MECHANICAL DESIGN ANALYSIS

CODES AND REFERENCES

- International Mechanical Code (IMC) 2021
- International Building Code (IBC) 2021
- ASHRAE Standard 62.1 - 2019 “Ventilation for Acceptable Indoor Air Quality”
- ASHRAE 90.1 - 2019 “Energy Standard for Buildings Except Low-Rise Residential Buildings”
- National Fire Codes (NFPA) Latest Edition
- SMACNA HVAC Duct Construction Standards
- UFC 3-410-01, 2013 Change 8 2021, Heating, Ventilating, and Air Conditioning Systems
- UFC 4-010-01, 2018 Change 2 2022, DoD Minimum Antiterrorism Standards for Buildings
- National Electric Code
- National Plumbing Code
- ICD/ICS 705-I Standards

PROJECT SYNOPSIS

Building 1416 is the F-35 Academic Training Facility on Eglin AFB. The facility was built in 2008 and is an IDS/ICS 705 facility. The CRAC units are located throughout the building, all of the units are located in secure areas and will require escorts for access. The existing DATA AIRE Computer Room Air Conditioning Units (CRACU) serving the building comm rooms are past life expectancy and are experiencing problems. Further, Data Aire is no longer in business and units are obsolete.

Due to the nature high density of electronics in the simulator area, low humidity is a concern. Environments with a low relative humidity are susceptible to electrostatic discharge or ESD. ESD is a serious problem for computers and other electrical devices, as the slightest amount of static electricity discharge can cause major damage to electrical devices and their components.

NEW WORK

A total of 23 Data Aire CRACU will be replaced with new CRAC units of a different manufacturer. The 5-ton units are serving the POD server rooms, with two units in each server room. The fifteen (15) ton unit, located in room 1040 will require break down to remove. The existing width of the unit is approximately 43” and the width of the existing door is 41.5”. Three (3) Data Aire, one 30-ton and two 20-ton, units are located in the ICD 705 Data Room 1019. The last three Data Aire units are located on the second floor in ICD 705 Data room 2009.

All of the units are down flow, configured, with top return. All of the units will contain reheat for dehumidification, and all of the units will be provided with a humidifier and full humidity control. The 15-ton, 20-ton, and 30-ton units will reheat using hot water. The 5-ton units will use electric reheat. All of the units are to have BACnet cards for connectivity to existing base DDC system.

New water piping is to be routed into the existing SCIF areas, via new secured penetrations. Existing SCIF penetrations were mentioned to exist, however, there is no record of the locations of the penetrations. Contractor to assume 13 new secure area penetrations. This approach will require the contractor to request approval for new penetrations. The approval process may take as long as 60 days. Once the new units are installed, the secure areas are to be recertified.* New power for the humidifiers should come from existing electrical service in each POD, as to not have to provide new penetrations into the SCIF.

MECHANICAL EQUIPMENT LIST AND PRELIMINARY SIZING

- 16 – New 5-ton chilled water Computer Room Air Conditioners
  - Provide with humidifier.
  - Provide power from within the POD.
  - Provide with humidity, temperature, and lead/lag control.
  - Provide electric reheat.
  - Provide with 12” stands

- 1 – New 15-ton chilled water Computer Room Air Conditioner
  - Provide with humidifier.
  - Provide with humidity & temperature control.
  - Provide hot water reheat.
  - Provide with 12” stands

- 2 – New 20-ton chilled water Computer Room Air Conditioners
  - Provide with humidifier.
  - Provide with humidity, temperature, and lead/lag control.
  - Provide hot water reheat.
  - Provide with 12” stands

- 4 – New 30-ton chilled water Computer Room Air Conditioners
  - Provide with humidifier.
  - Provide with humidity, temperature, and lead/lag control.
  - Provide electric reheat.
  - Provide with 12” stands

NONE OF THE UNITS CAN CONTAIN BLUETOOTH, WIFI, OR ANY OTHER NFC CAPABITLITY.

TESTING, ADJUSTING, & BALANCE and COMMISIONING

The Contractor shall coordinate all efforts with the T&B contractor and Commissioning authority hired.