A4. AL AIN MUNICIPALITY REQUIREMENTS

A4.1 Precipitation depth and intensity-duration-frequency curves

Twenty-four-hour intensity-duration-frequency (IDF) curves for the design storm frequencies are shown in Figure A-4.1. Total design precipitation depths, measured in millimetres, for different statistical recurrence intervals for the 24-hour duration storm graphs are shown in Figure A-4.2.

The estimation of runoff discharges shall utilize the precipitation frequency and intensity values shown on the following graphs. These 24-hour precipitation-frequency and frequency-intensity-duration curves have been prepared utilizing precipitation records from the Al Ain International Airport. Until such time as more regional precipitation or runoff values are developed, the curves noted the curves noted for the Al Ain area Figure A-2 shall be used for Al Ain Region 2 and W2.

The graphs have been prepared using probability statistics to define the storm size and appropriate precipitation intensities for various future occurrence events from which discharge rates can be calculated for design of the structures and pipes required to handle the runoff. The total precipitation graphs show the total rainfall in millimetres in a 24-hour period for the “n-year flood” (return period). The precipitation intensity graphs show the design intensity in millimetres per hour for the various “n-year” storms that are to be used for the calculation of peak discharge. It is noted that from observations and records that the typical storm events in this locale area of high intensity short duration type storms, wherein most of the 24-hour total precipitation will occur within the first 2 hours of the event. When designing systems utilizing on-line or off-line storage where the discharge structures and pipes are sized smaller than that required for the peak runoff volumes, consideration should be given to what will happen if back-to-back storms occur.

TableA-1: IDF equations for Al Ain Region 2 and W2 are provided for various storm reoccurrence intervals. Intensity can be calculated directly for the Al Ain Region and the interior areas of the Western Region 2.

A4.1.1. Background and characteristics of design frequency curves

Regions 1 (Abu Dhabi) and W1 (coastal area of Western Region) show similar hydrological characteristics in terms of having low-lying plains with mild to flat terrain gradients dominated by salt marshes and wetland areas just a few metres above sea level along the coast.

These regions also have similar meteorological characteristics of rainfall and evaporation and thus have been grouped together for the purpose of developing the design storm frequency curves.

Regions 2 and W2 are heavily influenced by their higher elevations and proximity to the Al Hajar (Omani) Mountains, which vary in elevation from 500 m to 900 m, with some peaks as high as 2,000 m. Thus, Regions 2 and W2 are significantly different meteorologically from the other two regions, and a separate set of design storm frequency curves have been provided. Additional information on the emirate’s climate conditions can be found in Volume 4, Section 3.1.2, of these standard specifications.