



**AQUA-AEROBIC SYSTEMS, INC.**  
A Metawater Company

# SUCCESS STORIES

## PLANT NAME AND LOCATION

**FOX METRO WATER RECLAMATION DISTRICT - OSWEGO, IL**

## DESIGN DAILY FLOW / PEAK FLOW

**42 MGD (158,988 m<sup>3</sup>/day) / 85 MGD (321,762 m<sup>3</sup>/day)**

## AQUA-AEROBIC SOLUTION

**3 AquaDiamond® CLOTH MEDIA FILTERS**



## **FOX METRO RETROFITS TRAVELING BRIDGE FILTERS WITH AquaDiamond® CLOTH MEDIA FILTERS**

Fox Metro Water Reclamation District in Oswego, Illinois started up in the 1920s with a trickling filter system which treated an average daily flow of 8 MGD. Growth and new stringent effluent regulations during the 1960s and 1970s resulted in a major expansion and several upgrading projects for the plant. The upgrading projects included the installation of traveling bridge sand filters for tertiary filtration in the late 1970s, and conversion of the trickling filter system to an activated sludge treatment process in 1982. Fox Metro's service area continued to grow and currently services a population of almost 250,000 which includes the Aurora, Boulder Hill, Montgomery, Oswego, and Sugar Grove areas. To accommodate the growing community, the plant expanded its treatment capacity to an average daily flow of 42 MGD and peak flow of 85 MGD.

Fox Metro's treatment scheme included traveling bridge sand filters for tertiary filtration. High flow situations caused by rainfall and melting snow often produce peak flows in excess of 100 MGD, almost 20% more than the plant's rating. In addition, solids carryover from the secondary clarifiers during these events can result in total suspended solids (TSS) loadings on the filters in excess of 100 mg/l. Originally, consideration was given to rehabilitating the existing sand filters and adding more traveling bridge filters in order to solve the high flow problems. It was felt that this solution would ultimately not, however, eliminate the ongoing maintenance and performance issues experienced in the past. Fox Metro then considered retrofitting the sand filter tanks with AquaDisk® cloth media disk filters, manufactured by Aqua-Aerobic Systems, Inc. The AquaDisk filters could have provided the required hydraulic and solids loading capacity in a smaller footprint but would have



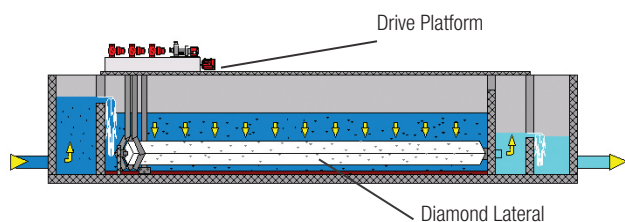
One of Fox Metro's AquaDiamond® Filters retrofitted into an existing traveling bridge filter tank.

required significant modifications to the existing concrete filter structures to meet the hydraulic design of the plant. The best solution for Fox Metro was to incorporate the benefits of cloth media filtration with minimal modifications to the existing concrete tank structures. The AquaDiamond® cloth media filter was born out of this need for a hybrid solution.

The AquaDiamond filter utilizes pile cloth filter media but is applied in a lower profile diamond configuration that easily retrofits into existing traveling bridge filter cells while maintaining the original gravity feed. The unique pile cloth filter media provides benefits of high hydraulic and solids loading rates and a smaller footprint. All of these features were attractive to Fox Metro.

In January 2005, the plant retrofitted one (1) of its nine (9) existing 16' x 112' traveling bridge sand filters with an 80' long AquaDiamond cloth media filter, which increased the maximum hydraulic flow almost 2.5 times the single sand filter's maximum design capacity and the solids loading capacity by a similar factor. Two more AquaDiamond filters were retrofitted into sand filter tanks in September 2005. The three combined cloth media filters now provide an average design flow capacity of 36 MGD and peak flow capacity of 72 MGD. Future installation of two additional AquaDiamond filters will provide a peak flow capacity of 120 mgd. The future total of five AquaDiamond filters will provide 30% more hydraulic capacity than the original nine traveling bridge sand filters, while realizing a 45% decrease in footprint. Until the plant retrofits its remaining traveling bridge sand filters, it will use them to aid in peak flow conditions.

### AquaDiamond® FILTER PROCESS



The cloth media is completely submerged during filtration. Solids are deposited on the outside of the cloth as the influent wastewater flows through. The filtered effluent is collected inside the diamond lateral and flows by gravity, to discharge. The filtration process requires no moving parts. Increased headloss due to the deposited solids automatically initiates periodic backwashing.

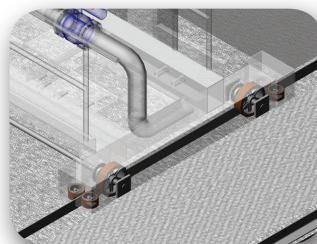
During backwash, a pump provides suction to the vacuum heads, allowing solids to be vacuumed from the cloth as the platform traverses the length of the diamond laterals. The platform operates only during backwashing and solids collection.

Because of the vertical orientation of the media, some solids will settle to the basin floor during normal operation. Small suction headers provide a means for collecting and discharging the settled solids. The solids collection process utilizes the backwash pump for suction.

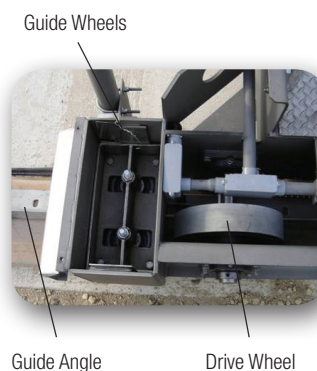
The solids removal performance of the AquaDiamond filters is less than 2.0 NTU on average with influent turbidity typically in the range of 4.0 to 5.0 NTU.

### AquaDiamond® FILTER ADVANTAGES

- Unique cloth media
- Reuse quality effluent
- Low backwash rate
- Small footprint
- Low head requirements
- No downtime for backwashing
- Less maintenance than sand filters
- 2-3 times the flow capacity of a traveling bridge filter with an equivalent footprint
- Variable speed drive platform and backwash pump for immediate response to solids excursions
- Drive platform designed for better guidance and traction
- Resistance to "crabbing" experienced with sand traveling bridge filters
- Tolerates extreme variations in loads
- New plants or retrofits
- Lowest life-cycle cost



Advanced tracking system consists of (1) stainless steel guide angle, (2) main drive wheels, and (2) pairs of guide wheels to avoid misalignment.



Drive and tracking system is more reliable than the traditional design. Drive and guide wheels are made of hard, wear-resistant rubber.