

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 Manager
- Facility Manager
- Capital Project Manager
- Owner Representative (consultant)
- Arena President (in-house staff)

Project Delivery Team:

- D-B Project Manager
- D-B-B Project Manager
- Mechanical and General Construction Coordinator
- Boiler Manufacturer
- Architect, Acoustical, Plumbing, Electrical, Structural, Fire Protection, and Security Consultants

HVAC Project Team:

- HVAC Project Manager
- ATC and Security Technician
- BAS Technician
- O&M Startup Technician
- O&M Technician (outsourced staff)
- Third-Party Commissioning Consultant (CxC)

Application 2019 ASHRAE Handbook

- Commercial & Public Buildings, Chapter 3
- Places of Assembly, Chapter 5
- Library Space, Chapter 33
- IAQ, Chapter 34

Systems 2020 ASHRAE Handbook

- IAQ, Chapter 36
- BAS and Security, Chapter 38
- O&M Management, Chapter 47
- HVAC Security, Chapter 61

Equipment 2020 ASHRAE Handbook

- Boilers, Chapter 32
- Furnaces, Chapter 33
- Chimney, Vent, and Fireplace Systems, Chapter 35
- Heat Exchangers, Chapter 47

Project Type:

- Deferred Maintenance
- Infrastructure
- New Construction
- Renovation

References:

- 2018 ASHRAE Handbook – Refrigeration
- 2019 ASHRAE Handbook – HVAC Applications
- 2020 ASHRAE Handbook – HVAC Systems and Equipment
- 2017 ASHRAE Handbook – Fundamentals

Other References:

- ASHRAE Practical Guide to Seismic Restraints
- ASHRAE Standard for Commercial Building Energy Audits
- Refer to the Codes and Standards located at the Back of Each ASHRAE Handbook for Additional Reference
- ASHRAE TC 2.10 Resilience and Security
- Design-Build Institute of America (DBIA)

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:

- The Owner's Building Program Goals and Additional Goals
- System Constraints and Demolition Document
- Finalized System Selection Is Based on Condensing Boiler Replacement Following the Building's Deferred Maintenance Budget

Program & Project Goals:

- Budget Goals: First Cost and Operating Cost
- The Final System Selection Based on the Methods to Furnish and Install Heat Systems to Serve a New 150,000-Seat Arena in an Existing Office Park
- Automatic Controls Shall Include a New Direct Digital Building Automation System (BAS) Computer, Boiler-Furnished Automatic Controls, BACnet interface, a Security System, the Internet, and a new Computerized Maintenance Management Software (CMMS) System Interface
- Management Goals: Three-Year Extended Warranty Service Contract for the Boilers and Piping System
- Central Air Systems, Exhaust Systems, and Direct Expansion Cooling with Each Central Air System

DESIGN CRITERIA DOCUMENT – BASIS OF DESIGN (BOD)

- The HVAC Design Criteria Shall Be In Sync with the D-B-B Project Delivery Method and Owner's Project Requirements
- The Design Criteria Shall Be Based on ASHRAE 90.1 and the State Energy Code
- The Design Criteria Shall Be Based on an Analytical Analysis of the Arena's Budgeted Building Activities Calendar and Anticipated Occupancy as well as LEED Platinum status (80 points) and HVAC Conditions, Associated Operation, and Proactive Maintenance Management
- Furnish, Install, Monitor, and Measure Indoor Temperature and Humidity Levels, IAQ Particle Counts (One Per Space over 2,000 Square Feet), and Outdoor Air Temperature
- Conceptual/Schematic Phase General Notes: This D-B Engineer Shall Coordinate this Project with the Architectural Design Team
- The Owner's Facility Environmental Audit for IAQ, Occupant Health, and Preservation of the Arena
- From the Above Criteria, Implement an Update of All P&P Manuals