

Project Delivery Method

- Design-Build (D-B)
- [Integrated Project Delivery \(IPD\)](#)
- Construction Management @ Risk (CM) with Guaranteed Maximum Price (GMP)
- Design-Bid-Build (D-B-B)

Owner Team

- Building Owner
- [Owner Representative \(consultant\)](#)
- Project Manager of Capital Projects
- [Facility Manager \(outsource staff\)](#)

Project Delivery Team

- D-B Project Manager
- [IPD Project Manager](#)
- CM Project Manager
- [Job Superintendent](#)
- [Mechanical-Electrical Coordinator](#)
- Architect, HVAC, Plumbing, Electrical, Structural, Fire Protection, and Security Consultants

HVAC Project Team

- HVAC Contractor Project Manager
- Automatic Temperature Control (ATC) Technician (in-house staff)
- [O&M Technician \(outsource staff\)](#)
- [Third-Party Commissioning Consultant \(CxC\)](#)
- [Testing, Adjusting, and Balancing \(TAB\) Technician](#)

Application 2019 ASHRAE Handbook

- Retail Facilities, Chapter 2
- [Commercial and Public Buildings, Chapter 3](#)
- Tall Buildings, Chapter 4
- Places of Assembly, Chapter 5

Systems & Equipment 2020 ASHRAE Handbook

- Air-Handling and Distribution, Chapter 4
- In-Room Terminal Systems, Chapter 5
- [Radiant Heating and Cooling, Chapter 6](#)
- [Hydronic Heating and Cooling, Chapter 13](#)

Project Type

- New Construction
- Addition
- Renovation
- [Tenant Fit-Out](#)

References

- 2017 ASHRAE Handbook – Fundamentals
- 2018 ASHRAE Handbook – Refrigeration
- [2019 ASHRAE Handbook – Applications](#)
- [2020 ASHRAE Handbook – HVAC Systems and Equipment](#)

Other References

- Refer to the Codes and Standards Located in the Back of Each ASHRAE Handbook for Additional Reference
- ASHRAE GreenGuide: Design, Construction, and Operation of Sustainable Buildings
- ASHRAE Indoor-Air Quality Guide: Best Practice for Design, Construction, and Commissioning
- [ASHRAE Standard 55 \(Thermal Environmental Conditions for Human Occupancy\)](#)
- ASHRAE Standard 202 (Commissioning Process for Buildings & Systems)

DESIGN INTENT DOCUMENT (DID)

The HVAC System Selection and Design Intent Is Based on the Process Outlined in ASHRAE Handbook 2020, Chapter 1, HVAC System Analysis and Selection and Includes the Following:

- [Owner Building Program Goals and Additional Goals](#)
- [Finalized Equipment Selections Shall Be Made to Replace Perimeter Baseboard Radiation with New Overhead Hot Water Radiant Heat Panels in 2-by-4-Inch Ceiling Panels, Reusing the Existing Perimeter Hot Water Heating System](#)

Program & Project Goals

- Functional Goals: (Refer to Chapter 6, 2020 Handbook)
- [Management Goals: Property Management and Outsource Mechanical and Electrical Services](#)

Available Utilities

- Gas (propane), Electrical Power, Emergency Power, Low-Pressure Steam, and a Building Automation System (BAS) System

Existing Conditions

- [Central Air Systems: Supply Air and/or Return Air CFM, General Exhaust, and Toilet Exhaust](#)
- [Heating System: Hot Water Perimeter System with Baseboard Radiation and Cabinet Unit Heaters](#)
- [Pipe Distribution: Schedule 40 Steel Piping with 1-, 1 ½-, and 2-Inch Pipe Insulation Based on Pipe Size](#)
- [Pumps: Existing End Suction Secondary Perimeter Zone Pumping](#)

DESIGN CRITERIA DOCUMENT

- [The HVAC Design Criteria Shall Be in Sync with the Project Delivery Method and OPRs](#)
- [The Design Criteria Shall Be Based on ASHRAE 90.1 and State Energy Code Compliance for Outdoor Air](#)

Temperature Compliance

- Reuse Existing Utilities and Central Heating and Chilled Water Systems
- [The New Automatic Controls Shall Be Interfaced with the Existing BAS System](#)
- The New Central Plant Hot Water System Shall Be Primary Pumps Per Boiler and Secondary Pumps with Variable Frequency Drives (VFD) with the Pipe Distribution Shall Be Installed Overhead and Connect to Existing Baseboard Radiation
- [The Existing Central Plant Shall Provide Heating in the Winter to Maintain 68° During the Occupied Cycle and 60° During the Unoccupied Cycle of the Individual Tenant-Leased Zones](#)
- Existing VAV Central Air Systems Shall Have New MERV-7 Prefilters and a MERV-14 Final Filter

Conceptual/Schematic Phase General Notes

- [HVAC Design Engineer Shall Provide System Flow Diagrams with these Three Documents \(OPR, DID, and BOD\) along with ATC Sequences of Operation](#)
- The HVAC Design Engineer Shall Include Electrical Data Sheet to Coordinate with the D-B Firm

