DDC SYSTEM GENERAL NOTES

1. THE CONTRACTOR SHALL PROVIDE A COMPLETE NEW DDC SYSTEM TO PERFORM THE INDICATED SEQUENCES, ALL OTHER FUNCTIONS REQUIRED BY THE CONTRACT DOCUMENTS, AND ALL OTHER FUNCTIONS REQUIRED FOR A COMPLETE AND FUNCTIONAL SYSTEM.
2. ALL SEQUENCES ARE SUBJECT TO SAFETIES. DDC CONTRACTOR SHALL PROVIDE ALL NECESSARY AND CUSTOMARY SAFETIES.
3. ALL CONTROL WIRING SHALL BE RUN IN CONDUIT. ALL CONDUIT SHALL BE IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS, REQUIREMENTS FOR 120 VAC CIRCUITS.
4. ALL WELLS SHALL BE 316 STAINLESS STEEL AND SHALL BE INSTALLED IN NEW THREDOLETS. IN CHILLED AND HOT WATER PIPING, PROVIDE NEW WELLS WITH EXTENDED NECK TO SUIT INSULATION THICKNESS.
5. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE PROPER INSTALLATION OF WELLS, PRESSURE TAPS, AND P/T TAPS IN ALL LOCATIONS INDICATED AND OTHERWISE AS REQUIRED FOR A COMPLETE AND FULLY FUNCTIONAL SYSTEM.
6. THE CONTRACTOR SHALL UTILIZE P/T'S TO CALIBRATE INSTRUMENTS TO CERTIFIED PRESSURE GAGES, PRESSURE METERS AND THERMOMETERS.
7. CONDUIT SHALL BE RUN PERPENDICULAR AND PARALLEL TO BUILDING LINES IN A FIRST CLASS WORKMANSHIP LIKE MANNER.
8. THE CONTROLS CONTRACTOR SHALL PROVIDE ALL POWER REQUIREMENTS AND CONTROL VOLTAGE TRANSFORMERS AS REQUIRED FOR FULLY FUNCTIONAL SYSTEM. COORDINATE WITH ELECTRICAL CONTRACTOR FOR TRANSFORMER LOCATIONS AND REQUIREMENTS.
9. PROVIDE DETAILED CONTROL SUBMITTALS FOR EACH PIECE OF EQUIPMENT VERIFYING THE SEQUENCE OF OPERATION AND INCLUDING WIRING DIAGRAMS, CONTROL PANEL LAYOUT AND WIRING, AND SUBMITTALS FOR ALL CONTROL EQUIPMENT (I.E., VARIABLE FREQUENCY DRIVES, MOTORIZED ISOLATION VALVES, FLOW METERS, DIFFERENTIAL PRESSURE SENSORS, TEMPERATURE SENSORS, WALL THERMOSTAT/HUMIDISTAT, ETC.)
10. COORDINATE INTEGRATION OF ALL MECHANICAL EQUIPMENT INTO DDC INTERFACE VIA BACNET. PROVIDE ALL DDC ALARMS, SAFETIES, SETPOINTS, ETC.
11. PROVIDE POINTS FOR NEW DIFFERENTIAL PRESSURE SENSORS FOR CHILLED AND HOT WATER SYSTEM.
12. SMOKE DETECTORS SHALL BE FURNISHED BY DIVISION 26, INSTALLED BY DIVISION 23, AND WIRED BY DIVISION 26. INSTALL SMOKE DETECTORS FOR AHU'S AS SHOWN ON DRAWINGS.
13. AHU-1 TO 3; DURING OCCUPIED MODE, CARBON DIOXIDE CONCENTRATIONS SHALL BE MONITORED FROM THE RETURN DUCT AND SPACE SENSORS AS INDICATED. THE CARBON DIOXIDE SENSOR'S SETPOINT SHALL BE SET AT 1000 PPM (PARTS PER MILLION) (ADJUSTABLE). IF THE PPM CONCENTRATION EXCEEDS THE SETPOINT BY 10% OR MORE AT ANY MEASURED LOCATION, AN ALARM SHALL BE SENT TO THE OPERATOR'S WORKSTATION. COORDINATE WITH DEMAND CONTROL VENTILATION SEQUENCE. SEE AHU SEQUENCE OF OPERATION.
14. THE DDC SYSTEM SHALL PROVIDE FOR AUTOMATIC RESTART OF ALL AIR AND WATER-SIDE SYSTEMS. IF ANY SYSTEM SHOULD FAIL TO RE-START AFTER 3 (ADJ) ATTEMPTS, AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKSTATION.
15. THE DCC SYSTEM SHALL BE CAPABLE OF TRENDING ALL POINTS IN THE SYSTEM AND SHALL BE CAPABLE OF STORING 15 DAYS (24HR/DAY) OF TREND POINTS (MINIMUM)
16. PROVIDE OPTIMIZED START/STOP SCHEDULE FOR BUILDING HVAC SYSTEMS.
17. COORDINATE WITH CENTRAL DDC SYSTEM WORKSTATION TO PROVIDE BUILDING MANAGER LOCAL CONTROL OF ATU 1-12 THROUGH 1-17 FOR LOCAL TEMPURATURE CONTROL TO FACILITATE TRAINING OPERATIONS.

DDC SYSTEM - SCOPE OF WORK

1. PROVIDE DDC PROGRAMMING AND GRAPHICS AS REQUIRED TO PROVIDE THE CAPABILITY TO VIEW, COMMAND AND CONTROL ALL EQUIPMENT AS NOTED IN THIS PROJECT.

2. PROVIDE NEW CHILLED WATER AND HEATING WATER SYSTEM WITH NEW DDC CONTROL PANEL WITH INTERFACE TO EXISTING EMCS. PROVIDE NEW VALVES, ACTUATORS, SENSORS AND OTHER CONTROL DEVICES.

3. PROVIDE NEW CONTROLS FOR NEW EQUIPMENT AS SCHEDULED WITH NEW WALL THERMOSTAT WITH LOCKABLE COVER FOR USER OVERRIDE AND ALL RELATED CONTROL ACCESSORIES AS SPECIFIED.

DDC SYSTEM - GRAPHIC REQUIREMENTS

BUILDING GRAPHIC - THIS SCREEN SHALL HAVE A 3D GRAPHIC OF THE FRONT OF THE BUILDING AND A BUILDING NUMBER.

THE FOLLOWING LINKS ARE REQUIRED ON THIS PAGE: BACK TO MAIN MAP, FLOOR PLANS, ALARMS, REPORTS, SCHEDULES, HISTORY, AND USER SERVICE.

FLOOR PLAN GRAPHIC
- THE FLOOR PLAN SHALL BE 3D WITH COLOR CODED ZONES, ROOM NUMBERS, AND AS- BUILT SENSOR AND EQUIPMENT LOCATIONS.

- THE FOLLOWING POINTS ARE REQUIRED ON THIS PAGE: ROOM TEMP, ROOM HUMIDITY, OCCUPANCY STATUS

- THE FOLLOWING LINKS ARE REQUIRED ON THIS PAGE: BACK TO BUILDING GRAPHIC, EQUIPMENT (CLICK ON SENSOR OR EQUIPMENT SHOWN ON THE FLOOR PLAN AND THE LINK SHALL GO TO THE CORRESPONDING EQUIPMENT

TYPICAL EQUIPMENT GRAPHIC
- INCLUDE A HEADER WITH EQUIPMENT TYPE AND NUMBER, ROOM NUMBERS AND AREA SERVED.
- INCLUDE ALL POINTS ON THE EQUIPMENT GRAPHIC.
- THE FOLLOWING POINTS SHALL BE ANIMATED: FANS, DAMPERS, VALVES AND PUMPS.
- ALL SET POINTS SHALL HAVE THE CAPABILITY OF BEING CHANGED FROM THE GRAPHIC.

EXHAUST FANS AND SUPPLY FANS

FAN WITH INTERLOCKS
FANS SHALL BE INTERLOCKED AS INDICATED IN THE FAN SCHEDULE WITH ALL LISTED INTERLOCKS SUCH THAT WHENEVER INTERLOCKED EXHAUST FAN IS OPERATING, THE INTERLOCKED EXHAUST FAN IS ALSO OPERATING, EXCEPT DURING UNOCCUPIED TIMES. DURING UNOCCUPIED TIMES, EXHAUST FANS SHALL NOT RUN.

ALL FANS AND AIR HANDLING UNITS SHALL SHUT DOWN ON A SIGNAL FROM THE FIRE ALARM CONTROL PANEL.

VRF & DUCTLESS SPLIT DX SYSTEM CONTROLS

THE DUCTLESS SPLIT SYSTEM AIR CONDITIONING UNITS SHALL OPERATE ACCORDING TO THE MANUFACTURER'S STAND-ALONE CONTROLS. DDC CONTRACTOR SHALL PROVIDE A DEDICATED ROOM TEMPERATURE SENSOR AND PROVIDE AN ALARM WHEN ROOM TEMPERATURE IS ABOVE 80 DEG F (ADJ.) OR BELOW 55 DEG F (ADJ.).

GENERATOR LOAD SHED SEQUENCE

THE CONTRACTOR SHALL COORDINATE WITH ALL TRADES REGARDING GENERATOR LOAD SHED SEQUENCING AND EQUIPMENT INSTALLATION. PER THE ELECTRICAL DWGS, CONTRACTOR SHALL PROVIDE MANUFACTURER RECOMMENDED CONTROL CABLES FROM THE TRANSFER SWITCH TO THE DDC PANEL. SEE BELOW FOR THE SEQUENCE OF EVENTS PER BELOW LOCK-OUTS AND DELAYED STARTS.

STEP 1 (LOCK-OUT):
1. ONE (1) CHILLED WATER PUMP.
2. ONE (1) HOT WATER PUMP
3. BLOWER COIL UNITS (BCU-1, 2, 3, 4, AND 5)
4. AIR HANDLER UNITS (AHU-2, AHU-3, AND OTHER UNITS THAT ARE NOT SERVING TORNADO SHELTER)

STEP 2 (DELAYED START):
1. AIR HANDLER UNIT (AHU-1) TURN ON AFTER STEP 2.
2. ALL RESTROOM EXHAUST FANS SHALL BE TURNED OFF EXCEPT THE FOLLOWING FANS:
   - 2.1 EF-1 SERVING THE SINGLE RESTROOM
   - 2.2 EF-2 SERVING THE SINGLE RESTROOM
   - 2.3 EF-3 SERVING THE SINGLE RESTROOM
3. AHU-1 OUTSIDE AIR DAMPER SHALL OPEN TO ITS MAXIMUM SETPOINT.
4. AHU-2 OUTSIDE AIR DAMPER SHALL BE CLOSED.
5. AHU-3 OUTSIDE AIR DAMPER SHALL BE CLOSED.
6. ALL TEMPERATURE AND HUMIDITY SETPOINTS SHALL BE SET TO THE UNOCCUPIED MODE.

BLOWER COIL UNIT SEQUENCE

START/STOP CONTROL:
PROVIDE DDC SYSTEM FOR SCHEDULED START/STOP AND LOCAL OVERRIDE. THE UNIT SHALL BE STARTED AUTOMATICALLY BY THE ELECTRONIC CONTROL SYSTEM AND ALL CONTROLS ACTIVATED SUBJECT TO THE FIRE ALARM RELAY, SAFETIES AND OVERLOADS. ALL BLOWER COIL UNITS SHALL BE CONTROLLED BY ONE THERMOSTAT.

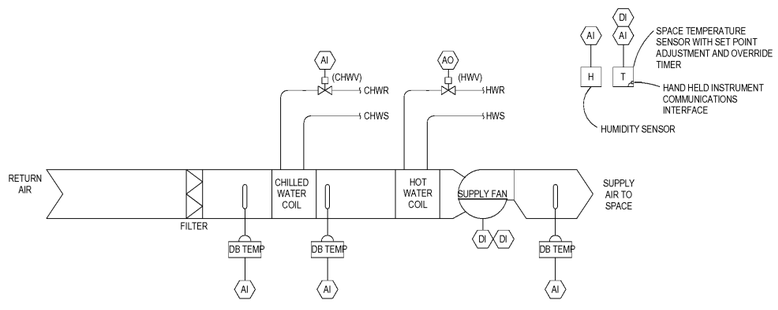
OCCUPIED MODE:
COOLING
WHEN THE SPACE TEMPERATURE RISES ABOVE THE SPACE TEMPERATURE SET POINT, THE CHILLED WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN A CONSTANT LEAVING AIR TEMPERATURE AS INDICATED ON THE BCU SCHEDULE

HEATING
WHEN THE SPACE TEMPERATURE FALLS BELOW THE SPACE TEMPERATURE SET POINT, THE HOT WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN A CONSTANT LEAVING AIR TEMPERATURE AS INDICATED ON THE BCU SCHEDULE.

UNOCCUPIED MODE:
THE BCU'S FAN AND CHILLED/HOT WATER VALVE SHALL MODULATE TO MAINTAIN A HI/LOW LIMIT SETPOINT TEMPERATURE.

OVERRIDE MODE:
THE OVERRIDE TIMER SHALL PLACE THE UNIT IN OCCUPIED MODE FOR TWO HOURS (ADJ.).

SPACE DEHUMIDIFICATION:
WHEN THE DDC SYSTEM HAS THE BUILDING EITHER "OCCUPIED" OR "UNOCCUPIED", AND THE RELATIVE HUMIDITY IN ANY ZONE RISES ABOVE SETPOINT (60% RH, ADJ.), THEN THE CONTROLS SHALL BE OVERRIDDEN AND THE SUPPLY AIR FAN SHALL BE ENERGIZED. THE CHILLED WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN A CONSTANT LEAVING AIR TEMPERATURE OF 55°F (ADJ.) AND THE HOT WATER VALVE SHALL MODULATE TO MAINTAIN THE ZONE TEMPERATURE SET POINT (70°F, ADJ) UNTIL THE ZONE RELATIVE HUMIDITY IS SATISFIED (55%RH, ADJ.).



1 BLOWER COIL UNIT DIAGRAM
SCHEMATIC

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