ROME-FLOYD COUNTY
LAW ENFORCEMENT CENTER

5 GOVERNMENT PLAZA
ROME, GA 30161

CHILLER REPLACEMENT
AND
CONTROLS UPGRADE

DRAWING INDEX

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RYAN DAVIS, FACILITIES DIRECTOR

LAW ENFORCEMENT CENTER

CHILLER REPLACEMENT
AND
CONTROLS UPGRADE

DRINKARD
ENGINEERING GROUP, INC.
119 SOUTH BROAD ST. ROME, GA 30161
PH. (706) 237-6013

GEORGIA REGISTERED PE030294 PROFESSIONAL ENGINEER JEFFREY A. DRINKARD

9/26/14

	ISSUED FOR BID	9/26/14
-	-	-

DRAWING TITLE
DRAWING INDEX

PROJECT NO.		SCALE AS SHOWN	
APPROVED	CHECKED JD	DRAWN JD	DATE 9/26/14

DRAWING NO.
M-1.0

EXISTING FAN POWERED VAV UNITS (FPV)

MARK	CONFIGURATION	AIR VALVE MAX CFM	AIR VALVE MIN CFM	FAN CFM	ELECTRIC HEAT STEPS	NOTES
FPV 1–1	PARALLEL	1400	460	1060	3	1 2 3
FPV 1–2	PARALLEL	970	320	720	2	1 2 3
FPV 1–3	PARALLEL	600	200	400	1	1 2 3
FPV 1–4	PARALLEL	560	240	400	1	1 2 3
FPV 1–5	PARALLEL	480	160	320	1	1 2 3
FPV 1–6	PARALLEL	1500	500	1100	3	1 2 3
FPV 1–7	PARALLEL	230	85	160	1	1 2 3
FPV 1–8	PARALLEL	2320	775	1550	3	1 2 3
FPV 1–9	PARALLEL	2320	775	1550	3	1 2 3
FPV 1–10	PARALLEL	2000	670	1320	3	1 2 3
FPV 1–11	PARALLEL	1400	450	1050	3	1 2 3
FPV 1–12	PARALLEL	2000	670	1330	3	1 2 3
FPV 1–13	PARALLEL	800	230	660	2	1 2 3
FPV 1–14	PARALLEL	1520	510	1110	3	1 2 3
FPV 1–15	PARALLEL	200	85	160	1	1 2 3
FPV 2–1	PARALLEL	870	290	690	2	1 2 3
FPV 2–2	PARALLEL	810	270	670	2	1 2 3
FPV 2–3	PARALLEL	780	260	660	2	1 2 3
FPV 2–4	PARALLEL	560	190	380	1	1 2 3
FPV 2–5	PARALLEL	1140	380	760	2	1 2 3
FPV 2–6	PARALLEL	1360	450	900	2	1 2 3
FPV 2–7	PARALLEL	180	85	160	1	1 2 3
FPV 2–8	PARALLEL	650	220	440	1	1 2 3
FPV 2–9	PARALLEL	1340	450	1050	3	1 2 3
FPV 2–10	PARALLEL	1340	450	1050	3	1 2 3
FPV 2–11	PARALLEL	1200	400	1000	3	1 2 3
FPV 2–12	PARALLEL	630	230	420	1	1 2 3
FPV 2–13	PARALLEL	1440	480	1080	3	1 2 3
FPV 2–14	PARALLEL	830	280	700	2	1 2 3
FPV 2–15	PARALLEL	680	230	460	1	1 2 3
FPV 2–16	PARALLEL	1620	540	1080	3	1 2 3
FPV 2–17	PARALLEL	1060	360	720	2	1 2 3
FPV 2–18	PARALLEL	480	155	310	1	1 2 3
FPV 2–19	PARALLEL	290	100	200	1	1 2 3
FPV 2–20	PARALLEL	290	100	200	1	1 2 3
FPV 2–21	PARALLEL	300	100	200	1	1 2 3
FPV 2–22	PARALLEL	890	300	700	2	1 2 3
FPV 2–23	PARALLEL	1020	320	640	2	1 2 3
FPV 3–1	PARALLEL	1100	370	770	2	1 2 3
FPV 3–2	PARALLEL	900	300	700	2	1 2 3
FPV 3–3	PARALLEL	600	200	400	1	1 2 3
FPV 3–4	PARALLEL	960	300	700	2	1 2 3
FPV 3–5	PARALLEL	900	300	700	2	1 2 3
FPV 3–6	PARALLEL	1140	380	760	2	1 2 3
FPV 3–7	PARALLEL	1200	400	800	2	1 2 3
FPV 3–8	PARALLEL	380	130	260	1	1 2 3
FPV 3–9	PARALLEL	900	300	700	2	1 2 3
FPV 3–10	PARALLEL	2000	670	1340	3	1 2 3
FPV 3–11	PARALLEL	2000	670	1340	3	1 2 3
FPV 3–12	PARALLEL	500	170	340	1	1 2 3
FPV 3–13	PARALLEL	1800	600	1200	3	1 2 3
FPV 3–14	PARALLEL	725	240	490	2	1 2 3
FPV 3–15	PARALLEL	850	290	570	1	1 2 3
FPV 3–16	PARALLEL	1500	500	1100	3	1 2 3
FPV 3–17	PARALLEL	520	180	360	2	1 2 3
FPV 3–18	PARALLEL	600	200	400	1	1 2 3
FPV 3–19	PARALLEL	500	170	340	1	1 2 3
FPV 3–20	PARALLEL	500	170	340	1	1 2 3
FPV 3–21	PARALLEL	480	160	330	1	1 2 3
FPV 3–22	PARALLEL	750	250	500	1	1 2 3
FPV 3–23	PARALLEL	600	200	400	1	1 2 3

1. VERIFY UNIT IS OPERATING CORRECTLY. REPORT ANY PROBLEMS TO THE ENGINEER. NOTE IN TEST AND BALANCE REPORT ANY OPERATIONAL ISSUES.
2. MAXIMUM AND MINIMUM VALVE CFM, FAN CFM AND ELECTRIC HEAT STEPS ARE FROM THE 8–2–86 DESIGN DRAWINGS.
3. PERFORM TEST AND BALANCE WORK ON THE EXISTING FAN POWERED VAV UNITS TO ADJUST AIR VALVE FLOW TO THE MAX. AND MIN. INDICATED AND ADJUST FAN CFM TO QUANTITY INDICATED.

GENERAL NOTES

1. THE CONTRACTOR SHALL PERFORM ALL DEMOLITION WORK ON EXISTING SYSTEMS WHERE NEW SYSTEMS ARE TO BE INSTALLED.
2. WHERE DEMOLITION WORK OF EQUIPMENT AND SYSTEMS IS REQUIRED, THE DIV 16 CONTRACTOR SHALL DISCONNECT POWER FROM EXISTING EQUIPMENT AND MAKE IT SAFE FOR REMOVAL.
3. THE CONTRACTOR SHALL OBTAIN FROM THE OWNER A SET OF BUILDING DESIGN DRAWINGS, INCLUDING MECHANICAL DRAWINGS, DATED 8–2–96 FOR USE AS A REFERENCE TO EXISTING MECHANICAL SYSTEMS.

NEW AIR COOLED CHILLER SCHEDULE

MARK	COOLING CAPACITY TONS	KW	EVAPORATOR GPM	EWT	LWT	PD FT WG	AMBIENT TEMP °F	REFRIG.	COMPRESSOR QTY.	TYPE	OPERA. WEIGHT (LBS.)	BASIS OF DESIGN	NOTES
CH–1	180	225	432	54	44	17	95	410A	2	SCREW	13,072	DAIKIN AWS190CDS	1 2 3 4 5 6 7
CH–2	180	225	432	54	44	17	95	410A	2	SCREW	13,072	DAIKIN AWS190CDS	1 2 3 4 5 6 7

1. COMPRESSOR SOUND BLANKET
2. COOLER HEATER FREEZE PROTECTION
3. SINGLE POINT POWER CONNECTION
4. LOW AMBIENT HEAD PRESSURE CONTROL
5. HAIL GUARD
6. PERFORM TEST AND BALANCE WORK ON THE NEW CHILLER.
7. FIELD MOUNTED FUSED DISCONNECT SWITCH BY DIV. 16.

EXISTING PUMP DATA

MARK	SERVICE	TYPE	FLOW GPM	IMPELLER DIA. IN.	MOTOR HP	RPM	MODEL NO. PUMP INSTALLED	NOTES
P–1	CHILLED WATER	END SUCTION	432	9.875	20	1760	BELL & GOSSET 1510–4E	1
P–2	CHILLED WATER	END SUCTION	432	9.875	20	1760	BELL & GOSSET 1510–4E	1

1. PERFORM TEST AND BALANCE WORK ON THE EXISTING PUMP TO ADJUST CHILLED WATER FLOW TO GPM INDICATED.

EXISTING FANS

MARK	SERVICE	FAN DATA CFM	FAN DATA SP "WC	NOTES
F–1	EXHAUST	7,780	1.0	1 2
F–2	RELIEF AIR	60,000	.75	1 2

1. FAN CFM IS FROM THE 8–2–86 DESIGN DRAWINGS.
2. PERFORM TEST AND BALANCE WORK ON THE EXISTING FANS TO ADJUST FAN TO CFM INDICATED.

EXISTING AIR HANDLING UNIT

MARK	FAN DATA SUPPLY CFM	FAN DATA EXT. STATIC IN. W.G.	OA CFM MIN	OA CFM MAX	COOLING COIL DATA WATER DATA GPM	EWT	LWT		NOTES
AHU–1	60,000	2.5	15,000	60,000	432	45	55		1 2 3 4

1. FAN CFM AND WATER DATA IS FROM THE 8–2–86 DESIGN DRAWINGS.
2. PERFORM TEST AND BALANCE WORK ON THE EXISTING SUPPLY FANS TO ADJUST FAN TO CFM INDICATED.
3. PERFORM TEST AND BALANCE WORK ON THE EXISTING AIR HANDLING UNIT TO ADJUST CHILLED WATER FLOW TO GPM INDICATED.
4. TWO EACH SUPPLY FANS AT 30,000 CFM EACH FOR TOTAL SUPPLY OF 60,000 CFM.
5. INSTALL NEW FILTERS PRIOR TO TEST AND BALANCE WORK.

EXISTING VAV UNITS (VAV)

MARK	AIR VALVE MAX CFM	AIR VALVE MIN CFM	NOTES
VAV–1	420	140	1 2 3
VAV–2	220	0	1 2 3
VAV–3	450	0	1 2 3
VAV–4	450	0	1 2 3
VAV–5	350	100	1 2 3
VAV–6	350	100	1 2 3
VAV–6A			1 4

1. VERIFY UNIT IS OPERATING CORRECTLY. REPORT ANY PROBLEMS TO THE ENGINEER. NOTE IN TEST AND BALANCE REPORT ANY OPERATIONAL ISSUES.
2. MAXIMUM AND MINIMUM VALVE CFM ARE FROM THE 8–2–86 DESIGN DRAWINGS.
3. PERFORM TEST AND BALANCE WORK ON THE EXISTING VAV UNITS TO ADJUST AIR VALVE FLOW TO THE MAX. AND MIN. INDICATED.
4. MEASURE AIR FLOW.

NEW ELECTRIC UNIT HEATER SCHEDULE

MARK	LOCATION	KW	CFM	FAN HP	BASIS OF DESIGN	NOTES
UH–1	INSIDE AHU–1	5.0	530	1/40	MODINE HER 50	1 2 3 4

1. PROVIDE UNIT HEATER MOUNTING BRACKET
2. UNIT MOUNTED THERMOSTAT
3. THIS HEATER REPLACES EXISTING HEATER
4. VERIFY EXISTING VOLTAGE AND CIRCUIT CAPACITY OF EXISTING UNIT HEATER BEFORE ORDERING

NEW FAN POWERED VAV UNITS (FPV)

MARK	CONFIGURATION	AIR VALVE MAX CFM	AIR VALVE MIN CFM	FAN CFM	ELECTRIC HEAT KW	NOTES
FPV 2–24	PARALLEL	370	100	1060	4	1 3 5
FPV 2–25	PARALLEL	350	0	720	–	1 2 4 5

1. NEW UNIT INSTALLATION, UNIT FURNISHED BY OWNER FROM OWNER'S INVENTORY.
2. DISABLE ELECTRIC HEAT AND FAN IN THIS UNIT, ONLY AIR VALVE TO OPERATE.
3. TEST AND BALANCE THIS UNIT TO VERIFY CORRECT OPERATION OF AIR VALVE, ELECTRIC HEAT AND FAN.
4. TEST AND BALANCE THIS UNIT TO VERIFY CORRECT OPERATION OF AIR VALVE.
5. VERIFY UNIT IS OPERATING CORRECTLY. REPORT ANY PROBLEMS TO THE ENGINEER. NOTE IN TEST AND BALANCE REPORT ANY OPERATIONAL ISSUES.

KEYED NOTES

THIS SHEET ONLY

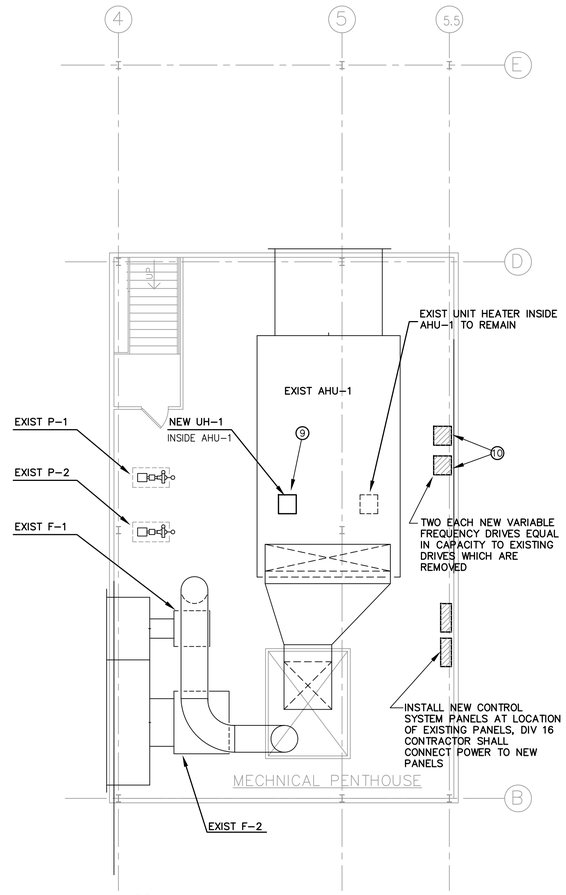
1. REMOVE EXISTING ABOVE GROUND 4" CHILLED WATER PIPING AND INSTALL NEW 6" CHILLED WATER PIPING.
2. INSTALL NEW 6" MOTORIZED BUTTERFLY SHUT–OFF VALVE WITH ROUND HAND WHEEL FOR MANUAL OPERATION. MOTOR SHALL OPERATE ON CONTROL SYSTEM 24 VOLT POWER.
3. CONNECT NEW 6" CHILLED WATER PIPING TO EXISTING 6" UNDERGROUND PIPING. NEW 6" PIPING TO RISE UP AND RUN ABOVE GROUND.
4. SAVE AND REINSTALL EXISTING FLOW STEM THERMOMETER IN NEW THERMOMETER WELL.
5. NEW FLOW STATUS SWITCH.
6. NEW INSERTION TEST PLUG.
7. NEW BUTTERFLY ISOLATION VALVE.
8. ABANDONED IN PLACE, EXISTING UNDERGROUND CHILLED WATER PIPING.
9. INSIDE EXISTING AHU–1 REMOVE EXISTING INOPERABLE UNIT HEATER AND INSTALL NEW HEATER. VERIFY WITH OWNER WHICH OF THE TWO EXISTING HEATERS IS TO BE REPLACED.
10. REMOVE TWO EACH EXISTING VARIABLE SPEED DRIVES. THE TWO EACH EXISTING BYPASS ASSEMBLIES SHALL REMAIN. INSTALL TWO EACH NEW VARIABLE SPEED DRIVES WITH EACH DRIVE CONTROLLING ONE OF TWO EXISTING 40 HP FAN MOTORS. CONNECT NEW DRIVE ASSEMBLIES TO EXISTING BYPASS ASSEMBLIES. SEE SPECIFICATION SECTION 15900 FOR OTHER VFD SPECIFICATIONS. ELECTRICAL CONTRACTOR SHALL PERFORM ALL LINE VOLTAGE WIRING INSTALLATION AND CONNECTIONS AT THE RECONFIGURED VFD ASSEMBLIES

PIPING LEGEND

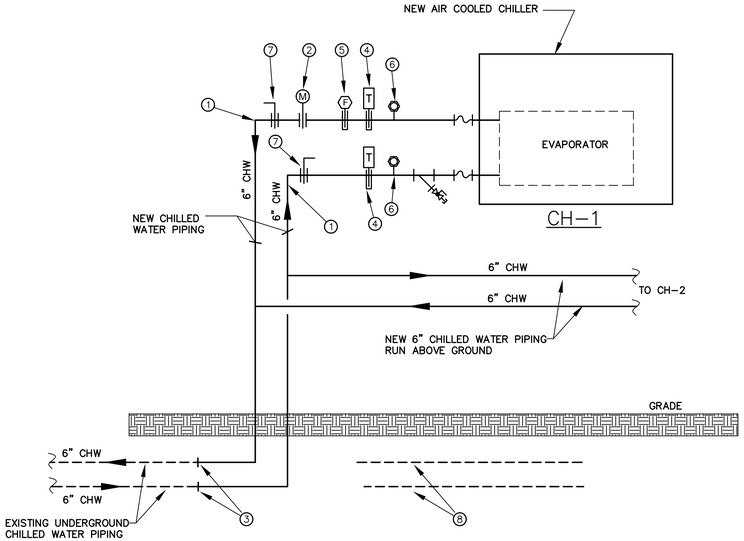
SYMBOL	DESCRIPTION	ABBREVIATION
	CHILLED WATER	CHW
	PIPE SIZE CHANGE	
M	MOTORIZED TWO POSITION VALVE	
	3–WAY VALVE	
	SWING CHECK VALVE	
	BUTTERFLY VALVE	
	BALL VALVE	
	PLUG VALVE	
	GATE VALVE	
	COMBINATION TEMP./PRESSURE TEST PORT	
	UNION	
	FLEXIBLE CONNECTOR	FC
	PUMP	
	STRAINER WITH BLOWDOWN	
	SENSOR WELL FOR THERMOMETER OR DDC SENSOR	
T	THERMOMETER	

ADD ALTERNATE NO. 1

PROVIDE A 10 YEAR EXTENDED WARRANTY FOR CHILLERS CH–1 AND CH–2 COVERING ALL PARTS AND LABOR FOR THE ENTIRE UNIT. SEE SPECIFICATION SECTION 15750–1.6



1 M-1.1 **MECHANICAL PENTHOUSE PLAN**
1/8"=1'-0"



2 M-1.1 **CHILLER PIPING DIAGRAM**
NO SCALE

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9/26/14

	OWNER REVIEW SET	9/12/14
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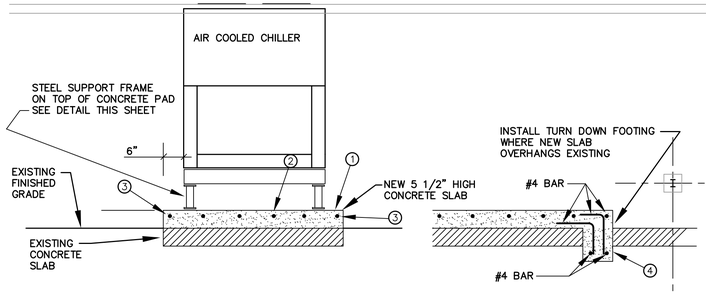
DRAWING TITLE

PART PLANS
EQUIPMENT SCHEDULES

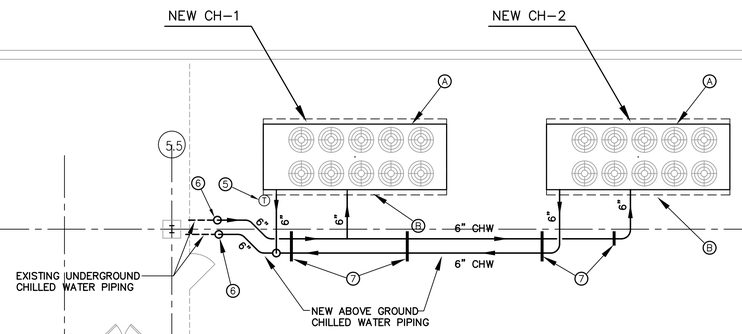
PROJECT NO.		SCALE	
		AS SHOWN	
APPROVED	CHECKED	DRAWN	DATE
	JD	BH	9/26/14

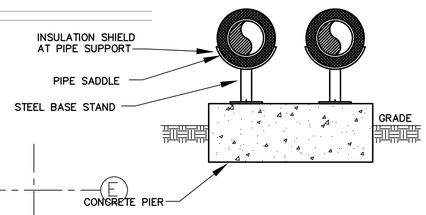
DRAWING NO.

M-1.1

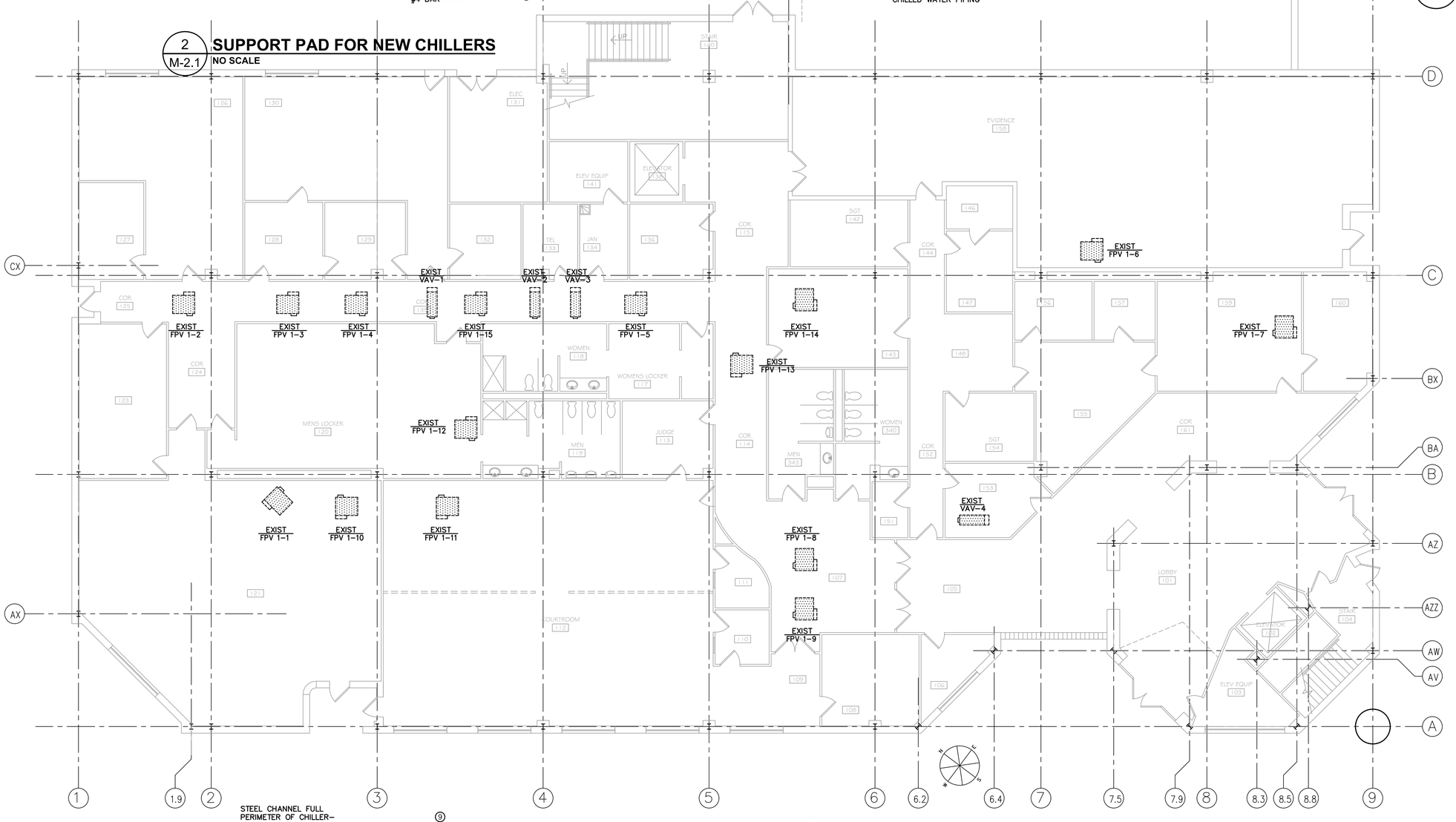


2 M-2.1 SUPPORT PAD FOR NEW CHILLERS
NO SCALE

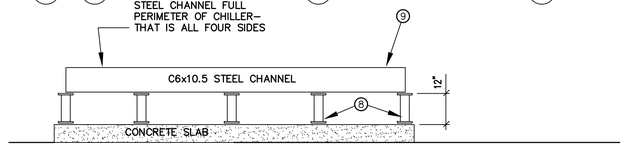




3 M-2.1 PIPE SUPPORT DETAIL
NO SCALE



1 M-2.1 FIRST FLOOR HVAC PLAN
1/8"=1'-0"



3 M-2.1 STEEL SUPPORT FRAME FOR NEW CHILLERS
NO SCALE

KEYED NOTES
THIS SHEET ONLY

1. POUR NEW 5 1/2" CONCRETE SLAB ON TOP OF EXISTING SLAB SO AS TO RAISE NEW CHILLER INSTALLATION 5 1/2" ABOVE EXISTING GRADE. DOWEL NEW SLAB INTO EXISTING WITH #4 BAR INSERTS SET INTO EXISTING SLAB AND EXTENDING INTO NEW SLAB. SET DOWELS 24" O.C. EACH WAY.
2. REINFORCE SLAB WITH #3 OR #4 BAR 12" O.C. EACH WAY.
3. REINFORCE SLAB PERIMETER EDGE WITH A #4 BAR.
4. IF THE NEW SLAB OVERHANGS EXISTING SLAB, DUE TO A NEW CHILLER FOOT PRINT BEING LARGER THAN EXISTING SLAB, THEN INSTALL CONCRETE TURN DOWN FOOTING. BOTTOM OF FOOTING 24" BELOW GRADE. MECHANICALLY COMPACT BOTTOM OF FOOTING TRENCH BEFORE POURING CONCRETE.
5. HEAT TRACE CONTROLLER.
6. NEW 6" CHILLED WATER RISER CONNECT TO EXISTING UNDERGROUND 6" CHILLED WATER PIPE. ABANDONED IN PLACE ANY REMAINING UNDERGROUND 6" AND 4" PIPING.
7. PIPE SUPPORT. MAXIMUM SUPPORT SPACING 15'-0".
8. 4x4x1/4" STEEL TUBE COLUMNS 12" HIGH WITH 1/4" STEEL WELDED BASE PLATE AND TOP PLATE. SUPPORT TUBE COLUMNS TO BE INSTALLED AT EACH CORNER AND MAXIMUM 4'-0" O.C. BETWEEN CORNER COLUMNS
9. STEEL SUPPORT CHANNEL FULL PERIMETER OF CHILLER BASE CHANNEL. CHILLER BASE CHANNEL TO MATE WITH STEEL SUPPORT CHANNEL. WELD CHANNEL TO 4x4 TUBE COLUMNS

GENERAL NOTES

1. HEAT TRACE ALL NEW ABOVE GROUND CHILLED WATER PIPING AT NEW CHILLERS. INSTALL HEAT TRACE ON PIPES BEFORE INSULATING. HEAT TRACE CABLE SHALL BE RAYCHEM XL-TRACE (8XL1 CABLE) NOMINAL 8 WATTS/FT. HEAT TRACE THERMOSTAT SHALL BE RAYCHEM MODEL AMC-1A. DIV 15 CONTRACTOR SHALL COORDINATE WITH DIV 16 CONTRACTOR SO THAT LINE VOLTAGE POWER IS CONNECTED TO THE THERMOSTAT CONTROLLER UNIT.

KEYED DEMOLITION NOTES
THIS SHEET ONLY

- (A) REMOVE EXISTING GROUND MOUNTED AIR COOLED CHILLER.
- (B) AT EACH CHILLER: REMOVE EXISTING ABOVE GROUND CHILLED WATER PIPING TO A POINT 12" BELOW GROUND SURFACE AND CAP. REMOVE EXISTING MOTORIZED VALVES AND EXISTING MANUAL SHUT-OFF BUTTERFLY VALVES. REMOVE EXISTING FLOW MEASURING STATION AND ASSOCIATED REMOVABLE INSULATION BOX. EXISTING STEM THERMOMETER SHALL BE SAVED AND INSTALLED IN A NEW THERMOMETER WELL. REMOVE ANY EXISTING HEAT TRACE WIRING AND CIRCUITS AND DISCONNECT THE POWER.

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9/26/14

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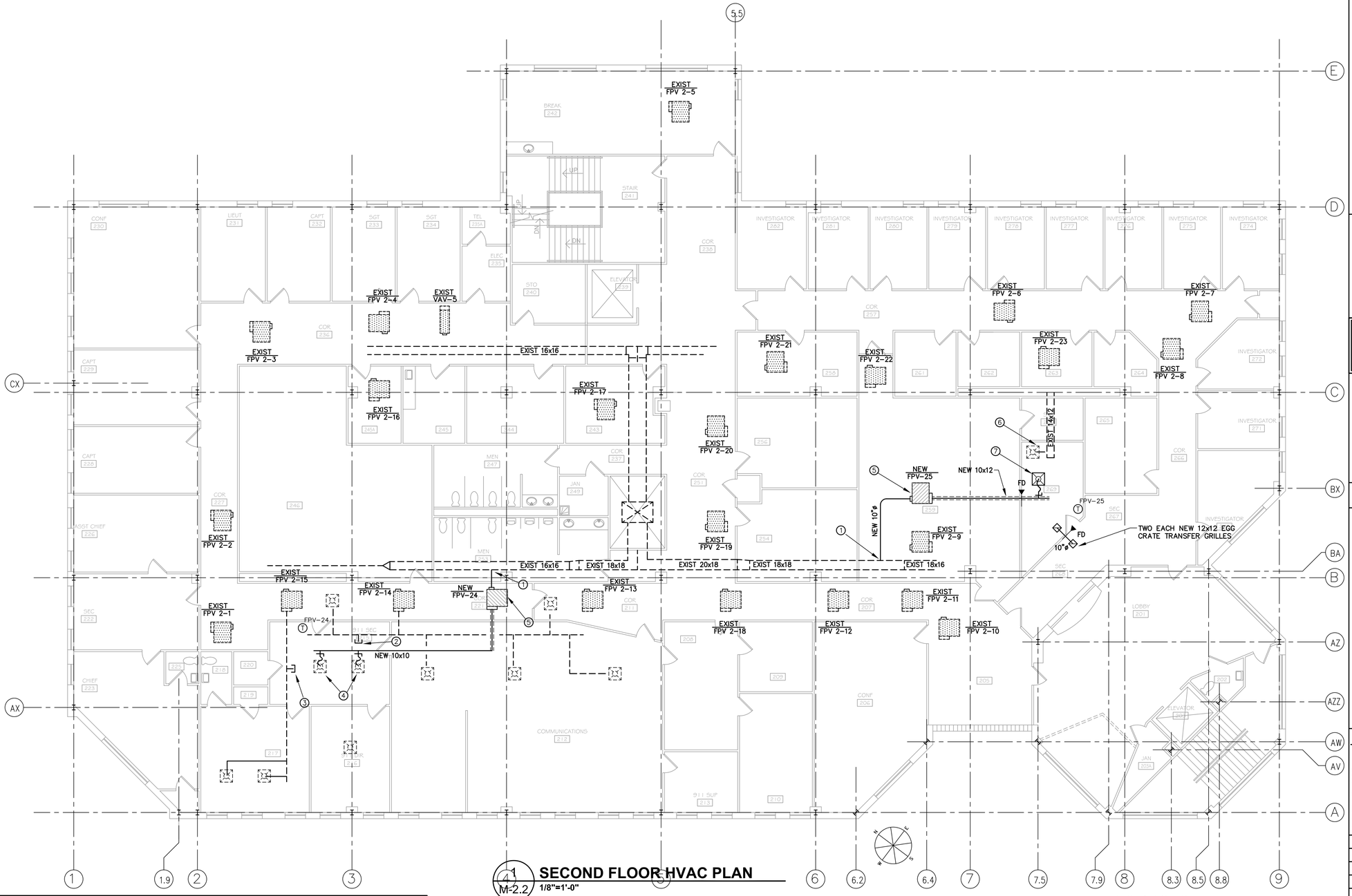
-	-	-

DRAWING TITLE
FIRST FLOOR HVAC PLAN

PROJECT NO.		SCALE	
		AS SHOWN	
APPROVED	CHECKED	DRAWN	DATE
	JD	BH	9/26/14

DRAWING NO.
M-2.1



SECOND FLOOR HVAC PLAN

1/8"=1'-0"

HVAC ABBREVIATIONS			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
OA	OUTSIDE AIR	MBH	1000 BTU/HR
CD	CONDENSATE DRAIN	OC	ON CENTER
RA	RETURN AIR	AFF	ABOVE FINISHED FLOOR
SP	STATIC PRESSURE (IN. W.C.)	VFD	VARIABLE FREQUENCY DRIVE
DB	DRY BULB	A.C.	AIR CONDITIONER
WB	WET BULB	FC	FLEXIBLE EQUIPMENT CONNECTOR
EAT	ENTERING AIR TEMPERATURE	CU	AIR COOLED CONDENSING UNIT
LAT	LEAVING AIR TEMPERATURE	ERV	ENERGY RECOVERY VENTILATOR
ESP	EXTERNAL STATIC PRESSURE (IN. W.C.)	AHU	AIR HANDLING UNIT
FCU	FAN COIL UNIT	RA	RETURN AIR
ODU	OUTDOOR UNIT	FD	FIRE DAMPER

KEYED NOTES

THIS SHEET ONLY

1. CONNECT NEW PIU AIR SUPPLY TO EXISTING PRIMARY SUPPLY DUCT .
2. DISCONNECT EXISTING SUPPLY DIFFUSER SERVING ROOM 215 FROM FROM FPV 2-14 SUPPLY DUCT AND CAP SUPPLY DUCT OPENING.
3. DISCONNECT EXISTING SUPPLY DIFFUSER SERVING ROOM 215 FROM FROM FPV 2-15 SUPPLY DUCT AND CAP SUPPLY DUCT OPENING.
4. CONNECT TWO EXISTING SUPPLY DIFFUSERS SERVING ROOM 215 TO NEW SUPPLY DUCT FROM NEW VAV-7. BALANCE EACH DIFFUSER TO 175 CFM.
5. NEW UNIT PROVIDED BY OWNER.
6. DISCONNECT EXISTING SUPPLY DIFFUSER SERVING ROOM 269 FROM EXISTING SUPPLY DUCT. REMOVE DIFFUSER AND CAP OPENING IN SUPPLY DUCT.
7. NEW SQUARE INSULATED THREE CONE LOUVER FACE CEILING DIFFUSER WITH 10"ø NECK. TITUS TMSA OR EQUAL. FRAME FOR LAY-IN CEILING. PANEL SIZE 24x24 WITH OBD. BALANCE TO 350 CFM.

FLOYD COUNTY

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SECOND FLOOR HVAC PLAN

PROJECT NO.		SCALE AS SHOWN	
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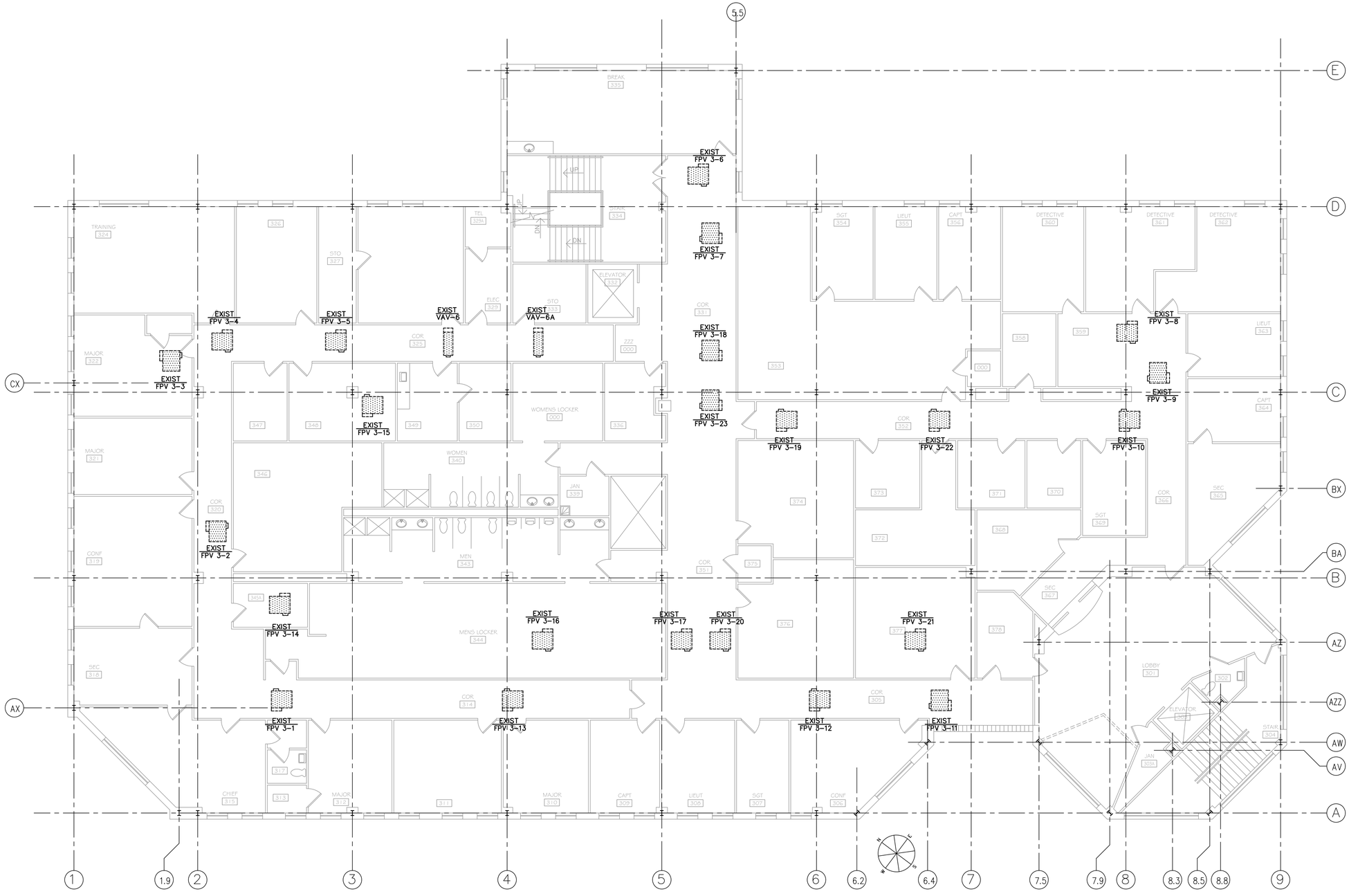
DRAWING NO.

M-2.2



1 M-2.3 **THIRD FLOOR HVAC PLAN**

1/8"=1'-0"

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THIRD FLOOR HVAC PLAN

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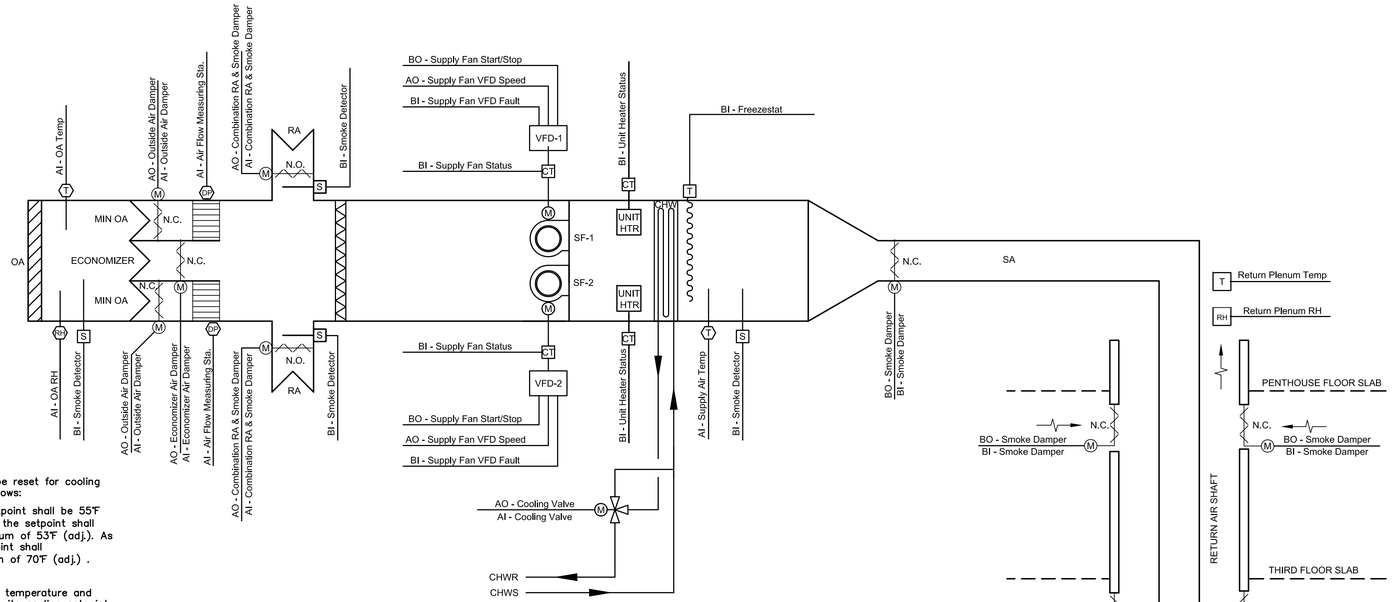
APPROVED	CHECKED JD	DRAWN BH	DATE 9/26/14

DRAWING NO.

M-2.3



OPERATING SEQUENCE – EXISTING VAV AIR HANDLER AHU–1

Occupied Mode:
The unit shall start up and run in the following sequence based upon an operator adjustable schedule. When indexed to the occupied mode the AHU shall always start with the return air damper fully open and the outside air damper fully closed. When indexed to the occupied mode the AHU supply discharge smoke damper shall open; the return air chase smoke dampers at the first second and third level shall open; the supply fans in AHU–1 shall start and the relief air fan will start and the fans shall gradually ramp up to the operating speed through control of the respective motor VFD. The return air and outside air dampers shall slowly modulate in unison to the minimum outdoor air flow position over a period of two minutes (adj). ; the duct static pressure controller will modulate the supply fan speed to maintain the duct pressure setpoint; the space pressurization controller will modulate the relief fan speed to maintain the space pressure setpoint.

Unoccupied Mode:

The outside air dampers, the economizer dampers and the relief air dampers shall be closed; the AHU–1 supply fans shall be off; the building relief fan F–2 shall be off; all smoke dampers shall go to the normally closed position.

Emergency Shutdown: The supply fans in AHU–1 and relief fan F–2 shall shut down and generate an alarm upon receiving an emergency shutdown signal.

Freeze Protection: The unit shall shut down and generate an alarm upon receiving a freezestat status.

High Static Shutdown: The unit shall shut down and generate an alarm upon receiving a high static shutdown signal.

Return and Supply Air Smoke Detection: The unit shall shut down and generate an alarm upon receiving a return or supply air smoke detector status.

AHU Optimal Start: The unit shall start prior to scheduled occupancy based on the time necessary for the zones to reach their occupied setpoints. The start time shall automatically adjust based on changes in outside air temperature and zone temperatures.

Demand Limiting – Setpoint Adjust: To lower power consumption, the supply air temperature setpoint shall automatically relax (raised for cooling; lowered for heating) when the facility power consumption exceeds definable thresholds. The amount of relaxation shall be accomplished by one of the following methods:

The supply air temperature setpoint shall relax by 2°F (adj.) for each demand threshold exceeded. The setpoints in the zones supplied by this unit shall be relaxed as specified in the Sequence of Operations for the zones. This shall in turn relax the unit's supply air temperature setpoint by a user definable amount.

All setpoints shall automatically return to their previous settings when the facility power consumption drops below the thresholds.

Supply Fan: The supply fan shall run anytime the unit is commanded to run, unless shutdown on safeties. To prevent short cycling, the supply fan shall have a user definable (adj.) minimum runtime.

Alarms shall be provided as follows:

Supply Fan Failure: Commanded on, but the status is off.

Supply Fan in Hand: Commanded off, but the status is on.

Supply Fan Runtime Exceeded: Status runtime exceeds a user definable limit (adj.).

Supply Fan VFD Fault.

Supply Air Duct Static Pressure Control: The controller shall measure duct static pressure and shall modulate the supply fan VFD speed to maintain the duct static pressure at 1.5 in H20 (adj.). The supply fan VFD speed (adj.) shall not drop below 30% of maximum speed.

Alarms shall be provided as follows:

High Supply Air Static Pressure: If the supply air static is greater than setpoint pressure (adj.).

Low Supply Air Static Pressure: If the supply air static is less than the setpoint pressure (adj.)

Supply Air Temperature Setpoint – Optimized: The controller shall monitor the supply air temperature and shall maintain a supply air temperature setpoint reset based on zone cooling and heating requirements

The supply air temperature setpoint shall be reset for cooling based on zone cooling requirements as follows:

The initial supply air temperature setpoint shall be 55°F (adj.). As cooling demand increases, the setpoint shall incrementally reset down to a minimum of 53°F (adj.). As cooling demand decreases, the setpoint shall incrementally reset up to a maximum of 70°F (adj.) .

Cooling Coil Valve:
The controller shall measure the supply air temperature and modulate the cooling coil valve to maintain its cooling setpoint.

The cooling shall be enabled whenever:
Scheduled by the BAS to be enabled for cooling service.
AND the economizer (if present) is disabled or fully open.
AND the supply fan status is on.

The cooling coil valve shall open to 50% (adj.) and the chilled water pump shall start whenever the freezestat signals the air temperature is below 37°F.

Alarms shall be provided as follows:

High Supply Air Temp: If the supply air temperature is 5°F (adj.) greater than setpoint.

Low Supply Air Temperature Alarm: The controller shall alarm if the supply air temperature is less than 45°F (adj.).

when AHU–1 is in the occupied mode and the outdoor air dampers or the economizer cycle dampers are open, then the VFD shall modulate the building relief air fan (F–2) to maintain the space pressure at the set point.

The outside air dampers shall modulate to maintain the minimum outdoor air flow rate at 15,000 cfm (adj.) as measured by the outdoor air flow measuring station. The VFD shall modulate the building relief fan to maintain the space pressure at the set point.

Outside air override shall close the outside air damper on a command by the user at the display screen. Place a button graphic next to the symbol for the outside air damper with the text similar to OA DAMPER OVERRIDE.

Economizer Mode:
Economizer: If the supply fan status is ON and the outdoor enthalpy is less than the return air enthalpy then the economizer cycle shall be enabled. The economizer cycle shall always start with the return air damper fully open and the outside air damper fully closed. The return air and outside air dampers shall slowly modulate in unison, over a period of two minutes (adj), to the position required to maintain leaving air set point. The BAS shall modulate the economizer dampers and the outdoor air dampers in sequence to maintain the the supply air temperature setpoint at 65°F (adj.). The modulation of the outside air dampers shall not allow the minimum outdoor air flow rate to go below 15,000 cfm (adj.) as measured by the outdoor air flow measuring station. The chilled water valve shall open to assist the cooling process if the outdoor air temperature is too high to maintain the supply air temperature setpoint. The VFD shall modulate the building relief fan to maintain the space pressure at the set point. The economizer cycle shall be disabled whenever the outdoor air enthalpy is greater than the return air enthalpy or if the mixed air temperature is less than 37°F (adj.). The outside air damper shall return to the minimum outside air flow position.

Supply Air Temperature: The controller shall monitor the supply air temperature.

Return Air Temperature: The controller shall monitor the temperature and relative humidity in the return air plenum and use as required for setpoint control or economizer control.

Mixed Air Temperature: The controller shall monitor the mixed air temperature and use as required for economizer control.

Alarms shall be provided as follows:

High Mixed Air Temp: If the mixed air temperature is greater than 90°F (adj.).

Low Mixed Air Temp: If the mixed air temperature is less than 45°F (adj.).

High Return Air Temp: If the return air temperature is greater than 90°F (adj.).

Low Return Air Temp: If the return air temperature is less than 45°F (adj.).

High Supply Air Temp: If the supply air temperature is greater than 120°F (adj.).

Low Supply Air Temp: If the supply air temperature is less than 45°F (adj.).

Under local control the unit heaters inside AHU–1 shall cycle on and off to maintain the chilled water coil face above 38°F (adj.)

EQUIPMENT CONTROL SCHEMATIC – EXISTING VAV AIR HANDLING UNIT (AHU–1)

ZONE	HARDWARE POINTS AI	AO	BI	BO	SOFTWARE POINTS AV	BV	SCHED	TREND	ALARM	GRAPHIC	NOTES
SUPPLY AIR TEMP	X							X	X	X	1
RETURN AIR TEMP.	X							X	X	X	1
RETURN AIR R.H.	X							X	X	X	1
OUTDOOR AIR TEMP.	X							X	X	X	1
OUTDOOR AIR R.H.	X							X	X	X	1
SUPPLY AIR TEMP. SETPOINT					X			X		X	
ECONOMIZER SUPPLY AIR TEMP. SETPOINT					X			X		X	
S.A. STATIC PRESS.	X				X			X	X	X	1
SUPPLY FAN VFD SPEED		X						X		X	10
SUPPLY FAN VFD FAULT			X						X	X	10
SUPPLY FAN STATUS			X					X		X	7
SUPPLY FAN START/STOP				X				X		X	
RELIEF FAN BUILDING STATIC PRESSURE SENSOR	X							X	X	X	1
RELIEF FAN VFD SPEED		X						X		X	5
RELIEF FAN VFD FAULT			X						X	X	5
RELIEF FAN STATUS			X							X	7
RELIEF FAN START/STOP				X				X		X	
RELIEF FAN DAMPER			X	X						X	3
CHILLED WATER VALVE	X	X						X		X	4
UNIT HEATER INSIDE AHU–1			X						X	X	9
OUTSIDE AIR DAMPERS	X	X		X						X	
OUTSIDE AIR DAMPER OVERRIDE						X				X	
ECONOMIZER DAMPERS	X	X		X				X		X	3
TWO POSITION SMOKE DAMPERS			X	X					X	X	3
COMBINATION RETURN AIR/SMOKE DAMPERS	X	X		X				X	X	X	3
AIR FLOW MEASURING STATION	X							X		X	6
FREEZESTAT			X					X	X	X	1
SMOKE DETECTOR			X					X	X	X	2
DEMAND LIMIT LEVEL					X					X	
EMERGENCY SHUTDOWN						X		X	X	X	8
SCHEDULE							X				
HIGH SUPPLY AIR STATIC PRESSURE									X		
LOW SUPPLY AIR STATIC PRESSURE									X		
SUPPLY FAN FAILURE									X		
SUPPLY FAN IN HAND									X		
SUPPLY FAN RUNTIME EXCEEDED									X		

EQUIPMENT CONTROL SCHEMATIC – EXISTING RELIEF AIR FAN (F–2)

NOTES

1. EXISTING CONTROL SYSTEM POINT. EXISTING DEVICE MAY BE REUSED IN PLACE IF OPERATING CORRECTLY AND COMPATIBLE WITH MANUFACTURER'S CONTROL SYSTEM. REPLACE EXISTING DEVICE WITH NEW DEVICE IF REQUIRED.
2. EXISTING SMOKE DETECTORS TO REMAIN IN PLACE. CONNECT TO NEW CONTROL SYSTEM.
3. EXISTING DAMPER TO REMAIN IN PLACE. INSTALL NEW DAMPER MOTOR AND CONNECT TO NEW CONTROL SYSTEM.
4. REMOVE EXISTING CHILLED WATER CONTROL VALVE. INSTALL NEW CHILLED WATER CONTROL VALVE TO REPLACE EXISTING VALVE. PROVIDE NEW VALVE SAME SIZE AS EXISTING AND SAME CV.
5. INTERFACE NEW CONTROL SYSTEM WITH EXISTING FAN MOTOR VFD.
6. EXISTING AIR FLOW MEASURING STATION TO REMAIN AND BE REUSED. EXISTING CONTROL SYSTEM DELTA–P MEASURING DEVICE AT FLOW STATION MAY BE REUSED IF COMPATIBLE WITH NEW CONTROL SYSTEM. REPLACE THAT DEVICE IF REQUIRED. CONNECT FLOW MEASURING STATION ASSEMBLY TO NEW CONTROL SYSTEM.
7. INSTALL NEW C.T. TO MONITOR FAN MOTOR ON/OFF STATUS. CONNECT TO NEW CONTROL SYSTEM. THIS IS A NEW DEVICE NOT CURRENTLY INSTALLED.
8. EXISTING BUILDING HVAC SYSTEM–EMERGENCY–SHUTDOWN SWITCH TO REMAIN AND BE INTERFACED WITH NEW CONTROL SYSTEM.
9. COIL FREEZE PROTECTION UNIT HEATER.
10. INTERFACE NEW CONTROL SYSTEM WITH NEW FAN MOTOR VFD.

ROME–FLOYD COUNTY
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CHILLER REPLACEMENT AND CONTROLS UPGRADE

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GEORGIA REGISTERED PE030294 PROFESSIONAL ENGINEER JEFFREY A. DRINKARD

9/26/14

	OWNER REVIEW SET	9/12/14
	ISSUED FOR BID	9/26/14
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CONTROL SEQUENCES

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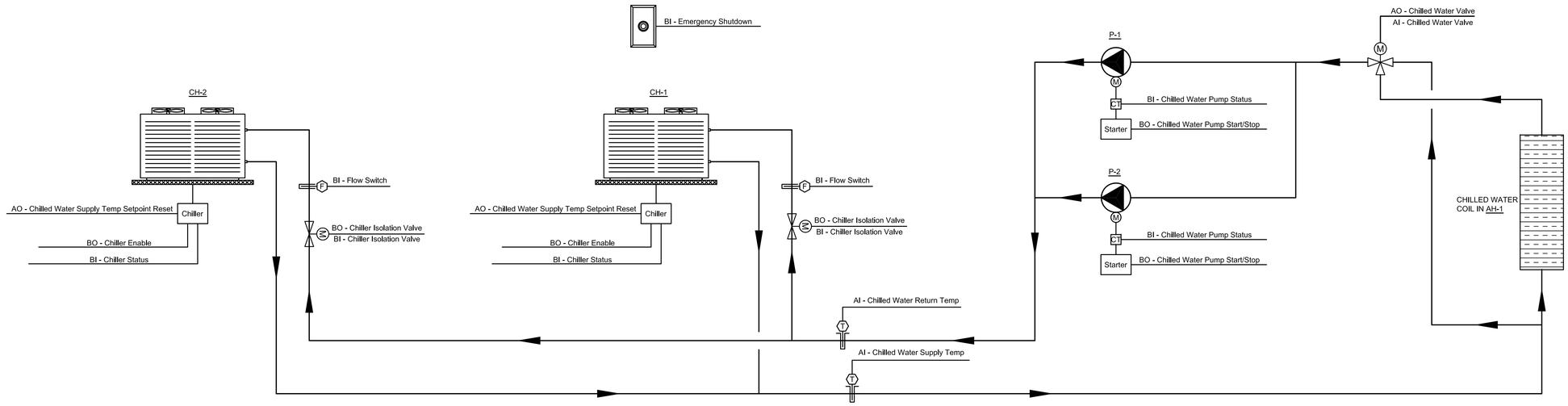

EQUIPMENT CONTROL SCHEMATIC – AIR COOLED CHILLER

ZONE	HARDWARE POINTS AI	AO	BI	BO	SOFTWARE POINTS AV	BV	SCHED	TREND	ALARM	GRAPHIC	NOTES
CHW SUPPLY TEMP.	X							X		X	
CHW RETURN TEMP.	X							X		X	
CHW SUPPLY TEMP RESET SETPOINT		X						X		X	
EMERGENCY SHUTDOWN			X						X	X	
CHW PUMP STATUS			X					X		X	③
CHILLER STATUS			X					X		X	
CHW PUMP START/STOP				X						X	④
CHILLER ENABLE				X						X	
CHILLER ISOLATION VALVE STATUS OPEN OR CLOSED			X	X							①
CHILLER FLOW SWITCH STATUS			X								②
AHU–1 CHILLED WATER CONTROL VALVE	X	X									⑤
OUTSIDE AIR TEMP.					X					X	
CHW PUMP FAILURE									X		
CHW PUMP RUNNING IN HAND									X		
CHW PUMP RUNTIME EXCEEDED									X		
CHILLER FAILURE									X		
CHILLER RUNNING IN HAND									X		
CHILLER RUNTIME EXCEEDED									X		
HIGH CHW SUPPLY TEMP.									X		
LOW CHW SUPPLY TEMP.									X		

NOTES

① REPLACE EXISTING MOTORIZED CHILLER ISOLATION VALVE ASSEMBLY WITH NEW 6" VALVE AND MOTOR OPERATOR. CONNECT TO NEW CONTROL SYSTEM.

② NEW CHILLER FLOW SWITCH TO REPLACE EXISTING SWITCH. CONNECT TO NEW CONTROL SYSTEM.

③ INSTALL NEW C.T. TO MONITOR PUMP MOTOR ON/OFF STATUS. CONNECT TO NEW CONTROL SYSTEM. THIS IS A NEW DEVICE NOT CURRENTLY INSTALLED.

④ CONNECT NEW CONTROL SYSTEM TO EXISTING PUMP MOTOR STARTER.

⑤ REMOVE EXISTING CHILLED WATER CONTROL VALVE. INSTALL NEW CHILLED WATER CONTROL VALVE TO REPLACES EXISTING VALVE. PROVIDE NEW VALVE SAME SIZE AS EXISTING AND SAME CV.

OPERATING SEQUENCE – AIR COOLED CHILLERS & PUMPS

Chiller – Run Conditions:
The chiller shall be enabled to run whenever:
* Scheduled by the BAS to be enabled for cooling service.
* AND the outside air temperature is greater than 50°F (adj.).

Interface the control module on chiller CH–1 and CH–2 so the control system can communicate with the chiller and monitor chiller operation.

The new chillers CH–1 and CH–2 are sized for 100% redundancy. The chillers shall run in a lead lag configuration controlled by the BAS software to impose approximately equal run time on each chiller. The BAS software shall provide user interface capability to run either CH–1 or CH–2 with the lead–lag feature disabled for a building operator defined period of time.

The existing pumps P–1 and P–2 are sized for 100% redundancy. The pumps shall run in a lead lag configuration controlled by the BAS software to impose approximately equal run time on each pump. The BAS software shall provide user interface capability to run either P–1 or P–2 with the lead–lag feature disabled for a building operator defined period of time. The chilled water pump shall start prior to the chiller being started as described below and shall stop only after the chiller refrigeration system is off. The chilled water pump shall have a user adjustable delay on start and a user adjustable delay on stop. The chilled water pump shall also run for freeze protection whenever the outside air temperature is less than a user definable setpoint (adj.).

The chillers shall be cycled on and off to maintain the chiller leaving water temperature at the set point (adj.). When the lead chiller is commanded to start by the BAS the normally closed motorized chiller isolation valve shall open. When the BI signal from the isolation valve indicates that the the valve is open then the lead chilled water pump shall start. When water flow is proven by the chiller flow switch then the chiller refrigeration start sequence shall be initiated (after a user adjustable time) to cool water supplied to the chiller. The delay time shall be set appropriately to allow for orderly chilled water system start–up, shutdown and sequencing. The chiller shall run subject to its own internal safeties and controls. The normally closed chiller isolation valve on the lag chiller shall be closed.

Chilled Water Supply Temperature Setpoint: The chilled water supply temperature setpoint shall reset based on outside air temperature. As outside air temperature drops from 75°F (adj.) to 50°F (adj.) the chilled water supply temperature setpoint shall reset upwards by adding from 0°F (adj.) to 10°F (adj.) to the current setpoint.

Provide software to allow demand limit scheduling.

To prevent short cycling, the chiller shall run for and be off for minimum adjustable times (both user definable), unless shutdown on safeties or outside air conditions.

Emergency Shutdown: The chiller shall shut down and an alarm generated upon receiving an emergency shutdown signal status.

Alarms shall be provided as follows:

Chilled Water Pump Failure: Commanded on, but the status is off.

Chilled Water Pump Running in Hand: Commanded off, but the status is on.

Chilled Water Pump Runtime Exceeded: Status runtime exceeds a user definable limit.

Chiller Failure: Commanded on, but the status is off.

Chiller Running in Hand: Commanded off, but the status is on.

Chiller Runtime Exceeded: Status runtime exceeds a user definable limit.

High Chilled Water Supply Temp: If the chilled water supply temperature is greater than 55°F (adj.).

Low Chilled Water Supply Temp: If the chilled water supply temperature is less than 38°F (adj.).

The following temperatures shall be monitored:

Chilled water supply.

Chilled water return.

FLOYD COUNTY

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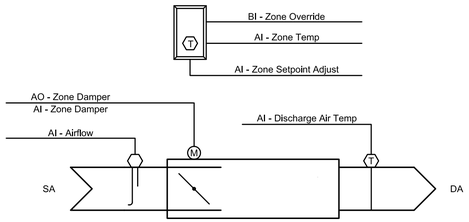


EQUIPMENT CONTROL SCHEMATIC – EXISTING COOLING ONLY VAV BOX

	HARDWARE POINTS				SOFTWARE POINTS						
ZONE	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM	GRAPHIC	NOTES
ZONE TEMP	X							X	X	X	③
ZONE SETPT ADJUST	X									X	
AIRFLOW	X							X		X	②
DISCH. AIR TEMP	X							X	X	X	④
ZONE DAMPER	X	X								X	①
ZONE OVERRIDE			X					X		X	
AIRFLOW SETPT.					X			X		X	
SCHEDULE							X				

NOTES

① EXISTING BOX MOUNTED AIR VALVE MOTOR ASSEMBLY MAY BE REUSED IN PLACE IF OPERATING CORRECTLY AND COMPATIBLE WITH MANUFACTURER'S CONTROL SYSTEM. REPLACE EXISTING DEVICE WITH NEW DEVICE IF REQUIRED.

② CONNECT NEW CONTROL SYSTEM TO EXISTING BOX MOUNTED AIR FLOW RATE SENSORS.

③ REPLACE EXISTING ZONE SENSOR WITH NEW WALL MOUNTED SENSOR.

④ THIS IS A NEW CONTROL SYSTEM SENSOR NOT CURRENTLY INSTALLED. INSTALL THIS NEW DEVICE AND INTERFACE WITH NEW CONTROL SYSTEM.

OPERATING SEQUENCE – EXISTING COOLING ONLY VAV BOX

Run Conditions – Scheduled:
The unit shall run according to a user definable time schedule in the following modes:

The VAV unit shall always operate in the occupied mode. The unit shall maintain A 74°F (adj.) cooling setpoint. When zone temperature is greater than its cooling setpoint, the zone damper shall modulate between the minimum occupied airflow (adj.) and the maximum cooling airflow (adj.) until the zone is satisfied. When the zone temperature is less than the cooling setpoint, the zone damper shall maintain the minimum required zone ventilation (adj.).

Zone Setpoint Adjust:
The building operator shall be able to adjust the zone temperature heating and cooling setpoints at the zone sensor.

Discharge Air Temperature:
The controller shall monitor the discharge air temperature.

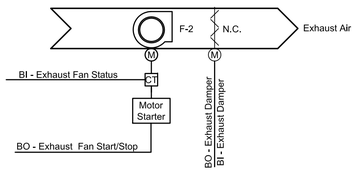
Alarms shall be provided as follows:

High Zone Temp: If the zone temperature is greater than the cooling setpoint by a user definable amount (adj.).

Low Zone Temp: If the zone temperature is less than the cooling setpoint by a user definable amount (adj.).

High Discharge Air Temp: If the discharge air temperature is greater than 60°F (adj.).

Low Discharge Air Temp: If the discharge air temperature is less than 40°F (adj.).



EQUIPMENT CONTROL SCHEMATIC – EXISTING EXHAUST FAN (F-1)

FAN F-1	HARDWARE POINTS				SOFTWARE POINTS						
ZONE	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM	GRAPHIC	NOTES
EXHAUST FAN START/STOP				X				X		X	①
EXHAUST FAN STATUS			X					X		X	③
EXHAUST FAN DAMPER			X	X						X	②

NOTES

① INTERFACE NEW CONTROL SYSTEM WITH EXISTING MOTOR STARTER.

② EXISTING DAMPER TO REMAIN IN PLACE. INSTALL NEW DAMPER MOTOR AND CONNECT TO NEW CONTROL SYSTEM.

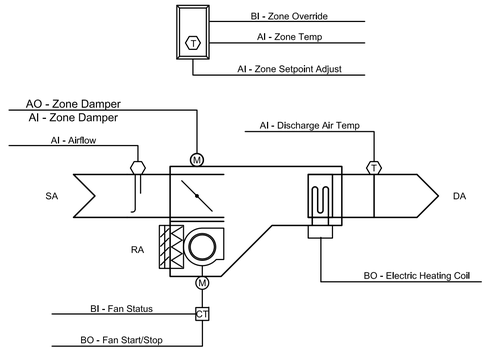
③ INSTALL NEW C.T. TO MONITOR FAN MOTOR ON/OFF STATUS. CONNECT TO NEW CONTROL SYSTEM. THIS IS A NEW DEVICE NOT CURRENTLY INSTALLED.

OPERATING SEQUENCE – EXISTING EXHAUST FAN F-1

Occupied Mode:
According to schedule the BAS shall start the exhaust system by first opening the exhaust damper and when the damper is proven open, the exhaust fan shall start.

Unoccupied Mode:
When the building is indexed to the unoccupied mode the reverse of the above sequence shall occur resulting in exhaust system shut down.

The exhaust fan shall shut down on receiving an emergency shut down signal.



EQUIPMENT CONTROL SCHEMATIC – NEW & EXISTING PIU WITH ELECTRIC HEAT

	HARDWARE POINTS				SOFTWARE POINTS						
ZONE	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM	GRAPHIC	NOTES
ZONE TEMP	X							X	X	X	③
HEATING SETPT.	X							X		X	
COOLING SETPT.	X							X		X	
ZONE DAMPER	X	X								X	①
AIRFLOW	X							X		X	②
ELECTRIC HEAT				X				X		X	⑤
DISCH. AIR TEMP	X							X	X	X	④
FAN STATUS			X					X	X	X	⑥
FAN START/STOP				X						X	⑦
ZONE OVERRIDE			X					X		X	
SCHEDULE							X				
FAN RUNTIME EXCEEDED									X		

NOTES

① EXISTING BOX MOUNTED AIR VALVE MOTOR ASSEMBLY MAY BE REUSED IN PLACE IF OPERATING CORRECTLY AND COMPATIBLE WITH MANUFACTURER'S CONTROL SYSTEM. REPLACE EXISTING DEVICE WITH NEW DEVICE IF REQUIRED.

② CONNECT NEW CONTROL SYSTEM TO EXISTING BOX MOUNTED AIR FLOW RATE SENSORS.

③ REPLACE EXISTING ZONE SENSOR WITH NEW WALL MOUNTED SENSOR.

④ THIS IS A NEW CONTROL SYSTEM SENSOR NOT CURRENTLY INSTALLED. INSTALL THIS NEW DEVICE AND INTERFACE WITH NEW CONTROL SYSTEM.

⑤ PROVIDE INDIVIDUAL BO POINT FOR EACH STAGE OF ELECTRIC HEAT. ONE STAGE HEATER – ONE AO POINT. TWO STAGE HEATER – TWO AO POINTS. THREE STAGE HEATER – THREE AO POINTS.

⑥ INSTALL NEW C.T. TO MONITOR FAN MOTOR ON/OFF STATUS. CONNECT TO NEW CONTROL SYSTEM. THIS IS A NEW DEVICE NOT CURRENTLY INSTALLED.

⑦ CONNECT NEW CONTROL SYSTEM TO EXISTING FAN MOTOR STARTER.

⑧ CONNECT NEW CONTROL SYSTEM TO EXISTING FAN MOTOR STARTER.

OPERATING SEQUENCE – PARALLEL PIU WITH ELECTRIC REHEAT

Run Conditions – Scheduled:
The unit shall run according to a user definable time schedule in the following modes:
Occupied Mode: The unit shall maintain
A 74°F (adj.) cooling setpoint
A 70°F (adj.) heating setpoint.

Unoccupied Mode (night setback): The unit shall maintain
A 85°F (adj.) cooling setpoint.
A 55°F (adj.) heating setpoint.

Alarms shall be provided as follows:
High Zone Temp: If the zone temperature is greater than the cooling setpoint by a user definable amount (adj.).

Low Zone Temp: If the zone temperature is less than the heating setpoint by a user definable amount (adj.).

Zone Setpoint Adjust:
The occupant shall be able to adjust the zone temperature heating and cooling setpoints at the zone sensor.

Zone Optimal Start:
The unit shall use an optimal start algorithm for morning start-up. This algorithm shall minimize the unoccupied warm-up or cool-down period while still achieving comfort conditions by the start of scheduled occupied period.

Zone Unoccupied Override:
A timed local override control shall allow an occupant to override the schedule and place the unit into an occupied mode for an adjustable period of time. At the expiration of this time, control of the unit shall automatically return to the schedule.

PIU Variable Volume Terminal Unit – Flow Control: The unit shall maintain zone setpoints by controlling the airflow through one of the following:

Occupied:
* When zone temperature is greater than its cooling setpoint, the zone damper shall modulate between the minimum occupied airflow (adj.) and the maximum cooling airflow (adj.) until the zone is satisfied.
* When the zone temperature is between the cooling setpoint and the heating setpoint, the zone damper shall maintain the minimum required zone ventilation (adj.).
* When zone temperature is less than its heating setpoint, the controller shall enable heating to maintain the zone temperature at its heating setpoint.

Unoccupied:
* When the zone is unoccupied the zone damper shall control to its minimum unoccupied airflow (adj.).
* When the zone temperature is greater than its cooling setpoint, the zone damper shall modulate between the minimum unoccupied airflow (adj.) and the maximum cooling airflow (adj.) until the zone is satisfied.
* When the zone temperature is greater than its cooling setpoint, the zone damper shall modulate between the minimum unoccupied airflow (adj.) and the maximum cooling airflow (adj.) until the zone is satisfied.
* When zone temperature is less than its unoccupied heating setpoint, the controller shall enable heating to maintain the zone temperature at the setpoint. Additionally.

Fan Control – Parallel:
The fan shall run whenever the zone controller calls for heat. The fan shall run for a minimum user definable time (adj.). If the AHU is not running, the zone damper will close completely to prevent the unit fan from blowing air back into the supply duct.

Electric Heat:
The controller shall measure the zone temperature and stage the electric heat to maintain its heating setpoint. On units with more than one stage of heating provide an algorithm to properly energize and de-energize the stages of heat at the appropriate times.

Discharge Air Temperature:
The controller shall monitor the discharge air temperature.

Fan Status:
The controller shall monitor the fan status.

Alarms shall be provided as follows:
High Discharge Air Temp: If the discharge air temperature is greater than 120°F (adj.).

Low Discharge Air Temp: If the discharge air temperature is less than 40°F (adj.).

Fan Failure: Commanded on, but the status is off.

Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

ROME–FLOYD COUNTY
LAW ENFORCEMENT CENTER
5 GOVERNMENT PLAZA
ROME, GA 30161

RYAN DAVIS, FACILITIES DIRECTOR

LAW ENFORCEMENT CENTER

CHILLER REPLACEMENT AND CONTROLS UPGRADE

DRINKARD
ENGINEERING GROUP, INC.
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GEORGIA REGISTERED PE030294 PROFESSIONAL ENGINEER JEFFREY A. DRINKARD

9/26/14

	OWNER REVIEW SET	9/12/14
	ISSUED FOR BID	9/26/14
-	-	-

DRAWING TITLE

CONTROL SEQUENCES

PROJECT NO.		SCALE AS SHOWN	
APPROVED	CHECKED JD	DRAWN BH	DATE 9/26/14

DRAWING NO.

M-3.3

SECTION 15010 – MECHANICAL GENERAL

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Reference Codes: This installation shall comply with the following codes and regulations, along with all Georgia amendments.
1. Current Georgia State Minimum Standard Mechanical Code.
2. Current NFPA No. 90A Installation of Air Conditioning and Ventilation Systems.
3. Current Georgia State Minimum standard Plumbing Code.
4. Current Georgia State Minimum Standard Gas Code.
5. Current NFPA #54 National Fuel Gas Code.
6. Current Georgia State Minimum Standard Gas Code.
7. Current NFPA No.70, National Electric Code.
8. Current Georgia State Minimum Life Safety Code.
9. Current Georgia State Minimum Standard Fire Prevention Code.
10. Current Georgia State Energy Code for Buildings

B. Reference Standards: This installation shall comply with the following standards.
1. Manufacturers Standardization Society of the Valve and fittings Industry (1815 North Ft. Meyer Drive, Arlington, VA 22209). MSS–SP–58–2002, called MSS–SP–58. MSS–SP–69–2003, called MSS–SP–69.
2. American Society of Heating and Ventilating and Air Conditioning Engineers Guide, Fundamentals, 2009 Edition.
3. Sheet Metal and Air Conditioning Contractor National Association (SMACNA) HVAC Duct Construction Standards, Metal & Flexible, 2005 Edition. Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems. 1986 Edition. Seismic Restraint Manual Guidelines for Mechanical Systems, Second Edition.
4. American Society of Sanitary Engineers (ASSE) Standard, Latest Edition.

1.2 REGULATIONS

A. Attention is called to the fact that all work shall be done in accordance with all applicable City, County and State regulations, which regulations shall be considered as minimum requirements, and shall not alter the arrangement and pipe sizes indicated on the plans, except where they conflict.

B. Contractor is responsible for obtaining all permits and paying all fees required to complete the Work

1.3 DRAWINGS

A. The work is shown on the project drawings and specifications.

1.4 PROTECTION OF PUBLIC

A. If the contractor must operate any potentially dangerous devices before all specified safety valves controls and devices are installed, he shall notify the Architect in writing. He shall not operate such devices under these conditions until arrangements for supervision by competent operators have been instituted and Architect's written approval has been issued.

1.5 EXCAVATION, SHORING AND BRACING

A. Excavate and back–fill for the installation of all underground work.

B. Provide all shoring and bracing to prevent cave–ins during the construction period.

1.6 SHOP DRAWINGS

A. Shop drawings shall be submitted for but not limited to the following items:
1. All Scheduled New Equipment
2. Hangers
3. Piping & Accessories
4. Supports including steel chiller support frame
5. Vibration Isolation
6. Control System
7. Insulation
8. Filters
9. Valves
10. Test and Balance Work

B. Provide a complete list of all accessories and options (indicate factory or field installed) for all scheduled mechanical equipment, including air distribution devices. Provide manufacturer generated specifications and ratings sheets for each individual piece of air conditioning and heating equipment. Generic photocopies from manufacturers catalog will not be accepted.

C. In addition to cut sheets, provide a summary sheet indicating exactly what pipe material joining methods, valves, etc. will be provided in the various piping systems.

D. The Contract Drawings are diagrammatic and indicated generally the size and location of systems. It is recognized that job site conditions may require re–routing of systems and shall be the Contractor's responsibility and at his expense.

E. Steel fabrication shop drawings shall be coordinated with all Division 15 equipment.

1.7 AIR DISTRIBUTION SYSTEMS

A. Supply return, and exhaust air ducts are to be std, 1" static pressure type, class "A" seal, ASHRAE. Perform work in accordance with state and local building inspection department's standard. Duct work shall be rectangular, or round as shown on plans, and shall be fabricated from ASTM A653/A653m galvanized steel sheet, lock–forming quality. All fasteners shall be galvanized steel. All rigid duct work shall be sealed to ASHRAE Class A standard. Fabricate and support rectangular ducts in accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated. Fabricate and support round ducts with longitudinal seams in accordance with SMACNA HVAC Duct Construction Standards. Seal ducts to ASHRAE Class A standard.

B. Flex duct connections shall be made with a band on inner and another band to secure vapor jacket. Max length of any flexible duct section is 5'–0".

C. Paint ductwork, cans, and plenums visible behind air outlet's and inlets matte black.

D. Flexible connections shall be used for all duct connections to HVAC equipment and fans. Flexible connections shall be per SMACNA chapter 7, figure 7–7 and 7–8.

E. Furnish volume dampers with locking, indicating quadrant regulators.

F. All ductwork shall be supported by the building structure..

G. Per the Georgia State Energy Code, the contractor shall produce and submit to the Engineer, "as–built" drawings of the duct system.

H. Fire dampers shall be type "B" except at wall grilles. Damper shall be UL 555 listed and labeled as a 1–1/2 hour static fire damper. UL approved for dual directional air flow. Integral sleeve frame: minimum 20 gage by 12 inches roll formed, galvanized steel. Mill galvanized finish. Type "B" fire dampers shall have no less than 90% free area, shall have 160 degree fusible link, and integral 12" long 20 gauge integral sleeve and preformed picture frame mounting angles. Basis of design is Ruskin IBD2 style B. Equivalent models by Nailor, United, or Greenheck are acceptable. Installation of fire dampers shall comply with SMACNA Fire, Smoke, and Radiation Damper Installation Guide for HVAC Systems.

I. Install fire dampers in all rated wall, floor, and ceiling penetrations as applicable. Provide access doors in duct at each fire damper location.

1.8 DUCT INSULATION

A. Duct insulation installed on interior duct systems shall be astm C1290 Type 100, commercial grade with factory applied reinforced aluminum foil jacket meeting ASTM C1136 Type II.

B. Duct insulation installed on outdoor exterior duct systems shall be 1" thick board insulation or 1" thick elastomeric insulation applied to exterior of supply and return ducts. Cover insulation with waterproof jacket.

C. Insulate all new interior supply ducts and outside air ducts with R–6, 2" insulation duct wrap. Verify all surfaces are clean and dry before applying insulation. Butt joints of insulation together to obtain total coverage. Do not compress the insulation. All interior supply ducts, including ducts with internal liner indicated, shall be externally insulated.

D. Duct Liner: ASTM C1071, type I glass fiber with 100% coated air side. 1" thick, minimum density 3 lb per c.f.

E. Tape all joints. Repair breaks, holes, and perforations' to full thickness flush with adjoining surface, with new sections if large, with tape on small areas so that 2" of tape or replacement foil–kraft project away from the imperfection.

F. Cover flexible equipment connections on air conditioning units with specified duct insulation. Lap connection 6" and secure 2" edge flap with adhesive.

G. Acceptable manufacturers : Certainteed, Knauf, Johns Manville, Owens–Corning.

1.9 PIPE INSULATION

A. Insulate exterior chilled water piping with cellular glass insulation.

1. Cellular Glass insulation: Inorganic, foamed glass, annealed, rigid, hermetically sealed cells, incombustible.

2. Preformed Pipe Insulation, with Jacket: Comply with ASTM C 552, Type II, Class 2. Thickness 3/4" thickness for 1–1/4" pipe and smaller. 1" thickness for 1–1/2" and larger

3. Above ground piping: Install aluminum jacket, factory cut and rolled to size. Below ground piping: Install modified bituminous membrane jacket.

4. Install cellular glass insulation using joint sealers, vapor retarder mastic, reinforcing fabrics and jackets as recommended by manufacturer's installation instructions. Secure each layer of insulation to pipe with wire, tape, or bands without deforming insulation materials. Seal longitudinal seams and end joints with vapor–retarder mastic.

1.10 MOTORS, WIRING AND ELECTRICAL EQUIPMENT

A. All motors required for this work shall be built in accordance with the latest standards of National Electrical Manufacturer's Association, and shall be especially designed for quiet operation. All motors shall be selected for operation within their nameplate amperage. Adjustable bases shall be provided with motors and equipment which have belt drives.

B. All electrical materials shall comply with requirements of the National Electric Code. All contactors, starters, relays and panels used in this work, which are included in Underwriters Label Service, shall be new and bear the National Board of Fire Underwriters inspection label. Material not included in Underwriters Label service shall be new and conform to NEMA or other applicable industry standard.

C. Division 16, ELECTRICAL, provides for the furnishing of conduit and wire from electrical source to electrical use, called path of power, and for the installation of certain line voltage devices specified in Division 15 which lie in the path of power, including but not limited to:
1. Manual switches.
2. Line voltage thermostats.
3. Solid state speed controllers.
4. Operators for operable dampers.
5. Aquastats for domestic hot water circulating pumps.
6. Alarms for Flow Switches and Valve Supervisor Switches.
7. Variable Frequency Drives.

D. The path of power terminates at contactors or control panels of the following listed items of equipment. These control panels contain starters/contactors for the motors or heaters installed on or within the unit and are specifies in Division 15. Any wiring past the point of termination described above is Division 15 work.

1. Packaged Rooftop Units.
2. Fan Powered VAV Units.
3. Make–up Air Units.
4. Condensing and/or Heat Pump Units.
5. Fan Coil Units.
6. Air cooled chillers.
7. Electric Heaters.

E. Division 16, ELECTRICAL, provides for electrical power to any given item of equipment at the voltage and phase required by the primary use only. If the item of equipment contains devices such as fans, thermostats, motorized dampers or other controls which require other than primary voltage for their proper function, then transformers shall be furnished under Division 15 for that purpose.

F. Voltage and phase for Division 15 equipment shall be as specified by Division 16. Division 15 Contractor shall submit a list of all mechanical equipment requiring electrical connections to the Division 16 Contractor prior to release of any equipment, for coordination. Any miscellaneous line voltage wiring required by field conditions but not shown on equipment wiring diagrams shall be coordinated and be the responsibility of Division 16. A copy of this list that has been reviewed and approved by the Division 16 and Division 15 Contractor shall be submitted to the Engineer with the submittal for mechanical equipment. Failure to include this list may result in the rejection of the entire mechanical equipment submittal.

G. The control power source (point of connection for control power) for major equipment except those single phase fans which are thermostatically controlled and those items listed in C above, are provided at the combination starters.

H. The automatic control of signal for STOP–START of major equipment is furnished and installed to and from combination starts as part of Division 15.

I. All other conduit and wire, not in the path of power described above is included in Division 15.

J. If any Division's Contractor makes a change by submittal, by delivery, by wiring rearrangement or power requirements, which results in increased costs, the Contractor initiating the change shall bear all cost increases.

K. All motors that are 1 HP and larger shall be high efficiency motors with nominal and minimum full load efficiencies equal to or greater than those specified by the State Energy Code. Specifications shall be submitted for each motor furnished.

L. Starters or contractors shall be furnished in Division 15 for each motor.

1. Magnetic starters shall be NEMA standard sizes adequate for the load served, Size 00, 1, 2, 3, 4. Half sizes and/or quarter sizes are not acceptable.
2. Overload relays shall be unit constructed, hand reset melting alloy type, and shall be provided for all ungrounded legs.
3. Units shall have NEMA–1 enclosures, three thermal overloads in three–phase starts, HAND–OFF–AUTO switches.
4. All fractional HP single–phase motors shall have internal thermal overload protection except where starters are scheduled.
5. All motor starters shall be of the same manufacturer and shall be General Electric Type CR–306, or equal by Square–D, Westinghouse, Allen–Bradley, Furnas, Siemens, or Cutler–Hammer subject to full compliance with all criteria.

M. Where power wiring to Division 15 equipment is not within the equipment curb, roof curbs with boots shall be provided under Division 16. The portal location shall be coordinated with Division 15 equipment power inlet requirements, and located not to block access for equipment servicing.

1.11 WARRANTY

A. The Contractor shall operate the air conditioning, heating and ventilating systems for a period of one week to the satisfaction of the Engineer. Thereafter, the Contractor shall guarantee and be responsible for all materials and workmanship (parts and labor) for a period of one (1) year following the date of acceptance by the Architect.

B. The Contractor shall also provide maintenance for the one (1) year period by providing four (4) periodic inspections at approximately three–month intervals, which shall include the following.
1. Check all bearing, align and oil or grease.
2. Check belt tensions and pulley adjustment and adjust as necessary.
3. Check filters and advise Owner when change is necessary.
4. Check refrigerant charges and oil levels and replenish as necessary.
5. Check and re–calibrate controls as necessary.

C. Any required maintenance for the above shall be performed and materials needed shall be furnished by the Contractor. Not included in the materials to be furnished by the Contractor are fuel, electricity, water and filters. Provide the Owner with four (4) copies of the inspection reports indicating all items checked and adjustment or repairs performed.

D. Air cooled chiller refrigerant compressors shall be warranted as noted in specification section 15750.

1.12 CUTTING AND PATCHING

A. The Contractor shall set sleeves for pipes, ducts and equipment accurately before the concrete walls and floors are poured.

B. Should the contractor neglect to perform this preliminary work and should cutting and patching be required in order to install the piping, ductwork or equipment, then the expense of the cutting and restoring of surfaces to their original condition shall be borne by the Contractor.

1.13 BASIS OF DESIGN

A. When brand, trade or manufacturer's names are used for basis of design, they are used in the interest of brevity to describe the style, type, size, quality or arrangement of articles of equipment and are not intended to limit competition. If articles of equipment by manufacturers other than basis of design are submitted for installation, the Engineer shall compare them with specified articles of equipment on the basis of qualities mentioned on the drawings and in the specifications. The size, weight and arrangement of other equipment shall be checked by the Contractor to ascertain that it can be installed, connected, operated, and serviced successfully, and that walking space and service space can be maintained without altering equipment space or enclosures or the work of other trades. Manufacturers not listed as acceptable Manufacturers will not be considered.

B. If any Division's Contractor makes a change by submittal, by delivery or by wiring rearrangement which results in increased costs, the Contractor initiating the change shall bear all cost increases.

1.14 AS–BUILT DRAWINGS

A. Per the Georgia State energy Code, the Contractor shall produce and submit to the Engineer, As–Built drawings, four (4) copies, as described below.

B. As work progresses, neatly and clearly record on four (4) sets of mechanical plans (in red) all changes and deviations from the contract drawings in size, locations, etc., of all piping, ductwork terminal units and other equipment. Record (in red) final location of piping, ductwork, starts, valves, thermostats, etc., by dimensions to adjacent walls and floors. Make sufficient measurement to accurately locate all equipment. Locate underground lines by dimension from building walls.

1.15 OPERATION AND MAINTENANCE MANUALS

A. Operation and Maintenance manuals (6 sets) shall be provided to the Owner or the Owners designated representative. Manuals shall be in accordance with the Georgia State Energy Code for Buildings.

1. Manuals shall include as a minimum the following:
a. Final, corrected submittal data with equipment sizes and selected options for each piece of equipment, including Engineer's submittal review comments.
b. Current manufacturer's published operation and maintenance manuals for each piece of equipment.
c. Name, address and phone number of at least one LOCAL service agency.
d. HVAC controls system maintenance and calibration information including wiring diagrams, schematics, and control drawings.
e. Complete narrative of how each system is intended to operate, including suggested set–points.
f. Copy of the final Test & Balance report.
g. Copy of the final As–built drawings.
h. Controls certification letter.
i. Copy of Engineer's final punch list items, with each item checked off when completed or an explanation of why the item was not completed.

1.16 INTERFACES WITH OTHER WORK

A. There are many interfaces between the work involved with Division 15 and the work involved with other Sections and Divisions, particularly with Division 16. Contractor shall be aware of the requirements of these other Sections or Divisions and his responsibilities at the interfaces.

B. No mechanical equipment, piping, or ductwork shall be places within 42" of of switchboards and/or panel boards.

C. No water piping (domestic, storm, sanitary, etc., except sprinkler piping when required) shall be located above electrical switchboards and/or panel boards. When sprinklers are required, shields must be provided over the panels.

1.17 EQUIPMENT IDENTIFICATION

A. Equipment Identification:
1. All mechanical equipment shall be labeled with engraved plastic nameplates with 2" high letters on a black background, securely affixed to equipment for outdoor or indoor service.
2. Equipment Identification numbers shall be the same as those scheduled on the design drawings. Identification shall be located where it can be conveniently read, and shall be located in the same relative position on like equipment.
3. In addition to the above ID tags, all scheduled equipment shall be provided with permanent factory installed engraved nameplate labels listing complete model and serial numbers, unit voltage, motor sizes, etc.
4. Identify all disconnect switches that are not directly attached to the equipment that they serve, with identical ID tags as specified above for the equipment.
4. At exterior wall mounted disconnect switches for chillers CH–1 and CH–2, mount a permanent label on exterior of disconnect switch reading "WARNING IF POWER IS DISCONNECTED TO CHILLER THEN THE CHILLER EVAPORATOR FREEZE PROTECTION IS DISABLED".

1.18 PIPE IDENTIFICATION

A. All new piping systems shall be identified.
1. All piping systems within the building except as noted herein shall be identified with clear block letters and number stenciled on the outside surface of the pipe or insulation, indicating the system contents by abbreviated letters and direction of the flow.
2. This identification marking shall be applied to the pipe systems where pipe enters or leaves a wall or floor, and item of equipment such as pumps, fan coil units and tanks, and at tees. Identification shall be applied no less than 50 feet apart on horizontal pipe; and one identification per floor on vertical pipe.
3. Letters and numbers shall be 1/2" high on pipe 2 inches and smaller.
4. Letters and numbers shall be 1" on pipe 3 inches and larger.
5. Directional arrows shall be 4 inches long and 1/2" wide.
6. Letters and numbers shall be black on white pipe or insulation.
7. Letters and number shall be white on dark pipe or insulation.
8. Pipe identification symbols shall be the same as shown on the drawings.
9. Soil, vent and refrigerant piping shall not be identified.
10. New exterior above ground chilled water piping shall be identified with the letters "CHW" and with direction flow arrows applied to insulation metal jacket.

1.19 PERMITS AND INSPECTIONS

A. The Contractor shall secure and pay for all permits, fees, inspections, and utility connection costs.

1.20 EQUIPMENT & MATERIAL PROTECTION

A. All equipment and material shall be kept clean and free of debris as construction progresses. Closures shall be provided over duct, piping and major equipment openings during storage, erection and prior to connection. Material finishes shall be protected by covers to prevent impingement of corrosive, abrasive and disfiguring foreign matter. Accidental finish damage shall be repaired equivalent to original finish.

1.21 TEST, BALANCE AND REPORT

A. See Section 15950.

1.22 PROHIBITED MATERIALS

A. All products, materials or assemblies which contain asbestos or polychlorinated biphenyl (PCB) in any form or in any concentration whatsoever, are expressly forbidden from being used on this project.

1.23 SITE VISIT AND FAMILIARIZATION

A. Contractors proposing to undertake work under this Division shall visit the site of the work and fully inform themselves of all conditions that effect the work or cost thereof, examine the drawings and specifications as related to the site conditions, and acquaint themselves with the utility companies from whom services will be supplied; verify locations of utility services and determine requirements for connections.

B. Consideration will not be granted for any alleged misunderstanding of the amount of work to be performed. Tender of proposal shall convey full agreement to all items and conditions specified, indicated on the drawings, and/or required by nature of the site.

C. Attention is called to the fact that this scope of work includes renovation to an existing facility. When the work is finished, the mechanical systems shall be complete in every respect, and completely integrated with all affected mechanical and control systems.

D. Existing mechanical systems in the existing facility shall not be interrupted without prior approval of the Owner or Engineer.

GENERAL NOTES:

1. ALL MECHANICAL EQUIPMENT AND INSTALLATIONS SHALL CONFORM WITH THE REQUIREMENTS OF THE LOCAL CODE OFFICE'S LATEST APPROVED VERSION OF THE INTERNATIONAL MECHANICAL CODE, THE INTERNATIONAL BLDG. CODE, THE STATE ENERGY CODE, NFPA 90A, 101, UNDERWRITERS LABORATORIES AND ALL APPLICABLE LOCAL CODES AND ORDINANCES.
2. PRIOR TO PURCHASING ANY MATERIALS OR STARTING ANY WORK, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, DUCTWORK, ELECTRICAL BREAKER AND WIRING, AND PIPE SIZES, EQUIPMENT LOCATIONS, ETC. AFFECTING THIS WORK AND SHALL REPORT ANY DEVIATIONS TO THE ARCHITECT.
3. SUBMITTALS AND SHOP DRAWINGS SHALL BE SUBMITTED TO AND APPROVED BY THE ARCHITECT AND MECHANICAL ENGINEER PRIOR TO ORDERING, PURCHASING, OR FABRICATING ANY MECHANICAL EQUIPMENT. THESE SHALL INCLUDE ALL EQUIPMENT SPECIFIED ON THE PLANS OR IN THE PROJECT SPECIFICATIONS.
4. ALL MECHANICAL EQUIPMENT REQUIRING ELECTRICAL POWER SHALL BE INSTALLED WITH DISCONNECT SWITCHES AT EACH PIECE OF EQUIPMENT. COORDINATE SWITCH TYPE (FUSED OR NON–FUSED) WITH EQUIPMENT CHARACTERISTICS, MANUFACTURER'S RECOMMENDATIONS, AND ELECTRICAL PLANS AND SPECIFICATIONS. SEE SPECIFICATIONS FOR DESCRIPTION OF INTERFACE WITH DIVISION 16 WORK.
5. ALL REQUIRED CONTROL WIRING SHALL BE INCLUDED AS PART OF THE MECHANICAL WORK. WIRING IN HVAC PLENUM SPACES SHALL BE INSTALLED ACCORDING TO CODE REQUIREMENTS.
6. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. ALL MECHANICAL EQUIPMENT SHALL BE LABELED WITH ENGRAVED PLASTIC NAMEPLATE WITH 2" HIGH WHITE LETTERS ON A BLACK BACKGROUND. NAMEPLATE SHALL SHOW EQUIPMENT TAG USED ON THESE DRAWINGS. ELECTRICAL DISCONNECTS FOR EQUIPMENT SHALL BE LABELED TO MATCH EQUIPMENT SERVED.
8. ALL PIPING, ELECTRICAL CONDUIT, AND DUCTWORK SHALL BE SUPPORTED BY THE BUILDING STRUCTURE AND SHALL NOT HANG FROM OR REST ON CEILING TILES OR CEILING STRUCTURE.
9. BRANCH RUN–OUT DUCTS SHALL BE SAME SIZE AS DIFFUSER NECK IF NOT NOTED OTHERWISE.
10. EQUIPMENT LOCATIONS SHOWN ARE DIAGRAMMATIC. COORDINATE AND ROUTE EQUIPMENT TO MEET JOB REQUIREMENTS. LOCATION OF EQUIPMENT MUST BE COORDINATED WITH ALL DISCIPLINES BEFORE FINAL LOCATIONS ARE SELECTED. HEIGHTS OF EQUIPMENT MUST BE VERIFIED AND COORDINATED WITH STRUCTURAL SYSTEMS MANAGERS BEFORE EQUIPMENT CAN BE MOVED INTO LOCATION OR INSTALLED.
11. ALL CONDENSATE DRAIN LINES FROM HVAC EQUIPMENT SHALL BE TRAPPED AND SHALL DRAIN INTO BUILDING FLOOR DRAINS, ROOF DRAINS, OR STORM DRAINS. CONDENSATE SHALL BE INSULATED SCHEDULE 40 PVC (EXCEPT INSULATED COPPER IN HVAC PLENUMS). CONDENSTATE SHALL BE PUMPED AS REQUIRED.
12. ALL INTERIOR PIPING ABOVE GRADE SHALL BE SUPPORTED BY THE BUILDING STRUCTURE, AND SHALL NOT REST ON CEILING TILES OR CEILING STRUCTURE. PIPE HUNG FROM JOISTS SHALL BE HUNG FROM THE TOP CHORD OF JOISTS.
13. ALL PIPE AND DUCT PENETRATIONS OF FIRE AND/OR SMOKE RATED ASSEMBLIES SHALL BE FIRESTOPPED AS REQUIRED TO RESTORE ASSEMBLY TO ORIGINAL INTEGRITY. FIRE BARRIER PRODUCTS SHALL BE MANUFACTURED BY 3M COMPANY, CP25 CAULK, CP195 COMPOSITE PANEL, FS195 WRAP/STRIP, OR PSS 7900 SERIES SYSTEMS AS RECOMMENDED BY MFG. FOR PARTICULAR APPLICATIONS, OR EQUIVALENT SYSTEM AS APPROVED BY LOCAL CODE OFFICIALS.
14. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL MECHANICAL EQUIPMENT, DUCTWORK, ETC. TO FIT WITHIN THE SPACE ALLOWED BY ARCHITECTURAL AND STRUCTURAL CONDITIONS. CUTTING OR OTHERWISE ALTERING ANY STRUCTURAL MEMBERS SHALL NOT BE PERMITTED WITHOUT WRITTEN PERMISSION FROM THE ARCHITECT.
15. THE ELECTRICAL CONTRACTOR, THROUGH COORDINATION WITH THE MECHANICAL CONTRACTOR, IS RESPONSIBLE FOR ALL LINE VOLTAGE WIRING ASSOCIATED WITH THE WORK. THIS INCLUDES ANY MISCELLANEOUS WIRING NOT SPECIFICALLY INDICATED ON THE DRAWINGS BUT STILL NECESSARY TO CREATE FUNCTIONING SYSTEMS IN THE SCOPE OF WORK.

HVAC LEGEND

SYMBOL – SINGLE LINE	SYMBOL – DOUBLE LINE	DESCRIPTION
BDD	BDD	BACKDRAFT DAMPER
		CEILING DIFFUSER
		CEILING RETURN GRILLE
S–1B 190	S–1B 190	DIFFUSER TAG: TYPE S–1B BALANCED FOR 190 CFM
D	D	DROP
16x12	16x12	DUCT SIZE – RECTANGULAR
10"ø	10"ø	DUCT SIZE – ROUND
		DUCT TRANSITION
		FIRE DAMPER, HORIZONTAL
		FIRE DAMPER, VERTICAL
H	H	HUMIDISTAT
		LINED DUCT
	MVD	MANUAL VOLUME DAMPER
MOD	MOD	MOTOR OPERATED DAMPER
		RETURN/EXHAUST AIR DUCT TURNED DOWN
		RETURN/EXHAUST AIR DUCT TURNED UP
		SMOKE DAMPER
		SUPPLY AIR DUCT TURNED DOWN
		SUPPLY AIR DUCT TURNED UP
T	T	THERMOSTAT, WALL–MOUNTED
		RECT. ELBOW WITH TURNING VANES
SD	SD	SMOKE DETECTOR

FLOYD COUNTY GEORGIA

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9/26/14

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	ISSUED FOR BID	9/26/14
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DRAWING TITLE
MECHANICAL LEGEND SPECIFICATIONS

PROJECT NO.		SCALE AS SHOWN	
APPROVED	CHECKED JD	DRAWN JD	DATE 9/26/14

DRAWING NO.
M-4.1

KEYED NOTES

1	REPLACE TWO BREAKERS WITH SAME STYLE (GE SG SERIES) WITH 600A FRAME AND 500A TRIP. SET INSTANTANEOUS TRIP TO MAXIMUM. INSURE LUGS WILL ACCEPT 600 KCMIL COPPER.
2	REPLACE EXISTING CIRCUIT WITH 3-600 KCMIL & #2G COPPER XHHW2 IN EXISTING CONDUIT. CLEAN AND INSPECT CONDUIT. REPLACE IF NEEDED.
3	REPLACE TWO SWITCHES WITH TWO 600A, 480V, 3 POLE, NEMA 3R HEAVY DUTY SAFETY SWITCHES WITH 600 KCMIL , 75°C LUGS. FUSE WITH 450A DUAL ELEMENT FUSES.
4	REMOVE EXISTING CONDUCTORS AND ABANDON CONDUIT.
5	INSTALL 3" CONDUIT (SEE 3/E1.0) WITH 3-500 KCMIL COPPER XHHW2 & #2 COPPER GROUND.
6	INSTALL 20A, SINGLE POLE CIRCUIT BREAKER IN AN EXISTING 208/120V PANEL WITH AVAILABLE SPACE AND CAPACITY. LABEL "CHILLER PIPING HEAT TAPE."
7	INSTALL 1/2" IMC AND 2-#12 COPPER THHN & #12 COPPER GROUND FROM NEW BREAKER TO NEW FUSED SWITCH.
8	INSTALL 30A, SINGLE POLE 120V NEMA 3R LOCKABLE FUSABLE SAFETY SWITCH. INSTALL FUSES BASED ON REQUIREMENTS OF HEAT TAPE. LABEL "CHILLER PIPING HEAT TAPE." COORDINATE LOCATION AND ELECTRICAL REQUIREMENTS WITH MECHANICAL CONTRACTOR. MAKE FINAL CONNECTIONS AS REQUIRED BY INSTALLED EQUIPMENT.
9	3" IMC WITH THREATED FITTINGS.
10	3" LIQUID TIGHT FLEXIBLE METAL CONDUIT.
11	CHILLER ELECTRICAL CABINET.
12	CONCRETE PAD.
13	INSTALL 3/4" IMC AND LIQUID TIGHT FLEXIBLE METAL CONDUIT WITH 2-#12 & #12G TO THERMOSTAT BOX PROVIDED AND INSTALLED BY MECHANICAL CONTRACTOR. MAKE FINAL CONNECTIONS OF BRANCH CIRCUIT TO THERMOSTAT AND HEAT TAPE TO THERMOSTAT. MAINTAIN 6" COVER.
14	HEAT TAPE CONTROL BOX PROVIDED AND INSTALLED BY MECHANICAL CONTRACTOR.
15	DISCONNECT AND RECONNECT ELECTRICAL CONNECTIONS TO ELECTRIC HEATER. IF ELECTRICAL REQUIREMENTS OF NEW HEATER EXCEEDS CAPACITY OF BRANCH CIRCUIT, INCLUDING BREAKER AND DISCONNECT SWITCH, INCREASE AS REQUIRED.
16	DISCONNECT AND RECONNECT ELECTRICAL CONNECTIONS TO VARIABLE FREQUENCY DRIVES. IF ELECTRICAL REQUIREMENTS OF NEW DRIVES IS DIFFERENT OR EXCEEDS CAPACITY OF BRANCH CIRCUIT, INCLUDING BREAKER AND DISCONNECT SWITCH, MODIFY AS REQUIRED.
17	DISCONNECT POWER FROM EXISTING CONTROL SYSTEM PANELS. RECONNECT POWER TO NEW CONTROL SYSTEM PANELS

ELECTRICAL DESIGN BASED ON MECHANICAL EQUIPMENT BASIS OF DESIGN IN DIVISION 15 PLANS. IF OTHER EQUIPMENT IS INSTALLED, CONTRACTOR SHALL BEAR ALL RESPONSIBILITY FOR REQUIRED DESIGN CHANGES AND SHALL BEAR ALL COSTS OF INSTALLING ALTERNATE EQUIPMENT.

PATHFINDER™ Air-Cooled Screw Chiller — DAIKIN

Sound (*without insulation*)

Sound Pressure (*at 30 feet*)

63 Hz dB	125 Hz dB	250 Hz dB	500 Hz dB	1 kHz dB	2 kHz dB	4 kHz dB	8 kHz dB	Overall dBA	75% Load dBA	50% Load dBA	25% Load dBA
83	75	71	64	57	51	42	35	**67**	66	65	63

Sound Power

63 Hz dB	125 Hz dB	250 Hz dB	500 Hz dB	1 kHz dB	2 kHz dB	4 kHz dB	8 kHz dB	Overall dBA	75% Load dBA	50% Load dBA	25% Load dBA
110	102	98	91	84	78	69	62	**94**	93	91	90

One-third Octave Band Sound Power

50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz
103	109	95	94	101	88	88	86	95	82	80	89	79	79	79	77	71	68	66	63	62	58	57	53

Octave band is non 'A' weighted and overall readings are 'A' weighted. Sound data rated in accordance with AHRI Standard-370.

Physical

Unit				
Length	**Height**	**Width**	**Shipping Weight***	**Operating Weight***
246 in	100 in	88 in	12829 lb	13072 lb

** Shipping and operating weights do not include the weights of any Options or Accessories. Contact Chiller Applications for additional information.*

Electrical

Unit Electrical Data				
Voltage	**Starter Type**	**Fan Motor Quantity**	**LRA Fan Motor (each)**	**FLA Fan Motors (each)**
460 / 60 / 3	Solid State	10	14 A	3.4 A

Power Connection Type:	Single Point Disconnect Switch with Circuit Protection
Phase Voltage:	None (PVM included as part of Solid State / VFD)
Single Point Power Connection	
MCA:	362.6 A
Fuse Size (*recommended*):	450 A
Fuse Size (*maximum*):	500 A
Connector Wire Range:	(1) 3/0 to 500 MCM & (2) 3/0 to 250MCM

Compressor Electrical Data

Compressor Type	Compressor Quantity	Starter Type
Screw	2	Solid State

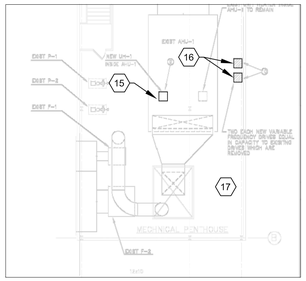
	Compressor # 1	Compressor # 2
RLA:	146 A	146 A
Inrush Current:	566 A	566 A

Note: Power wiring connections to the chiller may be done with either copper or aluminum wiring. Wire should be sized per NEC and/or local codes. Wire sizing and wire count must fit in the power connection lug sizing listed in latest installation manual. Please contact your local sales office for more information.

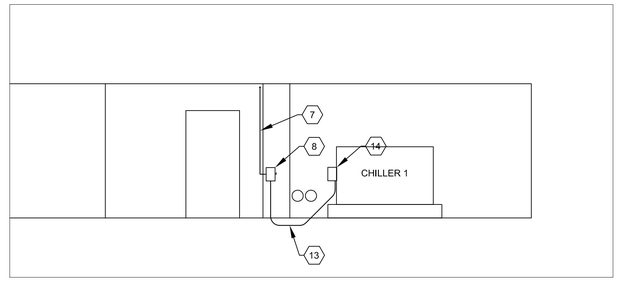
Options

Basic Unit	
Control Box Ambient:	High Ambient with Exhaust Fans (125°F maximum)
Motor Cooling:	With Additional Liquid Injection Cooling
Control	
Communication:	BACnet MS/TP
Electrical	
Unit Options:	Slide Indicator (Linear Transducer)
Water Flow Indicator:	Evaporator only (Thermal Dispersion)

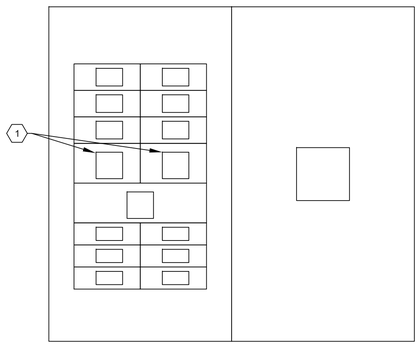
www.DaikinApplied.com



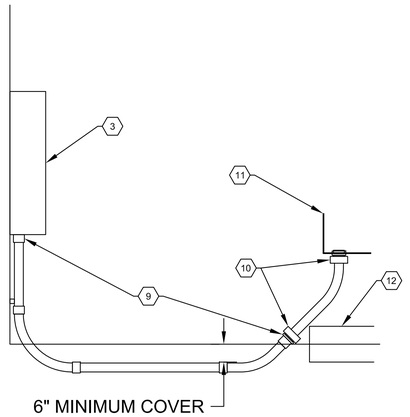
5 ELECTRICAL CONNECTIONS IN AHU-1
NO SCALE



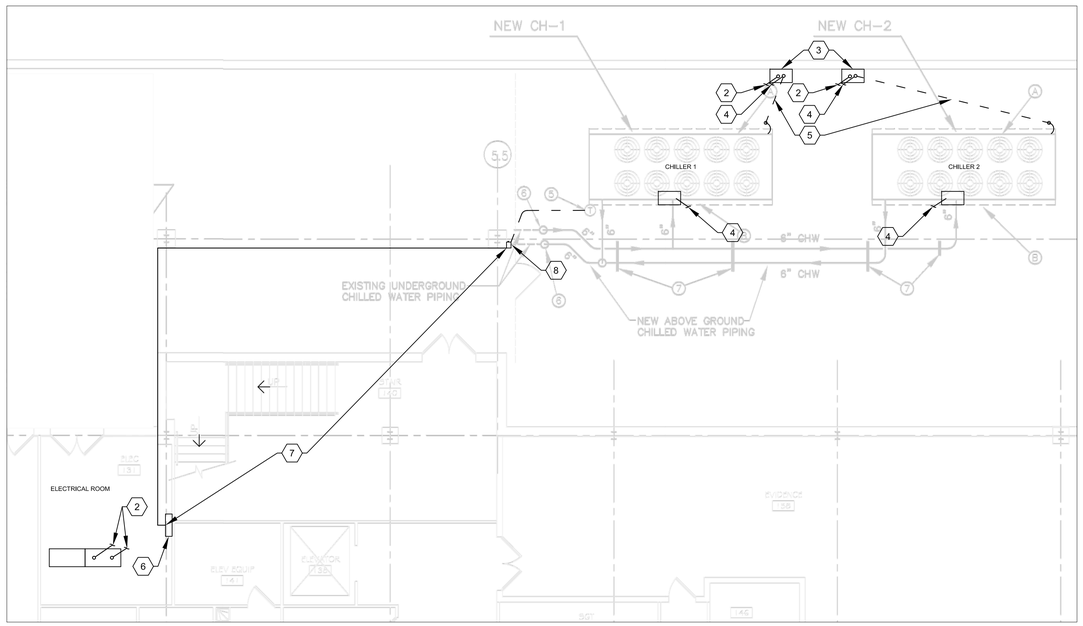
4 HEAT TAPE CIRCUIT
NO SCALE



2 BRANCH CIRCUITS IN SWITCHBOARD
NO SCALE



3 CHILLER CONNECTION DETAIL
NO SCALE



1 PLAN VIEW OF CHILLER CIRCUITS
SCALE: 1/8" = 1'

ROME–FLOYD COUNTY
LAW ENFORCEMENT CENTER
5 GOVERNMENT PLAZA
ROME, GA 30161

RYAN DAVIS, FACILITIES DIRECTOR

LAW ENFORCEMENT CENTER

CHILLER REPLACEMENT
AND
CONTROLS UPGRADE

DRINKARD
ENGINEERING GROUP, INC.
119 SOUTH BROAD ST. ROME, GA 30161
PH. (706) 237-6013

GEORGIA REGISTERED PROFESSIONAL ENGINEER WESLEY K TURNER

	OWNER REVIEW SET	9/12/14
	ISSUED FOR BID	9/26/14

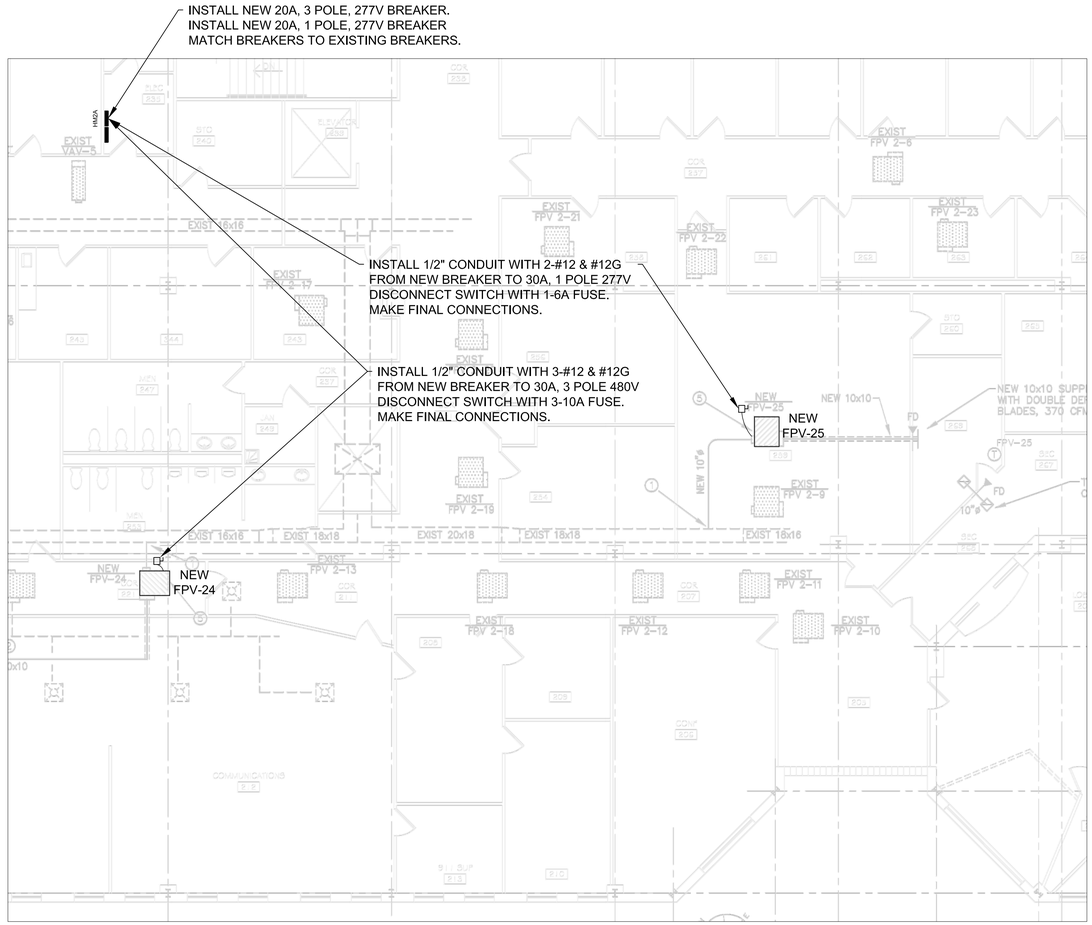
DRAWING TITLE
CHILLER ELECTRICAL CONNECTIONS

PROJECT NO.		SCALE	
APPROVED	CHECKED	DRAWN	DATE 9/26/14

DRAWING NO.
E-1.0

GENERAL NOTES:

1. ALL WORK SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE, AMERICANS WITH DISABILITIES ACT AND ALL OTHER CODES ENFORCED BY THE AUTHORITIES HAVING JURISDICTION.
2. CONTRACTOR SHALL PROVIDE AND PAY FOR ALL MATERIAL, EQUIPMENT, LABOR, SUPERVISION, SERVICES, PERMITS AND INSPECTIONS REQUIRED TO PROVIDE A COMPLETE, SAFE AND FUNCTIONING ELECTRICAL SYSTEM.
3. CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORT FOR SWITCHES, STARTERS, FIXTURES, RACEWAYS AND OTHER ELECTRICAL EQUIPMENT WHEREVER THE BUILDING STRUCTURE IS NOT SUITABLE FOR DIRECT MOUNTING.
4. ALL EQUIPMENT AND MATERIAL SHALL BE LISTED BY A NATIONALLY RECOGNIZED LISTING AGENCY FOR THE INSTALLED USE.
5. THE DRAWINGS ARE GENERALLY DIAGRAMMATIC AND IT IS THE INTENT AND MEANING OF THE CONTRACT DOCUMENTS THAT THE CONTRACTOR SHALL PROVIDE AN ELECTRICAL INSTALLATION THAT IS COMPLETE WITH ALL ITEMS NECESSARY, INCIDENTAL AND CUSTOMARILY INCLUDED, EVEN THOUGH EACH AND EVERY ITEM IS NOT SPECIFICALLY CALLED OUT OR SHOWN.
6. ALL WORK SHALL BE COORDINATED SO THAT INTERFERENCES ARE AVOIDED. PROVIDE ALL NECESSARY OFFSETS IN CONDUITS, RACEWAYS, ETC. REQUIRED TO PROPERLY INSTALL THE WORK. EXPOSED WORK MUST BE KEPT AS CLOSE AS POSSIBLE TO WALLS, CEILINGS, COLUMNS, ETC. SO AS TO TAKE MINIMUM AMOUNT OF SPACE. ALL OFFSETS, FITTINGS, ETC. REQUIRED SHALL BE PROVIDED WITHOUT ADDITIONAL EXPENSE TO THE OWNER. WORK SHALL BE COORDINATED WITH OTHER TRADES.
7. CONDUIT RUNS ARE DIAGRAMMATIC IN NATURE. CONTRACTOR IS RESPONSIBLE FOR SIZING AND LOCATING PULL BOXES ACCORDING TO THE N.E.C. AND COORDINATING WITH OTHER DISCIPLINES.
8. CONTRACTOR SHALL INSTALL ONE 3/4" CONDUIT FOR EACH SET OF THREE SPARE BREAKERS AND/OR BREAKER SPACES OR FRACTION THEREOF FROM EACH FLUSH MOUNTED PANELBOARD. THE SPARE CONDUITS SHALL BE STUBBED UP INTO THE NEAREST ACCESSIBLE CEILING CAVITY.
9. PENETRATIONS OF WALLS, FLOORS AND ROOFS FOR THE PASSAGE OF ELECTRICAL RACEWAYS SHALL BE APPROVED BY THE STRUCTURAL ENGINEER OF RECORD. ALL SUCH PENETRATIONS SHALL BE PROPERLY SEALED AFTER INSTALLATION OF RACEWAY SO AS TO MAINTAIN THE STRUCTURAL, WATER PROOF AND FIRE PROOF INTEGRITY OF THE WALL, FLOOR OR ROOF SYSTEM.
10. ALL OUTDOOR ENCLOSURES SHALL HAVE A NEMA 3R RATING.
11. ALL WIRING, INCLUDING PANEL BUSES, SHALL BE COPPER.
12. ALL OUTLET BOXES SHALL BE METALLIC AND SHALL BE GROUNDED ACCORDING TO N.E.C. ARTICLE 250.
13. ALL INCOMING CONDUCTORS INTO PANELBOARDS AND TRANSFORMERS SHALL BE IDENTIFIED BY COLOR TAPING AS FOLLOWS: 480 VOLTS- PHASE "A" BROWN; PHASE "B" ORANGE; PHASE "C" YELLOW; NEUTRAL GRAY; 208 VOLTS - PHASE "A" BLACK; PHASE "B" RED; PHASE "C" BLUE; NEUTRAL WHITE. BRANCH CIRCUIT CONDUCTORS SHALL HAVE SIMILAR COLORED CONDUCTORS.
14. ALL POWER CIRCUITS SHALL HAVE AN EQUIPMENT GROUNDING CONDUCTOR ROUTED IN THE CONDUIT AND SIZED ACCORDING TO THE N.E.C. METAL RACEWAY, CABLE ARMOR OR SHEATH SHALL NOT BE USED AS AN EQUIPMENT GROUNDING CONDUCTOR.
15. PROVIDE A SEPARATE CONDUIT AND JUNCTION BOX SYSTEM FOR 120V AND 277V WIRING.
16. FOR UNDERGROUND INSTALLATIONS USE RIGID METAL CONDUIT, INTERMEDIATE METAL CONDUIT OR THICKWALL NON-METALLIC CONDUIT.
17. FOR OUTDOOR ABOVE GROUND INSTALLATIONS USE RIGID METAL CONDUIT OR INTERMEDIATE METAL CONDUIT.
18. FOR IN SLAB ABOVE GRADE INSTALLATION USE RIGID METAL CONDUIT OR INTERMEDIATE METAL CONDUIT.
19. FOR WET OR DAMP INSTALLATIONS USE RIGID METAL CONDUIT OR INTERMEDIATE METAL CONDUIT.
20. FOR DRY CONCEALED INSTALLATIONS USE RIGID METAL CONDUIT, INTERMEDIATE METAL CONDUIT OR ELECTRICAL METALLIC CONDUIT.
21. FOR DRY EXPOSED INSTALLATIONS USE RIGID METAL CONDUIT OR INTERMEDIATE METAL CONDUIT.
22. FLEXIBLE METAL CONDUIT AND LIQUID TIGHT METAL CONDUIT MAY BE USED FOR TAP CONNECTIONS TO FIXTURES ACCORDING TO N.E.C. ARTICLE 350 AND AS SPECIFIED.
23. ALL EQUIPMENT SHALL BE GROUNDED ACCORDING TO N.E.C.
24. ALL LIGHTING AND RECEPTACLE CIRCUITS SHALL HAVE INDEPENDENT NEUTRALS.
25. UNLESS OTHERWISE NOTED LIGHTING AND RECEPTACLE HOMERUNS SHALL BE LIMITED TO SEVEN CONDUCTORS, THREE PHASE WIRES, THREE NEUTRALS AND ONE GROUND.
26. ALL BRANCH CIRCUIT BREAKER POSITIONS IN SWITCHBOARDS AND PANELBOARDS SHALL BE LABELED PER N.E.C. ARTICLE 408-4.
27. CONTRACTOR SHALL PROVIDE ALL CONNECTIONS INCLUDING WIRE, CONDUIT AND SWITCHES NECESSARY TO CONNECT MECHANCIAL AND PLUMBING EQUIPMENT.
28. ALL SWITCHES AND BREAKERS SERVING EQUIPMENT SHALL HAVE HANDLE LOCKS.
29. ALL CIRCUIT BREAKERS SERVING MECHANICAL EQUIPMENT SHALL BE H.A.C.R RATING.
30. CONTRACTOR SHALL COORDINATE WITH TRADES AND PROVIDE CONTROL POWER FOR ALL VAV BOXES/DAMPERS/ETC AS REQUIRED TO ENSURE A COMPLETE AND FULLY FUNCTIONAL HVAC SYSTE. PROVIDE POWER FROM NEAREST 120V GENERAL PURPOSE CIRCUIT OR FROM BUILDING CONTROL POWER DISTRIBUTION SYSTEM.
31. CONTRACTOR SHALL COORDINATE MOTOR DISCONNECT AND CONTROL WITH MECHANICAL CONTRACTOR. PROVIDE STARTERS AND DISCONNECT SWITCHES FOR ALL MECHANICAL EQUIPMENT THAT IS NOT PROVIDED INTEGRAL TO THE EQUIPMENT. PROVIDE MOTOR STARTERS FOR ALL MOTORS ONE HORSPOWER OF LARGER. PROVIDE MOTOR RATED SWITCHES FRO ALL MOTORS LESS THAN ONE HORSEPOWER. PROVIDE ALL NECESSARY WIRE, CONDUIT AND POWER FOR INTERLOCKED MOTOR CONTROLS.
32. PROVIDE 20A, 120V RECEPTACLE WITHIN 25' OF ALL HVAC EQUIPMENT.
33. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR LOCATION OF ALL ELEMENTS (CEILING HEIGHTS, SPRINKLERS, DIFFUSERS, ETC). ALL CEILING MOUNTED ITEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE ARCHITECTURAL DIMENSIONED DRAWINGS. IF LOCATION FOR AN ITEM IS NOT SHOWN ON THE ARCHITECTURAL DRAWINGS, VERIGY THE EXACT LOCATION OF THE ITEM WITH THE ARCHITECT PRIOR TO INSTALLATION. THESE REQUIREMENTS APPLY TO ALL CEILING TYPES IN ALL AREAS. DO NOT SCALE DIMENSION LOCATION FROM THESE DRAWINGS.
34. CONTRACTOR SHALL PROVIDE AND INSTALL ALL SUPPORTS FOR LIGHT FIXTURES. SUPPORTS SHALL BE INDEPENDENT OF THE CEILING GRID SUPPORT SYSTEM.
35. ALL LIGHT FIXTURES SHALL BE INSTALLED WITH APPROPRIATE LAMPS AS INDICATED. FIXTURES SHALL BE ALSO INSTALLED WITH BALLAST AS NECESSARY.
36. EMERGENCY LIGHTING SHALL BE PROVIDED WITH A LOCK-ON CLIP IN THE LIGHTING PANEL.
37. EMERGENCY LIGHTS AND EXIT SIGNS SHALL HAVE A BACKUP ENERGY SOURCE.
38. ALL SWITCHES SHALL BE 20AMP SPECIFICATION GRADE.
39. MOUNT WALL MOUNTED EMERGENCY LIGHTS AND EXIT SIGNS ONE FOOT BELOW CEILING OR BELOW LOWEST STRUCTURAL MEMBER FOR UNFINISHED AREAS. VERIFY PROPER VISIBILITY FROM ALL DIRECTIONS.
40. PROVIDE ZERO DEGREE BALLAST FOR FIXTURES IN EXTERIOR AND UNHEATED LOCATIONS.
41. WIRE ALL EMERGENCY LIGHT FIXTURES AHEAD OF SWITCHES AND LIGHTING CONTACTORS.
42. VERIFY DOOR SWINGS WITH ARCHITECTURAL PLANS PRIOR TO ROUGH IN FOR ALL LIGHT SWITCHES.
43. PROVIDE SHATTER RESISTANT LAMPS FOR ALL FIXTURES OVER FOOD PREPARATION/SERVING AREAS.
44. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR LOCATION AND MOUNTING HEIGHT FOR ALL WALL AND FLOOR MOUNTED ELEMENTS (OUTLETS, LIGHT SWITCHES, CONTROLLERS, ETC) ALL WALL/FLOOR MOUNTED ITEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE ARCHITECTURAL DIMENSIONED DRAWINGS. IF LOCATION FOR AN ITEM IS NOT SHOWN ON THE ARCHITECTURAL DRAWINGS, VERIFY THE EXACT LOCATION OF THE ITEM WITH THE ARCHITECT PRIOR TO INSTALLATION. THESE REQUIREMENTS APPLY TO ALL WALL/FLOOR TYPES IN AL AREAS. DO NOT SCALE OR DIMENSION LOCATION FROM THESE DRAWINGS.
45. CONTRACTOR SHALL COORDINATE THE LOCATION AND INSTALLATION DETAIL OF OUTLETS IN MILLWORK WITH ARCHITECTURAL DRAWINGS (WALL ELEVATIONS, MILLWORK DETAIL, ETC.) AND WITH MILLWORK MANUFACTURER PRIOR TO ELECTRICAL ROUGH IN.
46. WALL AND FLOOR MOUNTED POWER RECEPTACLES SHOWN NEAR DATA OUTLETS SHALL BE LOCATED WITHIN SIX INCHES OF DATA OUTLET. LOCATE AT SAME MOUNTING HEIGHT UNLESS NOTED OTHERWISE.
47. CONTRACTOR SHALL VERIFY THE EXACT POWER CONNECTION TYPE AND NEMA CONFIGURATION OF THE RECEPTACLE FOR EQUIPMENT FURNISHED BY THE OWNER, OTHER TRADES OR UNDER A SEPARATE SECTION OF THIS CONTRACT PRIOR TO ELECTRICAL ROUGH IN.
48. ALL RECEPTACLES LOCATED OUTSIDE THE BUILDING ENVELOPE SHALL BE HOUSED IN ENCLOSURES THAT ARE RATED "WEATHER-PROOF-WHILE-IN-USE" AND SHALL BE GFCI.
49. FINISH COLORS OF DEVICES AND CORRESPONDING COVER PLATES SHALL BE SELECTED AND APPROVED BY THE ARCHITECT.
50. ELECTRICAL OUTLET BOXES LOCATED ON THE OPPOSITE SIDES OF FIRE RATED WALLS SHALL BE OFFSET BY 24 "
51. WHERE DEMOLITION WORK OF EQUIPMENT AND SYSTEMS IS REQUIRED, THE DIV 16 CONTRACTOR SHALL DISDONNECT POWER FROM EXISTING EQUIPMENT AND MAKE IT SAFE FOR REMOVAL.



1 ELECTRIC POWER PLAN SECOND FLOOR
SCALE: 1/8" = 1'

ROME–FLOYD COUNTY
LAW ENFORCEMENT CENTER
5 GOVERNMENT PLAZA
ROME, GA 30161

RYAN DAVIS, FACILITIES DIRECTOR

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GEORGIA REGISTERED NO. 31915 PROFESSIONAL ENGINEER WESLEY R TURNER

	OWNER REVIEW SET	9/12/14
	ISSUED FOR BID	9/26/14
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DRAWING TITLE

NOTES & 2ND FLR PLAN

PROJECT NO.		SCALE	
APPROVED	CHECKED	DRAWN	DATE 9/26/14

DRAWING NO.

E-2.0