ABSTRACT

The development of information technology and communication services in the current era has increased every year. The need for internet services is also experiencing faster growth. However, many areas in Indonesia are still not connected to the Fiber to The Home (FTTH) network. In the Situbondo area, which is located on one of the largest islands in Indonesia, there is no FTTH network. The use of the Fiber to The Home (FTTH) access network in the Situbondo area will help the community in terms of accessing internet services with fast and stable speeds with minimal obstacles. Especially in industrial areas, tourism, and regional centers located in the Situbondo area. The Panarukan area is one of the sub-districts that has the potential to be a developed area. International ports, white market beaches, tourist villages, and historical sites are one of the reasons for equitable infrastructure development and internet services are needed for a fast and smooth data transmission process whenever needed.

To determine the feasibility and performance parameters of this FTTH design system, calculations are carried out which include predetermined parameters. These parameters include Power Link Budget and Rise Time Budget for system feasibility, BER (Bit Error Rate) for system performance. And OptiSystem software to compare the results of manual calculations of the parameters with the results using OptiSystem. In addition, the use of Google Earth Pro software is also used to determine the coordinate points of devices such as OLT, ODC, ODP, ONT and customer coordinate points where there is no FTTH.

The results of manual calculation and feasibility of downstream power link budget parameters, the largest manual calculation downstream attenuation value is in Panarukan sub-district, namely 27.271 dB located in Gelung village. As for the value of the receiving power (Prx) in the manual calculation in Panarukan sub-district in Duwet village which is the largest, namely -24.271 dBm.

The results of manual calculation and feasibility of upstream power link budget parameters, the largest manual calculation upstream attenuation value is 26.50 dB located in Gelung village, Panarukan sub-district. As for the value of the

receiving power (Prx) in the manual calculation in Panarukan sub-district, the largest is - 26.50 dBm.

The largest result of the BER simulation is 5.926 x 10^{-14}*, where the value is included as ideal/appropriate because it is below the BER standard of 1* x 10^{-9}.

The results of manual calculation and feasibility of downstream rise time budget parameters, the largest manual calculation downstream attenuation value is in Panarukan sub-district, namely 1.00918204 ns located in Gelung village. As for the manual calculation of the upstream rise time budget in Panarukan sub-district, the largest is 0.9957004 ns, which is located in Kliensari village. This value is in accordance with the standards set by PT Telkom and ITU-T, which is below 11.11 ns.

Keywords: *Situbondo, FTTH, Power Link Budget, Rise Time Budget, BER.*