

1 5. Vibrations. ~~Vibration shall not be discernible at any~~
2 ~~property line to the human sense of feeling for three (3)~~
3 ~~minutes or more duration in any one (1) hour. No vibration~~
4 ~~at any time shall produce an acceleration of more than 0.1~~
5 ~~gravities or shall result in any combination of amplitudes~~
6 ~~and frequencies beyond the "safe" range of Table 7 United~~
7 ~~States Bureau of Mines Bulletin No. 442 "Seismic Effects~~
8 ~~of Quarry Blasting", on any structure. The methods and~~
9 ~~equations of said Bulletin No. 442 shall be used to compute~~
10 ~~all values for the enforcement of this provision. No~~
11 ~~activity or operation shall cause or create earth borne~~
12 ~~vibrations in excess of the displacement values given below.~~
13 Measurements shall be made at or beyond the adjacent lot
14 line or the nearest residence district boundary line, as
15 described below:

16 a. Vibration displacements shall be measured with an
17 instrument or complement of instruments capable of
18 simultaneously measuring in three (3) mutually
19 perpendicular directions. The maximum vector shall
20 be less than the vibration displacement permitted.
21 For the purpose of this Section, steady state
22 vibrations are vibrations which are continuous, or
23 vibrations in discrete impulses more frequent than
24 one hundred (100) per minute. Discrete impulses which
25 do not exceed one hundred (100) per minute shall be
26 considered impact vibrations.

1 b. The maximum permitted displacements shall be
2 determined by the following formula:

3 $D = K / f$

4 D = Displacement in inches

5 K = A constant to be determined by reference to
6 the following tables

7 f = The frequency of the vibration transmitted
8 through the ground expressed in cycles per second

9 c. In the general industrial district, the maximum
10 earth displacement permitted at the points
11 described below shall be determined by use of the
12 formula above and the appropriate K constant shown
13 in Table 1 below:

Table 1

K Value to be Used in Measuring Vibrations

<u>In any Neighboring Lot</u>	<u>K</u>
<u>Steady State</u>	<u>0.008</u>
<u>Impulsive</u>	<u>0.015</u>
<u>Less than 8 pulse per 24-hour period</u>	<u>0.037</u>
<u>In any Residential District</u>	
<u>Steady State</u>	<u>0.003</u>
<u>Impulsive</u>	<u>0.006</u>
<u>Less than 8 pulse per 24-hour period</u>	<u>0.015</u>

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1 **49-109.2 "M-1" Manufacturing District, Limited**

2 (e) *Bulk Restrictions.*

3 (11) *Performance Standards.*

4 g. Vibrations: ~~There shall be no uses that create heavy~~
5 ~~earth shaking vibrations that are noticeable at the~~
6 ~~property line of the subject premises. No activity or~~
7 ~~operation shall cause or create earth borne vibrations~~
8 ~~in excess of the displacement values given below.~~
9 Measurements shall be made at or beyond the adjacent
10 lot line or the nearest residence district boundary line,
11 as described below:

12 1. Vibration displacements shall be measured with an
13 instrument or complement of instruments capable of
14 simultaneously measuring in three (3) mutually
15 perpendicular directions. The maximum vector shall
16 be less than the vibration displacement permitted.
17 For the purpose of this Section, steady state
18 vibrations are vibrations which are continuous, or
19 vibrations in discrete impulses more frequent than
20 one hundred (100) per minute. Discrete impulses
21 which do not exceed one hundred (100) per minute
22 shall be considered impact vibrations.

23 2. The maximum permitted displacements shall be
24 determined by the following formula:

25
$$D = K / f$$

26 D = Displacement in inches

1 K = A constant to be determined by reference to
2 the following tables

3 f = The frequency of the vibration transmitted
4 through the ground expressed in cycles per second

5 3. In the general industrial district, the maximum
6 earth displacement permitted at the points
7 described below shall be determined by use of the
8 formula above and the appropriate K constant shown
9 in Table 1 below:

<u>Table 1</u>	
<u>K Value to be Used in Measuring Vibrations</u>	
<u>In any Neighboring Lot</u>	<u>K</u>
<u>Steady State</u>	<u>0.008</u>
<u>Impulsive</u>	<u>0.015</u>
<u>Less that 8 pulse per 24-hour period</u>	<u>0.037</u>
<u>In any Residential District</u>	
<u>Steady State</u>	<u>0.003</u>
<u>Impulsive</u>	<u>0.006</u>
<u>Less that 8 pulse per 24-hour period</u>	<u>0.015</u>

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12 **49-109.3 "M-2" Manufacturing District, General**

13 (e) *Bulk Restrictions.*

14 (11) *Performance Standards.*

1 g. Vibrations. There shall be no use that creates heavy
2 earth-shaking vibrations that are noticeable at any
3 district boundaries separating residential and business
4 uses from an M-2 manufacturing district. No activity or
5 operation shall cause or create earth borne vibrations
6 in excess of the displacement values given below.
7 Measurements shall be made at or beyond the adjacent
8 lot line or the nearest residence district boundary line,
9 as described below:

10 1. Vibration displacements shall be measured with an
11 instrument or complement of instruments capable of
12 simultaneously measuring in three (3) mutually
13 perpendicular directions. The maximum vector shall
14 be less than the vibration displacement permitted.
15 For the purpose of this Section, steady state
16 vibrations are vibrations which are continuous, or
17 vibrations in discrete impulses more frequent than
18 one hundred (100) per minute. Discrete impulses
19 which do not exceed one hundred (100) per minute
20 shall be considered impact vibrations.

21 2. The maximum permitted displacements shall be
22 determined by the following formula:

23 $D = K / f$

24 D = Displacement in inches

25 K = A constant to be determined by reference to
26 the following tables

1 f = The frequency of the vibration transmitted
 2 through the ground expressed in cycles per second
 3 3. In the general industrial district, the maximum
 4 earth displacement permitted at the points
 5 described below shall be determined by use of the
 6 formula above and the appropriate K constant shown
 7 in Table 1 below:

Table 1

K Value to be Used in Measuring Vibrations

<u>In any Neighboring Lot</u>	<u>K</u>
<u>Steady State</u>	<u>0.008</u>
<u>Impulsive</u>	<u>0.015</u>
<u>Less than 8 pulse per 24-hour period</u>	<u>0.037</u>
<u>In any Residential District</u>	
<u>Steady State</u>	<u>0.003</u>
<u>Impulsive</u>	<u>0.006</u>
<u>Less than 8 pulse per 24-hour period</u>	<u>0.015</u>

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10 3300 Warehouse, storage or distribution facility

E	R-1	R-2	R-3	R-4	R-4A	R-5	R-5A	B-1	B-2	B-3	O	DC	ORI	M-1	M-2	Additional Regulations
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