Acoustic Consultancy Report

Planning Permission Response

Prepared For

Trident Building Consultancy

Highgate Rd Baptist Church Conversion

Date

22nd January 2008

Report Reference

52707_PPR1_1ATN

Prepared By

Lee Cunningham Partnership

Author A.Nethersole MIOA

Content

1.0 Introduction

Trident Building Consultancy has commissioned Lee Cunningham Partnership to review the proposal for the conversion of the Highgate Road Baptist Church to Flats, and to respond to the letter from Camden Council, dated 21st November, regarding compliance with Condition 7 of the Planning Permission dated 23rd June 2006.

2.0 Environmental Conditions.

Lee Cunningham Technical Report **52707/3/1/3 Dated 29th March 2007**, provides the measured levels of Traffic Noise at the site, and the maximum levels measured at the various locations have been utilised to assess the internal conditions that will exist with the proposed structural design.
This ensures that even though night time traffic levels would be lower, the conditions for rest and sleep are maintained during all 24hrs.

3.0 Internal Noise Conditions due to External Noise

Lee Cunningham Technical Report **52707_S1_1ATN Dated 12th October 2007,** provides the results of an internal noise condition analysis utilising the above data, and giving the resultant noise levels within the rooms of the building, taking into account the current structure design which is also confirmed within this document.

4.0 Internal Flat and Room dividing structures.

Lee Cunningham Technical Report **52707_S3_ATN Dated 12th October 2007,** provides the results of an analysis of internal structures, and compares these to the requirements of Building Regulations Document E.

5.0 Noise and Vibration to adjacent areas.

The project has no Mechanical Plant within the building, other than Electric Water Heating, and low power extract systems in Shower Rooms.
As a result no noise or vibration transmission to other adjacent areas is expected, and the adjacent Sunday School building is separated by an independent Link Building containing an access staircase only, effectively acoustically separating the two buildings.

6.0 Conclusion.

Penetration of external traffic noise and transmission of noise between flat premises complies with BS8233, and Building Regulations Document E, respectively.

Acoustic Consultancy Report

Façade Sound Insulation

Report Prepared For

Trident Building Consultancy

Highgate Rd Baptist Church Conversion

Date

12th October 2007

Report Reference

52707_S1_1ATN

Prepared By

Lee Cunningham Partnership

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Content

1.0 Introduction

Trident Building Consultancy has commissioned Lee Cunningham Partnership to review the structures proposed for the conversion of the Highgate Road Baptist Church to Flats, to conduct an acoustic study of the proposed façade to establish suitability of the proposed design when compared to the existing background noise.

The findings contained in the report are based upon the results of a noise survey undertaken at the premises in March 2007, and contained in our report 52707/3/1/3 dated 29.3.07

The site plan contained in that report, identified the approximate measurement positions:

The ambient noise climate proximal to the site is principally dictated by contributions from vehicular road traffic movements.

The times at which the survey took place included the early rush-hour period and were considered to be appropriate for the purpose of obtaining representative measurements of the prevailing environmental noise conditions.

A full set of measurement data was reported, and the highest measured values to be used as the basis of a worst-case assessment of the building envelope sound insulation design, are as shown within the table below:

Table 1: Continuous Intrusive Sound Pressure levels, dB

		Frequency (Hz)								
Elevation	Index	63	125	250	500	1k	2k	4k	8k	A
Chetwynd Road	MP1	78	72	66	63	70	68	55	50	73
Highgate Rd Face	MP2	78	71	66	62	70	66	56	44	72
Corner Twisden / Chetwynd Roads	MP3	75	67	63	62	61	57	51	47	65

2.0 Review of the Building Envelope

Details of the external building envelope have been taken from the drawings listed below, and suitably interpreted so as to enable sound insulation values to be derived. Summary descriptions of the primary building elements are included in Table 2.

11862 – 100
11862 – 101C
11862 – 102C
11862 – 103C
11862 – 104C
11862 – 105B
11862 – 108
11862 – 141B
11862 – 142C
11862 – 143B
11862 – 144A
11862 – 145
11862 – 150A
11862 – 151B
11862 – 161A
11862 – 171
11862 – 172
11862 – 173
11862 – 174
11862 – 175
11862 – 176
11862 – 177
11862 – 178
11862 – 181
11862 – 182A

Table 2: General Description of Building Elements

Element	Build-up
External walls	Taken to be at least 300mm solid brickwork
Windows to Chetwynd Rd Facade	"Clement" Double glazed units with Tricklevent. Glazing 4/16/4
Windows to Rear Facade	"Rationel" Double glazed units with Tricklevent. Glazing 4/22/6
Roof Lights	"Velux" MO8 Roof lights. Glazing 4/14/6
Roof Construction	Slate Tiling on 213mm combination timber battens, mineral wool infill, and 12,5 mm plasterboard ceiling with 2.5mm skim coat plaster.

The sound reduction indices corresponding to the above constructions are set out in Table 3 below, having been taken from published data base values or derived using Insul proprietary prediction software, in the absence of spectral data from the material suppliers

Table 3: Sound Reduction Indices of Building Elements

Element	1/1 octave band sound reduction index, R dB					
	125	250	500	1k	2k	4k
External walls	40	46	54	61	70	78
"Clement" windows	23	24	33	37	39	38
Roof (Flat)	32	37	42	45	45	46
Window units	23	24	33	37	39	38

Finishes within the flats have been assumed as painted wall and ceiling surfaces, with good quality carpet on underlay in Bedrooms, and wood panel flooring in the Living Rooms.

The staircase treads are to be carpeted, and under these circumstances analysis indicates that staircases comply with the reverberation control absorption level of 0.25m^2 of total Absorption per m^3 of area volume called for in Building Regulations Document E

3.0 Ventilation

The building is to be naturally ventilated by means of trickle ventilators located within the headers of selected external windows and designed to provide background or "normal" ventilation at the rate of 4000mm^2 per unit.

Table 4: Ventilator Performance Requirements, $D_{n,e}$ dB

Ventilator Type	1/1 octave band centre frequency Hz							
	63	125	250	500	1k	2k	4k	8k
Trickle ventilator Size:4000mm^2	24	28	28	29	30	30	36	42

Evidence demonstrating conformance with the above minimum element normalised level difference must be provided by the contractor and shall refer to tests undertaken in an accredited acoustic laboratory. The testing shall have been conducted in accordance with BS EN 20140-10: 1992 "Laboratory measurement of airborne sound insulation in small building elements".

4.0 Windows - Quality of Construction

In situations where glazed elements are openable, it is essential that the façade sound insulation potential not be undermined by air leakage paths. It is therefore recommended that quality continuous neoprene (or similar) compression seals are rebated into the entire frame periphery, and that a suitable multi-point locking mechanism is employed to ensure firm even pressure is exerted onto the seal when in the closed position.

Where the window panels interface with the surrounding building elements, the detail shall be sealed against air leakage using quality mechanical pressure closures and/or flexible polysulphide or mastic sealant to ensure the acoustic performance is not undermined.

5.0 Predicted Resultant Indoor Ambient Noise Levels

External noise from transportation sources can be considered in the context of the guidance given in BS 8233:1999. This standard gives recommended indoor ambient noise levels in occupied spaces, reproduced as follows:

Criterion	Typical situations	Design range $L_{Aeq,T}$ dB	
		Good	Reasonable
Reasonable speech or telephone communications	Kitchen Toilet	50 45	55 55
Reasonable resting/sleeping conditions	Living rooms Bedrooms [a]	30 30	40 35

[a] For a reasonable standard in bedrooms at night, individual noise events (measured with F time-weighting) should not normally exceed 45 dB L_{Amax}

Detailed calculations have been undertaken in accordance with the guidance and methods detailed herein to predict the indoor ambient noise levels. The results of the analysis are summarised in Table 5 for comparison with the acoustic design requirements of BS8233above.

Table 5: Predicted Internal Noise Levels

Selected Representative Flats						BS 8233	
						Living Room 30/40dB(A)	Bedroom 30/35dB(A)
Code	Floor	Flat				Results	
1	G	1	L	Living Room		28	
2	G	1	B	Bedroom			30
3	G	2	L	Living Room		37	
4	G	2	B	Bedroom			35
5	G	3	B	Bedroom			29
6	G	4	B	Bedroom			35
7	1	5	L	Living Room		28	
8	1	5	B	Bedroom			30
9	1	6	L	Living Room		38	
10	1	6	B	Bedroom			35
11	1	7	B	Bedroom			30
12	1	8	B	Bedroom			35
13	2	9	L	Living Room	Roof Lights	28	
14	2	9	B	Bedroom	Roof Lights		35
15	2	10	L	Living Rm	Roof Lights	25	
16	2	10	B	Bedroom	Roof Lights		27
17	3	12	L	Living Room	Roof Lights	30	
18	3	12	B	Bedroom	Roof Lights		35
19	3	13	L	Living Room		27	
20	3	13	B	Bedroom	Roof Lights		28
21	4	14	L	Living Room		30	
22	4	14	B	Bedroom	Roof Lights		28

The results of our calculations above indicate compliance with BS8233.

6.0 Conclusions

A detailed review of the building envelope has been carried out to determine whether the proposed construction is sufficient to control resultant internal noise to levels compliant with the recommendations of BS 8233.. It is concluded that achievement of the acoustic performances contained in Tables 3 and 4 along with appropriate detailing will be adequate to maintain the necessary ambient noise levels within the occupied spaces of concern.