



Frederick C. Robie House, Chicago, Illinois (circa 1910)

Architectural Consulting Engineers (ACE) was the mechanical engineering consultant for the Frederick C. Robie House for a project that included improvements to the exterior masonry, replacement of the roof system, electrical system upgrade, fire alarm system, fire sprinkler system and a new four-pipe chilled hot water HVAC system. This house, located in the Hyde Park neighborhood of Chicago, Illinois, built in 1908-1910 and designed by Frank Lloyd Wright, is a U.S. National Landmark (1963) is owned by the University of Chicago but is operated by the Frank Lloyd Wright Preservation Trust as a house museum.

ACE was responsible for a comprehensive review of the building systems as part of a master planning study. In that study, different HVAC systems were considered through a Life Cycle Cost Analysis study. The overriding goal was to provide a system that could help manage the interior environment through simultaneous manipulation of temperature and humidity. A four-pipe chilled water/hot water system with distributed air handlers was selected as the most cost effective means to achieve the program goals. Given the limited space available for mechanical equipment, pipes and ductwork, creative solutions for installing the systems needed to be employed. Because the ground floor flooring system had to be removed for other reasons, below grade infra-structure was used. Similarly, while some ceilings were removed due to failed plaster systems, mechanical systems were installed in areas that were otherwise inaccessible. A high efficiency boiler and air cooled chiller provide the heating and cooling fluid for the building systems.

An aspiration type smoke detection system was installed to provide an early warning for any fires throughout the building. This also allowed for the elimination of large detectors at the ceiling throughout the building. A double-interlock pre-action fire sprinkler system was installed throughout the building to provide for further protection from a fire.

The electrical system was also improved. Historic lighting locations and fixtures were used for the City of Chicago emergency lighting by integrating a central inverter battery system for these circuits which keeps them illuminated for up to four-hours (the City requirement at the time of construction).

The MEP and exterior renovation is complete and the systems are operational. The interior restoration design is currently underway as of March 2014.