

Cost

Construction: \$30,000,000
MEPT Const: \$15,000,000

Owner

American Enterprise Group
Des Moines, Iowa
Medha Johson
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Team

Principal in Charge
Dwight Schumm, PE, LEED AP
Project Manager
Dwight Schumm, PE, LEED AP
Mechanical Engineer
Justin Opperman, PE, LEED AP
Electrical Engineer
Eric Bruxvoort, PE

Architect

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CM/General Contractor:

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Awards

2016 AIA National
Honor Award for Architecture

2015 AIA Central States
Honor Award for Design Excellence

2015 AIA Kansas City
Honor Award for Design Excellence

2016 IES Illumination
- Award of Excellence Finalist
- Award of Merit

Iowa State Historical Society
- 2017 William J Wagner Award

USGBC LEED Silver Certified



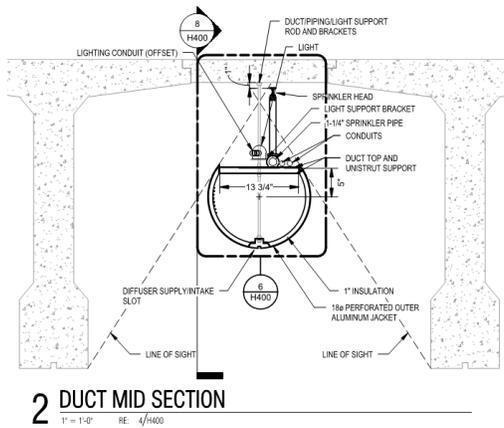
Project History

The American Enterprise Group building is a 150,000 square foot, eight-story office building located downtown Des Moines. This architecturally significant facility was designed by Gordon Bunshaft of Skidmore, Owings and Merrill in 1965. Primary goals of the project were to bring the building back to its original stature and upgrade the infrastructure to meet the Owner's needs for the next 50 years.

Challenges

The restoration provided a great opportunity for the design team to work side by side with the contractors from the start of the project. With a condensed design time frame and a construction period of less than a year, close collaboration between the design and contractor teams was required. Creativity and a willingness to think outside the box was key to solving long-standing comfort, code and energy use problems while remaining true to the original architectural vision of the project. Comfort, efficiency, and beauty were all priorities.





Integrated Solutions

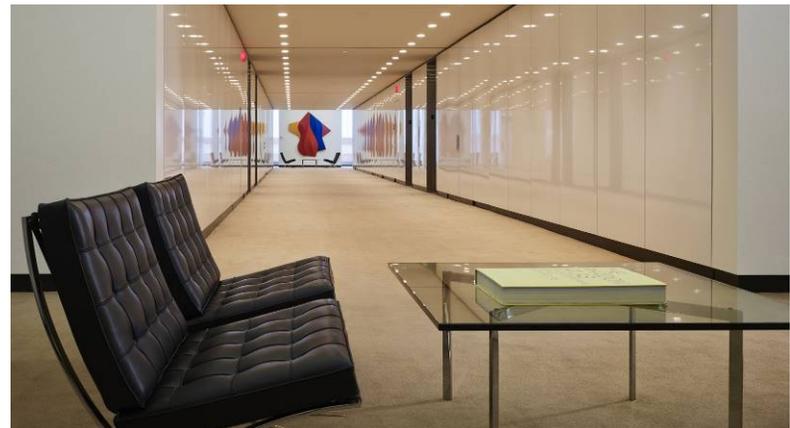
Primary mechanical and electrical features include dramatically improved temperature controls, wireless networked lighting controls, controlled receptacle power and careful coordination of all exposed components throughout the building to maintain the clean lines of the original architecture. Enhanced access control, intrusion detection and video surveillance systems were also provided for protection of the building’s extensive art collection.

A key architectural element of the building consisted of an exposed concrete structure with integrated ductwork and lighting. Maintaining this architectural feature while bringing the building into compliance with current building codes presented one of the most significant challenges of the project.

The design and construction team rose to the challenge by collaboratively developing a custom designed and custom built duct which concealed fire smoke dampers, sprinkler piping and new LED lighting. This concept was tested and further refined through multiple mockups with airflow and light level tests. The end result is true to the original architectural vision from the 1960’s but incorporates current code, life safety, and energy efficiency standards.

“This is a fine example of an exceptional restoration of a modern building.”

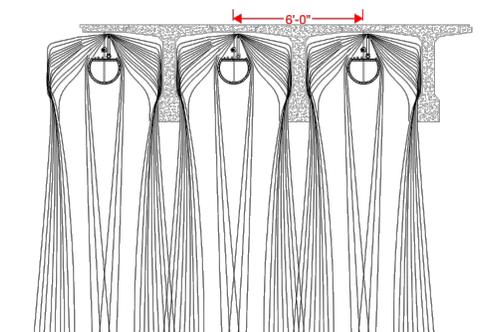
AIA Honor Award Jury



Mechanical Design

One of the primary goals of the project was to improve temperature controls and occupant comfort. The original building included only 6 zones for 90,000 sq-ft and 6 floors. This led to significant discomfort due to widely varying heating and cooling needs. The project upgraded this to 60 zones to allow separate control for conference rooms and unique spaces. Providing this level of zone control while maintaining the clean lines of the original exposed duct system required separate concealed terminal units in the shafts along the exterior walls.

Great care was taken in adding fire suppression in a manner sensitive to the original architecture. A unique distribution system was developed to conceal the piping above the exposed ductwork. A full scale mock up with water flow measurement and fire modeling was required to confirm fire sprinkler head configurations met code requirements.





Electrical Design

The entire electrical distribution system was replaced including a new 480V service and all downstream panelboards. The new system was able to repurpose a recently replaced bus-duct for a cost-effective design. Sub-metering was provided to allow the Owner to separately track mechanical, lighting and receptacle loads. A 200kW, generator was added to serve emergency power for egress lighting, elevators and vital Owner equipment. Panelboards utilizing motorized circuit breakers were installed to control receptacle power in private and open offices.

The existing building's minimal fire alarm system had inadequate notification capabilities. A new fire alarm system was provided to meet current high-rise requirements. Mock-ups were performed to ensure proper voice coverage and precise placement of devices.

Lighting

The main goal of the lighting was to provide an energy efficient, low maintenance system while bringing the building back to its original design intent. Color temperatures and illuminance were selected with the help of lighting mock-ups. 4000K LED linear fixtures were used to blend the primary lighting with the day lit spaces while warmer 3000K downlights were used to mimic the original incandescent fixtures.

The final results lowered the open office lighting power density to .84 W/SF, more than 50% less than the existing system. Wireless lighting controls were installed to add daylight harvesting and individual control of lighting in private offices, classrooms and conference rooms.

Energy Results

The energy consumption of the building was dramatically reduced by replacing the original systems with new energy efficient systems including condensing boilers, variable speed chillers, LED lighting and sophisticated controls. Annual utility costs are projected to be reduced by 80 percent.

