



ENERGY RETROFIT, BRIGHTON , MICHIGAN

Government

WILCOX ROLE

Wilcox began this project by providing a preliminary mechanical equipment assessment study of Brighton High School. This led to a mechanical and electrical energy study of the high school and the remaining ten schools within the district and resulted in increasing energy efficiency district wide.

PROJECT DESCRIPTION

Wilcox has worked with the Brighton area school in Michigan since 2000 to provide Architectural and Engineering services such as a technical energy analysis, underground tank removal, football/track bleacher structural analysis and the implementation of recommended Energy Conservation Measures (ECM's) including major HVAC renovations including chilled water ice storage and boiler replacements.

Wilcox performed field measurements of lighting power and footcandles, airflows and mechanical equipment performance for the Brighton High School Energy Retrofit project. This information was used to build a computer model that simulated the building to within 5% of historical utility bills. This model was used to evaluate mechanical or electrical system changes needed. Four phases were master planned to complete the project.

Phase 1

The first phase made the "heart and arteries" of the school's mechanical equipment reliable and energy efficient for future renovations. Two heating systems, one steam with water converters and three water boilers were removed and replaced with high efficiency modular boilers. In addition, ice storage was added to the existing air cooled chiller which allowed for the removal of over 250 tons of split system DX cooling and intermittently cool the field house for special events which it previously did not have.

Phase 2

During this phase the air side of the system was converted to a design that would eliminate the fan powered boxes and unit ventilators from the classrooms where most of the mechanical repairs were occurring. The ventilation system made use of dedicated energy recovery systems utilizing chilled water preheat so no cooling of the ventilation air was needed due to low temperature cooling air. The ventilation system

is now tied to the required room occupancy lighting sensors ensuring proper ASHRAE ventilation at all occupied times.

Phase 3

The third phase of the project included a district wide HVAC controls upgrade to central web-based DDC with an integrated front end computer display. This allows the facilities director to control scheduled occupancy, room temperature and other system operating parameters from a remote location. Lighting was also retrofitted and powered with program multi-volt rapid start ballasts with occupancy sensors on a room by room basis as well as the parking lot and exterior lighting.

Phase 4

The replacement of the air cooled chillers at the high school with a water cooled chiller system joined to the ice storage completed the fourth and final phase of the project. The water cooled system allowed Brighton to increase overall efficiency of the chiller plant.

