

STATE UNIVERSITY CONSTRUCTION FUND

PROGRAM DIRECTIVES

DIRECTIVE 15H-1

Issue date: November 2012

GENERAL HVAC REQUIREMENTS

1. General Requirements
 - a. Design to the current Energy Conservation Construction Code NYS referenced version of ASHRAE 90.1 Standard Climatic Data
2. Mechanical Equipment Rooms (MER)
 - a. Location: Locate all mechanical equipment in either a mechanical equipment room or penthouse. Where the project necessitates the installation of equipment outdoors see 15H-2 "Air Systems" for additional requirements.
 - b. Maintenance and Accessibility
 - 1) Identify on the plans Building Code required and equipment manufacturer's maintenance access.
 - 2) Locate equipment, valves and other components which require service, in readily accessible locations.
 - 3) Identify on the plans the removal path for the largest piece of equipment or component from each MER to the exterior of the building.
 - 4) Provide doors or removable panels which allow the removal of the largest piece of equipment or component from the MER to the exterior of the building.
 - 5) MERs and penthouses must be accessible by a standard egress stair or elevator. Ship's ladders are not acceptable.
 - 6) Provide provisions to remove equipment from the MER to the building's grade level. If direct elevator access is not available, provide a means to access a floor with an elevator or provide other alternate methods of removal from the building. Design any rigging equipment and necessary structural components for a minimum of a 1,500 lb. load.
 - 7) Provide housekeeping pad a minimum of 4", or thicker to provide the required height for drainage for all MER equipment.

STATE UNIVERSITY CONSTRUCTION FUND

PROGRAM DIRECTIVES

- 8) Provide a floor drain adjacent to all hydronic equipment requiring drainage. Provide drains piped to floor drains, which do not impede the maintenance access path.
- 9) Provide lighting in the MER.
- 10) Provide electrical outlets, and hose bibbs in locations requested by the Campus.
- 11) Provide thermostatically controlled heating and ventilation.

3. Metering

- a. Provide energy meters on the heating and cooling sources, provide flow meters on the domestic cold water, fuel oil and natural gas.
- b. Specify meters which are capable of providing readings both locally and remotely through the Building Management System or energy metering system.
- c. Confirm the acceptability of the meter type with the Campus and service provider.

4. Sound and Vibration Control

- a. Design to the general guidelines below unless otherwise recommended by an acoustic consultant to achieve lower values.

<u>Space Type</u>	<u>NC</u>
Private offices	30
Conference rooms	30
Open-plan offices	35
Public areas	40
Theaters	25
Laboratories	40
Classrooms	30
Lecture hall	30
Library	30
Gyms and natatoriums	45

See ASHRAE HVAC Applications Handbook for spaces not listed.

STATE UNIVERSITY CONSTRUCTION FUND

PROGRAM DIRECTIVES

- b. Engineers shall provide calculations to demonstrate that air systems are designed such that compliance with the NC ratings will be achieved. For special situations, for example theaters, teleconferencing rooms, music practice rooms, laboratories or art studios where large quantities of air are being delivered, an acoustic consultant should be retained to recommend both architectural and HVAC features that should be incorporated to ensure sound is controlled to acceptable levels.
 - c. All reciprocating and rotating equipment shall be vibration isolated. Vibration isolate piping within the MER. Vibration isolate ducts and pipes near their connections to vibration-isolated equipment.
 - d. Provide internally isolated fan/motor assemblies in all air handling units.
5. Shared Services - Central Utility Plant or Multiple Buildings
- a. Provide documented confirmation of available source capacity and proper distribution system capacity for shared services (heating, cooling, compressed air, etc.).
 - b. Discuss with the Campus any operational and maintenance shutdowns of the shared services which will require the installation of standalone sources for the project building(s).
6. Supporting Engineering Documentation
- a. Building HVAC Load Calculations: Provide HVAC load calculations performed using industry recognized software. Include in the submission of supporting documentation the weather data, system and building peak loads, individual zone and space loads and ventilation calculations. Provide load calculations that estimate the building's minimum loads for use in designing the HVAC equipment's minimum operating load (turndown) requirement.
 - b. Life Cycle Cost Analysis (LCCA)
 - 1) At the discretion of the Fund a LCCA may be requested to assist in selecting systems.
 - 2) Include in the LCCA initial capital, maintenance and operations cost. When available utilize the campus maintenance and energy cost as the basis of the analysis. The duration of the analysis should be up based on the system with longest replacement period.

STATE UNIVERSITY CONSTRUCTION FUND PROGRAM DIRECTIVES

- c. Smoke Control System Analysis
- d. Geo-exchange Well Field calculations and Test Well data
- e. Energy Modeling- See Directive 1B-7 "Executive Order No. 111"
- f. System pressure drop calculations for airside and waterside systems

Unless included in the lump sum fee or the Schedule B of the Consultant's Agreement, the services and fees related to LCCA, smoke control analysis, geo-exchange well field calculations and test well data as described in this Directive may be provided through extra compensation when approved by the Fund.

7. Design Documents

- a. See the group of 1A Directives for more specific Phase submission requirements.
- b. Airflow diagrams shall be provided for all supply, return and exhaust ductwork systems. All ductwork from the main system fan (supply, return or exhaust) to each zone shall be indicated on the flow diagram; as well as air terminal units (VAV) and laboratory control valves serving the zones. Airflows (CFM) shall be indicated for all equipment (fans, terminal units and control valves). Sizes shall be indicated for all duct mains, vertical duct risers, and branch mains at each floor level.

* * * * *