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Further Reduction of Construction Noise in the Community

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Abstract

Noise from general construction activities in Hong Kong during restricted hours (between 7 p.m. and 7 a.m. on a weekday and at any time on a Sunday or public holiday) is controlled by means of a construction noise permit system. The contractor who wishes to carry out construction work in restricted hours has to ensure that the noise level so generated at noise sensitive receivers must be less than a set of Acceptable Noise Levels in order to obtain a permit from the Authority.

Owing to the fast development in Hong Kong, complaints against construction noise are on the high side. The government has determined to further tighten up control of noise from general construction activities. As from 1.11.96, the Acceptable Noise Levels of five commonly used noisy equipment are lowered by 15 dB(A) and three type of prescribed construction work are virtually banned in high density built-up districts known as designated areas.

This paper describes the tightened up new control and the parallel enforcement actions. The effects of the control on the construction industry are covered. To increase public awareness of their right on environmental quality and ensure compliance of the control by the industry, the Authority has provided publicity materials and established regular liaison meetings with the trade associations and private contractors.

Introduction

1. Having all the vibrant metropolitan activities confined to an area of slightly more than 1,000 square kilometres, the six million people in Hong Kong are obviously seriously affected by the by-product - noise. Due to extensive infrastructure developments and urban reforms in Hong Kong, construction noise problem is pervasive and remains high on the league of major pollution sources of Hong Kong. Although it is impossible to completely eliminate construction noise in this compact metropolis, conscientious efforts are taken to alleviate construction noise disturbance. Introduction of legislative control is certainly an effective way to tackle this kind of noise problem. Since 1989, the carrying out of general construction work in restricted hours (between 7 p.m. and 7 a.m. on a weekday and at any time on a Sunday or public holiday) requires a construction noise permit. The permit is issued by the Noise Control Authority after having satisfied that the noise so generated complies with the statutory limits. This paper describes this legislative control system and the tightened up noise control introduced in 1996 which further reduces construction noise impact in Hong Kong.

The Noise Control Ordinance

2. Many construction noise complaints are associated with the use of powered mechanical equipment (PME) for carrying out of general construction work. Balancing in the interest of economic development and the well being of Hong Kong people, the Noise Control Ordinance (NCO) [1], put into operation in 1989, contains provisions to control noise from general construction activities during restricted hours. The Environmental Protection Department (EPD) - the Noise Control Authority, controls the noise by means of a construction noise permit (CNP) system. For other types of construction related noise during daytime of weekdays, there are provisions in the NCO to control noise from percussive piling, hand-held percussive breakers and portable air-compressors. Percussive piling is prohibited at night and on public holidays including Sundays. Whilst daytime percussive piling noise is controlled using CNP, noise from breaker and air-compressor is controlled by means of noise emission labels. Not until November 1996, there are no provisions in the NCO to control noise from manual construction activities, such as hammering, loading and unloading of construction materials.

3. The Authority may issue a CNP and may impose in relation to any CNP any condition that is considered suitable by reference to the statutory Technical Memoranda [2 and 3]. Normally the type of construction equipment and time period allowed for construction activities are specified in the permit. To strike a fine balance between the need for construction work and the impact it has on nearby noise sensitive receivers, the time period specified will vary particularly for percussive piling whose noise has been found to be most annoying.

Tightening up of Construction Noise Controls in Developed Areas

4. With the on-going construction of many infrastructure developments in Hong Kong, complaints against construction noise are common and stand on the high side. The government recognized the need to meet community's rising expectations of better living environment and determined to tighten up control of construction noise. As from November 1996, the following aspects of control have been amalgamated with the existing CNP system in regulating noise from construction activities in high density built-up districts known as Designated Areas (DA) of Hong Kong :

- (a). Tightened up control, by lowering the Acceptable Noise Levels by 15 dB(A), on the following five commonly used noisy Specified Powered Mechanical Equipment (SPME) :
 - Bulldozer
 - Concrete lorry mixer
 - Dump truck
 - Hand-held breaker
 - Hand-held vibratory poker

- (b). The following three manual construction activities have been a long standing source of noise disturbance to neighbourhood, especially during restricted hours. They are now under strict control and described as Prescribed Construction Work (PCW) :
 - Erection or dismantling of formwork or scaffolding
 - Loading, unloading or handling of rubble, wooden boards, steel bars, wood or scaffolding material
 - Hammering

5. A CNP for the carrying out of the above activities would not normally be granted except for very special circumstances. They are, for instance, essential road resurfacing and maintenance works; repairs of underground utilities in busy roads which could only be conducted during night time or on public holidays; or those employing particularly quiet construction equipment or methods, such as disposal of rubble through plastic chutes. Other than such special cases, the new control will have the effect of banning virtually all the construction activities carried out in built-up locations during noise sensitive hours.

6. It is obvious that some PME are normally used in conjunction with PCW. In order to effectively control the carrying out of PCW, the Authority will refuse to grant a CNP for use of PME if there is reason to believe that such PME is to be used in conjunction with the carrying out of any PCW not being permitted. A CNP applicant must supply sufficient information to justify and demonstrate to the Authority that the use of PME will not involve PCW. Some common examples of PME that are associated with PCW are tower crane, excavator, bar bender, etc, which are normally used in conjunction with loading, unloading or handling of wooden boards, steel bars, rubble or scaffolding material.

7. After the new control on SPME and PCW, the construction industry understand that they have to put more efforts in order to obtain a CNP for general construction works in DA. Notwithstanding their efforts, the average unsuccessful rate of CNP applications for building developments has increased from the original 30% in October 1996 to about 85% in July 1997 after the new control. The reduction in noisy construction activities in DA has brought about improved environmental conditions to the neighbourhood.

Stepped-up Construction Site Surveillance Programme

8. A stepped-up surveillance programme was implemented right after the launch of the new control on SPME and PCW. The purpose is to enhance observance of noise control regulations by the construction industry during restricted hours, in particular on Sundays. Extra resources were deployed within the Authority to cater for this vigilant enforcement exercise. Surveillance and enforcement actions were arranged and carried out by staff of the six Local Control Offices (LCO) of EPD, which are regional offices set up to increase enforcement efficiency and to provide a focal contact point for the local community. Table 1 below summaries the enforcement statistics of the surveillance programme.

Table 1

**Malpractice of the Construction Industry
observed between November 1996 and July 1997**

	Nov.96 to Jan.97	Feb. to Apr 97	May to July 97	Total
A. No. of inspections made by 6 LCOs	570	330	348	1248
B. Breaches spotted	115	51	30	196
C. Average rate of breaching the NCO in the period	20%	15%	9%	16%

9. In Hong Kong, there are about 1200 active construction sites working during restricted hours in a month. Up to July 1997, a total of over 1,200 inspections were made at 900 of the above construction sites on Sundays and after 7 p.m. in weekdays by the six LCOs. Higher inspection frequency was accorded to those construction sites which did apply for but were not granted with CNP or with previous offence records. The inspection of about 75% of the construction sites should give a fair picture of construction noise exposure on people of Hong Kong at times most of them expect to have a quieter living environment.

10. Over the 9-month enforcement period since the launch of new control, there are although almost 200 breaches of the NCO which take up to about 16% of all inspections, the rate of breaching the NCO is found dropping from 29% in November 96 to 15% in December 96 and has maintained fairly constant at around 10% from April to May 1997. The rate further drops to 8% in June 97 and 6% in July - the lowest in record. All these suggest a significant improvement over the corresponding highest rate of 29% in November 96.

Effects on the New Control on Construction Industry

11. Apart from increased enforcement action, the reduction in rate of breaching the NCO is mainly due to 3 factors, viz. (a) increase in awareness of new control; (b) high punitive fines, and (c) company image.

(a). Increase in awareness

Although there were extensive briefings and consultation with the relevant trades, institutes and professional bodies during the drafting and implementation of the new controls, the working level of the construction industry might not be fully aware of the regulations. As such, a number of briefing sessions at the time of launching the new control were given to the working level to bring them up to date. Furthermore, workshops were given after the launch to clarify doubts and misunderstanding on interpretation of the new control.

(b). High punitive fines

Prosecution actions against the suspected breaches follow construction site surveillance. A highest fine of HK\$180,000 (US\$23,500) against the carrying out of PCW without a CNP was registered in February 97. This is close to the maximum fine of HK\$200,000 (US\$25,000) in the NCO. It is considered that the high punitive fines have deterrent effect on the construction industry.

(c). Company image

Furthermore, it is now EPD's practice to publicize convictions regularly on a monthly basis for the information of the community. Both the name of the construction companies and their total number of convictions under the ordinance are included in the monthly press release. Almost all contractors are concerned about their public image and that give tremendous impetuses for them to avoid further breaching the ordinance.

Further Liaison with Construction Industry

12. To sustain the objective of construction noise control, cooperation from the whole

construction industry is required. The workload on noise control should not be restricted only to construction work force but to include construction related professional persons such as project proponents, architects and engineers. All contracts should have made allowance for the regulatory restrictions on construction works and be allowed sufficient time in respective project programmes.

13. The following areas of activities will be beneficial to the long term control of construction noise and some of them have been put into operation by EPD and the construction industry.

- Liaison with senior management of the repeated offending contractors and project proponents drawing their attention to rectifying malpractice in their construction sites.
- Liaison with works department thus enabling offences or environmental performance of a contractor could be reflected in the tender selection process.
- Establishment and employment of environmental engineer in a construction establishment to oversee and monitor environmental noise problems so that tailor made mitigation measures and correctly prepared CNP applications could be submitted for approval of the Authority.
- Ways to speed up the process of CNP application would be developed to facilitate programming of work of contractors.

Conclusion

14. The construction noise permit system that has been put in place since 1989 is effective in controlling excessive noise affecting sensitive receivers. In order to sustain the objective of protecting the community from noise disturbance, it is important to set up proper communication channels between the Noise Control Authority, contractors, project proponents and works departments. With the implementation of the new control and parallel enforcement actions, construction noise disturbance in Hong Kong can be further reduced. It is believed that a prudent and thorough planning to prevent excessive construction noise from arising is better than just deterring contractors by initiating prosecutions. The tightened up new control has so far made significant progress towards providing the 6 million people in Hong Kong an improved living environment.

References

- [1] Noise Control Ordinance (Chapter 400) 1988, Laws of Hong Kong.
- [2] Technical Memorandum on Noise from Construction Work other than Percussive Piling, Environmental Protection Department, March 1996.
- [3] Technical Memorandum on Noise from Construction Work in Designated Areas, Environmental Protection Department, March 1996.