DIVISION 23 IS RESPONSIBLE TO FURNISH, INSTALL, AND WIRE ALL COMPONENTS REQUIRED FOR INTEGRATION OF INFORMATION SHOWN TO BE ACCESSED BY THE EMS FROM OTHER SYSTEMS AND EQUIPMENT UNLESS OTHERWISE

REQUIRED FOR THE EMS AND/OR DDC SYSTEMS TO FUNCTION PROPERLY, SHALL BE FURNISHED AND INSTALLED BY DIVISION 23 UNLESS OTHERWISE SHOWN, NOTED, OR SPECIFIED,

ALL POWER WIRING FOR SENSORS, ACTUATORS, AND OTHER DEVICES SHALL BE FROM THE EQUIPMENT CONTROLLERS DDC PANELS OR THE FEP PANELS OF THE ASSOCIATED SYSTEM.

6. ALL CONTROL, INTERLOCK, AND POWER WIRING SHALL BE INSTALLED PER THE DIVISION 26, LOCAL, STATE, AND NATIONAL CODES. RACEWAY SHALL BE INSTALLED PER THE ELECTRICAL SPECIFICATIONS.

7. ALL CONTROL POINTS SHOWN ON THE CONTROL DIAGRAMS SHALL BE PROVIDED AND INTEGRATED INTO AN EMS SYSTEM GRAPHIC REPRESENTATIVE OF THE CONTROL DIAGRAMS.

 ALL CONTROL BANDS, SETPOINTS, SETPOINT LIMITS, SETPOINT INCREMENT VALUES, SETPOINT DECREMENT VALUES, ALARM LIMITS, AND OTHER PARAMETERS SHALL BE ADJUSTABLE FROM THE EMS.

ALL CONTROL BANDS, SETPOINTS, TIME DELAYS, CONTROL LOOPS, AND OTHER PARAMETERS SHALL BE COMMISSIONED BY THE DIVISION 23 TO PROVIDE STABLE CONTROL OF ALL SYSTEMS.

10. ALL SETPOINTS SHALL BE ADJUSTABLE FROM THE EMS SYSTEM GRAPHIC(S)

11. SPACE SETPOINTS SHALL BE ADJUSTABLE FROM THE ROOM SENSOR UNLESS OTHERWISE SHOWN ON DRAWINGS OR SPECIFIED.

12. THE EMS SYSTEM GRAPHICS SHALL BE LINKED WITH ASSOCIATED BUILDING FLOOR PLANS FROM THE SPACE SENSOR OR AREA SERVED.

WHERE ONE SYSTEM IS ASSOCIATED WITH ANOTHER SYSTEM, THE SYSTEM GRAPHIC SHALL BE LINKED TO THE ASSOCIATED GRAPHIC AS WELL AS THE BUILDING FLOOR PLAN GRAPHIC. EXAMPLE - AN AIR HANDLING UNIT SYSTEM GRAPHIC SHALL BE LINKED TO THE CHILLED WATER SYSTEM GRAPHIC IN ADDITION TO BOTH BEING LINKED TO THE BUILDING FLOOR PLAN.

THE BUILDING FLOOR PLAN SHALL DISPLAY THE SPACE TEMPERATURE AND THE ACTIVE SET POINT AT EACH SPACE SENSOR LOCATION WITH AREA SERVED DISPLAYED IN SEPARATE COLORS BASED ON THE CONDITION OF THE ZONE. AREAS WITH HUMIDITY AND PRESSURE CONTROL WILL ALSO HAVE THOSE VALUES DISPLAYED. EXAMPLE - ALARM, NORMAL, HIGH OR LOW TEMPERATURE, HIGH OR LOW HUMIDITY, ETC.

15. ALL GRAPHICS (SCHEDULES, PLANS, AND DIAGRAMS) WILL INDICATED EQUIPMENT , POINTS, AND AREAS IN ALARM VIA A RED ALARM INDICATOR, RED TEXT, AND/OR A RED HIGHLIGHT. OVERRIDDEN POINTS WILL BE INDICATED WITH PURPLE.

16. THE BUILDING FLOOR PLAN SHALL DISPLAY THE DUCTWORK AND THE PIPING LAYOUT. THE DUCTWORK AND PIPING SHALL BE ABLE TO TOGGLE ON AND OFF INDEPENDENTLY.

17. ALL BUILDING FLOOR PLANS AND SYSTEM GRAPHICS SHALL DISPLAY OUTSIDE AIR TEMPERATURE AND HUMIDITY

18. THE FLOOR PLAN GRAPHICS SHALL BE LINKED TO A BUILDING GRAPHIC WITH A DIGITAL PHOTOGRAPH BACKGROUND OF THE ACTUAL BUILDING. DURING CONSTRUCTION A TEMPORARY GRAPHIC MAY BE USED THAT IS REPRESENTATIVE OF THE BUILDING.

19. ALL GRAPHICS SHALL BE SUBMITTED IN COLOR WITH THE ATC SUBMITTAL. FAILURE TO INCLUDE ALL GRAPHICS IN SUBMITTAL SHALL BE CAUSE FOR REJECTION OF COMPLETE SUBMITTAL

20. VARIABLE FREQUENCY DRIVES ARE FURNISHED BY DIVISION 23, INSTALLED AND WIRED BY DIVISION 26. REFER TO VARIABLE FREQUENCY DRIVE SCHEDULE. VERIFY ALL EXISTING MOTOR HORSEPOWER AND ELECTRICAL RATINGS PRIOR TO SUBMITTAL AND ORDERING VARIABLE FREQUENCY DRIVES.

POWER WIRING (PWR) FROM POWER SOURCE TO VARIABLE FREQUENCY DRIVES AND FROM VARIABLE FREQUENCY DRIVES TO MOTORS SHALL BE FURNISHED AND INSTALLED BY DIVISION 26.

22. POWER WIRING (PWR) FROM POWER SOURCE TO MOTOR STARTERS AND FROM MOTOR STARTERS TO MOTORS SHALL BE FURNISHED AND INSTALLED BY DIVISION 26.

23. POWER WIRING (PWR) FROM POWER SOURCE TO DDC, AND FEP PANELS SHALL BE FURNISHED AND INSTALLED BY THE DIVISION 26 UNLESS OTHERWISE NOTED ON DRAWINGS.

24. GLOBAL DDC SYSTEM POINTS ARE DEFINED AS A SINGLE POINT USED IN ALL SYSTEMS IN A BUILDING OR CAMPUS TO MAINTAIN CONSISTENCY OF CONTROL ACTIONS THROUGHOUT THE BUILDING OR CAMPUS. EXAMPLE: OUTSIDE AIR TEMPERATURE POINT SAMPLED ON THE NORTH SIDE OF A BUILDING USED TO ENABLE/DISABLE AIRSIDE ECONOMIZER OPERATION THROUGHOUT THE BUILDING OR CAMPUS.

25. THE PROJECT SEQUENCES ARE WRITTEN IN A GENERAL FORM INTENDED FOR IMPLEMENTATION BY ANY CONTROLS SYSTEM AND CONTRACTOR. DIVISION 23 SHALL REVIEW ALL SPECIFICATIONS AND CONTROL SEQUENCES FOR CONSTRUCTABILITY, COMPATIBILITY, AND FEASIBILITY WITH ACTUAL CONDITIONS, BUILDING EQUIPMENT, AND THEIR OWN HARDWARE AND SOFTWARE LIMITATIONS AND CAPABILITIES. CONTROL SEQUENCES ARE INTENDED TO BE THE GENERAL STRUCTURE OF THE CONTRACTORS PROGRAMING, BUT DO NOT NECESSARILY CONTAIN ALL THE REQUIRED DETAILS (LOOP AND TABLE STATEMENT TUNING, RAMPS, LIMITS, ETC) AND BEST PRACTICES FOR THE FINAL PRODUCT DIVISION 23 SHALL PROVIDE A COMPLETE, OPERABLE, AND TUNED CONTROL SYSTEM THAT MEETS THE INTENDED SEQUENCES AND THE SPECIFIC EQUIPMENT REQUIREMENTS. IF UPON IMPLEMENTATION IT IS DISCOVERED THAT ADDITIONAL PROGRAMMING IS REQUIRED TO MEET THE INTENDED DESIGN OF THE CONTROLS SYSTEM, DIVISION 23 SHALL PROVIDE THE ADDITIONAL PROGRAMMING AT NO ADDITIONAL COST. ALL PROGRAMMING (GRAPHICAL AND/OR TEXT BASED) SHALL BE REVIEWED WITH THE DIVISION 23 AS PART OF THE SUBMITTAL AND COMMISSIONING PROCESSES. DIVISION 23 WILL PROVIDE A SUBMITTAL OF THE GRAPHICAL AND/OR TEXT BASED PROGRAMMING FOR A SIDE TO SIDE COMPARISON WITH THE CONTRACT DOCUMENTS. THIS REVIEW WILL BE PART OF A SCHEDULED MEETING INVOLVING THE BAS CONTROLS DESIGN TEAM, DIVISION 23, AND THE COMMISSIONING AGENT. LIBERTIES TAKEN BY DIVISION 23 ARE ALLOWED AFTER REVIEW AND APPROVAL FROM THE BAS DESIGN TEAM. ALL MODIFICATIONS SHALL BE RECORDED IN THE AS-BUILT DOCUMENTS. DIVISION 23 SHALL BE REQUIRED SET UP TRENDING AS INDICATED BY THE CONSTRUCTION DOCUMENTS, AND AS REQUESTED BY THE BAS DESIGN AND COMMISSIONING TEAM(S).

26. ALL EQUIPMENT SHALL HAVE THE OPTION OF BEING EXCLUDED FROM INDIVIDUAL RESET STRATEGIES BY EQUIPMENT SUMMARY SCHEDULES AND BY EQUIPMENT GRAPHICS.

27. ALL EQUIPMENT CONTROLLERS IN THIS PROJECT SHALL BE HARD WIRED. NO WIRELESS SENSORS SHALL BE ALLOWED UNLESS WRITTEN APPROVAL IS GIVEN BY THE OWNER AND EOR AND THE WIRELESS FREQUENCY BANDS ARE COORDINATED WITH THE OWNER.

28. DIVISION 23 SHALL SET UP ALARM CRITERIA ACCORDING TO EXISTING FACILITY STANDARDS, THE SPECIFICATIONS, AND AS FOLLOWS: LEVEL 1 ALARM: HIGHEST PRIORITY ALARM. ALL LOWER LEVEL PRIORITY ALARM RESPONSES APPLY PLUS ALL DESIGNATED HOSPITAL OPERATIONS PERSONNEL ARE NOTIFIED VIA TEXT. LEVEL 2 ALARM: HIGH PRIORITY ALARM. ALL LOWER LEVEL PRIORITY ALARM RESPONSES APPLY PLUS ALL DESIGNATED FACILITY OPERATIONS PERSONNEL ARE NOTIFIED VIA TEXT AND EMAIL. LEVEL 3 ALARM: HIGH PRIORITY ALARM. ALL LOWER LEVEL PRIORITY ALARM RESPONSES APPLY PLUS ALARM

WARRANTS IMMEDIATE RESPONSE BY FACILITY PERSONNEL LEVEL 4 ALARM: MEDIUM PRIORITY ALARM. ALL LOWER LEVEL PRIORITY ALARM RESPONSES APPLY. ALARM WARRANTS A PROMPT RESPONSE FROM PERSONNEL. MAINLY ALARMS CONCERNING COMFORT ISSUES. ALARM AND ALARM LEVEL IS INDICATED VIA FLASHING ALARMS AND POP UPS AT THE BAS. LEVEL 5 ALARM: LOW PRIORITY ALARM. ALARM IS LOGGED IN AN ALARM REVIEW SUMMARY.

29. AN ALARM SUMMARY SHALL BE CREATED FOR REVIEW OF FACILITY PERSONNEL DAILY. ALARM SUMMARY TO BE CAPABLE OF BEING SORTED BY ALARM LEVEL AND TIME OF ALARMS.

30. DIVISION 23 SHALL SET UP OPERATOR CLEARANCE REQUIREMENTS ACCORDING TO THE FACILITY STANDARDS, SPECIFICATIONS, AND AS FOLLOWS: LEVEL 1: HIGHEST CLEARANCE REQUIRED. THESE SET POINTS CANNOT BE CHANGED OR OVERRIDDEN EXCEPT BY AN

OPERATOR WITH THIS CLEARANCE LEVEL 2: HIGH CLEARANCE REQUIRED. THESE SET POINTS CAN ONLY BE CHANGED OR OVERRIDDEN BY SOME ONE WITH THIS LEVEL CLEARANCE OR HIGHER. LEVEL 3: MEDIUM CLEARANCE REQUIRED. THESE SET POINTS CAN ONLY BE OVERRIDDEN BY SOMEONE WITH THIS LEVEL CLEARANCE, OR CHANGED BY SOMEONE WITH A HIGHER LEVEL CLEARANCE.

LEVEL 4: LOW CLEARANCE REQUIRED. THESE SET POINTS CAN ONLY BE OVERRIDDEN BY SOMEONE WITH THIS LEVEL CLEARANCE, OR CHANGED BY SOMEONE WITH A HIGHER LEVEL CLEARANCE. LEVEL 5: NO CLEARANCE REQUIRED. THESE SET POINTS CAN BE CHANGED OR OVERRIDDEN BY ANYONE WITH BAS ACCESS. THIS IS ALSO THE CLEARANCE LEVEL FOR OCCUPANT CONTROL ITEMS SUCH AS THERMOSTATS.

30. AN OVERRIDE SUMMARY SHALL BE PROVIDED FOR ALL OVERRIDES AND SHALL BE CAPABLE OF BEING SORTED BY DATE, DURATION, AND LEVEL OF PRIORITY.

31. OVERRIDES SHALL BE CAPABLE OF TIMED RESETS.

32. CONTROL LOGIC AND COMPONENTS SHALL BE ADJUSTED TO OBTAIN AT A MINIMUM THE FOLLOWING RESULTS. A. TEMP CONTROL SHALL DEVIATE FROM SET POINT NO MORE THAN 0.2°F WITH PERIODS OF LESS THAN 1 MINUTE. B. AIRFLOW CONTROL SHALL DEVIATE FROM SET POINT NO MORE THAN 2% OF THE SYSTEM SET POINT OR SET POINT FOR THAT BRANCH OF THE SYSTEM WITHIN A PERIOD OF LESS THAN 5 MINUTES. C. HYDRONIC FLOW CONTROL SHALL DEVIATE FROM SET POINT NO MORE THAN 2% OF THE SYSTEM SET POINT OR SET

POINT FOR THAT BRANCH OF THE SYSTEM WITHIN A PERIOD OF LESS THAN 5 MINUTES. D. ACTUATORS SHALL NOT OSCILLATE MORE THAN 1% WITHIN A 5 MINUTE PERIOD.

E. VARIABLE FREQUENCY DRIVE COMMANDS SHALL NOT OSCILLATE MORE THAN 1% IN A 5 MINUTE PERIOD. 33. ALL ALARMS SHALL BE PROVIDED WITH ADJUSTABLE TIME DELAYS TO PREVENT NUISANCE ALARMS.

DIRECT DIGITAL CONTROL POINT TYPES

GLOBAL DDC SYSTEM ANALOG INPUT DDC SYSTEM ANALOG INPUT POINT POINT TYPE DDC SYSTEM ANALOG OUTPUT POINT GLOBAL DDC SYSTEM ANALOG OUTPUT POINT TYPE

DDC SYSTEM DIGITAL OR BINARY GLOBAL DDC SYSTEM DIGITAL OR BINARY OUTPUT POINT TYPE

GLOBAL DDC SYSTEM DIGITAL OR

AVERAGING DUCT TEMPERATURE SENSOR;

FURNISHED, INSTALLED, AND WIRED BY

DIVISION 23. REFER TO DETAIL I.

AND WIRED BY DIVISION 23.

CARBON MONOXIDE SENSOR WITH DIGITAL

DISPLAY: FURNISHED, INSTALLED, AND

BINARY INPUT POINT TYPE

ANALOG INPUT SENSORS

OUTSIDE AIR TEMPERATURE SENSOR: PIPE TEMPERATURE SENSOR; FURNISHED FURNISHED, INSTALLED, AND WIRED BY AND WIRED BY DIVISION 23; THERMAL WELL DIVISION 23. INSTALLED IN THE PIPING BY DIVISION 23. ROOM TEMPERATURE SENSOR WITH ROOM HUMIDITY SENSOR WITH DIGITAL DISPLAY: FURNISHED, INSTALLED, AND SETPOINT, OVERRIDE PUSHBUTTON, AND DIGITAL DISPLAY: FURNISHED, INSTALLED, WIRED BY DIVISION 23. AND WIRED BY DIVISION 23. ROOM HUMIDITY SENSOR: FURNISHED, ROOM TEMPERATURE SENSOR WITH INSTALLED, AND WIRED BY DIVISION 23. SETPOINT, AND OVERRIDE PUSHBUTTON: FURNISHED, INSTALLED, AND WIRED BY DIVISION 23. DUCT STATIC PRESSURE SENSOR WITH BUILDING STATIC PRESSURE SENSOR WITH DSP DIGITAL DISPLAY; FURNISHED, INSTALLED DIGITAL DISPLAY; FURNISHED, INSTALLED,

DIFFERENTIAL PRESSURE SENSOR FOR WET DIFFERENTIAL PRESSURE SENSOR WITH MEDIA WITH DIGITAL DISPLAY; FURNISHED, DIGITAL DISPLAY; FURNISHED, INSTALLED INSTALLED, AND WIRED BY DIVISION 23. AND WIRED BY DIVISION 23. ISOLATION VALVES AND TAPS IN PIPING BY

DIVISION 23. PRESSURE SENSOR FOR WET MEDIA WITH DIGITAL DISPLAY; FURNISHED, INSTALLED, DUCT RELATIVE HUMIDITY SENSOR: AND WIRED BY DIVISION 23. ISOLATION FURNISHED, INSTALLED, AND WIRED BY VALVES AND TAPS IN PIPING BY DIVISION 23. DIVISION 23.

STRAP ON TEMPERATURE SENSOR; FURNISHED, INSTALLED, AND WIRED BY DIVISION 23.

BY DIVISION 23.

DDC SYSTEM DIGITAL OR BINARY

DUCT TEMPERATURE SENSOR; FURNISHED,

INSTALLED, AND WIRED BY DIVISION 23.

AND WIRED BY DIVISION 23. REFER TO

▲ DETAIL F.

L WM F

INPUT POINT TYPE

OUTPUT POINT TYPE

LIQUID FLOW METER - FURNISHED AND WIRED BY DIVISION 23. INSTALLED IN PIPING

GAS FLOW METER - FURNISHED AND WIRED BY DIVISION 23. INSTALLED IN PIPING BY DIVISION 23.

WIRED BY DIVISION 23.

<u>LEGEND</u>

THREE PHASE POWER WIRING; FURNISHED AND INSTALLED BY DIVISION 26 (PWR) SINGLE PHASE POWER WIRING; FURNISHED AND INSTALLED BY DIVISION 26 (PWR) CONTROL AND INTERLOCK WIRING, FURNISHED AND INSTALLED BY DIVISION 23 (ILK) EMS ETHERNET LAN COMMUNICATION WIRING, FURNISHED AND INSTALLED BY DIVISION 23 (EMS LAN) EMS SUB-NETWORK COMMUNICATION WIRING, FURNISHED AND INSTALLED BY DIVISION 23 (EMS SN) ROOM SENSOR COMMUNICATION WIRING, FURNISHED AND INSTALLED BY DIVISION 23 (EMS RS) COMMUNICATION WIRING FOR OTHER HVAC SYSTEMS, FURNISHED AND INSTALLED BY DIVISION 23 (EMS OTH) PNEUMATIC CONTROL TUBING, FURNISHED AND INSTALLED BY DIVISION 23 CONTROL PIPING, FURNISHED AND INSTALLED BY DIVISION ---- ₂₅ LOCAL AREA NETWORK DATA PORT DROP, FURNISHED AND INSTALLED BY DIVISION 26. NORMALLY CLOSED - POWERED OPEN NORMALLY OPEN - POWERED CLOSED NORMALLY CLOSED - POWERED OPEN RELAY CONTACT

NORMALLY OPEN - POWERED CLOSED RELAY CONTACT

PNEUMATIC CONTROL SUPPLY AIR CONNECTION

E-PWR EMERGENCY (ESSENTIAL) ELECTRICAL POWER

TFD

TO FLOOR DRAIN

DIGITAL INPUT SENSORS

MANUAL RESET; FURNISHED, INSTALLED, MANUAL RESET; FURNISHED, INSTALLED, AND AND WIRED BY DIVISION 23. DPDT SWITCH HSL | WIRED BY DIVISION 23. DPDT SWITCH FOR FOR HARDWIRE INTERLOCK TO FANS AND HARDWIRE INTERLOCK TO FANS AND DDC DDC MONITORING. REFER TO DETAIL H. MONITORING. ORIENT FOR STATIC PRESSURE SENSING. OCCUPANCY SENSOR; FURNISHED AND CURRENT SENSING RELAY; FURNISHED, WIRED BY DIVISION 23, INSTALLED IN INSTALLED, AND WIRED BY DIVISION 23. LIGHTING CIRCUIT BY DIVISION 26.

SW H FURNISHED, INSTALLED, AND WIRED BY WIRED BY DIVISION 23 UNLESS OTHERWISE NOTED, SHOWN ON THE DRAWINGS, OR SPECIFIED.

WATER FLOW SWITCH SPECIFIED TO BE WFS FURNISHED WITH HVAC EQUIPMENT: INSTALLED BY DIVISION 23; WIRED BY DIVISION 23.

LOW LIMIT TEMPERATURE SWITCH WITH

END SWITCH: FURNISHED, INSTALLED AND

WALL MOUNTED ROOM OCCUPANCY CEILING MOUNTED ROOM OCCUPANCY SWITCH; FURNISHED, INSTALLED, AND SWITCH. FURNISHED, INSTALLED, AND WIRED OCC WIRED BY DIVISION 23. BY DIVISION 23.

MOISTURE SENSOR: FURNISHED. INSTALLED, AND WIRED BY DIVISION 23.

ELECTRONIC WATER FLOW SENSOR; EFS | FURNISHED, AND WIRED BY DIVISION 23; INSTALLED IN PIPING BY DIVISION 23.

BY DIVISION 23.

HIGH STATIC PRESSURE LIMIT SWITCH WITH

FILTER DIFFERENTIAL PRESSURE SWITCH:

MEDIA; FURNISHED, INSTALLED, AND WIRED

BY DIVISION 23. PRESSURE TAPS IN PIPING

L_{DP SW}H DIFFERENTIAL PRESSURE SWITCH FOR WET

OUTPUT DEVICES

CONTROL VALVE (2-WAY) WITH ELECTRIC OR CONTROL VALVE (2-WAY) WITH ELECTRONIC VA | ELECTRONIC ACTUATOR; FURNISHED AND ACTUATOR AND INTEGRAL END SWITCH; WIRED BY DIVISION 23. INSTALLED IN PIPING FURNISHED AND WIRED BY DIVISION 23. BY DIVISION 23. INSTALLED IN PIPING BY DIVISION 23. CONTROL VALVE (3-WAY) WITH ELECTRONIC

ES

CONTROL VALVE (3-WAY) ELECTRIC OR ELECTRONIC: FURNISHED AND WIRED BY DIVISION 23; INSTALLED IN PIPING BY DIVISION 23.

BUTTERFLY CONTROL VALVE (2-WAY) WITH ELECTRONIC ACTUATOR; FURNISHED AND WIRED BY DIVISION 23: INSTALLED IN PIPING BY DIVISION 23.

BUTTERFLY CONTROL VALVE (3-WAY) WITH ELECTRONIC ACTUATOR: FURNISHED AND WIRED BY DIVISION 23; INSTALLED BY DIVISION 23.

DAMPER ACTUATOR: FURNISHED. INSTALLED. AND WIRED BY DIVISION 23 UNLESS OTHERWISE NOTED ON DRAWINGS OR IN SPECIFICATIONS.

SMOKE DAMPER ACTUATOR(S) FURNISHED AND INSTALLED BY DIVISION 23. REFER TO DETAIL G.

FIRE/SMOKE DAMPER ACTUATOR(S): FURNISHED AND INSTALLED BY DIVISION 23. REFER TO DETAIL G.

DETAIL G. FIRE/SMOKE DAMPER ACTUATOR(S) WITH INTEGRAL END SWITCH: FURNISHED AND ES INSTALLED BY DIVISION 23. REFER TO DETAIL G.

NOTED ON DRAWINGS OR IN

SMOKE DAMPER ACTUATOR(S) WITH

INTEGRAL END SWITCH: FURNISHED AND

INSTALLED BY DIVISION 23. REFER TO

ACTUATOR AND INTEGRAL END SWITCH;

FURNISHED AND WIRED BY DIVISION 23:

BUTTERFLY CONTROL VALVE (2-WAY) WITH

ELECTRONIC ACTUATOR AND INTEGRAL END

INSTALLED IN PIPING BY DIVISION 23.

SWITCH: FURNISHED AND WIRED BY

SWITCH; FURNISHED AND WIRED BY

DIVISION 23; INSTALLED IN PIPING BY

DIVISION 23.

SPECIFICATIONS.

DIVISION 23; INSTALLED BY DIVISION 23

BUTTERFLY CONTROL VALVE (3-WAY) WITH

DAMPER ACTUATOR WITH INTEGRAL END

SWITCH(ES); FURNISHED, INSTALLED, AND

WIRED BY DIVISION 23 UNLESS OTHERWISE

ELECTRONIC ACTUATOR AND INTEGRAL END

OTHER CONTROL DEVICES

FIELD EQUIPMENT PANEL (FEP); FURNISHED AND INSTALLED BY DIVISION 23. POWER WIRING TO FEP BY DIVISION 26.

DIRECT DIGITAL CONTROL PANEL DDC (DDC); FURNISHED AND INSTALLED BY DIVISION 23. POWER WIRING TO DDC PANEL BY DIVISION 26.

CONTROL DEVICES FURNISHED BY OTHER TRADES:

HUMIDITY HIGH LIMIT SENSOR; FURNISHED WITH THE STEAM HUMIDIFIER; INSTALLED AND WIRED BY DIVISION 23.

PLENUM FAN INLET BELL HOUSING AIRFLOW MEASURING STATION FURNISHED AND INSTALLED BY THE FAN MANUFACTURER.

CENTRIFUGAL FAN INLET BELL HOUSING AIRFLOW MEASURING STATION FURNISHED AND INSTALLED BY THE FAN MANUFACTURER.

AIR FLOW MEASURING STATION; FURNISHED AND INSTALLED BY THE AIR HANDLING UNIT MANUFACTURER. WIRING FROM THE AFMS TO THE DDC PANEL BY DIVISION 23. POWER WIRING BY DIVISION 26.

CONTROL VALVE (2-WAY) WITH ELECTRIC OR ELECTRONIC ACTUATOR; FURNISHED WITH EQUIPMENT (EQ); WIRED BY DIVISION 23; INSTALLED IN PIPING BY DIVISION 23.

AIR FLOW MEASURING STATION WITH INTEGRAL CONTROL DAMPER: FURNISHED AND INSTALLED BY THE AIR HANDLING UNIT MANUFACTURER. WIRING TO DDC SYSTEM BY DIVISION 23.

FIRE ALARM PROGRAMMABLE RELAY (FAR) FOR SMOKE PURGE OPERATION (SMK); FURNISHED, INSTALLED, AND PROGRAMMED BY DIVISION 28. FAR SHALL BE LOCATED IN SAME ROOM AS HVAC EQUIPMENT SERVED PER NFPA. ALL WIRING FROM FAR TO FIRE ALARM SYSTEM BY DIVISION 28. INTERLOCK WIRING FROM FAR TO ATC PANEL BY DIVISION 23.

DUCT MOUNTED SMOKE DETECTOR(S) FURNISHED, INSTALLED, AND WIRED BY DIVISION 28 AS PART OF THE FIRE ALARM SYSTEM.

AIR FLOW MEASURING STATION: FURNISHED. AND INSTALLED BY DIVISION 23. WIRING FROM THE AFMS TO THE DDC PANEL BY DIVISION 23. POWER WIRING BY

DIVISION 26.

CONTROL DAMPER; FURNISHED AND INSTALLED BY DIVISION 23. DAMPER ACTUATOR FURNISHED INSTALLED AND WIRED BY DIVISION 23.

AIR FLOW MEASURING STATION WITH INTEGRAL CONTROL DAMPER; FURNISHED AND INSTALLED BY DIVISION 23.

> FIRE ALARM PROGRAMMABLE RELAY (FAR); FURNISHED. INSTALLED. AND PROGRAMMED BY DIVISION 28. FAR SHALL BE LOCATED IN SAME ROOM AS HVAC EQUIPMENT SERVED PER NFPA. ALL WIRING FROM FAR TO FIRE ALARM SYSTEM BY DIVISION 28. INTERLOCK WIRING FROM FAR TO ATC PANEL BY DIVISION 23.

SUPPLY AIRFLOW

SUPPLY AIR TEMPERATURE

ABBREVIATIONS HEATING WATER SUPPLY MIXED AIR HEATING WATER RETURN MIXED AIR TEMPERATURE HWR MIXED AIR HUMIDITY DISTRICT HEATING WATER SUPPLY DAT DISCHARGE AIR TEMPERATURE DISTRICT HEATING WATER RETURN DISCHARGE AIR HUMIDITY CONDENSER SUPPLY CWS DRY BULB CWR CONDENSER RETURN CHILLED WATER SUPPLY WB WET BULB RELATIVE HUMIDITY CHILLED WATER RETURN INTERLOCK DISTRICT CHILLED WATER SUPPLY ILK AIR HANDLING UNIT DISTRICT CHILLED WATER RETURN **BCCO** BLOWER COIL UNIT COOLING ONLY **SETPOINT** STATIC PRESSURE **BLOWER COIL UNIT** CONSTANT VOLUME EXHAUST TERMINAL DIFFERENTIAL PRESSURE CONSTANT VOLUME RETURN TERMINAL **OUTSIDE AIR** CONSTANT VOLUME SUPPLY TERMINAL OUTSIDE AIRFLOW FAN COIL UNIT COOLING ONLY OUTSIDE AIR TEMPERATURE (DRY BULB) OAH

OUTSIDE AIR HUMIDITY FCU RETURN AIR **RETURN AIRFLOW** RETURN AIR TEMPERATURE RETURN AIR HUMIDITY SUPPLY AIR

FAN COIL UNIT HEATING ONLY FAN COIL UNIT INDUCTION UNIT HEATER PARALLEL FAN SUPPLY TERMINAL

SERIES FAN SUPPLY TERMINAL UNIT HEATER VARIABLE VOLUME EXHAUST TERMINAL VVR VARIABLE VOLUME RETURN TERMINAL

VARIABLE VOLUME SUPPLY TERMINAL

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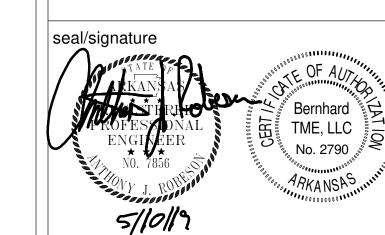
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Date Description

UCA Housing Renovations - Phase 2 State Hall

University of Central Arkansas Conway, Arkansas

SMA Project Number 05-10-2019 Construction Drawings UCA-19-021 UCA Project Number

Contents

CONTROLS - HVAC

Sheet Number

CONTROL SYMBOL LEGEND