CE 492 -- Noise Assignment #1

1) A rock concert has three speakers standing next to each other set to produce a sound of 100 decibels each at a distance of 10 meters from the speakers. How far away do you have to be to have a sound pressure level of 85 dbA?

2) A six lane freeway has a peak hourly volume of 5500 vehicles per hour in the northbound direction and 5000 vehicles per hour southbound at a speed of 50 mph. Traffic is uniformly split between lanes (1/3 per lane). Traffic is 80% automobiles, 15% medium trucks and 5% heavy trucks. The freeway has 12 foot lanes and a median of 24 feet. Assume an infinitely long roadway segment and a hard site.

   a) What is the equivalent lane distance for each direction from an observer 200 feet from the edge of the northbound pavement?

   b) What is the resulting sound level for an observer 5 feet (1.5 m) above and 200 feet from the edge of the northbound pavement? Find this:

      1) by hand, using figures in book
      2) using the WDOT nomographs

   b) What types of land use are permissible at this location?

3) A 10 foot sound barrier is to be placed along the freeway that emits a combined sound level of 75 dbA. It blocks an angle of 120 degrees from the observer. What is the resulting sound level at the observer? Use the barrier nomograph

4) Develop a graph that shows the sound reduction of an infinitely long, 10 foot high sound barrier for observers at 50, 100, 200 and 500 feet from the barrier, assume the barrier is 50 feet from the sound source.

   Due April 12, 2005.