according to ISO 717-2	**L'nT,w (C1)**	**43 (0)**	**dB**
Evaluation based on field measurement results obtained by an engineering method			

HRS Job Ref: 115451
Date: 24.7.14

Name of test institute: HRS Services Ltd
Signature:

Chart created with: *AcDoc012 ISO Impact SI Sheet - Issue 1(c).xls & X:\Acoustics General Info\AcDocuments\AcHRSDocuments\AcControlledHRSDocs*

Standardised impact sound pressure levels according to BS EN ISO 140-7:1998
Field measurements of sound insulation for the purposes of Building Regulations 41 & 20(1 & 5)

Client: BAM Construct UK Ltd

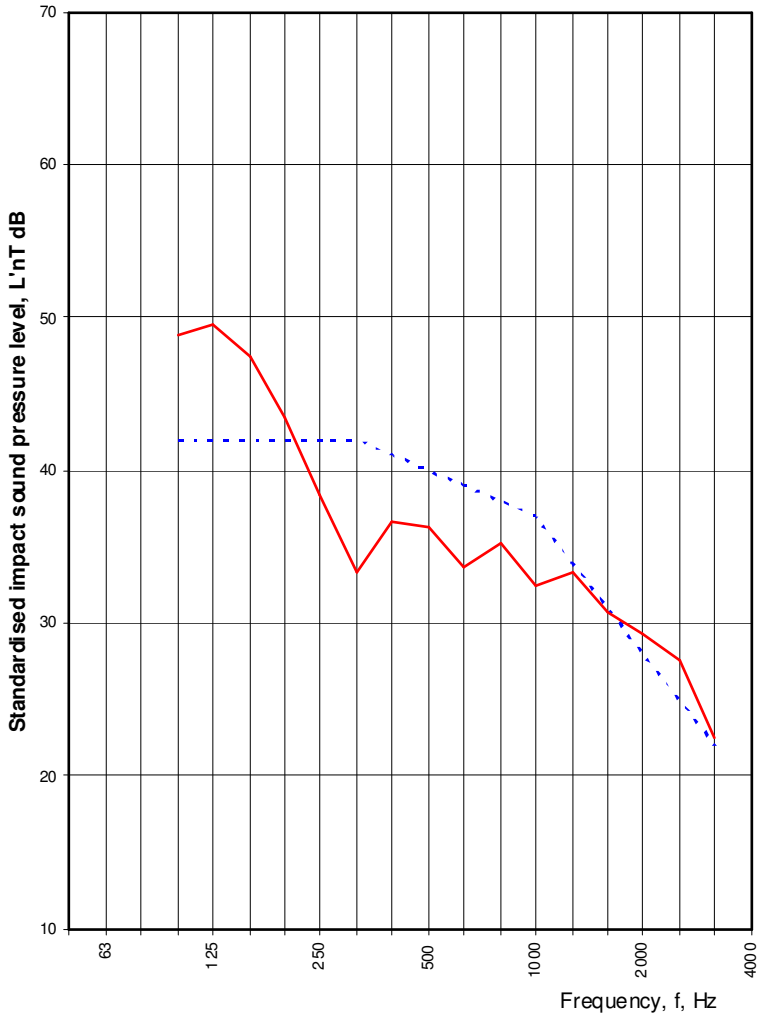
Site: Netley Street School

HRS test reference: 115451-SI-14
Date of test: 21.7.14
Test details: Impact floor test from PL-001 Office to PR-016 Group Room
Floor finish: Carpet

Receiver room volume: > 25 m^3

Frequency f Hz	L'_{nT} (one-third octave) dB	
50		
63		
80		
100	48.9	
125	49.5	
160	47.5	
200	43.4	b
250	38.4	B
315	33.3	B
400	36.7	b
500	36.3	
630	33.7	
800	35.2	
1000	32.4	
1250	33.3	
1600	30.7	
2000	29.3	
2500	27.5	
3150	22.5	
4000		
5000		

b or B Indicates background noise **or** max. background noise correction applied respectively



Rating according to ISO 717-2	**L'nT,w (C1)**	**40 (-1)**	**dB**
Evaluation based on field measurement results obtained by an engineering method			

HRS Job Ref: 115451
Date: 24.7.14

Name of test institute: HRS Services Ltd
Signature:

Chart created with: *AcDoc012 ISO Impact SI Sheet - Issue 1(c).xls & X:\Acoustics General Info\AcDocuments\AcHRSDocuments\AcControlledHRSDocs*