
Weston Corporate Center - Deep Water Cooling System

The Weston Corporate Center is a 350,000 SF office building in Weston, MA owned by Boston Properties of Boston, MA and now occupied by Biogen IDEC. The Corporate Center is built on the site of a former gravel production facility which has two deep quarry ponds. The 9.9 acre south quarry pond, which is 400 feet deep, contains approximately 700 million gallons of water and was chosen to provide all of the building's cooling requirements during days when air-side economizer is not feasible. The system uses the naturally renewable cold deep water of the quarry to directly cool the building without the use of air conditioning compressors. This is the only commercial office building in the United States that uses a deep water cooling system for 100% direct air conditioning. This building received a Platinum LEED Certification.



The deep water circulation system design incorporates a 16 inch diameter intake pipe with the suction end located at a depth of about 200 feet. The 40°F naturally cold water is drawn into a sump at pond level and is distributed to the building 500 feet away where it is circulated through a plate and frame heat exchanger. The water is then returned to the quarry pond at a depth of 25 feet. The building closed-loop distribution pumps deliver 44°F chilled water from the heat exchanger to 11

chilled water roof-top air handling units with a system peak design cooling capacity of 1000 tons.

The analysis and design of the deep water cooling system was provided by TMP Consulting Engineers, Inc. of Boston, MA. TMP performed the initial energy analysis and feasibility study to determine if the quarry pond would be sufficient to provide all of the building's cooling requirements, developed the system design concept required to take full advantage of the deep water for cooling and provided the design of the deep water and building water pumping and distribution systems.

The system is expected to require 630,000 ton-hours of air conditioning annually at full occupancy with an annual savings of \$60,000 and will save over 90% of the input energy required for mechanical cooling compared to a conventional chilled water system by using the annually renewable cold energy of the deep water. The system provides 4% of the buildings annual energy requirement from this renewable form of energy. The system has been in operation since June of 2010 and is operating normally.