



City of Sanibel

Planning Department

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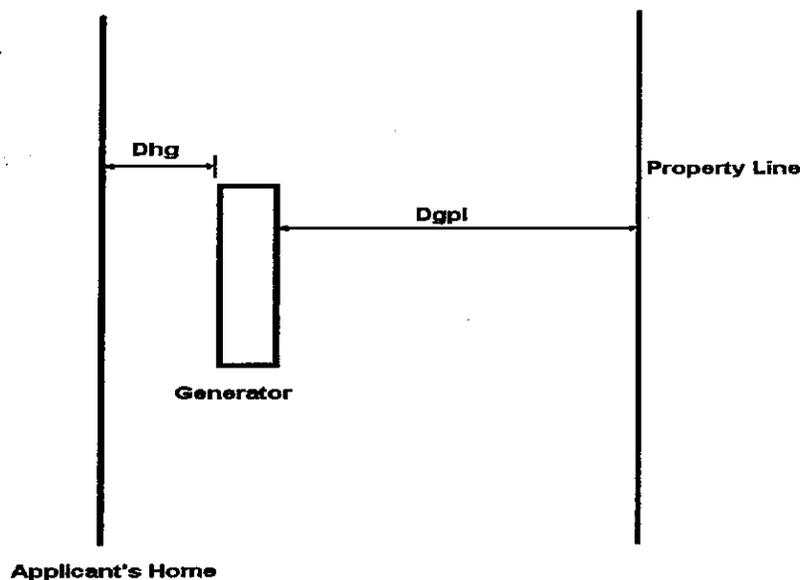
Guide for Calculating Sound Pressure Levels for Emergency Electrical Power Generators

The sound pressure level shall be computed using the following equation for calculating the “Generator’s Sound Pressure Level [dB(A)] at the Property Line”:

$$\text{Generator's corrected dB(A)} = \text{Gen} + A + B + C$$

The calculations shall be based on the generator manufacturer’s sound pressure level data (“Gen”), the distance the generator unit is placed from the closest point of the nearest property line (“A”), its’ proximity to the applicant’s existing structures, such as a wall of the applicant’s home (“B”), and whether a sound wall, located adjacent to the generator unit, is used for noise abatement (“C”). The distances from the applicant’s home (or other structure) to the generator (“B” or D_{hg}) and the distance from the generator to the closest point of the nearest property line (“A” or D_{gpl}) are defined in Figure 1 below:

Figure 1. Reference Distances Necessary for Generator Noise Calculation



Four major components are necessary for estimating the generator’s sound level at the applicant’s property line:

“Gen” = the generator Manufacturer’s sound level data. These data must be in the form of A-weighted sound level, or dB(A), at 7 meters (23 feet) from the generator in a free-field environment.

- “A” = a correction for the closest actual distance from the generator’s surface to the applicant’s property line**
- “B” = a correction for reflective sound based on the distance the generator is located relative to the wall of a structure or the applicant’s home**
- “C” = a correction for a sound barrier constructed such that it fully blocks the line of sight to the generator when viewed from the applicant’s property line (if applicable).**

The input for the terms “A”, “B” and “C” in the Generator Sound Pressure Level [dB(A)] at the Property Line Equation are provided in Tables 1 through 3, respectively.

Table 1. Correction (“A”) for Distance from Generator to Property Line

<u>Actual Distance from Generator to closest point of nearest Property Line in feet (dgpl)*</u>	<u>Distance Correction (A)</u>
5 **	+11 dB(A)
6 **	+10 dB(A)
7 **	+9 dB(A)
8 **	+8 dB(A)
9 **	+7 dB(A)
10	+6 dB(A)
12	+5 dB(A)
14	+4 dB(A)
16	+3 dB(A)
17	+2 dB(A)
20	+1 dB(A)
23	0 dB(A)
27	-1 dB(A)
30	-2 dB(A)
33	-3 dB(A)
37	-4 dB(A)
43	-5 dB(A)
46	-6 dB(A)
53	-7 dB(A)
60	-8 dB(A)
66	-9 dB(A)
73	-10 dB(A)
83	-11dB(A)
92	-12 dB(A)

***Select distance equal to or just less than the actual distance the generator is located from the closest point to the nearest property line. For example, if the generator’s closest surface is located at an actual distance of 45 feet from the property line, a value corresponding to the 43 feet correction [minus -5dB(A)] from Table 1 must be used.**

****The minimum setback from a property line is 10 feet.**

Table 2. Correction (“B”) for Reflected Sound from Applicant’s Home

<u>Distance from Generator to Home or closest structure in feet (dhg)*</u>	<u>Reflection Correction (B)</u>
Closer than or equal to 5 feet	+3 dB(A)
Further than 5 feet and closer than or equal to 10 feet	+2 dB(A)
Further than 10 feet and closer than or equal to 20 feet	+1 dB(A)
Further than 20 feet	+0 dB(A)

Table 3 Correction (“C”) for Presence of a Sound Barrier Wall

<u>Will a Sound Barrier Wall be Used?</u>	<u>Sound Barrier Correction (C)**</u>
Yes	-5 dB(A)
No	0 dB(A)

**** A sound barrier wall can only be used for input in the calculation of the “Generator’s Sound Pressure Level [dB(A)] at the Property Line Equation” for an emergency electrical power generator that is located so that the bottom of the generator is no higher than four feet above the finished grade of the ground. The sound barrier wall must extend from the ground to a minimum of two feet higher than the top of the generator and extend a minimum of two feet past the sides of the generator. A sound barrier wall must have no gaps, holes or penetrations. Walls of masonry, concrete block or wood construction meeting the above requirements are considered adequate. Foliage is not an adequate sound barrier.**

EXAMPLES

Examples using the equation for calculating the “Generator’s Sound Pressure Level [dB(A)] at the Property Line”

Example 1.

An applicant wishes to place an emergency electric generator on his property. The generator’s manufacturer provides data indicating a sound level of 65 dB(A) will be obtained at a distance of 23 feet. The applicant plans on placing the generator 6 feet from his home (Dhg) and the generator’s closest surface will be located a distance of 15 feet from the closest location of the property line (Dgpl). The applicant does not intend to use a sound barrier wall.

Use Equation for Generator’s Sound Pressure Level [dB(A)] at Property Line:

$$\text{Generator's corrected dB(A)} = \text{Gen} + \text{A} + \text{B} + \text{C}$$

$$\text{Gen} = 65 \text{ dB(A)}$$

$$\text{A} = +4 \text{ dB(A) (from Table 1)}$$

$$\text{B} = +2 \text{ dB(A) (from Table 2)}$$

$$\text{C} = 0 \text{ dB(A) (from Table 3)}$$

$$\text{Generator's corrected dB(A)} = 65 + 4 + 2 + 0 = 71\text{dB(A)}$$

Example 2.

An applicant would like to place an emergency electric generator on his property. The generator’s manufacturer provides data indicating a sound level of 74 dB(A) will be obtained at a distance of 23 feet. The applicant plans on placing the generator 5 feet from his home (Dhg) and the generator’s closest surface will be located a distance of 48 feet from the closest location of the property line (Dgpl). The applicant intends to construct a sound barrier wall around the generator unit that meets the criteria provided in Table 3 of this section.

Use Equation for Generator’s Sound Pressure Level [dB(A)] at the Property Line:

$$\text{Generator's corrected dB(A)} = \text{Gen} + \text{A} + \text{B} + \text{C}$$

$$\text{Gen} = 74 \text{ dB(A)}$$

$$\text{A} = -6 \text{ dB(A) (from Table 1)}$$

$$\text{B} = +3 \text{ dB(A) (from Table 2)}$$

$$\text{C} = -5 \text{ dB(A) (from Table 3)}$$

$$\text{Generator's corrected dB(A)} = 74 - 6 + 3 - 5 = 66\text{dB(A)}$$

COMPLIANCE

When the use of the equation for calculating the “Generator’s Sound Pressure Level [dB(A)] at the Property Line” does not result in a sound pressure level of 78dB(A)s or less, the applicant has the alternative to relocate the proposed siting of the generator or prepare a certified sound attenuation plan that certifies the sound pressure (noise) levels anticipated at the subject’s property lines. This sound attenuation plan must be certified by a board certified member of the Institute of Noise Control Engineering, an individual who has been qualified as an expert witness in the field of acoustics or noise control engineering by a court of competent jurisdiction or an individual who has demonstrated competence in the field of acoustics or noise control engineering through a combination of education, training, and experience.

Regardless of which method is used (the equation or the sound attenuation plan) to demonstrate that the sound pressure level of the installed generator at the closest point of the nearest property line, no completion certificate or other final City approval shall be issued for a permanently installed emergency electrical power generator until the City has measured the sound pressure level of the permitted generator and determined that it does not exceed the maximum permitted sound pressure levels of emergency electrical power generators.