

World Trade Center – Central Chiller Plant & River Water Systems

New York, NY

WM Group Engineers was selected by the Port Authority of NY & NJ to provide the detailed design and construction documents for this high profile \$200 million dollar project including a central chiller plant, site chilled water distribution systems and river water systems serving the World Trade Center (WTC) site.



The 12,500 ton chiller plant will be located within the National September 11 Memorial & Museum (NS11MM). The chiller plant will serve multiple users across the WTC Site including: the Memorial & Museum, the Freedom tower retail spaces, the PATH Hub station, the Performing Arts Center, the East Bathtub retail spaces, the Vehicular Security Center and the MTA Cortland street '1-train' station.

This project included providing a detailed energy model to determine the optimal configuration of the chiller plant as well as providing a Basis-of-Design. The plant configuration study and Basis-of-Design report were completed within three months from the project award.

The chiller plant design includes five 2500 ton electric centrifugal chillers, five 300 hp chilled water pumps with variable frequency drives (VFDs) and two 1000 ton plate & frame heat exchangers to provide 2000 tons of “free-cooling” capacity in the winter and shoulder months.

The chiller plant utilizes river water from the Hudson river for condenser water, and the scope of the project also includes renovation/reactivation of the below-grade river water pump station. The pump station has not been active since the events of September 11, 2001, and the pump station equipment has been subjected to the corrosive effects of the brackish river water. All electrical equipment inside the pump station will be replaced. The existing river water pumps will be removed and replaced with four new 500 hp 15,000 gpm vertical turbine pumps with VFDs. The existing sluice gates and traveling screens will be refurbished. In addition, a section of the existing 60-inch and 66-inch underground river water distribution piping between the pump station and the chiller plant will be relocated.

The design addresses environmental concerns related to the use of the river water. In order to minimize the impact to the marine life in the area, the amount of river water and temperature of the outfall is monitored and recorded in accordance with the New York State Department of Environmental Conservation (NYSDEC).

Due to the use of the brackish river water, corrosion protection measures are included in the river water system design including selection of corrosion resistant materials, internal cathodic protection of the river water piping and equipment and external corrosion protection measures addressing stray current issues due to the nearby PATH train operation.

The chiller plant is located inside the Memorial & Museum space, and the site chilled water distribution piping will run through various stakeholder spaces across the site. One major challenge for this project includes the extensive coordination that is required with other design teams of the many other projects across the WTC site.

WM Group is leading the project team to provide detailed and coordinated architectural, electrical, HVAC, plumbing, fire protection, structural, civil, telecommunications and security design documents.

Project Award: November 2006

Basis of Design Complete: January 2007

Preliminary Design Complete (Stage II): March 2007

Projected Construction Document Completion (Stage III): November 2008

Estimated Project Cost: \$200 million

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