

Element D Services

Heating, Ventilating, and Air
Conditioning

D3030 TECO Cooling Generating Systems

PART 1 - GENERAL

1.1 OVERVIEW

- A. For projects requiring new or modified cooling generating systems via the Texas Medical Center Central Heating and Cooling Services Corporation (TECO), this section includes criteria for the design of building cooling generating systems including isolation valves, hydronic piping and fittings, hydronic specialties, control valves, plate and frame heat exchangers, and primary chilled water pumps.

PART 2 - DESIGN CRITERIA

2.1 GENERAL

- A. The system will use N+1 design with a minimum of three plate and frame heat exchangers each sized for 50 percent building peak cooling load to isolate the building's chilled water system pressure from TECO. Refer to Design Guideline Element D3010.
- B. Plate and frame heat exchangers must be used to transfer heat from the building chilled water secondary side to the primary (TECO) chilled water side of the heat exchanger. The heat exchanger shall be selected for a 2 degree F approach where the leaving chilled water on the secondary side will not exceed 45 degrees F and the (TECO) chilled water entering on the primary side is 43 degrees F. Whenever possible, the heat exchanger selection shall be selected with primary and secondary chilled water temperature differential at a minimum of 20 degrees F for new buildings.
 - 1. For renovation projects, the heat exchanger minimum differential temperature shall be coordinated with the owner, but shall not be less than 14 degrees F. Refer to Design Guidelines Element D3045.
- C. The maximum pressure drop on the primary or secondary side of the chilled water heat exchanger shall be 8 psi at design flow and load conditions. The maximum inlet and outlet connection velocity shall be 10 feet per second on both the primary and secondary sides of the heat exchanger. A pressure transmitter shall be placed across the primary and secondary chilled water side of the heat exchanger inlet and outlet to provide a reading on the building automation system of the differential pressure.
- D. To accommodate for heat exchanger fouling, provide 10 percent excess surface area on each chilled water heat exchanger.
- E. The selected heat exchanger frame shall accommodate a minimum of 30 percent more plate count for future requirements. This should be achievable by simply adding plates and without the need for any kind of modification to the frame or equipment pad.
- F. Under this design concept, the primary chilled water system will have a minimum of two vertical or horizontal split case pumps (N+1 design). One set will pump TECO water through

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the TECO-side of the heat exchangers. A secondary chilled water system, minimum three pumps, will circulate building water through the building side of the plate and frame heat exchangers and distribute chilled water to end devices in the building (reference Design Guideline Element D3045). Each secondary building pump will be sized for 50% of the flow with one pump redundant.

- G. Primary chilled water pumps shall be equipped with variable frequency drives.
- H. Primary chilled water pumps shall be on emergency power. Refer also to Design Guideline Element D3000 for additional emergency power requirements.
- I. Provide full line size primary pump bypass complete with check valve and two manual, isolation, high performance, soft seat butterfly valves to bypass primary pumps serving the heat exchangers.
- J. Provide manual duplex basket strainers at the inlet of primary pumps and wye strainers at the inlet of secondary pumps. Strainers are to be located at serviceable locations and accessible from the mechanical room floor without the use of a ladder or scaffolding. Strainers shall be equipped with a local DP gauges and remote sensor integrated to the building automation system.
- K. The A/E shall incorporate a make-up water meter on any connections to the secondary side of the chilled water system. The meter shall be positive displacement type with a non-resettable register.
- L. Do not make any piping cross connections between the TECO's side (primary) and the building's side (secondary) of the chilled water system.

PART 3 - SPECIAL CONTRACT DOCUMENT REQUIREMENTS

3.1 GENERAL

- A. The A/E shall include a schematic of the cooling generating system in the Contract Documents.
- B. The A/E shall confirm information system environmental requirements and include in load calculations.

PART 4 - PRODUCTS

4.1 GENERAL

- A. Refer to Owner's Master Construction Specifications. These are available on the Owner's Design Guidelines website: <http://www2.mdanderson.org/depts/cpm/standards/specs.html>

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DOCUMENT REVISION HISTORY

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	20190301	Initial Adoption of Element	
Rev. 1			

END OF ELEMENT D3030