ABSTRACT

The Green Cagar City housing complex, located in the suburban area of Depok City, is currently under development, requiring an internet network and Triple Play services with faster data transfer capabilities. In this study, the author discusses the design of an FTTH (Fiber To The Home) network to support internet and Triple Play services using XG-PON technology in the Green Cagar City housing complex.

In this research, the author utilizes the OptiSystem simulation application to design the FTTH network. The design and simulation process involves creating cable routes and selecting devices while considering parameters such as Link Power Budget (LPB), Rise Time Budget (RTB), Bit Error Rate (BER), Signal-to-Noise Ratio (SNR), and Q-Factor based on ITU-T G.987 standards.

The simulation results for the downstream LPB (Link Power Budget) calculation show that the closest distance is -26.292 dBm, while the farthest distance is -26.319 dBm. These values meet the sensitivity standard set by ITU-T G.987.2, which is -28 dBm. For the Rise Time Budget, the time limit value is 0.07 ns for NRZ encoding on the downstream link, whereas, for the upstream link, the time limit value is 0.35 ns for NRZ encoding. The calculated results are 0.050346 ns for the downstream link and 0.050087 ns for the upstream link. The Rise Time Budget results are considered good, as they are lower than the encoding time limit.

Keywords: FTTH, XG-PON, *Power Link Budget, Rise Time Budget, Bit Error Rate, Signal to Noise Ratio, Q Factor*