

Project Delivery Method:

- Design-Build (D-B)
- Construction management at risk (CM with GMP)
- Design-bid-build (D-B-B)
- Construction management at risk

Owner Team:

- Owner representative (consultant)
- Project manager of capital projects
- Facility manager (out-source staff)
- University president

Project Delivery Team:

- HVAC engineer (lead consultant)
- Architect, acoustical, plumbing, electrical, structural, fire protection, and security consultants
- Third-party commissioning consultant (CxC)
- Third-party testing, adjusting, and balancing technician

DBB Project Team:

- Project manager, HVAC contractor/prime contractor
- Mechanical-electrical coordinator
- Architect and subconsultants
- BAS contractor

HVAC Application 2023 ASHRAE Handbook

- Retail Facilities Chapter 2
- Commercial & Public Buildings Chapter 3
- Educational Facilities Chapter 8
- Power Plants Chapter 28

HVAC Systems and Equipment 2020 ASHRAE Handbook

- HVAC System Analysis and Selection Chapter 1
- Decentralized Cooling and Heating Plants Chapter 2
- Boilers Chapter 32
- Furnaces Chapter 33

Project Type:

- New infrastructure (central heating)
- Addition
- Renovation
- Energy retrofit

Other References:

- 2017 ASHRAE Handbook – Fundamentals
- 2020 ASHRAE Handbook – HVAC Systems and Equipment
- 2023 ASHRAE Handbook – HVAC Applications
- ASHRAE Standard 202 (RE: Commissioning Process for Buildings & Systems)

DESIGN INTENT DOCUMENT (DID)

HVAC Design Intent: The HVAC system selection and design intent is based on the processed outlined in ASHRAE Handbook 2020, 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 units
- Budget goals: first cost and operating cost
- Timeline goals: Summer installation, balancing, and commissioning due dates
- Utility availabilities: natural gas, electrical service, and BAS
- Pipe distribution: Schedule 40 black iron steel for steam supply, boiler feed piping and condensate return piping with fiberglass insulation (thickness per state energy code)

BASIS OF DESIGN (BofD) DOCUMENT

- The HVAC design criteria shall be in sync with the project delivery method and owner' building program requirements noted above.
- The design criteria shall be based on ASHRAE 60.2 and Federal Energy Code compliance for outdoor air temperature compliance.
- Utility shall be existing electrical 480/3/60 power and existing natural gas service to serve the new gas-fired 100-boiler horsepower (bhp) unit B-1 to serve existing kitchen equipment for 400-student cafeteria. This boiler replacement project is phase one of a three-part mechanical equipment replacement project based on the University's deferred maintenance master plan.
- The new remote automatic controls shall be interfaced with the existing building automation system (BAS).
- The new lead boiler feed pump shall be sized for 75% with matching lag pump.
- HVAC design engineer shall include electrical data sheet to coordinate with electrical design engineer, plumbing data sheet to coordinate with plumbing design engineer, and equipment and distribution weights to coordinate with structural design engineer, as well as DID to the security consultant.