N I C K

H I T A K E R

electro-acoustics

Graeme Durham
Phonographic Services
132 Kentish Town Road,
London NW1 9QB.

19th May 2016

re: Acoustic insulation of recording studio - 132, Kentish Town Rd.

Dear Graeme,

Further to my visit & inspections on Tuesday afternoon:

1. The main recording studio area is located in the single storey extension to the front of the original main 4 storey building. The frontage is directly onto Kentish Town Rd & it is flanked by two retail units (which are likewise single storey extensions of the original 4 storey buildings to each side).

The closest noise sensitive premises are:
a) the retail units to each side.
b) residential flats on the 1st - 3rd floors of the two adjacent main building

2. Extensive sound insulations works have been carried out to the recording space:

a) The original (>250mm thick) masonry walls were rendered using Gyproc "Soundcoat Plus", to ensure all mortar joints, gaps & cracks in the walls were sealed. And also add superficial mass to the walls.

b) Framework independent from the masonry walls was constructed with a 75mm space to the masonry. The framework was infilled with semi-rigid Rockwool slabs.
19mm & 15mm high density plasterboard with and intermediate layer of high mass barrier mat, with 20mm T&G timber finish were attached to the framework via high performance ("Genie") resilient fixings, to reduce vibration from these linings into the main building structure.
There is a minor variation due to available space on the northern party wall, in that the plasterboard specification is reduced to 15mm + 15mm. However there are heavy duty anti vibration pads to the masonry wall.

c) The floor suspended floor of the recording studio is "floated" via anti-vibration pads, with mineral fibre in the cavities between the flooring joists.

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d) The existing, deep ceiling joists have been part filled with 60Kg semi-rigid slab mineral fibre. The outer flat roof consists of 25mm timber layer with bituminous felt over. The inner ceiling is constructed in a similar manner to the insulating wall lining & is also decoupled from the roof structure via anti vibration mounts/hangers.
The skylight is triple gazed.

e) The shop front has secondary glazing to the existing shop window consisting of an Optiphon acoustic laminated double glazed unit. There are also two "back to back" doors at the entrance.

f) There is a glazed door to the basement from the recording area, and "back to back" doors from the recording area to the main house upper floors.

g) There are quite extensive acoustic absorbent treatments (walls & ceiling) in the recording studio. Consequently the reverberation times are quite low for a room of this volume.

3. Given that these sound insulation works appear to have been completed quite conscientiously & also the relatively substantial nature of the existing walls between the adjacent retail units, it is likely that the sound insulation to the adjacent units now exceeds D_{nTw} 75dB. (D_{nTw} for existing 200mm masonry wall + at least D_{nTw} 15dB for lining) Given that background noise levels inside the adjacent retail units is unlikely to be much lower than 45dBA, sound levels impinging on the room surfaces in the studio area would have to exceed 110dBA to be even potentially be perceived in the adjacent retail units.

The roof insulation is likely to provide in excess of D_{nTw} 65dB, and there is likely to be at least a further 15dBA attenuation of any sound emissions before they potentially enter (via semi open windows) the front rooms of the adjacent residential flats.
Again, sound levels impinging on the ceiling in the recording studio would have to exceed 110dBA in order for there to be any potential of the emissions being perceived inside the residential properties.

Due to the acoustically "dead" / low RT60 of the recording room, despite potentially high (100-110dBA) peak levels from louder instruments (drums for example) in close vicinity to the instrument, the levels impinging on the room surfaces (the ceiling in particular) are significantly lower, as measured during the survey.

4. Measurements & observations:

A RION NA-28 type 1 integrating sound level analyser (S/N 00991178), calibration was checked before & after the survey with RION NC74 acoustic calibrator (S/N 34536131), both calibrated to traceable national standards – no significant drift in the calibration was noted between the start & end of the survey period.
Appropriate RION weather protection was provided for the measurement microphone.

	$L_{Aeq,\ 1\ min}$	$L_{A90,\ 1Min}$	$L_{Amax,\ 1\ min}$
External noise levels - 1st floor facade - 1	60.1dBA	55.6dBA	64.8dBA
External noise levels - 1st floor facade - 2	61.0dBA	58.8dBA	66.0dBA
Internal noise levels - 1st floor front room windows closed	37.8dBA	33.5dBA	48.4dBA
Internal noise levels - 1st floor rear bedroom, windows closed	31.1dBA	26.8dBA	49.2dBA
Internal background noise levels - Studio recording area	35.1dBA	28.2dBA	44.3dBA
Internal noise levels in studio recording area with drummer at 4m distance	88.2dBA	73.0dBA	96.4dBA
External noise levels - 1st floor facade, 1m above roof/ skylight to recording area with drummer playing in studio	57.8dBA	52.7dBA	63.2dBA
Internal noise levels - 1st floor front room windows closed - with drummer playing in studio area	38.4dBA	33.7dBA	44.3dBA

a) The external noise levels are typical of a busy urban road, a major bus route, including 3 night bus routes (there is a stop almost directly outside, one opposite &several others within a few 100m).
According to the Defra London Noise Map, the day time noise levels are gauged even higher (L_{den} >70dBA) and even the night time levels are almost higher (L_{night} 60-65dBA) than measured. I would expect the night time L_{Aeq} noise levels probably to fall to around 50dBA in this location.

b) The internal noise levels measured on the 1st floor are relatively high at the front, overlooking Kentish Town Rd - due to both the high external noise levels & large, single glazed windows.
In the rear bedroom (despite the connecting door not being very effective), the noise levels are obviously lower.

c) The recording area of the studio is quite large and has a mezzanine walkway which allowed taking measurements at a reasonable distance from the drum kit, therefore allowing me to estimate the sound levels incident on the room surfaces, the roof in particular.
As can be seen, one of the loudest instruments typically used in the studio produces just under 90dBA at 3-4m distance. The low reverberation of sound energy in the recording area means that there is little reinforcement & the sound levels diminish in a reasonably free-field manner. The corresponding levels close to the drum kit easily exceed 100dBA.
The drum kit was used as a sound source to observe sound leakage because: (i) It is one of the instruments which produces the highest sound levels, across the widest of frequency ranges, and (ii) the impulsive nature of the sound makes it easier to detect than a steady state noise.
Ideally full sound insulation would have been carried out, however this would be quite unfeasible because of the high levels of external background noise (over 125dBA sound source would be required to make a meaningful/valid (BS:EN:140) measurement…..).

d) With the drummer continuing to play the external background noise levels just above the roof were measured & found to be lower than the previous measurements without the drummer. A small amount of leakage in the low mid frequency region could be heard when observed very close to the roof surface, however I do not think that this had any significance on the measured values at 1m above.

e) With the drummer continuing to play the internal background noise levels in the front 1st floor room (windows closed) were measured & found to be slightly higher (0.6dB) higher than the previous measurements without the drummer.
The drummer could just be perceived in the front room, however it was noted that the emissions appeared to be via the floor & in turn via the “back to back” doors on the ground floor directly below (the floor is exposed/open floor boards with I expect, a lathe & plaster ceiling below - low insulation).
This relatively small degree of leakage into the main building would be attenuated by a further 50-60dB travelling through the party walls to the adjacent neighbouring properties, therefore should be substantially below the background levels in the flats.

The drummer was completely inaudible in the rear bedroom of the 1st floor.
No sound or vibration could be heard in the walls of the 1st floor.

5. Conclusions:

From the details of the sound insulation constructions employed in the recording studio & my inspections, measurements and observations, I think that is is highly unlikely that your neighbours, both in the commercial units directly adjacent & the residential properties to either side at the rear of the property, will be caused any significant disturbance by the normal activities in the recording studio.

The only notable weakness found during the inspections was a small degree of airborne sound transmission from the recording studio to the main house, via the “back to back” doors on the ground floor. However this would be more than sufficiently attenuated by the party walls to the adjacent properties.

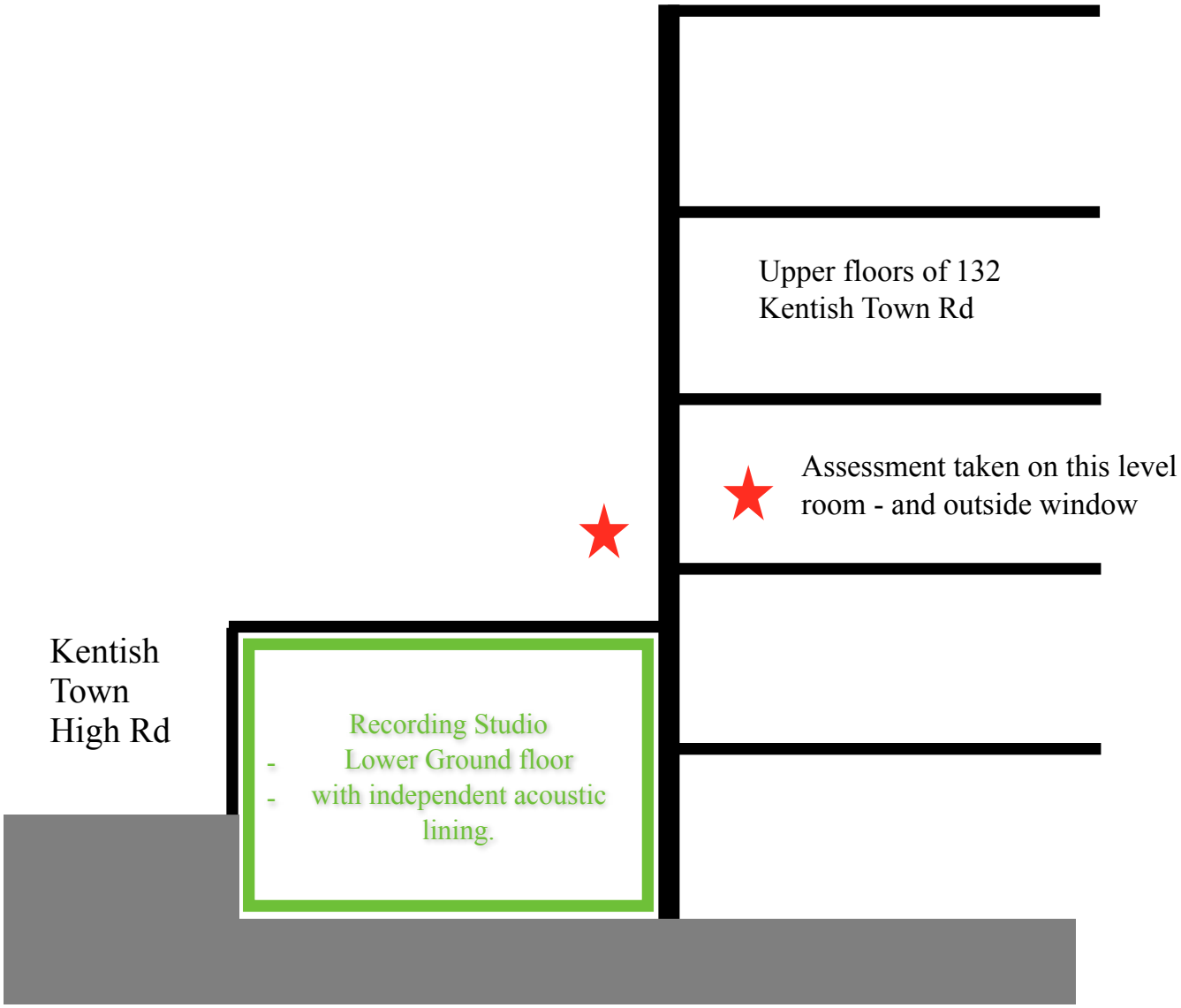
Nick Whitaker BSc MIOA.

Appendix

Location:

Schematic **plan** showing relationship between recording studio & adjacent properties:

Schematic **vertical section** showing relationship between recording studio & attached building:



Description of measurement statistical analysis used in this report to describe time-varying noise sources:

Instantaneous A-weighted sound pressure level is not generally considered as an adequate indicator of subjective response to noise because levels of noise usually vary with time.

For many types of noise the Equivalent Continuous A-Weighted Sound Pressure Level ($L_{Aeq,T}$) is used as the basis of determining community response. The $\mathbf{L_{Aeq,T}}$ is defined as the A-weighted sound pressure level of the steady sound which contains the same acoustic energy as the noise being assessed over a specific time period (in these measurements, 15 minutes).

Statistical descriptors:

$\mathbf{L_{A90}}$ describes the sound level which is exceeded for 90% of the time period & is normally taken as a description of the ambient background noise levels – this is the underlying noise level, largely ignoring transient events during the time period.
This descriptor is most useful to evaluate the underlying prevailing background noise levels & also noise emissions which are of a reasonable consistent level over the measurement period - for example, operating ac equipment.

$\mathbf{L_{A10}}$ describes the sound level which is exceeded for 10% of the time period & is normally taken as a descriptor of the road traffic noise.

$\mathbf{L_{Amax}}$ describes the maximum sound level recorded during the time period.