

**PULL OUT STRENGTH OF EXPANDED POLYSTYRENE (EPS) – STEEL  
FIBRE (SF) LIGHTWEIGHT CONCRETE (LWC)**

By

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## **DECLARATION**

I Nur Amirah binti Mustafa Kamal, 2011410248 confirm that the work in this report is my own work and the appropriate credit has been given where references have been made to the work of other researchers.

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## ABSTRACT

In 21st century, engineers are challenged to build taller and skyscrapers to be an iconic to the country. This situation challenges development of new light weight material with superior strength to enhance the carrying capacity of the structural death in the build design. Lightweight concrete (LWC) is one of the favourable material to be used as it has low density with acceptable high strength, good tensile strain capacity, low coefficient of thermal expansion due to the voids present in the LWC. Nevertheless, in certain applications, such as ocean platforms and long-span bridges, the need higher for durability and toughness concrete because important and must be given appropriate attention. Structures from LWC mixture can design to have similar strength and mechanical characteristic as in normal concrete. To achieve higher structural carrying capacity, steel fiber was be added to EPS lightweight aggregate. This research paper evaluates the pull out strength of lightweight concrete mix and reinforcement steel rod. Poison's Ratio and Modulus of Elasticity also determined in this paper. Three different series eas made, label as Series A, Series B and Series C. Series A is defined as control sample, Series B is concrete mix containing 30% of EPS, and Series C is concrete mix containing 30% of EPS with 0.5% of steel fiber. Two different tests were carried out by using 1000kN UTM machine with same dimension of cylindrical sample size 150mm x 300mm. All the testing methods are in accordance to American Standard Test and Material, ASTM. Maximum pull out strength was achieved by 30% EPS mix proportion, 174.539 kPa. Maximum Modulus of Elasticity was achieved by 30% EPS with 0.5% steel fiber and Poison's Ratio value is 0.17.

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