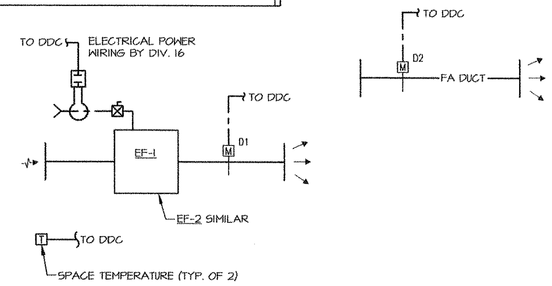
POINT LIST					
SYSTEM / POINT	DO	DI	AO	AI	REMARKS
FAN PROOF		•			(TYP. OF 2)
DAMPER ACT/END SWITCH	•	•			(TYP. OF 4)
FAN STOP/START	•				(TYP. OF 2)
SPACE TEMPERATURE				•	(TYP. OF 2)
FAN STATUS ALARM		•			(TYP. OF 2)

EF-1 AND EF-2 ARE CONTROLLED BY APPLICATION SPECIFIC CONTROLLERS WITH ELECTRIC ACTUATION.

UPON RISE IN SPACE TEMPERATURE ABOVE SETPOINT, BAS SHALL OPEN DAMPERS D1 AND D2, AND START ITS RESPECTIVE EXHAUST FAN.

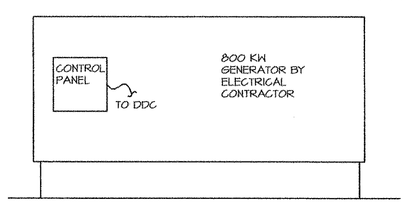
ONCE SPACE TEMPERATURE DROPS BELOW SETPOINT, BAS SHALL SHUT DOWN THE RESPECTIVE EXHAUST FAN AND CLOSE DAMPERS D1 AND D2.

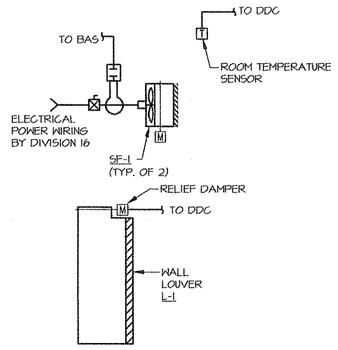
CURRENT SENSOR SHALL BE USED TO CONFIRM EXHAUST FAN IS IN THE DESIRED STATE (I.E. ON OR OFF) AND GENERATE AN ALARM IF STATUS DEVIATES FROM START/STOP CONTROL.



A1 NOT TO SCALE — **Control of EF-1 & EF-2**

POINT LIST					
SYSTEM / POINT	DO	DI	AO	AI	REMARKS
ROOM TEMPERATURE				•	
GENERATOR STATUS		•			
GENERATOR ALARMS		•			(TYPICAL OF 8)
RELIEF DAMPER			•		SEE FLOOR PLANS
SUPPLY DAMPERS			•		SEE FLOOR PLANS
SUPPLY FAN SF-1 START/STOP	•				(TYPICAL OF 2)
SUPPLY FAN SF-1 STATUS		•			(TYPICAL OF 2)





JOHNSON CONTROLS METASYS BY TRIDENT CONTROLS INC. BUILDING AUTOMATION SYSTEM SHALL BE UTILIZED FOR MONITORING AND CONTROL OF SYSTEM ASSOCIATED WITH EMERGENCY GENERATOR.

ON LOSS OF ELECTRICAL POWER TO FACILITY ELECTRICALLY ACTIVATED SUPPLY AND RELIEF DAMPERS SHALL OPEN IMMEDIATELY. DAMPER END SWITCHES SHALL ENABLE SF-1 FANS. FANS SHALL RUN AND DAMPERS SHALL REMAIN OPEN FOR 2 MINUTES MINIMUM (ADJUSTABLE)

BAS SHALL MONITOR GENERATOR OPERATION. RELAY WILL BE FURNISHED IN EMERGENCY GENERATOR CONTROL PANEL FOR INTERFACE WITH BAS.

AFTER INTAKE AND EXHAUST DAMPERS HAVE BEEN OPEN FOR 2 MINUTES, BAS SHALL CONFIRM OPERATION OF EMERGENCY GENERATOR. IF GENERATOR IS NOT OPERATING, SUPPLY AND RELIEF DAMPERS SHALL BE CLOSED.

WHEN GENERATOR STOPS OPERATING AND ROOM TEMPERATURE IS BELOW SETPOINT, SUPPLY AND RELIEF SHALL CLOSE AND SF-1 FANS SHALL SHUT DOWN.

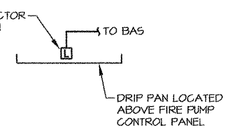
BAS SHALL MONITOR ALARMS GENERATED AT EMERGENCY GENERATOR CONTROL PANEL. RELAYS WILL BE FURNISHED BY GENERATOR MANUFACTURER FOR INTERFACE WITH BAS. GENERAL ALARM TO BE SIGNALED AT OPERATOR INTERFACE.

DAMPER QUANTITIES TO BE DETERMINED BY ATC SUB-CONTRACTOR.

UPON RISE IN ROOM TEMPERATURE ABOVE SETPOINT WHEN GENERATOR IS NOT RUNNING, SUPPLY AND RELIEF DAMPERS TO OPEN AND SF-1 FANS SHALL BE STARTED.

BAS SHALL ENABLE EXISTING ELECTRIC UNIT HEATER ANYTIME ROOM TEMPERATURE DROPS BELOW SETPOINT.

A2 NOT TO SCALE — **Generator Room Ventilation, Status and Alarm**

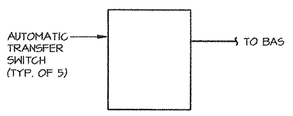


THIS SYSTEM SHALL BE MONITORED BY BAS

GENERAL ALARM TO BE SIGNALED AT OPERATOR INTERFACE

POINT LIST					
SYSTEM / POINT	DO	DI	AO	AI	REMARKS
ALARM		•			
FIRE PUMP	•				
LEAK DETECTION ALARM		•			

A3 NOT TO SCALE — **Fire Pump Status and Alarms**



THIS SYSTEM SHALL BE MONITORED BY BAS

POINT LIST					
SYSTEM / POINT	DO	DI	AO	AI	REMARKS
AUTOMATIC TRANSFER SWITCH	•				(TYP. OF 5)

B1 NOT TO SCALE — **Automatic Transfer Switch Monitoring**

JOHNSON CONTROLS METASYS BY TRIDENT CONTROLS, INC. BUILDING AUTOMATION SYSTEM SHALL MONITOR STATUS FUEL OIL PUMPSETS AND FUEL OIL FILTRATION SYSTEM.

BAS SHALL GENERATE ALARM IF LEAK DETECTION SYSTEM DETECTS A FUEL LEAK FROM ANY OF THE 3 SENSORS.

BAS MONITORS 5 ALARM POINTS GENERATED THROUGH ISOLATED RELAY CONTACTS IN EACH FUEL OIL PUMPSET. ALARMS SHALL INCLUDE "PUMP 1 FAIL", "PUMP 2 FAIL", "STRAINER HIGH DIFFERENTIAL", PUMP SET LEAK", "BROKEN FUEL LINE",

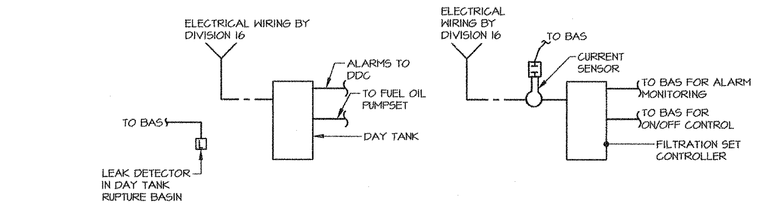
BAS SHALL PROVIDE ON/OFF CONTROL FOR OIL FILTRATION SET, ACCORDING TO A SET SCHEDULE TO BE DETERMINED BY OWNER. IF A LEAK IS DETECTED IN EITHER TANK #5 OR TANK #6, THE FUEL OIL FILTRATION SET SHALL BE SHUT DOWN AND AN ALARM GENERATED.

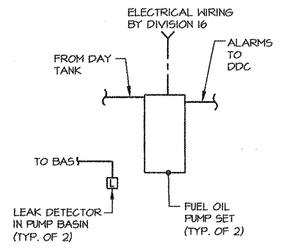
BAS SHALL MONITOR STATUS OF FUEL OIL FILTRATION SET, AND REPORT ALARM CONDITIONS GENERATED BY THE CONTROLLER.

CURRENT SENSORS ARE INSTALLED ON THE POWER SUPPLY TO THE FUEL OIL FILTRATION SET. BAS USE THIS SENSOR TO CONFIRM THAT THE FUEL OIL FILTRATION SET IS IN THE DESIRED STATE (I.E. ON OR OFF) AND GENERATES AN ALARM IF STATUS DEVIATES FROM DDC START/STOP CONTROL.

OPERATION OF THE FUEL OIL PUMPSET SERVING THE GENERATOR SHALL BE INITIATED FROM THE DAY TANK IN THE FUEL SYSTEM. DAY TANK HAS FOUR FLOAT OPERATED SWITCHES. IF FUEL LEVEL IN THE DAY TANK REACHES 50%, THE DAY TANK CONTROL PANEL OPENS THE NORMALLY CLOSED SOLENOID VALVE SERVING THE TANK AND STARTS THE FUEL OIL PUMPSET. IF PRIMARY FUEL OIL PUMP FAILS TO OPERATE, FUEL OIL PUMPSET CONTROL PANEL SHALL AUTOMATICALLY START LAG PUMP AND SOUND ALARM. IF FUEL LEVEL IN DAY TANK CONTINUES TO DROP TO 30% THE DAY TANK CONTROL PANEL SIGNALS AN ALARM. ONCE FUEL LEVEL IN THE DAY TANK REACHES 80%, THE DAY TANK CONTROL PANEL CLOSES THE NORMALLY CLOSED SOLENOID VALVE, AND ALLOWS FUEL OIL PUMPSET TO STOP IF DAY TANK IS SATISFIED. IF THE FUEL OIL LEVEL CONTINUES TO RISE TO 90% , THE DAY TANK CONTROL PANEL CLOSES THE NORMALLY OPEN SOLENOID VALVE AND STARTS THE PRIMARY DAY TANK RETURN PUMP. IF THE PRIMARY DAY TANK RETURN PUMP DOES NOT START, THE BAS SIGNALS AN ALARM. THE LEAD PUMP FOR THE FUEL OIL PUMPSET AUTOMATICALLY ALTERNATES TO EQUALIZE RUN TIME ON PUMPS.

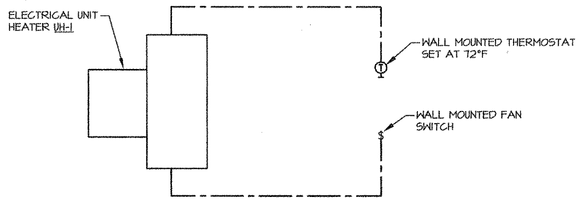
BALL VALVES ARE MANUALLY OPERATED TO DETERMINE WHICH TANK WILL BE USED TO SUPPLY FUEL OIL TO THE BOILERS.





POINT LIST					
SYSTEM / POINT	DO	DI	AO	AI	REMARKS
LEAK DETECTION ALARM		•			TYPICAL OF 3
FUEL OIL PUMPSET ALARMS		•			TYPICAL OF 2
DAY TANK ALARMS		•			
FILTRATION SET START/STOP	•				
FILTRATION SET ALARMS		•			
FILTRATION SET STATUS		•			

B2 NOT TO SCALE — **Fuel System Monitoring and Control**



ELECTRIC UNIT HEATER
120V ELECTRIC ROOM THERMOSTAT CONTROLS THE UNIT HEATER TO MAINTAIN SPACE SETPOINT.

WALL MOUNTED FAN SWITCH IS USED TO MANUALLY SELECT FAN SPEED.

B4 NOT TO SCALE — **Electric Unit Heater Control**

THIS SYSTEM SHALL BE MONITORED BY BAS.

ALARMS TO BE SIGNALED AT OPERATOR INTERFACE.

POINT LIST					
SYSTEM / POINT	DO	DI	AO	AI	REMARKS
PUMP FAIL TO START		•			
PUMP OVERLOAD		•			
PUMP POWER FAILURE		•			
PHASE FAILURE		•			

C1 NOT TO SCALE — **Jockey Pump Alarms**

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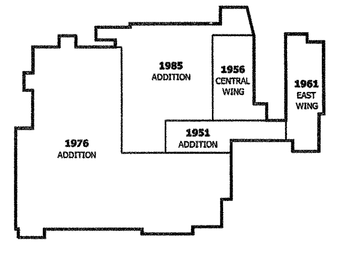
B	08/13/09	ISSUED FOR BID

REVISION:

NO:	DATE:	DESCRIPTION:

KEY PLAN:



DRAWING TITLE:
CONTROLS

DRAWN BY: MEB
CHECKED BY: AG
SCALE: AS NOTED
PROJECT NO.: 093274.00.E

SEAL:

DRAWING NO.:
M-301

CAD FILE NAME:
R:\Dwg - Engineering\093274.00.E MMC - Generator - MV Gear Replacement\Project\Sheets\Drawing Set\Mechanical\M-301 CONTROLS.dwg

Monday, August 31, 2009 - 1:36:12 PM - mbenner