ABSTRACT

The concrete and steel frame construction in the offices buildings, hospitals, hotels, apartements and shopping malls making the signal coverage of outdoor base transceiver station(BTS) is not maximal. It is caused of there are some signals of the reflected, scattered and reflected, so that the signal quality indoor environment is too bad. The traffic capacity of outdoor BTS was not coverage traffic capacity for outdoor and indoor environment causes drop calls frequently.

The pico cell is a solution to improve signal quality and increase traffic capacity in an indoor environment. The distributed antenna system(DAS) is an effective and efficient network system in pico cell by dividing the signal into every floor inside the building and radiated by each pico antenna. Pusat grosir Surabaya, the building has concrete and steel frame construction so that the signal quality inside buildings is low signal. So outdoor traffic capacity of base stations to the buiding was no longer able to cover because of frequently drop calls at peak hours.

The three models of indoor propagation that is used in pusat grosir Surabaya such as COST 231 indoor, ITU propagation indoor and keenan motley, only propagation keenan motley can cover pusat grosir Surabaya building. Pusat grosir Surabaya takes 51 points antenna that is used jointly by several operators to improve signal quality in the building. While the traffic calculation used just one sector of three radio base station(RBS) sectors are available, with assumption if one sector has been used already overloaded traffic in the future it is used two other reserve sector. After implementation of the pico cell in the pusat grosir Surabaya building to be conducted walk test after. Results walk test after, the signal quality is in conformity with the key performance indicator(KPI) standard operators such as Rxlevel-min $\geq$ -85 dBm(99.9%), RxQuality 0-3(99.9%), *drop call rate statistic*(0%), *hand over success rate statistic*(100%), Ec/Io $\geq$ -10dB(100%) and *call setup rate* $\leq$ 4 sec(100%).