1.01 General Requirements

A. This standard is intended to provide usef
establish a basis of design. The responsib
and the ones that follow so that the Sam
consistency in the mechanical design of
justified through LCC analysis and subm

B. Not used

C. Not used.

D. Use gravity drain of liquids at all possibl
economic feasibility.

E. SHSU preference for mounting of air han
without the use of ladder; maximum heig

N. All instrumentation that can be damaged from construction dust or smoke must be protected prior to beginning of construction. This includes all Fire & Smoke devices that are a part of the Fire Alarm System.

1.02 Mechanical Systems Selection:

A. Airside – HVAC

1. Provide air handling units configured to serve campus buildings in accordance with these standards as minimum level and consistent with good engineering practice, zoned in a practical manner to facilitate convenient building operation, thermal performance and shutdown. Design HVAC systems with a practical number of air handling units preferably located to a common mechanical room to increase functional space within the building. The exact quantity, location, and configuration of the air handling units shall be verified through LCC analysis. The baseline system required by these standards shall be as follows:

a. LABS: 100% outside air, dual duct, variable air volume, central air-handling units with single duct VAV boxes with reheat coils.

i. Lab Exhaust – Header system connecting all chemical fume hoods, ducted bio-safety cabinets, and general lab exhaust to common lab exhaust fan system located on roof. Lab exhaust shall terminate with stack to exhaust contaminants to provide acceptable dilution and prevent recirculation of containments into building ventilation.

ii. Exhaust Energy Recovery – Laboratory facilities with total exhaust, excluding fume hood exhaust, greater than 15,000 CFM shall include heat energy recovery systems to precondition outside air.

iii Energy recovery systems will be designed for zero cross-contamination with fume hood exhaust systems.

b. CLASSROOM/OFFICE/DORMITORY: Single duct, variable air volume, central air-handling units with VAV boxes with reheat coils with approval as needed. Building ventilation shall be provided by dedicated outside air pre-treatment unit(s) unless otherwise approved by SHSU

2. Utilize dedicated 100 percent outside air handling units to pre-treat ventilation air prior to delivery to main central air handling unit(s), unless otherwise approved by SHSU. Provide outside air handling units dedicated to a single or group of central air handlers consistent with prudent engineering practice and to facilitate convenient building operation and shutdown.

3. Locate building air intakes as high as possible to ensure the cleanest possible air. Devote special attention to noxious fume exhaust systems to make certain that the exhaust contents escape boundary layer entrainment and subsequent contamination of the building or its neighbors.

4. Use variable frequency drives (VFDs) for fan static pressure control.

5. Control air handling system outside air ventilation rates using a carbon dioxide based demand ventilation control strategy to reduce the total supply or outside air during periods of reduced occupancy. Monitor the carbon dioxide levels in the zones and vary ventilation rates to track a carbon dioxide offset consistent with ASHRAE 62 recommendations.

6. Provide balancing dampers at supply, return, and general exhaust branches as required to appropriately balance the system.

7. Provide night setback temperature control on classroom/office buildings. Laboratory temperature setback shall be evaluated based on specific environmental requirements of laboratory space.

B. Waterside

1. Chilled Water

a. Use only 4 pipe Hot/Cold water systems.

b. Chilled water design supply water temperature should be 42 °F, with a minimum return water temperature of 58 °F to optimize pipe sizing for water systems. This shall be accomplished without the use of blending stations.

c. Modulate chilled water pumps with variable frequency drives.

d. Chilled water pumps shall typically be end suction type with mechanical seals and bronze fitted and connected to campus chilled water loop whenever practical.

e. Provide building chilled water pumps to handle full building differential pressure. Provide bypass line with check valve and isolation valves around building chilled water pumps.

f. Provide Isolation valves on Chill Water Pumps for removal.

g. When connected to a centralized distribution system, pumps shall be selected such that there is minimal impact on distribution system pressure curve. PSP shall coordinate pump selection with SHSU System Hydronic Model. Pumps shall be sized such that