

# NOISE MANAGEMENT AT HYDRO-QUÉBEC CONSTRUCTION SITES

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## 1. INTRODUCTION

Noise generated by construction site activities is likely to become a major source of nuisance if inadequately managed. This prompts the need for criteria to control the nuisance resulting from such activities. Prescribed controls must take into account the specific nature of construction noise, i.e., temporary and fluctuating. Hydro-Québec conducted an exhaustive review of the statutes, regulations, criteria and procedures used by different agencies and organizations to manage this type of noise. That review resulted in the 1993 publication of guidelines for noise management at Hydro-Québec construction sites (*Guide relatif à la gestion du bruit des chantiers de construction d'Hydro-Québec*).

## 2. NOISE CRITERIA

Two types of criteria are used to manage noise at construction sites. The first refers to individual items of equipment likely to generate noise. It prescribes the permissible noise level at a given distance from the apparatus, generally 15 metres, when only that one apparatus is in operation. This criterion varies with the item of equipment involved.

The second type of criterion sets a maximum noise level for construction site activities as a whole, at one or more specific spots. This approach has the advantage of reckoning with the worksite environment, as the criteria are established in light of milieu sensitivity.

Having weighed both options, Hydro-Québec decided to base its noise criteria (NC) on the noise emanating from the site as a whole, given that the magnitude of the noise impact of a construction site is determined by all the noises heard in the sensitive areas of the site, not the

noise originating from individual items of equipment.

Noise criteria were thus established in terms of host milieux, i.e., the types of areas in which the noises are heard. Table 1 gives permissible maximum noise levels. Note that noise emanating from trucks operating off-site is not subject to the levels prescribed in this table. It was deemed more appropriate to establish maximum noise levels for different categories of trucks (see Table 2).

**Table 1: Recommended Noise Criteria  
for Construction Sites**

Type of host milieu	Permissible daytime level (dBA)	Permissible nighttime level (dBA)
Institutional	65	50 ( $\leq 1$ month) 45 ( $> 1$ month)
Inhabited	75 ( $\leq 1$ month) 70 (1 to 6 months) 65 ( $> 6$ months)	50 ( $\leq 1$ month) 45 ( $> 1$ month)
Commercial	75	60
Industrial	80	80
Vacant	No NC	No NC

**Table 2: Recommended Noise Criteria  
for Heavy Trucks**

Truck horsepower (HP)	Measuring distance (m)	Permissible noise level
under 275	15	84
275 and over	15	87

## 3. NOISE MEASUREMENT

The guidelines mentioned earlier describe the procedure for evaluating construction site noise.

Needless to say, meteorological conditions, e.g., temperature, humidity, wind velocity and direction, soil type and cloud cover, must be determined and logged. It is inadvisable to make measurements when the temperature is below -10°C or the wind velocity above 6 m/s.

### 3.1 Measuring Construction Site Noise

The procedure for measuring construction site noise is derived from Standard SAE J1075 MAR87 "Sound Measurement-Construction Site." However, that standard was modified somewhat for our purposes. First, the measuring points are to be located in areas most susceptible to site noise. Second, the measuring process shall last a minimum of 30 consecutive minutes (Leq 30 min) and shall be scheduled to include the times of greatest impact.

### 3.2 Measuring Truck Noise

In situations that require measuring the noise generated by trucks, Standard SAE J1096 FEB87 "Measurement of Exterior Sound Levels for Heavy Trucks under Stationary Conditions" shall be used.

### 3.3 Measuring Noise from Trucking Activities

Most impact-assessment studies for construction sites require measurement of the noise from trucks on the surrounding roads. Although no criterion has been prescribed, this is necessary to determine and, where appropriate, minimize the impact of truck traffic. The recommended measuring procedure is derived from the document "Sound Procedures for Measuring Highway Noise," prepared for the US Federal Highway Administration.

The recommended minimum sampling time is 10 minutes, and the vehicles are counted by category for the duration of the procedure

## 4. NOISE IMPACT-ASSESSMENT STUDY

Hydro-Québec's guidelines describe the stages of a noise impact-assessment study for

construction sites, as well as some of the sampling tools to be used.

The stages are as follows:

- Verify the need for the study
- Gather the relevant information
- Establish applicable noise criteria
- Measure background noise
- Forecast noise levels
- Validate project conformity and impact
- Propose mitigative measures
- Design monitoring program

Project impact is determined by the gain in noise levels together with the duration of the work. It is evaluated by means of tables 3 and 4.

**Table 3: Gain in Noise Levels**

Gain in noise level (dBA)	Description of gain
Less than 0	Negative
0 to 3	Insignificant
3 to less than 5	Small
5 to less than 10	Medium
10 to less than 15	Strong
15 and over	Very strong

**Table 4: Impact Evaluation**

Description of gain	Duration		
	1 month or less	1 to 6 months	more than 6 months
Negative	Positive	Positive	Positive
Insignificant	Insignificant	Insignificant	Insignificant
Small	Insignificant	Small	Small
Medium	Small	Small	Medium
Strong	Small	Medium	Strong
Very strong	Medium	Strong	Very strong

## 5. CONCLUSION

Hydro-Québec's guidelines for the management of construction site noise provide a standardized approach to the problem of noise pollution and a means of clearly determining the associated impacts.