Proceedings of The Institute of Acoustics

Noise Control and the use of the Control of Pollution Act 1974

PAUL A. COONEY M.I.E.H.

PRINCIPAL ENVIRONMENTAL HEALTH OFFICER, L.B. OF GREENWICH

The theme running throughout my talk today is concerned with noise from the construction of the Rochester Way Relief Road and the thoughts and recollections contained in my paper deal solely with problems and incidents that have occurred up to the time of writing this resume.

For the few people present who have not used the A2, the Rochester Way Relief Road will be a three mile stretch of 4 lane highway which will link the Blackwall Tunnel Southern Approach with the A2 (M2) at Falconwood. The new road will alleviate congestion and benefit residents along the Rochester Way by reducing the levels of noise and atmospheric pollution from vehicular traffic.

Construction of the Relief Road began in January 1982, with demolition of properties on the road alignment; the noisier activities involving pile-driving, excavating and carting away soil, and bridge works by British Rail were soon to follow.

From the onset Greenwich Council was committed to monitoring works where noise could pose a problem or give rise to nuisance. This has already imposed a considerable demand on staff resources and noise measuring equipment which will continue for some years yet until the completion of the new road.

Consultations took place with the Greater London Council (the Highway Authority) and British Rail at an early stage, and although no formal applications for prior consent have so far been made under Section 61, Control of Pollution Act 1974, agreement has been reached between officers on methods of construction and permitted working hours.

Prior to tendering noise control clauses have been agreed with both B.R. and the G.L.C. for inclusion in tender documents. Although noise limits set in the contract documents were originally based on Appendix D, BS 5228: 1975 these have now been altered to take into account local needs and circumstances.

For example, the original noise clause agreed with B.R. read as follows:

		10 hr Leq	Peak
Ex. I	08.00 - 19.00 Mon-Sat (and abnormal occupation periods) 22.00 - 07.00: No pile driving involving use of percussive equipment.	77dB(A)	82d B(A)

In the light of problems that arose with B.R. Contract I: Haul Route Bridge No. 733AA, which I shall outline later, these have now been altered to:

NOISE CONTROL AND THE CONTROL OF POLLUTION ACT

08.00 - 18.00:	Mon-Fri	(not applicable during)
08.00 - 16.00:	Saturday	(periods of abnormal)
no work :	Sunday	(occupation.)

Typical noise clauses agreed between L.B. of Greenwich (with reservations) and the G.L.C. are:

07.30 - 18.00:	Mon-Fri	75dB(A)
08.00 - 14.00:	Saturday	75dB(A)
14.00 - 07.30:	Sat-Mon (when permitted)	65dB(A)
18.00 - 07.30:	Weekdays (when permitted)	65dB(A)

Haul Route Bridge No. 733AA

Preliminary works involved constructing a new bridge under the railway line to provide access for vehicles carting excavated soil. Parallel lengths of interlocking sheet piles had to be driven across the elevated section of the track through several metres of dense compacted material. The contractor used a silenced system of piling comprising a suspended box enclosure around the hammer only. It was soon apparent that there were drawbacks with this system as the acoustic material packing the box quickly broke-up and was prone to ignite; and the rigs could not operate without considerable wire slap. Needless to say the contractor could not keep within the constraints of the noise clause (Ex.I) and the 82dB(A) peak level was regularly exceeded by pitch piling (the use of a 1-ton monkey hammer to couple second-hand piles whose clutches were clogged up). The peak level was, no doubt, also exceeded by B.R's use of a chain saw at 4 am. Complaints were received and led to a very rapid revision and introduction of new permitted hours of work.

Our experiences with this first contract were not forgotten and when the second contract was to be let the Council required that a fully silenced system ('HUSH') be used during all piling operations; this clause was subsequently written into the contract document.

Advance Sewer Works

As the existing sewers were on the line of the new road Greenwich Council has had to construct new sewers in the Well Hall area. Unfortunately, tunnelling operations were affected by ground water penetration and in order to overcome this problem it was necessary to use compressed air working.

A scheme was prepared with the Council's engineer which ensured that all plant used on this work was properly muffled, all static plant housed in acoustic enclosures and a partition screen wall erected to muffle any moving plant. Noise monitoring was carried out to assess the effectiveness of the acoustic enclosure around the compressors and the screen wall around the crane. Comparison with figures obtained prior to operation of the plant showed an increase of 2 - 3 dB(A) in the accumulative Leq. It was considered that local residents would not be disturbed; in fact the work was satisfactorily completed without complaint.

NOISE CONTROL AND THE CONTROL OF POLLUTION ACT

New Rail and Bus Interchange - Eltham Well Hall

Work associated with moving the station from the west to the east of Well Hall Road involved laying down sheet piling at the site of the new station. When the contract for this work was being drawn up by B.R. the problem of noise and vibration was considered. As a result of our experiences with the semi-hushed system at the Haul Route Bridge it was felt necessary to reduce noise levels and it was made a condition of the contract that the quietist form of pile-driving be used (the system adopted would obviously depend on ground conditions).

The use of two Hush piling rigs with silenced cranes, together with a restriction on times of actual pile-driving, ensured that noise was kept to a minimum. In addition, prior to work commencing the G.L.C. had through its discretionary powers under the Noise Insulation Regulations 1975 provided double windows to the eligible rooms of all but one (for some unknown reason one was left out) of the adjacent houses. Very few complaints about noise were made during the piling operations except for a major incident when an attempt was made to pile through the night during a weekend possession period. On this occasion all hell let loose with threats of violence and arson from irate local residents and at my request/insistence work ceased immediately. Even using the quietist rig available one unforeseen drawback was found when piling at right angles to the railway line on top of a steep embankment. Whilst the base of the box silencer can be effectively plugged by sandbags when it is on level ground this is virtually impossible when piling on a steep slope. Various barriers were tried with little effect except for the spectacular incident when straw bales were accidentally ignited with an oxyacetylene torch, leading to momentary panic and destruction of nearby undergrowth and part of a garden fence.

However, no measures could be taken to reduce the level of vibration and not only did it give rise to complaint of disturbance, etc., it also gave rise to complaints of damage to property.

During the piling operations we carried out measurements of vibration levels; these were below the safety limits set by all but one (Danish figures) of the relevant criteria. It was felt though that the vibration would probably have caused slipped slates, plaster cracks and other minor architectural damage; but structural damage was unlikely to have occurred. Pre and post pile-driving surveys of properties likely to be affected had been carried out by an independent surveyor and the contractor effected repairs on the properties found to have suffered damage.

Conclusions

It has been my experience so far with the construction of the Relief Road and associated engineering works that :

(1) prior consultation and subsequent close liaison with the developer and his contractor is vitally important;

NOISE CONTROL AND THE CONTROL OF POLLUTION ACT

(2) the use of Sections 60 and 61 of the Control of Pollution Act, 1974 are inappropriate with civil engineering works of this magnitude as they can prove too restrictive and leave little room for manouvre;

(3) public relations exercises and consultation with local resident associations are necessary adjuncts to noise control measures. I have found a public relations exercise to be a good attenuator of noise as, subjectively, up to 10dB(A) can be achieved by a well worded letter;

(4) a great deal more knowledge is needed on the effect of ground-borne vibration on buildings, and

(5) before committing yourself to any monitoring programme make sure that staff and equipment resources are available. Although I must say that in our case this has been further complicated by the time span involved which will be upwards of five years by the end of the contract.