

LAW SCHOOL (0043)

Hirsch Hall was originally constructed in 1932 and was heated and ventilated only. In 1967 the building underwent a major expansion and renovation. The building was air conditioned during this renovation.

As part of the 1967 renovation, five air handling units (AHUs) were added to condition the building. Air handling unit AC-1 is a multi-zone air handling unit where each zone is provided with cooling or heating air from the central AC unit. The four other units (AC-2, AC-3, AC-4 and AC-5) were designed as dual ductwork units where warm air is distributed in a hot duct and cold air is distributed in a cold duct. Based on the space temperature requirements a dual duct terminal unit will blend air from the two ducts to supply tempered air to the space. The units were designed to supply air to the spaces with between 9% and 15% composed of ventilation air from outside the building. For all of the units, cooling is by chilled water and heating is by hot water coils in the unit.

In 2011, two new air handling units were added; AHU-5 and AHU-6. The new units served areas on the first floor on either side of the open courtyard. Both are variable air volume air handling units serving variable air volume zone terminal units (VAVs) with hot water reheat. AHU-5 was designed to supply air with 12% composed of ventilation air from outside the building and AHU-6 was designed to supply air with 6% composed of ventilation air from outside the building.

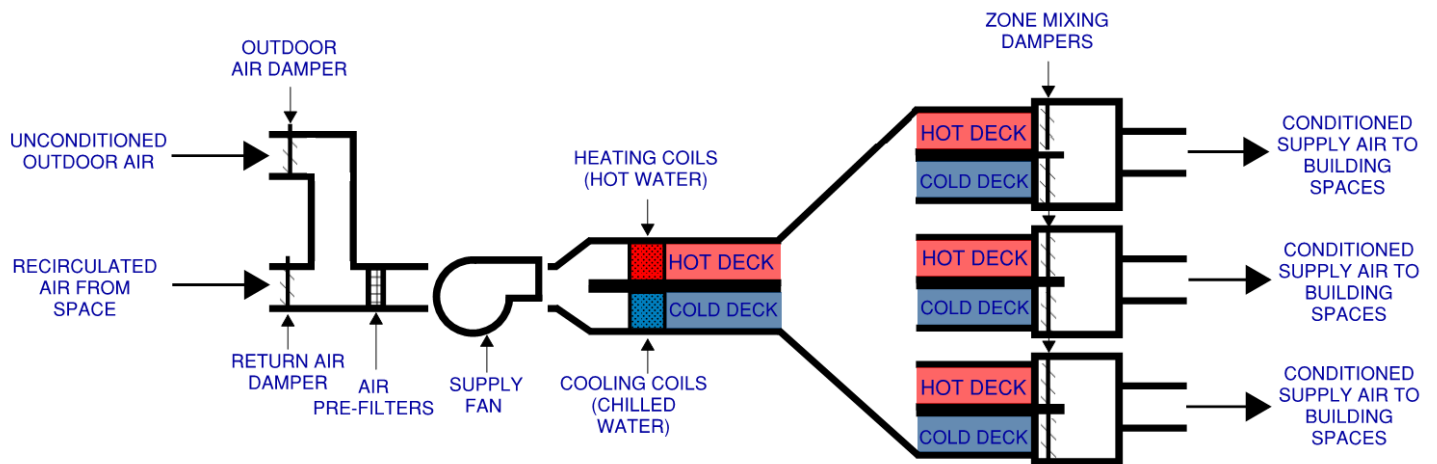
The building HVAC systems operate 24 hours per day, seven days a week.

Chilled water is supplied throughout the building from chillers located in the two mechanical rooms or from the campus chilled water system. Heating hot water, distributed throughout the building for heating, is provided by a steam to water heat exchanger using steam from the campus central steam system.

The building units are equipped with an air side economizer function that increases ventilation to provide free cooling when ambient weather conditions are appropriate. These units are equipped with an occupancy schedule that disables the AHU during periods when the facility is unoccupied. The occupancy schedules have been adjusted to operate the unit and ventilate the building continuously as part of FMD's COVID-19 response plan. AHU-5 and AHU-6 are also equipped with demand controlled ventilation programming that adjusts ventilation rates based on space occupancy.

MULTI-ZONE AIR HANDLING UNITS (AC-1)

The multi-zone air handling unit (AHU) provides ventilation, air filtration and movement, and heating and cooling functions to a single floor. The AHU has a hot water heating coil and chilled water cooling coil that respectively generate parallel warm and cool air streams. The air flow is distributed to a number of ducts that exit the AHU to serve individual zones, which may be single rooms or groups of rooms depending on their size. Each zone's duct has a mixing damper that allows only warm air, only cool air, or a mixture of the two, depending on the signal being sent from the zone thermostat. Ventilation is provided at each AHU by drawing a mixture of fresh air from outdoors and recirculated air from the area being served by the AHU.



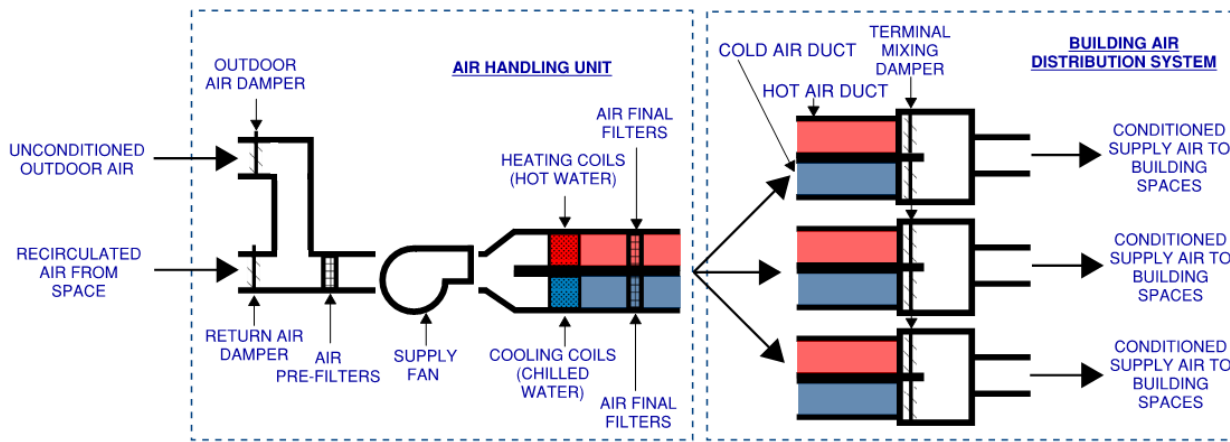
MULTI-ZONE AIR HANDLING SYSTEM SCHEMATIC

DUAL DUCT AIR HANDLING UNITS (AC-2, AC-3, AC-4, AC-5)

The dual duct air handling units each provide ventilation, cooling, heating and air filtration and distribution functions for the building. Each dual duct air handling unit delivers heated air and cooled air simultaneously through a hot deck and cold deck within the unit that comes from a mixture of recirculated building air and fresh air from outside of the building. The hot air and cold air streams are supplied to the building spaces via separate ductwork.

Space heating and cooling is provided by duct mounted, mixing boxes in supply ductwork throughout the building. The dual duct mixing boxes blend hot and cold air from the hot air duct and cold air duct supplied by the central AHU to provide either heating or cooling to the spaces served by each box based on space temperatures.

The building return air is mixed with outdoor air, filtered and cooled with chilled water coils in each of the four dual duct air handling units before being supplied to rooms throughout the building through above ceiling ductwork.



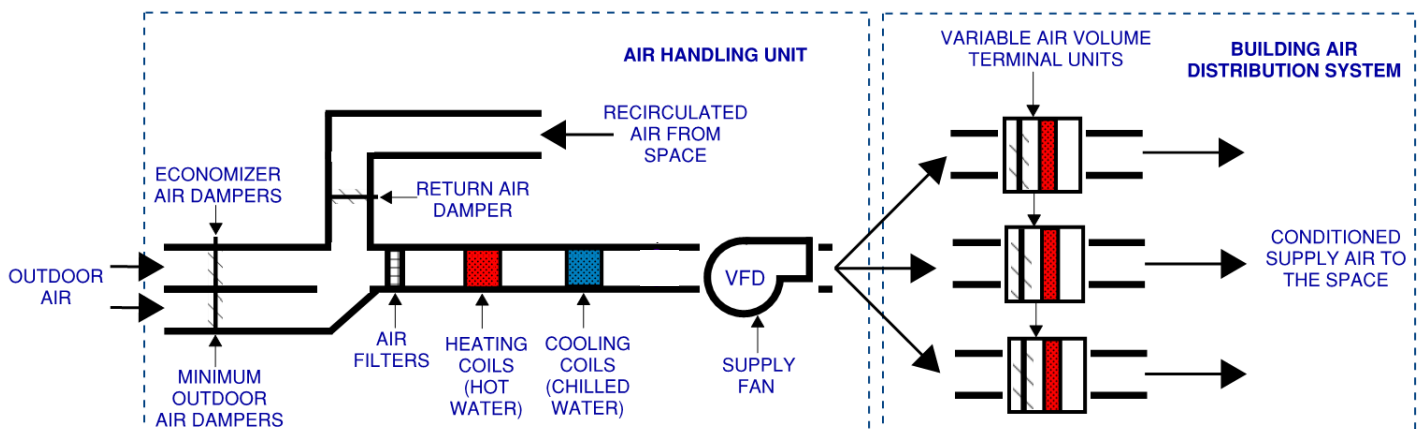
DUAL DUCT AIR HANDLING SYSTEM SCHEMATIC

VARIABLE VOLUME AIR HANDLING UNITS

Variable volume air handling units (AHUs) deliver a variable volume of conditioned air consisting of a mixture of recirculated building air and fresh air from outside. The building return air is filtered, mixed with outdoor air and cooled with chilled water coils in the air handling unit before being supplied to rooms throughout the building via above ceiling ductwork.

Space heating is provided by Variable Air Volume terminal units (VAVs) with hot water reheat coils located in supply ductwork throughout the building. The VAVs are equipped with an air damper to regulate the volume of air delivered from the central AHU to the space based on the current space temperatures and a hot water reheat coil to provide space heating when needed. The VAVs include a fan and a filter combination that will mix air from above the ceiling with the conditioned air from the central AHU when the space requires heating.

Air is recirculated from the spaces back to the air handling units through ceiling mounted air return registers located in each space. Return air is pulled from a plenum space above the ceiling. Exhaust is provided in restrooms on each floor to remove odors and to maintain a slightly positive building pressurization.



VARIABLE VOLUME AIR HANDLING UNIT SCHEMATIC