

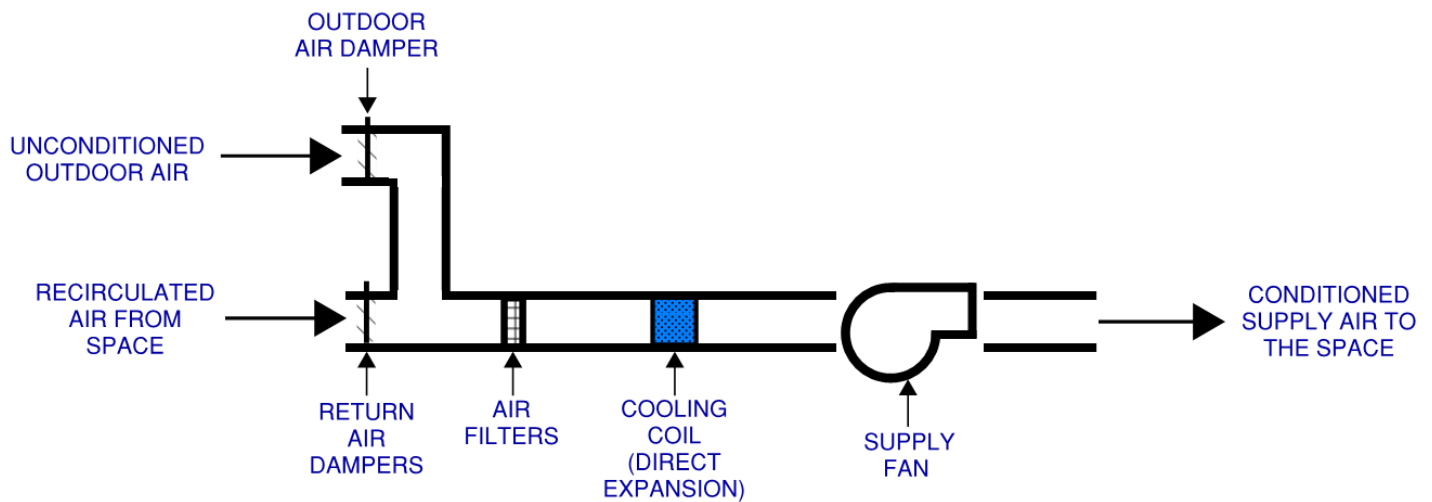
MARINE SCIENCES/DANCE BUILDING (1030)

The Marine Sciences/Dance Building is a 97,409 square foot facility originally constructed in 1928. It is home to a combination of classroom, administrative, research and specialty spaces including a natatorium, ballroom and studio spaces. The facility has seen more than 25 renovation and alteration projects since this time.

Chilled water is supplied throughout the building from the campus chilled water system. Heating hot water, distributed throughout the building for heating, is provided by a building steam to water heat exchanger using steam from the central campus steam system.

DANCE HVAC SYSTEM

The Dance Building's ballroom and stage area HVAC system was renovated in 1997 with four parallel split systems (refrigerant based cooling) and corresponding air handling units (AHUs) in the ceiling. Each unit has an outside air intake hood on the roof that allows fresh air to mix with recirculating room air. The fans are controlled by a time clock. The AHUs are equipped with an air side economizer function that increases ventilation to provide free cooling when ambient weather conditions are appropriate.



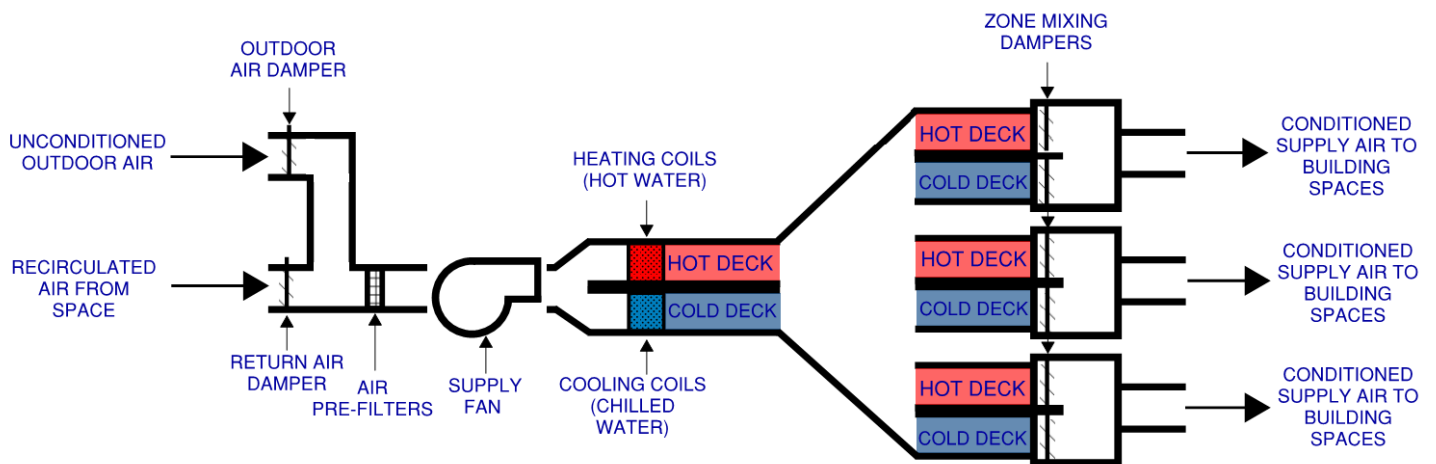
DX COOLING ONLY AIR HANDLING UNIT SCHEMATIC

MARINE SCIENCES HVAC SYSTEM

Marine Sciences was originally built with multi-zone air handling units, but the HVAC has been modernized with variable air volume systems and exhaust fans through a series of renovations between 1997 and 2006. All air handling units combine outside air and return air which pass through conventional air filters. There are a number of laboratory spaces within the Marine Sciences section of the facility. These labs have special exhaust and ventilation requirements to prevent fume migration from the labs into the hallways. There are also a number of fume hoods and snorkel exhaust systems in place to capture process fumes at their source. Additional outdoor air is provided to the building in order to provide fresh fume hood make-up air and prevent negatively pressurizing the building as a whole.

MULTI-ZONE AIR HANDLING UNITS

Multi-zone Air Handling Units (AHUs) provide ventilation, air filtration and movement, and heating and cooling functions. Each 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 that 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 areas being served.

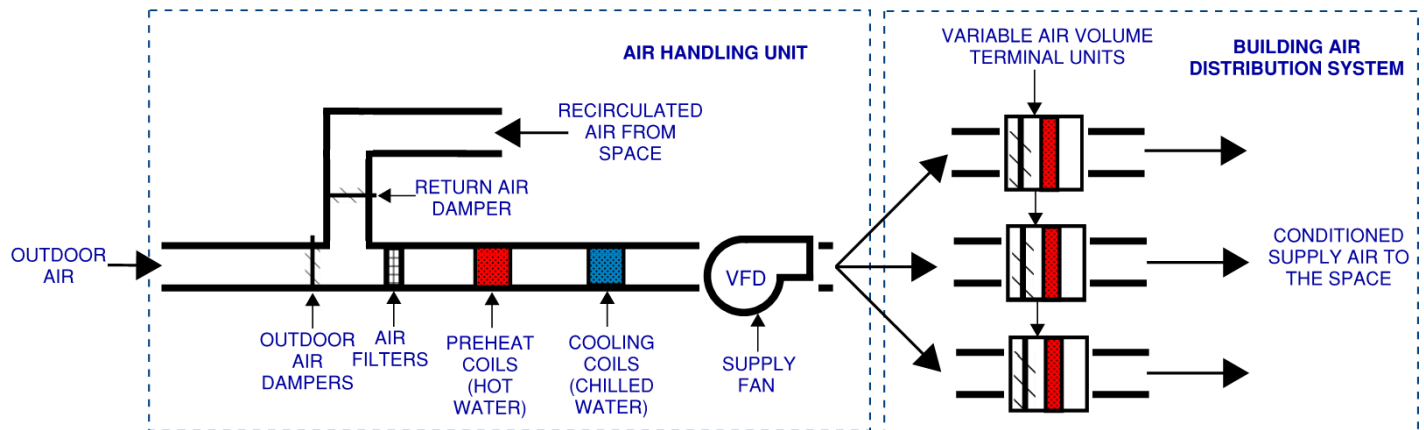


MULTI-ZONE AIR HANDLING SYSTEM SCHEMATIC

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 of the building. The return air is mixed with outdoor air, passed through a bank of filters and cooled with chilled water coils in the air handling unit before being supplied to rooms throughout the building through above ceiling ductwork. The Variable Air Volume zone terminal units (VAVs) are equipped with an air damper to regulate the volume of air delivered from the central AHU to each space (or group of spaces) and a hot water coil to provide space heating based on the current space temperatures.

Air is recirculated from the spaces back to the air handling unit through ceiling mounted air return registers located in each space. Room air is returned to the central AHUs via the above ceiling plenum space. Exhaust is provided in restrooms on each floor to remove odors and in studio spaces via general exhaust, snorkel exhaust and hood exhaust to remove process fumes and to maintain building pressurization.



VARIABLE VOLUME AIR HANDLING UNIT SCHEMATIC

