

Chapter 1

Introduction

1.1 General

Water is the blessing to the mankind as one of the fundamental needs to live with. By and large, it takes the body heat away and neutralizes the physical fatigue of the human when immersed in. Ancient Ceylon, as for many other trades, was in fore front using this natural resource for pleasure by designing surprising models of swimming pools such as twin ponds in Anuradhapura. It is surprising to see a swimming pool on a huge stone as on "Sigiriya" using clay bricks. Sinhalese Kings were so engineered to craft things to be named as wonders of the 21st Century.

Today, Swimming pools are considered as luxurious components for private houses, institutions and schools in Sri Lanka due to high cost of capital investment.

The basic requirements for any swimming pool may be summarized as follows:

1. The pool shell must be structurally sound.
2. The pool must be watertight when it is full and, if constructed below ground level, against infiltration of water from the subsoil when it is empty.
3. It must be finished with an attractive, smooth, impermeable surface.
4. The water must be maintained at a proper standard of clarity and purity, either by a continuous flow – through system or by means of a correctly designed and operated water treatment plant.
5. A walkway, of adequate width and a non-slip surface, should be provided around the pool.

The traditional and alternative structural forms should fulfill the requirements stipulated above. Those should fulfill the provisions of BS 8007:1987 when reinforced concrete is used.

1.2 Main Objectives

The main objectives of this study was to develop cost effective structural forms for swimming pools for Sri Lanka so that the capital cost of a swimming pool could be affordable to many institutions and private clients.

1.3 Methodology

The following methodology was used to achieve the above objective:

1. A detailed literature review was carried out to determine the various structural concepts and materials adopted in other countries. The alternatives that could be cost effective were identified.
2. These concepts were further investigated to determine the applicability to the soil types and ground water available in Sri Lanka.
3. Detailed structural designs were used to determine the suitability of the proposed concepts.
4. Detailed Survey was carried out to collect alternative water treatment processes in Sri Lanka to be used for water purification system in the swimming pool.

1.4 The main findings

The main findings of this study are listed below.

1. Cost of traditional swimming pools could be reduced significantly using alternative methods.
2. The reduction is mainly achieved by changing the structural forms used in the construction of structural walls and base slab of the swimming pools.
3. The reduction of the cost of water treatment process of the swimming pool is not in considerable magnitude. This is because the structural components used for treatment process is only the aerator of the system. Traditional methods to construct the structures and pressure filters can therefore be used for purification.

1.5 The arrangement of the report

The report is arranged in the following manner.

Chapter 2 gives a detailed literature review including design methodologies and construction details

Chapter 3 presents the design calculations and detailed drawings of traditional swimming pools and the alternative structural forms

Chapter 4 describes the cost calculations and comparisons of the traditional swimming pool with alternative structural forms to show the effectiveness of the alternative structural forms.

Chapter 5 deals with alternatives for associated structures mainly in water purification systems of swimming pools to obtain any cost savings using alternatives.

Chapter 6 presents the conclusions and recommendations



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