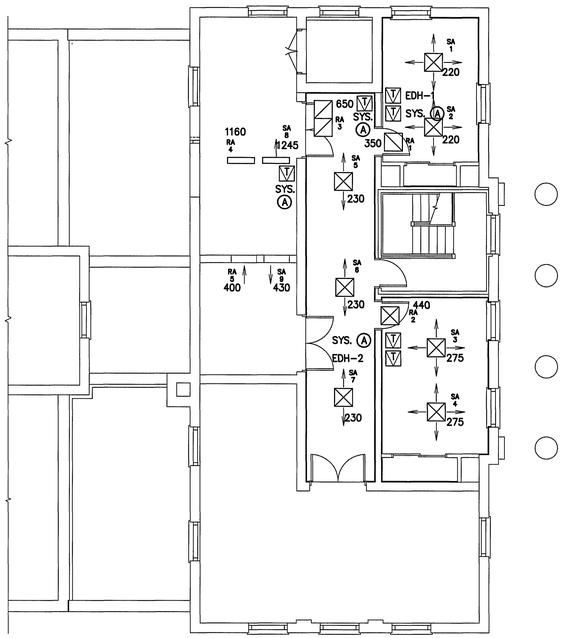
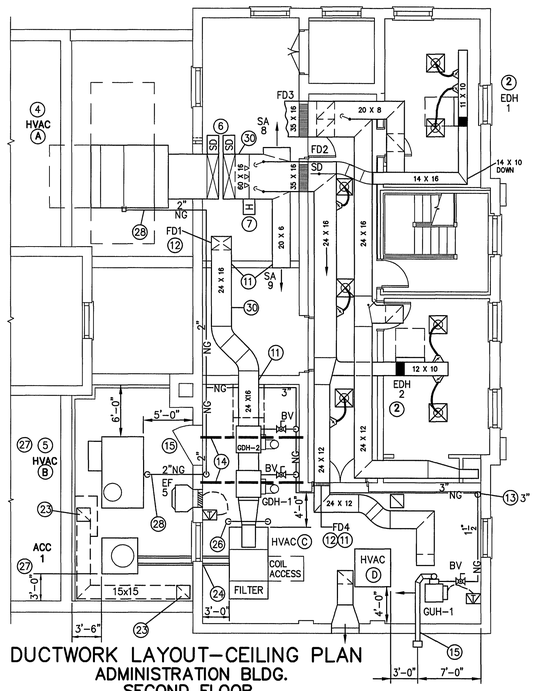
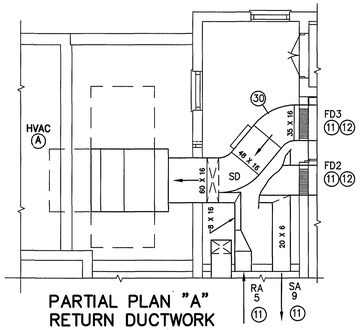


AIR OUTLET/INLETS–CEILING PLAN
ADMINISTRATION BLDG.
SECOND FLOOR
SCALE: 1/8" = 1'–0"

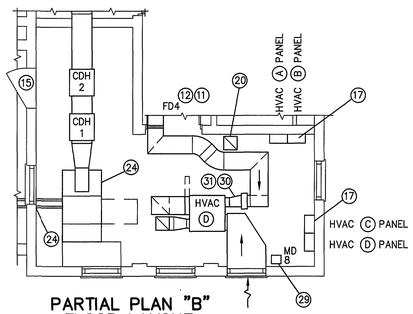


DUCTWORK LAYOUT–CEILING PLAN
ADMINISTRATION BLDG.
SECOND FLOOR
SCALE: 1/8" = 1'–0"

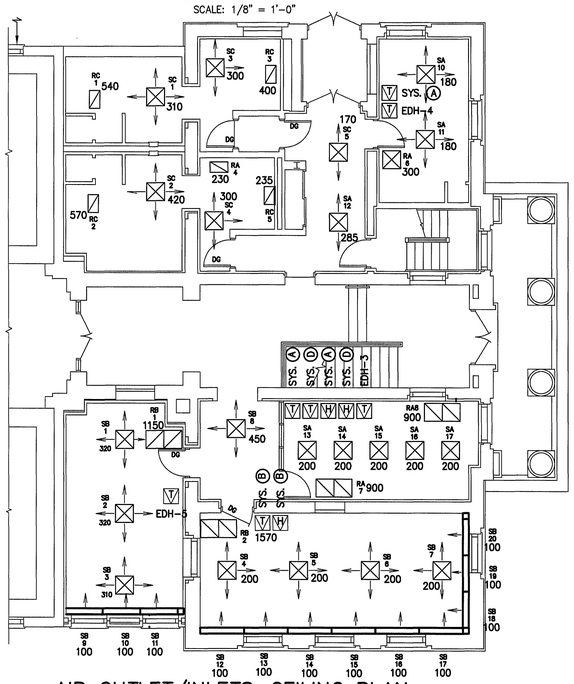


PARTIAL PLAN "A"
RETURN DUCTWORK
SCALE: 1/8" = 1'–0"

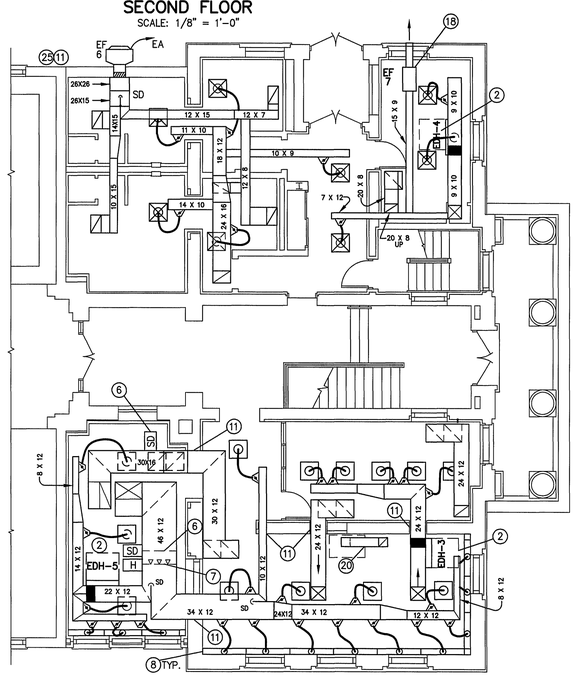
HVAC SYSTEM AIR CFM					
	SYSTEM CFM	SUPP. CFM	RET CFM	MAKE UP AIR	EXH. AIR
HVAC A	5,000	5,000	4,000	1,000	
HVAC B	3,400	3,400	2,700	700	FUME HOODS
HVAC C	1,600	1,600	0	1,600	1,600
HVAC D	1,000	1,000	900	100	



PARTIAL PLAN "B"
FLOOR LAYOUT
SCALE: 1/8" = 1'–0"

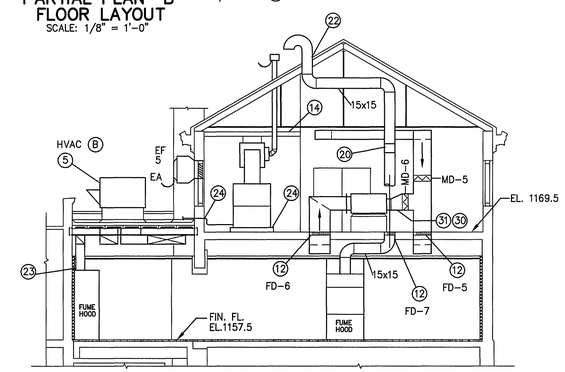


AIR OUTLET/INLETS–CEILING PLAN
ADMINISTRATION BLDG.
MAIN FLOOR
SCALE: 1/8" = 1'–0"

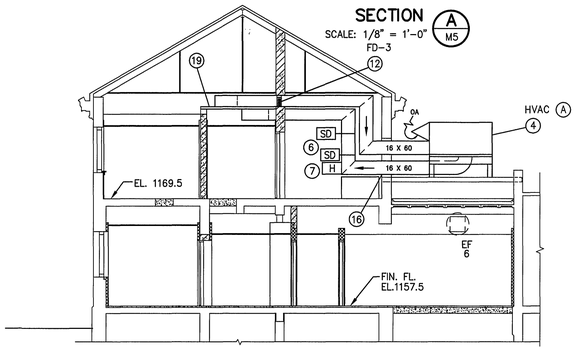


DUCTWORK LAYOUT–CEILING PLAN
ADMINISTRATION BLDG.
MAIN FLOOR
SCALE: 1/8" = 1'–0"

SCALE OF DRAWING 1/8" = 1'–0"
8' 6' 4' 2' 0 8' 16'



SECTION A/M5
SCALE: 1/8" = 1'–0"



SECTION B/M5
SCALE: 1/8" = 1'–0"

DRAWING OF RECORD
DATE: SEP 30 1997

GENERAL NOTES –FOR THE ADMINISTRATION BLDG.

COORDINATE THE LOCATION OF ALL CEILING GRILLES, REGISTERS, DIFFUSERS AND SLOT DIFFUSERS WITH THE LIGHT FIXTURES, LAY–IN CEILING PANEL GRID AND THE FIXED CEILING LAYOUT.

PROVIDE ACCESS DOORS IN FIXED CEILINGS, CHASES AND DUCTWORK TO ALL FIRE DAMPERS, BALANCING AND MOTORIZED DAMPERS OR OTHER MECH DEVICES NEEDING SERVICE ACCESS.

ALL THERMOSTATS SHALL BE MOUNTED UP 4'–6" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED. PROVIDE APPROVED ALUMINUM VENTILATED TYPE THEMOSTAT GUARDS.

FLEXIBLE DUCT RUN–OUTS TO DIFFUSERS SHALL BE PRE–INSULATED AND NOT TO EXCEED 7 FEET IN LENGTH.

INSTALL MANUAL "SPIN–IN" TYPE FITTINGS AND DAMPERS FOR BRANCH RUN–OUTS TO EACH DIFFUSER INSTALLED IN A LAY–IN TYPE CEILING. BRANCH RUN–OUTS SHALL BE SAME SIZE AS NECK SIZE OF DIFFUSER.

KEEP SUPPLY AND RETURN AIR DUCTWORK AS HIGH AS POSSIBLE IN CEILING SPACE.

ALL 90 DEGREE DUCT ELBOWS SHALL BE PROVIDED WITH DOUBLE THICK TURNING VANES.

EXHAUST FANS WITH MOTORIZED BACKDRAFT DAMPERS WILL HAVE THE DAMPERS AND MOTORS PROVIDED BY THE EQUIPMENT VENDOR PER THE EQUIPMENT SCHEDULE, WALL THERMOSTATS ARE TO BE PROVIDED BY THE HVAC CONTROLS CONTRACTOR.

THE FOLLOWING HVAC SYSTEMS SHALL HAVE ALUMINUM FABRICATED DUCTWORK:
A. HVAC SYS. HVAC–A, HVAC–B, HVAC–C, HVAC–D, EF5,& EF7.
B. LOCKER ROOM EXHAUST SYSTEM EF6.

THE FOLLOWING HVAC SYSTEMS SHALL HAVE STAINLESS STEEL DUCTWORK:
A. BACTERIOLOGICAL & CHEMICAL LABORATORIES FUME HOOD BLOWER EXHAUST SYSTEMS EF8 & EF9.
B. GAS FIRED UNIT HEATER GUH–1 AND GAS FIRED DUCT HEATERS GDH–1 & GDH–2 (DOUBLE WALL).

THE FOLLOWING HVAC SYSTEMS SHALL HAVE EXTERNAL DUCT INSULATION.
A. HVAC SYSTEMS HVAC–A, HVAC–B, HVAC–C, HVAC–D, LOCKER ROOM EXHAUST SYSTEM EF6 & EF7.
B. BACTERIOLOGICAL & CHEMICAL LABORATORIES FUME HOOD EXHAUST SYSTEMS EF8 & EF9.

THE FOLLOWING SYSTEMS SHALL BE INSULATED AS FOLLOWS: DUCTWORK EXPOSED TO AND HANDLING OUTDOOR AIR SHALL HAVE BOTH INTERNAL AND EXTERNAL INSULATION AS PER SPECIFICATIONS. DUCT SIZES FOR INTERNALLY LINED RECTANGULAR DUCTS ARE OUTSIDE DIMENSIONS WITH ALLOWANCE FOR 1" THICK ACOUSTIC/INSULATING DUCT LINER.

THE ABOVE INSULATION REQUIREMENT INCLUDES: OUTDOOR AIR INTAKE PLENUM SYSTEMS HVAC–C & HVAC–D.

PROVIDE STRUCTURAL LINTEL SECTION ABOVE EACH WALL PENETRATION, BOTH EXIST & NEW, FOR FIRE DAMPERS & DUCTS.

GENERAL CONTRACTOR TOGETHER WITH ELECTRICAL CONTRACTOR AND HVAC CONTROLS CONTRACTOR ARE RESPONSIBLE FOR PROVIDING ELECTRICAL POWER AND ELECTRICAL CONTROL WIRING SYSTEMS TO HVAC RELATED EQUIPMENT DEFINED ON MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS.

SYMBOLS

SD – DUCTWORK SMOKE DETECTOR
H – DUCT HUMIDIFIER
– WALL THERMOSTAT
– WALL HUMIDISTAT
NG – NATURAL GAS

FIRE DAMPER NOTES

DUCT SIZE SHOWN WITH FIRE DAMPER IS GROSS DUCT SIZE AND MUST BE DEFINED AS UNINSULATED, INTERNALLY INSULATED, OR EXTERNALLY INSULATED.

INDICATED DIMENSIONS MUST BE ADJUSTED TO COORDINATE WITH FIRE DAMPER INSTALLATION REQUIREMENTS.

DUCT SIZE AT FIRE DAMPER MUST BE ADJUSTED AS REQUIRED FOR HEIGHT AND WIDTH FOR VERTICAL OPERATION OF DAMPER.

INSTALL FIRE DAMPERS AT FULL HEIGHT WALLS AND FLOOR OPENINGS WHERE INDICATED IN ACCORDANCE WITH N.F.P.A. AND U.L. REQUIREMENTS.

EACH FIRE DAMPER SHALL BE RATED FOR INSTALLATION IN A 3 HOUR FIRE WALL, PER INSTALLATION DETAIL ON DRAWINGS. PROVIDE ACCESS DOOR IN DUCTWORK AT EACH FIRE DAMPER.

FOR EACH FIRE DAMPER, PROVIDE AIR FLOW SWITCHES FOR APPLICATION IN PROVIDING CLOSURE SIGNAL TO FIRE DAMPER CLOSURE INDICATOR PANEL PER DETAILS IN WRITTEN SPECIFICATIONS.

CONTINUOUS BAR DIFFUSER INSTALLED IN CEILING WITH CONTINUOUS SLOT OUT OF BOTTOM OF PLENUM. BAR DIFFUSER SHALL BE (OR GIVE THE APPEARANCE OF) A SINGLE CONTINUOUS STRIP WITH NO VISIBLE MEANS OF ATTACHMENT TO THE CEILING.

(30) INSTALL DUCT PRESSURE RELIEF BLOW OUT PANEL. RUSKIN COMPANY.

(31) PROVIDE DUCTWORK SMOKE DETECTOR SYSTEM.

KEYED NOTES –THIS DRAWING

1. OUTDOOR AIR INTAKE COMBINATION FIXED RAIN LOUVER AND 120V MOTORIZED DAMPER SET TO BE PROVIDED PER ARCHITECTURAL SPECIFICATIONS AND DRAWINGS.
2. ELECTRIC DUCT HEATER INSTALLED IN DUCTWORK. REFER TO ELECTRICAL DRAWINGS AND TYPICAL INSTALLATION DETAIL. PROVIDE ACCESS DOORS IN DUCTWORK ON EACH SIDE OF HEATER ELEMENT.
3. MOTORIZED CONTROL DAMPERS TO ALLOW SWITCHING FROM HVAC–A UNIT TO HVAC–D UNIT TO ACT AS BACKUP FOR CONTROL ROOM. A SEPARATE MANUALLY OPERATED ELECTRICAL CONTROL ROOM PANEL (WITH STATUS LIGHTS AND LABELS) SHALL HAVE A SINGLE SWITCH TO CHANGE THE DAMPERS FROM THEIR NORMAL POSITION. REFER TO WRITTEN SPECIFICATIONS.
4. ROOF MOUNTED, SELF CONTAINED, GAS FIRED HEATING, ELECTRIC DIRECT EXPANSION REFRIGERATION COOLING AIR CONDITIONING UNIT, MOUNTED ON STRUCTURAL SKID WITH HORIZONTAL SUPPLY AND RETURN DUCTWORK. (REFER TO DWG. M6 FOR DETAILS)
5. ROOF MOUNTED, SELF CONTAINED, GAS FIRED HEATING, ELECTRIC DIRECT EXPANSION REFRIGERATION COOLING AIR CONDITIONING UNIT WITH SUPPLY AND RETURN AIR DUCT DROPS OUT OF BOTTOM OF UNIT. UNIT SHALL BE SET LEVEL ON FACTORY CURB AND FLASHED INTO ROOF. FRAME EACH OPENING WITH A WELDED ANGLE IRON FRAME.
6. PROVIDE SMOKE DETECTOR ASSEMBLY IN SUPPLY AND RETURN DUCTWORK. REFER TO SPECIFICATIONS. PROVIDE ELECTRICAL POWER AND CONTROLS FOR A COMPLETE SYSTEM.
7. PROVIDE STEAM GRID HUMIDIFIER PER SPECIFICATIONS. ROUTE CONDENSATE TO BOILER ROOM CONDENSATE RETURN SYSTEM PER DRAWING M2. PROVIDE ELECTRICAL POWER AND CONTROLS FOR A COMPLETE SYSTEM.
8. PLENUM BOOT WITH EXTERNAL INSULATION INSTALLED FULL LENGTH OF BAR DIFFUSER WITH ROUND FLEXIBLE DUCT TAPS.
9. PROVIDE PIPING SHAFT IN CORNER FOR PIPING FROM BASEMENT TO UPPER LEVEL. STEAM CONDENSATE, STEAM, CONDENSATE FROM HVAC–(D), NATURAL GAS, DISTILLED WATER, ELECTRICAL CONDUIT, ETC.
10. ROUTE GAS UNIT HEATER COMBUSTION GAS VENT THRU OUTER WALL 12 FT. ABOVE UPPER FLOOR,WITH BOTTOM OF HEATER 7'–6"A.F.
11. PROVIDE LINTEL SECTION ABOVE OPENING PER ARCHITECTURAL DWG.
12. PROVIDE FIRE DAMPER PER NOTES.
13. ROUTE NATURAL GAS PIPING FROM BASEMENT LEVEL. PROVIDE NEW CONNECTION FROM OUTDOOR METER–REGULATOR STATION. REFER TO GAS SCHEMATIC DETAILS. ROUTE PIPING 12 FT. ABOVE FLOOR.
14. PROVIDE OVERHEAD SUPPORT FOR GAS DUCT HEATERS. PROVIDE BEAM SEATS IN BRICK & CONCRETE BLOCK WALLS. POUR GROUT INTO CONCRETE BLOCKS FOR BEAM SEATS. INSTALL W6x9# BEAM FOR EACH HEATER. INSTALL UNI–STRUT SECTIONS FOR DUCT SUPPORT.
15. PROVIDE NEW STEEL ACCESS DOOR AT WINDOW OPENING PER ARCHITECTURAL DRAWINGS.
16. PROVIDE WALL SLEEVE FOR DOUBLE DUCT PENETRATION PER DETAIL ON DWG. M6. PROVIDE 2"x2"x3/16"L SUPPORT FRAME OF ALUMINUM FABRICATION.
17. MOUNT HVAC SYSTEM CONTROL PANELS ON WALL WITH BOTTOM 3'–6"A.F.
18. MOUNT APPLIANCE EXHAUST FAN EF7 ABOVE CEILING PER TYPICAL DETAIL. OPERATION TO BE WITH MANUAL SWITCH FOR ON–OFF SEQUENCE. PROVIDE ALUMINUM DUCTWORK WITH EXTERNAL DUCT INSULATION FROM HOOD AT APPLIANCE.
19. PROVIDE DUCT SUPPORTS IN AISLE SPACE WITH UNISTRUT CORP. SERIES P–1001 1 5/8" CHANNEL WIDTH, 12 GAUGE GALVANIZED CHANNELS. MOUNT IN BEAM SEATS FOR CONCRETE BLOCK.
20. FUME HOOD EXHAUST DUCT, 18 GAUGE TYPE 304 S.S. WITH EXTERNAL DUCT INSULATION.
21. INSTALL BACKDRAFT DAMPER (EPOXY COATED), AUTOMATIC GRAVITY TYPE, 8FT. ABOVE FLOOR.
22. INSTALL EXHAUST GOOSENECK W/TOP MIN. 4FT. ABOVE HIGH POINT OF SLOPED ROOF PENETRATION. PROVIDE ROOF FLASHING.
23. ROUTE FUME HOOD EXHAUST DUCT, 18 GAUGE TYPE 304 S.S. W/EXTERNAL DUCT INSULATION INSIDE OF BUILDING, UP THROUGH ROOF AND BOLT TO OUTER WALL UP TO 10 FT. ABOVE ROOF. INSTALL GOOSENECK AT TOP WITH AUTOMATIC GRAVITY BACKDRAFT DAMPER.
24. HVAC–C PROVIDE 4" HIGH CONCRETE PAD. ROUTE REFRIGERANT PIPING FROM COILS ABOVE FLOOR, THROUGH WALL ONTO ROOF TO AIR COOLED CONDENSING UNIT ACC1. ROUTE 1"ø COPPER PIPING FOR COIL CONDENSATE TO CLOSEST DRAIN. PROVIDE PIPE SLEEVES AT WALL PENETRATION & SEAL FOR WEATHER PROTECTION.
25. INSTALL EF6 IN CEILING SPACE. PROVIDE SOFFIT AT FAN INLET OR ADJUST CEILING HEIGHT TO ACCOMODATE FAN IF FIELD CONDITIONS RESTRICT CLEARANCE.
26. PROVIDE "T" FRAME FOR DUCT SUPPORT OF 3"ø GALVANIZED PIPE, BRACED TO WALL.
27. CONTRACTOR TO COORDINATE LOCATION OF UNIT (CARRIER CORP.) WITH ROOF OPNG.& CURB ON ARCH. DWG. DIMENSIONS OF M5 TO GOVERN LOCATION.
28. ROUTE GAS LINE THROUGH WALL @ FLOOR, PROVIDE SLEEVE, CONNECT TO EQUIPMENT ABOVE ROOF.
29. INTERLOCK MD8 WITH EF5 (UPPER SECTION OF OPENING) AND WITH HVAC(D).

MATTERN & CRAIG
CONSULTING ENGINEERS • SURVEYORS
ROANOKE VIRGINIA

ALVORD, BURDICK & HOWSON
ENGINEERS CHICAGO

DESIGNED: S.C.
DRAWN: C.T.M. H.R.F. R.E.T.
CHECKED: S.C.

COMMONWEALTH OF VIRGINIA
YA–TAI LIN
NO. 022786
PROFESSIONAL ENGINEER

REV.	DATE	DESCRIPTION	BY	APP.

CARVINS COVE FILTER PLANT IMPROVEMENTS – PHASE I

ROANOKE, VIRGINIA

ADMINISTRATION BUILDING – HVAC SYSTEMS – PLANS

DATE APRIL 1992
COMM. NO. 9130
SHEET M5

PLAN NO. 6199