

North Campus Chiller Plant Expansion



Project Description

The North Campus Chiller Plant (NCCP) was completed in 2005 to provide chilled water to North Campus. The NCCP, when compared with individual building chillers, has resulted in energy savings, reduced operation and maintenance costs, increased redundancy and reliability, and reduced proliferation of cooling towers and the associated noise. In fiscal year 2009, the estimated annual operating cost savings due to the NCCP was approximately \$200,000, with the majority of savings achieved with increased energy performance. We are now increasing the size of the facility by 8,500 square feet and add two 1,300 ton chillers, increasing the total capacity to 6,500 tons. In addition to the expansion of the NCCP, underground connections will be extended to provide chilled water to the Earl V. Moore Building, Space Research Laboratory, and Naval Architecture and Marine Engineering Building (NAME). The increased overall capacity of the plant will allow the elimination of the existing building chillers at the Francois-Xavier Bagnoud, Electrical Engineering and Computer Science, and George Granger Brown Memorial Laboratories (G. G. Brown) buildings, as well as provide cooling for the planned additions to G. G. Brown and the Michigan Memorial Phoenix Laboratory. The estimated incremental annual operating cost savings will be approximately \$100,000 based on today's cost, with the majority of savings achieved with increased energy performance. In addition, we will replace the steam and condensate interconnection between the Aerospace Propulsion Lab and NAME buildings to eliminate the need for one boiler.

Energy Efficiency Measures

The North Campus Chiller Plant Expansion design concept in general minimizes energy and operating cost by incorporating the following energy conservation measures:

- Selecting chillers based on lowest life cycle cost, which is largely dictated by highest energy efficiency.
- Turning off the new substation during winter operation and just using the existing substation.
- Reducing the energy usage of general lighting by nearly 50% as a result of utilizing energy efficient High Bay Fluorescent light fixtures in place of less efficient Metal Halide lamped light fixtures.
- Daylight harvesting through the glass curtain wall and lowering energy usage of general lighting in this area.

- Insulating all exterior walls.

Other Sustainability Features

- Salvaging the existing acoustical screen-wall panels on the east end of the building and re-installing them in the same relative location on the new east wall of the NCCP.
- Salvaging the existing glass curtain wall on the east end of the building and re-installing it in the same relative location on the new east wall of the NCCP.
- Underground piping extended to satellite buildings was installed by directional boring piping in select areas, to minimize disruption of trees and other surface elements.
- The bentonite slurry from the directional boring will be mixed with the top soil and compose at the North Campus Grounds Facility to improve moisture retention in lieu of going to a landfill.

Project Data

- Budget: \$8.7 million
- Schedule: Completion scheduled for Fall 2011
- Square Feet: 8,500 gsf