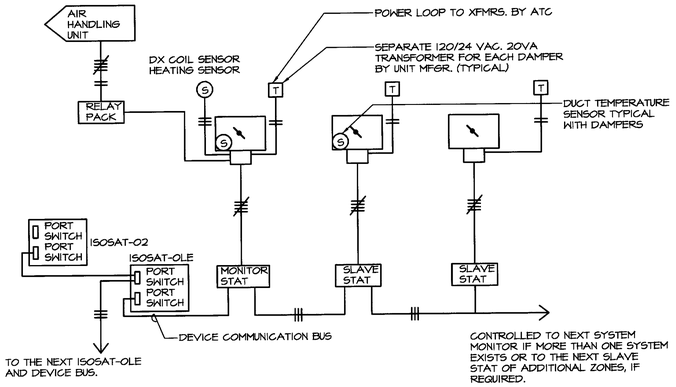


VVT SEQUENCE OF OPERATION

THE VVT SYSTEM SHALL CONTROL IN THE FOLLOWING MANNER:

1 THE MONITOR THERMOSTAT SHALL DETERMINE THE DEMAND FOR HEATING OR COOLING BASED ON THE NUMBER OF ZONES CALLING FOR THE GREATEST DEMAND FOR A PARTICULAR MODE. THE MONITOR SHALL ESTABLISH THE ZONE WITH THE GREATEST DEMAND FOR THE MODE SELECTED AS THE REFERENCE ZONE.

2 THE MONITOR THERMOSTAT SHALL COMMUNICATE WITH ITS SLAVE THERMOSTATS AND THE BYPASS CONTROLLER VIA A THREE WIRE COMMUNICATION BUS. THIS COMMUNICATION SHALL OCCUR NO LESS THAN ONCE EVERY 30 SECONDS. THE MONITOR THERMOSTAT(S) SHALL BE CAPABLE OF COMMUNICATING WITH UP TO 62 SLAVE THERMOSTATS AND A BYPASS CONTROLLER.

3 DURING THE COMFORT OR SETBACK MODE, THE MONITOR THERMOSTAT SHALL ACCESS ZONE DEMAND FOR HEATING AND COOLING FROM EACH ZONE SLAVE THERMOSTAT AND USE THIS INFORMATION TO CONTROL THE HVAC UNIT BASED ON ZONE DEMAND.

4 WHEN ANY THERMOSTAT SENSES A TEMPERATURE DEVIATION OF 1.5 DEGREES OR MORE FROM ITS CURRENT SETPOINT IT BECOMES A ZONE HEATING OR COOLING CALLER. WHEN A ZONE BECOMES A CALLER, THE MONITOR REGISTERS IT'S DEMAND AND WHETHER ITS A HEATING OR COOLING CALLER. WHEN THE MONITOR THERMOSTAT REGISTERS THE MINIMUM REQUIRED NUMBER OF ZONE CALLERS, AS DETERMINED BY THE SYSTEM MODE DEMAND, AND THE MODE SELECTED MEETS ANY LOCKOUT TEMPERATURE CRITERIA (IF APPLICABLE), THE MONITOR SHALL ENERGIZE THAT SPECIFIC MODE VIA ITS RELAY PACK THAT IS INTERFACED TO THE HVAC UNIT. ON A RISE TO TWO DEGREES THE MONITOR SHALL ENERGIZE A RELAY FOR THE SECOND STAGE IF THE TEMPERATURE-TRENDING PROGRAM ALLOW SECOND STAGE OPERATION.

5 THE MONITOR THERMOSTAT SHALL HOLD THE SYSTEM MODE UNTIL THE REFERENCE ZONE IS WITHIN .5 DEGREES F OF ITS SETPOINT OR UNTIL THE SYSTEM MODE RESELECT TIME LIMIT HAS EXPIRED AND THE SYSTEM'S DEMAND IS SUCH THAT THE MONITOR SELECTS THE OPPOSITE MODE.

6 ONLY ONE MONITOR WITH A 7 DAY ELECTRONIC CLOCK SHALL BE ON EACH DEVICE COMMUNICATION BUS. THIS MONITOR SHALL BE CAPABLE OF BROADCASTING THE TIME OF DAY TO ALL OTHER MONITORS AND DEVICES ON THE BUS. ALL ZONES SHALL BE CAPABLE OF THEIR OWN INDEPENDENT TIME OF DAY PROGRAM SCHEDULES FOR OCCUPIED AND UNOCCUPIED OPERATION.

7 ONLY ONE MONITOR THERMOSTAT WITH AN OUTSIDE AIR SENSOR SHALL BE ON EACH DEVICE COMMUNICATION BUS. THIS MONITOR THERMOSTAT SHALL BROADCAST OUTSIDE AIR TEMPERATURE TO EVERY OTHER MONITOR THERMOSTAT INTERFACED TO ITS DEVICE BUS.

8 THE BYPASS CONTROLLER SHALL WORK IN CONJUNCTION WITH ALL ZONE THERMOSTATS TO MAXIMIZE THE AMOUNT OF SUPPLY AIR IN THE DUCT SYSTEM AND TO PREVENT INADEQUATE AIR FLOW THROUGH THE HVAC UNIT.

9 THE BYPASS CONTROLLER SHALL BE CAPABLE OF PREPOSITION ITS DAMPER(S) TO THE MAXIMUM OPEN POSITION PRIOR TO SYSTEM STARTUP, THE BYPASS SHALL REGULATE PRESSURE FROM MINIMUM SYSTEM PRESSURE, DURING STARTUP, TO MAXIMUM SYSTEM PRESSURE, NORMAL OPERATING CONDITION.

10 THE BYPASS CONTROLLER SHALL ALSO MONITOR SUPPLY AIR TEMPERATURE SO THAT, WHEN SYSTEM CHANGE OVER OCCURS, THE BYPASS CONTROLLER CAN OPEN THE BYPASS DAMPERS TO PRE-CONDITION THE SUPPLY AIR IF IT IS COUNTER-PRODUCTIVE FOR USE BY THE REFERENCE ZONE.

11 THE INDIVIDUAL THERMOSTATS SHALL BE CAPABLE OF OPERATING IN THE VENTILATION MODE UNTIL THEY BECOME 1.5 DEGREES OUT OF SETPOINT IN EITHER DIRECTION. AT THIS POINT, THE THERMOSTAT SHALL REQUEST THE APPROPRIATE MODE FROM THE MONITOR THERMOSTAT.

12 ALL THERMOSTATS IN COMFORT SHALL DISPLAY THEIR SEPARATE HEATING AND COOLING COMFORT SETPOINTS, THE CURRENT SYSTEM MODE, AND SYSTEM FAN OPERATION.

13 ALL THERMOSTATS IN SETBACK SHALL DISPLAY THEIR SEPARATE HEATING AND COOLING SETBACK SETPOINTS, THE CURRENT SYSTEM MODE, SYSTEM FAN OPERATION, AND THEIR ANNUNCIATORS SHALL INDICATE THE THERMOSTAT IS IN SETBACK.

14 MONITOR THERMOSTAT SHALL HAVE SMART START AND ALLOW THE MONITOR TO START THE SYSTEM HVAC EQUIPMENT PRIOR TO THE FIRST OCCUPIED PERIOD TO GRADUALLY HEAT/COOL THE BUILDING TO ACHIEVE THE COMFORT SETPOINT BY THE START OF THE OCCUPIED PERIOD.

15 SMART START (MSST) SHALL SET THE MAXIMUM TIME (IN HOURS) BEFORE THE FIRST OCCUPIED PERIOD THAT THE MONITOR MAY START IS ASSOCIATED SYSTEM TO PERFORM THE SMART START OPERATION. FOR EXAMPLE, MSST IS SET FOR 3 HOURS AND THE FIRST OCCUPIED PERIOD IS 7 AM, THE MONITOR WON'T START SYSTEM WARM UP OR COOL DOWN PRIOR TO 4 AM.

16 ENABLE SMART STOP TO ADJUST THE MONITOR'S HVAC STAGING ALGORITHM DURING THE LAST HOUR AND A HALF OF THE FIRST OCCUPIED PERIOD TO LOWER ENERGY CONSUMPTION WITHOUT SACRIFICING COMFORT.

SPLIT SYSTEM AIR HANDLING UNIT SCHEDULE

ITEM#	AREA SERVED	FAN DATA (AHU-1) C.F.M.	E.S.P.	H.P.	R.P.M.	C.F.M. O.A.	COOLING DATA (AHU-1) TYPE	TOTAL BTU/HR	SENS. BTU/HR	ELECTRIC HEATING DATA (AHU-1) K.W.	B.T.U.H	ELEC. DATA	INDOOR UNIT (AHU-1) MFGR./ MODEL NO.	WEIGHT	OUTDOOR UNIT (ACU-1) MANUFACTURER	MODEL NO	WEIGHT	ELEC. DATA
AHU-1/ ACU-1	PROCEDURE ROOM 1	400	.65"	1/2	MED.-HIGH	400	DX	25,134	24,099	5	17,065	208/1	DESERT AIRE/GS02A	470	DESERT AIRE	RQ030	275	208/1

NOTE:
1) AHU-1 (INDOOR UNIT) SHALL BE FURNISHED WITH THE FOLLOWING, ELECTRIC HEATING COIL, HOT GAS BYPASS AND LOW AMBIENT DOWN TO 0°F°.

MISCELLANEOUS HEATING SCHEDULE

ITEM#	AREA SERVED	HEATER TYPE	C.F.M.	K.W.	BTU/HR	ELEC. DATA	STEPS OF CONTROL	CONTROL	MANUFACTURER/ MODEL #
1	ENTRANCE	WALL HEATER FAN FORCED	100	1.5	5,120	208/1	1	INTEGRAL THERMOSTAT	QMARK/AWH-4204-2
2	TOILET ROOMS, ETC.	WALL HEATER FAN FORCED	100	1.0	3,413	120/1	1	INTEGRAL THERMOSTAT	QMARK/CWH-2101
DH-1	WAITING ROOM	ELECTRIC DUCT MOUNTED HEATER	340	4.5	15,360	208/1	2	THERMOSTAT	INDEECO/SLIP-IN
UH-1	ABOVE THE SECOND FLOOR CEILING	HORIZONTAL UNIT HEATER FAN FORCED	350	3.0	10,239	208/1	2	INTEGRAL THERMOSTAT	BERKO/HUHAA-320

NOTE:
1) ELECTRIC DUCT HEATER (DH-1) TO BE HEATER TYPE QUA SLIP-IN HEATER (OPEN COIL) WITH CONTROL OPTION G AND AIR PROVING SWITCH.

ELECTRONIC DAMPER SCHEDULE

ITEM #	AREA SERVED	INLET SIZE	C.F.M.	VELOCITY F.P.M.	PRESSURE DROP (IN WG.)	MODEL #	MANUFACTURER	REMARKS
1	NURSE CONSULT	6"ø	130	580	.05"	ZD-06	CARRIER	NEW
2	CONFERENCE	6"ø	160	800	.07"	ZD-06	CARRIER	NEW
3	PHYSICIAN	6"ø	100	530	.05"	ZD-06	CARRIER	NEW

NOTES:
1) MINIMUM BOX SETTINGS WILL BE AT ZERO FOR ALL BOXES
2) ALL DAMPERS SHALL BE SLAVE DAMPERS AND NOT CONTROL THE HEATING /COOLING MODE OF THE ROOFTOP UNIT.

SEQUENCE OF OPERATIONS

PACKAGED ROOFTOP (HEAT PUMP) UNIT

1 DURING OCCUPIED PERIOD AS PROGRAMMED ON ASSOCIATED HEAT PUMP THERMOSTAT, BLOWER FAN SHALL RUN CONTINUOUSLY.

2 ON A CALL FOR HEATING, IF ALL SAFETIES ARE SENSED, THEN HEAT PUMP/ELECTRIC HEATER SHALL BE ENERGIZED, HEATER SHALL RUN UNTIL SETPOINT IS SATISFIED.

3 ON A CALL FOR COOLING, THE UNIT MOUNTED CONTROLS SHALL ENERGIZE OUTDOOR COMPRESSOR (MECHANICAL COOLING) SHALL BE ENERGIZED. THE UNIT COOLING CYCLE SHALL RUN UNTIL SETPOINT IS SATISFIED.

4 DURING NIGHT SETBACK PERIOD AS PROGRAMMED ON ASSOCIATED HEAT PUMP UNIT THERMOSTAT, BLOWER FAN SHALL BE OFF. ON A CALL FOR HEATING OR COOLING, THE FAN OR ASSOCIATED ELECTRIC HEATER AND/OR COMPRESSOR SHALL CYCLE UNTIL SPACE SETPOINTS ARE SATISFIED.

ALL COMPONENTS OF THE VVT SYSTEM SHALL BE PROVIDED BY THE EQUIPMENT MANUFACTURER. CONTROL CONTRACTOR SHALL INSTALL ALL COMPONENTS OF THE SYSTEM WITH THE EXCEPTION OF THE SLAVE DAMPERS.

OPERATION OF THE VVT SYSTEM SHALL BE IN ACCORDANCE WITH SYSTEM MANUFACTURER'S SEQUENCE. REFER TO VVT SEQUENCE OF OPERATION.

ELECTRIC HEATER/ COMPRESSOR SHALL CYCLE UNTIL SPACE SETPOINTS ARE SATISFIED.

EXHAUST FANS

1 EXHAUST FAN (F-2, F-4, F-5) SHALL BE INTERLOCKED WITH TIME CLOCK. TOILET ROOM EXHAUST FAN SHALL BE ENERGIZED DURING OCCUPIED MODE AND DE-ENERGIZE DURING UNOCCUPIED MODE.

2 TOILET ROOM EXHAUST FAN (F-3) SHALL BE INTERLOCKED WITH ON/OFF LIGHT SWITCH.

MISCELLANEOUS HEAT

1 WALL RECESSED FAN FORCED HEATER SHALL BE CONTROLLED VIA UNIT/FACTORY MOUNTED INTEGRAL THERMOSTAT. HEATER SHALL BE ENERGIZED UPON A CALL FOR HEAT. UPON REACHING SET POINT HEATER SHALL BE DE-ENERGIZED.

ELECTRIC DUCT HEATER

1 ELECTRIC DUCT HEATER SHALL BE INTERLOCKED WITH VVT THERMOSTAT. UPON AIRFLOW AIR PROVING SWITCH, BEING SATIFIED, SHALL ALLOW ELECTRIC HEATER TO BE ENERGIZED UPON A CALL FOR HEAT. UPON REACHING SET POINT HEATER SHALL BE DE-ENERGIZED.

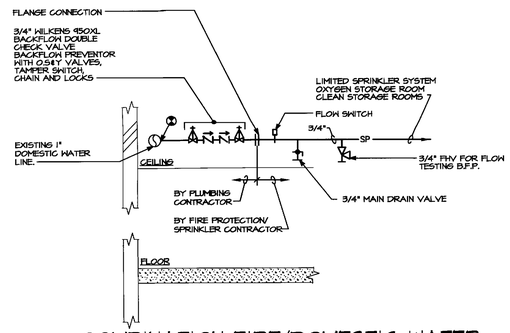
SPLIT SYSTEM AHU UNIT

1 DURING OCCUPIED PERIOD AS PROGRAMMED ON ASSOCIATED AHU THERMOSTAT, BLOWER FAN SHALL RUN CONTINUOUSLY AND ALL OUTSIDE AIR DAMPERS OPEN AND IN-LINE FAN F-6 ENERGIZE.

2 ON A CALL FOR HEATING, IF ALL SAFETIES ARE SENSED, THEN ELECTRIC HEATER SHALL BE ENERGIZED, HEATER SHALL RUN UNTIL SETPOINT IS SATISFIED.

3 ON A CALL FOR COOLING, THE UNIT MOUNTED CONTROLS SHALL ENERGIZE OUTDOOR COMPRESSOR (MECHANICAL COOLING) SHALL BE ENERGIZED. THE UNIT COOLING CYCLE SHALL RUN UNTIL SETPOINT IS SATISFIED.

4 DURING NIGHT SETBACK PERIOD AS PROGRAMMED ON ASSOCIATED AHU UNIT THERMOSTAT, BLOWER FAN SHALL BE OFF AND OUTSIDE AIR DAMPERS SHUT. ON A CALL FOR HEATING OR COOLING, THE OUTSIDE AIR DAMPERS SHALL OPEN AND THE BLOWER FAN OR ASSOCIATED ELECTRIC HEATER OR COMPRESSOR SHALL CYCLE UNTIL SPACE SETPOINTS ARE SATISFIED.



COMBINATION FIRE/DOMESTIC WATER SERVICE ENTRANCE PIPING SCHEMATIC

NO SCALE

NOTES:
1) REFER TO FLOOR PLANS FOR PIPE SIZES. FINAL FIRE PROTECTION SYSTEM PIPE SIZE AND SYSTEM DETAILS TO BE DETERMINED BY FIRE PROTECTION/SPRINKLER CONTRACTOR.
2) PLUMBING CONTRACTOR TO PROVODE FIRE SERVICE CONNECTION FROM EXISTING INCOMING DOMESTIC WATER INCLUDING UL CLASSIFIED/FM APPROVED DOUBLE CHECK VALVE ASSEMBLY. PLUMBING CONTRACTOR TO PROVIDE FLANGED CONNECTION DOWNSTREAM OF DOUBLE CHECK VALVE ASSEMBLY. FIRE PROTECTION/SPRINKLER CONTRACTOR TO INSTALL ALL PIPING, VALVES, EQUIPMENT ETC. DOWNSTREAM OF FLANGED CONNECTION.
3) AT THE TIME OF DRAWING ISSUE, A FLOW REPORT HAD NOT BEEN DONE. PRIOR TO ANY SERVICE WORK WATER PRESSURES MUST BE VERIFIED. SERVICE SHALL BE ADJUSTED AS REQUIRED TO MEET PRESSURES.

FAN SCHEDULE

ITEM #	AREA SERVED	C.F.M.	E.S.P.	HP/WATTS	R.P.M.	CONTROL	ELEC. DATA	SONES	MODEL #	MFGR.
F-1	OXYGEN ROOM	100	.500"	1/6 HP	1,188	24HOUR/1DAY TIME CLOCK ENERGIZED DURING OCCUPIED HOURS	120/1	11.6	80C3B	COOK
F-2	JANITOR'S CLOSET	50	.375"	18.71 W	1081	INTERLOCK ON/OFF LIGHT SWITCH ENERGIZED DURING OCCUPIED HOURS	120/1	2.7	6C-140	COOK
F-3	TOILET ROOMS	75	.450"	33.6 W	1126		120/1	3.3	6C-160	COOK
F-4	SOILED WORK	95	.450"	36.76 W	1142		120/1	3.4	6C-160	COOK
F-5	TRASH ROOM	130	.450"	47.08 W	1053		120/1	3.6	6C-180	COOK
F-6	PROCEDURE ROOM 1	400	.500"	94.28 W	1071	ENERGIZED DURING AHU-1 OPERATION	120/1	1.4	6N-T20	COOK

NOTE:
1) MANUFACTURER FAN SELECTIONS SHALL INCLUDE EXTERNAL PRESSURE DROP AND FAN DRIVE LOSS.
2) ELECTRICAL CONTRACTOR TO BE PROVIDE AND INSTALL ON/OFF SWITCH FOR EXHAUST FANS F-3.
3) EXHAUST FAN F-1 TO HAVE EXPLOSION PROOF MOTOR, EXPLOSION PROOF DISCONNECT AND BACKDRAFT DAMPER. BACKDRAFT DAMPER TO BE MANUFACTURED BY COOK, MODEL #BD-12.

PLUMBING FIXTURE SCHEDULE

ITEM #	DESCRIPTION	PIPE SIZES C.W.	H.W.	SAN.	VENT	TRAP TYPE	REMARKS
P-1	WATER CLOSET	3/4"	-	3"	2"	INTEGRAL	HANDICAPPED
P-1A	BEDPAN CLEANER	1/2"	-	-	-	-	-
P-2	WALL HUNG SINK	1/2"	1/2"	2"	2"	"P"	HANDICAPPED
P-2A	PROCEDURE SINK	1/2"	1/2"	2"	2"	"P"	-
P-2B	NURSE/CLEAN/SOILED WORK SINK	1/2"	1/2"	2"	2"	"P"	ONLY THE NURSE CONTROL SINK TO BE PROVIDED WITH EYE WASH
P-2C	LOUNGE SINK	1/2"	1/2"	2"	2"	"P"	-
P-2D	SCRUB SINK	1/2"	1/2"	2"	2"	"P"	-
P-3	JANITOR'S SINK	3/4"	3/4"	3"	2"	"P"	-
P-4	SHOWER	1/2"	1/2"	2" S.D	2"	"P"	HANDICAPPED
P-5	COUNTERTOP COFFEE MAKER	1/2"	-	-	-	-	-
P-6	REFRIG. ICE MAKER	1/2"	-	-	-	-	-

ELECTRIC WATER HEATER SCHEDULE

ITEM #	AREA SERVED	K.W. ELEMENT	SIZE HEIGHT xDIAMETER (INxIN.)	RECOVERY RATE (GPH)	TANK CAPACITY (GALLONS)	PIPE CONNECTIONS INLET (IN.)	OUTLET (IN.)	ELEC. DATA	MANUFACTURER/ MODEL #
WH-1	JANITOR' S CLOSET, TOILET ROOM/SHOWERS	6.0	70-3/4"X26-1/4"	30	82	3/4"	3/4"	208/3	STATE/ SBG-82-6-IFE-NSF

NOTE:
1) PROVIDE 80°F TEMPERATURE WATER RISE FOR 40°F ENTERING WATER TEMEPERATURE.

EXISTING ROOFTOP UNIT SCHEDULE

ITEM#	AREA SERVED	NOMINAL TONS	FAN DATA C.F.M.	OUTSIDE AIR	E.S.P.
EX.RTU-1	MANAGER, BUSINESS, WAITING, ETC.	4	1,805	220	.50"
EX.RTU-3	VACANT SPACE	2	800	50	.40"
EX.RTU-4	CONF., RECORDS, PREP LOCKER RMS., ETC.	4	1,600	400	1.30"
EX.RTU-5	PHYSICIAN, CLEAN SUPPLIES, SOILED, ETC.	3	1,200	100	1.25"
EX.RTU-6	STAFF LOUNGE, TRASH, RECOVERY, ETC.	3	1,225	140	1.40"

NOTES:
1) EXISTING ROOFTOP UNIT #1 TO BE ABANDONED IN PLACE.
2) CONTRACTOR TO FIELD VERIFY EXISTING ROOFTOP UNITS SERVING THE REVISED TENANT SPACE AND CLEAN FILTERS, LUBRICATE MOTORS AND REPLACE SHEAVES AND PULLEYS AS NEEDED TO ACHIEVE NEW AIRFLOW REQUIREMENTS.
3) CONTRACTOR ALSO TO FIELD VERIFY EXISTING ROOFTOP UNITS AND REPLACE EXISTING FAN MOTORS AS NEEDED TO ACHIEVE NEW EXTERNAL STATIC PRESSURE.

REVISIONS REV#	DATE	DESCRIPTION

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Columbia, Maryland Warrenton, Virginia

TENANT RENOVATIONS FOR:
RMS LIFE LINE
RIVERSIDE, CALIFORNIA

DATE 9/11/01
SCALE AS NOTED
DESIGNED BY DLI
DRAWN BY DLI
DRAWING NO. M4
SHEET 4 OF 5
FWA JOB NUMBER 2011215.00
JLR# 1-100a