Installation of fiber network is an expensive affair and proper planning is required to realize a fully functional network. Though it is expensive to install optic fiber networks, this paper proposes a model in their design, that if adopted can reduce on the overall cost of installation. Using University of Nigeria as a case study, the model in this paper uses Prim’s or Kruskal’s algorithm that would enable connection of all buildings to optic fiber network at a minimal cost. Data of strategic places (buildings) will be gotten from google map, a set of buildings will be considered connected if and only if there is an unbroken chain of optic fibre links between every two buildings in the set. A loop is not allowed and a redundant cable is not allowed either as this will increase the cost.