

Engineering Study of Mechanical & Electrical Systems – Manuel Lujan Building Santa Fe, NM

Project Description:

Location

Santa Fe, NM

Owner

State of New Mexico

Duration

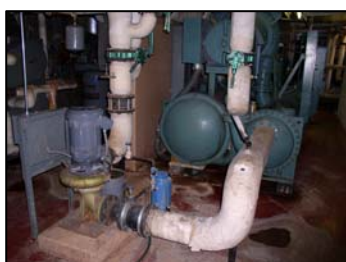
2009

Est. Construction Cost

\$16 million est. total

AI Engineers, Inc. was retained by the State of New Mexico to review the existing condition of the Manuel Lujan building and make recommendations with regard to repairs or renovation of the existing mechanical and electrical systems. AIE reviewed the available building documents and visited this thirty-five year old, 80,000 SF office building located in Santa Fe, New Mexico that is owned by the State of New Mexico in December 2008. AIE made observations and took measurements of the mechanical, electrical and architectural systems. On the basis of our site surveys and analysis we identified over \$6.9 million in direct cost mechanical, electrical, and architectural measures that would significantly improve both the energy efficiency and indoor air quality of this building.

This project included the complete inspection of all major heating, ventilating and air conditioning pieces of equipment. Mechanical equipment was evaluated for measures to reduce energy consumption, remedy code and safety violations, and replace worn-out equipment. This building was found to be unique in construction with excellent thermal mass overall construction. The lighting systems were adequate but dated from the early 1990's. The air distribution duct work in the occupied spaces and the HVAC control system had failed. Incremental tenant growth had compromised the original electrical and mechanical design. A computerized heating and cooling load analysis was performed to assess the size of existing boilers and chillers with respect to the current thermal loads in this building. On the basis of the information gathered from field inspections, we developed building energy load simulations, energy cost calculations, informational drawings and cost estimates.



Salient Features

- Coordinate with Utilities
- Design of Mechanical
- Design of HVAC
- Design of Plumbing
- Plan Preparation
- Quantity/ Cost Estimate
- Specification Preparation

Engineering Study of Mechanical & Electrical Systems – Manuel Lujan Building (Continued) Santa Fe, NM

Project Description:

The computerized load calculations showed that the existing chiller was oversized by a factor of two for the current cooling loads in this building. Our report included comments and recommendations for energy efficiency as well as observed deficient conditions. The major mechanical recommendation of this report was to remove the existing boiler, chiller, cooling tower and all air handling units. These were to be replaced with new smaller boilers, and an optional tie-in to the campus chilled water loop. Ventilation would be provided by an innovative double duct distribution system that provides 100% highly filtered outside air to this building. The 100% outside air supply approach will lower the total air volumes required in the building to meet minimum ventilation requirements. The use of heat energy recovered from the exhausted building air plus the lower total air volumes will reduce the heating requirement for the building as well. Cooling for the building would be provided by direct and indirect evaporative coolers within or in line with the air handling units. The use of direct and indirect evaporative cooling will eliminate the need for chilled water cooling and the associated chillers, pumps, piping and AHU cooling coils reducing both future energy costs and upfront construction costs.

It is expected that if the report mechanical and electrical recommendations are implemented this thirty-five year old building would outperform a typical new LEED-Silver building.

