Scenic WWTP Maintains a "Grit Look" with Beautiful PISTA® System

Application Profile: Nashville, TN

S&L Equipment: PISTA® Grit Removal System

Installed: 2001

The Harpeth Valley Treatment Plant is one of the most beautiful plants in existence. It sits on a sloping hillside that extends down a nearby river. Across the river is the water treatment plant. The plant is kept immaculate and all parts can be viewed from the control building at the top of the river valley. The plant is hidden until you enter the premises.

The flow scheme is that the waste flow is pumped to an inlet elevated rotary screen. The entering flow up to 30 MGD passes through the screen to the Smith & Loveless straight through **PISTA**®. As in most plant flow schemes, a straight through device fits in the flume arrangement.

The **PISTA**® inlet is a continuation of the incoming flume. The inlet is a closed conduit having four (4) sides. This is conducive to straightening the flow and making it more laminar. On the top of the flume, as the flume reaches the bottom of the grit removal chamber, is a spoiler. This device prevents coanda effect that would attach the flow to the top of the flume. Instead, the grit-laden flow is directed to the bottom of the grit removal chamber. The flow enters through a scientifically designed opening that directs the flow around the circumference of the chamber. As the flow moves around the circumference, it slowly revolves vertically, carrying the entrained grit in the flow stream round and round until it touches the floor and becomes attached. The spiral flow induced adjacent to the floor carries the grit to the hole in the center where the grit drops into the grit storage chamber.

When the flow around the circumference comes to the slice flume, it passes underneath and rises up the baffle wall, because of velocity, and continues around the chamber where it passes over the incoming flow. This risen flow stream now passes around the grit removal chamber again. The second time around, any remaining grit revolves around to become a part of the entering layer which carries the grit to the floor. The secondary layer on this second revolution flows around the circumference to the slice flume where this flow is sliced off and passes to the effluent. The slice flume controls the water level in the inlet flume. This level, at any flow, is the correct level to keep the entering flow velocity in the design range of 2 to 3.5 feet per second.

The comprehensive **PISTA** *Grit Removal System — with stainless steel internals and components — provides the Harpeth Valley WWTP with complete system responsibility, including grit removal, pumping, washing and dewatering.*

Smith & Loveless Equipment Supply Profile

(1) **PISTA**® Model 30.0A Grit Chamber With New Baffle

(1) **PISTA**® Top-Mounted Turbo Grit Pump (10 Hp)

(1) **PISTA**® Ni-Hard Grit Concentrator (Stainless)

(1) **PISTA**® Model 15 Grit Screw Conveyor (Stainless)

Peak Flow Capacity 30 MGD

All of this phenomena operates automatically with no need of any controls. You might say the slice flume is the brain.

The grit in the grit storage chamber is automatically pumped at preset time intervals to a Second-Stage **PISTA**® many times smaller in size and at a much, much higher velocity where the grit is separated from the water and any remaining organics. The water and organics are returned to the flow stream entering the **PISTA**®. The grit is dropped into a screw conveyor.

The screw conveyor removes the remaining water that is necessary to carry the grit out of the Second State **PISTA**®. The effluent grit is clean and free of unattached water.