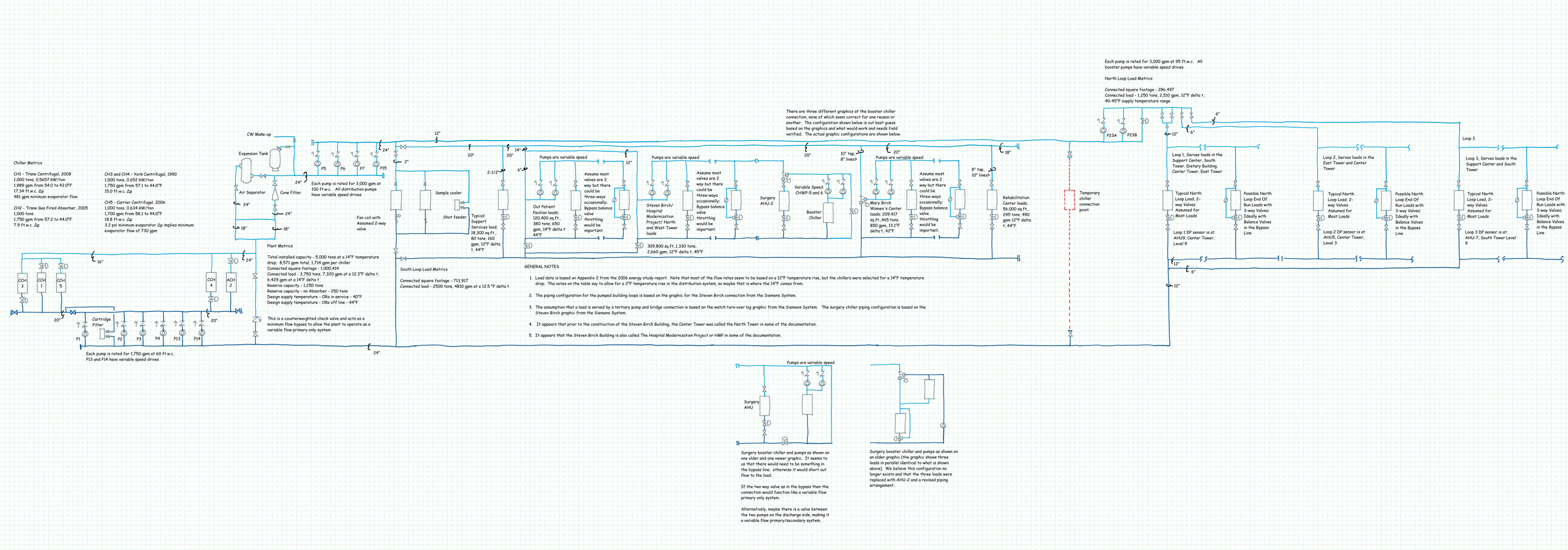
Chiller Metrics
CH1 - Trane Centrifugal, 2008
1,000 tons, 0.5657 kW/ton
1,989 gpm from 54.0 to 42.0°F
17.34 ft.w.c. Δp
481 gpm minimum evaporator flow
CH2 - Trane Gas Fired Absorber, 2005
1,000 tons
1,750 gpm from 57.2 to 44.0°F
7.9 ft.w.c. Δp
CH3 and CH4 - York Centrifugal, 1990
1,000 tons, 0.652 kW/ton
1,750 gpm from 57.1 to 44.0°F
15.0 ft.w.c. Δp
CH5 - Carrier Centrifugal, 2006
1,000 tons, 0.634 kW/ton
1,700 gpm from 58.1 to 44.0°F
18.8 ft.w.c. Δp
3.2 psi minimum evaporator Δp implies minimum evaporator flow of 730 gpm
CCH 3
CCH 1
CCH 5
CCH 4
ACH 2
Cartridge Filter
P1
P2
P3
P4
P13
P14
Each pump is rated for 1,750 gpm at 60 ft.w.c.
P13 and P14 have variable speed drives
CW Make-up
Expansion Tank
Air Separator
Cone Filter
P5
P6
P7
P15
Each pump is rated for 3,000 gpm at 100 ft.w.c. All distribution pumps have variable speed drives
Plant Metrics
Total installed capacity - 5,000 tons at a 14°F temperature drop; 8,571 gpm total, 1,714 gpm per chiller
Connected square footage - 1,000,414
Connected load - 3,750 tons, 7,320 gpm at a 12.3°F delta t,
6,629 gpm at a 14°F delta t
Reserve capacity - 1,250 tons
Reserve capacity - no Absorber - 250 tons
Design supply temperature - ORs in service - 40°F
Design supply temperature - ORs off line - 44°F
This is a counterweighted check valve and acts as a minimum flow bypass to allow the plant to operate as a variable flow primary only system
Sample cooler
Shot feeder
Fan coil with Assumed 2-way valve
Typical Support Services load: 18,300 sq.ft., 80 tons, 160 gpm, 12°F delta t, 44°F
South Loop Load Metrics
Connected square footage - 713,917
Connected load - 2500 tons, 4810 gpm at a 12.5 °F delta t
Pumps are variable speed
Out Patient Pavilion loads: 120,400 sq.ft., 380 tons, 650 gpm, 14°F delta t 44°F
Assume most valves are 2 way but there could be three-ways occasionally; Bypass balance valve throttling would be important.
Steven Birch/ Hospital Modernization Project/ North and West Tower loads
309,800 sq.ft.,1,330 tons, 2,660 gpm, 12°F delta t, 45°F
Surgery AHU-2
Variable Speed CHWP-5 and 6
Booster Chiller
There are three different graphics of the booster chiller connection, none of which seem correct for one reason or another. The configuration shown below is out best guess based on the graphics and what would work and needs field verified. The actual graphic configurations are shown below.
Mary Birch Women's Center loads: 209,417 sq.ft.,465 tons, 850 gpm, 13.1°F delta t, 42°F
Rehabilitation Center loads: 56,000 sq.ft., 245 tons, 490 gpm 12°F delta t, 44°F
10" tap, 8" lines?
8" tap, 10" lines?
Temporary chiller connection point
GENERAL NOTES
1. Load data is based on Appendix 2 from the 2006 energy study report. Note that most of the flow rates seem to be based on a 12°F temperature rise, but the chillers were selected for a 14°F temperature drop. The notes on the table say to allow for a 2°F temperature rise in the distribution system, so maybe that is where the 14°F comes from.
2. The piping configuration for the pumped building loops is based on the graphic for the Steven Birch connection from the Siemens System.
3. The assumption that a load is served by a tertiary pump and bridge connection is based on the watch turn-over log graphic from the Siemens System. The surgery chiller piping configuration is based on the Steven Birch graphic from the Siemens System.
4. It appears that prior to the construction of the Steven Birch Building, the Center Tower was called the North Tower in some of the documentation.
5. It appears that the Steven Birch Building is also called The Hospital Modernization Project or HMP in some of the documentation.
Each pump is rated for 3,000 gpm at 95 ft.w.c. All booster pumps have variable speed drives.
North Loop Load Metrics
Connected square footage - 286,497
Connected load - 1,250 tons, 2,510 gpm, 12°F delta t,
40-45°F supply temperature range
P23A
P23B
Loop 1, Serves loads in the Support Center, South Tower, Dietary Building, Center Tower, East Tower
Typical North Loop Load, 2-way Valves Assumed for Most Loads
Possible North Loop End Of Run Loads with 3-way Valves; Ideally with Balance Valves in the Bypass Line
Loop 1 DP sensor is at AHU9, Center Tower, Level 9
Loop 2, Serves loads in the East Tower and Center Tower
Typical North Loop Load, 2-way Valves Assumed for Most Loads
Possible North Loop End Of Run Loads with 3-way Valves; Ideally with Balance Valves in the Bypass Line
Loop 2 DP sensor is at AHU5, Center Tower, Level 3
Loop 3
Loop 3, Serves loads in the Support Center and South Tower
Typical North Loop Load, 2-way Valves Assumed for Most Loads
Possible North Loop End Of Run Loads with 3-way Valves; Ideally with Balance Valves in the Bypass Line
Loop 3 DP sensor is at AHU-7, South Tower Level 9
Surgery AHU
Pumps are variable speed
Surgery booster chiller and pumps as shown on one older and one newer graphic. It seems to us that there would need to be something in the bypass line; otherwise it would short out flow to the load.
If the two way valve as in the bypass then the connection would function like a variable flow primary only system.
Alternatively, maybe there is a valve between the two pumps on the discharge side, making it a variable flow primary/secondary system.
Surgery booster chiller and pumps as shown on an older graphic (the graphic shows three loads in parallel identical to what is shown above). We believe this configuration no longer exists and that the three loads were replaced with AHU-2 and a revised piping arrangement.