

DUCTLESS SPLIT SYSTEMS (HEAT PUMP + COOLING ONLY)

Table with columns for INDOOR UNIT (SYMBOL, CFM, MCA, FUSE, VOLTAGE, WEIGHT) and OUTDOOR UNIT (SYMBOL, TG, SHC, HEATING CAPACITY, COOLING CAPACITY, COMPRESSOR, ELECTRICAL DATA, OPERATING MANUFACTURER, ALLOWABLE LINE-SET LENGTHS).

NOTES:

- 1. ALL UNITS SHALL BE U.L. LISTED AND HAVE A MINIMUM SEER OF 13.
2. COOLING CAPACITIES ARE BASED ON 95° AMBIENT, 80° ENTERING AIR DRY BULB, 67° ENTERING AIR WET BULB. AIRFLOWS INDICATED ARE AT 'HIGH' SPEED.
3. MOUNT GROUND-MOUNTED UNITS ON 4" CONCRETE PAD.
4. PROVIDE MANUFACTURER'S SUGGESTED CLEARANCES AROUND UNIT.
5. PROVIDE UNITS WITH MANUFACTURER'S WIND BAFFLES OR LOW AMBIENT CONTROLS FOR OPERATION DOWN TO 0° F, CONDENSATE PUMP, INVERTER COMPRESSOR, 7-DAY PROGRAMMABLE THERMOSTAT (WALL-MOUNTED), NON-LOCKING DISCONNECT FOR INDOOR UNIT.
6. PROVIDE OUTDOOR UNITS WITH 6 YEAR EXTENDED COMPRESSOR WARRANTY.
7. SEE MANUFACTURER'S RECOMMENDATIONS FOR REQUIRED ADDITIONAL REFRIGERANT CHARGE AND RECOMMENDED LINE-SET LENGTHS.
8. POWER SUPPLY TO CONDENSING UNIT (CU-1) IS A SINGLE POINT ELECTRICAL CONNECTION FOR THE SYSTEM (A/C UNIT AND CONDENSING UNIT). THE ELECTRICAL CONTRACTOR SHALL PROVIDE POWER TO THE CONDENSING UNIT AND FROM THE CONDENSING UNIT TO THE A/C UNIT INCLUDING CODE REQUIRED DISCONNECT SWITCHES. POWER TO ALL OTHER UNITS SHALL BE AS NOTED IN THE SCHEDULE.
9. REFRIGERANT PIPING AND WIRING FOR WALL-MOUNTED INDOOR UNITS SHALL BE ROUTED IN WALL WHERE POSSIBLE. ANY EXPOSED PIPING SHALL BE PAINTED TO MATCH WALL-FINISH.
10. TELCOM ROOMS: MOUNT INDOOR AC UNIT 8"-0" A.F.F. COORDINATE WITH ALL DATA LADDER RACKS, UTILITIES, LIGHTS, CEILING, DOORS, ETC.
11. SYSTEMS USING SOLENOID CONTROL VALVES MUST INCLUDE FULL PORT ISOLATION VALVES BEFORE AND AFTER REFRIGERANT CONTROL BOX AND ACOUSTIC TREATMENT TO PROVIDE NO GREATER THAN NC00 IN THE OCCUPIED MODE.
12. MC SHALL PROVIDE ALL DISCONNECTS FOR ALL UNITS POWER CONNECTIONS.
13. MC SHALL PROVIDE IDS WITH WATER LEVEL DETECTION IN THE PRIMARY DRAIN PAN, THAT UPON DETECTION OF HIGH WATER, SHUTS DOWN THE ASSOCIATED UNIT.

ELECTRIC WALL/UNIT HEATER SCHEDULE

Table with columns: SYMBOL, LOCATION, CFM, BTU/H, KW, R.P.M., AMP, VOLTAGE, MANUFACTURER, ACCESSORIES.

NOTES:

- 1. SEE PLANS FOR TYPE OF THERMOSTAT REQUIRED (WALL MOUNTED OR UNIT MOUNTED). UNIT HEATERS SHOWN WITHOUT THERMOSTAT INDICATED SHALL BE PROVIDED WITH A UNIT MOUNTED THERMOSTAT.
A: DISCONNECT SWITCH E: WALL BRACKET
B: BUILT-IN THERMOSTAT
C: WALL MOUNTING TRIM KIT
D: REMOTE THERMOSTAT

BASE BOARD ELECTRIC HEATER

EH-1,2,3,4,5,6,7
INDECO - B81- 1.0 KW, 277/1/60, 3.6 A
ELECT BASE BOARD HEATER W/ ENCLOSURE, 48" LONG, W/ INTEGRAL TSTAT
DISCONNECT BY M.C., COLOR TO BE SELECTED BY ARCH.

FAN SCHEDULE

Table with columns: SYMBOL, LOCATION, TYPE, CFM, APPROX. S.P., DRIVE, FAN RPM, WATTS, H.P., VOLTAGE, MANUFACTURER, ACCESSORIES, CONTROLS.

ACCESSORIES:

- A: DISCONNECT SWITCH
B: GRAVITY BACKDRIFT DAMPER
C: MOTORIZED BACKDRIFT DAMPER
D: PREFAB. ROOF CURB
E: BRIDGSOREEN
F: ACOUSTICAL LINING
G: HANGING BRACKETS WITH VIBRATION ISOLATION
H: WL. WALL LOUVER DISCHARGE
J: RCC OR GRS ROOF CAP (LAT ROOF) OR RJ ROOF CAP (PITCHED ROOF)
K: WALL MOUNTING COLLAR
L: INLET GUARD

CONTROLS:

- 1: WALL MOUNTED THERMOSTAT (REVERSE ACTING, SET FOR 80)
2: INTERLOCK WITH ROOM LIGHT SWITCH (FAN SHALL OPERATE WHEN LIGHT IS ON IN ANY ROOM SERVED BY FAN)
3: WALL MOUNTED ON/OFF SWITCH WITH IDENTIFICATION LABEL
4: WALL MOUNTED MUSHROOM PUSH BUTTON SWITCH/STARTER WITH IDENTIFICATION LABEL
5: CONTROLLED BY BUILDING ALC SYSTEM
6: CONTINUOUS OPERATION
7: INTERLOCK WITH KITCHEN HOOD CONTROLS
8: INTERLOCK WITH DISHWASHER
9: INTERLOCK WITH THE HOOD

NOTES:

- 1. ALL FANS SHALL BE U.L. LISTED AND LABELED AND SHALL BE AMCA CERTIFIED FOR SOUND AND AIR FLOW. ALL FANS SHALL BE INSTALLED INSIDE, ABOVE, OR ADJACENT TO OCCUPIED SPACES SHALL HAVE A MAXIMUM 8.0 INLET SONE LEVEL.
2. ALL FANS SHALL BE SUPPLIED BY ONE MANUFACTURER UNLESS NOTED OTHERWISE.
3. MECHANICAL CONTRACTOR SHALL PROVIDE MAGNETIC STARTERS WITH AUXILIARY CONTACTS AS REQUIRED.
4. PROVIDE ALL DIRECT DRIVE FANS WITH SPEED CONTROLS.
5. BACKDRIFT DAMPER ON ROOF SUPPLY FANS SHALL BE MOTORIZED.

INPUT/OUTPUT SUMMARY

Large table with columns for INPUTS (MEASURED, ANALOG, CALC., BINARY, DIGITAL, ANALOG) and SYSTEM FEATURES (ALARMS, PROGRAMS, GENERAL, SUPPLEMENT NOTES).

SEQUENCE OF OPERATION

A COMPLETE AND OPERATIONAL DDC CONTROL SYSTEM (BAS) SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS (SECTION 230900) AND AS INTENDED ON THESE PLANS. ALL CONTROL POINTS AND EQUIPMENT SEQUENCES OF OPERATION LISTED IN SPECIFICATION SECTION 230900 SHALL BE CONSIDERED IN ADDITION TO THOSE LISTED HERE. IN THE EVENT THAT THE VERBAGE IS IN CONFLICT OR CONTRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED BEFORE BIDDING OR THE MORE STRINGENT SHALL APPLY AT THE ENGINEER'S DISCRETION.

NOTE: NEW BAS SHALL BE INTEGRATED WITH THE OWNER'S EXISTING CAMPUS BAS SYSTEM. BAS CONTRACTOR SHALL INCLUDE ALL NECESSARY HARDWARE AND SOFTWARE TO FULLY INTEGRATE NEW SYSTEM WITH THE EXISTING SYSTEM.

DUCTLESS SPLIT SYSTEMS: UNITS SHALL PROVIDE COOLING ON A CONTINUOUS BASIS. SUPPLY FAN SHALL RUN CONTINUOUSLY AND COOLING CYCLE SHALL CYCLE WITH A CALL FOR COOLING TO MAINTAIN ROOM TEMPERATURE SETPOINT OF 75° F. (ADJ.). UNITS SHALL BE PROVIDED WITH STANDBY FACTORY CONTROLS. BAS SHALL MONITOR SYSTEM STATUS AND SHALL ALSO MONITOR ROOM TEMPERATURE WITH A WALL MOUNTED TEMPERATURE SENSOR. AN ALARM SHALL BE GENERATED UPON AN EQUIPMENT FAILURE OR IF THE ROOM TEMPERATURE RISES ABOVE 85° F. (ADJ.)

UNIT HEATERS / BASEBOARD: A SPACE TEMPERATURE SENSOR SHALL CONTROL UNIT HEATER FAN AND ELECTRIC HEAT IN STAGES (IF EQUIPPED) TO MAINTAIN SPACE TEMPERATURE: 65° F. (ADJ.) WITH SPACE TEMPERATURE ABOVE SETPOINT, FAN SHALL REMAIN OFF AND HEAT SHALL REMAIN OFF. AS SPACE TEMPERATURE FALLS BELOW SETPOINT, THE FAN SHALL BE STARTED AND THE ELECTRIC HEAT SHALL STAGE ON TO SATISFY SETPOINT.

MISC. EXHAUST FANS: PROVIDE WALL SWITCHES, WALL THERMOSTATS, INTERLOCKS, ETC. AS INDICATED ON THE FAN SCHEDULE TO CONTROL FANS AS INDICATED ON PLANS.

TOILET EXHAUST FANS: BAS SHALL OPERATE EXHAUST FANS ON A PROGRAMMED SCHEDULE.

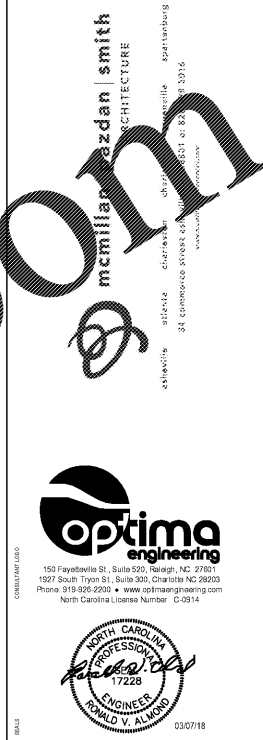
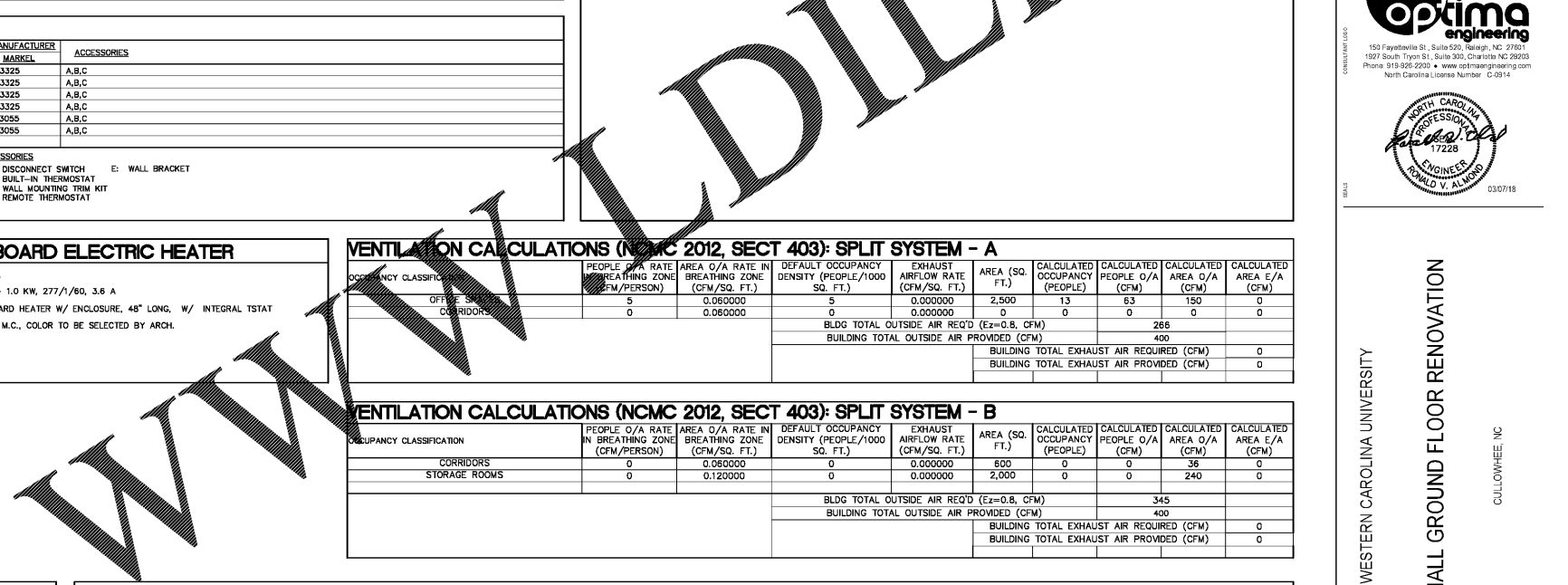
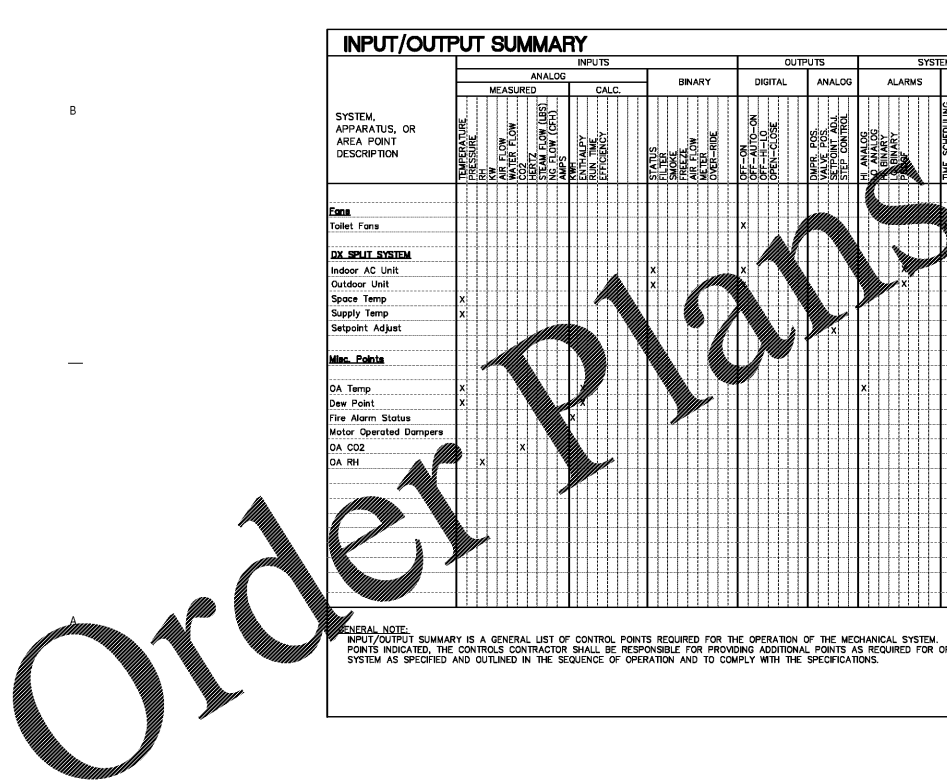
DUCTLESS VRF SPLIT SYSTEM

UNIT SHALL BE CONTROLLED BY ITS THERMOSTAT. UNIT SUPPLY FAN SHALL RUN CONTINUOUSLY IN THE OCCUPIED MODE. CYCLE WITH HEATING AND COOLING WHILE UNOCCUPIED. UPON A RISE IN SPACE TEMPERATURE, UNIT COMPRESSOR AND CONDENSER FAN SHALL ACTIVATE TO SATISFY SPACE. UPON A DROP IN SPACE TEMPERATURE, UNIT COMPRESSOR SHALL ACTIVATE IN REVERSE CYCLE FOR HEATING. THERMOSTATS SHALL PROVIDE A DEADBAND OF 5° WITHIN WHICH THE SUPPLY OF HEATING OR COOLING ENERGY TO THE ZONE CAN BE REDUCED TO THE MINIMUM. OCCUPANCY SCHEDULES SHALL BE SET TO OCCUPY MONDAY THRU FRIDAY, X AM TO X PM (OWNER DETERMINED), UNOCCUPIED NIGHTS AND WEEKENDS. THERMOSTATS SHALL BE SET FOR OCCUPIED COOLING 75°, UNOCCUPIED HEATING 70°, UNOCCUPIED COOLING 85°, UNOCCUPIED HEATING 55°. ALL TIME AND TEMPERATURE SETPOINTS SHALL BE VERIFIED BY THE OWNER PRIOR TO PROGRAMMING.

CONTROL SYSTEM NOTES

- 1. THE SEQUENCE OF OPERATION AND POINTS LIST IS INTENDED TO COMMUNICATE THE MINIMUM REQUIREMENTS AND GENERAL DESIGN INTENT TO THE CONTROL CONTRACTOR AND IS NOT INTENDED TO BE A FULLY DEVELOPED OR COMPLETE SEQUENCE OF OPERATION. IN THE CONTROLS SUBMITTAL, THE CONTROL CONTRACTOR SHALL FULLY DEVELOP THE SEQUENCE OF OPERATIONS FOR ALL SYSTEMS IDENTIFIED AND SHALL PRESENT ALL SEQUENCE PARAMETERS, TIME DELAYS, ALARM POINTS, ETC. AS REQUIRED TO COMPLY WITH THE DESIGN INTENT. THE CONTROLS CONTRACTOR SHALL INCORPORATE STANDARD FEATURES SUCH AS MINIMUM RUN TIME DELAYS AND DEAD BANDS TO PREVENT SHORT CYCLING. ALL MONITORED POINTS SHALL INCLUDE EARLY HIGH/LOW ALARM NOTIFICATIONS PRIOR TO REQUIRED CORRECTIVE ACTIONS OR UNIT SHUT-DOWNS. CONTROL CONTRACTOR SHALL SPECIFY IN THE CONTROL SUBMITTAL FAIL SAFE POSITION FOR OUT OF RANGE, FAIL SAFE POSITIONING FOR OPEN CIRCUITS OR LOSS OF COMMUNICATION.
2. SYSTEM SHALL USE CAMPUS SYSTEM GLOBAL OUTSIDE AIR TEMPERATURE AND HUMIDITY SENSORS FOR PRIMARY SYSTEM OPERATION. LOCAL OUTSIDE AIR TEMPERATURE AND HUMIDITY SENSORS SHALL BE PROVIDED FOR SYSTEM OPERATION UPON LOSS OF NETWORK COMMUNICATION.
3. ALL CONTROL SETPOINTS SHALL BE ADJUSTABLE AND TRENDALE. INDICATED TEMPERATURE SETPOINTS SHOULD BE USED FOR ORIGINAL SYSTEM SET-UP. ANY CHANGES IN SETPOINT SETTINGS REQUIRED FOR INTENDED SYSTEM OPERATION SHALL BE NOTED ON AS-BUILT CONTROL DRAWINGS.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE DEDICATED 120V CIRCUIT(S) IN A J-BOX FOR CONTROL POWER. CONTROLS CONTRACTOR SHALL EXTEND 120V POWER FROM J-BOX TO CONTROL PANELS, DAMPER ACTUATORS, TRANSFORMERS, ETC. AS REQUIRED FOR OPERATION OF CONTROL SYSTEM.
5. LOCATE MAIN DDC CONTROL PANEL(S) IN 104 MECHANICAL ROOM. COORDINATE EXACT LOCATION PANEL WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
6. PROVIDE EXPORT TAGGING AND CONTROLS PROGRAMMING AS REQUIRED TO FULLY INTEGRATE WITH THE UNIVERSITY BAS SERVER PLATFORM TO SIMPLY IMPORTING TO EXISTING ALC PLATFORM, POINTS LIST, AND GRAPHIC CONTROL SCREENS.
7. PROVIDE ALL CONTROL PANELS WITH 3RD PARTY U.L. LISTING

GENERAL NOTE: INPUT/OUTPUT SUMMARY IS A GENERAL LIST OF CONTROL POINTS REQUIRED FOR THE OPERATION OF THE MECHANICAL SYSTEM. IN ADDITION TO CONTROL POINTS INDICATED, THE CONTROLS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADDITIONAL POINTS AS REQUIRED FOR OPERATION OF THE MECHANICAL SYSTEM AS SPECIFIED AND OUTLINED IN THE SEQUENCE OF OPERATION AND TO COMPLY WITH THE SPECIFICATIONS.



WESTERN CAROLINA UNIVERSITY
MOORE HALL GROUND FLOOR RENOVATION
CULLOWHEE, NC

SHEET TITLE: MECHANICAL SCHEDULES
PROJECT ARCHITECT: LR APR
DRAWN BY:
SHEET TITLE: MECHANICAL SCHEDULES

M002
AGENCY REVIEW D: 17-1742-01A
2 OF 6
OPTIMA # 17-0355