



Hazardous Occupational Noise



April 2024

This document is neither a substitute for, nor a legal interpretation of, the occupational safety and health regulations. Readers must refer directly to title 8 of the California Code of Regulations and the Labor Code for details regarding the regulations' scopes, specifications, and exceptions, and other requirements that may apply to their operations.

Workplace safety and health information is available online at:

- General information: www.dir.ca.gov/dosh
- Cal/OSHA regulations: www.dir.ca.gov/samples/search/query.htm
- Cal/OSHA safety and health publications: www.dir.ca.gov/dosh/puborder.asp
- Cal/OSHA etools: www.dir.ca.gov/dosh/etools/etools.htm

Cal/OSHA Consultation Services offers free telephone, email, and onsite assistance. Find a local office online (www.dir.ca.gov/dosh/consultation.html) or with the contact information listed in the back of this document.

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DANGER

**NOISE
HAZARD**

Introduction

Millions of U.S. employees are occupationally exposed to hazardous noise levels every year. These exposures can result in:

- Temporary loss of hearing, one of the warning signs of excessive noise exposure.
- Permanent loss of hearing, something that affects the ability to communicate, hear alarms, and reduces quality of life. Occupational hearing loss is one of the most common work-related illnesses in the United States.
- Tinnitus (ringing, buzzing, or humming in the ears), another warning sign of excessive noise exposure and something that can become permanent.
- Other health effects such as heart disease, hypertension, insomnia, increased fatigue, and stress.
- A high economic price to society.



- **About 1 in 8 people** in the U.S. working population have hearing difficulty. Occupational noise exposure accounts for 1 in 4 of those people.
- Noise-induced hearing loss is permanent, and preventable.

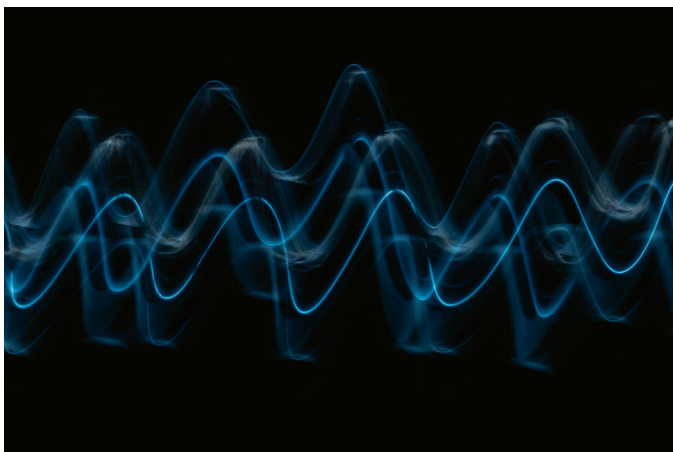
This publication is intended to help employers better understand:

- The hazards of excessive noise exposure to their employees.
- How to evaluate employee noise exposure levels.
- How to reduce employee noise exposures.
- The Cal/OSHA requirements for employees excessively exposed to noise.

Noise

A sound wave in air is generated when an object vibrates or compressed air is suddenly allowed to expand (air shear), producing oscillations of air

pressure. The intensity of those air pressure oscillations, typically measured as sound pressure levels, is usually expressed in decibels (dB). How quickly the air pressure oscillations occur (frequency), is expressed in hertz (Hz), the number of wave cycles per second. Workplace noise typically consists of numerous frequencies with varying sound pressure levels.



The intensity of the sound pressure levels (dB), how long it persists, as well as the frequency (Hz), are important factors when evaluating the hazardousness of noise in the workplace.

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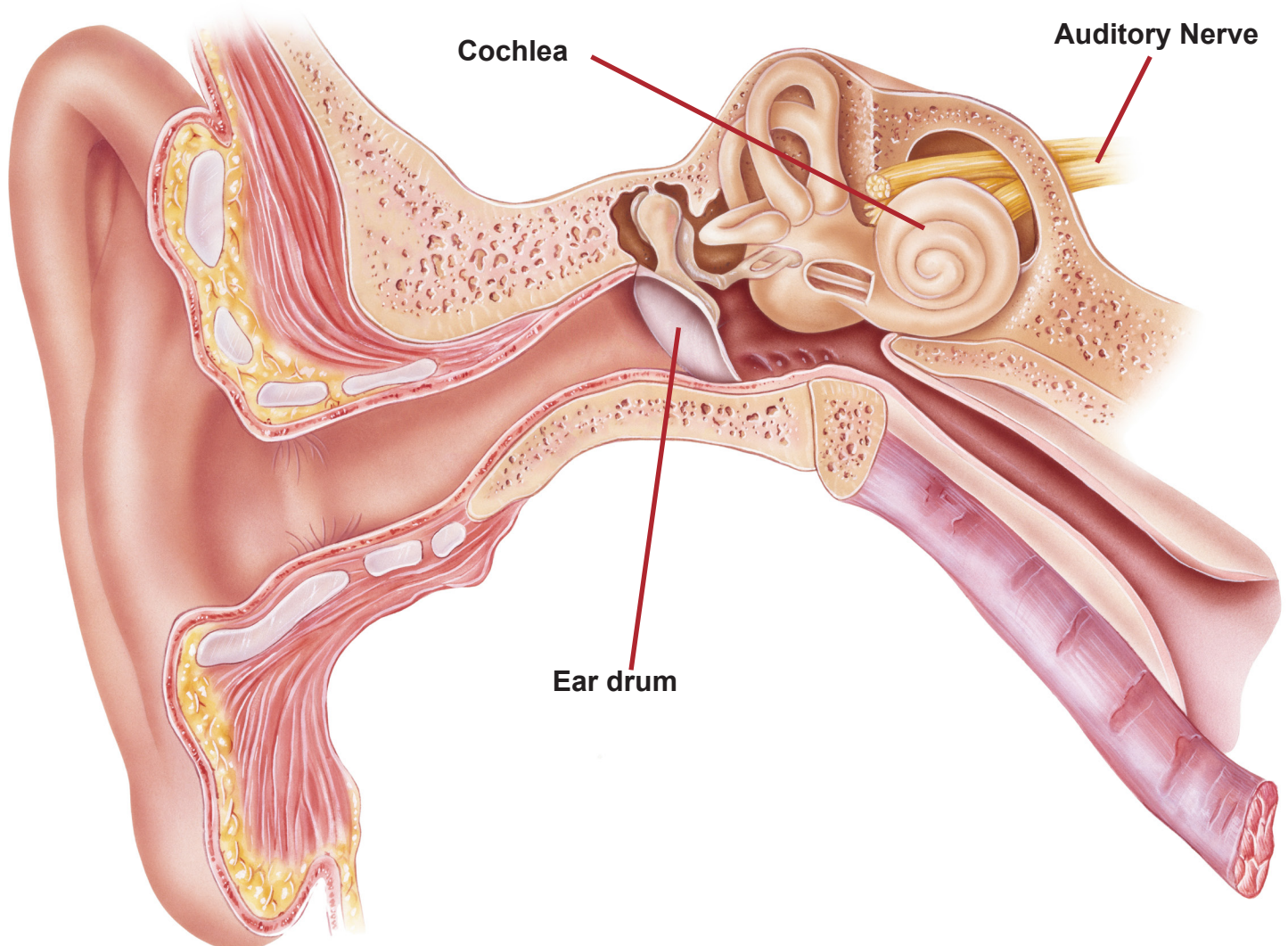
The human ear is not equally sensitive to sounds at different frequencies. This perceived intensity of sound by an individual is called its loudness. The loudness of a sound differs for different frequencies, even though the sound intensity may be the same.

Since the ear is more sensitive to higher frequencies, occupational noise exposure is measured with instruments that approximate the sensitivity of the human ear to noise. These measurements are expressed in decibels measured on the A-scale (dB-A).

Measurements on the C-scale (dB-C) are sometimes also used for determining the minimum attenuation that hearing protection must provide.

Continuous vs. impact (impulse) noise

The Cal/OSHA noise regulations focus on continuous noise, which is a variation in noise level peaks occurring at intervals of one second or less. Impact (collision of solid objects) and impulse (rapid release of compressed gas) noise occurs if the noise peaks occur more than one second apart. For instance, although a jack hammer produces noise impacts, it is continuous noise because the impacts occur in rapid succession.



Hearing Loss

The hearing system consists of several components that include the outer, middle, and inner ear. The cochlea of the inner ear has sensory cells that convert sound energy into neural energy. This is then transmitted via the auditory nerve to the brain, where it is deciphered.

Temporary hearing loss This can result from excessive exposures to noise, with normal hearing returning after a period of quiet. This temporary decrease in hearing ability is called a temporary threshold shift (TTS).

Permanent hearing loss Prolonged exposures to excessive noise over time can cause permanent damage to the sensory cells of the cochlea. A person who regularly sustains TTS can eventually suffer permanent hearing loss, or a permanent threshold shift (PTS). This typically occurs gradually over time. The damage to the sensory cells is permanent and cannot be corrected by surgery or medication.

When someone suffers noise-induced hearing loss, they have decreased sensitivity to frequencies above 2000 Hz. The loss usually appears first, and most severely, at frequencies around 4000Hz. With continued exposure, the loss spreads to frequencies between 500 and 6000 Hz. This results in difficulties in speech perception.

“I’ve already lost some hearing, so why should I care about further exposures to hazardous noise?”

Because the hearing loss can get worse!

Warning signs

Employees may be experiencing excessive noise levels if they:

- Must speak louder to be heard by someone more than an arm’s length away.
- Notice a temporary loss of hearing when the

noise stops or they leave the workplace.

- Complain about the loudness.
- Notice a temporary tinnitus when the noise stops or they leave the workplace.
- Experience permanent hearing loss or tinnitus.

Tinnitus and hearing loss may, or may not, be work related. There are many sources of hazardous noise levels outside of the workplace. Hearing loss and tinnitus can occur because of other reasons, such as age, exposure to certain chemicals, or certain medications.

“Can employees lose their hearing even though they are not exposed to hazardous levels of noise?”

Yes, employees can lose their hearing naturally with age, something referred to as presbycusis. Even more reason to not make it worse by also exposing them to hazardous noise levels.

The following can also be used to warn of excessive noise levels:

- Some manufacturers have conducted noise evaluations of their equipment. This information can help you get an idea of what sorts of noise levels your employees may be exposed to, and help you select which equipment to purchase — i.e., choose quieter equipment.
- Publications and other guidance.
 - Your industry association or workers’ compensation insurance carrier may have done noise exposure assessments for workplaces like yours, and are willing to share that information.
 - The National Institute of Occupational Safety and Health (NIOSH) has also conducted numerous noise health hazard evaluations (HHE) of a variety of workplaces that can be accessed through their web page:

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- [HHE Program Noise Measurement Database](#)
- The general [HHE data base](#), where you can also request an HHE
- [Noise and Hearing Loss, 1986-1997](#)

Additional information

Refer to the following websites:

- NIOSH: [Noise and Occupational Hearing Loss](#)
- OSHA: [Hearing Loss in Construction](#)

Noise Measurement

Conducting appropriate noise exposure assessments is the best way to determine how much noise employees are exposed to. There are several different types of equipment that can be used. It is important that the equipment used is suitably accurate and the noise assessments accurately represent employee exposures.

Sound level meters

Sound level meters used for occupational noise evaluations are hand-held devices that are typically used to:

- Conduct general area monitoring that screen areas of the workplace to see if additional measurements are needed.
- Identify hazardous noise sources.
- Confirm measurements taken by dosimeters.

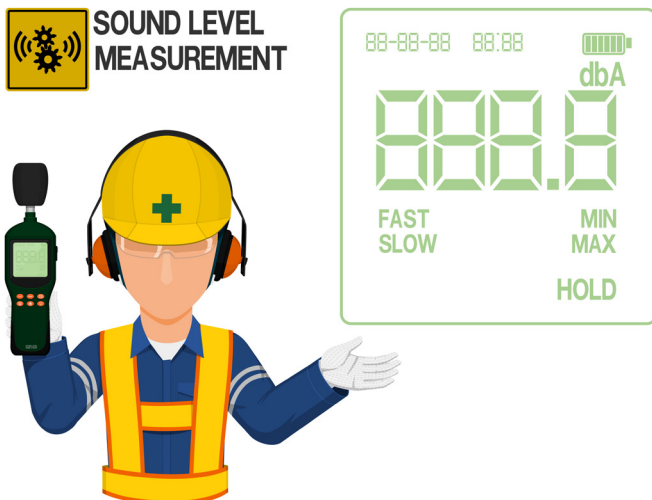
- Measure impact or impulse noise.
- Determine feasible engineering controls.

For employee occupational noise evaluation purposes, sound level meters must be used with:

- An A-weighted frequency filter.
- A slow meter response.
- An omni-directional microphone.

Dosimeters

Noise dosimeters are typically used to conduct personal monitoring and can be worn by employees with the microphone positioned in their hearing zones. This better approximates what the employees are exposed to as they conduct their work, and provide full-shift time-weighted averages. The hearing zone is the area within 12 inches of the employee's head.



Dosimeters measure and average the noise levels that exceed specified threshold levels. A threshold level is the sound pressure level above which a noise dosimeter begins measuring. The threshold level is set at:

- 80 dB to determine if a hearing conservation program is required, including the provision of hearing protection to employees.
- 90 dB to determine if feasible engineering and administrative controls must be implemented, and employees must be provided with and wear hearing protection.

Dosimeters are required to measure all continuous and impact (impulse) noise levels between the threshold and 130 dB, using an exchange rate of 5 dB. The exchange rate is the increase (or decrease) in decibels corresponding to twice (or half) the noise dose. Dosimeters must also be used with an A-weighted frequency filter; a slow meter response; and an omni-directional microphone.

The Environmental Protection Agency, NIOSH, and other countries use a 3 dB exchange rate, while the U.S. Department of Defense uses a 4 dB exchange rate. Some dosimeters may provide simultaneous results using more than one exchange rate.

Octave band analyzers

Octave band analyzers are primarily used to determine the dominant frequency bands that make up the noise. This is important information when determining the best types of engineering controls and hearing protection to reduce employee exposures.

Calibrators

Calibration of all these instruments is critical to ensure accurate noise assessments. There are two types of calibration:

- Periodic calibrations conducted according to manufacturer specifications. These are typically done by the manufacturer, or their authorized representative. The manufacturer determines the frequency of these calibrations.
- Pre- and post-measurement calibrations done using a calibrator that itself must be calibrated according to manufacturer specifications.

Be sure to follow the manufacturer's instructions.

Equipment accuracy

The American National Standards Institute (ANSI) establishes precision and accuracy specifications for sound level meters, dosimeters, and calibrators. There are two types commonly used for noise measurements in the workplace:

- **Type 1:** Used for precision measurements in the field, conducting octave band analysis, and preferred for the design of cost-effective noise controls. Accurate within +/- 1 dB.
- **Type 2:** Used for general purpose measurements, and is the type most used to conduct employee noise exposure assessments. Accurate within +/- 2 dB.

The International Electrotechnical Commission (IEC) also specifies technical requirements for sound level meters and dosimeters.

Sound level meters and noise dosimeters used to conduct employee noise exposure assessments to determine compliance with Cal/OSHA requirements must meet at least the Type 2 precision and accuracy requirements.

It is important that the manufacturer instructions be followed so that accurate noise exposure results can be obtained, particularly when it comes to:

- The location of the microphone on the employee being evaluated relative to the noise source.
- The type of noise source, such as if the noise source is highly directional or there is reverberation (repeated reflections of noise within a room).
- Environmental conditions that can affect the readings, such as:
 - Humidity.
 - Atmospheric pressure.
 - Magnetic fields.
 - Chemical and dust contamination.
 - Temperature extremes.
 - Wind.

Cal/OSHA Requirements

Cal/OSHA's regulations on occupational noise are found in T8CCR, sections 1521, and 5095-5100.

Employee Noise Exposure Limits (Section 5096)

Continuous noise

Employee protection (administrative and engineering controls, and personal protective equipment) against the effects of noise exposure must be provided and used when employee noise level exposures exceed the Cal/OSHA Permissible Exposure Limit (PEL), which is either:

- The levels shown in Table N-1 of section 5096 when measured on the A-scale of a standard sound level meter set at slow response.

Table N-1 Permissible Noise Exposure
(Summarized — refer to section 5096 for details)

dBA	Permitted exposure duration (hours)
90	8
95	4
100	2
105	1
110	0.5
115	0.25

Agriculture, construction, and oil and gas well drilling and servicing operations are covered by these exposure limits, but exempt from the requirements of sections 5097 through 5100. However, since hazardous noise levels occur in these operations, it is recommended that employers protect their employees by implementing the requirements in sections 5097 through 5100.

- A dose of 100% when measured on the A-scale of a noise dosimeter set at slow response, a threshold of 90 dB, and a 5 dB exchange rate.

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Impact/Impulse noise

Employee exposure to impulsive or impact noise should not exceed a 140 dB peak sound pressure level.



Hearing Conservation Program (Section 5097)

In addition to the PEL for noise, the Cal/OSHA noise standards also establish an Action Level (AL) that is an 8-hour time-weighted average of 85 dB (A-scale, slow meter response), or equivalently, a dose of 50% using a threshold of 80 dB and 5 dB exchange rate.

The Cal/OSHA allowable exposure limits are intended to protect most, not all employees. Some employees may experience hearing loss when exposed to noise levels below the PEL. NIOSH has a Recommended Exposure Limit (REL) of 85 dBA averaged over 8 hours based on noise dosimetry using a 3 dB exchange rate. Using the 3 dB exchange rate is recommended since it is more protective than the Cal/OSHA PEL and AL, which are based on a 5 dB exchange rate. Some dosimeters provide simultaneous measurements based on 3 and 5 dB exchange rates.

Whenever employee noise exposures are at or above the AL, employers must administer an on-going effective hearing conservation program. Employee noise exposures must be computed in accordance with [Appendix A and Table A-1](#) and without regard to any attenuation (reduction in

noise reaching an employee's ears) provided by the use of personal protective equipment such as ear plugs or ear muffs.

The following are the required elements of the hearing conservation program:

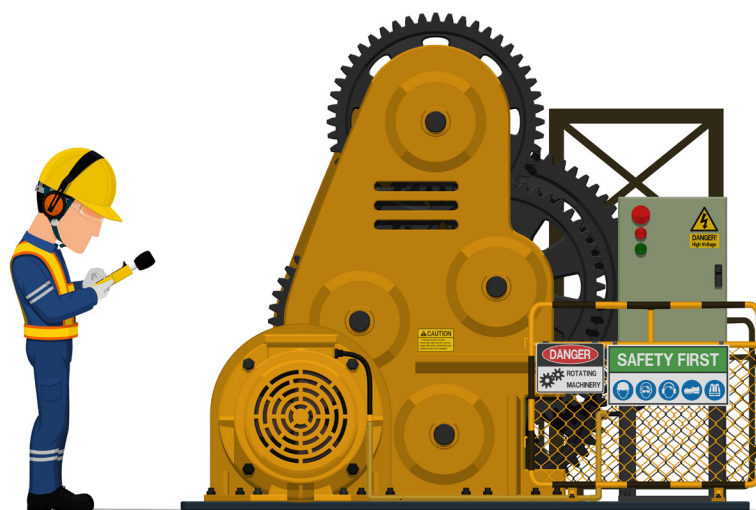
Employee exposure monitoring

When information indicates that any employee's exposure may equal or exceed the AL, the employer must obtain noise exposure measurements for those affected employees. The employer must ensure the following:

- That area or personal monitoring is representative of the employee's exposure and includes:
 - A sampling strategy designed to identify employees to include in the hearing conservation program and to enable the proper selection of hearing protectors.
 - All continuous, intermittent, and impact/impulsive sound levels from 80 dB to 130 dB are included.
 - Instruments used to measure employee noise exposure are calibrated according to the manufacturer instructions.
- Monitoring is repeated whenever a change in production, process, equipment, or controls increases noise exposures to the extent that:



NOISE MEASUREMENT



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- Additional employees may be exposed at or above the AL.
- The attenuation provided by hearing protectors used by employees may be rendered inadequate — i.e., it no longer meets the requirements of section 5098(b).
- Affected employees or their representatives are provided with an opportunity to observe any measurements of employee noise exposure.
- All employees exposed at or above the AL are notified of the results of the monitoring.

Representative exposure monitoring are measurements of an employee's noise dose or 8-hour time-weighted average (TWA) sound level that the employer deems to be representative of exposures of the employees in the workplace. Circumstances such as high employee mobility, significant variations in sound level, or a significant amount of impact/impulse noise make area monitoring generally inappropriate. In such situations the employer must use representative personal sampling to comply with the monitoring requirements unless the employer can show that area sampling produces equivalent results.

Audiometric testing

The employer must establish and maintain an audiometric testing program for all employees whose exposures equal or exceed the AL by:

- Making hearing tests available at no cost.
- Establishing a valid baseline audiogram that subsequent audiograms can be compared to.
- Making subsequent hearing tests available on at least an annual basis.

The purpose of audiometric testing is to identify employees that may be experiencing hearing loss, or standard threshold shift (STS). An STS is a change in hearing threshold, relative to a

baseline audiogram, of an average of 10 dB or more at 2000, 3000 and 4000 Hz in either ear.

The audiometric testing program must meet the following [section 5097](#) requirements:

- 5097(c): Audiometric Testing Program
- 5097(d): Evaluation of Audiogram
- 5097(e): Audiometric Test Requirements
- 5097(f): Audiometer Calibration

This includes the requirements of the following appendices:

B: Audiometric Measuring Instruments

C: Audiometric Test Rooms

D: Acoustic Calibration of Audiometers

F: Determination and Application of Age Corrections to Audiograms

Hearing Protectors (Section 5098)

Employers must make hearing protectors available at no cost to all employees exposed above an 8-hour time-weighted average of 85 decibels or greater.



Employers must also require employees to use the hearing protectors when employees are exposed to the PEL or above, or who are exposed above an 8-hour time-weighted average of 85 decibels or greater and who have either:

- Been required to wear hearing protectors because baseline audiograms have not

yet been established (refer to section 5097(c)(9)).

- Experienced an STS.

When providing hearing protectors, employers must ensure:

- Hearing protectors are replaced as necessary.
- Employees are offered a variety of suitable hearing protectors to choose from.
- Employees are trained in the use and care of the hearing protectors they are provided.
- Proper initial fitting and supervision to ensure the correct use of all hearing protectors.
- The hearing protection selected provides adequate noise attenuation.

Hearing protector attenuation

The employer must use [Appendix E, Methods for Estimating the Adequacy of Hearing Protector Attenuation](#) to ensure the hearing protection used sufficiently reduces employee noise exposures.

- Hearing protectors must attenuate employee exposure to an 8-hour time-weighted average of 90 decibels or lower.
- Hearing protectors must attenuate exposures to an 8-hour time-weighted average of 85 decibels or lower for employees who have experienced an STS.
- The adequacy of hearing protector attenuation must be reevaluated whenever employee noise exposures increase to the extent that the hearing protectors provided may no longer provide adequate attenuation.

There are several methods that can be used to determine if hearing protection is providing adequate attenuation. The method may depend on the type of noise measurement instruments used.

- Four methods that involve the Noise Reduction Rating (NRR) developed by the Environmental Protection Agency (EPA).
- Three methods developed by the National Institute for Occupational Safety and Health (NIOSH).

Training (Section 5099)

The employer must institute a training program for all employees who are exposed to noise at or above the AL. This training must be repeated annually and updated to be consistent with changes in protective equipment and work processes. Employees must be informed of the following:

- The effects of noise on hearing.
- The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care.
- The purpose of audiometric testing, and an explanation of the test procedures.

Employers must also ensure access to information and training materials, including:

- Providing affected employees (or their representative) access to copies of the Cal/OSHA noise regulation ([Article 105](#)), and posting a copy in the workplace.
- Providing affected employees any informational materials pertaining to this standard that are supplied to the employer by the U.S. Department of Labor, Occupational Safety and Health Administration.

Recordkeeping (Section 5100)

Employers must ensure retention of the following records:

- All employee exposure measurements.
- All employee audiograms as required by section 5097(c) and (d).
- Measurements required by [Appendix C, Audiometric Test Rooms](#) of the background sound pressure levels in audiometric test rooms.

The employer must retain records for at least the following periods:

- Noise exposure measurement records: 2 years.

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- Audiometric test records: For the duration of the affected employee's employment.

All required records must be provided upon request to employees, former employees, representatives designated by the individual employee, and any authorized representative of the Chief of Cal/OSHA. Also refer to the provisions of [section 3204\(a\)–\(g\) and \(h\)](#).

Log 300 Injury & Illness Recording Requirements—Hearing Losses (Section 14300.10)

Unless employers fall under the allowed exceptions (10 or fewer employees or certain exempt industries), they are required to record all work-related fatalities, injuries, and illnesses as identified in Employer Records of Occupational Injury or Illness ([sections 14300–14400](#)).

Refer to Recording Criteria for Cases Involving Occupational Hearing Loss ([section 14300.10](#)) when it comes to occupational hearing losses. A Log 300 recordable hearing loss occurs when an employee's hearing test reveals that both of the following occur:

- The employee has experienced a work-related STS in hearing in one or both ears.
- The employee's total hearing level is 25 dB or more above audiometric zero (averaged at 2000, 3000, and 4000 Hz) in the same ear(s) as the STS.

Reducing Employee Noise Exposures

Feasible administrative and engineering controls must be implemented for employees experiencing noise exposures higher than the values listed in [Table N-1 of section 5096](#), or an equivalent dose of 100%. Ear protection may only be relied upon when those controls are not feasible, or don't adequately reduce employee noise exposure.

The following outlines some basic hazard control measures, ranked from the most effective to the least:

1. Eliminate or substitute

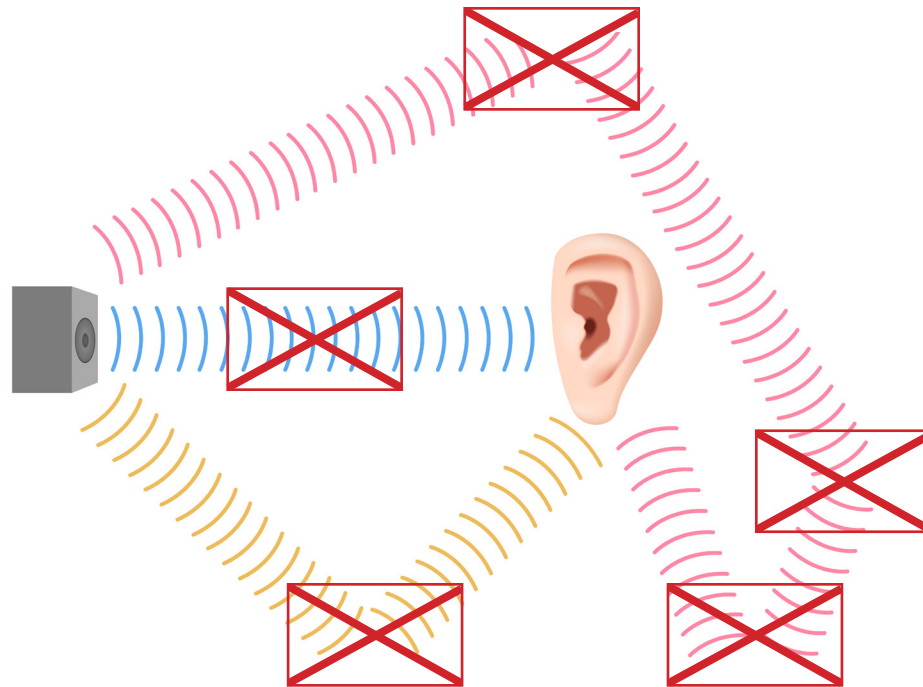
This is the ideal means of controlling employee hazardous noise exposure. Some examples include:

- Using **quieter machinery and tools**. Refer to the NIOSH [Buy Quiet initiative](#).
- Ensuring an effective **preventive maintenance** program for all machinery and tools.

2. Engineering

This type of control involves making changes that reduce the amount of noise created or its transmission. These changes can be to the equipment itself, adding an acoustical barrier between the source of the noise and the employee, and preventing/reducing reflection of noise off surrounding surfaces. Some examples include:

- Using **sound absorption** materials on reflecting surfaces.
- Installing barriers or enclosures that **isolate the noise** sources.
- **Dampening** equipment, or parts of equipment, that vibrate.
- Reducing the speed of **moving parts**.
- Changing the type of **hydraulic** pumps, or changing from **pneumatic** to hydraulic systems.
- **Moving machinery** to the center of a room, away from walls and reflective surfaces.
- Moving the source of noise to a **larger room** where reverberation (repeated reflections of noise within a room that can increase in amplitude) becomes less of a factor.
- Using compressed air nozzles or attachments designed to reduce the air shearing noise levels.



3. Administrative controls

This type of control depends on employees altering their work practices and procedures. Examples include:

- Increasing the distance between employees and the noise sources, which can significantly reduce noise exposures.
- Reducing the duration of exposure to noise to less than the Table N-1 section 5096 permitted durations per workday.
- Reducing the number of employees exposed to noise.
- Educating employees on the hazard and measures they can take to reduce their exposures (e.g., don't play loud music or wear headphones)

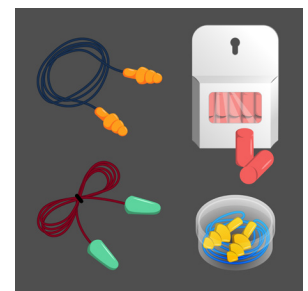
4. Hearing protection

There are several types, including:

- Ear muffs that cover the entire ear and rely on

a head or neck band to hold in place.

- Ear inserts. There are several types:
 - Expandable foam earplugs. The user must roll up the plug, insert it into the ear canal and hold it in place until it fully expands.
 - Pre-molded earplugs. They are one size-fits-all, or come in different sizes.
 - Canal caps that are like earplugs, but are on a flexible band that holds the plugs in place.

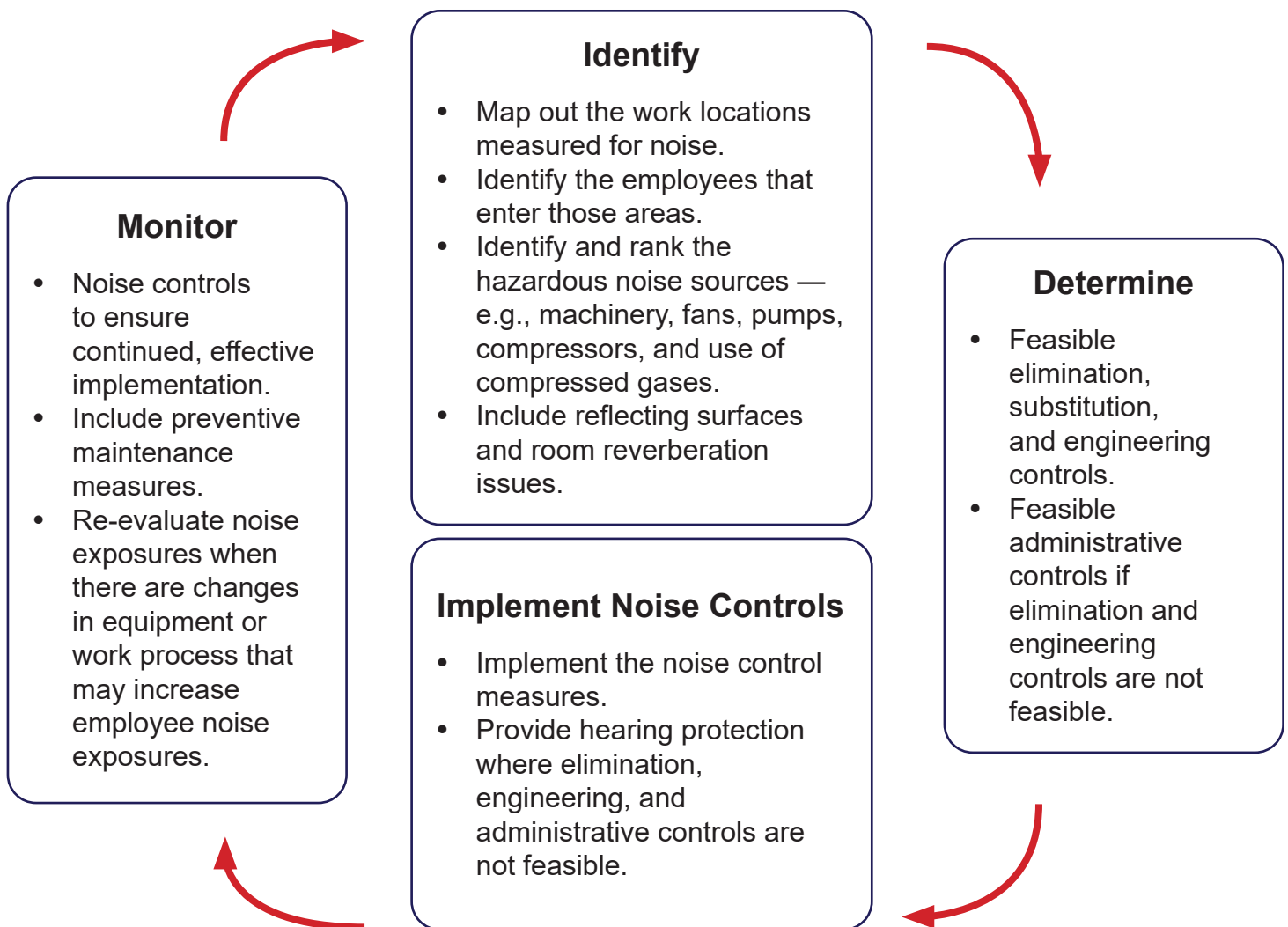


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Hearing protection is ranked the least desirable method of hazard control since:

- The employer must consistently enforce proper use.
- They are uncomfortable to wear and can create skin disorders, particularly in hot or dirty environments.
- They must be properly inserted and worn.
- They may not be the correct size for the user.
- They can interfere with other personal protective equipment.
- They can interfere with the ability to hear alarms.

Summary of the noise evaluation and control process



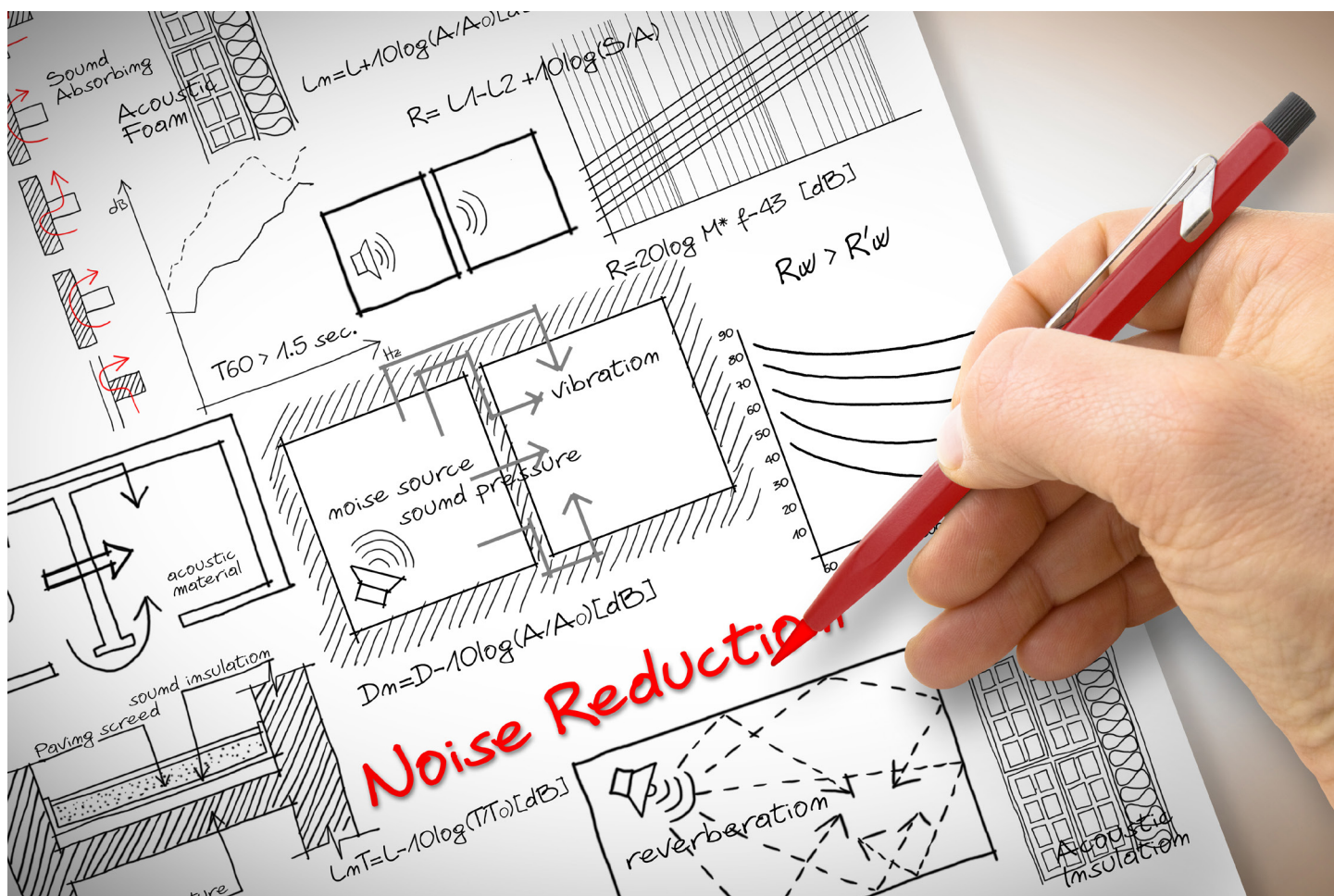
Additional information

NIOSH

- [Directory of Engineering Controls](#)
- [Preventing Occupational Hearing Loss – A Practical Guide](#)
- [Hearing Protector Device Compendium](#)
- [Industrial Noise Control Manual](#)

OSHA

- [Occupational Noise Exposure Controls](#)



Noise Exposure Checklist

This checklist summarizes Cal/OSHA’s noise regulation, T8 CCR, sections 5096 through 5100. It is intended to assist employers conducting hearing conservation program evaluations. It is not intended to be used as a substitute for the Cal/OSHA regulation.

T8CCR	Yes/No What needs to be done
5095: Scope and Application	
Is there excessive occupational exposure to noise?	
Does that exposure fall under the agriculture , construction , or oil and gas well drilling and servicing operations exemption from sections 5097 through 5100?	
5096: Where employee 8-hour average noise exposure limits exceed the PEL:	
<ul style="list-style-type: none"> • The levels shown in Table N-1 of section 5096 when measured on the A-scale of a standard sound level meter set at slow response, or • A dose of 100% when measured on the A-scale of a noise dosimeter set at slow response, a threshold of 90 dB, and a 5 dB exchange rate. 	
Are feasible engineering or administrative controls implemented?	
Is hearing protection provided to employees at no cost, and are they required to wear it when other control measures do not adequately reduce employee exposure levels?	
5097: Where employee 8-hour average noise exposure limits exceed the AL	
<ul style="list-style-type: none"> • The 8-hour time-weighted average of 85 dB (A-scale, slow meter response), or • A dose of 50% using a threshold of 80 dB and 5 dB exchange rate (computed in accordance with Appendix A and Table A-1 and without regard to any attenuation provided by the use of personal protective equipment). 	
Employee noise exposure monitoring	
Has representative personal monitoring for highly mobile employees, significantly varying sound levels, and impulse noise exposures been done?	
Has monitoring included all continuous, intermittent, and impulse sound levels from 80 to 130 dB?	
Has all monitoring equipment been calibrated according to the manufacturer’s instructions?	

T8CCR	Yes/No What needs to be done
Has the monitoring been repeated when there are significant changes to employee noise exposure levels?	
Have employees or their representatives been given an opportunity to observe noise monitoring?	
Have employees been notified when their exposures have been determined to be in excess of the AL?	
Audiometric testing	
Is audiometric testing being made available to employees exposed above the AL on at least an annual basis?	
Are the audiometric tests performed by a licensed or certified professional/competent technician?	
Do the audiograms meet Article 105 Appendix B requirements?	
Have valid baseline audiograms for employees exposed to noise levels above the AL been established within 6 months of exposure (or within 1 year where mobile test vans are used and employees wear hearing protection until the baselines have been established)?	
Is there is a 14-hour period without workplace noise (or hearing protection is worn that reduces exposures below 80 dB) before baseline audiograms are conducted?	
Have employees been notified to avoid high non-occupational noise levels before baseline audiograms are conducted?	
Is each ear being tested at 500, 1000, 2000, 3000, 4000, and 6000 Hz?	
Do the audiometers meet ANSI S3.6-1969 requirements?	
Do pulsed-tone and self-recording audiometers meet Article 105 Appendix B requirements?	
Do testing rooms meet Article 105 Appendix C requirements?	

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T8CCR	Yes/No What needs to be done
Do audiometer calibrations include: <ul style="list-style-type: none"> • Functional checks before each day's use? • Annual acoustical checks according to Article 105 Appendix D requirements? • Exhaustive calibrations every two years? 	
Audiogram evaluations	
Are annual audiograms being compared to the baselines to determine if an STS has occurred?	
Do the physician, audiologist, or otolaryngologist review the audiograms and determine the need for further evaluation?	
Are employees that experience an STS notified in writing within 21 days?	
Are employees determined to have a work-related STS: <ul style="list-style-type: none"> • Provided with, and required to use, hearing protection? • Trained on proper use and care of hearing protection? • Re-fitted and trained where they have already been wearing hearing protection? 	
Are employees determined to have an STS that is not work-related informed of the need for otologic examination?	
Are baselines being revised based on the judgment of the audiologist, otolaryngologist, or physician evaluating the audiograms?	
Are STS being defined as a change in hearing threshold relative to the baseline audiogram of 10 dB or more in average hearing level at 2000, 3000, and 4000 Hz, either ear (with allowance for aging per Appendix F)?	
For Log 300 recording purposes, is section 14300.10 being used to determine an STS?	
Are occupational hearing losses being recorded on the Log 300 per section 14300 through 14400 requirements?	

T8CCR	Yes/No What needs to be done
5098: Hearing protection	
Is hearing protection being made available at no charge to employees exposed at or above an 8-hour time-weighted average of 85 dB?	
Is hearing protection being made available at no charge, and employees required to wear them, when: <ul style="list-style-type: none"> • Exposed to the PEL or above? • Exposed to an 8-hour time-weighted average of 85 dB or above and no baseline audiogram established? • Exposed to an 8-hour time-weighted average of 85 dB or above and an STS occurs? 	
Are employees allowed to select from a variety of suitable hearing protectors, such as ear inserts or muffs?	
Are employees trained in proper care and use?	
Is proper initial fitting and supervision of correct use being implemented?	
Is adequate hearing protection attenuation being determined according to Article 105 Appendix E requirements?	
Is there attenuation to: <ul style="list-style-type: none"> • At least 90 dBA? • 85 dBA if an STS has occurred? • 80 dBA when used prior to an audiogram? 	
Is adequate attenuation being re-evaluated when noise exposures increase?	
5099: Training	
Is annual training of employees exposed above the AL being conducted that addresses: <ul style="list-style-type: none"> • Effects of noise on hearing? • Purpose of hearing protectors; advantages; disadvantages; attenuation; instructions on selection, fit, use, and care? • Purpose and procedures of audiometric testing? 	

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T8CCR	Yes/No What needs to be done
Is Article 105 posted in the workplace, and copies made available to affected employees or their representatives?	
5100: Recordkeeping	
Are records of noise exposure measurements being maintained?	
<p>Are audiometric test records being maintained with the following information:</p> <ul style="list-style-type: none"> • Employee name and job classification? • Date of audiogram? • Examiner's name? • Date of last acoustic or exhaustive calibration of audiometer? • Employee's most recent noise exposure assessment? 	
Are records required by T8 CCR, Article 105, Appendix C, Audiometric Test Rooms of background sound pressure levels in audio test rooms being maintained?	
Are all noise exposure records being maintained for at least 2 years?	
Are all audiometric test records being maintained for the duration of employment?	
Are all records being transferred to successor employers?	
Are all records provided upon request to employees, former employees, and representatives?	

Resources

Cal/OSHA

General Industry Safety Orders: Control of Noise Exposure ([sections 5095 – 5100](#))

Construction Safety Orders: Ear Protection ([section 1521](#))

Tunnel Safety Orders: Personal Protective Equipment ([section 8414](#))

Canada

[Noise – Basic Information](#)

The Center for Construction Research and Training (CPWR)

[Preventing Hearing Loss](#)

NIOSH

[Noise & Hearing Loss Prevention: Program Checklist](#)

[Preventing Hearing Loss Caused by Chemical \(Ototoxicity\) and Noise Exposure](#)

[Hearing Loss Simulator](#)

[What Does a Hearing Loss Sound Like](#)

OSHA

[Noise and Hearing Conservation](#)

State Compensation Insurance Fund

Noise Hazard Checklist ([English/Spanish](#))

A Guide to Hearing Safety ([English/Spanish](#))

Index of Weblinks

Appendix A and Table A-1: www.dir.ca.gov/Title8/sb7g15a105apa.html

Appendix B: Audiometric Measuring Instruments: www.dir.ca.gov/Title8/sb7g15a105apb.html

Appendix C: Audiometric Test Rooms: www.dir.ca.gov/Title8/sb7g15a105apc.html

Appendix D: Acoustical Calibration of Audiometers: www.dir.ca.gov/Title8/sb7g15a105apd.html

Appendix E: Methods for Estimating the Adequacy of Hearing Protection Attenuation: www.dir.ca.gov/Title8/sb7g15a105ape.html

Appendix F: Determination and Application of Age Corrections to Audiograms: www.dir.ca.gov/Title8/sb7g15a105apf.html

Article 105: www.dir.ca.gov/Title8/sb7g15a105.html

Buy Quiet initiative: www.cdc.gov/niosh/docs/2014-129/default.html

Directory of Engineering Controls: www.cdc.gov/niosh/engcontrols/default.html

Hearing Loss in Construction: www.osha.gov/noise/construction

Hearing Protector Device Compendium: www.cdc.gov/niosh/docs/2012-178/default.html

HHE Program Noise Measurement: www.cdc.gov/niosh/data/datasets/RD-1005-2014-0/

HHE Data Base: www.cdc.gov/niosh/hhe/default.html

Industrial Noise Manual: stacks.cdc.gov/view/cdc/5778

Noise – Basic Information: www.ccohs.ca/oshanswers/phys_agents/noise_basic.html

Noise and Hearing Loss, 1986-1997: www.cdc.gov/niosh/docs/99-106/pdfs/99-106.pdf?id=10.26616/NIOSH PUB99106

Noise and Occupational Hearing Loss: www.cdc.gov/niosh/topics/noise/about.html

Occupational Noise Exposure Controls: www.osha.gov/noise/exposure-controls

Preventing Occupational Hearing Loss - A Practical Guide: www.cdc.gov/niosh/docs/96-110/default.html

Section 1521: www.dir.ca.gov/Title8/1521.html

Section 5096: www.dir.ca.gov/Title8/5096.html

Section 5097: www.dir.ca.gov/Title8/5097.html

Section 5098: www.dir.ca.gov/Title8/5098.html

Section 5099: www.dir.ca.gov/Title8/5099.html

Section 5100: www.dir.ca.gov/Title8/5100.html

Section 3204: www.dir.ca.gov/Title8/3204.html

Section 8414: www.dir.ca.gov/Title8/8414.html

Section 14300 through 14400: www.dir.ca.gov/T8/ch7sb1a2.html

Sound Level Meter App: www.cdc.gov/niosh/topics/noise/app.html

Technical Manual: www.osha.gov/otm/section-3-health-hazards/chapter-5#introduction

Understand Noise Exposure: www.cdc.gov/niosh/topics/noise/preventoccnoise/understand.html

NOTES



Cal/OSHA Consultation Programs

Toll-free Number: 1-800-963-9424

Internet: www.dir.ca.gov

On-site Assistance Program Area Offices



Voluntary Protection Program – Oakland, CA 94612 (510) 622-1081

This guide is available with active links at: www.dir.ca.gov/dosh/PubOrder.asp