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THE CONTROL OF NOISE FROM ROAD CONSTRUCTION SITES

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Construction noise is the major factors that affects people in the implementation of an urban road scheme [1]. During the period between the publication of a line order and the start of construction, it is more difficult to sell ones house [2]. In the post construction period the noise from the road can give rise to problems, but by noise insulation or by the normal movement in house occupancy these factors are mitigated. However, during construction of the road there is often substantial intrusion that has no short term solution.

Under the Control of Pollution Act the road building authority must obtain a Consent Order from the Local Authority. That Consent Order can either stipulate maximum noise levels that are to be permitted or the type of equipment and plant that may used.

In our work a complication arises from the fact that the Department of Transport assert that their contractors have Crown exemption and although wishing to adhere to the spirit of the law are not legally constrained by the Control of Pollution Act.

In an urban environment it is generally physically impossible to build a major highway without causing some disruption. So as not to limit the contractor's operations insulation against construction noise is offered to householders. Under the provisions of the Land Compensation Act Regulations, noise insulation may be provided, if in the opinion of the appropriate highway authority the enjoyment of an eligible building is seriously affected for a substantial period of time.

At present the interpretation of this is that the average noise level over a period of two months must exceed a value of 70dB(A) 12 hour Leq. To attempt to control a Contractor in terms of such a long duration criterion is not feasible. A suggested limit was that the noise level on the nearest property, without noise insulation, should not exceed 75dB(A) 12 hour Leq or a peak level of 85dB(A) measured on slow response.

Latterly, from our experience on a recent major highway we are suggesting that the 12 hour criterion is too long and that an hourly Leq of 75dB(A) be used.

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The calculations of the various construction noise indices in the planning stage needs to be undertaken. First, to assess what properties may be eligible for insulation against construction noise and second to determine whether it is feasible for the contractor to keep within the hourly Leq level for properties adjacent to the site.

There are a number of predictions for construction noise [3] and [4] but these are manual methods which are very time consuming. We have, therefore, developed a construction noise program that takes into account the noise from the static sources, haul roads and which undertakes various barrier calculations. The type of equipment assumed is generally that which the contractor is likely to use, and if the contractor keeps to the scenario assumed then construction noise levels are obtainable. On a major urban highway the number of calculations that would have to be taken makes it almost impossible for a manual calculation to be undertaken.

The major assessment is undertaken for the day time period from 0700 to 1900 hours, other time zones are also specified these are shown in the Table. These are noise levels that are not be exceeded at properties which are without noise insulated either for construction noise or for traffic noise on their ground floor facades. The problem that has arisen is that the contractor then started to use an unsilenced pile driver outside a noise insulated house, which even with the noise insulation produced excessively high levels within the property. From that experience we now specify that the noise levels on any property should not exceed 10dB(A) higher than in the table.

TABLE: Maximum permitted noise levels

Period	Hours	Hourly Leq Noise Level dB(A)	Peak Noise dB(A)
Mondays to Fridays	0700-1900	75	95
Mondays to Fridays	1900-2200	65	75
Saturdays	0700-1300	75	95
Saturdays	1300-2200	65	75
Sundays	0700-0900	50	60
Sundays	0900-1700	65	75
Sundays	1700-2200	50	60
Any day	2200-0700	50	60

Peak noise levels refer to levels reached on a BS 4197 sound level meter set to slow response.

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In urban highway schemes it is not the prediction and calculation of construction noise that is difficult but the enforcement of those levels. On a major scheme monitoring is undertaken on a full time bases by a technician attached to the resident engineers staff. Any complaints from the public are channelled through the liaison engineer who arranges for measurements to to be taken and the appropriate action instigated.

As a generality, if the noise levels are kept to below 75dB(A) Leq or 85dB(A) then there are no complaints regarding noise. As soon as the 75dB(A) criteria is exceeded then a larger number of complaints can be expected.

In theory, if the contractor exceeds a noise level in the specification he must cease work on that activity and provide the resident engineer with calculations indicating how he will keep to the noise criteria. In practice the contractor stops work and asks for instructions.

The contractor is wishing for instructions to use a specific piece of plant. If that instruction is given then the client, i.e. the funding authority, has to pay for the extra works. However if the engineer indicates that the contractor has to proceed under the contract, i.e. to do the work within the controls that he has agreed to, the temperature of the debate starts to rise.

Finally, not all the construction noise problems relate to noise levels generated during the day. We are presently trying to make a judgement on the level of noise that will be acceptable to a large community at night. The cost penalties of not working at night will extend into millions of pounds. We are also endeavouring to determine the acceptable level of noise from blasting, again where the blast has to be undertaken at night.

References:-

[1] Urban Motorways Case Studies - Birmingham, Main Report R. Travers Morgan & Partners, 1972

[2] HOOD R.A. and STERLING C.A. Effects of New Roads on Housing Turnover - Internoise, 1973

[3] J.E. LUDLOW - Measurement and Prediction of Noise from Construction Site, ISVR MEMO 554, 1976.

[4] CIRIA REPORT 64 - Noise from Construction and Demolition Sites. Measured levels and their prediction, 1977