

## **Hearing Levels and Hearing Protection Use in the British Columbia Construction Industry - 1988-1997**

**by Heather Gillis and Christine Harrison, WCB of BC**

In 1987, the regulatory requirement for annual hearing tests was extended to noise-exposed construction workers in British Columbia. Hearing tests are conducted in audiometric booths meeting ANSI S3.1-1991 with audiometers meeting ANSI S3.6-1996 for at least Type 4, by technicians certified by WCB of BC. Hearing test results are submitted to a central data registry.

An analysis of tests received in the first full year of the program (1988) and the most recent full year (1997) is presented for six construction trades: carpenters, electricians, equipment operators, labourers, truck drivers, and welders. 16,167 tests were available for analysis in 1988; 23,796 tests for 1997. Of these, 3510 tests in 1988 and 4634 tests in 1997 came from male workers in the six aforementioned trades with from 16 to 25 years at that trade. Mean ages of the workers in the six trades ranged from 42 to 46 years. Noise exposures for the six occupations ranged from 85.4 to 93.3 dBA  $L_{ex}$ .

Median hearing levels (right ears only) in each occupation for 1988 and 1997 were compared with the ISO 1999 predicted noise induced permanent threshold shift (NIPTS) as well as the expected age-related hearing loss (ARHL) for non-noise-exposed 40-year olds from database B (.50 fractile). In all trades, the 1988 median hearing levels of workers were better than the predicted NIPTS + age-related loss, and the 1997 median hearing levels were better than the 1988 levels.

Regular use of hearing protection ranged from 49 - 76% in the six trades in 1988. Usage rates improved by 1997 to 64 - 94%. Hearing protection used by construction workers is predominantly class A earplugs (typically compressible foam plugs).

In Canada, hearing protection is classified by attenuation according to Canadian Standards Association Standard Z94.2-1994. See table below for roughly equivalent values of NRR and CSA classes:

CSA Class	NRR (Approximate)
A	24+
B	17-24
C	<17

## Population Characteristics

Occupation	1988			1997		
	Sample Size	Mean Age	Mean Years at Occupation	Sample Size	Mean Age	Mean Years at Occupation
<b>Carpenters</b>	<b>1294</b>	<b>43</b>	<b>20</b>	<b>1576</b>	<b>42</b>	<b>21</b>
<b>Electricians</b>	<b>566</b>	<b>42</b>	<b>21</b>	<b>558</b>	<b>42</b>	<b>20</b>
<b>Equipment Operators</b>	<b>384</b>	<b>45</b>	<b>21</b>	<b>987</b>	<b>43</b>	<b>21</b>
<b>Labourers</b>	<b>893</b>	<b>46</b>	<b>20</b>	<b>1025</b>	<b>44</b>	<b>21</b>
<b>Truck Drivers</b>	<b>158</b>	<b>44</b>	<b>21</b>	<b>302</b>	<b>44</b>	<b>21</b>
<b>Welders</b>	<b>215</b>	<b>44</b>	<b>21</b>	<b>186</b>	<b>44</b>	<b>21</b>

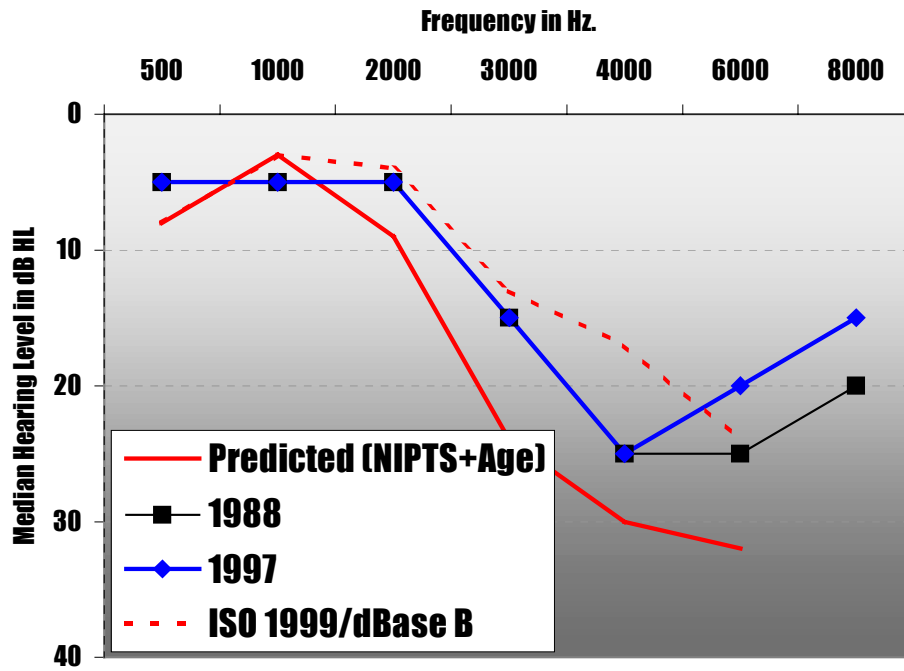
## Construction Industry Noise Exposures

Occupation	Noise Exposure Level in dBA, $L_{ex}$	Sample Size
<b>Carpenters</b>	<b>91.3</b>	<b>63</b>
<b>Electricians</b>	<b>85.4</b>	<b>15</b>
<b>Equipment Operators</b>	<b>91.6</b>	<b>46</b>
<b>Labourers</b>	<b>93.3</b>	<b>59</b>
<b>Truck Drivers</b>	<b>88.3</b>	<b>17</b>
<b>Welders</b>	<b>91.7</b>	<b>22</b>

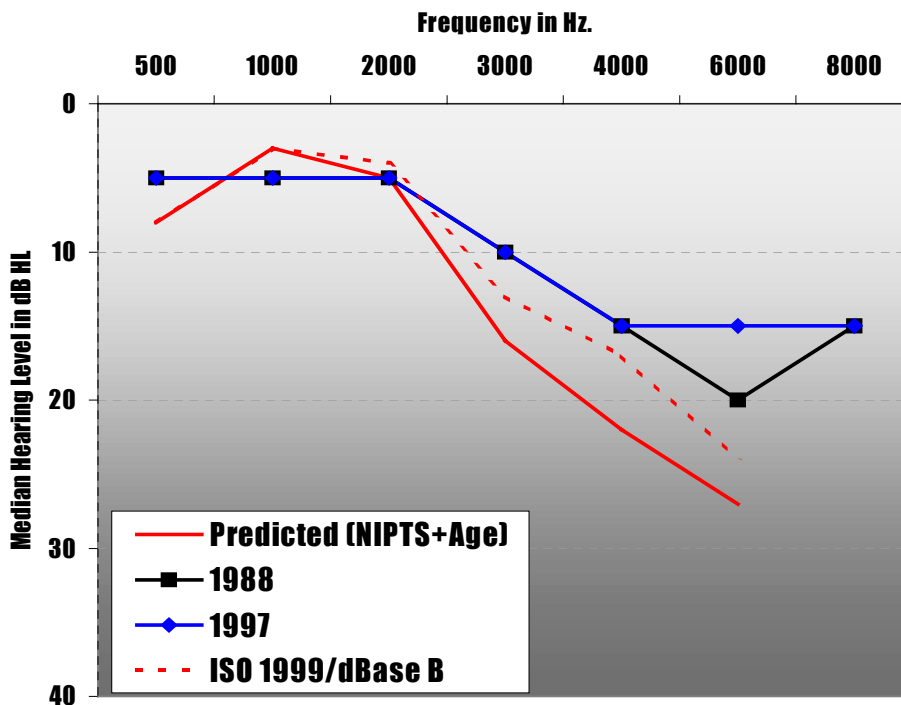
Noise exposure levels determined in accordance with sampling method in CSA Standard Z107.56-94 "Procedures for the Measurement of Occupational Noise Exposure" for precision of  $\pm 2$ dB with 95% confidence.

**$L_{ex}$  is the A-weighted equivalent steady sound level which, over 8 hours, has the same noise dose as that actually acquired in the entire work shift.**

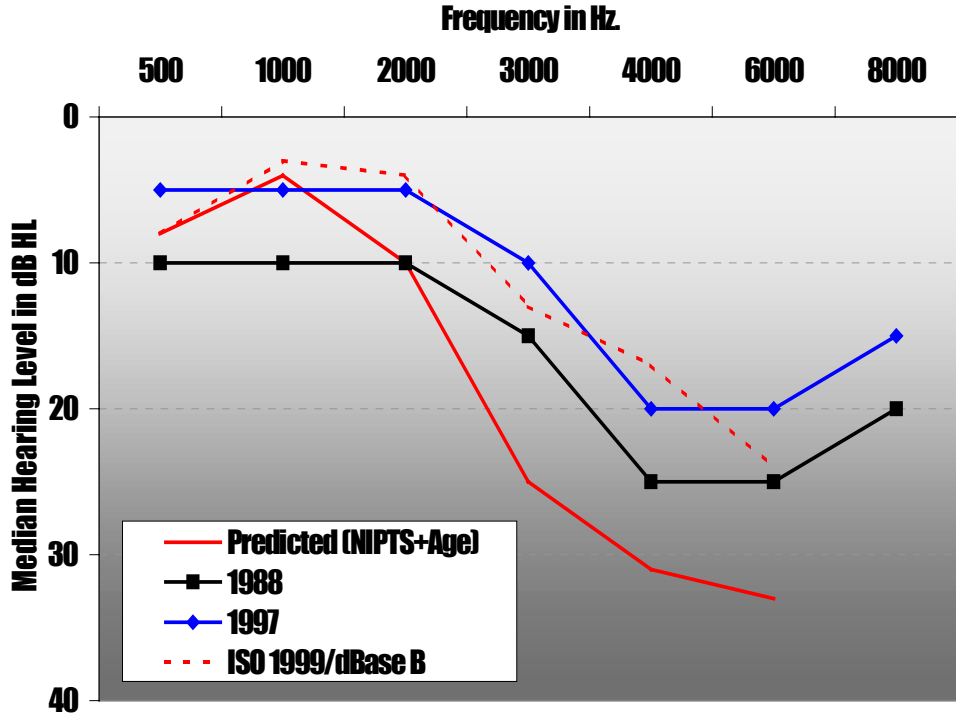
# Carpenters



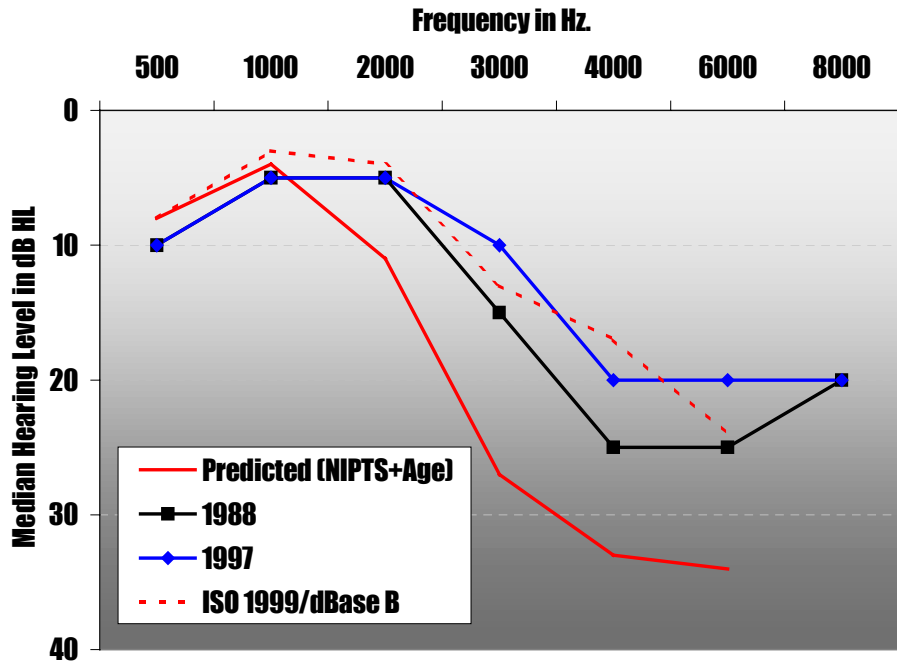
# Electricians



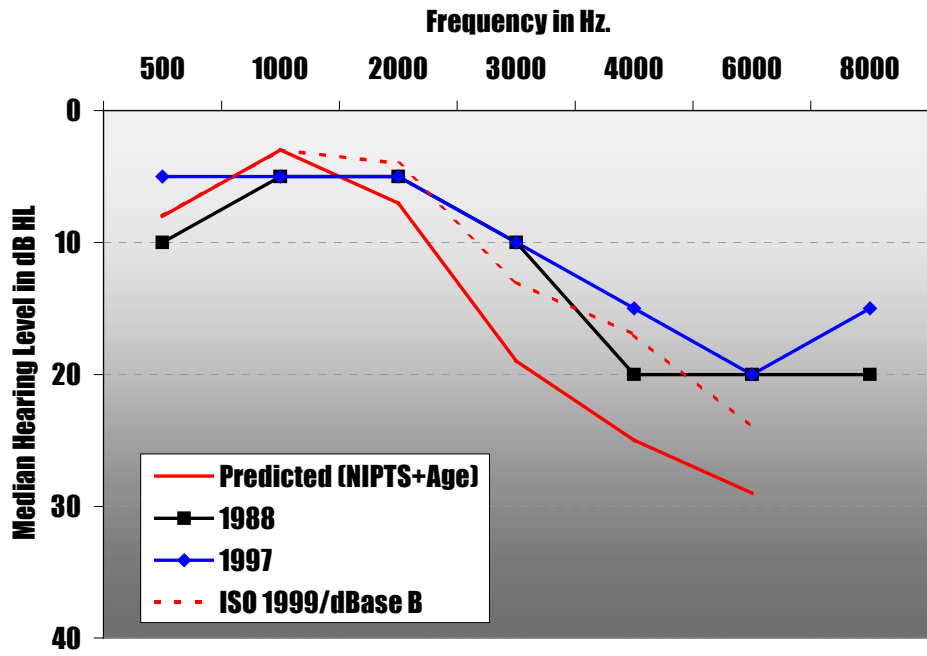
# Equipment Operators



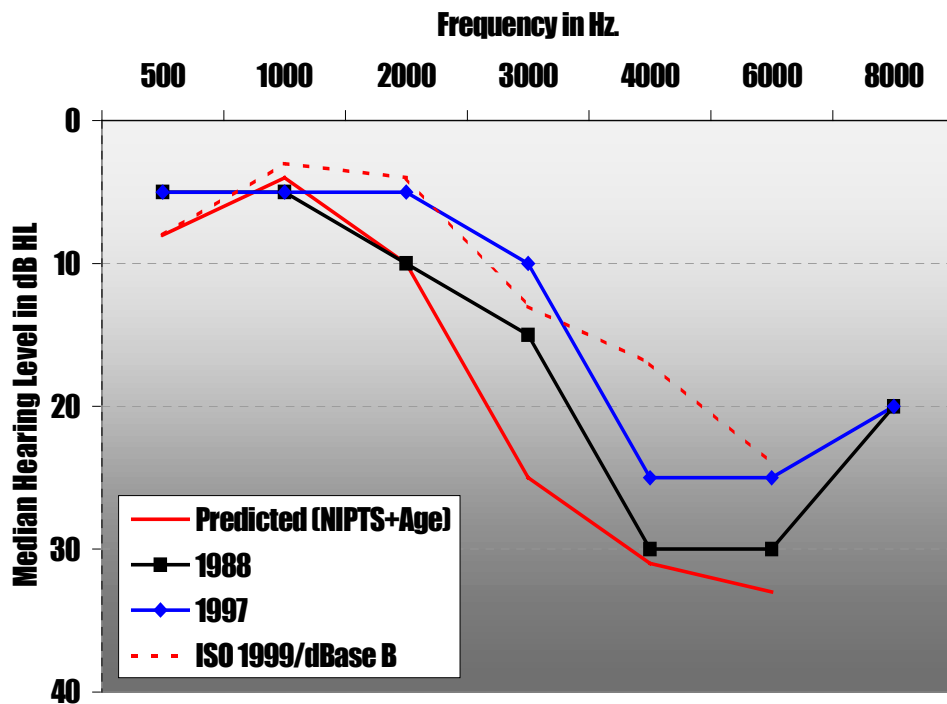
# Labourers



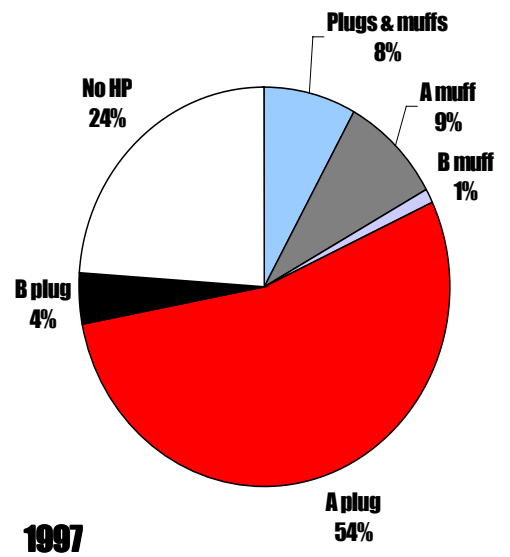
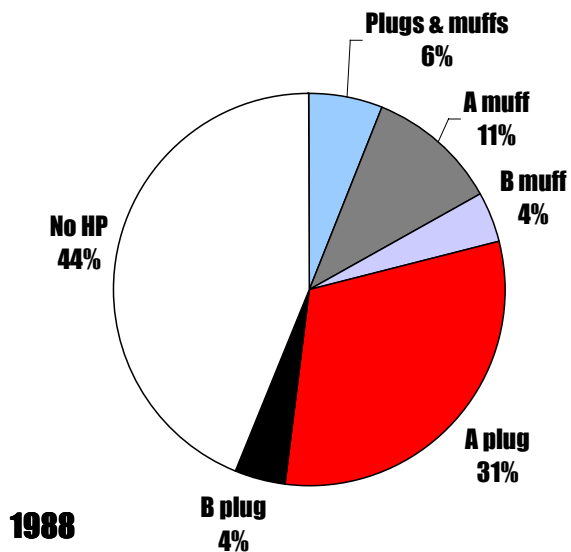
# Truck Drivers



# Welders



## Hearing Protection Use





WORKERS'  
COMPENSATION  
BOARD  
OF BRITISH  
COLUMBIA

## Regular Use of Hearing Protection by Occupation

