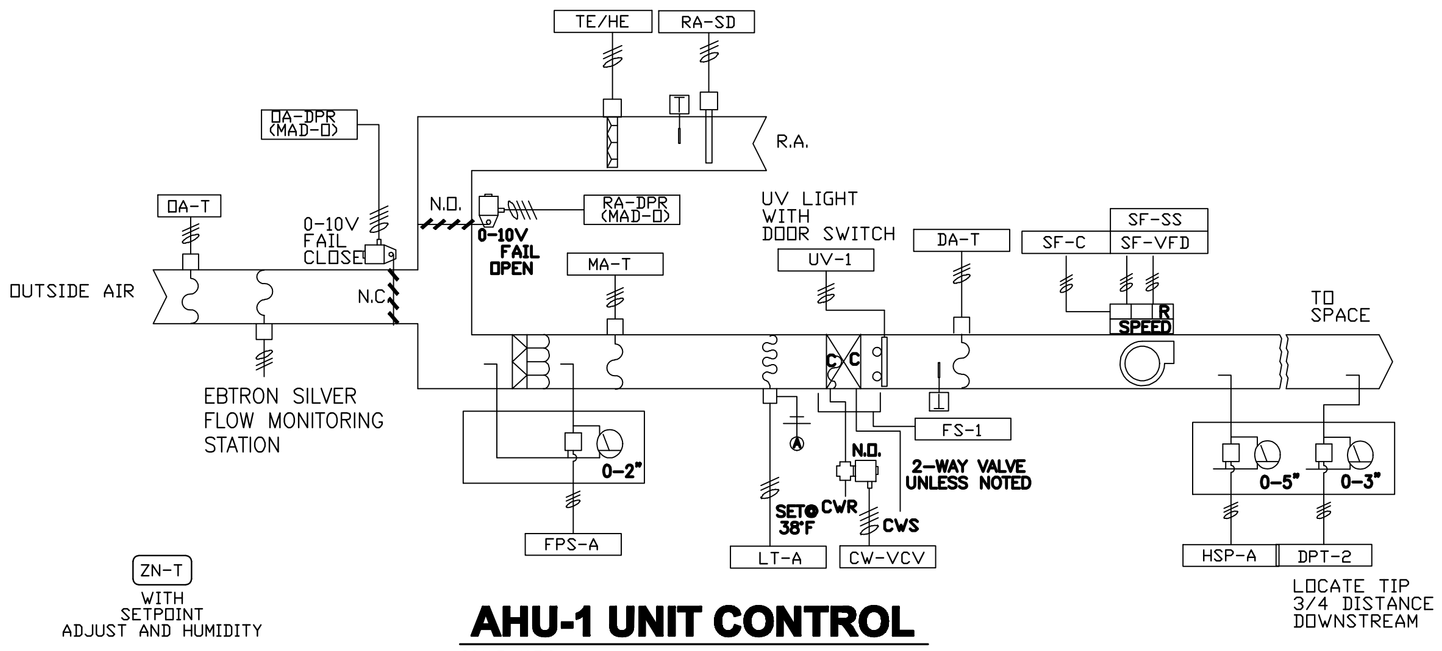
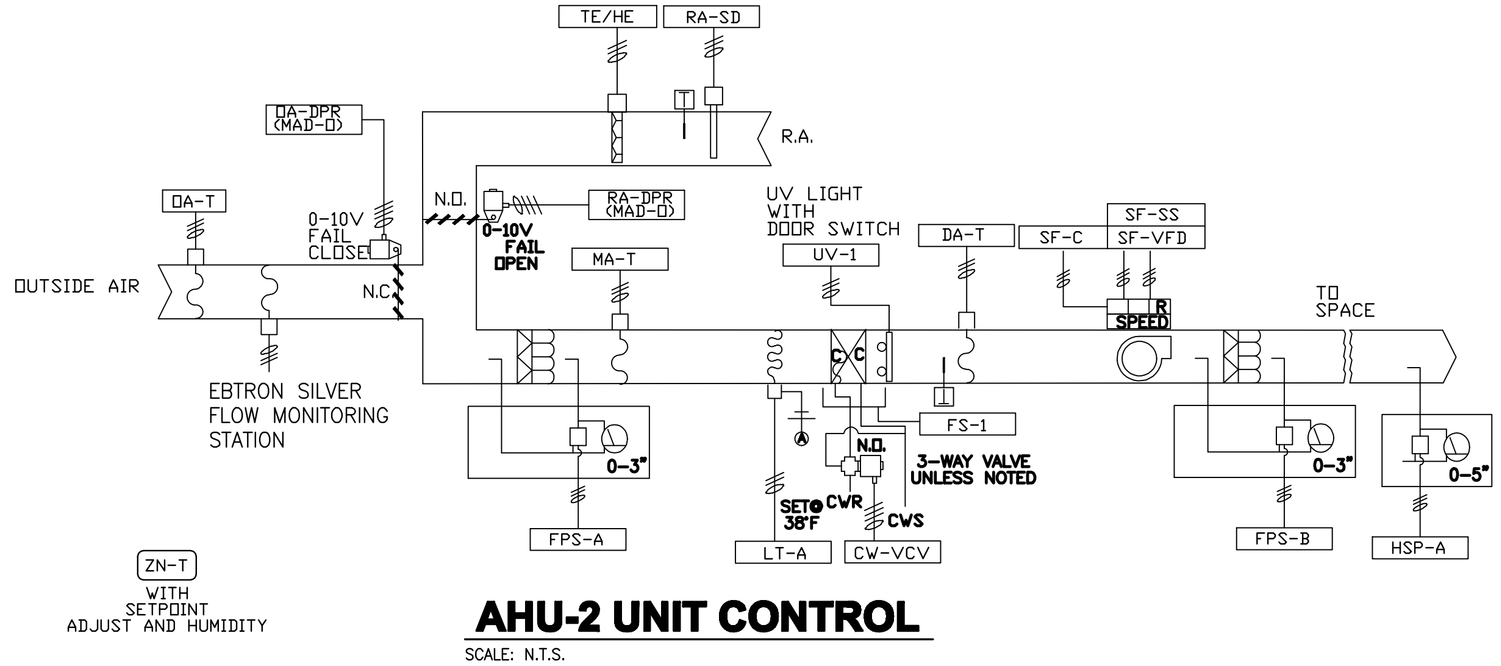


AHU-1 UNIT CONTROL

SCALE: N.T.S.



AHU-2 UNIT CONTROL

SCALE: N.T.S.

HVAC SEQUENCE OF OPERATION
* CONTROL CONTRACTOR IS RESPONSIBLE FOR PROVIDING CONTROL POWER TO ALL CONTROL DAMPERS.
* RECOMMEND LOCATING THE CONTROLS WORKSTATION PANEL IN THE MECHANICAL ROOM. THIS NEEDS TO BE COORDINATED WITH THE OWNER PRIOR TO INSTALLATION.
* CO2 MONITOR TO BE LOCATED IN THE CONFERANCE ROOM #1 (107) AND INSTALLED BY THE CONTROLS CONTRACTOR.
* THIS SYSTEM WILL OPERATE 24 HOURS PER DAY.

1.0 CHILLED WATER SYSTEM
(1 AIR–COOLED CHILLER WITH 2 CHW PUMPS)

CHILLED WATER PUMP CONTROL: WHEN ENABLED, THE LEAD PUMP WILL START AND RUN CONTINUOUSLY. IF FOR ANY REASON ITS STATUS DOES NOT MATCH ITS COMMANDED VALUE AN ALARM WILL BE GENERATED. THE LAG PUMP WILL START IF THE LEAD PUMP IS IN ALARM. ALL SET POINTS WILL BE ADJUSTABLE.

CHILLER CONTROL: THE CHILLER WILL BE ENABLED WHEN THE CHILLED WATER PUMP HAS A STATUS OF ON. THE CHILLER VIA ITS INTERNAL CONTROLS WILL MAINTAIN THE CHILLED WATER SUPPLY TEMPERATURE AT SET POINT. IF THE CHILLED WATER SUPPLY TEMPERATURE RISES ABOVE THE HIGH LIMIT SET POINT AFTER OPERATING FOR A PERIOD OF TIME (10 MINUTES CONTINUOUSLY ADJUSTABLE), AN ALARM WILL BE GENERATED.

2.0 HOT WATER SYSTEM
(1 NON–CONDENSING BOILER WITH 2 VFD HHW PUMPS)

HOT WATER PUMP CONTROL: THE OPERATOR SELECTED LEAD HOT WATER PUMP WILL BE STARTED ACCORDING TO THE TIME SCHEDULE. WHEN ENABLED, THE LEAD PUMP WILL START AND RUN CONTINUOUSLY. WHILE RUNNING THE HOT WATER PUMP WILL MODULATE TO MAINTAIN THE HOT WATER DIFFERENTIAL PRESSURE AT SETPOINT. THE LAG PUMP WILL START IF THE LEAD PUMP IS IN ALARM. WHENEVER THE SYSTEM IS COMMANDED OFF, THE LEAD HOT WATER PUMP WILL RUN FOR A PERIOD OF TIME TO DISSIPATE THE HEAT IN THE SYSTEM. ALL SET POINTS WILL BE ADJUSTABLE.

BOILER CONTROL: THE BOILER CONTROL SEQUENCE WILL BEGIN WHEN ONE OF THE HOT WATER PUMPS HAS A STATUS OF ON. WHEN A BOILER ENABLE COMMAND IS SENT, THE COMBUSTION DAMPERS SHALL OPEN AND THE BOILER WILL FIRE WHEN THE DAMPER STATUS SWITCH INDICATES OPEN. THE BOILER WILL CYCLE TO MAINTAIN THE HOT WATER RETURN TEMPERATURE AT A SET POINT. THE BOILERS SAFETIES CIRCUIT WILL BE MONITORED AND THE SYSTEM WILL REPORT A GENERAL ALARM CONDITION IF A SAFETY IS TRIPPED. A MANUAL RESET OF THE BOILER SAFETY WILL BE REQUIRED BEFORE THE BOILER CAN BE RESTARTED.

3.0 VAV AIR HANDLING UNIT (AHU–1) – VAV

SUPPLY FAN START/STOP: THE FAN START SCHEDULE SHALL BE ESTABLISHED BY THE USER AND THE CONTROL CONTRACTOR SHALL INCORPORATE THE SH CEULE IN THE BAS SYSTEM. IF THE FAN STATUS IS NOT COMPATIBLE WITH THE DEMAND AN ALARM SHALL MAKE AT THE BAS SYSTEM. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE AHU CONTROL SEQUENCE WILL BE ENABLED. AHU–1 SHALL BE CONTROLLED IN TEH OCCUPIED AND UNOCCUPIED MODE ACCORDING TO THE REQUIREMENTS OF THE USER. THE CONTROL CONTRACTOR SHALL COORDINATE WITH THE USER TO DETERMINE THE REQUIRED SCHEDULES.

STATIC PRESSURE CONTROL: THE SUPPLY FAN WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE AT SETPOINT. PRESSURE SENSOR SHALL BE APPROXIMATLY 2/3 DOWNSTREAM OF THE SUPPLY FAN. ALL SETPOINTS WILL BE ADJUSTABLE.

DISCHARGE AIR CONTROL: THE COOLING VALVE WILL MODULATE IN SEQUENCE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT SET POINT (51.7 °F ADJ.).

MIXED AIR LOW LIMIT OVERRIDE:
IF THE MIXED AIR TEMPERATURE OF AHU–1 FALLS BELOW (38°F ADJ.) THE FOLLOWING SHALL OCCUR:
AHU–1 FAN SHALL CYCLE OFF
THE FAN VFD WILL BE COMMANDED TO 0%
THE OUTSIDE AIR DAMPER SHALL CLOSE
THE RETURN AIR DAMPER SHALL OPEN
THE CHILLED WATER CONTROL VALVE SHALL FULLY OPEN

AIR MONITORING STATION:
EBTRON AIR FLOW MONITORING AND CONTROL SYSTEMS SHALL BE UTILIZED IN THE OUTSIDE AIR DUCT OF THE AIR HANDLING UNIT. SUBSTITUTES SHALL, WITHOUT EXCEPTION, HAVE EQUAL OR IMPROVED ACCURACY, REPEATABILITY, AND RELIABILITY, AT ALL OPERATING FLOW RATES. ALSO THE INTERVALS BETWEEN FACTORY RECOMMENDED CALIBRATION, CHECK–OUT AND ADJUSTMENT SHALL BE EQUAL OR GREATER THAN THE EBTRON SYSTEM. EACH DEVICE SHALL HAVE A MINIMUM OF EIGHT SEPARATE MEASURING POINTS THAT SHALL MEASURE AND INDICATE BOTH FLOW RATE AND TEMPERATURE. CONTROL CONTRACTOR SHALL COORDINATE WITH EBTRON TO DETERMINE THE REQUIRED LOCATION FOR THE MONITORING TUBES TO OBTAIN FACTORY PUBLISHED FLOW RATE ACCURACY.

VOC SENSOR:
THE VOC SENSOR SHALL ALARM AT THE BAS IF VOC LIMITS ARE EXCEEDED. LOCATE SENSOR IN THE RETURN DUCT OF AHU–1.

CO2 SENSOR:
THE OUTSIDE AIR CFM SET POINT SHALL HAVE 2 SETTINGS, A MINIMUM AND A MAXIMUM SETTING (ADJ.). A CO2 SENSOR CONTROLLER SHALL MODULATE THE FLOW OF OUTSIDE AIR TO MAINTAIN 1000 PPM CO2 (ADJ.) BETWEEN THOSE MINIMUM AND MAXIMUM OUTSIDE AIR CFM SET POINTS. THE OUTSIDE AIR AND THE RETURN AIR DAMPERS WILL BE CONTROLLED BY SEPERATE ACTUATORS AND SHALL BE MODULATED AS REQUIRED TO MEET THE CO2 SET POINT DEMAND.

NIGHT SETBACK/NIGHT SETUP: WHEN IN "UNOCCUPIED" MODE, THE UNIT WILL CYCLE AS NECESSARY TO MAINTAIN THE SHARED NIGHT SETBACK ZONE TEMPERATURE AT SET POINT. A DIFFERENTIAL PREVENTS THE UNIT FROM CYCLING EXCESSIVELY. THE VAV SPACE TEMPERATURE CONTROL IN THE OCCUPIED MODE SHALL BE 75 °F IN COOLING MODE AND 68 °F IN THE HEATING MODE. IN THE UNOCCUPIED MODE THE COOLING SET POINT SHALL BE 78 °F AND THE HEATING SET POINT SHALL BE 65 °F. ALL SET POINTS SHALL BE ADJUSTABLE.

SPACE HUMIDITY: THE SPACE HUMIDITY SENSOR WILL BE USED TO MONITOR AND CONTROL THE HUMIDITY NEAR THE MAIN ENTRANCE. UPON A RISE IN RH ABOVE 60% RH FOR CONTINUOUS 15 MINUTES WHEN OPERATING THE COOLING VALVE SHALL BE FORCED ON TO MAINTAIN DISCHARGE AIR TEMPERATURE SET POINT (50°F) AND THE REHEAT VALVE SHALL MODULATE SIMULTANEOUSLY TO MAINTAIN SPACE TEMPERATURE SET POINT. ALSO AN ALARM WILL BE GENERATED BY THE BAS AND A RED LIGHT LOCATED BY ENGINEER AND BY OWNER. THE CAUSE OF THE HIGH RH MUST BE CORRECTED IMMEDIATELY TO PREVENT BUILDING DAMAGE. IF THE RETURN AIR SPACE RELATIVE HUMIDITY RISES ABOVE 60% RH, THE DISCHARGE AIR SET POINT SHALL BE RESET TO 50 °F

SHUTDOWN:
WHEN THE UNIT IS SHUTDOWN BY EITHER A STOP COMMAND OR SYSTEM SAFETY THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
SUPPLY FAN VFD WILL BE COMMANDED TO 0%
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
COOLING VALVE WILL CLOSE

IF A FIRE ALARM SHUTDOWN CONTACT IS PROVIDED, THE SUPPLY FAN WILL BE SHUTDOWN WHEN TRIGGERED.

IF A HIGH STATIC PRESSURE SWITCH (ADJ. 1"–3" W.G.) LOCATED AFTER THE SUPPLY FAN SENSES A DISCHARGE PRESSURE THAT IS GREATER THAN SET POINT, THE SUPPLY FAN WILL BE SHUTDOWN.

FLOAT SWITCH:
A FLOAT SWITCH WILL BE INSTALLED IN THE AHU COOLING COIL DRIP PAN. ONCE THE FLOAT SWITCH IS ENERGIZED IT WILL SHUTDOWN THE AHU.

4.0 CONSTANT VOLUME AIR HANDLING UNIT (AHU–2)

SUPPLY FAN START/STOP: THE FAN START SCHEDULE SHALL BE ESTABLISHED BY THE USER AND THE CONTROL CONTRACTOR SHALL INCORPORATE THE SCHEDULE IN THE BAS SYSTEM. IF THE FAN STATUS IS NOT COMPATIBLE WITH THE DEMAND AN ALARM SHALL MAKE AT THE BAS SYSTEM. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE AHU CONTROL SEQUENCE WILL BE ENABLED.

BUILDING PRESSURE CONTROL: THE RETURN AIR AND OUTSIDE AIR DAMPERS WILL MODULATE TO MAINTAIN THE ROOM STATIC PRESSURE AT 0.01 TO 0.05 IN WG IN CONTROLLED ROOMS O_2 AND ELECTRONIC ROOM WITH REFERENCE TO ROOM 121. THE REFERENCE ROOM 121 PRESSURE WITH REFERENCE TO OUTDOOR PRESSURE TO BE MONITORED THROUGH THE BAS SYSTEM.

DISCHARGE AIR CONTROL: THE DISCHARGE AIR CONTROL ON THE LEAVING SIDE OF THE CHILLED WATER COIL SHALL MODULATE THE CONTROL VALVES TO MAINTAIN SET POINT OF 43 °F. THE DISCHARGE AIR CONTROLLING SENSOR SHALL MAINTAIN ACCURATE CONTROL OF DISCHARGE AIR TEMPERATURE AT 43 °F +/– .5 °F BECAUSE OF THE CRITICAL NATURE OF THE HIGH LIMIT RH REQUIREMENT IN THAT LAB. IF THE SPACE HUMIDITY IN THE PRECISION DIMENSIONAL LAB RISES ABOVE 45% RH FOR LONGER THAN 5 MINTUES (ADJ), THE DISCHARGE AIR TEMPERATURE SHALL RESET TO 42.5 °F AND THEN TO 42 °F IF THE HIGH RH CONDITION IS NOT CORRECTED IN AN ADDITIONAL 10 MINUTES (ADJ). ALARMS SHALL INDICATE AT THE BAS SYSTEM WHEN THE RH EXCEEDS 45% RH.

MIXED AIR LOW LIMIT OVERRIDE: IF THE MIXED AIR TEMPERATURE OF AHU–2 GALLS BELOW 38 °F THE FOLLOWING SHALL OCCUR.
AHU–2 FAN SHALL CYCLE OFF
THE FAN VFD WILL BE COMMANDED TO 0%
THE OUTSIDE AIR DAMPER SHALL CLOSE
THE CHILLED WATER CONTROL VALVE SHALL FULLY OPEN.

AIR MONITORING STATION:
EBTRON AIR FLOW MONITORING AND CONTROL SYSTEMS SHALL BE UTILIZED IN THE OUTSIDE AIR DUCT OF THE AIR HANDLING UNIT. SUBSTITUTES SHALL, WITHOUT EXCEPTION, HAVE EQUAL OR IMPROVED ACCURACY, REPEATABILITY, AND RELIABILITY, AT ALL OPERATING FLOW RATES. ALSO THE INTERVALS BETWEEN FACTORY RECOMMENDED CALIBRATION, CHECK–OUT AND ADJUSTMENT SHALL BE EQUAL OR GREATER THAN THE EBTRON SYSTEM. EACH DEVICE SHALL HAVE A MINIMUM OF EIGHT SEPARATE MEASURING POINTS THAT SHALL MEASURE AND INDICATE BOTH FLOW RATE AND TEMPERATURE.

STEAM HUMIDIFIER: THE STEAM HUMIDIFER SHALL BE LOCATED ON THE PLATFORM ADJACENT TO AHU–2. THE STEAM DISPERSION TUBE SHALL BE LOCATED IN THE MAIN SUPPLY AIR DUCT IN A LOCATION COMPATIBLE WITH THE MANUFACTURER'S INSTALLATION GUIDELINES. COORDINATE WITH ENGINEERING BEFORE INSTALLING THE DISPERSION TUBES. A RH HIGH LIMIT SENSOR DOWNSTREAM OF THE DISPERSION TUBES SHALL PROVIDE A HIGH RH LIMIT OVERRIDE SHOULD THE RH IN THE DUCT EXCEED ACCEPTABLE LIMITS OF RH EXPECTED TO BE IN THE 80% TO 90% RANGE. THE HIGH LIMIT HUMIDSTAT WILL BE TIED INTO THE BAS SYSTEM & WILL SHUTDOWN THE HUMIDIFIER IF ACTIVATED. THE DEMAND FOR HUMIDIFICATION SHALL COME FROM THE HIGHEST DEMAND FOR HUMIDIFICATION OUT OF THE 5 LAB RH SENSORS. THE SENSORS SHALL PROVIDE MODULATING CONTROL OF THE HUMIDIFER. CONTACT HUMIDIFER VENDOR FOR REQUIRED CONTROL INPUT TO CONTROL THE HUMIDIFIER. THE CONTROL OF THE HUMIDIFICATION SYSTEM SHALL BE STABLE WITH NO MISTING OR VISIBLE CONDENSATION IN THE OCCUPIED SPACES. A DISCHARAGE AIR TEMPERATURE SENSOR IN THE SUPPLY DUCTWORK ON THE LEAVING SIDE OF THE AHU FAN AND UPSTREAM OF THE STEAM DISPERSION TUBES SHALL PROVIDE ACCURATE TEMPERATURE READOUTS.

DIRTY FILTER LIGHT:
A GREEN LED & RED LED LIGHT IS TO BE INSTALLED IN THE CALIBRATION LAB TO NOTIFY THE OWNER WHEN THE AHU FINAL FILTER IS CLEAN AND DIRTY. EXACT LOCATION OF THE LIGHTS ARE TO BE DETERMINED BY OWNER. INSTALL LABELS OVER EACH LIGHT. GREEN LIGHT LABEL – " FILTER IS CLEAN". RED LIGHT LABEL – " FILTER IS DIRTY – CHANGE FILTER".

SHUTDOWN:
WHEN THE UNIT IS SHUTDOWN BY EITHER A STOP COMMAND OR SYSTEM SAFETY THE UNIT WILL BE SET AS FOLLOWS:
SUPPLY FAN WILL BE OFF
SUPPLY FAN VFD WILL BE COMMANDED TO 0%
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
COOLING VALVE WILL OPEN

IF A FIRE ALARM SHUTDOWN CONTACT IS PROVIDED, THE SUPPLY FAN WILL BE SHUTDOWN WHEN TRIGGERED.

FLOAT SWITCH:
A FLOAT SWITCH WILL BE INSTALLED IN THE AHU COOLING COIL DRIP PAN. ONCE THE FLOAT SWITCH IS ENERGIZED IT WILL SHUTDOWN THE AHU.

5.0 VAV BOX WITH HOT WATER REHEAT

NOTE ALL BOXES SHALL BE INTERLOCKED WITH THE BAS

DISCHARGE AIR TEMP SENSOR: A DISCHARGE AIR TEMP SENSOR IS PROVIDED ON EACH BOX FOR MONITORING PURPOSES.

OCCUPIED MODE: WHEN THE ZONE TEMPERATURE IS BETWEEN THE OCCUPIED HEATING AND COOLING SETPOINTS (INSIDE OF THE BIAS), THE PRIMARY AIR DAMPER WILL BE AT THE MINIMUM CFM AND THE REHEAT VALVE SHALL BE FULLY CLOSED. ON A RISE IN ZONE TEMPERATURE ABOVE THE COOLING SETPOINT, THE PRIMARY AIR DAMPER SHALL INCREASE THE CFM AND THE REHEAT VALVE REMAINS FULLY CLOSED. ON A DROP IN ZONE TEMPERATURE BELOW THE HEATING SETPOINT, THE REHEAT VALVE MODULATES OPEN AND THE DAMPER IS CONTROLLED TO PROVIDE A MINIMUM CFM.

UNOCCUPIED (NIGHT SETBACK) MODE: WHEN THE AIR HANDLING UNIT SHUTS DOWN, ALL BOX CONTROLLERS ARE INDEXED TO UNOCCUPIED MODE. WHEN THE ZONE TEMPERATURE IS BETWEEN THE UNOCCUPIED HEATING AND COOLING SETPOINTS (INSIDE OF THE BIAS), THE PRIMARY AIR DAMPER SHALL BE AT THE MINIMUM CFM, AND THE REHEAT VALVE SHALL BE FULLY CLOSED. ON A RISE IN ZONE TEMPERATURE ABOVE THE UNOCCUPIED COOLING SETPOINT, THE PRIMARY AIR DAMPER SHALL INCREASE THE CFM (IF AVAILABLE), AND THE REHEAT VALVE REMAINS FULLY CLOSED. ON A DROP IN ZONE TEMPERATURE BELOW THE UNOCCUPIED HEATING SETPOINT, THE REHEAT VALVE MODULATES OPEN, AND THE DAMPER IS CONTROLLED TO PROVIDE A MINIMUM CFM.

6.0 COMPUTER ROOM AC UNIT

NOMINAL COOLING ONLY APPLICATION WITH ONE COMPRESSOR AND NO HEATING.
FAN: ON–AUTO CONTROL
COOLING: ON–OFF CONTROL
ENABLE THRU BAS SYSTEM.

7.0 EMERGENCY SHUTDOWN

THE EMERGENCY SHUTDOWN SWITCH SHALL DISABLE ALL HVAC EQUIPMENT SHUTTING DOWN THE AIR DISTRIBUTION SYSTEM THROUGHOUT THE BUILDING INCLUDING AHU–1, AHU–2, CAHU–1 & EF–1. ALL OUTSIDE AIR INTAKES DAMPERS & EXHAUST DAMPERS SHALL CLOSE WHEN THE SWITCH IS ACTIVATED.

8.0 DIFFERENTIAL PRESSURE SENSORS
THE PRESSURE CONTROL IN THE OXYGEN LAB & FORCE TORQUE AND THE REFEREANCE STATIC PRESSURE SENSOR IN THE REFERANCE AREA SHALL MONITOR THROUGH THE BAS SYSTEM. THE 2 LAB SENSORS SHALL MONITOR AND CONTROL THE OUTSIDE AIR DAMPER AND THE RETURN AIR DAMPER TO INCREASE OR DECREASE THE OUTSIDE AIR FLOW INTO AHU–2 AS REQUIRED TO MAINTAIN A PRESSURE DIFFERENTIAL IN EACH ROOM AT 0.01 – 0.05" WC. THE OUTSIDE AIR FLOW RATE SHALL BE MONITORED AND CONTROLLED THROUGH THE EBTRON FLOW STATION WHICH SHALL BE PROGRAMMED FOR DESIGN OUTSIDE AIR FLOW AS SCHEDULED AND A MINIMUM CFM OF 1,200 CFM. THE MAXIMUM AND MINIMUM CFM WILL BE SUBJECT TO CHANGE AS A RESULT OF THE DATA COLLECTED DURING BALANCING AND DURING SYSTEM COMMISSIONING. IF THE PRESSURE DIFFERENTIAL IN ANY ROOM FALLS OUTSIDE OF THE THE RANGE OF 0.01 – 0.05" WC FOR LONGER THAN 1 MINUTE (ADJ.), THE OUTSIDE AIR DAMPER AND RETURN AIR DAMPER WILL BE MODULATED AS REQURED TO INCREASE THE OUTSIDE AIR FLOW TO THE SPACES AS REQUIRED TO RAISE THE SPACE PRESSURE OR LOWER THE OUTSIDE AIR FLOW AS REQUIRED TO LOWER THE SPACE PRESSURE TO MAINTAIN MINIMUM ROOM PRESSURE IN EACH ROOM AT 0.01 – 0.05" WC. THE PRESSURE CONTROLS SHALL RESULT IN STABLE CONTROL OF ROOM PRESSURE DIFFERENTIALS.

THE CONTROL SYSTEM SHALL HAVE THE CAPACITY TO MAINTAIN ALL LAB AREAS IN THE LIMITS OF TEMPERATURE AND RH FOR THE RESPECTIVE SPACES. THOSE LIMITS ARE GENERALLY 73 °F AND 20% TO 60% RH FOR ALL LAB AREAS EXCEPT THE PRECISION DIMENSIONAL LAB WHICH HAS LIMITS OF 68 °F +/– 0.5 °F AND STABLE RELATIVE HUMIDITY BELOW 45% BUT NOT LESS THAN 20% RH. THE SPACE TEMPERATURE AND RELATIVE HUMIDITY IN THOSE LABS SHALL BE STABLE UNDER ALL OPERATING CONDITIONS. THE CONTROL CONTRACTOR SHALL INSTALL THE NECESSARY CONTROLS TO MEET THESE CONDITIONS WITH SPECIAL ATTENTION TO THE STRICT REQUIREMENTS AND TOLERANCES IN THE PRECISION DIMENSIONAL LAB.

AHU CONTROL SYMBOL LEGEND:

AFMS	AIRFLOW MEASURING STATION
CC	CHILLED WATER COOLING COIL
CW–VCV	CHILLED WATER CONTROL VALVE
DA–T	DISCHARGE AIR TEMPERATURE SENSOR
DPT–1,2	DIFFERENTIAL PRESSURE SENSOR
FS–1,2	FLOAT SWITCH
HSP–A	HIGH PRESSURE SENSOR ALARM SENSOR
HW–VCV	HOT WATER CONTROL VAVLE
LT–A	LOW TEMPERATURE SENSOR SET @ 38°F(A05)
MA–T	MIXED AIR TEMPERATURE SENSOR
NC	NORMALLY CLOSED VALVE/DAMPER
NO	NORMALLY OPEN VALVE/DAMPER
OA–DPR	OUTSIDE AIR MOTORIZED DAMPER
OA–T	OUTSIDE AIR TEMPERATURE
PH–S1	ELECTRIC RESISTANCE PREHEATER
RA	RETURN AIR
RA–DPR	RETURN AIR MOTORIZED DAMPER
RA–SD	RETURN AIR DUCT SMOKE DETECTOR
SCR	ELECTRIC RESISTANCE HEATER SCE TYPE
TE/HE	TEMPERATURE & HUMIDITY SENSOR
SF–SS	VARIABLE FREQUENCY DRIVER START/STOP
SF–C	VARIABLE FREQUENCY DRIVE CURRENT
ZN–T	ZONE TEMPERATURE SENSOR

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0	FINAL DESIGN	RP	10/29/09	CB

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NAVAIRSEFAC CALIBRATION BLDG.
HVAC CONTROL SCHEMATICS

APPROVED DATE: AUGUST 22, 2008
EFD FOR COMMANDER, NAVFAC

NAVFAC
Naval Facilities Engineering Command
Southeast Division, Jacksonville, FL

STATE OF LOUISIANA
THOMAS W. BOYLE, JR.
REG. NO. 18400
REGISTERED PROFESSIONAL ENGINEER IN MECHANICAL ENGINEERING

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