

CONSULTANTS:

OWNER'S PROJECT ADVISOR:
MOSES TUCKER REAL ESTATE, INC.

CIVIL ENGINEER:
McCLELLAND ENGINEERS

LANDSCAPE ARCHITECT:
LARSON BURNS SMITH

STRUCTURAL ENGINEER:
CROMWELL ENGINEERS INC.

MECH., ELEC., PLUMB. ENGINEER:
CROMWELL ENGINEERS INC.

SUSTAINABLE CONSULTANT:
BNM / ELEMENTS

GLOBAL VILLAGE CONSULTANT
CAMBRIDGE SEVEN ASSOCIATES

INTERIOR DESIGNER:
POLK STANLEY YEARY

GENERAL CONTRACTOR:
CDI

GENERAL NOTES:

NOTES:

ISSUE DATE:
DECEMBER 15, 2003
CORE/SHELL
PACKAGE #5

REVISIONS:

#	DATE	DESCRIPTION
1	1-16-04	ADDENDUM #1
2	1-28-04	PACKAGE 5-ADDM. 03
3	7-1-04	PACKAGE 7, 100% ROLL UP

**HEIFER
INTERNATIONAL
CENTER
OFFICE BUILDING**

LITTLE ROCK, ARKANSAS

PSY PROJECT NUMBER:
431C

CONTENTS:
HVAC CONTROLS

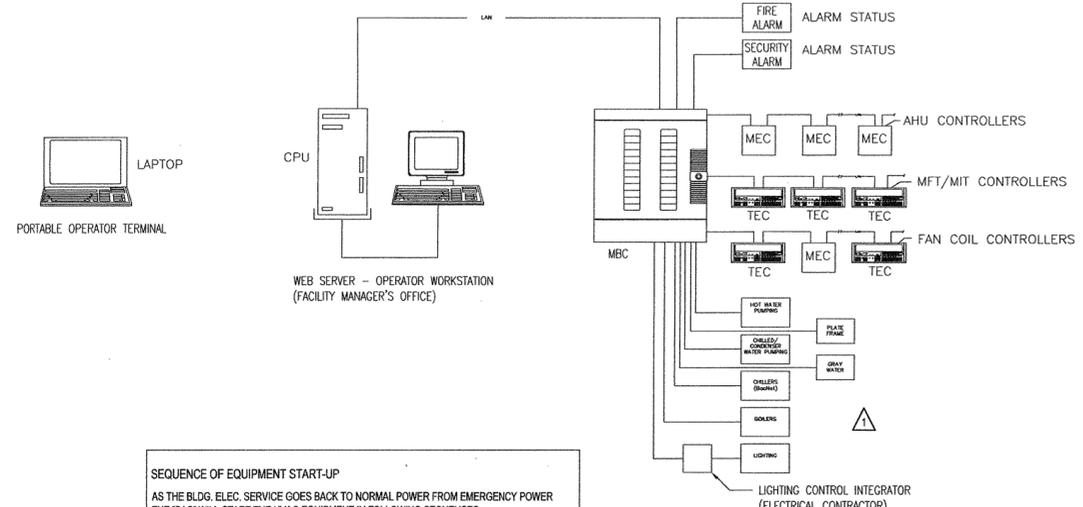
SHEET NUMBER:

M400

CONTROL LEGEND	
SYMBOL	DESCRIPTION
(AI)	ANALOG INPUT POINT
(AO)	ANALOG OUTPUT POINT
(DI)	DIGITAL INPUT POINT
(DO)	DIGITAL OUTPUT POINT
(CT)	CURRENT TRANSMITTER
(LRT)	LOOP RETURN TEMPERATURE
(LST)	LOOP SUPPLY TEMPERATURE
(SD)	SMOKE DETECTOR
(SD)	SMOKE DAMPER
(DPS)	DIFFERENTIAL PRESSURE SENSOR
(RAH)	RETURN AIR HUMIDITY
(RAT)	RETURN AIR TEMPERATURE
(MAT)	MIXED AIR TEMPERATURE
(MAH)	MIXED AIR HUMIDITY
(SAT)	SUPPLY AIR TEMPERATURE
(SAH)	SUPPLY AIR HUMIDITY
(CHR)	CHILLED WATER RETURN TEMPERATURE
(CWS)	CHILLED WATER SUPPLY TEMPERATURE
(CWR)	CONDENSER WATER RETURN SENSOR
(CWS)	CONDENSER WATER SUPPLY SENSOR
(HWR)	HOT WATER RETURN TEMPERATURE
(HWS)	HOT WATER SUPPLY TEMPERATURE
(CV)	CONTROL VALVE
(BV)	BUTTERFLY VALVE
(HSL)	HIGH STATIC LIMIT
(LSL)	LOW STATIC LIMIT
(HHL)	HIGH HUMIDITY LIMIT
(RHS)	ROOM HUMIDITY SENSOR
(RTS)	ROOM TEMPERATURE SENSOR
(RSP)	ROOM STATIC PRESSURE SENSOR
(HCL)	HEATING COIL LEAVING AIR TEMPERATURE
(CCL)	COOLING COIL LEAVING AIR TEMPERATURE
(PRT)	PLATINUM RTD SENSOR
(OAT)	OUTSIDE AIR TEMPERATURE
(OAH)	OUTSIDE AIR HUMIDITY
(AMS)	AIRFLOW MEASURING STATION
(DPT)	DIFFERENTIAL PRESSURE TRANSMITTER
(LTB)	LOW TEMPERATURE DETECTOR (LOW LIMIT)
(HTB)	HIGH TEMPERATURE DETECTOR (HIGH LIMIT)
(CDD)	CARBON DIOXIDE DETECTOR
(FTS)	FLOOR TEMPERATURE SENSOR
(FM)	WATER FLOW METER
BAS	BUILDING AUTOMATION AND CONTROL SYSTEM
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
FCR	FREE COOLING WATER RETURN
FCS	FREE COOLING WATER SUPPLY
VFD	VARIABLE FREQUENCY DRIVE
N.O.	NORMALLY OPEN
N.C.	NORMALLY CLOSED
CHS	CHILLED WATER SUPPLY
CHR	CHILLED WATER RETURN
HS	HOT WATER SUPPLY
HR	HOT WATER RETURN
MBC	MASTER BUILDING DDC PANEL
TEC	TERMINAL EQUIPMENT CONTROLLER
MEC	MECHANICAL EQUIPMENT CONTROLLER
(IW)	IMMERSION SENSOR WITH WELL
(SD)	SMOKE DETECTOR
(HL)	HIGH OR LOW LIMIT WITH INTERLOCK
(AT)	AIR TEMPERATURE OR HUMIDITY SENSOR
(DPS)	DIFFERENTIAL PRESSURE SENSOR
(RT)	ROOM TEMPERATURE OR HUMIDITY SENSOR
(ADPT)	AIR DIFFERENTIAL PRESSURE TRANSMITTER
(DPT)	WATER DIFFERENTIAL PRESSURE TRANSMITTER
(FM)	WATER FLOW METER

- The HVAC system shall be provided with a computer controlled central building automation system (BAS) that monitors the temperature in each room, evaluates the operating status of all major pieces of equipment, turns equipment on and off to meet changes in environment (both inside and out), evaluates operating conditions, sends operating alarms, and provides for the lowest cost energy use of the system. The system shall be connected to all portions of the building.
- Monitoring points for the BAS system shall include the Security Control Center and the Building Maintenance Offices. Remote download and access to the system by modem and internet broadband connection is also required as well as the capabilities to connect to the system by laptop computer at various locations in the building, including the major mechanical and equipment rooms.
- The BAS shall have a graphical user interface (Windows compatible), be user friendly, and show operating conditions of the equipment and alarms on a color monitor. The user interface shall show a floor plan and room by room status against the required operating conditions so that the security or building maintenance staff can quickly note any problems and advise the facility manager's staff.
- Radiation system zone valves must be absolutely silent. Use motorized ball valve with two position actuator.
- Provide multiple copies of BAS software if required to provide offsite access by the laptop.

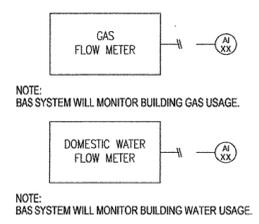
4 CONTROL GUIDELINES
M400 | M400 NO SCALE



SEQUENCE OF EQUIPMENT START-UP
AS THE BLDG. ELEC. SERVICE GOES BACK TO NORMAL POWER FROM EMERGENCY POWER THE "BAS" WILL START THE HVAC EQUIPMENT IN FOLLOWING SEQUENCES:
- "BAS" WILL BRING THE CHILLER PLANT ON-LINE.
- "BAS" WILL BRING ALL THE AIR HANDLING UNITS AND EXHAUST FANS ON-LINE.
- "BAS" WILL BRING OTHER MISCELLANEOUS EQUIPMENT ON-LINE.

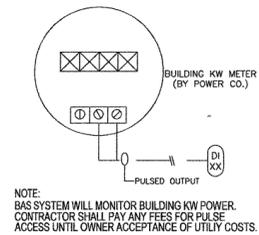
NOTE: USE OF ANY TYPE OF POINT (AI,AO,DI,DO) IN A CONTROLLER (EXCEPT TECs) SHALL NOT EXCEED 90% OF THE CONTROLLER'S POPULATION OF THAT TYPE OF POINT. MINIMUM SPARE POINT REQUIREMENT IS ONE OF EACH.

1 BAS NETWORK SYSTEM
M400 | M400 NO SCALE



NOTE: BAS SYSTEM WILL MONITOR BUILDING GAS USAGE.

NOTE: BAS SYSTEM WILL MONITOR BUILDING WATER USAGE.

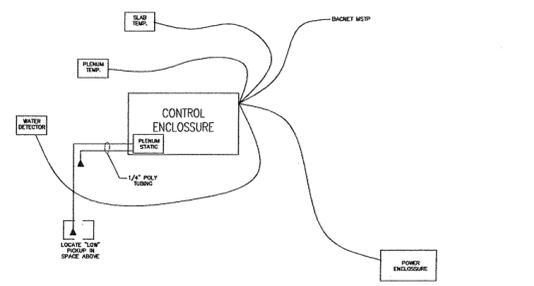


NOTE: BAS SYSTEM WILL MONITOR BUILDING KW POWER. CONTRACTOR SHALL PAY ANY FEES FOR PULSED ACCESS UNTIL OWNER ACCEPTANCE OF UTILITY COSTS.

2 BUILDING UTILITY MONITORING
M400 | M400 NO SCALE

TEMPERATURE AND RELATIVE HUMIDITY STANDARDS		
AREAHOLDING TYPE	DRY BULB TEMPERATURE RANGE - °F	RELATIVE HUMIDITY RANGE - %
OFFICES	70 - 78	35 - 55
MECHANICAL ROOMS	50-80	55-60

3 TEMPERATURE AND RH STANDARDS
M400 | M400 NO SCALE



SEQUENCE OF EQUIPMENT START-UP
SLAB TEMPERATURE MONITORING:
THE SLAB TEMPERATURE SHALL BE MONITORED AND THE DATA REPORTED TO THE GLOBAL CONTROLLER.
PLENUM TEMPERATURE AND RELATIVE HUMIDITY MONITORING:
VLC SHALL MONITOR PLENUM TEMPERATURE AND RELATIVE HUMIDITY TO CALCULATE THE PLENUM AIR DEWPOINT. CALCULATED DEWPOINT IS TRANSMITTED TO THE GLOBAL CONTROLLER. GLOBAL CONTROLLER SHALL NOTIFY CORRESPONDING AHU CONTROLLER AND DISPLAY AN ALARM AT THE OPERATOR WORKSTATION IF SLAB TEMPERATURE IS SENSED TO BE 5(1) OF THE CALCULATED PLENUM DEWPOINT TEMPERATURE. CORRESPONDING AHU CONTROLLER SHALL TAKE ACTION TO RAISE THE PLENUM DEWPOINT (I.E. BY RAISING SUPPLY AIR SETPOINT AND/OR INITIATING DEHUMIDIFICATION CYCLE).
PLENUM STATIC PRESSURE CONTROL:
THE VLC SHALL MONITOR THE STATIC AND MODULATE THE VFD TO MAINTAIN A PLENUM TO SPACE PRESSURE OF +.05 W.C.

4 PLENUM SLAB CONTROLLER
M400 | M400 NO SCALE

WATER DETECTION SEQUENCE
PROVIDE A WATER DETECTOR EQUAL TO KELE MODEL WD-16 AT FLOOR DRAIN UNDER ALL RESTROOMS & SHOWERS IF WATER IS DETECTED AN ALARM SHALL BE SENT TO THE BAS.

5 RAISED FLOOR WATER DETECTION SEQUENCE
M400 | M400 NO SCALE

