Preventing Water Leakage in Concrete Structures
to ensure Water Tightness and Durability

Introduction

A typical problem in most Water Retaining or Water Resisting Structures is the leakage of water. This can happen due to various reasons.

Such structures include Water Tanks, Swimming Pools, Basement Wall and Floor perimeter joint, Basement column and floor slab joint, vertical joints in basement retaining walls, Sewage Treatment Plants, Sump Tanks, Potable water Reservoirs, Raft Slabs cast in more than one pour, final roof slabs cast in more than one pour, pipe intrusions in concrete walls, fish hatcheries, concrete lined storm water and irrigation channels, precast structures such as box culverts, septic tanks and utility vaults, pedestrian and below grade tunnels, butt joint between old roof and new roof and other joints.

Typically, leakage can occur due to four major reasons:

1. **Through Construction and Cold Joints**: A construction joint is formed when concrete is cast in different stages successively. These joints may be horizontal, vertical, inclined or curved depending on how the concrete is cast.

2. **Through honeycombs in concrete**: This occurs due to defective concreting procedures, inadequate vibration, bad placement, harsh mixes and other reasons.

3. **Through capillary pores**: Formation of pores is a natural process in when concrete sets. Water can leak through capillary pores. Typically this is seen as moist areas.

4. **Through cracks in the concrete**: This generally occurs either due to inadequate structural design or due to inadequate curing.

More than 90 percent of leakage problems are associated with lack of providing a proper seal in Construction or Cold joints. This can be solved easily today by using a compressible, flexible preformed joint sealant (SYNKOFLEX) which does not require any skill in laying.

The other three problems are to be addressed individually by the designer of the structure by using the right mix design, by specifying correct placement procedures, by adding certain additives that close capillary pores and by insisting correct curing practice on site.

When all the four problems are addressed in totality, the structure will be sound and waterproof.