

CASE STUDY

Lamella - Tempe, AZ



City of Tempe, AZ Improves Water Quality with Lamella®

Overview

The Johnny G. Martinez Water Treatment Plant is one of two water treatment plants in Tempe, AZ. Due to population growth there was a need to expand the plant to 80 MGD capacity. During expansion the plant became the first large scale UV facility for drinking water disinfection in Arizona.

Prior to UV disinfection, post filtration is necessary. As a result, a new 50 MGD post filter granulated carbon filter contactor facility was added.

Challenge

The existing and new filter contactor facility created a large quantity of backwash water. This backwash water needed to be clarified and thickened to a level that could be fed to a gravity thickener. Equipment was sought that could accomplish this in a small footprint.

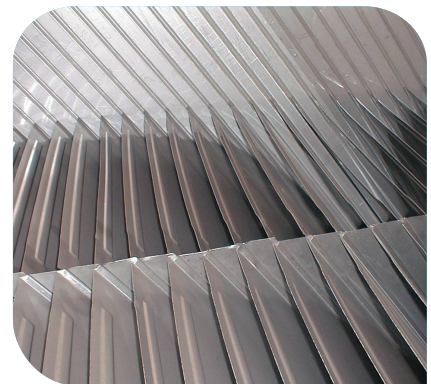
Journey

Carollo Engineers was hired by the City of Tempe for the design of the improvements.

Conventional clarification was analyzed but was rejected in favor of plate settlers with thickeners in large part because plate settlers provide faster settling in one tenth the space of conventional clarification equipment.

This is due to the fact that effective gravity settling area of the inclined plate design equals each plate's area projected on a horizontal surface.

Therefore, up to ten square feet of settling area becomes available for each square foot of physical area occupied by the unit. Loading rates normally used for the design of conventional settlers can be applied to the sizing of plate



settlers by substituting the projected area for the surface settling area of a conventional settler. Furthermore, with the addition of a sludge thickener to the plate settlers, increased underflow sludge concentration and sludge storage flexibility was also possible.

The sludge could now be further dewatered downstream by sludge dewatering equipment.

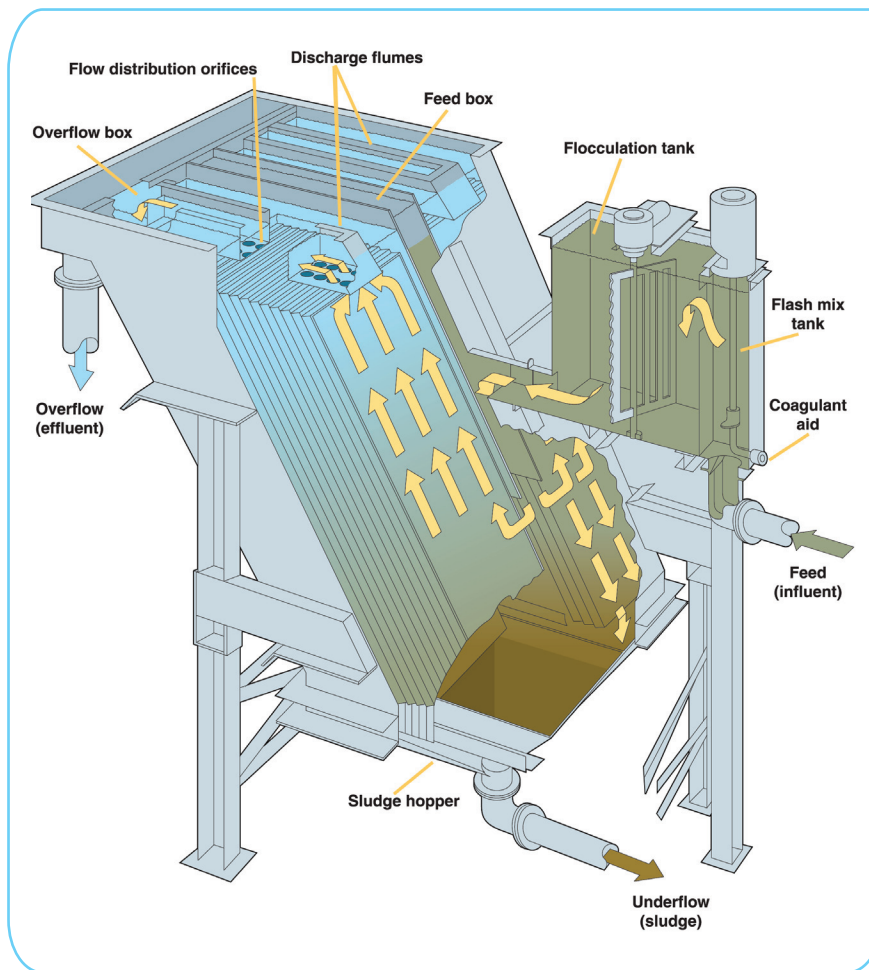
Discovery

The engineer was familiar with the use of Parkson Lamella® Gravity Settler Thickeners for treating filter backwash. Parkson also had a successful installation on the same application at the Scottsdale, Arizona's Chapparal Water Treatment Plant.

Based on Parkson's experience with treating filter backwash, the city decided to specify the Parkson Lamella® Gravity Settler Thickeners to treat a total design flow of 4.4 MGD filter backwash. The

overall scope of supply for Parkson consisted of three Lamella® Gravity Settlers with rapid mixers, flocculators, and thickeners.

For this project, it was necessary to optimize the footprint, space, and construction costs even further. Parkson proposed the use of their new integral (mounted on outside of tank) flash mix/flocculator tank design. This new feature reduced the footprint of the standard Parkson design from approximately 38' to 29 ½'.



Implementation

The winning contractor (PCL) and Parkson worked together to plan the installation of the new system.

The construction of the plant took approximately 8 months. During installation and startup, several design improvements were recognized and Parkson worked with PCL to resolve any issues in a timely fashion. Parkson made several trips to the jobsite for installation assistance, training of the operators, startup of the equipment, and performance testing. Startup to the completion of the performance testing took approximately 1 month.

Results

The plant has been in operation since July 2010. Parkson was able to supply a Lamella® Gravity Settler Thickener that was able to clarify the total suspended solids from 200 ppm to 20 ppm at a design loading rate of .33 gpm/ft² in a significantly reduced footprint. ■



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