SECTION 23 21 15
CHILLED WATER SYSTEMS
Design Standard

PART 1 GENERAL

1.1 PURPOSE:

The chilled water systems are an essential element of the mechanical space cooling systems. This design standard has the purpose of creating a consistent application of chilled water system requirements throughout the San Mateo County Community College District therefore achieving a standard of quality for maintenance, energy efficiency, and reliability throughout all renovation and new building projects.

1.2 SUSTAINABLE DESIGN STANDARDS (Section 01 81 13)

For all proposed fossil fuel using systems, a life cycle cost assessment of natural gas using systems and their equivalent electric alternatives should be conducted.

PART 2 PRODUCTS

2.1 DESIGN AND SPECIFY WORK TO INCLUDE MATERIALS, INSTALLATION, AND TESTING OF CHILLERS AND COOLING TOWERS FOR BUILDING COOLING AND ASSOCIATED ACCESSORIES FOR A COMPLETE AND OPERABLE SYSTEM.

A. All chilled water systems shall have refrigerant systems that meet all LEED requirements for refrigerant use with regards to ozone depletion and global warming.

B. All chilled water systems shall include control and monitoring points consistent with District Control Standards.

C. All chilled water systems shall include heat recovery systems where applicable.

D. Air-Cooled Chiller:

1. Air-cooled, reciprocating or screw type, dual independent refrigerant circuits with lead-lag switch, assembled at the factory on a steel base. Individual performance test at full and part load conditions. Units to be leak tested and provided with a full operating charge of refrigerant

2. Design on Skyline campus shall provide casing and all components in contact with the outdoor environments to be corrosion resistant

3. Design with integration to campus wide control system

E. Evap-Cooled Chiller:

1. Evap-cooled, reciprocating or screw type, dual independent refrigerant circuits with lead-lag switch, assembled at the factory on a steel base. Individual performance test at full and part load conditions. Units to be leak tested and provided with a full operating charge of refrigerant

2. Design on Skyline campus shall provide casing and all components in contact with the outdoor environments to be corrosion resistant

3. Design with integration to campus wide control system

F. Water-Cooled Chiller:

1. Water cooled, centrifugal type, assembled at the factory on a steel base. Individual performance test at full and part load conditions. Units to be leak tested and provided with a full operating charge of refrigerant

2. Locate indoors in a refrigeration machinery rooms

3. Design with variable frequency drive

4. Design with integral touch screen control panel

5. Design with integration to campus wide control system

G. Induced Draft Counterflow Cooling Tower:

1. Factory assembled, sectional, counterflow, induced draft design. Fan assemblies built completely into the pan with moving parts factory mounted and aligned.

2. All steel components: Hot-dip galvanized steel with cut edges given a protective coat of zinc-rich compound, with a final coating of zinc chromatized aluminum.

3. Stainless steel sumps.

H. Ice Storage Systems:

1. Installed in manufacturers steel tanks or underground insulated concrete tanks.

2. Contained within the tank shall be a steel heat exchanger that is constructed of 1.05" O.D., all prime surface serpentine steel tubing encased in a steel framework. The coil, which is hot-dip galvanized after fabrication, shall be pneumatically tested at 190 psig and rated for 150 psig operating pressure. The coil circuits are configured to provide maximum storage capacity. The coil connections on the unit are galvanized steel and are grooved for mechanical coupling.

I. Heat Exchangers:

1. Plate and Frame Exchanger: Pressure plate and frame supporting heat transfer plates to be carbon steel. Heat transfer surfaces to be corrugated Type 304 stainless steel. Piping connections to be ANSI flanges. Minimum 150 PSIG working pressure to conform to ASME rules for pressure vessels. Install as recommended by manufacturer and provide adequate clearance for cleaning

J. Ground Source Heat Pumps and Energy Recovery Applications:

1. Follow ASHRAE TC 6.8 guidance for Geothermal Heat Pump and Energy Recovery Applications

2.2 APPROVED MANUFACTURERS:

A. Air-Cooled Chiller:

1. Trane

2. Carrier

3. McQuay

4. York
5. Team Air
6. Petra

B. Evap-Cooled Chiller:

1. Team Air
2. Governair
3. Aaon
4. BAC

C. Water-Cooled Chiller:

1. Trane
2. Carrier
3. McQuay
4. York

D. Induced Draft Counterflow Cooling Tower:

1. BAC
2. Marley
3. Evapco

E. Ice Storage Systems:

1. BAC
2. FAFCO

F. Heat Exchangers:

1. Bell & Gossett
2. Alfa Laval
3. Taco

PART 3 EXECUTION

3.1 SUBSTITUTES ALLOWED?

Yes, if performance and quality equivalency can be evidenced.

3.2 ASSOCIATED DESIGN STANDARDS AND CONSTRUCTION SPECIFICATIONS:

23 05 10 – HVAC Piping Design Standard

23 05 53 - Identification for HVAC Piping and Equipment Design Standard

23 21 05 - Hydronic Piping Systems Design Standard

END OF SECTION