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Effluent from our RoDisc® 20 micro-screens



RoDisc® 20 in concrete tank at the Al Sweihat pumping station in Sharjah, UAE

Population growth in Dubai and adjacent Sharjah is a consequence of rapid development. Population growth, enforced growing wealth and luxury, generate great strain on the infrastructure of these cities. All existing wastewater treatment plants are heavily overloaded. Several treatment plants are presently in the process of becoming extended and upgraded, but even when the construction and installation will be finished, the plants will hardly be able to treat the enormous and ever growing wastewater flows.

Because of freshwater scarcity in this arid region, treated wastewater is viewed and reused as a valuable resource. In the Emirates, great portions of the treated effluents are reused for irrigation of parks and palm trees. For some time the United Arab Emirates have been evolving as a heaven for golf players. For example, the prestigious Sherjah Golf & Shooting Club was opened in 2005, though its golf course is not yet entirely completed. Water for the irrigation of this golf course is supplied from the largest wastewater treatment plant of the Emirate Sharjah, the Sharjah Main Sewage Treatment Plant (MSTP). Some of the treated effluent is supplied to the Sharjah Golf & Shooting Club via the Al Sweihat pump station. The supplied water is then distributed through an underground pipe network.

The Sharjah MSTP was originally designed for a capacity of 80,000 m³/d (21 MGD). The actual inflow is around 162,000 m³/d (43 MGD). The plant is by 100 % overloaded. The secondary clarifiers are no longer able to retain the activated sludge and the final effluent contains a high concentration of suspended solids. This leads to frequent clogging of the irrigation nozzles at the golf course, some times enormous odour nuisance, and even to the formation of sludge ponds on the green. This prompted the management of the golf course to intervene and demand a fast solution of these problems from the Sharjah Drainage Section. The management of the Sharjah Drainage Section approached our local subsidiary, HUBER TECHNOLOGY MIDDLE-EAST, asked for our help and the proposal of viable solutions. It was rather obvious that our relatively “new” product, RoDisc® micro-strainer, could solve the problems. During several meetings with the management of the Sharjah Drainage Section and their consulting engineers we explained the simple and reliable operation of our micro-strainers. We could convince the decision makers that our RoDisc® filters would be ideally suited for their application.

The tender was published in August 2006. HUBER RoDisc® Filters were specified as base of the bid, and sand filters were specified as a possible alternate in the tender documents. Technical data and guaranteed performance are shown in the following table. Based on these data we offered two units of our RoDisc® size 20, equipped with a 10 micron mesh. We submitted our proposal by the end of August and on November 8, 2006 we received the order for the “provision of polishers / secondary filters at the Al Sweihat pumping station”. Decisive for the customer’s decision to award this contract to HUBER was the comparison of our RoDisc® filters with sand filters: our filters are far more compact and easier to operate.

A special challenge by this project was that HUBER TECHNOLOGY MIDDLE-EAST was not only responsible for supply and installation of the mechanical equipment, but had to assume all responsibilities of a main contractor. This meant that our subsidiary also had to plan

and coordinate all work including earthwork, construction and pipe installation. Another challenge was presented by the fact that the entire project had to be finished within a period of six months. The deadline was May 15, 2007 – on this day the two RoDisc® were required to turn and operate successfully. Operation and maintenance of the system over a one year period after start-up were also included in the contract.

Other challenges during construction and installation were a consequence of the confined space at the pump station and of the fact that the pump station is located in a preferred residential neighbourhood. For this reason construction and installation work was subject to stringent constraints. Construction work finally commenced during January, 2007. We decided to install each RoDisc® unit in a concrete tank and to bury these tanks up to two thirds of their height below ground. In this way we could comply with the requirement that neither the filters nor their containers may be visible from the neighbourhood. On the other hand, with this design, we could guarantee easy access for operation and maintenance. The wire mesh on the filter discs are washed with spray water that is supplied from the filter tank to each filter by two high-pressure pumps.

The RoDisc® units were shipped in mid March 2007 and were installed into their tanks in early May. Commissioning took place on May 21 and was attended and supervised by representatives of the Sharjah Drainage Section. The RoDisc® Filters have now been in operation for almost an entire year and show excellent performance. The only problem for their operation is that the fed wastewater has solids concentrations that are continuously far above the limits that were specified in the tender documents.

Suspended solids concentrations between 200 and 300 mg/l (ppm) are common and peak concentrations of up to 750 mg/l occur. We also had to discover that hair and fibre materials pass almost uninhibited through the entire treatment plant and constitute an additional load on the mesh of our RoDisc® filters. This much higher than specified solids load leads to elevated head loss through the filter mesh, high pressure thereon and a reduced hydraulic filtration capacity. However, in spite of these adverse conditions, the effluent quality of our RoDisc® filters is excellent. The remaining suspended solids concentration in their effluent is between 10 and 20 mg/l. The managements of the Sharjah Golf & Shooting Club and of the Sharjah Drainage Section are both very happy with operation and performance of our RoDisc® filters.

Conclusion:

With these first two RoDisc® micro-strainers that we sold and installed at the Arab Golf, we could impressively demonstrate their outstanding performance in respect to capacity and effluent quality – not only during demonstrations and pilot tests, but in the field, under extremely difficult conditions. RoDisc® micro-strainers are very effective and efficient for this type of application, i.e. for straining the effluent of hydraulically overloaded wastewater treatment plants. The need for such post-treatment becomes ever more common, as existing wastewater treatment plants become overloaded, or effluent requirements become more stringent. Our RoDisc® filters are ideal solutions for such challenges. Particularly in arid and booming regions suffering from freshwater shortage, such as in the Middle East, wastewater is a valuable resource. Our RoDisc® micro-strainers guarantee consistently low suspended solids concentrations in wastewater treatment plant effluents.

By Michael Sammiller, Project Manager Business Unit Mechanical Treatment

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