

Micron seeds filters case study

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Russell Loom, Shanghai-La Sydney chief engineer Ageing filtration system installed in 1992 Challenge Shanghai-La Hotel Sydney 1.5-million liter pool was not meeting otelengineer's expectations due to an ageing filtration system installed in 1992. As a result, pool water clarity was substandard and the filters required frequent backwashing due to an ever-increasing swimming load. The swimming pool has a volume of 90,000 liters with a surface area of 1,000 m² and an average depth of 1.5 m.

Hotel management needed to improve pool water turn over rate to at least every two hours. To achieve this, a flow rate of 100 m³/hr or 400 l/s was required. In addition, the pool's plant room door was only 1.5 m wide, thus limiting the options for a larger sized commercial filter. The existing filtration plant consisted of two 1,000 mm diameter sand filters plumbed with 100 mm pipe to two, two horse power pumps. Each Hydrometers plus 200 pump was plumbed to one Multimillion filter and the flow was split between two Micron SEEDS filters.

Solution to achieve a turn over rate of two hours, Russell Fagan and Brad Weir from Steel Pity Ltd sized up four Micron SEEDS fiberglass wound filters, with two high head Hydrometers plus 200 pumps, and two Multimillion centrifugal pre-filters.

Each Hydrometers plus 200 pump was plumbed to one Multimillion filter and the flow was split between two Micron SEEDS filters. The Micron deep bed filters were chosen over standard Micron filters. The deep bed filters have a filter media bed depth of 1,000 mm, providing enhanced in-depth filtration and increased dirt capacity.

The effect of deep filter media bed Improves the filtration efficiency over standard high-rate filters. The filter's mm filter media bed also ensures that finer dirt particles and colloidal substances are retained to a far greater level than standard bed depth. Additionally, the greater bed depth permits the efficient use of a mixed filter media bed. The gravel formed an underlay around the filter's laterals improving the hydraulic efficiency of the filter and Garnet was added to provide a superior level of filtration.

The mixed filter media bed of sand, garnet and gravel at a low filtration velocity is capable of filtering effectively down to 5 microns (0.05 mm). A high rate filter media bed is only capable of filtering down to 30 microns (0.3 mm). Four Micron SEEDS fiberglass Mound filters, with two high head Hydrometers plus 200 pumps, and two Multimillion centrifugal pre-filters Water flow from the pump was split between each sand filter at approximately 187 liters per minute.

This flow rate was nearly half the flow rate of the former filters, equating to a low filtration velocity of 25.5 mm/hr/mm. A low filtration velocity vastly improves the contact time of the pool water with the filter media and enables the filter's media bed to capture finer particles. Benefits Russell Loom, Shanghai-La Sydney chief engineer saw an immediate improvement once the filtration plant was turned on. " We have never seen the pool water clarity look so good," he says.

On backwash the filters, the full flow of the pump is dedicated to each filter one at a time, producing a filtration velocity of 50 mm/hr/mm to thoroughly expand the filter media and release its trapped contents. A high flow velocity

improves the filter media bed expansion, minimizes the amount of water utilized during each backwash and also decreases the frequency between backlashes. Multimillion pre-filters were installed above each pump, to pre-filter incoming particles to reduce the dirt load on each filter, further reducing filter maintenance and vastly reducing backwash requirements leading to significant water savings.