Chapter 5

# Alternatives for associated structures

## 5.1 Introduction

As mentioned in Chapter 2 water treatment or purification is the next most important consideration of swimming pools. The physical and chemical pollution of swimming pools can be divided into the following four zones.

1. Surface Pollution
2. Dissolved Pollution
3. Suspended Pollution
4. Deposited insolubles

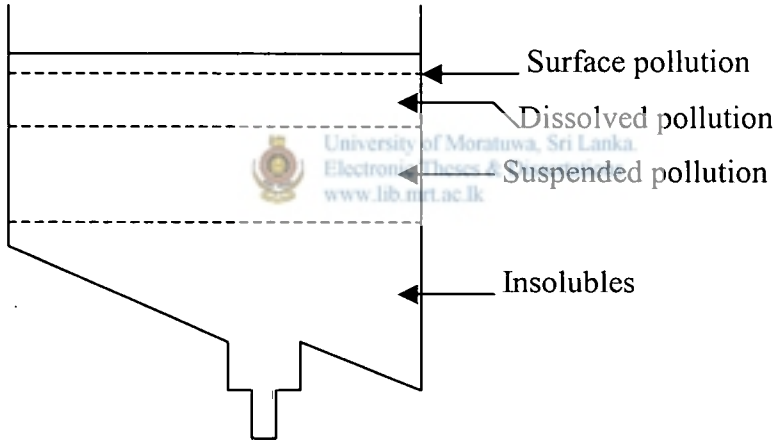



Fig 5.1:Water pollution zones in pools

## 5.2 Methods of removal of pollution

### 5.2.1 Removal of surface pollution

1. Remove surface water as soon as possible
2. Add sufficient chlorine to maintain free chlorine residual of 1 – 2 mg/L at all times.

### 5.2.2 Removal of dissolved pollution

1. Provide adequate filtration cycle
2. Add sufficient chlorine to breakdown, nitrogenous matter and render it harmless

### 5.2.3 Removal of suspended pollution

1. Use minimum quantity of chemicals
2. Maintain balanced water in the pool
3. Maintain careful control of pH and Alkalinity
4. Use chemicals which do not produce suspended solids.

### 5.2.4 Removal of deposited insoluble pollution

1. Adopt vacuum cleaning of the pool bottom daily.

### 5.2.5 Removal of the biological pollution in the swimming pool

1. Maintain free chlorine residual of 1 – 2 mg/L in the pool water at all times. chlorine will kill – off all the bacteria immediately and render the pool water safe for public bathing.
2. Provide an efficient top water drew – off system
3. Provide an efficient filtration system



## 5.3 Structural forms for water treatment

### 5.3.1 Traditional swimming pool forms for water treatment

The study made on the system shows no important structural components are present within it

But for removal of dissolved gases and for aesthetics of swimming pools cascade aerators are part of several pools. Figure 5.2 shows a schematic diagram of an aerator. The aerator is generally made using reinforced concrete. This is now built using ferro – cement technology which is cheaper to reinforced concrete structure.

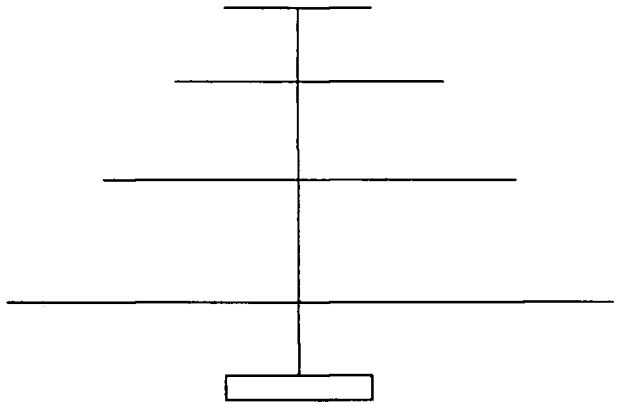

Fig. 5.2: Schematic diagram of an aerator

### 5.3.2 Alternative forms – Aerators built using ferro – cement technology

The cascade aerator are built using ferro – cement technology. This cuts down the cost by 30% of the aerator. This reduction of cost when compared with the total cost is not significant. The pools built in schools may use this since the smallest saving is important to the government funded school system.



## 5.4 Cost study

The cost study for the ancillary work of the swimming pool is as given below.

### 5.4.1 Cost for pool without deep end

Following list comprises the cost incurred in ancillary structures for a swimming pool without deep end. No spectator accommodation facility is taken into consideration for this cost study.

| | | |
|---|---|---|
| 1. | Pre-cleansing areas – showers and footbaths | Rs. 60,000.00 |
| 2. | Ceramic Tiling | Rs. 450,000.00 |
| 3. | Walkway slabs and floors of changing and shower rooms (wet areas) | Rs. 80,000.00 |
| 4. | Stainless steel hand rails | Rs. 40,000.00 |

| | | |
|---|---|---|
| 5. Sanitary accommodation | Rs. | 40,000.00 |
| 6. Pipe work for water circulation, water supply & drainage | Rs. | 50,000.00 |
| 7. Electrical installations & power supply | Rs. | 60,000.00 |
| 8. Electrically – driven centrifugal pump | Rs. | 60,000.00 |
| 9. Filters | Rs. | 80,000.00 |
| 10. Plant room for 7., 8., 9. above | Rs. | 30,000.00 |
| 11. Chlorinator | Rs. | 60,000.00 |
| 12. Aerator (optional) | Rs. | 40,000.00 |
| Total | Rs. | 1,100,000.00 |



### 5.4.2 Cost for pool with deep end

The items for the pool with deep end are some as for 5.4.1 above. But the quantities increase in several items.

The cost for the pool with deep end =Rs.1,600,000.00

## 5.5 Cost savings

There are no significant cost savings with regard to the other ancillaries as shown above. The maximum possible saving would be less than 1% of the total cost.

## 5.6 Summary

The cost study carried out for other ancillary structures and facilities shows that a significant cost is involved for providing these.

These need to be further studied with respect to modern technological findings with the aspect of water purification to minimize the cost incurred.