

Behaviors of High Strength Concrete Containing Para Rubber Latex and Rubber Sludge

Abstract— The objective of this study was to investigate the behaviors of high strength concretes containing concentrated latex and rubber sludge such as workability, compressive strength and tensile strength. The designed strength was 45 MPa. The required slump was from 7.5 to 12.5 cm. The water in mixture proportions was substituted by the latex at the rates of 0.5% and 1.0% by weight while the fine aggregate was replaced at the rates of 2.0% and 4.0% by volume. The mold dimension was in cylindrical shape with 10 cm of diameter and 20 cm of height. The concrete specimens were observed at the ages of 3, 7, and 28 days of curing for the compressive strength and at the age of 28-day curing for the tensile strength test. The result showed that the workability of high strength concrete increased when it contained the para rubber latex. However, it decreased when the percentage of concentrated latex and rubber sludge increased. In addition, the compressive strength of 0.5% latex-concrete was higher than the that of control sample while the 1.0% latex-concrete provided a lower strength. Moreover, the mixtures that contained both latex and sludge gave less strengths while the amount of sludge replacement increased. At 28-day curing, most of mixtures provided better tensile strengths except the sample with 1.0% latex and 4.0% sludge. The 0.5% latex-concrete produced the highest tensile strength.

Keywords— *Compressive strength, workability, tensile strength, para rubber latex, and rubber sludge.*