LAST UPDATED 04.09.2024

COOLING

EXISTING CONSTRUCTION

WHEN TO USE THIS BASIS OF DESIGN SECTION

This BOD section should be used for 1) rehab projects to guide Architects, Engineers, and Development staff, and 2) during system replacement to guide maintenance staff. Modifications to existing cooling equipment present significant and uncommon opportunities to increase cooling system efficiency and reduce utility costs.

REQUIREMENTS FOR ALL COOLING SYSTEM TYPES DURING REHAB:

When planning a major rehabilitation, it is important to assess the condition of the existing heating and cooling equipment and distribution systems. If the existing systems are failing, the possibility of converting to heat pump technology should be considered.

EVALUATE CONVERSION TO HEAT PUMPS:

- Projects shall evaluate removing existing cooling systems and installing a new central heat pump system with heat recovery (VRF-HR). For requirements on heat pumps, see the Heating + Cooling: New Construction section of the Basis of Design.
- If converting to heat pumps is not possible, proceed with the following requirements, as well as those listed for specific system types (below):

IF NO COOLING SYSTEM CURRENTLY EXISTS:

Where there is no cooling provided presently, and converting the property to a heat pump system is not possible, the project development team should investigate the provision of cooling through the following options:

- If the building has baseboard heating: install new through-wall AC units in a panel fixed within the window frame. See the AC Units and AC Cover sections of the Basis of Design for more information.

- If the building has forced hot air heating: install new AC compressors that can supply existing heating ductwork with cooling during summer months.
- Incorporate cooling (and dehumidification and off-season heating) through an integrated in-unit ventilation system.

USE PROGRAMMABLE THERMOSTATS:

- See the Thermostat section of the Basis of Design for more information. Note: Through-wall ACs and PTAC units will not include separate thermostats.

INCLUDE SPECIFICATIONS FOR COMMISSIONNING (CX):

The following specification sections are required in all projects. Commissioning specifications to be reviewed, updated to reflect the current project, and included within the design specification. The HVAC Section (Division 23) must reference the following specifications:

1. **Section 019013 – General Commissioning Specification:** Section includes general and specific requirements that apply to the implementation of commissioning process for HVAC&R systems, assemblies, and equipment.
2. **Section 019013.01 Sample Commissioning (CX) Plan:** Provide a sample Cx Plan. This document outlines the organization, schedule, allocation of resources, and documentation requirements of the commissioning process. Each commissioning plan should include:
    a) Commissioning Objectives
    b) Systems to be Cx.
    c) Project team contact list, Cx roles and responsibilities of team, general management plan, communication protocols.
    d) Summary of Cx process, schedule for Cx activities.
    e) Documentational requirements. Plan for delivery and review of submittals, systems manuals, and other documents and reports.
    f) Process and schedule for completing construction checklists and manufacturer's prestart and startup checklists for HVAC&R systems, assemblies, equipment, and components to be verified and tested.
    g) Certifications: installation, prestart checks, and startup procedures have been completed. Ready for testing.
    h) Verification of testing, adjusting, and balancing (TAB) reports.
    i) Sample Issues Log and Corrective Action document.
3. **Section 230800 - Commissioning of HVAC:** Section includes commissioning process requirements for HVAC&R systems, assemblies, and equipment.
    a) If a Building Automation System (BAS/BME/EMS) is to be installed, the Integrated Automation Cx specifications within Section 23 HVAC will also require the following specification. All Cx specifications will also need to reference this specification.

a. **Section 250800 - Commissioning of Integrated Automation:** Section includes commissioning process requirements for BAS.

b) The Cx specifications within Section 23 HVAC must also reference the following specifications, as applicable to the project:

a. **Section 220800 - Commissioning of Plumbing:** Section includes commissioning process requirements for plumbing systems, assemblies, and equipment.

b. **Section 260800 - Commissioning of Electrical:** Section includes commissioning process requirements for electrical systems, assemblies, and equipment.

REQUIREMENTS FOR SPECIFIC COOLING SYSTEM TYPES DURING REHAB:

FURNACES WITH AC COMPRESSORS OUTSIDE (SPLIT SYSTEM):

(listed in order of preference)

1. **Replace the Outdoor Condenser with a Heat Pump:** Convert AC compressor to a heat pump compressor. Take into account the reduced loads (building enclosure upgrades) resulting from the renovation. Compressors should be placed away from windows and outdoor patios, and should be easily accessed by maintenance. Compressors should be installed on stands a minimum of 18 inches off the ground or roof. Any/all refrigerant lines should be covered/protected. Landscape plans should include a visual barrier of compressors without interfering with operation or access by maintenance.

a) Confirm the electrical panel has adequate amperage available to serve the new heat pump. If amperage is limited, the system will be duel-fuel and the heat pump heating capacity will be determined by the available amperage. If the system is duel-fuel, the heat pump will lock-out at low temperatures (based on available amperage), at which point the furnace will turn on.

2. **Replace the Condenser with a More Efficient Model:** SEER and HSPF as required to meet ENERGY STAR requirements.

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HYDRONIC FAN-COIL SYSTEMS:

1. **Replace Central Chiller According to ANSI/ASHRAE/ACCA Standard 183:** Calculate heating and cooling loads according to ANSI/ ASHRAE/ACCA Standard 183 and size equipment not greater than these loads.

THROUGH-WALL OR WINDOW MOUNTED AC UNITS WITH BASEBOARD OR RADIATORS:

1. **See the following BOD Sections:**
    a) Appliances (subsection "AC Units"): Information on AC Units
    b) AC Covers: Information on insulated, hard-plastic AC covers
    c) Windows (subsection "AC Sleeve in Window Sash"): Information on AC sleeves

IF PTACS EXIST:

1. **See the Heating: Existing Construction Section of the Basis of Design.**