



Infiltrator® High Capacity H-20 Chambers Used in Wastewater Treatment Plant Expansion, Hopkinton, Mass.

System Specifications

Infiltrator High Capacity H-20 Chambers in an 80,223 square foot infiltration bed disposal field at a town wastewater treatment plant

Infiltrator Products Used

4,532 Infiltrator High Capacity H-20 Chambers

System Flow

350,000 gallons per day

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Although the Town of Hopkinton, MA had its own municipal sewer system, it did not have its own wastewater treatment plant which required their wastewater to be sent to two neighboring towns. As these facilities reached their discharge limits, the town needed to find a long term solution to their growing wastewater needs so they hired AECOM to investigate their options and perform a cost analysis. This led to the design and construction of a 350,000 gallon per day wastewater treatment plant which was partially funded by the American Recovery and Reinvestment Act.

History

At the October 21, 2002 Special Town Meeting, the Town of Hopkinton voted to purchase 255 acres of land for conservation, passive and active open space, and other municipal purposes. A concept Master Plan was developed and approved at the Annual Town Meeting on May 5, 2003. The Master Plan, including development of a town owned well and a wastewater treatment facility received approval under the Massachusetts Environmental Policy Act (MEPA). Based on this positive outcome, the town proceeded with detailed design of the well and wastewater facility and obtained all regulatory approvals for these projects. Construction of the wastewater treatment facility was delayed until 2010 due to appeals at the local, state and federal levels.

Project Design Challenges

After moving past the initial hurdles, AECOM designed an innovative sewer-mining solution that partially diverts flows from an existing force main to the new treatment plant owned by the Town of Hopkinton. Because permitting a new surface discharge was impossible, a subsurface infiltration basin was utilized which was less costly and provided an aquifer replenishment opportunity.

Due to the proximity to natural wetlands, the space available for the system was very small and constrained. Although the actual site for the wastewater treatment plant has good soils, the surrounding areas have very poor soils. This made a highly efficient infiltration system composed of chambers a good option. Another challenge solved by the infiltration system was that it could fit into a constrained and irregular two acre site, in the suburbs of Boston where land is expensive.

System Details

Ultimately, a membrane treatment plant was designed to treat the wastewater received from a conventional sewer. The treatment plant receives the flow and treats the effluent before the highly treated effluent is pumped to an onsite disposal system that includes 4,532 Infiltrator High Capacity H-20 Chambers in a series of beds. The water is ultimately dispersed to replenish local groundwater aquifers.

The project will be constructed in phases. The first phase is designed for the disposal of 250,000 gpd of highly treated effluent and was installed in January 2011. This phase consists of an 80,223 square foot infiltration bed with 4,532 Infiltrator High Capacity H-20 Chambers. Phase 2 will incorporate 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 onto 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 the major snowstorms that hit the area. Construction was able to continue on the treatment building because it was covered from the elements.