Johnson Controls

Charlottesville Airport Controls Upgrade

LEGEND

S 20 — Main Air Supply Tube at 20 PSIG	7 — Pneumatic Tube indicating Tube Number	NO — Opposed Blade Damper	H/C — Heating or Cooling Coil
D-N 15-20 — Dual Air Supply Tube at 15/20 PSIG Day=15, Night=20	2/18 — Wire Symbol indicating: number of wires and size (E.G. 2 #18 wires)	NO — Parallel Blade Damper	Ductwork or Piping with Flow Direction Shown
S 80 — High Pressure Air Supply Tube at 80 PSIG	3 - 2/18 — Wire Symbol indicating: Cable Destination (DA-T), Cable number (3), Number of wires and size (E.G. 2 #18 wires)	Filter	Gage
Air line or Electrical Wire	1 — Electrical Wire Terminal with Appropriate Number	Air Flow Measuring Station	
Connected Lines or Wires	Item Located on Panel Face	Humidifier	
Crossing Lines or Wires, Not Connected		Fan	
In-Line Restrictor	1 — Drawing Revision Symbol with Appropriate Number	Pump	

Device	Strap-on Bulb Type Temperature Sensing Element	Paddle Type Flow Switch	Duct Detector (Smoke, CO, CO2)
Bulb Type Temperature Sensing Element Located under Shield in Outside air	Combination Bulb Type Temperature Sensing Element and Humidity Sensor (Duct Mount)	Vapor Tension Temperature Sensing Element (Hi Limit)	2-Way Valve with Actuator (NC)
Humidity Sensing Element Located under Shield in Outside air	Bulb Type Temperature Sensing Element	Vapor Tension Temperature Sensing Element (Low Limit)	3-Way Valve with Actuator (C, NC, NO)
Bulb Type Temperature Sensing Element Located inside Separable Socket/Well	Pressure Sensing Device	Current Sensing Switch or Combination Current Sensing switch & Command Relay	

Johnson Controls

Creating a better climate for business.

- ☐ Environmental Control System
- ☐ Facility Management System
- ☐ Air and Water System Balancing
- ☐ Fire Management System
- ☐ Security System
- ☐ Lighting Services
- ☐ Instrumentation System Installation
- ☐ Building Operations Management
- ☐ Energy Conservation Control
- ☐ Training Programs
- ☐ Performance Contracting
- ☐ Planned Service Agreements

Air Conditioning
Heating
Diagnostic Services
Coil Cleaning
Refrigeration
Automatic Temperature Controls
Facility Management Systems
Fire Management
Security Management
Building Operations and Management
Water Treatment
Electrical Equipment
Emergency Generator / Lighting Equipment
Industrial Controls / Recording / Indication Equipment

PROJECT TITLE

Charlottesville Airport Controls Upgrade

ARCHITECT	ENGINEER
, Phone:	, Phone:
MECHANICAL CONTRACTOR	**ELECTRICAL CONTRACTOR**
, Phone:	, Phone:

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Johnson Controls

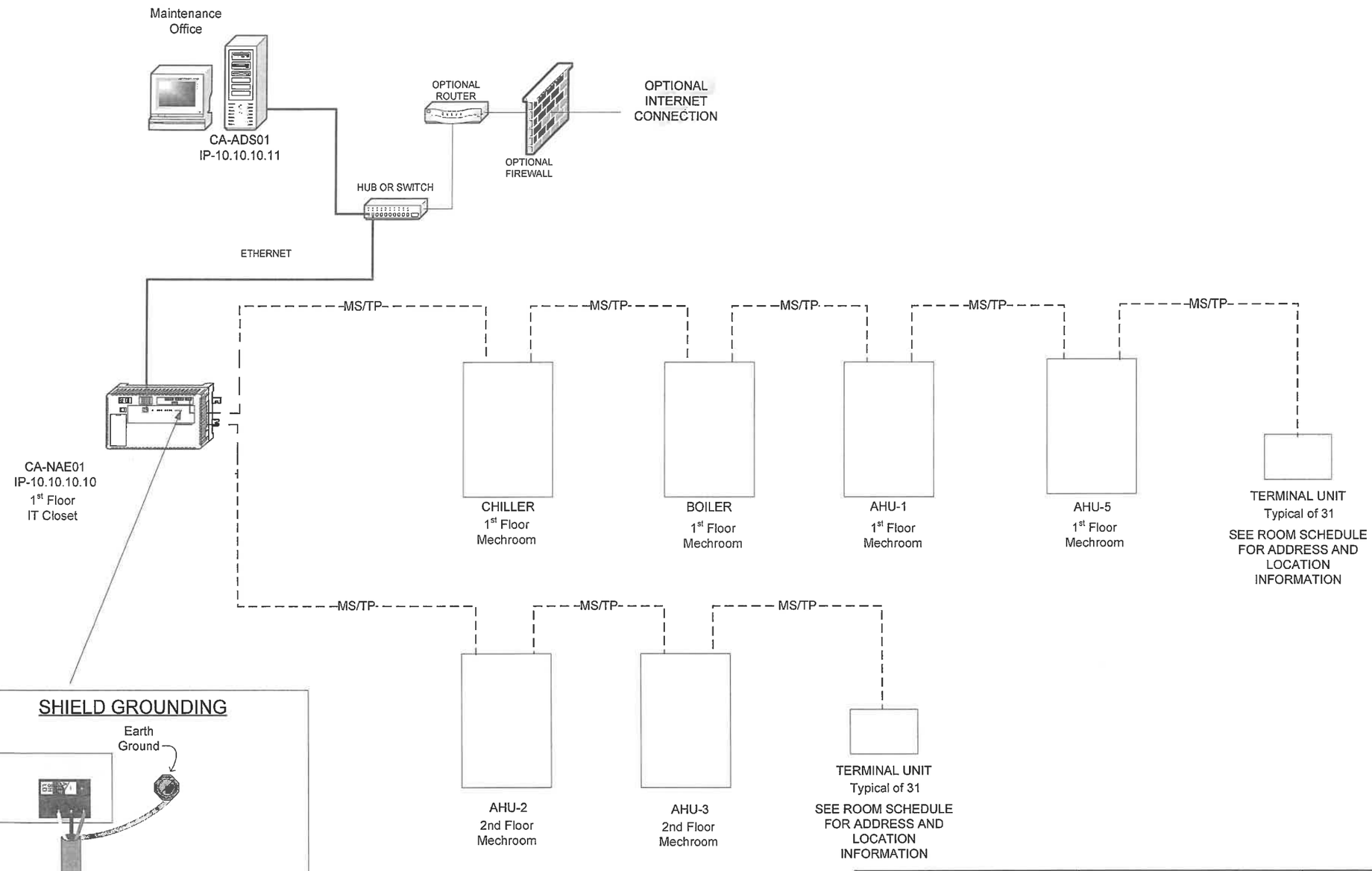
Branch Information
2315 Commerce Center Dr
Suite D
, Rockville VA 23146
Phone: 1-866-272-6406

SALES ENGINEER	PROJECT MANAGER	APPLICATION ENGINEER	DATE	CONTRACT NUMBER
				1-2744395808

Network Riser

BILL OF MATERIALS

Designation	Qty	Part Number	Description
CA-ADS01	1	ADSTK-0	Application Data Server Turnkey
CA-NAE01	1	MS-NAE5510-1	Network Automation Engine



SHIELD GROUNDING

If a shield is used, it should be earth grounded at one and only one point for the entire bus segment. (Preferably in the NAE panel.) The shield screws on the controllers are simply a convenient way to continue the daisy chain of the bus. They are not attached to earth ground.

Drawing Title
NET Network Riser

REFERENCE DRAWING		NO.	REVISION-LOCATION	ECN	DATE	BY
Sales Engineer	Project Manager	Application Engineer	DRAWN BY / DATE		APPROVED BY / DATE	

Project Title
Charlottesville Airport Controls Upgrade

Johnson Controls

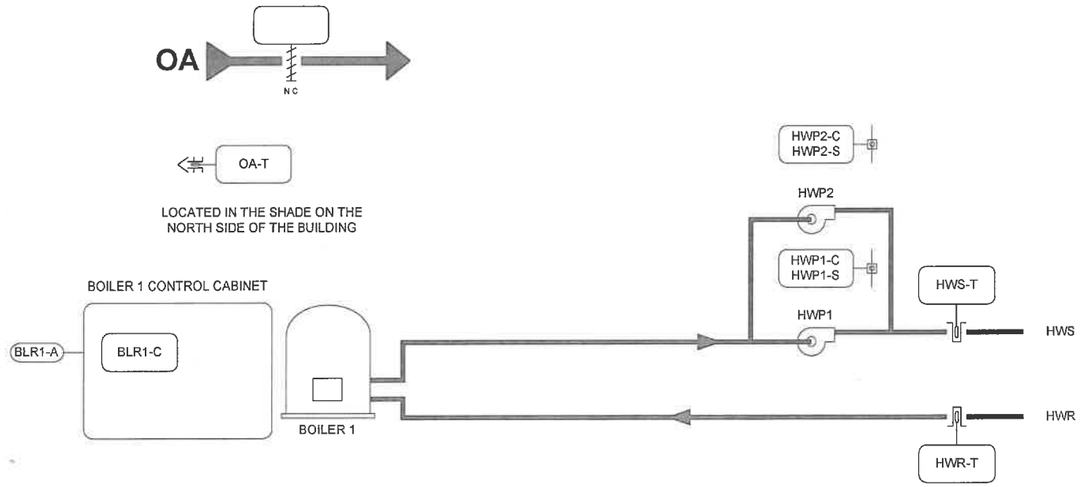
Branch Information
2315 Commerce Center Dr Suite D Rockville VA 23146

CONTRACT NUMBER
1-2744395808

DRAWING NUMBER
NT-1

29004

Boiler Plant



BILL OF MATERIALS

Designation	Qty	Part Number	Description
HWS-T,HWR-T	2	TE-631AM-1	1000 OHM NICKEL SENSOR WELL INSERTION
BOILER	1	MS-FEC2621-0	17 PT FIELD EQUIPMENT CONTROLLER
	1	MS-IOM4711-0	17 PT IO MODULE

HOT WATER PUMP CONTROL: THE HOT WATER PUMP WITH THE LOWEST RUNTIME WILL AUTOMATICALLY START WHEN THE OUTSIDE AIR TEMPERATURE FALLS BELOW THE SYSTEM ENABLE SETPOINT. WHEN THE OUTSIDE AIR TEMPERATURE RISES ABOVE THIS SETPOINT, THE HOT WATER PUMPS WILL TURN OFF. 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. WHENEVER THE SYSTEM IS COMMANDED OFF, THE LEAD HOT WATER PUMP WILL RUN FOR A PERIOD OF TIME TO DISPATE THE HEAT IN THE SYSTEM.

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. THE BOILER WILL CYCLE TO MAINTAIN THE HOT WATER RETURN TEMPERATURE AT A SETPOINT AND IS RESET INVERSLY TO THE OUTSIDE AIR TEMPERATURE. 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.

Drawing Title: **HWS Flow Layout**

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN BY	DRAWN DATE	APPROVED BY	APPROVED DATE

Project Title: **Charlottesville Airport Controls Upgrade**

Johnson Controls

Branch Information: **2315 Commerce Center Dr Suite D Rockville VA 23146**

CONTRACT NUMBER: **1-2744395808**

DRAWING NUMBER: **BLR-1**

28001

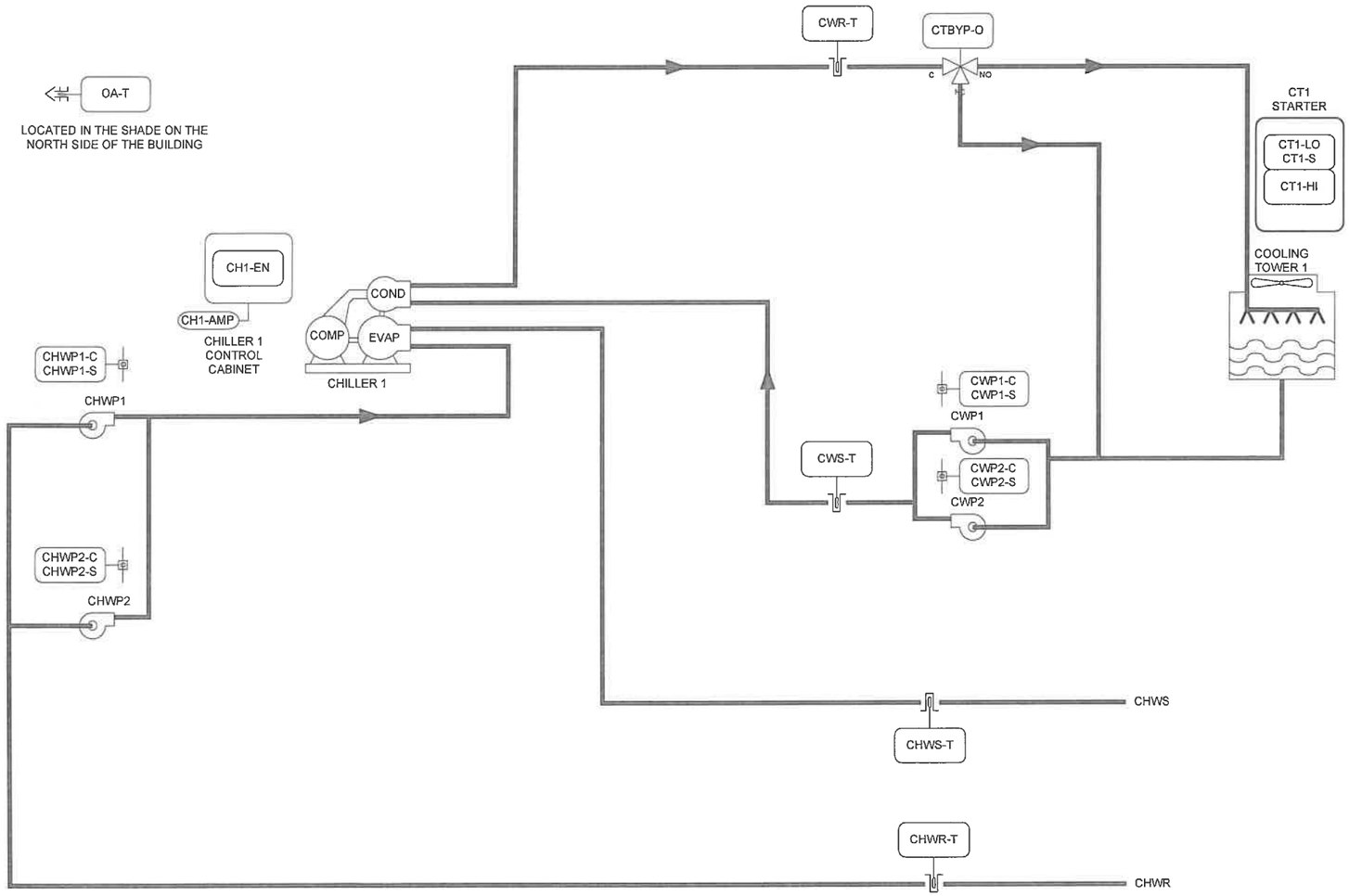
Electrician/Fitter		Point Information			Controller Information							Panel Information						Intermediate Device	
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	Module Type	Termination Out	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring /Tubing	Termination In	Device
					FEC 26xx														
					FEC 26xx	MS/TP	1	6						0					
	UI IN-1	AHU-3	DA-T	Discharge Air Temperature	FEC 26xx	MS/TP	1	6	UI IN-1					0		-6-UI IN-1			
	UI IN-2	AHU-3	DA1-P	Discharge Air Static Pressure	FEC 26xx	MS/TP	1	6	UI IN-2					0		-6-UI IN-2			
	UI IN-3	AHU-3	MA-T	Mixed Air Temperature	FEC 26xx	MS/TP	1	6	UI IN-3					0		-6-UI IN-3			
	UI IN-4	AHU-3	RA-T	Return Air Temperature	FEC 26xx	MS/TP	1	6	UI IN-4					0		-6-UI IN-4			
	UI IN-5	AHU-3	RA-H	Return Air Humidity	FEC 26xx	MS/TP	1	6	UI IN-5					0		-6-UI IN-5			
	UI IN-6	AHU-3			FEC 26xx	MS/TP	1	6	UI IN-6					0		-6-UI IN-6			
	BI IN-7	AHU-3	LT-A	Low Temperature Alarm	FEC 26xx	MS/TP	1	6	BI IN-7					0		-6-BI IN-7			
	BI IN-8	AHU-3	SF-S	Supply Fan Status	FEC 26xx	MS/TP	1	6	BI IN-8					0		-6-BI IN-8			
	BO OUT-1	AHU-3	EF2-C	Exhaust Fan 2 Command	FEC 26xx	MS/TP	1	6	BO OUT-1					0		-6-BO OUT-1			
	BO OUT-2	AHU-3	SF-C	Supply Fan Command	FEC 26xx	MS/TP	1	6	BO OUT-2					0		-6-BO OUT-2			
	BO OUT-3	AHU-3			FEC 26xx	MS/TP	1	6	BO OUT-3					0		-6-BO OUT-3			
	CO OUT-4	AHU-3	SF-O	Supply Fan Output	FEC 26xx	MS/TP	1	6	CO OUT-4					0		-6-CO OUT-4			
	CO OUT-5	AHU-3			FEC 26xx	MS/TP	1	6	CO OUT-5					0		-6-CO OUT-5			
	CO OUT-6	AHU-3			FEC 26xx	MS/TP	1	6	CO OUT-6					0		-6-CO OUT-6			
	CO OUT-7	AHU-3			FEC 26xx	MS/TP	1	6	CO OUT-7					0		-6-CO OUT-7			
	AO OUT-8	AHU-3	CLG-O	Cooling Output	FEC 26xx	MS/TP	1	6	AO OUT-8					0		-6-AO OUT-8			
	AO OUT-9	AHU-3	MAD-O	Mixed Air Damper Output	FEC 26xx	MS/TP	1	6	AO OUT-9					0		-6-AO OUT-9			

Electrician/Fitter		Point Information			Controller Information							Panel Information							Intermediate Device
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	Module Type	Termination Out	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring /Tubing	Termination In	Device
					FEC 26xx														
					FEC 26xx	MS/TP	1	9						0					
	UI IN-1	BOILER	OA-H	Outdoor Air Humidity	FEC 26xx	MS/TP	1	9	UI IN-1					0		-9-UI IN-1			
	UI IN-2	BOILER	PHWR-T	Primary HW Return Temp	FEC 26xx	MS/TP	1	9	UI IN-2					0		-9-UI IN-2			
	UI IN-3	BOILER	PHWS-T	Primary HW Supply Temp	FEC 26xx	MS/TP	1	9	UI IN-3					0		-9-UI IN-3			
	UI IN-4	BOILER	PHWP1-S	Primary HW Pump 1 Status	FEC 26xx	MS/TP	1	9	UI IN-4					0		-9-UI IN-4			
	UI IN-5	BOILER	PHWP2-S	Primary HW Pump 2 Status	FEC 26xx	MS/TP	1	9	UI IN-5					0		-9-UI IN-5			
	UI IN-6	BOILER			FEC 26xx	MS/TP	1	9	UI IN-6					0		-9-UI IN-6			
	BI IN-7	BOILER	BLR1-A	Boiler 1 Alarm	FEC 26xx	MS/TP	1	9	BI IN-7					0		-9-BI IN-7			
	BI IN-8	BOILER	BLR1-S	Boiler 1 Status	FEC 26xx	MS/TP	1	9	BI IN-8					0		-9-BI IN-8			
	BO OUT-1	BOILER	BLR1-C	Boiler 1 Command	FEC 26xx	MS/TP	1	9	BO OUT-1					0		-9-BO OUT-1			
	BO OUT-2	BOILER	PHWP1-C	Primary HW Pump 1 Comman	FEC 26xx	MS/TP	1	9	BO OUT-2					0		-9-BO OUT-2			
	BO OUT-3	BOILER	PHWP2-C	Primary HW Pump 2 Comman	FEC 26xx	MS/TP	1	9	BO OUT-3					0		-9-BO OUT-3			
	CO OUT-4	BOILER			FEC 26xx	MS/TP	1	9	CO OUT-4					0		-9-CO OUT-4			
	CO OUT-5	BOILER			FEC 26xx	MS/TP	1	9	CO OUT-5					0		-9-CO OUT-5			
	CO OUT-6	BOILER			FEC 26xx	MS/TP	1	9	CO OUT-6					0		-9-CO OUT-6			
	CO OUT-7	BOILER			FEC 26xx	MS/TP	1	9	CO OUT-7					0		-9-CO OUT-7			
	AO OUT-8	BOILER			FEC 26xx	MS/TP	1	9	AO OUT-8					0		-9-AO OUT-8			
	AO OUT-9	BOILER			FEC 26xx	MS/TP	1	9	AO OUT-9					0		-9-AO OUT-9			

Chiller Plant

BILL OF MATERIALS

Designation	Qty	Part Number	Description
CHWS-T,CHWR-T CWS-T,CWR-T	4	TE-631AM-1	1000 OHM NICKEL SENSOR WELL INSERTION
CHILLER	1	MS-FEC2621-0	17 PT FIELD EQUIPMENT CONTROLLER
	1	MS-IOM4711-0	17 PT IO MODULE



CHILLER CONTROL: THE CHILLER WILL BE ENABLED WHEN THE OUTSIDE AIR TEMPERATURE RISES ABOVE THE SYSTEM ENABLE SETPOINT. WHEN THE OUTSIDE AIR TEMPERATURE FALLS BELOW THIS SETPOINT, THE CHILLER WILL TURN OFF. WHEN ENABLED, THE CHILLER WILL, AND THE PUMP (S) WILL BE COMMANDED ON, SEE BELOW. ONCE THE CHILLER RECEIVES FLOW STATUS IT WILL, VIA ITS INTERNAL CONTROLS, MAINTAIN THE CHILLED WATER SUPPLY TEMPERATURE AT SETPOINT. IF ANY CHILLERS CHILLED WATER ISOLATION VALVE STATUS DOES NOT MATCH ITS COMMANDED VALUE AFTER A PERIOD OF TIME FOLLOWING BEING ENABLED, AN ALARM WILL BE GENERATED. IF THE CHILLER IS LEAD AT THE TIME OF THE ALARM THE LAG CHILLER WILL BE ENABLED.

CHILLED WATER PUMP CONTROL: THE CHILLED WATER PUMP WITH THE LOWEST RUNTIME WILL AUTOMATICALLY START WHEN EITHER CHILLED WATER ISOLATION VALVE HAS A STATUS OF OPEN. IF BOTH ISOLATION VALVES ARE OPEN THEN BOTH PUMPS WILL RUN. WHEN ENABLED, THE PUMPS 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.

CONDENSER WATER PUMP CONTROL: THE CONDENSER WATER PUMP WITH THE LOWEST RUNTIME WILL AUTOMATICALLY START WHEN EITHER CONDENSER WATER ISOLATION VALVE HAS A STATUS OF OPEN. IF BOTH ISOLATION VALVES ARE OPEN THEN BOTH PUMPS WILL RUN. WHEN ENABLED, THE PUMPS 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.

CONDENSER WATER CONTROL: WHEN EITHER CONDENSER WATER PUMP STATUS IS ON THE COOLING TOWER BYPASS, AND COOLING TOWER FANS WILL MODULATE OR CYCLE TO MAINTAIN THE CONDENSER WATER SUPPLY TO THE CHILLERS AT SETPOINT.

COOLING TOWER CONTROL: THE COOLING TOWER FAN WITH THE LOWEST RUNTIME WILL AUTOMATICALLY START WHEN THE COOLING BYPASS VALVE IS INDEXED FOR FLOW OVER THE TOWER AND MORE COOLING IS REQUIRED. THE COOLING TOWER FAN WILL CHANGE SPEEDS TO MAINTAIN CONDENSER WATER SETPOINT. IF FURTHER COOLING IS REQUIRED THE NEXT CELL WILL BE ENABLED AND OPERATE SIMULARLY WHILE, THIS CELL PROVIDES MAXIMUM COOLING. IF FOR ANY REASON ITS FAN STATUS DOES NOT MATCH ITS COMMANDED VALUE AN ALARM WILL BE GENERATED.

Drawing Title: **Chiller Flow Layout**

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN BY	DRAWN DATE	APPROVED BY	APPROVED DATE

Project Title: **Charlottesville Airport Controls Upgrade**

Johnson Controls

Branch Information: **2315 Commerce Center Dr Suite D Rockville VA 23146**

CONTRACT NUMBER: **1-2744395808**

DRAWING NUMBER: **CH-1**

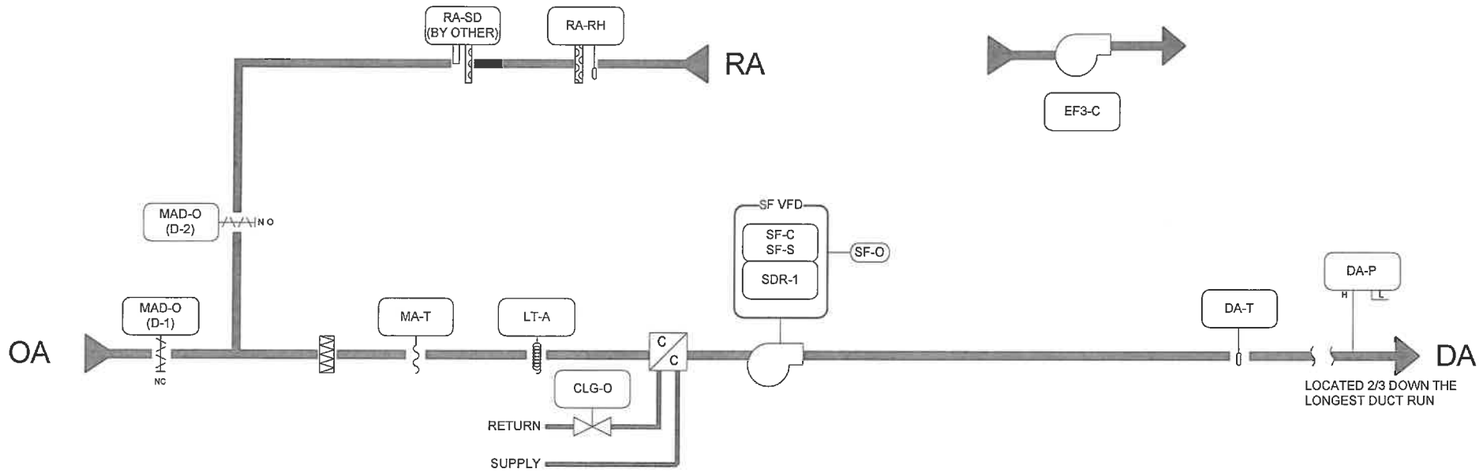
8105

Electrician/Fitter		Point Information			Controller Information							Panel Information							Intermediate Device
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	Module Type	Termination Out	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring /Tubing	Termination In	Device
					FEC 26xx														
					FEC 26xx	MS/TP	1	8						0					
	UI IN-1	CHILLER	CWS-T	Condenser Water Supply Tem	FEC 26xx	MS/TP	1	8	UI IN-1					0		-8-UI IN-1			
	UI IN-2	CHILLER	PCHWR-T	Primary CHW Return Temp	FEC 26xx	MS/TP	1	8	UI IN-2					0		-8-UI IN-2			
	UI IN-3	CHILLER	PCHWS-T	Primary CHW Supply Temp	FEC 26xx	MS/TP	1	8	UI IN-3					0		-8-UI IN-3			
	UI IN-4	CHILLER	CWP2-S	Condenser Water Pump 2 Stat	FEC 26xx	MS/TP	1	8	UI IN-4					0		-8-UI IN-4			
	UI IN-5	CHILLER	PCHWP1-S	Primary CHW Pump 1 Status	FEC 26xx	MS/TP	1	8	UI IN-5					0		-8-UI IN-5			
	UI IN-6	CHILLER	PCHWP2-S	Primary CHW Pump 2 Status	FEC 26xx	MS/TP	1	8	UI IN-6					0		-8-UI IN-6			
	BI IN-7	CHILLER	CH1-S	Chiller 1 Status	FEC 26xx	MS/TP	1	8	BI IN-7					0		-8-BI IN-7			
	BI IN-8	CHILLER	CWP1-S	Condenser Water Pump 1 Stat	FEC 26xx	MS/TP	1	8	BI IN-8					0		-8-BI IN-8			
	BO OUT-1	CHILLER	CH1-EN	Chiller 1 Enable	FEC 26xx	MS/TP	1	8	BO OUT-1					0		-8-BO OUT-1			
	BO OUT-2	CHILLER	CWP1-C	Condenser Water Pump 1 Cor	FEC 26xx	MS/TP	1	8	BO OUT-2					0		-8-BO OUT-2			
	BO OUT-3	CHILLER	CWP2-C	Condenser Water Pump 2 Cor	FEC 26xx	MS/TP	1	8	BO OUT-3					0		-8-BO OUT-3			
	CO OUT-4	CHILLER	PCHWP1-C	Primary CHW Pump 1 Comma	FEC 26xx	MS/TP	1	8	CO OUT-4					0		-8-CO OUT-4			
	CO OUT-5	CHILLER	PCHWP2-C	Primary CHW Pump 2 Comma	FEC 26xx	MS/TP	1	8	CO OUT-5					0		-8-CO OUT-5			
	CO OUT-6	CHILLER	CT1L-C	Tower 1 LO Command	FEC 26xx	MS/TP	1	8	CO OUT-6					0		-8-CO OUT-6			
	CO OUT-7	CHILLER	CT1H-C	Tower 1 HI Command	FEC 26xx	MS/TP	1	8	CO OUT-7					0		-8-CO OUT-7			
	AO OUT-8	CHILLER	CTV-O	Tower Valve Output	FEC 26xx	MS/TP	1	8	AO OUT-8					0		-8-AO OUT-8			
	AO OUT-9	CHILLER			FEC 26xx	MS/TP	1	8	AO OUT-9					0		-8-AO OUT-9			
					IOM 4710														
					IOM 4710	SA Bus	1	4						0					
	UI IN-1	CHILLER			IOM 4710	SA Bus	1	4	UI IN-1					0		8--4-UI IN-1			
	UI IN-2	CHILLER			IOM 4710	SA Bus	1	4	UI IN-2					0		8--4-UI IN-2			
	UI IN-3	CHILLER			IOM 4710	SA Bus	1	4	UI IN-3					0		8--4-UI IN-3			
	UI IN-4	CHILLER			IOM 4710	SA Bus	1	4	UI IN-4					0		8--4-UI IN-4			
	UI IN-5	CHILLER			IOM 4710	SA Bus	1	4	UI IN-5					0		8--4-UI IN-5			
	UI IN-6	CHILLER			IOM 4710	SA Bus	1	4	UI IN-6					0		8--4-UI IN-6			
	BI IN-7	CHILLER	CT1-S	Tower 1 Status	IOM 4710	SA Bus	1	4	BI IN-7					0		8--4-BI IN-7			
	BI IN-8	CHILLER			IOM 4710	SA Bus	1	4	BI IN-8					0		8--4-BI IN-8			
	BO OUT-1	CHILLER			IOM 4710	SA Bus	1	4	BO OUT-1					0		8--4-BO OUT-1			
	BO OUT-2	CHILLER			IOM 4710	SA Bus	1	4	BO OUT-2					0		8--4-BO OUT-2			
	BO OUT-3	CHILLER			IOM 4710	SA Bus	1	4	BO OUT-3					0		8--4-BO OUT-3			
	CO OUT-4	CHILLER			IOM 4710	SA Bus	1	4	CO OUT-4					0		8--4-CO OUT-4			
	CO OUT-5	CHILLER			IOM 4710	SA Bus	1	4	CO OUT-5					0		8--4-CO OUT-5			
	CO OUT-6	CHILLER			IOM 4710	SA Bus	1	4	CO OUT-6					0		8--4-CO OUT-6			
	CO OUT-7	CHILLER			IOM 4710	SA Bus	1	4	CO OUT-7					0		8--4-CO OUT-7			
	AO OUT-8	CHILLER			IOM 4710	SA Bus	1	4	AO OUT-8					0		8--4-AO OUT-8			
	AO OUT-9	CHILLER			IOM 4710	SA Bus	1	4	AO OUT-9					0		8--4-AO OUT-9			

AHU-1

BILL OF MATERIALS

Designation	Qty	Part Number	Description
RA-T,DA-T	2	TE-6311M-1	1000 OHM NICKEL SENSOR
MA-T	1	TE-6316M-1	NICKEL DUCT AVERAGE SENSOR
AHU-1	1	MS-FEC2621-0	17 PT FIELD EQUIPMENT CONTROLLER



SUPPLY FAN START/STOP: THE SUPPLY FAN WILL BE STARTED ACCORDING TO THE SCHEDULE. IF THE SUPPLY FAN STATUS DOES NOT MATCH THE COMMANDED VALUE, AN ALARM WILL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

STATIC PRESSURE CONTROL: THE SUPPLY FAN WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE AT SETPOINT 1.0 INWC (ADJUSTABLE).

DISCHARGE AIR CONTROL: THE MIXED AIR DAMPERS, AND THE COOLING VALVE WILL MODULATE IN SEQUENCE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT SETPOINT 55 DEGF (ADJUSTABLE).

MIXED AIR LOW LIMIT OVERRIDE: THE MIXED AIR TEMPERATURE WILL OVERRIDE THE MINIMUM POSITION AND CLOSE THE OUTSIDE AIR DAMPER IF A TEMPERATURE IS SENSED BELOW THE SETPOINT 50 DEGF (ADJUSTABLE).

ECONOMIZER DRY BULB SWITCHOVER: WHEN THE SHARED OUTSIDE AIR TEMPERATURE IS BELOW THE SWITCHOVER SETPOINT, THE ECONOMIZER WILL BE ENABLED. WHEN THE SHARED OUTSIDE AIR TEMPERATURE RISES ABOVE THE SWITCHOVER SETPOINT PLUS A DIFFERENTIAL, THE ECONOMIZER WILL BE DISABLED.

EXHUAST FAN-3: WHEN THE BUILDING IS OCCUPIED BY SCHEDULE THE EXHUAST FAN WILL BE STARTED.

SAFETY:

ALL OF THE SAFETY DEVICES ARE MANUAL RESET; THE DEVICE THAT HAS TRIPPED MUST BE MANUALLY RESET BEFORE RESTARTING THE AIR HANDLING UNIT.

IF A TEMPERATURE LOW LIMIT SWITCH SENSES A TEMPERATURE BELOW SETPOINT THE SUPPLY FAN WILL BE SHUTDOWN.

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

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

Drawing Title
AHU 1 Flow Layout

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN BY	DRAWN DATE	APPROVED BY	APPROVED DATE

Project Title
Charlottesville Airport Controls Upgrade

Johnson Controls

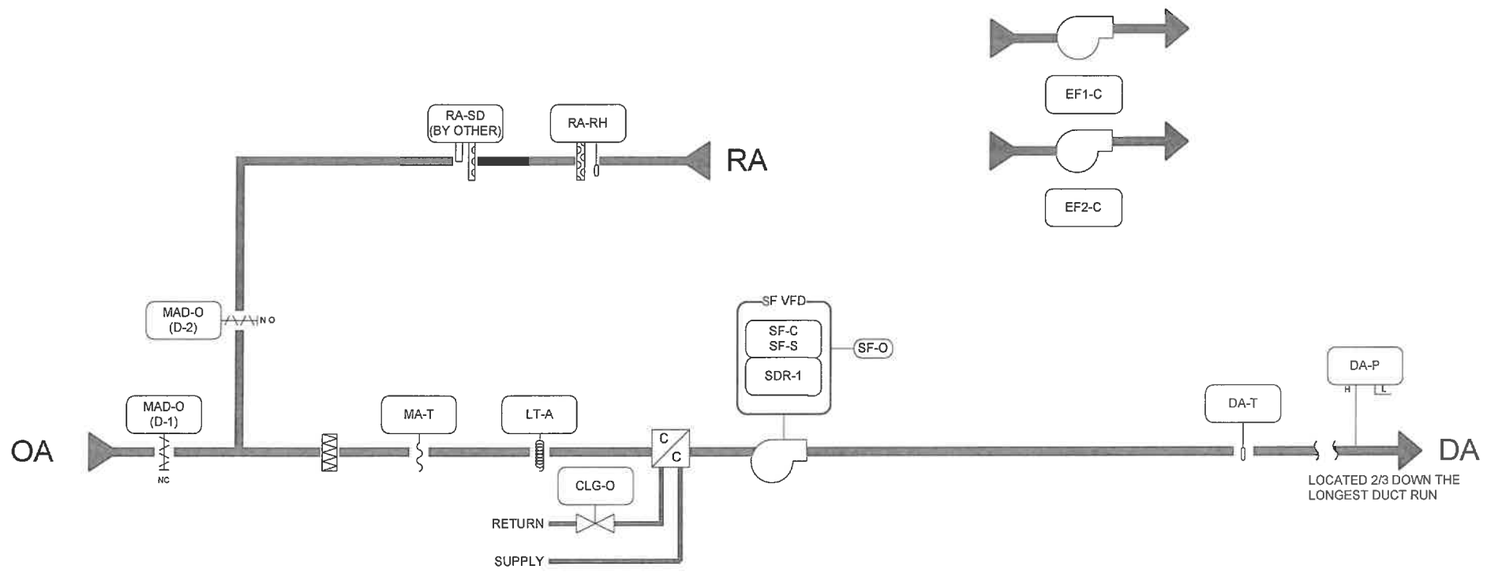
Branch Information
2315 Commerce Center Dr
Suite D
Rockville VA 23146

CONTRACT NUMBER
1-2744395808

DRAWING NUMBER
AH1-1

Electrician/Fitter		Point Information			Controller Information							Panel Information							Intermediate Device	
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	Module Type	Termination Out	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring /Tubing	Termination In	Device	
					FEC 26xx															
					FEC 26xx	MS/TP	1	4						0						
	UI IN-1	AHU-1	DA-T	Discharge Air Temperature	FEC 26xx	MS/TP	1	4	UI IN-1					0		-4-UI IN-1				
	UI IN-2	AHU-1	DA1-P	Discharge Air Static Pressure	FEC 26xx	MS/TP	1	4	UI IN-2					0		-4-UI IN-2				
	UI IN-3	AHU-1	MA-T	Mixed Air Temperature	FEC 26xx	MS/TP	1	4	UI IN-3					0		-4-UI IN-3				
	UI IN-4	AHU-1	RA-T	Return Air Temperature	FEC 26xx	MS/TP	1	4	UI IN-4					0		-4-UI IN-4				
	UI IN-5	AHU-1	RA-H	Return Air Humidity	FEC 26xx	MS/TP	1	4	UI IN-5					0		-4-UI IN-5				
	UI IN-6	AHU-1			FEC 26xx	MS/TP	1	4	UI IN-6					0		-4-UI IN-6				
	BI IN-7	AHU-1	LT-A	Low Temperature Alarm	FEC 26xx	MS/TP	1	4	BI IN-7					0		-4-BI IN-7				
	BI IN-8	AHU-1	SF-S	Supply Fan Status	FEC 26xx	MS/TP	1	4	BI IN-8					0		-4-BI IN-8				
	BO OUT-1	AHU-1	EF3-C	Exhaust Fan 3 Command	FEC 26xx	MS/TP	1	4	BO OUT-1					0		-4-BO OUT-1				
	BO OUT-2	AHU-1	SF-C	Supply Fan Command	FEC 26xx	MS/TP	1	4	BO OUT-2					0		-4-BO OUT-2				
	BO OUT-3	AHU-1			FEC 26xx	MS/TP	1	4	BO OUT-3					0		-4-BO OUT-3				
	CO OUT-4	AHU-1	SF-O	Supply Fan Output	FEC 26xx	MS/TP	1	4	CO OUT-4					0		-4-CO OUT-4				
	CO OUT-5	AHU-1			FEC 26xx	MS/TP	1	4	CO OUT-5					0		-4-CO OUT-5				
	CO OUT-6	AHU-1			FEC 26xx	MS/TP	1	4	CO OUT-6					0		-4-CO OUT-6				
	CO OUT-7	AHU-1			FEC 26xx	MS/TP	1	4	CO OUT-7					0		-4-CO OUT-7				
	AO OUT-8	AHU-1	CLG-O	Cooling Output	FEC 26xx	MS/TP	1	4	AO OUT-8					0		-4-AO OUT-8				
	AO OUT-9	AHU-1	MAD-O	Mixed Air Damper Output	FEC 26xx	MS/TP	1	4	AO OUT-9					0		-4-AO OUT-9				

AHU-2



BILL OF MATERIALS

Designation	Qty	Part Number	Description
RA-T,DA-T	2	TE-6311M-1	1000 OHM NICKEL SENSOR
MA-T	1	TE-6316M-1	NICKEL DUCT AVERAGE SENSOR
AHU-2	1	MS-FEC2621-0	17 PT FIELD EQUIPMENT CONTROLLER

SUPPLY FAN START/STOP: THE SUPPLY FAN WILL BE STARTED ACCORDING TO THE SCHEDULE. IF THE SUPPLY FAN STATUS DOES NOT MATCH THE COMMANDED VALUE, AN ALARM WILL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

STATIC PRESSURE CONTROL: THE SUPPLY FAN WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE AT SETPOINT 1.0 INWC (ADJUSTABLE).

DISCHARGE AIR CONTROL: THE MIXED AIR DAMPERS, AND THE COOLING VALVE WILL MODULATE IN SEQUENCE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT SETPOINT 55 DEGF (ADJUSTABLE).

MIXED AIR LOW LIMIT OVERRIDE: THE MIXED AIR TEMPERATURE WILL OVERRIDE THE MINIMUM POSITION AND CLOSE THE OUTSIDE AIR DAMPER IF A TEMPERATURE IS SENSED BELOW THE SETPOINT 50 DEGF (ADJUSTABLE).

ECONOMIZER DRY BULB SWITCHOVER: WHEN THE SHARED OUTSIDE AIR TEMPERATURE IS BELOW THE SWITCHOVER SETPOINT, THE ECONOMIZER WILL BE ENABLED. WHEN THE SHARED OUTSIDE AIR TEMPERATURE RISES ABOVE THE SWITCHOVER SETPOINT PLUS A DIFFERENTIAL, THE ECONOMIZER WILL BE DISABLED.

EXHUAST FANS-1&2: WHEN THE BUILDING IS OCCUPIED BY SCHEDULE THE EXHUAST FANS WILL BE STARTED.

SAFETY:
ALL OF THE SAFETY DEVICES ARE MANUAL RESET; THE DEVICE THAT HAS TRIPPED MUST BE MANUALLY RESET BEFORE RESTARTING THE AIR HANDLING UNIT.
IF A TEMPERATURE LOW LIMIT SWITCH SENSES A TEMPERATURE BELOW SETPOINT THE SUPPLY FAN WILL BE SHUTDOWN.
IF A FIRE ALARM SHUTDOWN CONTACT IS PROVIDED, THE SUPPLY FAN WILL BE SHUTDOWN WHEN TRIGGERED.

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

Drawing Title: **AHU-2 Flow Layout**

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN BY	DRAWN DATE	APPROVED BY	APPROVED DATE

Project Title: **Charlottesville Airport Controls Upgrade**

Johnson Controls

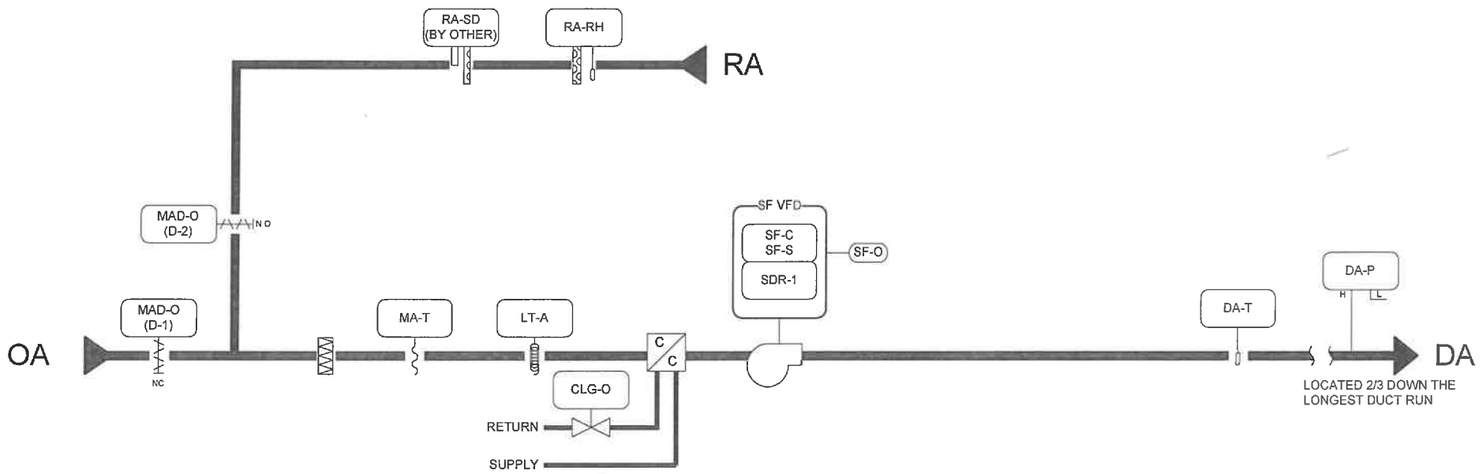
Branch Information: **2315 Commerce Center Dr Suite D Rockville VA 23146**

CONTRACT NUMBER: **1-2744395808**

DRAWING NUMBER: **AH2-1**

Electrician/Fitter		Point Information			Controller Information							Panel Information							Intermediate Device	
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	Module Type	Termination Out	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring /Tubing	Termination In	Device
					FEC 26xx														
					FEC 26xx	MS/TP	1	5						0					
	UI IN-1	AHU-2	DA-T	Discharge Air Temperature	FEC 26xx	MS/TP	1	5	UI IN-1					0		-5-UI IN-1			
	UI IN-2	AHU-2	DA1-P	Discharge Air Static Pressure 1	FEC 26xx	MS/TP	1	5	UI IN-2					0		-5-UI IN-2			
	UI IN-3	AHU-2	MA-T	Mixed Air Temperature	FEC 26xx	MS/TP	1	5	UI IN-3					0		-5-UI IN-3			
	UI IN-4	AHU-2	RA-T	Return Air Temperature	FEC 26xx	MS/TP	1	5	UI IN-4					0		-5-UI IN-4			
	UI IN-5	AHU-2	RA-H	Return Air Humidity	FEC 26xx	MS/TP	1	5	UI IN-5					0		-5-UI IN-5			
	UI IN-6	AHU-2			FEC 26xx	MS/TP	1	5	UI IN-6					0		-5-UI IN-6			
	BI IN-7	AHU-2	LT-A	Low Temperature Alarm	FEC 26xx	MS/TP	1	5	BI IN-7					0		-5-BI IN-7			
	BI IN-8	AHU-2	SF-S	Supply Fan Status	FEC 26xx	MS/TP	1	5	BI IN-8					0		-5-BI IN-8			
	BO OUT-1	AHU-2	EF2-C	Exhaust Fan 2 Command	FEC 26xx	MS/TP	1	5	BO OUT-1					0		-5-BO OUT-1			
	BO OUT-2	AHU-2	EF1-C	Exhaust Fan 1 Command	FEC 26xx	MS/TP	1	5	BO OUT-2					0		-5-BO OUT-2			
	BO OUT-3	AHU-2	SF-C	Supply Fan Command	FEC 26xx	MS/TP	1	5	BO OUT-3					0		-5-BO OUT-3			
	CO OUT-4	AHU-2	SF-O	Supply Fan Output	FEC 26xx	MS/TP	1	5	CO OUT-4					0		-5-CO OUT-4			
	CO OUT-5	AHU-2			FEC 26xx	MS/TP	1	5	CO OUT-5					0		-5-CO OUT-5			
	CO OUT-6	AHU-2			FEC 26xx	MS/TP	1	5	CO OUT-6					0		-5-CO OUT-6			
	CO OUT-7	AHU-2			FEC 26xx	MS/TP	1	5	CO OUT-7					0		-5-CO OUT-7			
	AO OUT-8	AHU-2	CLG-O	Cooling Output	FEC 26xx	MS/TP	1	5	AO OUT-8					0		-5-AO OUT-8			
	AO OUT-9	AHU-2	MAD-O	Mixed Air Damper Output	FEC 26xx	MS/TP	1	5	AO OUT-9					0		-5-AO OUT-9			

AHU-3



BILL OF MATERIALS

Designation	Qty	Part Number	Description
RA-T,DA-T	2	TE-6311M-1	1000 OHM NICKEL SENSOR
MA-T	1	TE-6316M-1	NICKEL DUCT AVERAGE SENSOR
AHU-3	1	MS-FEC2621-0	17 PT FIELD EQUIPMENT CONTROLLER

SUPPLY FAN START/STOP: THE SUPPLY FAN WILL BE STARTED ACCORDING TO THE SCHEDULE. IF THE SUPPLY FAN STATUS DOES NOT MATCH THE COMMANDED VALUE, AN ALARM WILL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

STATIC PRESSURE CONTROL: THE SUPPLY FAN WILL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE AT SETPOINT 1.0 INWC (ADJUSTABLE).

DISCHARGE AIR CONTROL: THE MIXED AIR DAMPERS, AND THE COOLING VALVE WILL MODULATE IN SEQUENCE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT SETPOINT 55 DEGF (ADJUSTABLE).

MIXED AIR LOW LIMIT OVERRIDE: THE MIXED AIR TEMPERATURE WILL OVERRIDE THE MINIMUM POSITION AND CLOSE THE OUTSIDE AIR DAMPER IF A TEMPERATURE IS SENSED BELOW THE SETPOINT 50 DEGF (ADJUSTABLE).

ECONOMIZER DRY BULB SWITCHOVER: WHEN THE SHARED OUTSIDE AIR TEMPERATURE IS BELOW THE SWITCHOVER SETPOINT, THE ECONOMIZER WILL BE ENABLED. WHEN THE SHARED OUTSIDE AIR TEMPERATURE RISES ABOVE THE SWITCHOVER SETPOINT PLUS A DIFFERENTIAL, THE ECONOMIZER WILL BE DISABLED.

SAFETY:

ALL OF THE SAFETY DEVICES ARE MANUAL RESET; THE DEVICE THAT HAS TRIPPED MUST BE MANUALLY RESET BEFORE RESTARTING THE AIR HANDLING UNIT.

IF A TEMPERATURE LOW LIMIT SWITCH SENSES A TEMPERATURE BELOW SETPOINT THE SUPPLY FAN WILL BE SHUTDOWN.

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

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

Drawing Title: **AHU-3 Flow Layout**

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN BY	DRAWN DATE	APPROVED BY	APPROVED DATE

Project Title: **Charlottesville Airport Controls Upgrade**

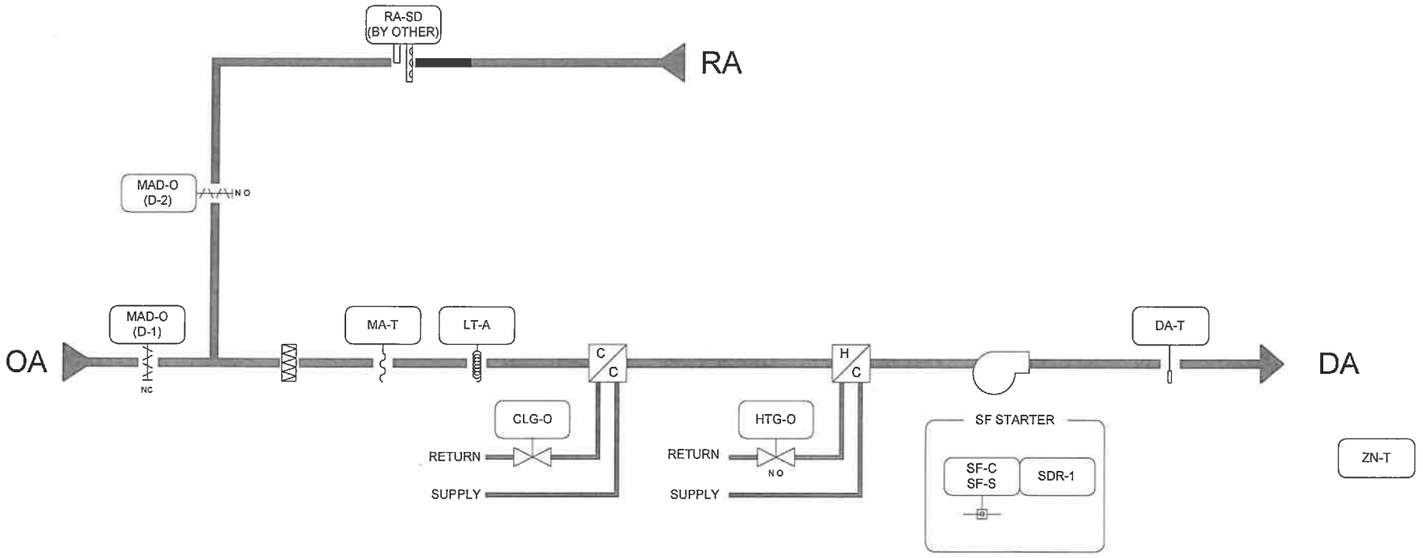
Johnson Controls

Branch Information
2315 Commerce Center Dr
Suite D
Rockville VA 23146

CONTRACT NUMBER: **1-2744395808**

DRAWING NUMBER: **AH3-1**

AHU-5



BILL OF MATERIALS

Designation	Qty	Part Number	Description
RA-T,DA-T	2	TE-6311M-1	1000 OHM NICKEL SENSOR
MA-T	1	TE-6316M-1	NICKEL DUCT AVERAGE SENSOR
AHU-5	1	MS-FEC2621-0	17 PT FIELD EQUIPMENT CONTROLLER

SUPPLY FAN START/STOP: THE SUPPLY FAN WILL BE STARTED ACCORDING TO THE SCHEDULE. IF THE SUPPLY FAN STATUS DOES NOT MATCH THE COMMANDED VALUE, AN ALARM WILL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED.

DISCHARGE AIR CONTROL: THE DISCHARGE AIR TEMPERATURE SETPOINT WILL RESET AS NECESSARY TO MAINTAIN THE RETURN TEMPERATURE SETPOINT AS SENSED BY THE RETURN TEMPERATURE SENSOR. THE MIXED AIR DAMPERS, HEATING VALVE, AND THE COOLING VALVE WILL MODULATE IN SEQUENCE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT SETPOINT.

MIXED AIR LOW LIMIT OVERRIDE: THE MIXED AIR TEMPERATURE WILL OVERRIDE THE MINIMUM POSITION AND CLOSE THE OUTSIDE AIR DAMPER IF A TEMPERATURE IS SENSED BELOW THE SETPOINT.

ECONOMIZER DRY BULB SWITCHOVER: WHEN THE SHARED OUTSIDE AIR TEMPERATURE IS BELOW THE SWITCHOVER SETPOINT, THE ECONOMIZER WILL BE ENABLED. WHEN THE SHARED OUTSIDE AIR TEMPERATURE RISES ABOVE THE SWITCHOVER SETPOINT PLUS A DIFFERENTIAL, THE ECONOMIZER WILL BE DISABLED.

SAFETY:

ALL OF THE SAFETY DEVICES ARE MANUAL RESET; THE DEVICE THAT HAS TRIPPED MUST BE MANUALLY RESET BEFORE RESTARTING THE AIR HANDLING UNIT.

IF A TEMPERATURE LOW LIMIT SWITCH SENSES A TEMPERATURE BELOW SETPOINT THE SUPPLY FAN WILL BE SHUTDOWN.

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

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
OUTSIDE AIR DAMPER WILL CLOSE
RETURN AIR DAMPER WILL OPEN
COOLING VALVE WILL CLOSE
HEATING VALVE WILL CLOSE

Drawing Title: **AHU 5 Flow Layout**

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN BY	DRAWN DATE	APPROVED BY	APPROVED DATE

Project Title: **Charlottesville Airport Controls Upgrade**

Johnson Controls

Branch Information
2315 Commerce Center Dr
Suite D
Rockville VA 23146

CONTRACT NUMBER: **1-2744395808**

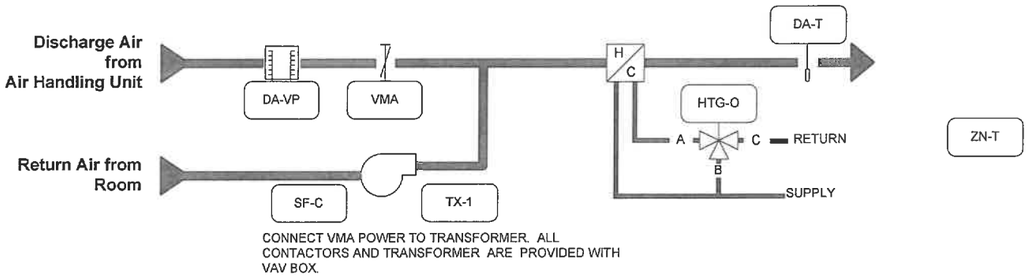
DRAWING NUMBER: **AH5-1**

Electrician/Fitter		Point Information			Controller Information							Panel Information							Intermediate Device
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	Module Type	Termination Out	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring /Tubing	Termination In	Device
					FEC 26xx														
					FEC 26xx	MS/TP	1	7						0					
	UI IN-1	AHU-5	DA-T	Discharge Air Temperature	FEC 26xx	MS/TP	1	7	UI IN-1					0		-7-UI IN-1			
	UI IN-2	AHU-5	MA-T	Mixed Air Temperature	FEC 26xx	MS/TP	1	7	UI IN-2					0		-7-UI IN-2			
	UI IN-3	AHU-5	RA-T	Return Air Temperature	FEC 26xx	MS/TP	1	7	UI IN-3					0		-7-UI IN-3			
	UI IN-4	AHU-5	RA-H	Return Air Humidity	FEC 26xx	MS/TP	1	7	UI IN-4					0		-7-UI IN-4			
	UI IN-5	AHU-5			FEC 26xx	MS/TP	1	7	UI IN-5					0		-7-UI IN-5			
	UI IN-6	AHU-5			FEC 26xx	MS/TP	1	7	UI IN-6					0		-7-UI IN-6			
	BI IN-7	AHU-5	LT-A	Low Temperature Alarm	FEC 26xx	MS/TP	1	7	BI IN-7					0		-7-BI IN-7			
	BI IN-8	AHU-5	SF-S	Supply Fan Status	FEC 26xx	MS/TP	1	7	BI IN-8					0		-7-BI IN-8			
	BO OUT-1	AHU-5	SF-C	Supply Fan Command	FEC 26xx	MS/TP	1	7	BO OUT-1					0		-7-BO OUT-1			
	BO OUT-2	AHU-5			FEC 26xx	MS/TP	1	7	BO OUT-2					0		-7-BO OUT-2			
	BO OUT-3	AHU-5			FEC 26xx	MS/TP	1	7	BO OUT-3					0		-7-BO OUT-3			
	CO OUT-4	AHU-5	RH-O	Reheat Output	FEC 26xx	MS/TP	1	7	CO OUT-4					0		-7-CO OUT-4			
	CO OUT-5	AHU-5			FEC 26xx	MS/TP	1	7	CO OUT-5					0		-7-CO OUT-5			
	CO OUT-6	AHU-5			FEC 26xx	MS/TP	1	7	CO OUT-6					0		-7-CO OUT-6			
	CO OUT-7	AHU-5			FEC 26xx	MS/TP	1	7	CO OUT-7					0		-7-CO OUT-7			
	AO OUT-8	AHU-5	CLG-O	Cooling Output	FEC 26xx	MS/TP	1	7	AO OUT-8					0		-7-AO OUT-8			
	AO OUT-9	AHU-5	MAD-O	Mixed Air Damper Output	FEC 26xx	MS/TP	1	7	AO OUT-9					0		-7-AO OUT-9			

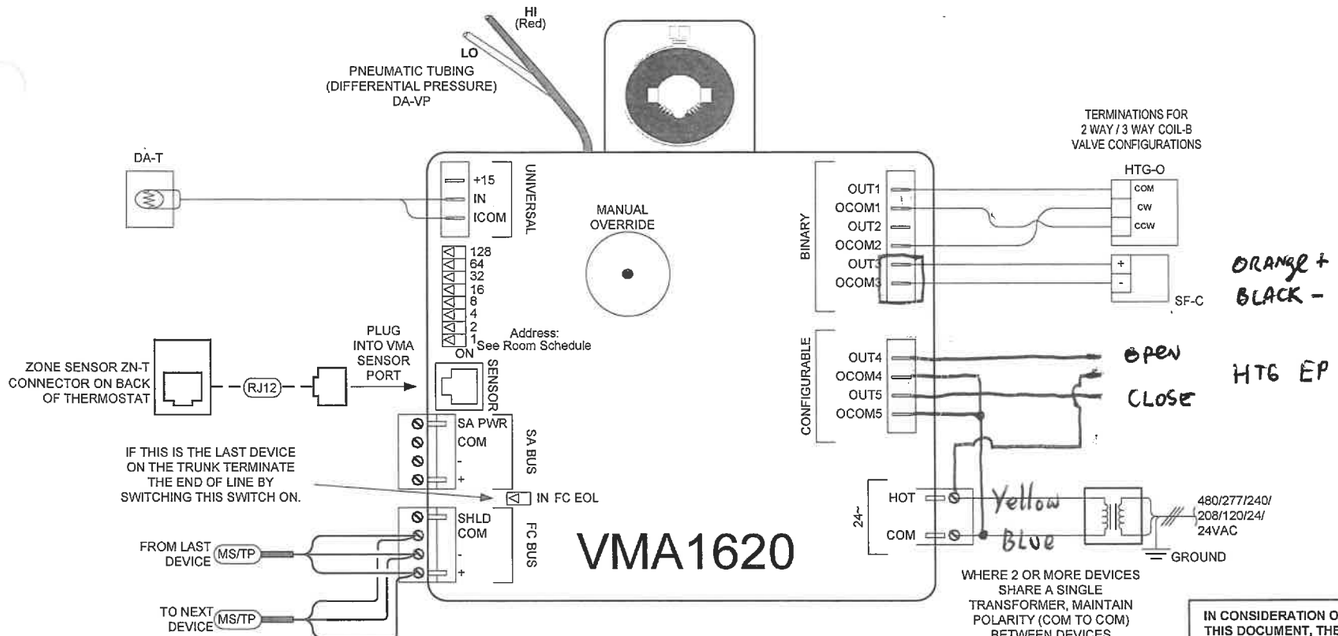
VAV System

BILL OF MATERIALS

Designation	Qty	Part Number	Description
ZN-T	62	NS-BTN7001-0	NETWORK SENSOR
DA-T	62	TE-631GV-2	4 INCH NICKEL DUCT SENSOR
VAV	62	MS-VMA1620-0	BACNET MS/TP VAV CONTROLLER



CONNECT VMA POWER TO TRANSFORMER. ALL CONTACTORS AND TRANSFORMER ARE PROVIDED WITH VAV BOX.



WHERE 2 OR MORE DEVICES SHARE A SINGLE TRANSFORMER, MAINTAIN POLARITY (COM TO COM) BETWEEN DEVICES

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 WILL BE FULLY CLOSED. ON A RISE IN ZONE TEMPERATURE ABOVE THE COOLING SETPOINT, THE PRIMARY AIR DAMPER WILL INCREASE THE CFM AND THE REHEAT VALVE REMAINS FULLY CLOSED. ON A DROP IN ZONE TEMPERATURE BELOW THE HEATING SETPOINT, THE FAN WILL CYCLE ON, 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 OF THE FAN-POWERED 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 WILL BE AT THE MINIMUM CFM AND THE REHEAT VALVE WILL BE FULLY CLOSED. ON A RISE IN ZONE TEMPERATURE ABOVE THE UNOCCUPIED COOLING SETPOINT, THE PRIMARY AIR DAMPER WILL INCREASE THE CFM (IF AVAILABLE) AND THE REHEAT VALVE REMAINS FULLY CLOSED. ON A DROP IN ZONE TEMPERATURE BELOW THE UNOCCUPIED HEATING SETPOINT, THE FAN WILL CYCLE ON, THE REHEAT VALVE MODULATES OPEN AND THE DAMPER REMAIN FULLY CLOSED.

FOR BOX PARAMETERS AND SETTINGS SEE THE ROOM SCHEDULE

Drawing Title: **VAV Flow Layout**

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN BY	DRAWN DATE	APPROVED BY	APPROVED DATE

Project Title: **Charlottesville Airport Controls Upgrade**

Johnson Controls

Branch Information: **2315 Commerce Center Dr Suite D Rockville VA 23146**

CONTRACT NUMBER: **1-2744395808**

DRAWING NUMBER: **VAV-1**

25007

Electrician/Fitter		Point Information			Controller Information							Panel Information							Intermediate Device	
Tag	Point Type	System Name	Object Name	Expanded ID	Controller Details	Trunk Type	Trunk Nbr	Trunk Addr.	Cable Destination Bay/Terminal	Module Type	Termination Out	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring /Tubing	Termination In	Device	
					VMA 1620															
					VMA 1620	MS/TP	1	10						0						
	UI IN-1	VAV-00	DA-T	Discharge Air Temperature	VMA 1620	MS/TP	1	10	UI IN-1					0		-10-UI IN-1				
	BO OUT-1	VAV-00	HTG-O	Heating Output	VMA 1620	MS/TP	1	10	BO OUT-1					0		-10-BO OUT-1				
	BO OUT-2	VAV-00	HTG-O	Heating Output	VMA 1620	MS/TP	1	10	BO OUT-2					0		-10-BO OUT-2				
	BO OUT-3	VAV-00	SF-C	Supply Fan Command	VMA 1620	MS/TP	1	10	BO OUT-3					0		-10-BO OUT-3				
	CO OUT-4	VAV-00			VMA 1620	MS/TP	1	10	CO OUT-4					0		-10-CO OUT-4				
	CO OUT-5	VAV-00			VMA 1620	MS/TP	1	10	CO OUT-5					0		-10-CO OUT-5				
		VAV-00			NET STAT															
		VAV-00			NET STAT	SA Bus	1	199						0						
	STAT	VAV-00	ZN-T	Zone Temperature	NET STAT	SA Bus	1	199	STAT					0		10--199-STAT				

Contract Name
Contract Number

Room Schedule

Box Location								Controller Information						Box Information											
	Room								Controller Required							Box Config Required						Required (N2)			
Bldg./Flr.	No.	Name	System Name	Mech. Dwg.	System Serving this Box	Box Mfgr.	Mfgr Box Type	JCI Ctrl Dwg No.	Controller Part No.	NC/ NAE Addr	Trunk ID	Device Addr	CSModel or Template	Box Heat	Supplemental Heat	Config File Name	Inlet Size (Inches)	Inlet Area (Sq. Ft.)	K Factor	Clg Min Flow	Clg Max Flow	VMA Box Config	Comments	Generate Flag
			VAV1-01							1	1	10												
			VAV1-02							1	1	11												
			VAV1-03							1	1	12												
			VAV1-04							1	1	13												
			VAV1-05							1	1	14												
			VAV1-06							1	1	15												
			VAV1-07							1	1	16												
			VAV1-08							1	1	17												
			VAV1-09							1	1	18												
			VAV1-10							1	1	19												
			VAV1-11							1	1	20												
			VAV1-12							1	1	21												
			VAV1-13							1	1	22												
			VAV1-14							1	1	23												
			VAV1-15							1	1	24												
			VAV1-16							1	1	25												
			VAV1-17							1	1	26												
			VAV1-18							1	1	27												
			VAV1-19							1	1	28												
			VAV1-20							1	1	29												
			VAV1-21							1	1	30												
			VAV1-22							1	1	31												
			VAV1-23							1	1	32												
			VAV1-25							1	1	33												
			VAV1-26							1	1	34												
			VAV1-27							1	1	35												
			VAV1-28							1	1	36												
			VAV1-29							1	1	37												
			VAV1-30							1	1	38												
			VAV1-31							1	1	39												
			VAV1-32							1	1	40												
			VAV1-33							1	1	41												
			VAV1-34							1	1	42												
			VAV1-35							1	2	4												
			VAV1-36							1	2	5												
			VAV1-37							1	2	6												
			VAV1-38							1	2	7												
			VAV1-39							1	2	8												
			VAV1-40							1	2	9												
			VAV1-41							1	2	10												
			VAV1-42							1	2	11												
			VAV1-43							1	2	12												
			VAV1-44							1	2	13												
			VAV1-45							1	2	14												
			VAV1-46							1	2	15												
			VAV2-01							1	2	16												
			VAV2-02							1	2	17												
			VAV2-04							1	2	18												
			VAV2-05							1	2	19												
			VAV2-06							1	2	20												
			VAV2-07							1	2	21												

Contract Name
Contract Number

Room Schedule

Box Location								Controller Information						Box Information										
	Room								Controller Required							Box Config Required						Required (N2)		
Bldg./Flr.	No.	Name	System Name	Mech. Dwg.	System Serving this Box	Box Mfgr.	Mfgr Box Type	JCI Ctrl Dwg No.	Controller Part No.	NC/ NAE Addr	Trunk ID	Device Addr	CSModel or Template	Box Heat	Supplemental Heat	Config File Name	Inlet Size (Inches)	Inlet Area (Sq. Ft.)	K Factor	Clg Min Flow	Clg Max Flow	VMA Box Config	Comments	Generate Flag
			VAV2-08							1	2	22												
			VAV2-09							1	2	23												
			VAV2-10							1	2	24												
			VAV2-11							1	2	25												
			VAV2-12							1	2	26												
			VAV2-13							1	2	27												
			VAV2-14							1	2	28												
			VAV2-15							1	2	29												
			VAV2-16							1	2	30												
			VAV2-17							1	2	31												
			VAV2-18							1	2	32												