

The hydraulic erosion of concrete is often found in civil and marine engineering construction. The present study explores the effects of several erosion parameters on the material loss of a concrete specimen subject to the hydraulic flow produced by a submerged jet. Such an investigation has rarely been reported in the literature. The concrete specimen has a typical compressive strength of 35 MPa, and the experimental parameters include the exposure time, incidence angle, standoff distance, and the hydraulic jet pressure. The impinging velocity is estimated based on the distance considered in the round jet model. The regression analysis shows the relationship between each parameter and the material loss. One finds that the material loss is proportional to the exposure time and the hydraulic pressure. The maximum erosion lies at an incidence angle of around 30° to 45° and is affected by the fourth-order polynomial of impinging velocity. The result of the present study provides a reference to engineering practice where concrete erosion is a concern.

Relationship of compressive strength at the bottom. Study the relationship of material loss, depending on the incidence angle.



1. Introduction

Concrete is widely applied in civil and marine construction. In the past, the principal development of concrete technology