In this project we study the problem of wireless sensor network (WSN) node placement in a modeled environment. Although various optimal and sub-optimal techniques with different objectives and constraints such as maximizing coverage, network lifetime and reliable data transfer have previously been proposed for different variations of the node placement problem, many of these methods make various simplifying assumptions such as homogeneous transmission ranges among nodes. In our work we model the real environment and then based on our model we specifically design two node placement algorithms for two-tiered heterogeneous networks that aim to solve problems such as minimizing the number of RNs and SNs needed to satisfy a coverage constraint while maintaining connectivity (with fault-less connections) of the SNs to the base station and also maximizing the area covered by a specific number of RNs and SNs.