ISSN 0511-5728
The West Indian Journal of Engineering
Vol.43, No.2, January/February 2021, pp.69-76

Special Paper:

Hydraulic Model Study of Arena Dam Spillway Works, Trinidad

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(Received 18 February 2021; Accepted 23 February 2021)

Abstract: *The work reported in this paper was carried out by the first author - the late Professor Harry Orville Phelps (1929-2018) - in the Fluid Mechanics Laboratory of the Department of Civil and Environmental Engineering at The University of the West Indies at St. Augustine in 1975, when the third author assisted him as his graduate assistant. Unfortunately, this physical model study was not published in the lifetime of Professor Phelps. The third author found a copy of the report prepared in 1975, while preparing a memorial for Professor Phelps, published concurrently in the West Indian Journal of Engineering as well as the Journal of the Association of Professional Engineers of Trinidad and Tobago. Moreover, for the sake of preserving the integrity of original work, it is essentially unaltered for publication. Finally, it is hoped that its publication will add to the history of landmark hydraulic engineering structures built in Trinidad, and indeed in the Commonwealth Caribbean, and equally to Professor Phelps' legacy.*

Keywords: *Dam, Spillway, Scale-Model, Trinidad, Water Supply*

d_0 - mean depth of flow at head of spillway channel
d_1 - mean depth of flow at tail of spillway channel
n - manning's roughness factor
q - discharge per unit width
u - percentage of air flow
v - mean velocity of flow
v_a - ritical velocity for air entrainment
v - maximum velocity in spillway channel*