

1 Pollution Control Agency
2 Air Quality Division
3
4 Adopted Rules Relating to Noise Control
5
6 Rules as Adopted

7 7010.0010 INCORPORATION BY REFERENCE.

8 For the purpose of chapter 7010, American National Standard
9 Standards Institute, Acoustical Terminology, S1.1-1960-(R1976)
10 and Specification for Sound Level Meters, S1.4-1983 are is
11 incorporated by reference. ~~These publications are~~ This
12 publication is available from the American National Standard
13 Standards Institute, 1430 Broadway, New York, N.Y. 10018 and can
14 be found at: the offices of the Minnesota Pollution Control
15 Agency, 1935 West County Road B-2, Roseville, Minnesota 55113;
16 the Government Documents Section, Room 409, Wilson Library,
17 University of Minnesota, 309 19th Avenue South, Minneapolis,
18 Minnesota 55454; and the State of Minnesota Law Library, Ford
19 Building, 117 University Avenue, Saint Paul, Minnesota 55155.
20 ~~These documents are~~ This document is not subject to frequent
21 change.

22 The Federal Highway Administration publication, Sound
23 Procedures for Measuring Highway Noise: Final
24 Report, FHWA-DP-45-1R FHWA-DP-45-1R (August 1981) is
25 incorporated by reference. This publication is available from
26 the United States Department of Transportation, Federal Highway
27 Administration, 1000 North Globe Road, Arlington, Virginia 22201
28 and can be found at: the offices of the Minnesota Pollution
29 Control Agency, 1935 West County Road B-2, Roseville, Minnesota
30 55113; the Government Documents Section, Room 409, Wilson
31 Library, University of Minnesota, 309 19th Avenue South,
32 Minneapolis, Minnesota 55454; and the State of Minnesota Law
33 Library, Ford Building, 117 University Avenue, Saint Paul,
34 Minnesota 55155. This document is not subject to frequent
35 change.

1 7010.0020 DEFINITIONS.

2 Subpart 1. **Application.** The terms used in chapter 7010
3 have the meanings given them in this part.

4 Subp. 2. **A-weighted.** "A-weighted" means a specific
5 weighting of the sound pressure level for the purpose of
6 determining the human response to sound. The specific weighting
7 characteristics and tolerances are those given in American
8 National Standards Institute S1.4-1983, section 5.1.

9 Subp. 3. **Daytime.** "Daytime" means those hours from 7:00
10 a.m. to 10:00 p.m.

11 Subp. 4. **dB(A).** "dB(A)" means a unit of sound level
12 expressed in decibels (dB) and A-weighted.

13 Subp. 5. **Decibel.** ~~"Decibel" has the meaning given it in~~
14 ~~American National Standard Institute S1.1-1960-(R1976), section~~
15 ~~2-3~~ means a unit of sound pressure level, abbreviated as dB.

16 Subp. 6. **Impulsive noise.** "Impulsive noise" means either
17 a single sound pressure peak (with either a rise time less than
18 200 milliseconds or total duration less than 200 milliseconds)
19 or multiple sound pressure peaks (with either rise times less
20 than 200 milliseconds or total duration less than 200
21 milliseconds) spaced at least by 200 millisecond pauses.

22 Subp. 7. ~~L_{dn} -- " L_{dn} " -- (day-night-sound-level) -- means the~~
23 ~~equivalent-A-weighted-sound-level-during-a-24-hour-time-period~~
24 ~~with-a-ten-decibel-weighting-applied-to-the-equivalent-sound~~
25 ~~level-during-nighttime.~~ L_{10} . " L_{10} " means the sound level,
26 expressed in dB(A), which is exceeded ten percent of the time
27 for a one hour survey, as measured by test procedures approved
28 by the director.

29 Subp. 8. ~~L_{eq} -- " L_{eq} " -- (equivalent-sound-level) -- means the~~
30 ~~constant-sound-level-that, in-60-consecutive-minutes, would~~
31 ~~convey-the-same-sound-energy-as-the-actual-time-varying~~
32 ~~A-weighted-sound-level.~~ L_{50} . " L_{50} " means the sound level,
33 expressed in dB(A), which is exceeded 50 percent of the time for
34 a one hour survey, as measured by test procedures approved by
35 the director.

1 Subp. 9. Municipality. "Municipality" means a county; a
 2 city; a town; a regional planning and development commission
 3 established under Minnesota Statutes, chapter 473; the
 4 metropolitan council; or other governmental subdivision of the
 5 state responsible by law for controlling or restricting land use
 6 within its jurisdiction.

7 Subp. 10. Nighttime. "Nighttime" means those hours from
 8 10:00 p.m. to 7:00 a.m.

9 Subp. 11. Person. "Person" means ~~a person as defined in~~
 10 part-7000-01007-subpart-9 any human being, any municipality or
 11 other governmental or political subdivision or other public
 12 department or agency, any public or private corporation, any
 13 partnership, firm, association, or other organization, any
 14 receiver, trustee, assignee, agency, legal entity, other than a
 15 court of law, or any legal representative of any of the
 16 foregoing, but does not include the agency.

17 Subp. 12. Sound pressure level. "Sound pressure
 18 level" ~~has the meaning given it in American National Standard~~
 19 Institute-S1-1-1960-(R1976)-section-2-6, in decibels, means 20
 20 times the logarithm to the base 10 of the ratio of the pressure
 21 to the reference pressure. The reference pressure shall be 20
 22 micronewtons per square meter.

23 7010.0030 NOISE CONTROL REQUIREMENT.

24 No person may violate the standards established in part
 25 7010.0040, unless exempted by Minnesota Statutes, section
 26 116.07, subdivision 2a. Any municipality having authority to
 27 regulate land use shall take all reasonable measures within its
 28 jurisdiction to prevent the establishment of land use activities
 29 listed in noise area classification (NAC) 1, 2, or 3 in any
 30 location where the standards established in part 7010.0040 ~~are~~
 31 ~~being or~~ will be exceeded violated immediately upon
 32 establishment of the land use.

33 7010.0040 NOISE STANDARDS.

34 Subpart 1. Scope. These standards describe the limiting
 35 levels of sound established on the basis of present knowledge

1 for the preservation of public health and welfare. These
 2 standards are consistent with speech, sleep, annoyance, and
 3 hearing conservation requirements for receivers within areas
 4 grouped according to land activities by the noise area
 5 classification (NAC) system established in part 7010.0050.
 6 However, these standards do not, by themselves, identify the
 7 limiting levels of impulsive noise needed for the preservation
 8 of public health and welfare. Noise standards in subpart 2
 9 apply to all sources. ~~For airports, the additional noise~~
 10 ~~standards in subpart 3 also apply.~~

11 Subp. 2. Noise standards.

12 Noise Area	13 Daytime		13 Nighttime	
13 Classification				
14 1	63-dB _{eq}		53-dB _{eq}	
15 2	68-dB _{eq}		68-dB _{eq}	
16 3	78-dB _{eq}		78-dB _{eq}	
	<u>L50</u>	<u>L10</u>	<u>L50</u>	<u>L10</u>
18 <u>1</u>	<u>60</u>	<u>65</u>	<u>50</u>	<u>55</u>
19 <u>2</u>	<u>65</u>	<u>70</u>	<u>65</u>	<u>70</u>
20 <u>3</u>	<u>75</u>	<u>80</u>	<u>75</u>	<u>80</u>

21 ~~Subp. 3. Additional airport noise standards. An dB_{eq} of~~
 22 ~~63, 74, and 84 for NAC 1, 2, 3, respectively, also applies to~~
 23 ~~airports.~~

24 7010.0050 NOISE AREA CLASSIFICATION.

25 Subpart 1. Applicability. The noise area classification
 26 is based on the land use activity at the location of the
 27 receiver and determines the noise standards applicable to that
 28 land use activity unless an exception is applied under subpart 3.

29 Subp. 2. Noise area classifications. The noise area
 30 classifications and the activities included in each
 31 classification are listed below:

32 Noise Area	33 Land Use Activities
34 Classification	
35 1	36 Residential, educational, medical, and dedicated nature areas; includes 37 all types of nontransient housing;

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1 ~~schools, churches, medical~~
2 ~~facilities providing nighttime care,~~
3 ~~such as hospitals and nursing homes,~~
4 ~~and nature preserves~~ Household units
5 (includes farm houses)
6 Group quarters
7 Residential hotels
8 Mobile home parks or courts
9 Transient lodging
10 Other residential
11 Motion picture production
12 Medical and other health services
13 Correctional institutions
14 Educational services
15 Religious activities
16 Cultural activities and nature
17 exhibitions
18 Entertainment assembly
19 Camping and picnicking areas
20 (designated)
21 Resorts and group camps
22 Other cultural, entertainment, and
23 recreational activities.

25 2 ~~Commercial, entertainment, and~~
26 ~~recreational, includes office~~
27 ~~buildings, retail stores and~~
28 ~~services, transient lodging, medical~~
29 ~~facilities not providing nighttime~~
30 ~~care, parks, and athletic fields~~
31 Railroad terminals (passenger)
32 Railroad terminals (passenger and
33 freight)
34 Rapid rail transit and street railway
35 passenger terminals
36 Bus passenger terminals (intercity)

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- 1 Bus passenger terminals (local)
- 2 Bus passenger terminals (intercity
- 3 and local)
- 4 Other motor vehicle transportation
- 5 Airport and flying field terminals
- 6 (passenger)
- 7 Airport and flying field terminals
- 8 (passenger and freight)
- 9 Marine terminals (passenger)
- 10 Marine terminals (passenger and
- 11 freight)
- 12 Automobile parking
- 13 Telegraph message centers
- 14 Transportation services and
- 15 arrangements
- 16 Wholesale trade
- 17 Retail trade -- building materials,
- 18 hardware, and farm equipment
- 19 Retail trade -- general merchandise
- 20 Retail trade -- food
- 21 Retail trade -- automotive, marine
- 22 craft, aircraft, and accessories
- 23 Retail trade -- apparel and accessories
- 24 Retail trade -- furniture, home
- 25 furnishings, and equipment
- 26 Retail trade -- eating and drinking
- 27 Other retail trade
- 28 Finance, insurance, and real estate
- 29 services
- 30 Personal services
- 31 Business services
- 32 Repair services
- 33 Legal services
- 34 Other professional services
- 35 Contract construction services
- 36 Governmental services (except

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1 correctional institutions)
2 Miscellaneous services (except
3 religious activities
4 Public assembly (except entertainment
5 assembly and race tracks)
6 Amusements (except fairgrounds and
7 amusement parks)
8 Recreational activities (except
9 designated camping and picnicking
10 areas)
11 Parks.
12
13 3 ~~Industrial;--includes-manufacturing,~~
14 ~~utilities;--transportation;--and~~
15 ~~agriculture~~ Food and kindred products
16 -- manufacturing
17 Textile mill products -- manufacturing
18 Apparel and other finished products made
19 from fabrics, leather, and similar
20 materials -- manufacturing
21 Lumber and wood products (except
22 furniture) -- manufacturing
23 Furniture and fixtures -- manufacturing
24 Paper and allied products --
25 manufacturing
26 Printing, publishing, and allied
27 industries
28 Chemicals and allied products --
29 manufacturing
30 Petroleum refining and related industries
31 Rubber and miscellaneous plastic products
32 -- manufacturing
33 Stone, clay, and glass products --
34 manufacturing
35 Primary metal industries
36 Fabricated metal products --

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- 1 manufacturing
- 2 Professional, scientific, and controlling
- 3 instruments; photographic and optical
- 4 goods; watches and clocks --
- 5 manufacturing
- 6 Miscellaneous manufacturing (except
- 7 motion picture production)
- 8 Railroad, rapid transit, and street
- 9 railway transportation (except
- 10 passenger terminals)
- 11 Motor vehicle transportation (except
- 12 passenger terminals)
- 13 Aircraft transportation (except
- 14 passenger terminals)
- 15 Marine craft transportation (except
- 16 passenger and freight terminals)
- 17 Highway and street right-of-way
- 18 Communication (except telegraph
- 19 message centers)
- 20 Utilities
- 21 Other transportation, communication,
- 22 and utilities (except transportation
- 23 services and arrangements)
- 24 Race tracks
- 25 Fairgrounds and amusement parks
- 26 Agricultural
- 27 Agricultural and related activities
- 28 Forestry activities and related services
- 29 (including commercial forest land,
- 30 timber production, and other related
- 31 activities)
- 32 Fishing activities and related services
- 33 Mining activities and related services
- 34 Other resource production and extraction
- 35 All other activities not otherwise
- 36 listed.

1

2

4Undeveloped and unused land area

3

(excluding noncommercial forest

4

development)

5

Noncommercial forest development

6

Water areas

7

Vacant floor area

8

Under construction

9

Other undeveloped land and

10

water areas.

11

12

Subp. 3. **Exceptions.** The noise area classification for a

13

land use may be changed in the following ways if the applicable

14

conditions are met.

15

A. The daytime standards for noise area

16

classification 1 shall be applied to noise area classification 1

17

during the nighttime if the land use activity does not include

18

overnight lodging.

19

B. The standards for a building in a noise area

20

classification 2 shall be applied to a building in a noise area

21

classification 1 if the following conditions are met:

22

(1) the building is constructed in such a way

23

that the exterior to interior sound level attenuation is at

24

least 30 dB(A);

25

(2) the building has year-round climate control;

26 and

27

(3) the building has no areas or accommodations

28

~~contiguous-to-it~~ that are intended for outdoor activities.

29

C. The standards for a building in a noise area

30

classification 3 shall be applied to a building in a noise area

31

classification 1 if the following conditions are met:

32

(1) the building is constructed in such a way

33

that the exterior to interior sound level attenuation is at

34

least 40 dB(A);

35

(2) the building has year-round climate control;

36 and

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1 (3) the building has no areas or accommodations
2 ~~contiguous-to-it~~ that are intended for outdoor activities.

3 D. The standards for a building in a noise area
4 classification 3 shall be applied to a building in a noise area
5 classification 2 if the following conditions are met:

6 (1) the building is constructed in such a way
7 that the exterior to interior sound level attenuation is at
8 least 30 dB(A);

9 (2) the building has year-round climate control;
10 and

11 (3) the building has no areas or accommodations
12 ~~contiguous-to-it~~ that are intended for outdoor activities.

13 7010.0060 MEASUREMENT METHODOLOGY.

14 Subpart 1. **Measurement location.** Measurement of sound
15 must be made at or within the applicable NAC at the point of
16 human activity which is nearest to the noise source. All
17 measurments shall be made outdoors.

18 Subp. 2. **Equipment specifications.** All sound level
19 measuring devices must ~~be-certified-to~~ meet Type O, I, II, or S
20 specifications under American National Standard Standards
21 Institute S1.4-1983.

22 Subp. 3. **Calibration.** All sound level measuring devices
23 must, at a minimum, ~~be-recertified-or-cross-referenced-according~~
24 ~~to-American-National-Standard-Institute-S1.4-1983-annually.--The~~
25 ~~equipment-must~~ be externally field calibrated before and after
26 monitoring using a calibration device of known frequency and
27 sound pressure level.

28 Subp. 4. **Measurement procedures.** The following procedures
29 must be used to obtain representative sound level measurements:

30 A. Measurements must be made between at least three
31 ~~and-five~~ feet off the ground or surface and away from natural or
32 manmade structures which would ~~diminish-the-sound-level~~ prevent
33 an accurate measurment.

34 B. Measurements must be made using the A-weighting
35 and fast response characteristics of the sound measuring device

1 as specified in American National Standard Standards Institute
2 Sl.4-1983.

3 C. Measurements must not be made in sustained winds
4 greater than 12 miles per hour or in precipitation which results
5 in a difference of less than ten decibels between the background
6 noise level and the noise source being measured.

7 D. Measurements must be made using a windscreen
8 microphone which is protected from ambient conditions which
9 would prevent an accurate measurement.

10 Subp. 5. Methods for determination of hourly Leq. -- For the
11 determination of an hourly Leq. measurements must be made using
12 the measuring devices as required under subpart 2 and used
13 according to the manufacturer's recommendations.

14 A. -- Hand-held measuring devices must use the checkoff
15 method described in FHWA-DP-45-1R, section 3.6 (August 1981) for
16 determination of hourly Leq.

17 B. -- Automated or integrating measuring devices may use
18 the checkoff method described in FHWA-DP-45-1R, section 3.6
19 (August 1981) or be operated in accordance with the
20 manufacturer's recommendations for determination of hourly Leq.

21 C. -- Methods equivalent to those described in subpart
22 5, items A and B may be used provided they are approved by the
23 director of the Minnesota Pollution Control Agency.

24 Subp. 6. -- Calculation of Leq. -- Leq. shall be calculated
25 using the following formula:

26
$$L_{eq} = 10 \log_{10} \frac{1}{24} \{ (15 - x) 10^{L_d/10} + (9 - x) 10^{L_n+10/10} \}$$

27 where

28 Leq -- Ten times the log₁₀ of the average energy for the
29 hours from 7:00 a.m. to 10:00 p.m.

30 Ln -- Ten times the log₁₀ of the average energy for the
31 hours from 10:00 p.m. to 7:00 a.m.

32 Subp. 7. Data documentation. A summary sheet for all
33 sound level measurements shall be completed and signed by the
34 person making the measurements. At a minimum, the summary sheet
35 shall include:

36 A. date;

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- 1 B. time;
2 C. location;
3 D. noise source;
4 E. wind speed and direction;
5 F. temperature;
6 G. humidity;
7 H. make and, model, and serial number of measuring
8 equipment;
9 I. field calibration results;
10 J. monitored levels; and
11 K. site sketch indicating noise source, measurement
12 location, directions, distances, and obstructions.

13 7010.0070 SOUND ATTENUATION MEASUREMENT METHODOLOGY.

14 Subpart 1. **Purpose.** Sound level measurements made for
15 assessing sound attenuation as specified in part 7010.0050,
16 subpart 3, item B, C, or D, shall be made according to the
17 requirements of this part.

18 Subp. 2. **Equipment.** The equipment shall meet the
19 requirements specified in part 7010.0060, subpart 2.

20 Subp. 3. **Calibration.** The equipment must meet the
21 calibration requirements specified in part 7010.0060, subpart 3.

22 Subp. 4. **Measurement procedure.** The measurement procedure
23 described in FHWA-DP-45-1R, section 8 must be used for
24 determination of the sound attenuation.

25 Subp. 5. **Equivalent methods.** Methods equivalent to those
26 described in subpart 4 may be used provided they are approved by
27 the director of the Minnesota Pollution Control Agency. The
28 director shall approve an alternative method if the director
29 finds that the method will produce representative data and
30 results which are as reliable as the methods specified in
31 subpart 4.

32 7010.0080 VARIANCE.

33 If, upon written application of the responsible person, the
34 agency finds that by reason of exceptional circumstances strict
35 conformity with any provisions of any noise rule would cause

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1 undue hardship, would be unreasonable, impractical, or not
2 feasible under the circumstances, the agency may permit a
3 variance upon the conditions and within the time limitations as
4 it may prescribe for the prevention, control, or abatement of
5 noise pollution in harmony with the intent of the state and any
6 applicable federal laws.

7

8 REPEALER. Minnesota Rules, parts 7010.0100, 7010.0200,
9 7010.0300, 7010.0400, 7010.0500, 7010.0600, and 7010.0700 are
10 repealed.