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**Application:**

- Retail Facilities, Chapter 2
- Commercial & Public Buildings, Chapter 3
- Educational Facilities, Chapter 8
- Industrial Air Conditioning, Chapter 15
- Laboratories, Chapter 17
- Power Plants, Chapter 28

**Project Type:**

- New Construction
- Renovation
- Infrastructure (central heating, cooling, and/or cogeneration)
- Facility Audit and Capital Project Master Planning

**References:**

- 2016 ASHRAE Handbook – HVAC Systems and Equipment
- 2017 ASHRAE Handbook – Fundamentals
- 2018 ASHRAE Handbook – Refrigeration
- 2019 ASHRAE Handbook – HVAC Applications

**Other References:**

- Cooling Technology Institute (cooling towers)
- ACGIH - Industrial Ventilation: A Manual of Recommended Practice for Design, 28th Edition
- ASHRAE Standard 202 (Commissioning Process for Buildings and Systems)
- ASHRAE Guideline 0 (Commissioning Process)
- International District Energy Association (IDEA) and applicable IDEA documents

**DESIGN INTENT DOCUMENT**

**HVAC Design Intent:** The HVAC system selection and design intent is based on the processed outlined in ASHRAE Handbook 2016, Chapter 1, HVAC System Analysis and Selection, and includes the following:

- Owner building program goals and additional goals

- Finalized system selection shall be decentralized HVAC systems and terminal
- Specialized systems shall include general exhaust, kitchen exhaust, and smoke exhaust
- Budget goals: first cost, operating cost, and/or life cycle cost
- Timeline goals: occupancy due date and pre-purchased equipment date
- Utility availabilities: natural gas, emergency power, hot water heating, and a BAS system.

**DESIGN CRITERIA DOCUMENT**

- The HVAC design criteria shall be in sync with the project delivery method and owner's building program requirements as noted above.
- The design criteria shall be based on ASHRAE 60.2 and federal energy code compliance for outdoor air temperature compliance.
- The utility shall be natural gas to serve the new central boiler plant that shall serve three firetube hot water boilers. The size shall be 2-800 boiler horsepower (BHP) units each sized at two-thirds capacity and 1-200 BHP intended to be a standby for these two boilers plus to operate during the air conditioning season.
- The new automatic controls shall be interfaced with the existing BAS system.
- The new central plant hot water system shall be primary pump with secondary pumps serving the boilers and heat exchangers.
- The pipe distribution shall be standard underground distribution to new tertiary pumps with VFDs within each building.
- A central air system within the boiler plant shall provide heating in the winter to maintain 65°F and 75°F in the air conditioning season.
- The HVAC design engineer shall provide system flow diagrams at the design development phase.
- HVAC design engineer shall include an electrical data sheet to coordinate with the electrical design engineer, a plumbing data sheet to coordinate with the plumbing design engineer, and equipment and distribution weights to coordinate with the structural design engineer at the conceptual/schematic phase.