THE LONDON BOROUGH OF SOUTHWARK

TOWN AND COUNTRY PLANNING ACT 1990

Soho Wharf, Clink Street, London SE1
APPEAL BY CHELSFIELD (CLINK STREET) LTD

Proof of evidence
of

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RUPERT TAYLOR
ACOUSTICS - NOISE - VIBRATION

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1. QUALIFICATIONS AND EXPERIENCE

1.1 My name is Rupert Maurice Thornely-Taylor. I am a Fellow of the Institute of Acoustics and have specialised exclusively in the subjects of noise, vibration and acoustics for more than thirty nine years. I have been an independent consultant in these subjects for the past thirty five years. I am also a director of Rupert Taylor Ltd which specialises in numerical methods of noise and vibration prediction. I am Chairman of the Association of Noise Consultants (ANC).

1.2 I was a member of the Noise Advisory Council chaired by the Secretary of State for the Environment for ten years and was a member of the Scott Committee on whose report the noise sections of the Control of Pollution Act 1974 were based. I was chairman of the Working Group on Noise Monitoring and deputy chairman of the Working Group on Noise as a Hazard to Health. In 1996 I carried out a research project for the then DoE to review its planning policy guidance note PPG24 Planning and Noise. My practice, jointly with Schal, is under contract to DEFRA for the project management of the Noise Mapping of England. I am a BSI nominated member of an ISO vibration working group (ISO TC108/SC2/WG8) and chairman of the ANC working group on BS 6472.

1.3 I have been expert witness in many planning inquiries including A3 developments.

1.4 I was instructed in August 2003 by the London Borough of Southwark to assess the noise implications of the proposed restaurant development at Soho Wharf, and following my conclusion that the noise implications made the development unacceptable, to prepare evidence for this inquiry.

2 SCOPE OF EVIDENCE

2.1 My evidence covers the topic of noise, from the operation of the proposed A3 restaurant use in application C—the conversion of the existing Clink Street Museum into a restaurant.

3 NOISE ASPECTS OF THE SITE

3.1 The proposed development is on the south side of Clink Street. Clink Street is one of the narrowest streets in London, the distance between the façade of Clink Wharf on the north side, and Soho Wharf at the entrance to the Clink Street Museum (the proposed entrance to the restaurant) is only 4m. This part of the street is pedestrianised and there is no through route between Park Street/Bank End and Stoney Street. The street carries a significant number of pedestrians, and vehicular traffic is limited to vehicles servicing properties in the vicinity and requiring access to the garage opposite the application site. The nearest streets carrying traffic are Park Street 40m to the west and Stoney Street 20m to the east. Immediately to the west of the museum entrance is the 37m long railway arch.

3.2 Opposite Soho Warf, at only 4m distance, are the residential and studio developments of Clink Wharf and New British Wharf, with bedroom windows in the Clink Street façade. The bedrooms have natural ventilation and opening windows on the Clink Street opposite the proposed restaurant entrance.

3.3 Just west of the proposed restaurant entrance the street widens out to 8m (façade to faced). East of Soho wharf the street also widens to a similar width.

3.4 At the western end of Clink Street, on the corner with Bank End, is the wine warehouse Vinopolis which incorporates the restaurant Cantina Vinopolis whose entrance is at the Clink Street/Bank End corner, beyond the railway arch. The entrance under the railway arch is an emergency exit only. North of Vinopolis on the corner of Bank End and Bankside is the Anchor public house.

3.5 To the east, on the corner of Stoney Street, a new development is under construction including an A3 use.

3.6 An ambient noise survey was carried out on behalf of the appellants in March 2002. This included four manned measurement positions which gave daytime results, and a rooftop unmanned measurement which gave continuous results over two days. The rooftop measurements may have given higher background (L_{A90}) noise levels since they did not benefit from the noise barrier effect of the facades in the narrow street, but they will also have shown lower L_{Amax} levels as the microphone would have been more remote from human voice sources. The survey shows the background noise level L_{A90} highest around 0830, progressively falling throughout the day to just above 50 dB at 23.30 when restaurants generally close. The L_{Aeq} level follows a similar pattern, but with a more pronounced fall in the evening from 17.30 to 23.30 at which time the L_{Aeq} is only about 2 dB higher than the L_{A90}, indicating a comparative absence of local noise events. The L_{Amax} levels, which are, during the morning anything up to 30 dB greater than L_{Aeq} levels, some within about 5 dB of the L_{Aeq} levels in the late evening, again indicating a sparsity of local noise events.

3.7 The Clink Street museum is currently used for banqueting and corporate entertainment, although the appellants' statement of case reports no record of consent for this use. Correspondence from objectors indicates that this has given rise to significant loss of amenity on a few evenings a year.

4 PLANNING POLICY AND GUIDANCE IN RELATION TO NOISE

Government guidance

4.1 The Government's policies on noise aspects of planning are set out in Planning Policy Guidance PPG 24, PLANNING AND NOISE.

4.2 PPG 24 considers separately the cases of noise sensitive development of land affected by pre-existing noise, and noise-emitting development near pre-existing noise-sensitive areas.

4.3 Under the heading of general principles, PPG 24 advises in paragraph 2 that "wherever practicable, noise-sensitive developments are separated from major sources of noise (such as road, rail and air transport and certain types of industrial development). It is equally important that new development involving noisy activities should, if possible, be sited away from noise-sensitive land uses. Development plans provide the policy framework within which these issues can be weighed but careful assessment of all these factors will also be required when individual applications for development are considered. Where it is not possible to achieve such a separation of land uses, local planning authorities should consider whether it is practicable to control or reduce noise levels, or to mitigate the impact of noise, through the use of conditions or planning obligations." The guidance continues (paragraph 10) "Much of the development which is necessary for the creation of jobs and the construction and improvement of essential infrastructure will generate noise. The planning system should not place unjustifiable obstacles in the way of such development. Nevertheless, local planning authorities must ensure that development does not cause an unacceptable degree of disturbance."

British Standard 8233:1999 — Sound Insulation and Noise Reduction for Buildings—Code of Practice

4.4 This document is principally concerned with advising on methods of planning and constructing buildings to achieve acceptable internal noise levels. BS 8233 gives criteria for "anonymous noise such as that from road traffic" inside spaces when they are unoccupied of 30 to 35 dB $L_{Aeq,T}$ in bedrooms and 30 to 40 dB $L_{Aeq,T}$ in living rooms where T is 2300-0700 for bedrooms and "appropriate for the activity involved" for living rooms.

World Health Organization

4.5 In 1999 a document was published by the World Health Organization entitled "Guidelines for Community Noise" (1999).

4.6 The document explains (para 4.1) that the guideline values presented "are essentially values for the onset of health effects from noise exposure. It would have been preferred to establish guidelines for exposure-response relationships. Such relationships would indicate the effects to be expected if standards were set above the WHO guideline values and would facilitate the setting of standards for sound pressure levels (noise emission standards). However, exposure-response relationships could not be established as the scientific literature is very limited."

4.7 At para 4.2.7 the guidance advises that, during daytime, few people are seriously annoyed by activities with L_{Aeq} levels below 55 dB; or moderately annoyed by activities with L_{Aeq} levels below 50 dB. Sound pressure levels during the evening and night should be 5-10 dB lower than during the day. Noise with low-frequency components requires even lower levels. It is emphasized that for intermittent noise it is necessary to take into account the maximum sound pressure level as well as the number of noise events. Guidelines or noise abatement measures should also take into account residential outdoor activities.

4.8 A table of guideline values is given related to adverse health effects, which refers to any temporary or long-term deterioration in physical, psychological or social functioning that is associated with noise exposure. There are several potential adverse effects ranging from annoyance, through sleep disturbance to hearing impairment, and when multiple adverse health effects are identified for a given environment, the guideline values are set at the level of the lowest adverse health effect called, in the table, the critical health effect.

4.9 The guidance considers effects described as moderate and serious annoyance for "outdoor living areas", and "speech intelligibility and moderate annyance" for dwellings indoors. The guidance values representing the onset of the effects mentioned, i.e. levels at which there is no effect, are 50 dB $L_{Aeq,16h}$, 55 dB $L_{Aeq,16h}$ and 35 dB $L_{Aeq,16h}$ daytime and evening. Inside bedrooms the effect considered is sleep disturbance and the guidance values representing the level at which there is no effect, are 30 dB $L_{Aeq,8h}$ 45 dB $L_{Amaxeq,\ fast}$, for night time, with corresponding outdoor values, window open, of 45 dB $L_{Aeq,8h}$, and 60 dB $L_{Amax,\ fast}$.

5 OUTLINE OF THE NOISE ASPECTS OF THE PROPOSED DEVELOPMENT

5.1 In general, noise sources associated with restaurants are (i) noise from mechanical services, including kitchen extracts and restaurant air conditioning plant, (ii) noise from plant including refuse compaction plant, (iii) noise from traffic generated by the use, (iv) noise from deliveries and refuse collections, (v) noise from the restaurant area, including music and patrons' voices and (vi) noise from patrons arriving at and departing from the restaurant.

Noise from mechanical services

5.2 Mechanical services noise can be controlled by condition, and section 8 of the appellants' noise survey report addresses this issue.

Noise from plant including refuse compaction plant

5.3 This is an issue which can in principle be controlled by condition. The appellants propose the storage of refuse internally and the main issue is likely to be associated with refuse collection, addressed below.

Noise from traffic generated by the use

5.4 As Clink Street is closed to through traffic, threre are not likely to be significant traffic noise effects.

Noise from deliveries and refuse collections,

5.5 Noise from refuse collections from restaurants in a residential area can be a major source of noise disturbance. It tends to take place in the early morning, and it is possible in this case that refuse collection vehicles, which the appellants state will be operated by a private contractor, will reverse into Clink Street to the restaurant entrance using a reversing alarm, and create substantial noise disturbance with lorry mounted lifting and compacting equipment to bedroom windows which would be only one or two metres away.

5.6 This is potentially a very major source of noise disturbance which could only be alleviated if refuse can be removed by some other means.

5.7 The same issues arises with deliveries, but unlike refuse collections deliveries are less likely to be daily, in the early morning.

Noise from the restaurant area, including music and patrons' voices

5.8 Noise from within the restaurant area, whether from music or patrons voices, could be controlled by condition preventing the opening of windows to Clink Street and requiring the use of a double door system and that the doors be kept closed when not in immediate use. Even so, some noise escape from the restaurant doorway is inevitable, and it is little more than 4m from bedroom windows.

5.9 The widened street area just outside the restaurant entrance would lend itself to the provision of outdoor tables, which would place noise sources from patrons voices within a few metres of bedrooms windows, but this could be prevented by planning condition.

Noise from patrons arriving at and departing from the restaurant.

5.10 Patrons tend to leave restaurants in small groups progressively through the evening up until the restaurant closes. They have frequently consumed alcohol, and in this location would be largely unaware of the extreme proximity of bedroom windows. It is unavoidable that through the evening there would be repeated noise events associated with voices, often loud particularly since some members of a group may depart towards Stoney Street and others towards Bank End, shouting to each other as they go. Both the narrowness of the gap between the facades, and the reverberant nature of the long railway arch just to the east will raise noise levels significantly above those for a normal open street.

5.11 To some extent the same issue arises with patrons leaving Cantina Vinopolis, and will in the case of the new A3 development on the corner of Stoney Street, but in neither case is the restaurant exit in a street only 4m wide.

6 EXPECTED NOISE LEVELS

6.1 The most important of the noise sources outlined above are those which cannot be controlled by condition. If it should be necessary for refuse vehicles to reverse into Clink Street, this would be a major noise source, and the noise of voices of departing patrons could also generate high levels of noise. Noise escaping from the restaurant doorway cannot be controlled entirely.

6.2 The sound level of a "very loud" human voice, obtained from BS ISO 9921-1:1996 is 78 dB(A) at 1m, with most of the energy concentrated in the 500Hz octave band (source ANSI S3.5-1969). In the reverberant surroundings of Clink Street by the restaurant entrance, a voice source of this level would be approximately 82 dB L_{Amax} at 1m from the façade of a bedroom in Clink Street, taking account of façade and ground reflections.

6.3 This would be equivalent to a maximum noise level of about 67 dB L_{Amax} inside the bedroom with a partially open window, and about 62 dB L_{Amax} with a closed window.

6.4 These levels are well above acceptable noise levels for the avoidance of sleep disturbance.

6.5 There are actually no validated environmental noise indices suitable for the assessment of noise from human activity, and in a matter such as this a value judgement has to be made, although it is helpful to consider likely noise levels in the context of sleep disturbance criteria and the existing ambient noise climate.

7 CONCLUSIONS

7.1 The proposed restaurant in application C is, in my experience unique in terms of its extreme proximity to bedroom windows in residential facades on one of the narrowest streets in London, and one which has no through traffic and therefore relatively low background noise levels.

7.2 Many of the potential noise sources associated with restaurant use can be controlled by condition. This includes noise from plant and mechanical services, from music and from other activities within the restaurant, from outdoor tables and from refuse collection. No reasonable condition can, however, deal with the noise disturbance caused by the departure of restaurant patrons throughout the evening into the time generally regarded for noise assessment purposes as night time. Because of the extremely short distances, the reverberant nature of the exceptionally narrow street and also of the nearby railway arch, voices from people departing, and not necessarily behaving unusually, will cause severe disturbance to the residents of Clink Wharf and New British Wharf. There appears to be no way of avoiding this other than by dismissing the appeal.

GLOSSARY

dB Decibel. The decibel scale measures levels relative to a reference, either a fixed reference when measuring absolute levels, or another level when expressing changes. If the quantity is power-like (i.e. could be expressed in watts) the level in decibels is 10 times the common logarithm of the ratio of the measured quantity to the reference quantity. If the quantity is a physical amplitude such as pressure or voltage, and the power of the quantity is related to the its square, then the decibel level is 20 times the common logarithm of the ratio of the measured quantity to the reference quantity. Thus doubling of power gives a 3 dB increase, while a doubling of pressure gives a 6 dB increase.

L_A A-weighted sound pressure level. The units are decibels, abbreviated dB (or dB(A) if the subscript A is omitted). A-weighting is a frequency weighting which discriminates against low frequency and very high frequency sound in order to approximate the frequency response of the human ear. The subscript *s* or *f* signifies that the time constant of the measurement is either 'slow' (1 second) or 'fast' (125 milliseconds)

L_{Amax} The maximum value of L_A reached during one or more noise events. (See reference to 's' and '*f*' subscripts above).

$L_{Aeq,T}$ Equivalent continuous sound level. The root mean square sound pressure level determined over time interval T expressed in decibels. May be regarded as the level of a notional steady sound which has the same energy in period T as an actual time-varying sound which occurs in the same period. Sound level, duration and number of events are treated such that doubling the number of events, or doubling the duration of an event, has the same effect as doubling the number of sources (i.e. doubling the energy), which in the decibel scale is an increase of 3 dB (see above).

L_{A90} The A-weighted sound level in dB which is exceeded for 90% of the time period stated. The "trough" noise level which exists between "peaks" of noise events such as passing vehicles.

APPENDIX I

Noise And Vibration Units

The noise levels to which I will refer are expressed using the decibel scale. The decibel scale has the characteristic that it measures proportions rather than absolute quantities, so that, for example, doubling the amount of energy in a sound (for example by putting two identical sound sources close together) always causes an increase of 3 decibels, whether it is a doubling of a large or of a small amount of noise energy. However, as I shall explain, the perceived loudness of a doubling of noise energy is quite small, and certainly much less than a doubling. A tenfold increase in the amount of energy gives an increase of 10 decibels, although, once again, the perceived increase in loudness is not nearly as great as the increase in energy would suggest and a ten fold increase in energy is certainly not a tenfold increase in loudness.

The kind of decibel scale most commonly used for overall noise assessment is known as the 'A-weighted decibel' or dB(A). The 'A-weighting' is a method of causing measuring instruments to respond in approximately the same manner as does the human ear, which is comparatively insensitive to low-pitched and very high-pitched sound. For example, two sounds which are perceived as the same loudness may have widely differing physical magnitudes if one is a low rumble and the other is a whistle. Without 'A' weighting, the low rumble would measure some 30 decibels more than the whistle, even though they both sound equally loud. In 'A-weighted decibels' both sounds would have the same decibel, or dB(A), level. Noise levels in dB(A), like the basic decibel scale, measure proportions so that a 10 dB(A) increase is a doubling of loudness and a 10 dB(A) decrease is a halving of loudness. Judgment of loudness is subjective, and dependent on the characteristics of the sound, but the '10 dB(A) increase is a doubling of loudness' rule is a useful general guide. For example, ten motor cycles close together sound only about twice as loud as one motor cycle, and certainly not ten times as loud; the same is true of one motorcycle which emits ten times as much sound power as another. As a further guide, one may say that a sound level of less than 20 dB(A) is virtual silence, 30 dB(A) is very quiet. 50 dB(A) is a moderate level of noise, 70 dB(A) is quite noisy and in a noise level of 90 dB(A) one has to shout to be understood.

The measurement of sound levels in decibels involves a kind of averaging process in which the fluctuating pressure signal is squared, averaged, and the square root obtained. This process is known as r.m.s. averaging, and it takes place over a defined time. There are two standard averaging times, 1/8 second, known as 'F' response and 1 second, known as 'S' response. In the present context, the dB(A) levels to which I refer are to be measured using the 'S' response.

The basic dB(A) scale can only measure the instantaneous level of sound, and where the level of sound fluctuates up and down, as it normally does in the environment, the dB(A) level also fluctuates. When it is necessary to measure a fluctuating noise environment by means of single number, an index known as equivalent continuous sound level, or L_{Aeq}, is employed. L_{Aeq} (which in some documents is referred to as L_{eq} rather than L_{Aeq} - the two terms have the same meaning) is a long term average of the amount of energy in the fluctuating sound, expressed in dB(A). In the case of a continuous, unchanging sound, its L_{Aeq} level is the same as its sound level in dB(A). Because a 3 decibel change is caused by a doubling or halving of sound energy, then it follows that if the sound energy entering an ear or a microphone over a particular period of time is doubled or halved, because the same sound went on for twice or half as long as it did previously, then the amount of energy received will be doubled or halved. The result is that the L_{Aeq} level will go up or down by

3 dB just as it would if the amount of energy in the sound, rather then the duration of the sound, had doubled or halved.

The consequence is that the L_{Aeq} scale will measure either the level of sound, or the duration of sound, or a combination of both such as the number and noise level of a series of train passages. Since the L_{Aeq} index is based on the dB(A) scale, it will measure loudness in the same way, that is, an increase of 10 units on the L_{Aeq} scale sounds like a doubling in loudness if the increase is due to the same sound just getting louder. Alternatively, a 10 unit increase could be due to a tenfold increase in the number of sounds all of the same individual loudness and duration.