

A Road Collapse at Pont Cassé, Dominica: Hydrologic and Hydraulic Aspects

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Abstract: *In the early morning (about 5:30 AM) of Friday 19th April 2013 a motor vehicle fell in a 13m deep and 25m wide ravine, which had rapidly formed across a major road, at a culvert crossing at Pont Cassé in the island of Dominica (15°N, 16°W) in the Lesser Antilles. There were intermittent heavy rains in the preceding three days, and particularly during the preceding twenty-four hours. About 400 mm of rain is believed to have fallen on the catchment upstream of the culvert crossing. This accident unfortunately led to the death of two persons. This technical note, based on a site visit during 5th to 7th May 2013, first outlines the hydrologic and hydraulic setting of the road collapse, as well as the unavailability of event specific hydrologic data. It concludes – essentially using heuristics, judgment and transposition - that the probable causes of the road failure were twofold - firstly, a flash flood, arguably, with a return period in excess of 100 years, and secondly, an inadequate maintenance of a concrete culvert in a terrain prone to slope instability. It ends with the following recommendations (a) there is a need to expand the network of recording rain-gauges and stream-gauges in Dominica for preparing Rainfall Intensity-Duration-Frequency and Flood Frequency Curves respectively, for an optimal design of hydraulic structures; (b) the Caribbean Council of Engineering Organisation should undertake the preparation of a code of practice for engendering the same in the islands of the Commonwealth Caribbean; and (c) in the aforementioned islands, there is a need for preventive maintenance and/or retrofitting of culvert and bridge crossings.*

Keywords: Culvert, Dominica, Flood, Rain, Road, Scour