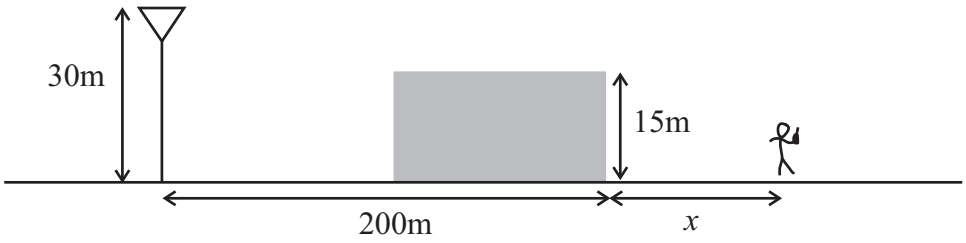
ECE 3065 Homework 5: Large-Scale Path Loss and Small-Scale Fading

1. **Outage Probability:** A WiMax link is deployed to provide wireless data services to the campus of Georgia Tech. This system must have a minimum SNR of 12 dB to operate properly. The typical received noise floor is -102 dBm for this type of radio. You are operating a wireless PDA by the shaft with an average received power of -77 dBm and no clear line-of-sight to the access point. What is the probability that, for a given point in space, you will loose the wireless link? (**5 points**)

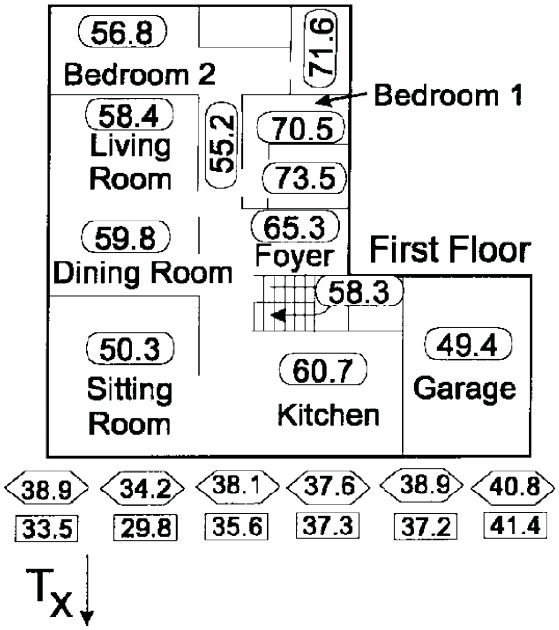
2. **Diffraction:** A 860 MHz, 10 dBW-EIRP, vertically polarized cell tower is transmitting to a 1.5m-tall user that is shadowed by a building with the following geometry:



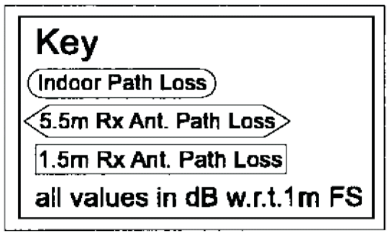
Discounting the effect of ground reflections, estimate and graph the received power into the 0 dBi-gain handset antenna over the interval 5m $\leq x \leq$ 50m. Approximate the right edge of the building as a vertical PEC screen. (**10 points**)

3. **Partition Model:** You are given a second set of path loss data that must be analyzed with a more sophisticated partition-based model (see below). Find typical loss values for exterior walls and interior walls. Report the standard deviation of your model. (**10 points**)

Diagram for Problem 3:



Scale: 0 5m



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