Abstract

Pouring of concrete underwater is necessary in the implementation of most in-shore, and off-shore structures. The pouring of underwater concrete is considered as a challenge for engineers, even during the design stage or during implementation and supervision. This is due to the fact that many precautions must be taken for the success of casting process. The most important precaution is to protect the fresh concrete during the casting process from the water to avoid the risk of washout of cement past and segregation of aggregates. Concrete can be placed underwater successfully though good design of concrete mix, and through choosing the most suitable method for placing of concrete. There are new techniques for underwater concreting such as grouted aggregate which is known as two-stage concrete (TSC) method which, as the name implies, consists of filling a form work with the coarse aggregate and then injecting the grout to fill the voids through pumping tubes extended to the bottom of the form. The main objective of the thesis is to present the capability of pouring the concrete underwater by using (TSC) method. A laboratory model was prepared and visually investigated and tested by extracting core samples, performing compressive test, tensile test and using ultrasonic pulse velocity test. From the obtained results it has been observed that, it is possible to pour concrete underwater by using two stage concrete in successful way, and it is recommended to develop this research by using different water cement ratios and cement sand ratios to get the optimum mix design and also, different types of aggregates which are available in local quarries.