STUDY ON BUILDINGS SUITABLE TO BE CONSTRUCTED IN HOT, WINDY COASTAL REGIONS

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As Sri Lanka is a small island located in the Indian Ocean close to the equator, most of the built-up areas are close to the coastal belt and subjected to hot temperatures. Due to the diurnal temperature changes, coastal belt is subjected to windy climate. This research focuses on the impacts and mitigation measures to avoid the impacts for the buildings that are constructed in the regions where the hot, windy, and coastal conditions exist.

Due to the existence of these conditions, the designers must go through lots of design standards to ensure the building does not fail during the execution. Otherwise, lots of serviceability problems can occur when the building is in use. Sometimes after realising these problems later, the owners may have to withdraw the buildings. This research focuses on studying concrete made up of recommended cement types to be used in the regions where the above-mentioned challengeable environmental conditions exist.

Since in the coastal regions, the chloride ion density in the atmosphere is very high it can be expected the penetration of these chloride ions into the concrete structures and reaction with the steel reinforcements and hence deterioration of reinforcement and concrete can happen. On the other hand, since the higher temperature, the possibility of propagating the cracks on the structural elements is high. Due to these cracks, concrete deterioration is induced as the chloride ions can penetrate through the concrete easily.

Some of the cement manufacturers have realised these problems and have recommended some types of cement to overcome these challenges. This research focuses on the behaviour of different types of cement that have been recommended by the manufacturers when they are subjected to tests like, the Compressive strength test, Rapid Chloride Ion Penetration Test, and Splitting Tensile Strength. The concrete specimens were cast by three different types of cement including Ultratech (Portland Fly Ash Cement) Tokyo Super (Hydraulic Blended Cement), and Insee (Marine Plus) to carry out the mentioned tests.

Keywords – Cement types, RCPT Test, Compressive Strength Test, Splitting Tensile Strength Test

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