ABSTRACT

This research study about usage of expanded polysterene for wall structure with strengthening of net wire. Styrofoam has very light weight unit which is about 13 kg/m$^3$ up to 15 kg/m$^3$. Lightweight concrete from expanded polysterene is an effort of utilising it as an alternative in the structure of lightweight walls.

In this research, used 12 specimens of lightweight walls which were sandwich wall reference (DSK.H$_1$-H$_6$) has core dimension 80mm and sandwich wall polyprophyelene fiber (DS.I$_1$-I$_6$) with variation 0.5kg/m$^3$; 1.0kg/m$^3$, 1.5kg/m$^3$ respectively. It has core 70mm, 80mm, 90mm in dimension. The dimension of lightweight wall were ±530, 400 and 120mm. Every variant consists of 2 wall, the type of load applied were compression, tensile and flexure. The data then analyzed with quantitative descriptive method.

The test result showed that the average of compressive strength and tensile splitting test of self compacting mortar using fibres 0kg/m$^3$, 0.5kg/m$^3$, 1.0kg/m$^3$, 1.5kg/m$^3$ which were 12.45MPa, 10.38MPa, 12.24MPa, 9.49MPa and were 1.54MPa, 1.28MPa, 1.41MPa and 1.08MPa respectively. The addition of polypropylene fibers were not influence compared with reference cylinder with 0kg/m$^3$ fibers.

The composition of the addition of polypropylene fiber will optimum of 1.0kg/m$^3$ in volume. The core and plastering effective were the results 80mm and 20 mm, that the dimensions can increase the capacity of load 6.92%. The value of the maximum load capacity of walls on sandwich styrofoam is of 22.86kN on the addition of polypropylene fibers 1.0kg/m$^3$ in volume.

**Keyword**: Sandwich Styrofoam, Lightweight concrete, polypropylene fibers