



Centennial Elementary School
ISD #12

Date: 06-11-25

Centennial Elementary School Submittal – Chiller Replacement Project

Completed By: Russ Schumacher, PE

Chiller Replacement Project Description:

- The Centennial Elementary School has one 27 year old air cooled water chiller. Due to the failing refrigeration components and loss of refrigerant, the chiller is not capable of providing adequate dehumidification to the building occupants. This chiller also utilizes R-22 refrigerant which has been phased out of production and no longer allowed to be used in HVAC equipment. This chiller is not providing adequate dehumidification for the below occupants:
 - Average of 60 staff at 5 cfm/person plus .06 cfm/square foot = 550 cfm
 - 495 Students at 10 cfm/person plus .12 cfm/square foot = 9,650 cfm
- The lack of dehumidification results in higher humidity levels and occupant discomfort. Some spaces are also unable to meet the American Society of Heating and Refrigeration Engineer's (ASHRAE) Thermal Environmental Conditions for Human Occupancy Standard 55-2020. This standard specifies the combinations of personal and indoor thermal environmental requirements necessary to achieve an occupant comfort satisfaction rate of 80% or greater. The indoor environmental requirements include temperature, humidity and air speed.
- The fact that the chiller capacity is not consistently operational does not allow for ASHRAE 62.1-2019 code required ventilation during building occupancy.

Project Work Scope:

The proposed project will include the replacement of the existing air cooled water chiller. This chiller will be sized to provide the ASHRAE 55-2020 compliant dehumidification capacity for the building occupants. This will include new primary and secondary chilled water pumps with premium efficiency motors and variable speed drives. This project will also include the addition of side stream filters to collect any particulate, debris, and rust within the water system. The existing system contains glycol which will prevent coil freezing.

These HVAC modifications will benefit the school by allowing for ASHRAE 62.1-2019 code required ventilation to be provided to the learning environments during all levels of occupancy.

Work will include all mechanical, electrical, general construction, engineering, construction management, and commissioning of all work associated with this project work scope.

Areas Affected by the Work:

The work will affect the entire Centennial Elementary School.

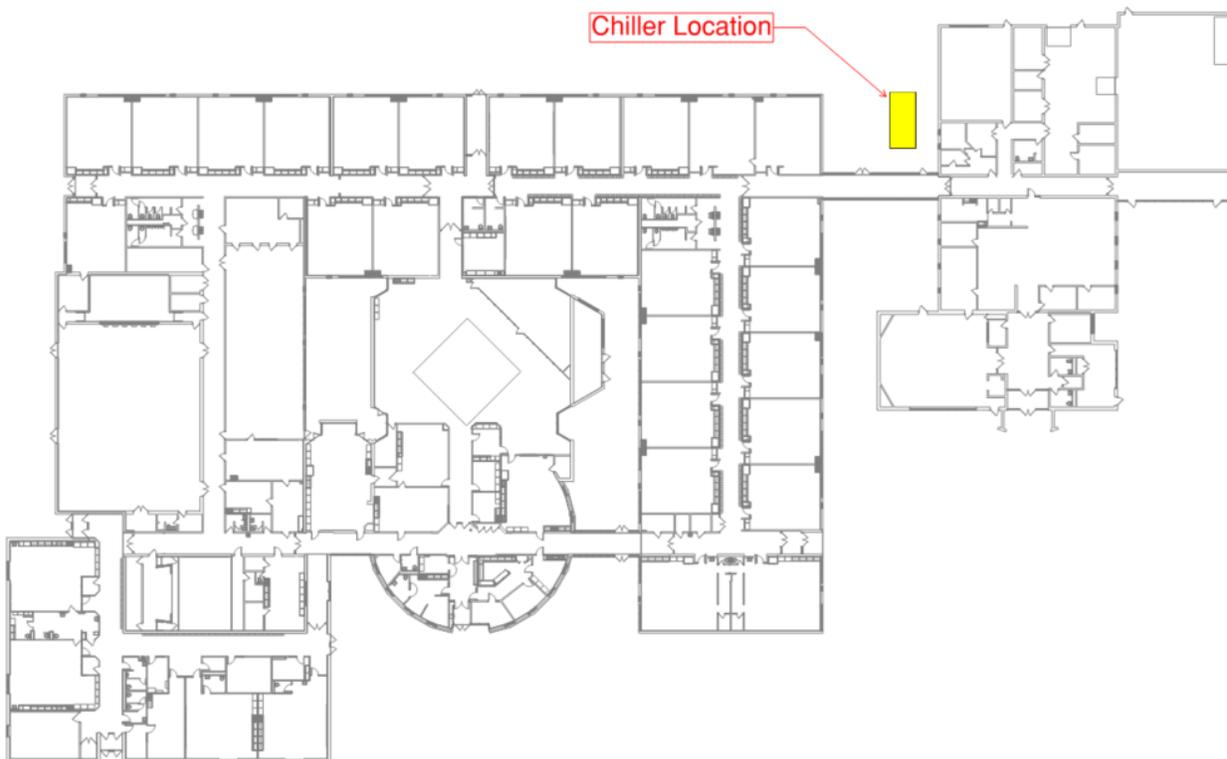
Design Criteria:

The following items will be addressed from this additional chiller work.

1. New chiller sized for code required ventilation air.
2. New control system with modern controls for improved system operation.
3. Dehumidification improvements.

Building Diagram:

See Floor Plan below indicating areas impacted at Centennial Elementary School.



Cost:

The total project cost to be funded through LTFM IAQ: **\$600,000**

Sincerely,

Russ Schumacher, P.E. (MN, WI, ND, IL) LEED AP
Principal