
6.0 MECHANICAL DEPTH: EXISTING CONDITONS

Waterside of Existing Mechanical System:

The existing waterside system for the Bronx School for Law consists of two 250 ton air cooled DX chillers that provide chilled water for the ten air handling units. The total capacity needed by the air handlers at peak load is only 320 tons therefore; the extra capacity of the chiller is used for redundancy or for future cooling loads. Each chiller uses R-22 refrigerant and was designed for an entering and leaving temperatures of 55°F and 44°F. Once the chilled water is supplied to the air handlers it is returned by three end suction pumps that pump the return chilled water back to the chillers. An expansion tank is connected to the chilled water system on the inlet (suction) side of the distribution pumps by a branch line. The chiller process can be shown in Figure 4 and 5.

Figure 4: Existing Condenser Water System Schematic

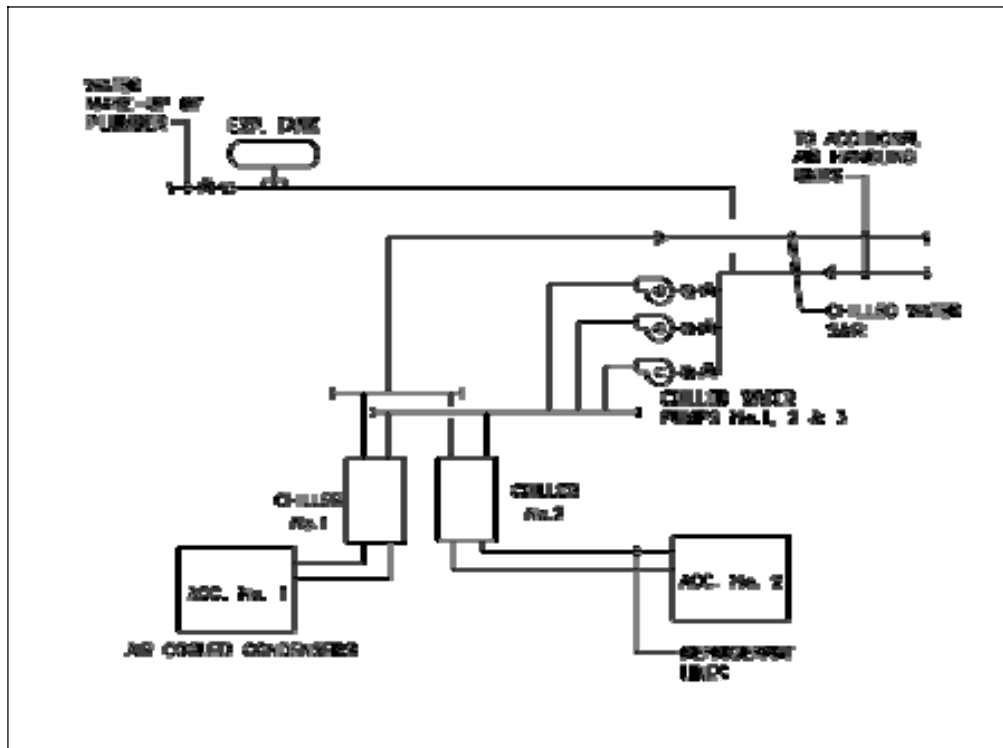
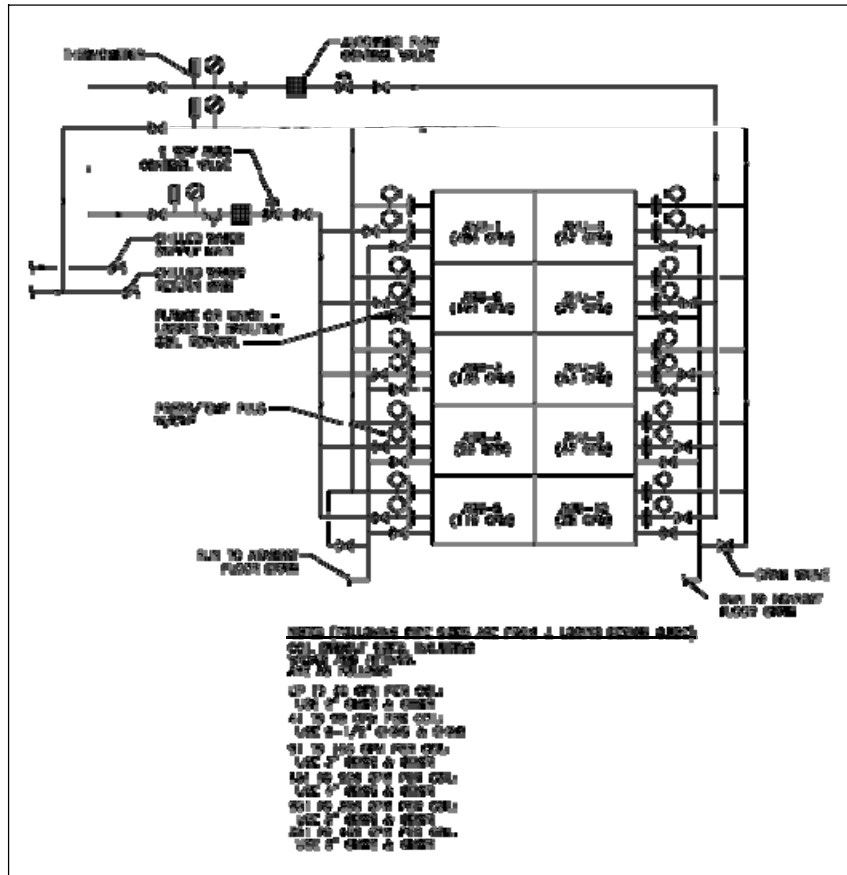


Figure 5: Existing Chilled Water Supply and Return



Airside of Existing Mechanical System:

All of the air handling units came pre-packaged and each equipped with steam heating coils. However, the primary heating in the building comes from steam fin tube radiators while the heating coils inside the air handling units act as the secondary or back-up heat source. There are a total of ten air handlers serving all of the major spaces within the school. Bronx High School of Law utilizes both variable air volume (VAV) and constant air volume (CAV) systems. The CAV system is used primarily for either single zone spaces or zones that are not temperature sensitive such as storage spaces. The VAV system was used for the multi-zone spaces such as the classrooms and offices. The VAV allows for better temperature and humidity control throughout the variety of spaces. Figure 6 represents a typical VAV detail from the original design documents.

a rated temperature of 212°F. A separate condensate pump is provided for return steam which is then pumped into the feeder tank. Figure 7 illustrates the heating system for Bronx School for Law.

Table 1: Air Handler Schedule

Air Handling Units (AHU)	Type	Total [CFM]	Min. Outdoor Air [CFM]	OA %
AHU 1 [Classrooms & misc.]	VAV	48000	26000	54.2
AHU 2 [Classrooms & misc.]	VAV	19000	9000	47.4
AHU 3 [Gymnasium]	CAV	18500	7500	40.5
AHU 4 [Library]	CAV	3400	1020	30.0
AHU 5 [Lobby & Corridor]	CAV	12000	6900	57.5
AHU 6 [Kitchen]	CAV	5200/2600	5200/2600	100/100
AHU 7 [Administration]	VAV	12000	3800	31.7
AHU 8 [Dining]	CAV	6000	3360	56.0
AHU 9 [Plant Operations]	CAV	7200	2200	30.6
AHU-10 [Orchestra]	CAV	3100	1050	33.9
TOTAL		133440	66030	49.1

Figure 7: Steam Heating System

