

## QL2.2 MINIMIZE NOISE AND VIBRATION

### INTENT:

Minimize noise and vibration generated during construction and in the operation of the constructed works to maintain and improve community livability.

### LEVELS OF ACHIEVEMENT

IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE
<b>(1) Studies, predictions.</b> Conduct baseline studies of existing levels of noise and vibration specified in the project for construction and operations. Predictions of levels of noise and vibration based on proposed project siting and design are produced. (A)			<b>(8) Achieving acceptable levels.</b> Proposals for mitigation of air-borne and ground-borne noise and vibration to acceptable levels in the affected community are created based on studies and determination of the noise goals of the affected communities. Proposals are presented, approved and incorporated into the project designs. Project team sets construction specifications for noise and vibration limits. Programs to monitor noise and vibration during operation are established. (A, B, C)	<b>(11) Creating quieter communities.</b> The project is designed in such a way as to reduce ambient noise in the area. As a result of the project and the completed works, noise levels in the community have been substantially reduced below previous levels, and at least to affected community noise objectives. Specifications set for noise and vibration during construction take into account community needs. (A, B, C)

### DESCRIPTION

Noise is defined as an unwanted or disturbing sound. It becomes unwanted when it interferes with normal activities or diminishes quality of life. Noise can have significant negative health effects, including hearing impairment, hypertension and sleep disturbance. It can also reduce performance in cognitive tasks. Residential property values may be improved as a result of reduced ambient noise levels.

Target noise levels are based on a cumulative period of 30 minutes or more. Noise measurements are taken at the nearest property boundary of the affected land use.

Permissible Sound Levels, dBA (7 AM – 10 PM, otherwise minus 5 dBA)					
Zone Categories of Source	Zone Categories of Receiver (measured at property line)				
		Residential	Open Space	Commercial	Industrial
	Residential	55	55	60	65
	Open Space	55	55	60	65
	Commercial	60	60	70	70
	Industrial	65	65	70	75
During all hours, the sound levels shall be decreased 5 dBA for narrow band or steady sound.					

Target Noise Levels (Source: City of Portland, Oregon, Noise Control Ordinance, City Code and Charter, Title 18, Chapter 18, Section 18.10.010, Land Use Zones.)

Proposals to mitigate noise and vibration from stationary and mobile sources are approved by local authorities and decision-makers, and incorporated into the design. Monitoring programs are included. Mitigation measures include the use

of sound proofing, noise barriers, designs to locate mechanical equipment and other sources away from exterior spaces designed for use, and use of innovative pavements designed to reduce traffic noise. For outdoor areas of occupancy, provide quiet outdoor spaces. The project team should measure ambient noise levels prior to initial design work. The team designs the project, giving extra attention to mitigating and eliminating sources of noise and vibration.

Specifications for minimizing construction noise and vibration should meet or exceed accepted local practices. Programs should include details on the expected sources of significant noise and vibration, how the effects of those sources will be minimized, how noise and vibration will be monitored, and what corrective actions will be taken if specified levels are exceeded. The construction contractor is expected to work with affected neighbors to develop construction plans, as well as monitoring and corrective action programs.

### ADVANCING TO HIGHER ACHIEVEMENT LEVELS

**Benchmark:** No baseline studies and predictions of noise and vibration have been conducted, unless required by regulations. Compliance with local laws and regulations regarding construction noise, but no proposed inspection and enforcement programs beyond stipulated requirements.

**Performance improvement:** Shift from meeting standards and regulatory requirements to further reductions in ambient noise and vibrations, ultimately creating quieter communities.

**METRIC:**

The extent to which noise and vibration will be reduced during construction and operation.

**EVALUATION CRITERIA AND DOCUMENTATION**

A. Have appropriate studies been carried out to predict the levels of air-borne, ground-borne and structure-borne noise and vibration that will be present during construction and when the completed works is in operation?

*1. Noise and vibration studies and field monitoring providing adequate baseline information and predictions of ambient noise and vibration levels during construction and operation.*

*2. Acceptability of the credentials and qualifications of the person(s) conducting the baseline studies and predictions, and developing the mitigation proposals.*

B. Have proposals for ambient noise and vibration mitigation and monitoring been made and incorporated into the project design to reduce noise and vibration to accepted standard target levels?

*1. Proposals for ambient noise and vibration mitigation and monitoring submitted.*

*2. Comprehensiveness of proposals in terms of coverage, detail and the flowdown of requirements to the construction contractor.*

C. Has the project been designed to markedly reduce ambient noise and vibration down to levels that substantially improve community livability?

*1. Analyses and documentation of estimates of ambient noise and vibration levels and comparisons to community needs and goals for livability.*

**SOURCES**

- Adapted from The Sustainable Sites Initiative: Guidelines and Performance Benchmarks 2009, Credit 6.7: Provide views of vegetation and quiet outdoor spaces for mental restoration.
- City of Portland, Oregon, Noise Control Ordinance, City Code and Charter, Title 18, Chapter 18, Section 18.10.010, Land Use Zones.
- CEEQUAL Assessment Manual for Projects Version 4, December 2008, Roger K. Venables, Section 11.3.