SWIMMING POOL FILTRATION PLANTS

Hydrarbeth

Sparkling Clarity

CIRCULATION OF PURIFIED WATER IN SWIMMING POOLS

Every bather getting into the pool contaminates the water; when bathers are few, contamination may be only slight. But when the bathers increase the contamination rapidly shoots up. the health of the bathers would then be endangered; the appearance of water in the pool becomes unpleasant. It is, therefore, necessary to install a purification and circulation plant of adequate capacity, to make the water clean and safe.

This is achieved by circulating purified water continuously through the pool (see figure 1). The water that is drawn from the pool is fed through the treatment plant and returned to the pool, bacteria safe and aesthetically crystal clear. Over a period, through the process of dilution, the pool water becomes safe.

With a continuous purification system, the same water is used again and again. For making up the loss due to splashing/evaporation and filter washing, fresh water has to be admitted, periodically, in the circulation system.

Purification of swimming pool water is achieved by :

i. Withdrawal of contaminated water from the pool through a circulating pump.

ii. Intercepting hair and floating matter by a strainer.

iii. Addition of alum for coagulation, when necessary.

iv. Removal of suspended matter in the filter.

v. Chlorination for sterilization of water and for oxidising the organic impurities.

vi. Addition of soda ash for pH correction, when necessary.

vii. Circulation of treated water through the pool for efficient process of dilution.

viii. Regular testing of the pool water to maintain desired standards.

WITHDRAWAL OF WATER FROM THE POOL :

The pool water is allowed to overflow into a balancing tank, where from the circulating pump sucks the water (see fig. 2 & fig. 3). Alternately, the pump can suck water directly from near the top surface of the pool through 'skimmer' units (see fig. 4).

Before entering the pump, the pool water is strained for trapping hair and suspended impurities.

COAGULATION :

By maintaining adequate chlorine residual in the pool, it is not necessary to add any coagulant. However, for heavily loaded pools it is better to make provision for coagulatn dosing.

For small and medium sized plants, a displacement type doser can be employed for coagulant

dosing and in the case of large capacity plants, it is advisable to provide metering pump.

Filter alum is the successfully tried out coagulatn.

Addition of alum is more use ful during the initial fill of pool, if water is not clear or after heavy bathing load.

Filtration :

The coagulatled water is admitted into rapid sand filter, which is normally of pressure type. The suspended matter gets trapped in the sand media. The water that comes out of filter is fairly crystal clear.

Chlorination :

Chlorine sterilizes the water and oxidises the organic impurities in the water.

For large capacity pools, usually a gas chlorinator is employed. The dosage of chlorine gas has to be such that a freely available chlorine residual is maintained at the desired level in the body of pool water. The normally recommended chlorine residual is 0.5 to 1.5 PPM. The actual dose of chlorine gas required to maintain this residual would depend on contamination of the pool water, which is again related to the bathing load as well as climatic conditions.

In the case of small sized plants, regular chlorinator can be used while in the case of bleaching powder dosing a displacement type doser can be employed.

With the break point chlorination, all organic matter in the water gets oxidised. Therefore, no separate aeration fountain is necessary for the process.

pH Correction :

Addition of chlorine gas causes acidity and depending upon the chlorine dose it may be necessary to add soda ash solution for correcting the acidity.

For small and medium sized plants, a displacement type doser can be employed while for large capacity plants metering pump has to be used.

When bleaching powder is used for chlorination, the addition of soda ash is normally not required for pH correction.

Control of algae :

By maintaining the pH value in the range of 7.2 to 7.8 and by maintaining proper chlorine residual in the pool water, the risk of algae growth can be minimised. However, if for any reason the chemical dosing was not upto the desired standard or circulation and filtration got disrupted, the water in the pool gets stagnated and invite growth of algae. In such an event it is advisable to resort to the application of algaecides like copper sulphate.

Process of dilution :

The purified water is admitted and withdrawn continuously; over a designed period of time, which is known as the Turn Over Period, the whole body of pool water gets diluted and replaced with purified water. However, efficient the purification system may be, unless and until the entry and withdrawal of water through the pool are properly designed, the process of dilution will not be fully effective.

Short circuiting and dead pockets in the pool have to be avoided. This is achieved by admitting water through out the length of the pool through equi-spaced orifices located at the floor level of the pool. The withdrawal can be through scum gutter built around the pool at the top surface, as shown in fig 2 or through surface collecting channel all around the pool as shown in fig 3, by allowing the water to cascade over a weir for uniform withdrawal. Alternately, skimmers can be fixed at regular intervals as shown in fig. 4 and the suction of the pump can be connected to these units. Withdrawal from the top, enables quick removal of floating impurities like mucus, oil, hair etc. In the case of surface gutters the pool water is allowed to gravitate into a balancing tank where from the water is sucked by the ciruclating pump.

An efficient circulation system helps uniform distribution of chlorine residual through out the swimming pool.

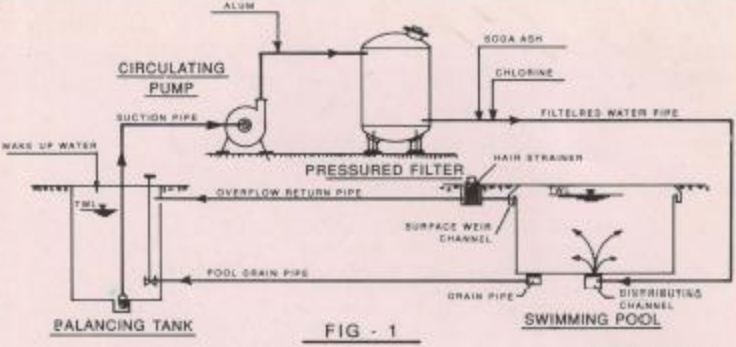

FIG - 1

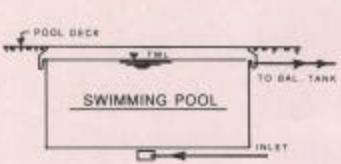

FIG - 2

FIG - 3

FIG - 4

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