

## Abstract

Intake structures, including accessory structures that should be designed so that water at the same time, the maximum flow rate with minimal sediment into the basin. Many studies have been conducted in a rectangular basin diversion channels and metrics are also presented. According to research done by selecting the appropriate position and angle of the water intake of the main channel, including measures to minimize the entry of sediment and increased water, the criteria in compliance with the losses due to pressure gradient, and the intake minimized and the ease of transferring water to the mouth of the basin. The main objective of this study is on the intake of trapezoidal channel and answer to this important question, which is basically the angle dewatering of the main channel flow it can increase and decrease of the sedimentation basin. Given that the software FLUENT the flow field of hydraulics has extensive capabilities in different situations, this software is used in this research. For verification, the output of the software FLUENT model with experimental data of Dr.Seyediyan model implemented and calibrated And ensure the accuracy of the work, by changing the angle of intake, examine its impact on the rate of incoming flow, then by using particle dynamics methods we examine the sediment basin. Also the effect of Froude number on the flow deviation angle covered. The results indicate that the angle of 30 degrees relative to the sedimentation pond to inlet flow is minimal compared to other angles and this angle can be introduced as the best point of intake in trapezoidal channel. Also, check out the different Froude numbers at any angle intake, it was concluded that the effect of these parameters on the flow rate deviation is small and negligible.

**Key words :** Discharge, Intake Angle, Trapezoidal channel



University of Zabol  
Graduate school  
Faculty of Engineering  
Department of Civil Engineering

**The Thesis Submitted for the Degree of M.Sc (in the field of  
Engineering Science)**

**Angle of intake effects on the water  
discharge and sediment to a trapezoidal  
channel**

**Supervisors:**

Dr. H. Derakhshan  
Dr. M. Sajjadi

**Advisors:**

Dr. M. Mollaei nia

**By:**

R. Behbahani

September 2013