Infiltrator Chambers Used in Subsurface Outfall for New Hopkinton, Mass. WWTP

Project Name
Hopkinton, Mass. WWTP

System Specification
80,223 square foot infiltration bed for subsurface outfall at new WWTP

Infiltrator Products Used
4532 Infiltrator High Capacity H-20 Chambers

System Flow
350,000 gallons per day

Installation Date
Winter 2011

Engineer
AECOM
Wakefield, Mass.

Contractor
Chuck Boudreau
Waterline Industries
Seabrook, New Hampshire

Owner
Town of Hopkinton, Mass.

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The Town of Hopkinton had a municipal sewer system but did not have a wastewater treatment plant. Their wastewater was being sent to other towns but they were at their discharge limits. A study was conducted to investigate town-wide alternatives and to perform a cost analysis, which led to the construction of a new 350,000-gpd-treatment plant.

An innovative sewer-mining solution was designed that partially diverts flows from an existing sewer main to the new treatment plant. A new surface discharge was impossible therefore a subsurface outfall consisting of a large infiltration basin was proposed. The plant has a capacity of 350,000 gpd and the soil application rate was 3 gpd/sf. Due to the proximity to natural wetlands, the space available for the system was constrained. This problem was solved by a highly efficient chamber infiltration system. Another challenge solved by the infiltration system was that it could fit on the constrained and irregular site as well as recharge the local aquifer and adjoining wetlands.

System Details
Ultimately, a membrane treatment plant was designed to treat the wastewater received from a conventional sewer. The treatment plant receives the flow, treats the effluent and then the highly treated effluent is pumped to an onsite disposal system that includes 4532 Infiltrator High Capacity H-20 Chambers in a series of Infiltrator chamber beds. The water is ultimately dispersed to replenish local groundwater aquifers.

The project was constructed in phases. The first phase of the wastewater disposal system is designed for disposal of 250,000 gpd of highly treated effluent and was installed in January 2011. This phase consists of an 80,2233 square foot infiltration bed with 4532 Infiltrator High Capacity H-20 Chambers. Phase 2 incorporates two more membrane trains and a second disposal bed designed to handle an additional 100,000 gallons per day.

The plant also includes headworks, an equalization basin, a biological nutrient removal membrane bioreactor, and UV disinfection. Wastewater flows from the headworks to the equalization basins, then on to an anoxic zone. It continues to a pre-aeration zone, then to a post-anoxic zone to membrane basins, to ultraviolet disinfection, and finally to the Infiltrator disposal beds and back to the groundwater.

Construction
The installation of the treatment building and infiltration bed proceeded rapidly and efficiently during the winter of 2011. A majority of the construction was completed prior to major snowstorms that hit the area. Construction was allowed to continue on the treatment building because it was covered from the elements.