

## ABSTRACT

*The technology that we know is always developing every year. One of the current developing technology is optical fiber transmission line communication. Bumi Adipura Cluster is one wide housing that is divided into 7 clusters located in the city of Bandung, and do not have access to optical fiber services yet in Cluster Cempaka. A large number of users and high level of internet necessity for each user, allows this design of optical fiber access network for Cempaka Cluster strategic and appropriate, so their needs can be fulfilled.*

*The calculation will be done refers to properness parameter and required performance, the method used in this FTTH (Fiber to The Home) design are location observation, designing, and also analyzation. Power Link Budget and Rise Time Budget for that properness parameter system will be counted and compared with simulation using OptiSystem software. The softwares that used for this research are Google Earth, GE SmallWorld and also OptySystem.*

*Based on the design result of fiber optic solution for adipura cluster require 1 OLT with 2 OLT port, 4 ports PON OLT, 1 new ODC with a capacity of 288 cores, 1 GPON module slot, 91 ODP, 600 ONT, HDPE 50/42 mm pipe fitting 1 pipe with 15 meter depth. From the calculation of PLB in the calculation can be the furthest downstream simulation value of -25.38 dBm and simulation calculation -22.193dBm, upstream simulation calculation value of -13.053dBm and simulation calculation of -7.142dBm value that meet the feasibility of the standards used by PT.Telkom and ITU -T G.984 is -28dBm, Rise Time Budget value based on the feasibility of power system using line coding Non Return to Zero limit 70% downstream direction 0.282 ns and upstream 0.564 ns with downstream and upstream rise time budget value of 0.2507 ns, Bit Error Rate value  $2.707 \times 10^{-132}$  with value standard  $1 \times 10^{-9}$*

**Keywords: FTTH, OptiSystem, Power Link Budget, Rise Time Budget**