

CHAPTER 1

Introduction

Background

Urban Stormwater Management Manual of Malaysia, 2000 (MSMA - Chapter 23) has mentioned the provision for rainwater harvesting system integration with on site detention tank.

This Guidebook covers the design of rainwater harvesting system for non ó potable water supply for Malaysian applications.

General Principles

Rainwater Harvesting is the technique of capturing the rainfall with particular emphasis on residential and commercial applications. The planning and development of rainwater harvesting system should be executed by following the principles and guidelines recommended by the authority and professionals. This is to ensure that the system complies with the safety, water quality and construction standard.

The rainwater harvesting system is a supplementary source of water supply for household, commercial, landscape, livestock, and agriculture.

The product of the rainwater harvesting system may be used either as a drinking water or for non-drinking purposes. However, the used of rainwater harvesting system for source of drinking water and other direct human purposes require a long-term commitment in term of operation and maintenance. This is to ensure that the system is continuously operating in safe condition.

The non-drinking purpose of rainwater harvesting system may include landscape irrigation and for toilet flushing.

The system should be designed and developed with innovative approaches for effective and affordability. The complexity of the rainwater harvesting system is closely related to the function and needs of the owner.

Rainwater harvesting system provides a source of soft, high quality water and the system can range in size from a simple water tank to a complicated designed and built system.

The rainwater harvesting system is inherently simple in design and easy to maintain. This system should be planned and design to be assembled with readily available materials by the owner or builder with a basic understanding of plumbing and construction skills.

Environmental Advantages

The interest on rainwater harvesting system has gained considerable attention in many countries throughout the world. This is attributed to the escalating environmental and economic costs of providing centralized water systems.

In developed countries, the majority of the populations receive water via main network and disposal of wastewater via pipe sewerage system. These systems require tremendous amount of investment by both public and private sectors. They have been linked to increase water demand, resources not located in areas of high demand and increase surface water runoff volumes and discharge rates due to urbanization.

The sustainable strategy which is based on the decentralised technologies such as the use of

green roofs and stormwater facilities such as on site detentions may result in partial retention and reduction in peak flow discharge of the drainage system; yet at a macro scale conserves energy.

The system which collects rainwater from roofs can be used for non-portable applications potentially reducing the utilization of portable water. The application of rainwater utilization for flushing and garden watering will include the benefits of conservation of water resources, relief of demand on public water supplies and potential attenuation of peak runoff into the stormwater drainage system.

Rainwater harvesting may reduce the land erosion and flooding caused by runoff from impervious cover such as pavement and roofs. This can be attributed to the some proportion of rainfall being captured and stored.

The normal behavior of stormwater runoff which picks up contaminants and degrades the waterways and receiving waterbody is bypassed by capturing the rainfall at source for productive uses. This is an effective measure to reduce the degradation of water quality in waterway and receiving waterbody.

Qualitative Advantages

The rainwater captured at source is considered as one of the purest water sources available. Rainwater quality always exceeds the surface water and comparable to that of ground water.

The harvested rainwater does not come in contact with soil and rocks where it can dissolve salts and mineral which is harmful for portable and non-portable uses and at the same time not exposed to various pollutants that often transported with surface water into the river.

The rainwater quality can be influenced by geographic location and economic activity in the area. The city dominated by heavy

industry or localized industrial emissions may affect rainwater purity.

Rainwater falling in rural and non-industrialised area can be superior to that in area dominated by heavy industrial and agricultural activities.

It is essential that the rainwater harvesting system is planned, designed and constructed conforming to this guideline to ensure the discharged of the polluted first flush is taken care of.

Rainwater is soft water compared to typical municipal tap water and not utilizing it as a supplementary water supply is a total waste of natural resources.