- ANSWERS MARKED IN BLUE -

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:
- Private School President
- Facility Manager
- Internal Owner Representative
- Owner Representative (consultant)
- Food Service Manager (in-house staff)

Project Delivery Team:
- D-B Project Manager
- D-B-B Project Manager
- Coordinator (Mechanical, Electrical, and Kitchen Equipment)
- Boiler Manufacturer Technician
- Architect, Acoustical, Plumbing, Electrical, Structural, Fire Protection, and Security Consultants

HVAC Project Team:
- HVAC Technician (in-house staff)
- Automatic Temperature Control (ATC) Technician (in-house staff)
- Building Automation System (BAS) Technician
- Operation & Maintenance (O&M) Technician (in-house staff)
- O&M Technician (out-source staff)
- Third-Party Commissioning Consultant (CxC)

Application 2019 ASHRAE Handbook
- Educational Facilities, Chapter 8
- Clean Space, Chapter 19
- Industrial Local Exhaust, Chapter 33
- Kitchen Ventilation, Chapter 34

Systems 2020 ASHRAE Handbook
- Hydronic Heating and Cooling, Chapter 13
- Condenser Water Systems, Chapter 14
- Medium and High Temperature Water Heating, Chapter 15
- Infrared Radiant Heating, Chapter 16

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
- Energy Audit & Retrofit
- Facility Audit & Capital Project Master Planning

References:
- 2017 ASHRAE Handbook – Fundamentals
- 2018 ASHRAE Handbook – Refrigeration
- 2019 ASHRAE Handbook – HVAC Applications
- 2020 ASHRAE Handbook – HVAC Systems and Equipment
- Refer to the codes and standards in the back of each ASHRAE Handbook for additional information

Other References:
- ASHRAE Design Guide for Dedicated Outdoor Air Systems
- ASHRAE Handbook of Smoke Control Engineering
- ASHRAE Practical Guide to Seismic Restraints
- ASHRAE Standard for Commercial Building Energy Audits
- ASHRAE Standard Practice for Inspection & Maintenance of Commercial Building HVAC Systems
- 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:

- Owner's building program goals and additional goals
- System constraints and demolition document
- Finalized system selection based on kitchen hot water condensing boiler replacement following the school's deferred maintenance budget to replace the existing boiler following unscheduled maintenance repairs
- Specialized systems shall include a new dedicated outdoor air system (DOAS) with a hot water heating supply to the DOAS heating coil, new food warmer radiant heat coil, and existing dishwasher high temperature booster coil
- Automatic controls shall include boiler furnished controls, a BACnet interface, an internet interface, existing BAS interface, and existing computerized maintenance management software (CMMS) system interface

DESIGN CRITERIA DOCUMENT

- The HVAC design criteria shall be in sync with the DBB project delivery method and owner's project requirements
- The design criteria shall be based on ASHRAE 90.1 and the state energy code
- Utilities shall be natural gas to serve the new kitchen boiler plant that shall include one 80 boiler horsepower (BHP) condensing boiler vented directly to outdoors. The new ATC shall be interfaced with the existing BAS system
- The new insulated hot water system shall replace the existing pipe distribution and shall include an in-line circulator and standby circulator, normally open ATC control valves to the radiant heat food warmers, DOAS heating, and existing dishwasher heating/booster coil. Pumps shall be controlled by variable frequency drives (VFDs). Hot water supply (HWS) temperature shall be a fixed 140°F HWS with an existing electric dishwasher booster heater to raise the temperature to 180°
- The new DOAS system shall provide heating in the winter to maintain 65° in the kitchen area and in the air conditioning season at 78°
- Filters shall be MERV-7 prefilter and MERV-18 final filter
- Conceptual/schematic phase general notes: This D-B engineer shall coordinate this project with the architectural design team