Guggenheim Museum
Bilbao, Spain

The building systems for this much celebrated museum presented many engineering challenges. For example, the building's unique exterior of sculptured forms could not be compromised visually by the obvious placement of external mechanical equipment. Also, the museum's program, with is many galleries and public assembly spaces, required systems to address wide variances in occupancy levels while also maintaining proper environmental conditions for the art work. Heating and cooling for the museum are accomplished by a central mechanical plant that produces chilled and heated water. The plant is located in the structure's basement and includes pumps, a heat exchanger and fire protection equipment. Cooling towers are located remote to the plant and are fully screened with architectural walls and grills.

Both aesthetics and careful environmental control determined the HVAC system design for this museum's galleries. Each gallery is served by an individual, fully screened air handling room. Ventilation systems within each gallery provide even, quiet, low velocity air distribution with minimal impact to interior architecture. Outlets for supply and return air are carefully concealed within the architecture of each space. Supply air is distributed through ducts and continuous architectural supply air slots concealed within the top of the wall. Return air enters the walls through continuous return air slots in the floor and is circulated through the wall cavities to allow for the control of temperature and humidity levels on interior wall surfaces where artwork is displayed. Special equipment for ventilation and hazardous chemical storage was provided for workshops and conservation labs. Internal air purification is achieved through the use of chemical particulate filtration which eliminates toxic and detrimental gases from the atmosphere.