

มหาวิทยาลัยสงขลานครินทร์

คณะวิศวกรรมศาสตร์

การสอบปลายภาค ประจำภาคการศึกษาที่ 2

วันที่ 24 กุมภาพันธ์ 2548

วิชา 223-483 Air and Noise Pollution and Control

ปีการศึกษา 2547

เวลา 13:30-16:30

ห้อง R 300

คำสั่ง - ไม่อนุญาตให้นำหนังสือ หรือเอกสารประกอบการสอนเข้าห้องสอบ

- ให้นำเครื่องคิดเลขเข้าห้องสอบได้
- ข้อสอบมีทั้งหมด 5 ข้อ

1. A compressor with A-weight sound power level of 140 dB is radiating uniformly over a flat non-absorbent surface. Calculate the sound level at a distance of (a) 10 m; b) 45 m.

2. A certain motor car was found to produce the following noise levels:

Octave band Centre frequency (Hz)	dB level
63	95
125	84
250	80
500	68
1000	65
2000	61
4000	60
8000	60

Calculate the level in Phons.

3. Calculate the L_{10} , L_{50} , and L_{90} values for the histogram shown in Fig.1

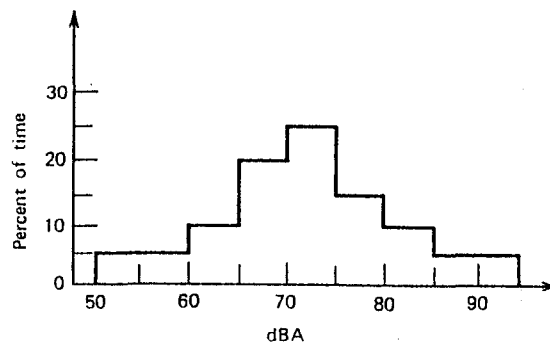


Fig.1

4. The noise exposure pattern of a worker over an eight-hour shift is as follows:

85 dBA for 3.5 h

88 dBA for 3 h

92 dBA for 1.0 h

97 dBA for 0.5 h

Calculate the L_{eq} over 8 h.

5. A four-lane freeway has 3000 automobiles per hour traveling at 60 mi/h average speed. What is the L_{50} experienced by an observer 200 ft from the nearest lane? Assume flat terrain, and so on.

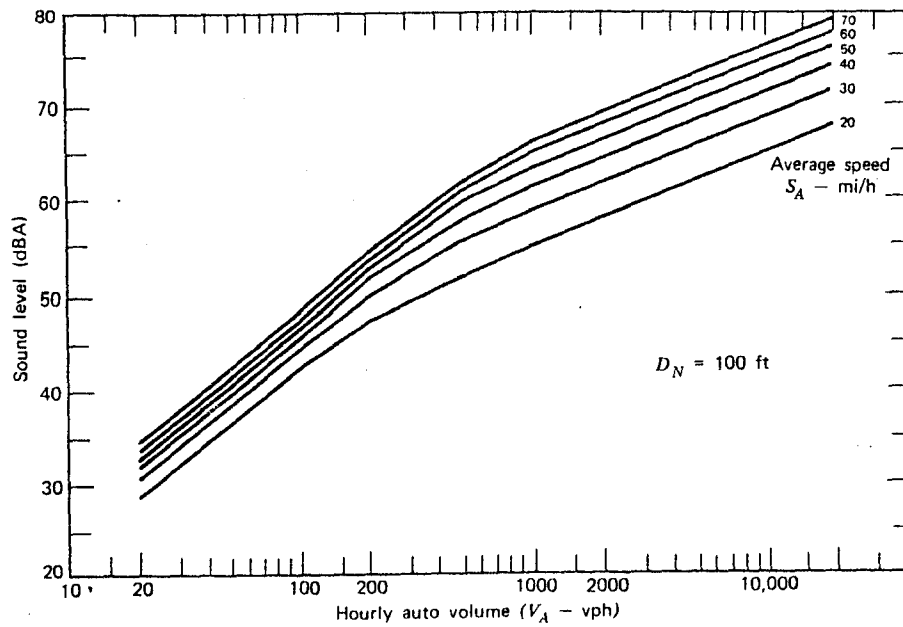


FIGURE 10.7 Sound pressure level as a function of hourly auto volume for average speeds, reference distance of 100 ft. (Source. C. G. Gordon, W. J. Galloway, B. A. Kugler, and D. L. Nelson "Highway Noise—A Design Guide for Highway Engineers," NCHRP Report 117, 1971.)

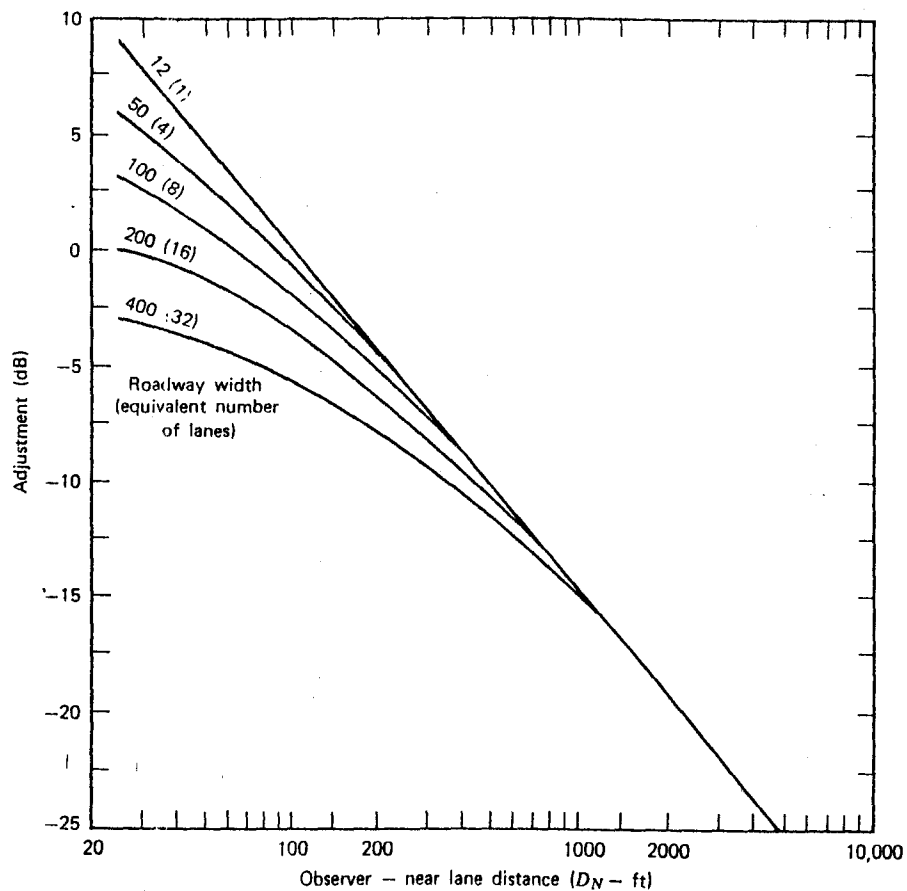


FIGURE 10.9 Attenuation as a function of the near lane distance to the observer for different roadway widths (equivalent number of lanes). (Source. C. G. Gordon, W. J. Galloway, B. A. Kugler, and D. L. Nelson, "Highway Noise—A Design Guide for Highway Engineers," NCHRP Report 117, 1971.)

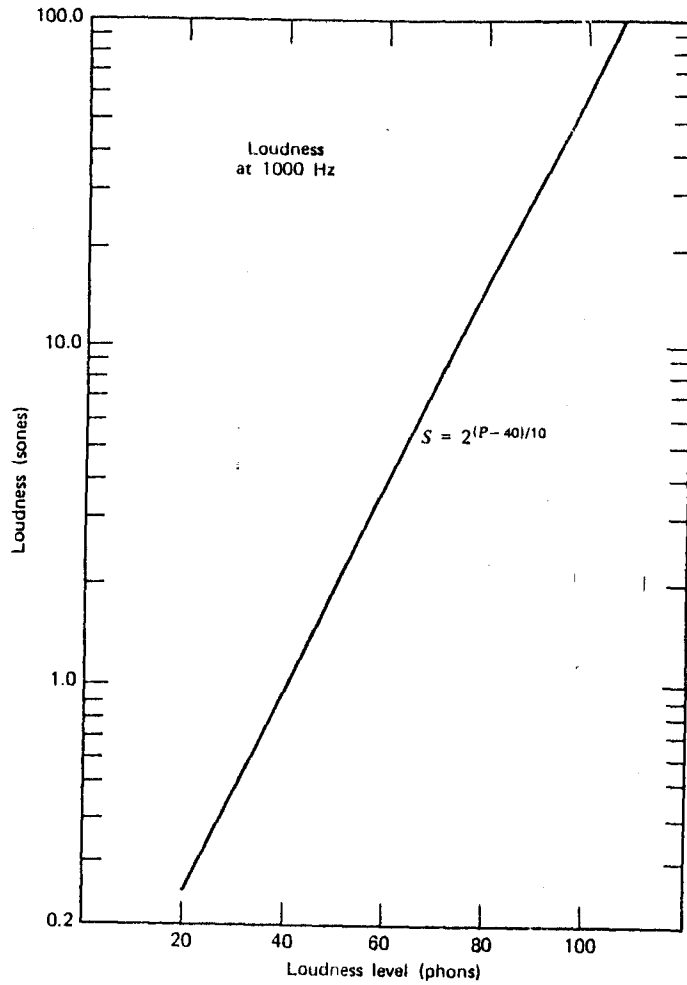


FIGURE 6.5 Graphical relationship between loudness in sones and loudness level in phons.

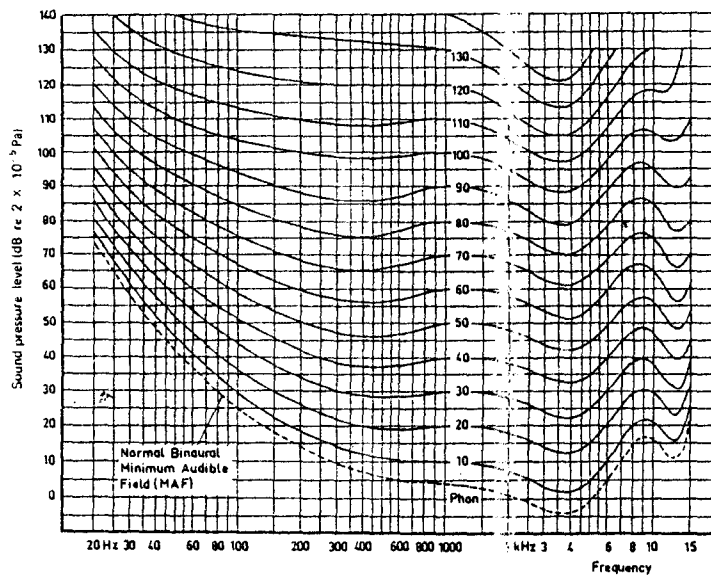


FIGURE 6.4 Internationally standardized set of equal loudness level contours. (Source: J. T. Broch, *Acoustic Noise Measurements*, B & K Instruments, Inc., January 1971.)

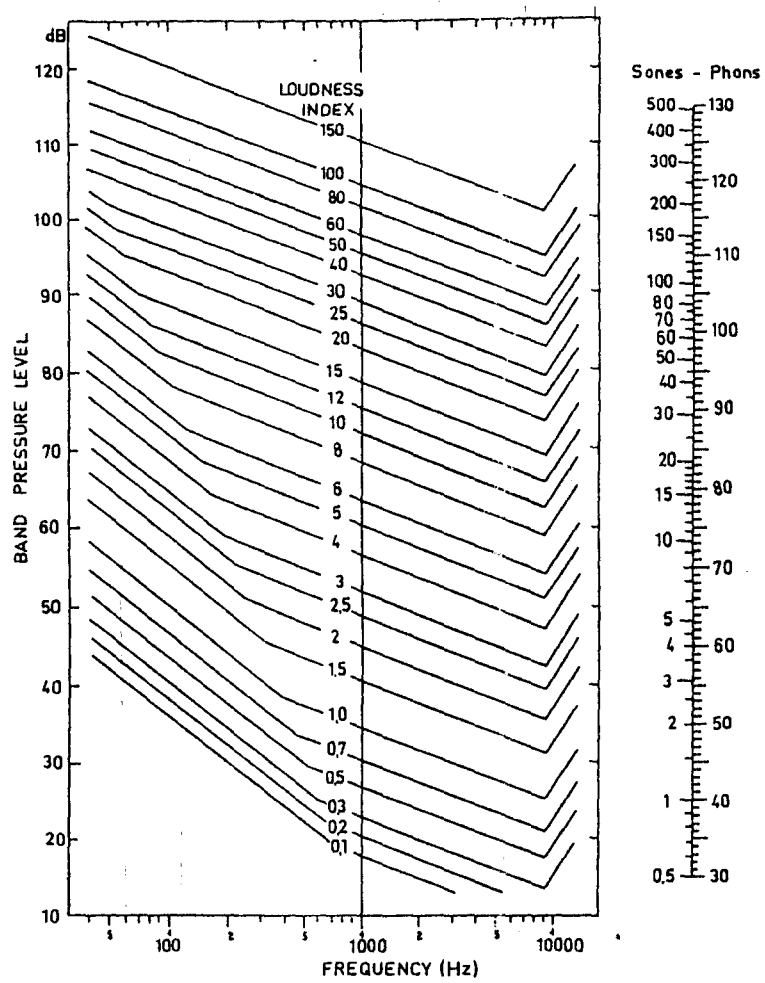


FIGURE 6.6 Equal loudness contours in sones. (Source: J. T. Broch, *Acoustic Noise Measurements*, B & K Instruments, Inc., January 1971.)