

CHAPTER 10

THE RECIRCULATION SYSTEM

10-1. GENERAL.

The recirculation system is best described as a type of transportation system which keeps the water constantly in motion. A recirculation pump delivers water from the pool to an equipment station where it is filtered, chemically treated, and then returned to the pool. A strong chlorine residual for disinfection and oxidation purposes is carried with the water as it reenters the pool. Each of the devices and components encountered by the pool water as it recirculates is discussed. Chlorine and pH feed may be provided after the water is filtered. This is especially applicable in cases where sand filters are used.

10-2. PIPING.

Though copper pipe is acceptable, most pools use one of several types of plastic for piping and fittings. Low cost, complete resistance to corrosion, good flow characteristics, flexibility, and ease of installation make plastic practical for all pool piping. Some local building codes have not yet accepted plastic pipe, but those local codes that do allow plastic pipe usually specify the allowable plastic types and wall thicknesses. Steel piping should not be used in swimming pool recirculation systems.

10-3. DRAINS, OVERFLOW GUTTERS AND SURFACE SKIMMERS.

Water for recirculation is removed from the pool through two main drainage systems.

a. Some water is removed through the main drain at the deepest point of the pool. This enhances the removal of heavier-than-water particles such as sand, silt, etc. Main drain removal also contributes to mix-and-flow characteristics of the main pool water and the constantly returning water that is introduced at multiple inlets at the periphery.

b. Some water is taken from the surface of the pool and is removed through the overflow system consisting of overflow rims or skimmers or combinations thereof. Surface water removal is important since the top few inches usually contain the highest degree of contamination due to oral and nasal discharges, airborne pollution, insects, etc.

10-4. STRAINER.

a. After removal, the water flows through a piping system to an equipment area where all the water at a

single point is strained through a sieve like device, a removable (for cleaning purposes) screen on basket, often referred to as the "hair and lint strainer" or "leaf trap." This device collects leaves, hair, lint, gravel, insects, and other relatively large particles which would clog the pump impeller or other parts in the system. The use of this device reduces filter loading and generally improves overall system performance.

b. The strainer must be checked often to prevent a progressive clogging condition. As the strainer becomes "plugged" with debris, the flow of water from the pool to the recirculating pump is impeded. Severe accumulations in the strainer prevent sufficient water from reaching the pump, causing a condition known as "cavitation" resulting in noise, vibration and erratic performance in the pump. Prolonged cavitation will result in serious damage to the pump impeller, bearings, and seal.

10-5. FILTER PLANT.

Having been strained of debris, the water then flows to the filter plant for the removal of fine-particles such as dust, body oils, algae, slime, bacteria, coagulated material, etc. This filtration aids the chemical disinfection and oxidation processes which beneficially take place after the water is returned to the pool. The removal of undesirable materials is accomplished by several mechanical systems which are discussed in the remaining chapters. In the present state-of-the-art, pool filtration is achieved most commonly by particle entrapment in either (1) a bed of sand or (2) a thin cake of diatomaceous earth.

10-6. CHEMICAL FEEDERS.

As the pool water flows beyond the filters it is chemically treated. Chlorine disinfecting agent is added, pH adjustment chemicals are introduced, and the treated water is returned to the pool to destroy bacteria and oxidize other undesirable solids.

10-7. INLET DISTRIBUTION SYSTEM.

Reentry of pool water is governed by the location and sizing of inlets. When a swimming pool is in design stage great care is exercised to locate and size the inlets to obtain the best possible flow characteristics of the filtered and treated water. The inlet fittings are normally adjustable to control volume, velocity, and even direction in order to obtain overall system

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balance. The object, of course, is to provide rapid and uniform dispersion of treated water.

10-8. SYSTEM OPERATION PARAMETERS.

The pool operator should, by reference to flow meters and manipulation of valves, maintain a constant flow rate of 85 gal/min plus or minus 10 percent. Such operation will provide a turnover rate consistent with

good pool management practice. Refer to appendix D, Calculation of Turnover and appendix E, Pump Characteristics for further information. Because rate of flow is constantly affected by soil accumulation in strainers and filters, the operator must understand the function of these mechanical components in order to keep the overall recirculation system functioning efficiently.