

GENERAL HVAC CONTROL NOTES, DDC, AND EMCS REQUIREMENTS

EGLIN DDC SYSTEM REQUIREMENTS: 22 JULY 2022

GENERAL HVAC CONTROL NOTES

1. PROVIDE BUILDING LEVEL SUPERVISORY CONTROLLERS BASED ON EGLIN'S EXISTING NIAGARA 4.0 VERSION 4.8 FRAMEWORK OR LATER. CONTRACTOR SHALL VERIFY EXACT VERSION WITH EGLIN'S DDC CONTROL SHOP AT TIME OF CONSTRUCTION. THE BUILDING LEVEL SUPERVISORY CONTROLLERS SHALL INCLUDE POINT-2-POINT (P2P), SECURE SOCKET LAYER SSL, WEB SERVER AND EMBEDDED WORKBENCH (WB). THE BUILDING LEVEL SUPERVISORY CONTROLLERS SHALL CONTAIN ALL BUILDING LOGIC, GRAPHICS, AND LOCAL CONTROLLER BACKUPS. JACE'S SHALL BE INSTALLED IN THE MECHANICAL ROOM.
2. ALL GRAPHICS AND POINTS SHALL BE DUPLICATED IN THE EXISTING NIAGARA 4.0 VERSION 4.8 FRAMEWORK ENS (ENTERPRISE NETWORK SERVER) USING EXISTING WORKBENCH SOFTWARE LOCATED IN BUILDING 696, WHICH SHALL SERVE AS THE WEB SERVER FOR THE SYSTEM. ALL TRENDED POINTS SHALL BE TRANSFERRED VIA P2P TO THE SERVER FOR HISTORY TRENDED OF POINTS.
3. PROVIDE ONE (1) LAPTOP COMPUTER THAT MEETS OR EXCEEDS THE TECHNICAL SPECIFICATIONS FOR THE MOST CURRENT VERSION OF THE WINDOWS OPERATING SYSTEM. THE NEW LAPTOP SHOULD HAVE AN INTERNAL OR EXTERNAL CD ROM WRITER. PROVIDE THE LATEST OPERATING SYSTEM TO AIR FORCE STANDARD, CPU, AND TECHNOLOGY AS IT RELATES TO LAPTOPS. PROVIDE SOFTWARE AND USB ADAPTERS FOR EACH TYPE OF DDC FIELD CONTROLLERS, TO INCLUDE FACTORY INSTALLED DDC CONTROLLERS. (THIS LAPTOP WILL BE USED AND VERIFIED DURING THE TRAINING.) LAPTOP SHALL BE SUBMITTED TO THE 96 CEG IT TO FACILITATE REQUIRED DEVICE SECURITY SCANS AND UPLOADING OF AIR FORCE NETWORK (AFNET) STANDARD DESKTOP CONFIGURATIONS (SDC) PRIOR TO THE CONTRACTOR UPLOADING ANY SPECIALTY DDC SOFTWARE. A MINIMUM OF SEVEN DAYS SHALL BE ALLOTTED TO ACCOMPLISH THIS. ONCE COMPLETE, THE DEVICE WILL BE RETURNED TO THE CONTRACTOR FOR DDC SOFTWARE INSTALLATION AND TRAINING. THE SYSTEM SHALL ALLOW CE TECHNICIANS TO CONNECT TO ALL CONTROLLERS WITH ALL AVAILABLE SOFTWARE IN ALL MODES AVAILABLE FROM THE MANUFACTURER FROM BLDG 696 VIA THE LOCAL AREA NETWORK (LAN) TO PROGRAM, BACKUP, DOWNLOAD, CONFIGURE AND PERFORM ALL FUNCTIONS NECESSARY TO MAINTAIN THE SYSTEM AS IF ONSITE AND DIRECT CONNECTED TO THE DEVICE.
4. ALL HARDWARE AND SOFTWARE ADMINISTRATOR LEVEL PASSWORDS SHALL BE PROVIDED TO THE GOVERNMENT TO ACCESS ALL LEVELS OF ALL CONTROLLERS INCLUDING THE NEW NIAGARA FRAMEWORK CONTROLLERS AS WELL AS COPIES OF THE SYSTEM'S TOPOLOGY, HARDWARE/SOFTWARE INVENTORY, AND CONFIGURATION. THE PASSWORD SHALL ALLOW COMPLETE ACCESS TO EVERYTHING THE MANUFACTURE HAS ACCESS TO. LEAVE THE DEFAULT FACTORY PLATFORM USER NAME AND PASSWORD.
5. ALL FIELD CONTROLLERS SHALL USE BUILDING AUTOMATION AND CONTROL NETWORK (BACNET) IP PROTOCOL. FIELD CONTROLLER BACKUPS SHALL RESIDE IN THE JACE.
6. PROVIDE A LAN DROP WITHIN THREE FOOT OF EACH BUILDING LEVEL SUPERVISORY CONTROLLER AND PROVIDE A PATCH CABLE BETWEEN THE LAN DROP AND THE BUILDING LEVEL SUPERVISORY CONTROLLER.
7. WHEN THE BACNET COMMUNICATION BUSS LEAVES AND ENTERS A BUILDING, USE FIBER OPTIC CABLE AND PROVIDE MEDIA CONVERTER PAIRS. (I.E. BETWEEN BUILDINGS OR OUT TO CHILLERS) AND PROVIDE DB TESTING RESULTS.
8. THE BACNET COMMUNICATION BUS SHALL BE DAISY CHAINED TO THE JACE. NO ADDITIONAL SWITCHES OR ROUTERS SHALL BE USED.

ENERGY MANAGEMENT CONTROL SYSTEM (EMCS) NETWORK REQUIREMENTS

1. COMM SQUADRON SHALL INSTALL OR IDENTIFY TWO (2) FIBER STANDS DEDICATED FOR DDC CONNECTIVITY.
2. CONTRACTOR SHALL INSTALL A WALL MOUNTED, LOCKABLE NETWORK ENCLOSURE (LNE) WITH A SURGE PROTECTOR FOR AN EIGHT (8) PORT SWITCH, PROVIDED BY THE GOVERNMENT, IN THE MAIN COMMUNICATIONS ROOM MOUNTED ON THE FIRE RATED BACKER BOARD. (SEE LNE DETAIL)
3. CONTRACTOR SHALL INSTALL A 20A/125V DUPLEX RECEPTACLE WITHIN THREE (3) FEET OF THE LNE FOR CONNECTION OF THE SURGE PROTECTOR. THIS RECEPTACLE SHALL BE CONNECTED TO THE EMERGENCY POWER PANEL, IF THE FACILITY IS OR WILL BE CONNECTED TO AN EMERGENCY GENERATOR.
4. CONTRACTOR SHALL INSTALL A SINGLE PORT LAN CONNECTION INSIDE THE LNE AND INSIDE EACH BUILDING LEVEL SUPERVISORY CONTROLLER.
5. CONTRACTOR SHALL INSTALL A 2" EMT CONDUIT FROM THE LNE TO EACH BUILDING LEVEL SUPERVISORY CONTROLLER IN THE BUILDING.
6. CONTRACTOR SHALL INSTALL A 1-1/4" PLIABLE RACEWAY, WITH PULL STRING, FROM THE LNE TO A HEIGHT APPROXIMATELY 12" ABOVE THE COMMUNICATIONS ROOM RACK. (DDC SHOP PERSONNEL SHALL INSTALL A FIBER JUMPER FROM THE LNE TO THE INSTALLED FIBER PATCH PANEL.)
7. CONTRACTOR SHALL INSTALL A PURPLE CAT 6 CABLE FROM THE LNE TO EACH BUILDING LEVEL SUPERVISORY CONTROLLER.
 - 7.1. NOTE: IF THE DISTANCE EXCEEDS 100 METERS BETWEEN THE LNE AND THE BUILDING LEVEL SUPERVISORY CONTROLLER, THE BUILDING LEVEL SUPERVISORY CONTROLLER SHALL BE MOVED OR FIBER W/MEDIA CONVERTERS SHALL BE USED.

IAW AFGM2019-32-02 CE CONTROL SYSTEMS CYBERSECURITY PARAGRAPH 3.3.8 REQUIRES THE VENDOR(S) TO PERFORM AN INITIAL SECURITY ASSESSMENT, A SCAN OF VULNERABILITIES, TO PROVIDE A COPY OF THE SCAN RESULTS, AND TO MITIGATE THE IDENTIFIED VULNERABILITIES PRIOR TO FINAL ACCEPTANCE BY THE AIR FORCE. AFTER ACCEPTANCE, ONLY GOVERNMENT OWNED ASSETS (E.G. COMPUTER, TABLET) MAY BE CONNECTED TO THE NETWORK FOR CS MAINTENANCE.

DDC GRAPHICS REQUIREMENTS

GRAPHICS SHALL BE IN THE EXISTING ENS (ENTERPRISE NETWORK SERVER) LOCATED IN BUILDING 696 WHICH SHALL SERVE AS THE WEB SERVER FOR THE SYSTEM, AS WELL AS IN THE JACE. INCLUDE DATE AND TIME ON ALL GRAPHIC SCREENS.

MAIN MAP GRAPHIC

- SCREEN WILL HAVE A LIST AND LINK TO ALL OF THE BUILDINGS ON THE ENTIRE EGLIN COMPLEX.

BUILDING GRAPHIC

- SCREEN WILL 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, USER SERVICE

FLOOR PLAN GRAPHIC

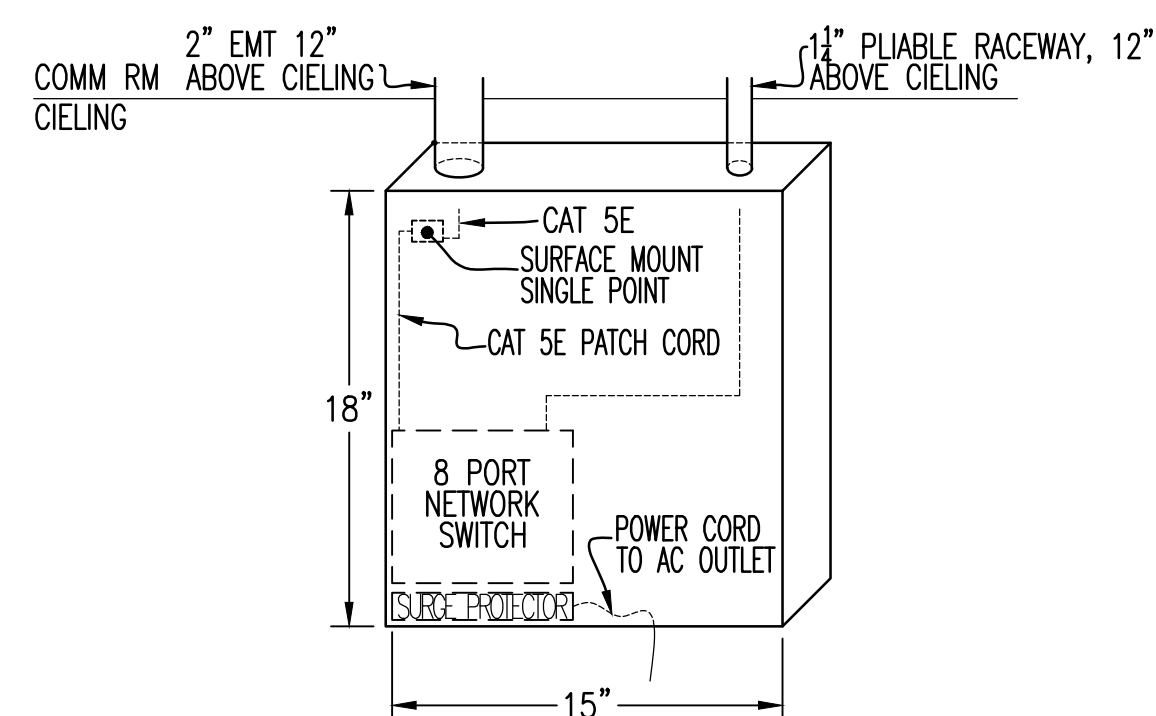
- THE FLOOR PLAN WILL BE 3D WITH COLOR CODED ZONES, ROOM NUMBERS, AND AS-BUILT SENSOR AND EQUIPMENT LOCATIONS.
- THE FOLLOWING POINTS ARE REQUIRED ON THIS PAGE: ROOM TEMP, ROOM HUMIDITY, OCCUPANCY STATUS
- THE FOLLOWING LINKS ARE REQUIRED ON THIS PAGE: BACK TO BUILDING GRAPHIC, ALL EQUIPMENT (CLICK ON SENSOR OR EQUIPMENT SHOWN ON THE FLOOR PLAN AND THE LINK WILL GO TO THE CORRESPONDING EQUIPMENT).

TYPICAL EQUIPMENT GRAPHIC

- INCLUDE A HEADER WITH EQUIPMENT TYPE AND NUMBER, ROOM NUMBERS AND AREA SERVED.
- INCLUDE ALL POINTS AVAILABLE FROM EQUIPMENT CONTROLLER ON THE EQUIPMENT GRAPHIC.
- THE FOLLOWING POINTS WILL BE ANIMATED: FANS, DAMPERS, COILS, PUMPS, BOILERS.
- ALL SET POINTS WILL HAVE THE CAPABILITY OF BEING CHANGED FROM THE GRAPHIC.
- THE FOLLOWING LINKS ARE REQUIRED ON THIS PAGE:
 - BACK TO FLOOR, PROVIDE A HIDDEN LINK OVER EACH POINT TO SHOW AN HOURLY 3 DAY TREND, PROVIDE A HIDDEN LINK OVER EACH POINT TO OVERRIDE ALL OUTPUTS. PROVIDE A LINK TO A SPREAD SHEET WITH MANUFACTURE AND PART NUMBERS AND WARRANTY DATES FOR ALL PARTS ON THE EQUIPMENT GRAPHIC.

COMMUNICATION BUS GRAPHIC

- INCLUDE AN AS-BUILT WIRING DIAGRAM OF THE COMMUNICATION BUS BETWEEN ALL CONTROLLERS.



LOCKABLE NETWORK ENCLOSURE (LNE) DETAIL
NOT TO SCALE

GENERAL

1. THE CONTRACTOR SHALL PROVIDE A COMPLETE 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. THE DDC SYSTEM SHALL EASILY COMMUNICATE ALL POINTS AND FUNCTIONS.
2. THE CONTROLS CONTRACTOR SHALL COORDINATE ALL ELECTRICAL POWER REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.
3. ALL EXPOSED WIRING SHALL BE IN CONDUIT. ALL CONDUIT SHALL BE IN ACCORDANCE WITH COMMUNICATION SPECIFICATIONS AND DRAWINGS, REQUIREMENTS FOR 120 VAC CIRCUITS. CONDUIT SHALL BE RUN PERPENDICULAR AND PARALLEL TO BUILDING LINES IN A NEAT AND CLEAN ORDER.
4. CONTROL WIRE LOCATED IN CONCEALED LOCATIONS SHALL BE PLENUM RATED WIRE. SUPPORT EVERY FOUR (4) FEET WITH CABLE HANGERS.
5. COORDINATED COLOR AND FINISH OF ALL WALL MOUNTED DEVICES, SUCH AS THERMOSTATS, HUMIDISTAT, CO₂ SENSORS, AND LIGHT SWITCHES WITH ELECTRICAL. ALL DEVICES SHALL BE THE SAME COLOR AND FINISH. ALL DEVICES SHALL BE MOUNTED AT THE SAME HEIGHT.
6. VARIABLE FREQUENCY DRIVES (VFD) SHALL BE SUPPLIED BY THE CONTROLS CONTRACTOR AND SHALL BE COMPATIBLE WITH THE NEW CONTROLS SYSTEM. NEW VFD SHALL BE 10% GREATER IN CAPACITY AND CONTAIN BYPASS FUNCTIONALITY.
7. CONTROL SET POINTS SHALL BE ADJUSTABLE OVER THE RANGE OF THE SENSED MEDIA. MEANS OF ADJUSTMENT AND CURRENT SETPOINT SHALL BE IDENTIFIED. DDC SET POINTS SHALL BE PROGRAMMED AS VARIABLES, EXPRESSED IN THE APPROPRIATE ENGINEERING UNITS, WHICH CAN BE ADJUSTED THROUGH THE DIGITAL DISPLAY UNIT OR FROM A CENTRAL STATION WITHOUT REQUIRING MODIFICATION OR RELOADING OF THE DDC CONTROL PROGRAMS.
8. ALL DDC PANELS SHALL COMMUNICATE BETWEEN EACH OTHER.

SAFETY INTERLOCKS

1. HAND-OFF-AUTOMATIC SWITCHES:
 - 1.1. SAFETY DEVICES SHALL BE INTERLOCKED WITH BOTH HAND AND AUTOMATION POSITIONS IN SERIES WITH MOTOR CONTROLLERS.
 - 1.2. INTERLOCKING WITH OTHER FANS AND EQUIPMENT OF THE SYSTEM SHALL BE THROUGH AUTOMATIC ONLY.
 - 1.3. REMOTE CONTROL FROM THE DDC SYSTEM SHALL BE THROUGH THE AUTOMATIC POSITION ONLY.
 - 1.4. HAND POSITION SHALL BE FOR MAINTENANCE ONLY.
 - 1.5. OPERATION REQUIRED FOR RESPONSE TO THE FIRE ALARM SYSTEM RELAYS AND EMERGENCY FAN SHUTDOWN STATIONS SHALL BE THROUGH BOTH HAND AND AUTOMATIC POSITIONS.
2. FLOW SWITCHES
 - 2.1. BOILER ENABLE COMMAND SHALL NOT START THE BOILER UNLESS FLOW IS PROVEN THROUGH THE FLOW SWITCH INSTALLED IN THE BOILER INLET PIPING.
 - 2.2. CHILLER ENABLE COMMAND SHALL NOT START THE CHILLER UNLESS FLOW IS PROVEN THROUGH THE FLOW SWITCH INSTALLED IN THE CHILLER INLET PIPING.

35% SUBMITTAL – NOT FOR CONSTRUCTION

REVISION	DATE	DESCRIPTION	BY	APPR'D
BASE CIVIL ENGINEER EGLIN AIR FORCE BASE, FLORIDA				
SABER PROJECT MANAGER		TITLE		
DATE	REPLACE AHU'S, CHILLER, BOILER IN BUILDING 843			
SIGNATURE				
APPROVED				
CENM				
DRAWN BY S. MCCRAW				
PROJ. ENGR. S. JOHNSON				
SABER AS-BUILT DRAWING BASED ON 35% DESIGN		CONTENTS		
		MECHANICAL CONTROLS GENERAL NOTES AND DDC REQUIREMENTS		
APPROVED		DATE		
96 CEG/CEN		JUNE 2024		
APPROVED		SCALE		
		AS SHOWN		
SPEC. NO.		PROJ. NO.	DRAWING NO.	FILE NO.
		FTFA 23MM04		
INDEX NO.		SHEET OF .		
M-701				

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D:\PROJECT\2024\24032 Replace AHU's, Chiller, Boiler in Bldg. 843\DWG\Mech\24032 M701.dwg, 6/18/2024 12:49:35 PM, seth, ARCH full bleed D (36.00 x 24.00 Inches)