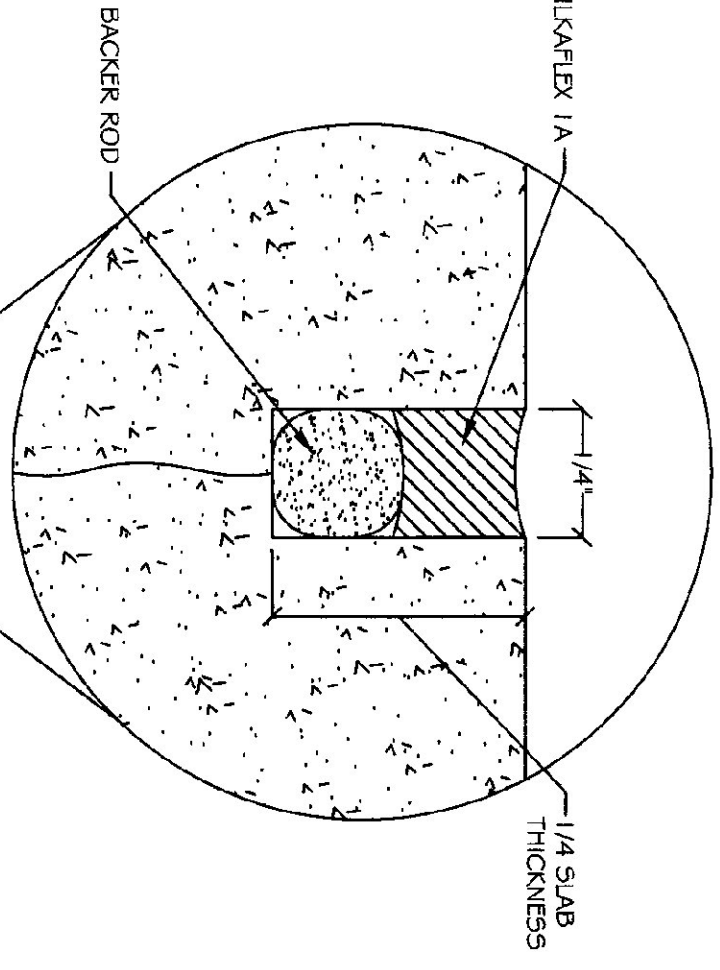
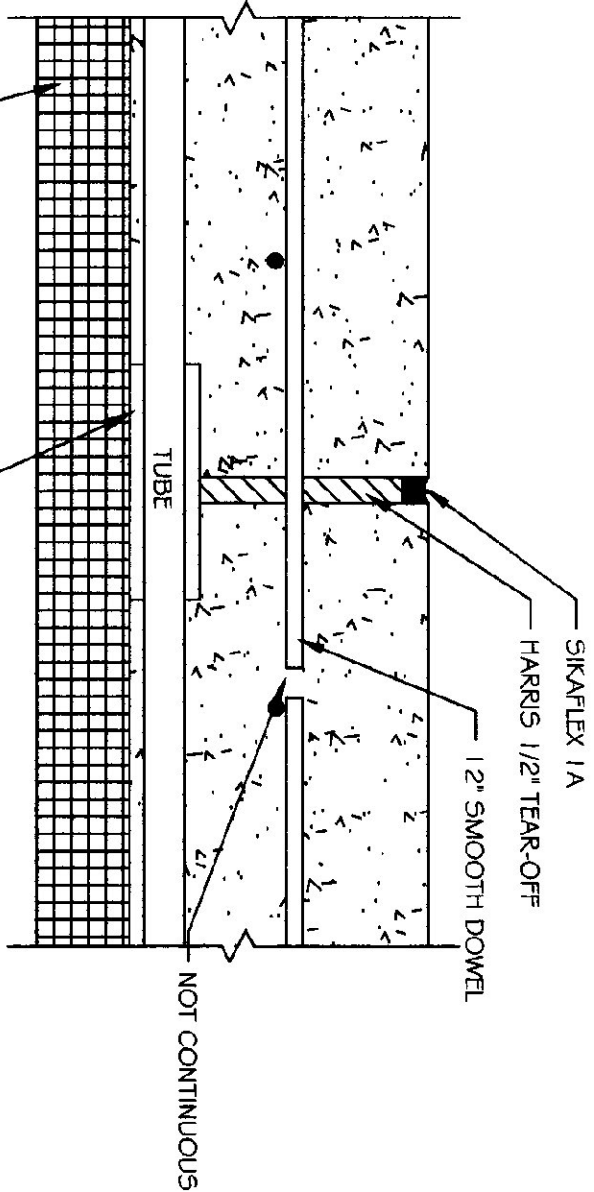


TYPICAL CROSS SECTION
NOT TO SCALE



SAW CUT JOINT
NOT TO SCALE



EXPANSION JOINT
NOT TO SCALE

SEQUENCE OF CONTROL

1. OUTSIDE AIR SENSOR SHALL BE LOCATED ON THE NORTH WALL WHERE IT WON'T BE INFLUENCED BY ANYTHING OTHER THAN THE OUTSIDE AIR TEMP.
2. HEATING SYSTEM
 - a. THE BOILER DOWNSIDE HOT WATER MAKER AND CIRCULATORS SHALL BE CONTROLLED BY A WINDUP FROM 21.2 CONTROL PANEL, EITHER DIRECTLY OR INDIRECTLY.
 - b. WHEN OUTDOOR AIR FALLS BELOW 60° (A.O.I.)
 - c. BOILER IS ENABLED.
 - d. TRANSFER PUMP IS ENABLED.
 - e. CIRCULATORS C-1 AND C-2 ARE STARTED.
 - f. CIRCULATORS C-3 THROUGH C-5 ARE ENABLED.
3. OPERATING ADJUST ON BOILER TO MAINTAIN BOILER BETWEEN 150°F AND 170°F.
4. INJECTION CIRCULATOR C-3 TO BE MODULATED BY A CONTROLLER BASED ON: OUTSIDE AIR TEMPERATURE, INSIDE AIR TEMPERATURE OF GARAGE AND LOOP TEMPERATURE TO MAINTAIN CALCULATED LOOP SUPPLY SETPOINT. SETPOINT, OFFSET AND RATIO TO BE ADJUSTABLE AT CONTROLLER. INITIAL VALUES FOR CONTROLLER:

MODES 1	93°F
MODES 2	63°F
MODES 3	63°F
MODES 4	63°F
MODES 5	63°F
MODES 6	63°F
MODES 7	63°F
MODES 8	63°F
MODES 9	63°F
MODES 10	63°F
MODES 11	63°F
MODES 12	63°F
MODES 13	63°F
MODES 14	63°F
MODES 15	63°F
MODES 16	63°F
MODES 17	63°F
MODES 18	63°F
MODES 19	63°F
MODES 20	63°F
MODES 21	63°F
MODES 22	63°F
MODES 23	63°F
MODES 24	63°F
MODES 25	63°F
MODES 26	63°F
MODES 27	63°F
MODES 28	63°F
MODES 29	63°F
MODES 30	63°F
MODES 31	63°F
MODES 32	63°F
MODES 33	63°F
MODES 34	63°F
MODES 35	63°F
MODES 36	63°F
MODES 37	63°F
MODES 38	63°F
MODES 39	63°F
MODES 40	63°F
MODES 41	63°F
MODES 42	63°F
MODES 43	63°F
MODES 44	63°F
MODES 45	63°F
MODES 46	63°F
MODES 47	63°F
MODES 48	63°F
MODES 49	63°F
MODES 50	63°F
5. CIRCULATOR C-4 TO CYCLE ON AND OFF BY THE THERMOSTAT IN THE BATHROOM TO MAINTAIN SETPOINT.
6. CIRCULATOR C-5 TO CYCLE ON AND OFF BY THE THERMOSTAT IN THE OFFICE TO MAINTAIN SETPOINT.
7. ADJUST IN DOMESTIC HOT WATER TANK TO MAINTAIN ROLER AND CYCLE CIRCULATOR C-6 TO MAINTAIN SETPOINT.
8. FUEL OIL TRANSFER PUMP TO OPERATE WHENEVER BOILER OPERATES. BATTERY BOILER SHUT-OFF SWITCH TO SHUT OFF TRANSFER PUMP ALSO.
9. FAN F-1 TO COME ON WITH LIGHT SWITCH, AND OPERATE FOR 5 MINUTES AFTER LIGHT IS TURNED OFF.
10. FAN F-2 TO BE CONTROLLED BY A SPRING WOUND TIMER SWITCH. SEE ELECTRICAL DRAWING FOR DETAILS.
11. MOD-1 TO OPEN WHENEVER FAN F-2 OPERATES, AND CLOSE WHEN F-2 STOPS.

LEGEND	
⊗	BALL VALVE, FULL PORTED, 5.5, BALL
⊕	BALL VALVE W/109E THREDS & BRASS CAP
⊖	STRAINER & BALL VALVE BLOW DOWN
⊗	MANING VALVE SET @ 95°F
⊕	TACO 5003-C1
⊖	PRESSURE RELIEF VALVE, PIPE TO 6" A.F.F.
⊗	THERMOSTAT, MOUNT @ 54" A.F.F.
⊕	SENSOR, MOUNT @ 54" A.F.F.
⊖	THERMOMETER
⊗	TACO FLO CHECK
⊕	CIRCULATOR
⊖	SHROUVE 1-1/2" AIR SEPARATOR
⊗	PRESSURE GAUGE
⊕	TOLLE-ANDERSON STAD BALANCING VALVE
⊖	KENT OIL METER
⊗	FUEL OIL TRANSFER PUMP, SLUICED DB-1020M
⊕	FUEL OIL RATED, FULL PORT, 5.5, BALL
⊖	SLUICED FRY-36
⊗	FRENCHIC VALVE
⊕	CHECK VALVE
Z	CHECK VALVE

EQUIPMENT SCHEDULE

PLAN SYMBOL	DESCRIPTION	MANUF. & MODEL	CHARACTERISTICS	ELECTRIC VOLTS / Ø / HZ	NOTES
B-1	BOILER	BUDERUS G215-4	36,000 BTU/NET, 171,000 BTU/NET BRK. RELI 400 SERIES 15 BURNER	120/1 / 60 2.2 A	
XT-1	EXP. TANK	AIRTRUQ ST 30V	1.4 GALLON TANK, 11.3 GALLON ACCEPTANCE		
L-1	RELIEF DAWPER	VENT PRODUCTS 2750	36" x 36"		
MOD-1	RELIEF DAWPER	VENT PRODUCTS 5703	36" x 36"	120/1 / 60	RETURN DIRECT CONTROLLED ACTUATOR SPRING WOUND N.C.

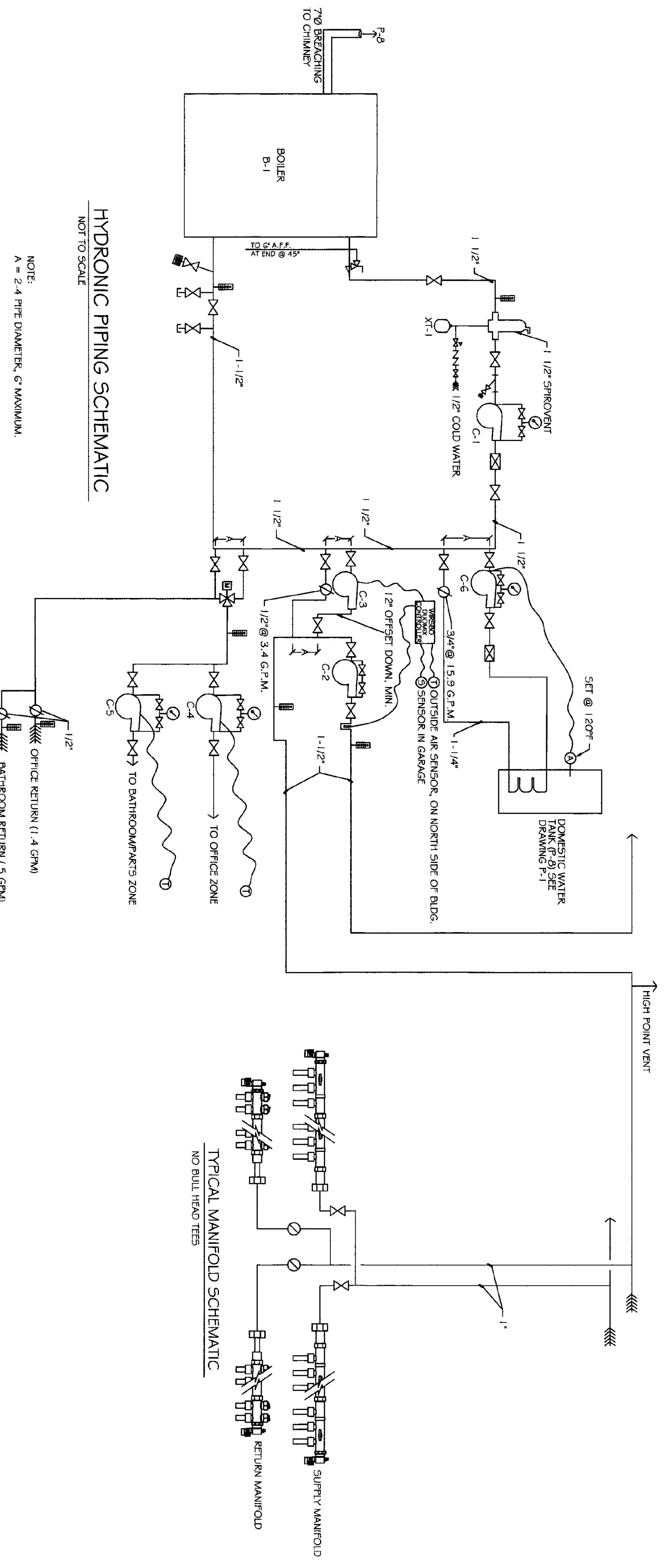
CIRCULATOR SCHEDULE

PLAN SYMBOL	SYSTEM	MANUF. & MODEL	G.P.M.	FEET HEAD	H.P.	ELECTRICAL	R.P.M.	NOTES
C-1	MAIN	TACO 0010	20	4.0	1/15	120/160 1.3 A	3250	
C-2	GARAGE ZONE	TACO 1G15	23	21.5	1/2	120/160	1750	
C-3	GARAGE INJECTION	TACO 005	3.4	3.5	1/55	120/160 .53 A	3250	
C-4	OFFICE ZONE	TACO 005	1.4	6.5	1/55	120/160 .53 A	3250	
C-5	STORAGE / BATHROOM ZONE	TACO 005	0.5	1.2	1/35	120/160 .53 A	3250	
C-6	WATER HEATER	TACO 007	15.9	5.0	1/25	120/160 .70 A	3250	

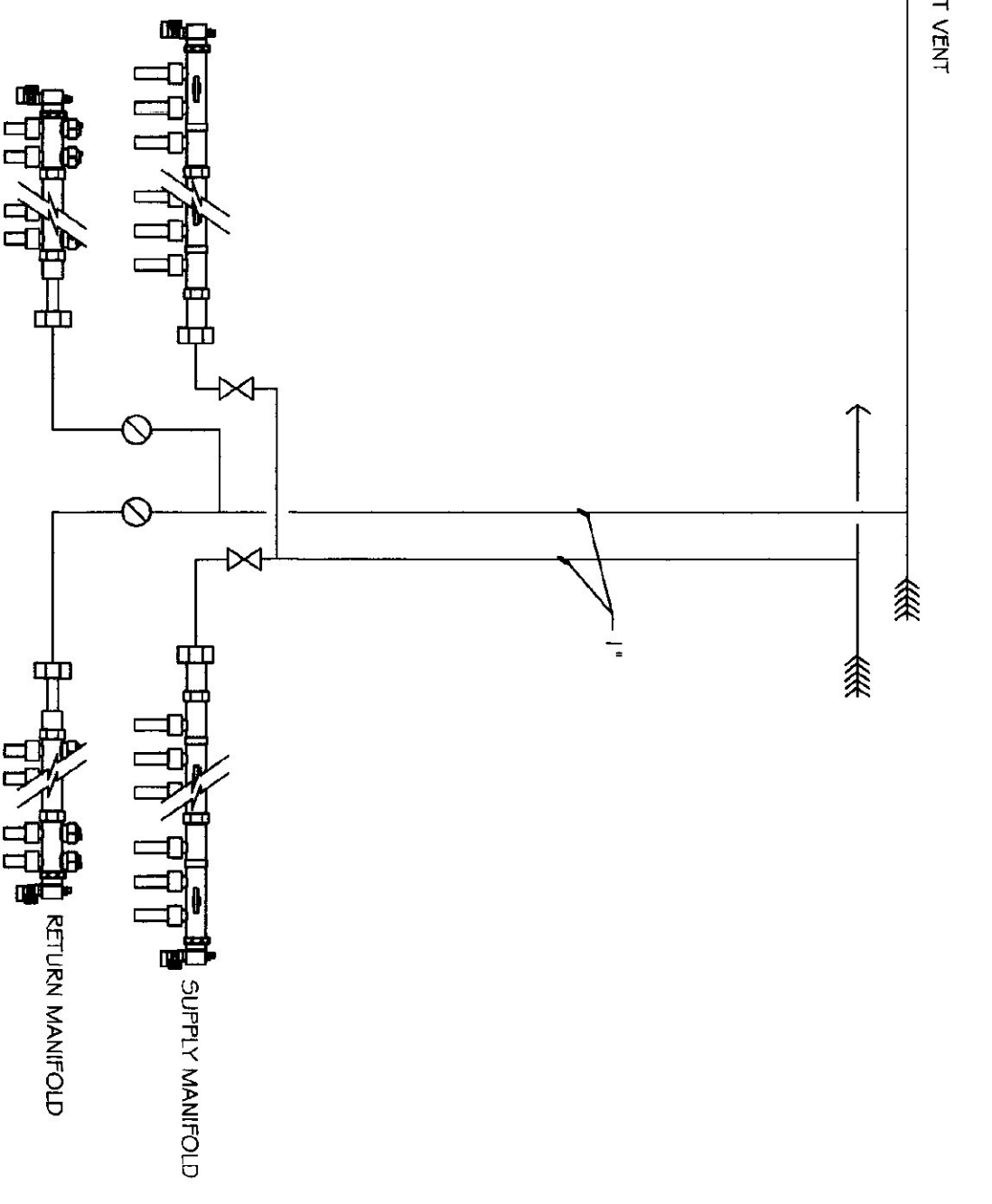
FAN SCHEDULE

PLAN SYMBOL	SYSTEM	MANUF. MODEL & TYPE	C.F.M.	S.F. IN	SOA(M)	FAN RPM	HP	ELECTRICAL	NOTES
F-1	BATHROOM	GREENHECK SEI-D-440-E	100	.125	2.2	1050	1/100	120/160	WEATHER HOOD, SCREEN & MOD W/ BELMO CIRCU.
F-2	GARAGE VENT	GREENHECK SRS-1124-4	4250	.125	12.2	649	1/4	120/160	WEATHER HOOD, SCREEN & MOD

HYDRONIC PIPING SCHEMATIC
NOT TO SCALE



TYPICAL MANIFOLD SCHEMATIC
NO BULL HEAD TEES



MONTGOMERY A.O.T. GARAGE
RADIANT HEATING
DETAILS & SCHEDULES



STATE OF VERMONT
Department of Buildings
and General Services
Agency of Administration
Montpelier, Vermont



SCALE: AS NOTED
DATE: MAY 2003
DRAWN BY: N. HERSEY
APPR. BY: TEIGH

REVISIONS

OF #
M-2
DETAILS
RADIANT HEATING
MONTGOMERY A.O.T. GARAGE