

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

Project Description:

Location

Santa Fe, NM

Owner

State of New Mexico

Completion

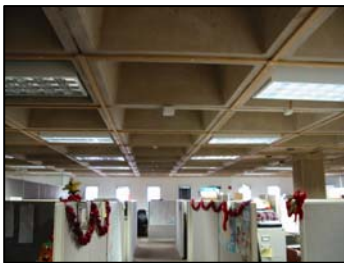
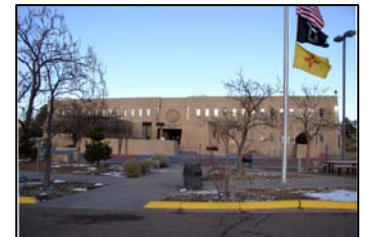
2009

Est. Construction Cost

\$14 million est. total

AI Engineers, Inc. (AI) was retained by the State of New Mexico to study the existing conditions of the Manuel Lujan building in Santa Fe and make recommendations with regard to repairs or renovation of the existing mechanical and electrical systems. The building was owned by the state and housed the Tax and Revenue Division. AI reviewed the available building documents and visited this thirty-five year old, two story, 80,000 SF data center converted to an office building. The structure consists of post-tensioned concrete two-way joist (waffle slab) floors and roof supported on interior columns and tilt-up concrete exterior walls. In December 2008, AI visited the building to make observations and take measurements of the mechanical, electrical and architectural systems. This building was found to be architecturally unique in construction for the area, with excellent overall thermal mass properties and had great potential for updating to current standards of interior open space design. On the basis of our site surveys and analysis, we identified over \$6.9 million in mechanical, electrical, and architectural measures that would significantly improve both the energy efficiency and indoor air quality of this building, as well as correct a variety of code and building program issues. The nature of the construction placed severe limitations on the modifications that could be made, since cutting through post-tensioned elements must be done with great care to avoid hazardous release of energy.

As a result of this study, AI was awarded the project as the Prime Consultant to renovate the building. The project scope includes complete replacement of the building mechanical, fire alarm and lighting systems as well as partial replacement of the building electrical distribution and plumbing systems. The scope also includes temporary relocation of the building occupants as well as new building interior finishes, partitions, workstations, furniture and ADA compliance.



Salient Features

- Design of Mechanical upgrades
- Coordination with existing post-tensioned waffle slab
- Plan Preparation
- Quantity/ Cost Estimate
- Specification Preparation

Engineering Study of Mechanical & Electrical Systems – Manuel Lujan Building (Continued)

Santa Fe, NM

As the primary consultant, our responsibilities include planning and coordinating the project for the client as well as our local architectural and engineering subconsultants. The project will correct numerous deficiencies in the building, achieve a 50% reduction in utility costs and provide a healthy interior work environment by meeting the requirements of ASHRAE 62.1. Based on information gathered from field inspections, we have developed a building energy load simulation, energy and construction cost calculations, and an understanding of the capacity of the structure and limitations on new equipment loads and removal of concrete and masonry wall elements.

The new building design will provide the following features:

- 100% highly filtered outside air ventilation during all occupied hours for superior indoor air quality.
- Air-to-air heat exchanger to pre-heat or pre-cool building supply air with the building exhaust air.
- Reconfigured masonry and concrete core walls to provide new ADA compliant toilet facilities to reduce water consumption and improve occupant comfort.
- Reduction in the capacity of the new boiler(s) needed for heating.
- Evaporative cooling of the supply air to reduce the need for mechanical refrigeration.
- Lighting to improve the interior environment and reduce electrical load by approximately 25%.
- Lighting controls and daylight harvesting.
- Storm water capture and reuse for evaporative cooling to reduce total building water consumption.



Primary cooling for the building will be provided by evaporative coolers in line with the supply air handling units. For secondary cooling for peak building loads, the existing campus chilled water will be extended into the building and a new chilled water system will be designed. It is expected that the maximum new mechanical cooling requirement from the campus chilled water loop will be less than 30% of the facility cooling requirements. The use of heat recovered from exhausted building air will reduce the size of the new boilers by more than 40%. New building lighting integrated with perimeter daylight sensing and building lighting controls to reduce energy consumption. A new building control system will control the facility mechanical equipment and lighting to maximize the building energy efficiency and comfort.



The renovated facility will meet the requirements for LEED Silver Certification. Construction of this project is scheduled for 2011.