

SAFETY MANUAL

[PP 10/13/2019 - 10/26/2019] Hearing Conservation Program

1. Temporary Hearing Loss
 - a. Results from short term exposure to noise
 - b. Hearing returns when away from the noise

2. Permanent Hearing Loss
 - a. Long term exposure to a moderate or high level of noise
 - b. Hearing loss is **PERMANENT**

3. Hearing protection devices are selected according to:
 - a. Employee comfort
 - b. Level of noise exposure
 - c. NRR of device
 - d. Type of work being performed
 - e. Environmental conditions

4. Employee may select hearing protection from a variety of suitable hearing protectors provided by employer.



"If I was wearing my 'what' ?!"



FOAM INSERT EARPLUGS

EAR MUFFS

SEMI-AURAL EARPLUGS

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Advantages

- More protection at lower frequencies than muffs
- Various NRRs available
- Inexpensive; disposable
- Can be custom molded for individual worker
- Reusable plugs are available

Disadvantages

- Hands must be cleaned before inserting earplugs
- Improper insertion reduces NRR value



Advantages

- More protection at higher frequencies than earplugs
- Various NRRs available
- Durable, long lasting
- Can be fitted on hard hat
- Reusable

Disadvantages

- Higher cost
- Eye glasses can interfere with ear muff seal
- May be uncomfortable in hot environments
- Must be cleaned before use by another worker



Advantages

- Various NRRs available
- Easy to insert
- May be used several times
- Ideal for people going in and out of noisy areas

Disadvantages

- Improper insertion reduces effectiveness
- More expensive than ear plugs
- Typically have lower NRRs than plugs or muffs



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BCA HEARING CONSERVATION PROGRAM (HCP)

The BCA HCP is a conservative approach to ensuring employee hearing safety and health. Based on the three primary factors (Sound Levels – Duration – Distance) the following rules are mandated.

1. New employees, including part-time, temporary and contract, shall have baseline hearing tests performed by City Medical Services.
2. All employees will be issued NRR hearing attenuators to reduce sound levels to within the levels of the Appendix B: Table N-1. This PPE will be provided at no cost to the employee.
3. New employees will be initially trained in proper use of the BCA issued hearing attenuators.
4. All employees will have refresher training for Hearing Attenuation – Hearing Safety during the regularly scheduled BCA Tailgate Safety meeting (GISO Article 3, General §1509 (e)).
5. Employees are responsible for the proper fit and care of hearing protection and that BCA shall ensure proper initial fitting and training and supervise the correct use of all hearing protectors.
6. BCA will also replace old or worn-out hearing protection as necessary.
7. BCA supervisors and employees shall have regular discussions to determine what types of hearing attenuation is required for the assigned work. Inspectors shall follow the direction given or face disciplinary actions.

HEARING ATTENUATION USE - (Inspecting work near any power-actuated equipment)

1. Category 1: General Hearing Attenuation Policy
 - a. Referring to Appendix A (Tables 2, 3, 4) and Appendix C all inspectors may inspect without hearing attenuation PPE provided they are:
 - i. Standing no closer than 20 feet from the construction activity
 - ii. Not exceeding continuous observation for longer than 1 hour or,
 - iii. Exceeding a minimum exceeding 4 hours within the 8 hour day.
2. Category 2: Mandatory Hearing Attenuation Use Policy
 - a. Referring to Appendix A (Tables 2, 3, 4) and Appendix C all inspectors shall be required to use hearing attenuation PPE if;
 - i. Inspection requires continuous observation that exceeds 1 hour or,



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- ii. Exceeds more than 4 hours within the 8 hour day.
 - iii. All pile driving activities require mandatory continuous use of issued hearing attenuation for any duration that the inspector is within 100 feet from the operation.
- b. At any location posted with a sign stating “HEARING PROTECTION REQUIRED BEYOND THIS POINT” or similar statement.

EMPLOYEE RESPONSIBILITY

- 1) Employees shall maintain their assigned hearing protection PPE in clean and operable condition.
- 2) The inspector shall communicate with their supervisor any time that they have a concern about hearing attenuation PPE use.
- 3) Inspectors shall not perform their duties without hearing attenuation PPE if the assignment requires its use.

Per Cal/OSHA regulations (CCR, Title 8, Section 5097), all personnel who are exposed to occupational noise levels equal to or exceeding an 8-hour time-weighted average of 85 dBA shall be included in a hearing conservation program.





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APPENDIX A: SOUND LEVELS

In this brochure two tables were provided that compared the highest task and tool exposures for construction workers noise levels.

Table 2: Ten loudest tasks

Tasks (Trade)	Average noise level (dBA)	Maximum noise level (dBA)
Installing Trench Conduit (Electricians)	95.8	118.6
Operating Work Vehicle (Bricklayers)	98.0	116.7
Operating Manlift (Operating Engineers)	98.1	117.6
Welding, Burning (Ironworkers)	98.4	119.7
Operating Scraper (Oper. Engineers)	99.1	108.6
Demolition (Laborers)	99.3	112.1
Laying Metal Deck (Ironworkers)	99.6	119.9
Grinding (Masonry Trades)	99.7	118.6
Operating Bulldozer (Oper. Engineers)	100.2	112.5
Chipping Concrete (Laborers)	102.9	120.3

Table 3: Ten loudest tools

Tools	Average noise level (dBA)	Maximum noise level (dBA)
Welding, Cutting Equipment	94.9	122.8
Other Hand Power Tool	95.4	118.3
Hand Power Saw	97.2	114.0
Screw Gun, Drill Motor	97.7	123.7
Rotohammer	97.8	113.5
Chopsaw	98.4	117.7
Rattle Gun	98.4	131.1
Stationary Power Tool	101.8	119.8
Powder Actuated Tool	103.0	112.8
Chipping Gun	103.0	119.2

Equipment and daily activities at construction job sites can expose workers to high levels of noise. Sound levels on the chart below are listed in decibels (dBA) – the larger the number, the higher the volume or decibel level. How loud the noise is (volume), how long the noise lasts, and how close you are to the noise are all important in determining the hazard.

APPENDIX B: DURATION

§5096. Exposure Limits for Noise.

(a) Protection against the effects of noise shall be provided when the sound levels exceed those shown in Table N-1 of this section when measured on the A-scale of a standard sound level meter at slow response.

(b) When employees are subjected to sound levels exceeding those listed in Table N-1 of this section, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of the table, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.



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Table N-1 Permissible Noise Exposure¹

<i>Permitted Duration Sound Per Workday</i>			<i>Permitted Duration per Workday</i>		
<i>Level (dBA)</i>	<i>(hours- minutes)</i>	<i>hours</i>	<i>Sound Level (dBA)</i>	<i>(hours- minutes)</i>	<i>hours</i>
90.....	8-0.....	8.00	103.....	1-19....	1.32
91.....	6-58.....	6.96	104.....	1-9....	1.15
92.....	6-4.....	6.06	105.....	1-0....	1.00
93.....	5-17.....	5.28	106.....	0-52....	0.86
94.....	4-36.....	4.60	107.....	0-46....	0.76
95.....	4-0.....	4.00	108.....	0-40....	0.66
96.....	3-29.....	3.48	109.....	0-34....	0.56
97.....	3-2.....	3.03	110.....	0-30....	0.50
98.....	2-38.....	2.63	111.....	0-26....	0.43
99.....	2-18.....	2.30	112.....	0-23....	0.38
100.....	2-0.....	2.00	113.....	0-20....	0.33
101.....	1-44.....	1.73	114.....	0-17....	0.28
102.....	1-31.....	1.52	115.....	0-15....	0.25

APPENDIX C: DISTANCE

The sound pressure p changes with $1 / r$ of the distance. So, if we double the distance, we reduce the sound pressure by a ratio of 2 and the sound intensity by a ratio of 4. In other words, we reduce the sound level by 6 dBA. If we increase r by a ratio of 10, we decrease the level by 20 dBA.

The sound intensity level and the sound pressure levels in dB have the same value, but the size of sound pressure and the size of acoustic intensity is different, because $I \sim p^2$.

Noise energy dissipates in the air by 6 decibels as the distance doubles. The table below gives an illustration.

Distance from noise source (meters)	Noise level at that distance dB(A)
10	96
20	90
40	84
80	78
160	72
320	66
640	60