PART 1 - GENERAL

1.1 OVERVIEW

A. This section addresses design criteria for the Project's chilled water distribution system (secondary), including all isolation valves, hydronic piping and fittings, hydronic specialties, process heat exchangers (PHEX), control valves and pumps required to distribute chilled water to the building air handling units and fan coil units.

PART 2 - DESIGN CRITERIA

2.1 GENERAL

A. The chilled water piping shall be sized where the friction loss will not exceed 3 feet per 100 feet of (equivalent length) pipe.

B. Direct buried pipe shall be pre-insulated carbon steel unless the alternative of pre-insulated HDPE is approved by Onwer.

C. Minimum ¾ inch pipe size except at control valves.

D. The A/E shall allow for a minimum of three (3) horizontal centrifugal split case, vertical centrifugal split-case, or split-coupled vertical in-line secondary chilled water pumps. Pump configuration will depend on the scheduled capacity limits. Pumps shall be selected at 1750 rpm. Provide with end suction diffuser if five (5) pipe diameters at the suction end cannot be achieved.

E. Unless stated otherwise in Design Guideline Element 1010 Project Summary, select equipment such that one pump provides 50 percent redundant capacity based on peak design load.

F. The secondary chilled water pumps shall be equipped with variable frequency drives.

G. Provide line shut-off valves at locations required for proper operation, servicing and troubleshooting of the HVAC hydronic distribution systems and connected components. Locations shall include but not be limited to the following; at each piece of equipment, at each branch take-off from mains, at the base of each riser, where recommended by equipment manufacturers and at strategic locations to allow sectional isolation while limiting disruption of services to large portions of the system.

H. Chilled water piping shall not be routed above rooms with electrical power distribution, IDF/MDF rooms, and elevator equipment.

I. Chilled water pumps shall be on emergency power. Refer also to Design Guideline Element D3000 for additional emergency power requirements.

J. Closed loop chilled water piping systems shall include a chemical pot feeder, air/dirt separator, and captive air expansion tank.

K. In new facilities, maximize chilled water temperature differential (minimum 20 degrees F.) Refer to Design Guideline Element D3010.

L. Provide a tap into a non-stagnant domestic cold water pipe that will be used as a backup source in case chilled water piping serving the PHEX must be isolated. The domestic water pipe size and backflow preventer will need to meet the higher flow rate (gpm) due to the lower differential temperature across the PHEX.

M. The secondary chilled water system shall include a safety relief piping to nearest floor drain. A high pressure alarm switch shall alert MD Anderson Monitoring Services of an abnormal condition via the building automation system. To prevent nuisance alarms, alarm if open for more than 1 minute (adjustable) or if the valve opens 3 or more times in 24 hours (adjustable).

N. Incorporate a 2 inch drain at the lowest point of each riser. If the pipe riser is not located in a mechanical room then show the full size drain on the drawing being hard piped to the nearest suitable floor drain.

O. Incorporate a 2 inch quick fill with backflow preventer at the lowest point of each riser. Quick fill shall be full size and hard piped to the nearest domestic water pump.

P. All risers shall have full size dirt legs.

Q. Incorporate makeup water line with backflow preventer pressure reducing valve and flow meter.

R. Provide manual duplex basket strainers on the TECO side at the inlet of the primary and wye type strainers on the inlet side of the secondary chilled water 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 differential pressure gauges and remote sensor integrated to the building automation system.

S. Indicate automatic air vents at the top of each riser piped to the nearest floor drain.

T. Provide 3-way control valves at select coils or piping bypasses at locations farthest from pumps to prevent dead heading of pumps at low load conditions. This shall be done on a project by project basis only if needed.

PART 3 - SPECIAL CONTRACT DOCUMENT REQUIREMENTS

3.1 GENERAL

A. The A/E shall include a schematic of the chilled water distribution system in the Contract Documents.

B. Indicate the location all pumps, heat exchangers, air and dirt separators, expansion tanks, emergency chilled water connections for portable chiller, and etc. on floor plans. Include spacing requirements on chilled water piping layout drawing to allow for the installation of the thickest insulation material for each given pipe diameter. Refer to the insulation specification table for type of insulation and material thickness.

C. The A/E shall include a chilled water system distribution schematic indicating information required to clearly illustrate the intent of system design including, but not limited to, supply source, primary and secondary pumps, heat exchangers, expansion tanks, strainers, supply and return piping, piping risers, pressure, and temperature sensors, including branch piping and shut-off valves to equipment.

D. The A/E shall also include locations details of full size drip / dirt legs on the drawings that show piping risers.

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

B. Specify pressure-independent 2-way control valves for chilled water coils and heat exchangers, as applicable to the Project. Use of 3-way valves is not acceptable.

PART 5 - DOCUMENT REVISION HISTORY

Issue	Date	Revision Description	Reviser
	20190301	Original Issuance	
Rev. 1			

END OF ELEMENT D3045