

**SECTION 15010**  
**BASIC MECHANICAL REQUIREMENTS**

**A. DESIGN PARAMETERS**

1. Climate Data

- a. For cooling design utilize the 1% Monthly Design Dry Bulb and Mean Coincident Wet Bulb Temperatures as listed in ASHRAE's latest Handbook of Fundamentals for the month of July.
- b. For heating design utilize the Extreme Annual Design Conditions (return frequency of 5 years) as listed in ASHRAE's latest Handbook of Fundamentals.

2. Seismic Data

Refer to the latest editions of the Indiana Building, Fire, Plumbing and Mechanical codes for current seismic design requirements.

3. Minimum Burial Depth for Underground Piping

All exterior piping shall be buried a minimum of 6 inches beneath the maximum frost penetration depth for the project location. \*\*

Provide identification/warning tape for all buried exterior piping.

- (a.) Bloomington : 42" Frost Depth
- (b.) Indianapolis : 48" Frost Depth
- (c.) Gary : 60" Frost Depth
- (d.) South Bend : 60" Frost Depth
- (e.) Kokomo : 60" Frost Depth
- (f.) Richmond : 48" Frost Depth
- (g.) New Albany : 36" Frost Depth

*\*\* Frost depths listed above are based on data obtained during the winters of 1935-36, 1939-40, and 1976-77.*

4. Steam Pressures

Bloomington: Steam is produced in the Central Heating Plant at 150 PSIG and is distributed at either 150 or 40 PSIG. Consult with I.U. Utilities at (812) 855-3551 for details. For new construction, reduce steam pressure to 15 PSIG at entry points to buildings. Verify steam pressures in existing facilities prior to commencement of design.

IUPUI: Steam is supplied to IUPUI by Citizens Thermal Energy (CTE). Steam is supplied by CTE at 250 psig/600° F and distributed on campus at 10, 50 or 150 psig. Actual building steam pressures and temperatures are to be verified prior to design.

For new construction, reduce steam pressure to 10 psig at the point of entrance into the building, unless specific equipment or process requires a higher operating pressure. Include design loads and operating parameters on construction drawings. Consider condensate heat recovery. Consult with CFS for mechanical requirements of the IUPUI/CTE operating agreement. Contact Campus Facility Services (CFS) and the University Architect's Office (UAO) to verify design parameters and design responsibilities.

Regional Campuses: Currently there are no central heating plants on Indiana University regional campuses.

## 5. Hot Water Heating Systems

- a. Where available utilize campus steam for production of hot water for heating purposes.
- b. For new buildings, design for 180 degrees F supply and 160 degrees F return water temperature. For modifications to existing systems verify system design parameters prior to commencement of design.
- c. Consult with IU Engineering Services (IUB and Regionals) or Campus Facility Services (IUPUI) for reset schedules pertaining to heating water supply temperatures.

## 6. Chilled Water Systems

- a. Where available utilize Campus chilled water for cooling.
- b. Select cooling coils for 42 degrees F supply and 55 degrees F return water temperatures. Verify with I.U. Engineering Services for projects on the Bloomington and regional campuses.

IUPUI: Chilled water is supplied to IUPUI by Citizens Thermal Energy (CTE). Contact Campus Facility Services (CFS) and the University Architect's Office (UAO) to verify design parameters and design responsibilities.

## 7. Domestic Hot Water Systems.

- a. Where available, utilize campus steam for generation of domestic

hot water.

- b. Design domestic water systems for a supply temperature of 140° F. Provide thermostatic mixing valves to ensure proper temperatures at points of use.
- c. Water shall be supplied at 110° F to lavatories and showers. Water shall be supplied at 140° F to dishwashing and laundry facilities.

8. Domestic Water Supply.

- a. Design the domestic water system to maintain pressure at plumbing fixtures in the range of 40 to 80 psig. Provide pressure booster pumps and pressure reducing valves as required to maintain compliance.
- b. When connecting to water mains owned by local utilities, consult with the local water company for specific requirements related to backflow prevention, piping installation requirements, and metering.

IUPUI: Water service is supplied by the City of Indianapolis (Veolia Water) or private Campus mains. Contact Campus Facility Services (CFS) and the University Architect's Office (UAO) to verify design parameters and design responsibilities.

9. Indoor Design Conditions.

- a. On large projects follow the requirements outlined by the Bureau of Facilities Programming and Utilization for specific applications.
- b. For projects where no other direction is given, design for the following:

Dry Bulb Temperature: 75 Degrees F.  
Relative Humidity (summer): 50%-60% maximum.  
Relative Humidity (winter): 30% minimum.

10. HVAC System Noise Levels

Noise levels due to the building HVAC system shall not exceed the following:

Classrooms	NC35
Private Offices	NC35
Open Plan Offices	NC40
Recital Halls	NC20

Libraries	NC35
Laboratories	NC50

On projects where noise data presented by the user or the Bureau of Facilities Programming and Utilization differs from that listed above, comply with the more stringent requirement.

**B. Utility Metering at IUPUI**

Indianapolis: Metering shall be provided for all incoming building utilities including steam (vortex shedding or orifice plate meter w/compensation), electrical (Power Measurement, Ltd. w/Ethernet communication; refer to Section 16300), chilled water (magnetic flow meter w/Johnson Metasys or Siemens BAS communication) and where applicable natural gas and domestic water (refer to Section 15965). Contact CFS Utilities at **317-274-4553** for detailed requirements.

**C. Natural gas at IUPUI**

Natural gas service is supplied to IUPUI by Citizens Gas. IUPUI owns and is responsible for maintenance of lines from the gas meter to the building. This line length should be minimized where possible.

**D. Sewers at IUPUI**

Sewers on the Indianapolis campus are a mixture of city-owned (Department of Public Works) and IUPUI-owned. Both combined storm water/wastewater and separated systems exist on campus. Contact CFS Utilities at **317-274-4553** for specific project-related details.

**E. Wellfield Protection Area on the IUPUI Campus**

The IUPUI campus is located in a wellfield protection area. Investigation of acceptable design/construction practices and coordination with the City of Indianapolis shall be performed by the consultant as part of the preliminary design phase.

**F. Compliance with State and Federal Codes**

The designer is fully responsible for insuring that his/her design complies with all applicable state/federal codes. Where codes conflict with these standards the designer shall comply with whichever requirement is more stringent.

## **G. Temporary Ventilation Requirements for Occupied Buildings Under Construction at IUPUI**

1. All occupied areas of a building where there is the potential for dust or fume contamination from a construction project shall be protected by use of temporary ventilation equipment. In general a negative air pressure shall be provided in the construction area. Construction documents shall specify modifications required to existing mechanical systems or temporary equipment to be installed to provide proper ventilation. Construction documents to include (if required) temporary ductwork layouts and sizing/specifications of fans. Contractors shall not be contractually required to determine the scope of work for temporary ventilation.
2. Construction documents shall refer to SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction".
3. Both Division 1 and Division 15 specifications shall include the temporary ventilation requirements.