

Hearing Conservation Program Best Practices for Noise Control Engineers

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ABSTRACT

The design and implementation of engineering noise controls is, rightly, one of the first strategies that should be considered when protecting workers from harmful noise levels. However, when workers are exposed to noise in the workplace there are other regulatory requirements beyond implementation of noise controls. Also, noise controls are often not adequate to bring occupational noise to an acceptable level and a Hearing Conservation Program is required.

This report will cover briefly and broadly the topic of Hearing Conservation Programs for workers. Topics relevant to Noise Control Engineers will be highlighted including: relevant OSHA regulations; an overview of dosimetry for determining worker dose; audiometry, training and recordkeeping requirements. Moreover, the presentation will include a discussion of the pros and cons of engineering noise controls vs. other hazard control strategies like hearing protection devices, substitution and administrative controls. The presentation will also include Hearing Conservation Program best practices such as National Institute for Occupational Safety and Health recommendations for noise exposure measurements and hearing protector fit testing.

1 INTRODUCTION

We all know that landscapers can be exposed to noisy equipment and conditions but doing something about it can seem daunting. Owners and supervisors might wonder what's the actual risk to workers? What does OSHA require? Or how do I get started? This article is intended to shed light on these topics and to outline the basic elements of a Hearing Conservation Program (HCP) designed to protect workers' hearing and meet OSHA requirements.

The main reason to have a hearing conservation program is to protect workers from the harmful effects of noise. In the United States, about 22 million workers are exposed to hazardous noise each year and hearing loss is the third-most common chronic physical condition among adults after hypertension and arthritis.¹ For the Services Sector (which includes landscapers), about 20% of noise-exposed tested workers have a material hearing impairment.² Furthermore, for the sub-sector that includes Landscaping, 54% of noise-exposed workers report not wearing hearing protection.³ Some reasons to believe your workers might be affected by noise on the job are that they: hear ringing or humming in their ears when they leave work; have to shout to be heard by a coworker an arm's length away; or they experience temporary hearing loss when leaving work.⁴

Another compelling reason to implement an HCP is that it may be required by OSHA (or your state if it has its own occupational safety and health program). OSHA's official language states, "The employer shall administer a continuing, effective hearing conservation program . . . whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels."⁵ Basically this means that OSHA requires landscaping companies to have an HCP when, over an 8-hour shift, the average worker exposure to noise is 85 dBA or above. The term dBA is just a way to express loudness that accounts for how the human ear works and as a rule of thumb, workers typically have to shout to be heard in 85 dBA environments, like when a snow blower or gas-powered lawnmower is being used.

2 HEARING CONSERVATION PROGRAM ELEMENTS AND BEST PRACTICES

The following elements are not only a good basis for ensuring that workers are protected from the harmful effects of noise but are also part of an OSHA-prescribed Hearing Conservation Program.

2.1 Noise exposure monitoring – dosimetry

The primary instrument for determining worker exposure to noise (and if you need to have an HCP) is a 'dosimeter.' Using a dosimeter is relatively straightforward but there are some best practices to be aware of. First, the dosimeter must be set according to the following OSHA criteria: exchange rate: 5 dB; frequency weighting: A; response: slow; criterion level: 90 dBA; threshold level: 80 dBA. Furthermore, in addition to yearly dosimeter calibration, dosimeters must be field-calibrated before and after measurements are taken.⁶ If you have never used a dosimeter before, there is no reason to be intimidated. Straightforward procedures can be found on the OSHA website (https://www.osha.gov/dts/osta/otm/new_noise/#noisedosimeter) and following the manufacturer's directions for your dosimeter should make the whole process relatively easy.

2.2 Noise exposure monitoring – sound level meters

If you don't have a noise dosimeter available, you at least need a Sound Level Meter (SLM). In addition to providing Landscaping Professionals a rough estimate of workers' noise doses, SLMs can help determine which noisy equipment is responsible as well as resulting community noise levels. Settings and calibration procedures for SLMs are similar to those for dosimeters outlined above. More good, basic guidance for using SLMs can be found at the OSHA website (https://www.osha.gov/dts/osta/otm/new_noise/#soundlevel) and in the manufacturer's instructions. Perhaps the best news is that a user-friendly, mobile SLM app from the National Institute for Occupational Safety and Health (NIOSH) has made sound measurements more accessible than ever (plus the app is free!). The NIOSH SLM app is designed specifically for the iPhone – details can be found on the NIOSH website (<https://www.cdc.gov/niosh/topics/noise/app.html>) and for more information, refer to the NIOSH blog, "So How Accurate Are These Smartphone Sound Measurement Apps?" (<http://blogs.cdc.gov/niosh-science-blog/2014/04/09/sound-apps/>)

2.3 Engineering and administrative controls

Once you know that your workers are exposed to noise levels at or above 85 dBA, employers need to protect workers from hearing loss - a fundamental requirement of OSHA regulations. Before an employer just hands out earplugs, OSHA requires that other types of controls are considered first - like using less noisy equipment or limiting worker exposure to noise.⁷ Often the best way to protect workers from workplace noise is to purchase and use quieter equipment. Not only can 'buying quiet' better ensure worker protection from noise but also creating a quieter workplace can negate the need for an HCP and save money in the long run.

2.4 Hearing protection devices, fit testing and education

When Engineering or Administrative controls are not available or before they are fully implemented, workers are to be given hearing protection devices (HPDs). First and foremost, NIOSH recommends that hearing protectors attenuate noise sufficiently to keep the worker's daily exposure below 85 dBA as an 8-hour TWA. Although all hearing protectors are assigned a Noise Reduction Rating (NRR), most workers do not receive the labeled amount of noise reduction.⁸ The best way to determine hearing protector effectiveness is to use HPD fit-testing, which uses a computer program and special headphones to gauge the actual noise attenuation of HPDs worn by workers.⁸

Regardless of how you measure effectiveness, an essential element in using HPDs is proper training. Untrained workers are much less likely to wear their HPDs correctly (possibly rendering them essentially useless) and worse yet, untrained workers are less likely wear HPDs in the first place. When training workers it is important to keep in mind these basics: on-the-job training before exposure to noise and at regular intervals can be quite effective; ensure workers understand both the short-term and long-term hazards of noise; show workers how to use HPDs correctly and have them demonstrate they can insert them correctly.

2.5 Audiometric evaluation

If you have established that your workers' exposure to noise equals or exceeds an 8-hour TWA of 85 dBA, then audiometric testing (testing of workers' hearing ability) is a required part of an HCP. The main thing to know is that the tests must be performed by a professional certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC).⁹ Audiometric tests can be done on site by mobile testing firms or you can send your employees to an occupational health clinic. Furthermore, the certified CAOHC professional can make recommendations about establishing and maintaining an HCP.

2.6 Recordkeeping and program evaluations

As stated earlier, you may be required by law to establish and maintain an HCP. But if you do not document your efforts, then there is no evidence that your company is meeting these requirements. Although there is a long list of OSHA requirements for proper recordkeeping, the basics are simple - keep a record of all activities related to your HCP including any noise measurements, dosimetry, audiometry or training.

Another good reason to keep good records is to evaluate your program over the long term. Looking back at records can help you: meet necessary OSHA requirements; determine if noise exposures are getting worse or better over time; identify problem tasks/equipment that might need added attention. Furthermore, evaluating audiometry results over time can give you a strong indication as to whether workers' hearing is being affected by workplace noise.

3 CONCLUSIONS

The purpose of this article is to demystify Hearing Conservation programs by (hopefully) emphasizing that the key components are achievable by landscape professionals. There is a wealth of information on this topic to assist your efforts to establish and maintain an HCP. Several of the most helpful resources can be found at these sites:

- OSHA Occupational Noise Exposure page - <https://www.osha.gov/SLTC/noisehearingconservation/>
- OSHA Technical Manual – Noise Chapter: https://www.osha.gov/dts/osta/otm/new_noise/index.html
- OSHA Exposure and Controls Page:

- <https://www.osha.gov/SLTC/noisehearingconservation/evaluation.html>
- OSHA’s list of additional resources related to the topic:
<https://www.osha.gov/SLTC/noisehearingconservation/otherresources.html>
- Main NIOSH site relating to Noise and Hearing Loss Prevention -
<https://www.cdc.gov/niosh/topics/noise/default.html>
- Main NIOSH Buy Quiet page: <https://www.cdc.gov/niosh/topics/buyquiet/default.html>
- NIOSH Noise Controls Page:
<https://www.cdc.gov/niosh/topics/noise/reducenoiseexposure/noisecontrols.html>
- NIOSH document on Preventing Occupational Hearing Loss:
<https://www.cdc.gov/niosh/docs/96-110/pdfs/96-110.pdf>
- Facts and stats - <https://www.cdc.gov/niosh/topics/ohl/>
- CDC site about hearing loss (not specific to occupational noise):
https://www.cdc.gov/nceh/hearing_loss/default.html

If you or your company is interested in this or other topics related to worker safety and health, the NIOSH website (<https://www.cdc.gov/NIOSH/>) is dedicated to promoting knowledge in the field of occupational safety and health and transferring that knowledge into practice. For questions specific to HCPs, please do not hesitate to contact the author, Bryan Beamer, at zmy4@cdc.gov.

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4 REFERENCES

¹ From <https://www.cdc.gov/niosh/topics/ohl/default.html>

² Masterson EA, Deddens JA, Themann CL, Bertke S. & Calvert GM. (2015). Trends in worker hearing loss by industry sector, 1981-2010. *American Journal of Industrial Medicine*, 58, 392-401.

³ Tak S, Davis RR, Calvert GM. (2009). Exposure to hazardous workplace noise and use of hearing protection devices among US workers — NHANES, 1999-2004. *American Journal of Industrial Medicine*, 52(5):358-371.

⁴ From <https://www.osha.gov/SLTC/noisehearingconservation/>

⁵ 29 CFR 1910.95(c)(1)

⁶ From https://www.osha.gov/dts/osta/otm/new_noise/#noisedosimeter

⁷ 29 CFR 1910.95(b)(1)

⁸ <https://blogs.cdc.gov/niosh-science-blog/2013/05/31/well-fit/>

⁹ Council for Accreditation in Occupational Hearing Conservation: <https://www.caohc.org/>