



Development of IDF Curves for GALLE Meteorological Station

R.M.K.C. Rajapaksha¹, N.D.P. Ransara², and G.H.A.C. Silva^{1*}

¹*Dept. of Civil and Environmental Engineering, Faculty of Engineering, University of Ruhuna*

²*Sri Lanka Land Reclamation & Development Corporation*

Abstract

Flash floods are becoming more and more common and frequent particularly in urban areas all over the world. Unplanned development and alteration of existing land-use are identified as major contributing factors for flash floods. Nevertheless, according to climatologists there is a significant change in precipitation patterns due to climate variability and rainfall extremes have been distorted. Sri Lanka has no exception with regards to flash floods particularly in urban areas with lot of changes in relation to basin characteristics as well as variability of climate/weather. City of Galle has had flash flood experience due to inclement weather. Recently some research attempts have been made to investigate the vulnerability against flash floods through simple hydrological modeling approach and with extreme precipitation inputs. Design precipitation hyetographs have been used as the system input for above hydrological investigations using available Intensity-Duration-Frequency (IDF) relationships for required return period. However, the available IDF curves for Galle meteorological station were developed based on the precipitation data before 1980 and they do not represent the climatological changes that would have taken place in the recent past. The objective of this study is to develop/update IDF curves for Galle meteorological station using most recent precipitation data.

The data required for this study were rainfall depths for short durations from 15 minutes to several hours. As the digital data for Galle meteorological station are not available (except daily data), all short duration data had to be extracted from rainfall pluviographs. Several appropriate distribution functions were studied to obtain IDF curves. Then the statistical method, the Type-I extreme-value distribution (Gumbel) was identified as the most appropriate method to estimate the relevant parameters of the IDF model. Recommendations were made for the future development of rainfall IDF curves in the region both in terms of data and organizational requirements.

Keywords: *Extreme storm events, Galle meteorological station, IDF curves*

* *amila@cee.ruh.ac.lk*