

DESIGN CONDITIONS		
WINTER DESIGN TEMPERATURES:	INDOOR:	70 F DB
	OUTDOOR:	-21 F DB
ELEVATION		6900' FEET
WALL R-VALUE (AVG)		13 (CAV.) 7.5 (CONT.)
ROOF R-VALUE (AVG)		38
GLASS U-VALUE (AVG)		0.45
ELECTRICAL POWER AVAILABLE		120/1, 240/1 480/3

SHEET INDEX	
SHEET	DESCRIPTION
M0.0	MECHANICAL COVER SHEET
M1.0	MECHANICAL SCHEDULES
M2.0	MECHANICAL PLANS
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M4.0	MECHANICAL SPECIFICATIONS AND SEQUENCE OF OPERATION

DUCTWORK LEGEND		
SINGLE LINE	DESCRIPTION	DOUBLE LINE
	90° ELBOW DOWN	
	90° ELBOW UP	
	OFFSET TO CHANGE ELEVATION (AT 30° WHEN POSSIBLE. ARROW SLOPES DN.)	
	ROUND RADIUS ELBOW	
	90° STRAIGHT TEE	
	90° CONICAL TEE	
	45° BRANCH	
	45° CONICAL TEE	
	SIZE OR SHAPE TRANSITION	
	ROUND FLEXIBLE DUCT	
	90° ELBOW DOWN	
	90° ELBOW UP	
	OFFSET TO CHANGE ELEVATION (AT 30° WHERE POSSIBLE). ARROW IN DIRECTION OF AIRFLOW. INDICATE DROP OR RISE.	
	ROUND RADIUS ELBOW	
	RECTANGULAR ELBOW WITH TURNING VANES	
	SPLIT BRANCH TAKE-OFF WITH SQUARE ELBOW & SPLITTER DAMPER	
	SPLIT BRANCH TAKE-OFF WITH RADIUS ELBOW & SPLITTER DAMPER	
	BRANCH TAKE-OFF WITH RADIUS HEEL AND DAMPER	
	BRANCH TAKE-OFF WITH AIR EXTRACTOR	
	LINED DUCTWORK (UNLESS NOTED OTHERWISE)	
	SQUARE NECK CEILING DIFFUSER 4-WAY DIRECTIONAL THROW UNLESS INDICATED OTHERWISE	
	ROUND NECK CEILING DIFFUSER 4-WAY DIRECTIONAL THROW UNLESS INDICATED OTHERWISE	
	SIDEWALL SUPPLY GRILLE OR REGISTER WITH AIR EXTRACTOR	
	STATIC PRESSURE CLASS OR STATIC PRESSURE CLASS CHANGE (INCHES WATER COLUMN)	
	SUPPLY DUCT RISER	
	RETURN, EXHAUST OR OUTSIDE AIR DUCT RISER	
	CEILING RETURN AIR GRILLE OR REGISTER	
	DOOR GRILLE	
	MANUAL BALANCING DAMPER	
	MOTORIZED DAMPER	
	SMOKE DAMPER	
	FIRE DAMPER	
	COMBINATION FIRE AND SMOKE DAMPER	
	CEILING RADIATION DAMPER	
	GRAVITY BACKDRAFT DAMPER	
	DUCT MOUNTED SMOKE DETECTOR	
	CEILING ACCESS PANEL	
	WALL CAP - BATH OR DRYER EXHAUST WITH INTEGRAL BACKDRAFT DAMPER	

PIPING LEGEND		
	OR	GATE VALVE
	OR	CHECK VALVE
	OR	BALL VALVE
		BUTTERFLY VALVE
	OR	PLUG VALVE
		CIRCUIT SETTER WITH GPM
		GLOBE VALVE
	OR	STRAINER (Y-TYPE) WITH BLOW-DOWN
	OR	TWO-WAY AUTOMATIC CONTROL VALVE
	OR	THREE-WAY AUTOMATIC DIVERTING VALVE
	OR	SOLENOID VALVE
	OR	PRESSURE REGULATOR (OR REDUCING VALVE)
		TWO-WAY MODULATING CONTROL VALVE
		THREE-WAY MODULATING MIXING VALVE
		THERMOSTATIC MIXING VALVE (TMV)
		DIFFERENTIAL PRESSURE VALVE
		PRESSURE RELIEF VALVE
		MANUAL AIR VENT
		AUTOMATIC AIR VENT
		VACUUM BREAKER
	OR	PRESSURE GAUGE WITH GAUGE COCK
		PRESSURE SENSOR
		PRESSURE / TEMPERATURE TEST PORT
		TEMPERATURE SENSOR
		THERMOMETER WELL
		THERMOMETER
		BTU METER (FLOW & TEMPERATURE DIFFERENCE)
		FLOW METER
		FLOW SWITCH
		AQUASTAT
	OR	BRAIDED TYPE FLEXIBLE PIPE CONNECTOR
		ELASTOMERIC PIPING ISOLATOR (WITH KEVLAR)
		PIPE UNION
		QUICK CONNECT (GAS) OR HOSE BIB (WATER)
	OR	RADIANT OR SNOWMELT MANIFOLD WITH ACCESS
	OR	PIPE UP OR PIPE UP & DOWN
	OR	PIPE DOWN
		FLOOR DRAIN
		FLOOR SINK
		HORIZONTAL CLEANOUT
	OR	FLOOR CLEAN-OUT
		METER
PIPING DESIGNATIONS		
— CWS/R		CHILLED WATER SUPPLY/RETURN
— CS/R		CONDENSER WATER SUPPLY/RETURN
— HWS/R		HEATING WATER SUPPLY/RETURN
— HWS/R(H/T)		HEATING WATER SUPPLY/RETURN HIGH TEMP
— HWS/R(L/T)		HEATING WATER SUPPLY/RETURN LOW TEMP
— SWS/R		SNOWMELT SUPPLY/RETURN
— RS & RL		REFRIGERANT SUCTION & REF. LIQUID
— DCW		DOMESTIC COLD WATER (DCW)
— DHW		DOMESTIC HOT WATER (DHW)
— DHR		DOMESTIC HOT WATER RECIRC (DHR)
— DHW-T		DOMESTIC HOT WATER (TEMPERED)
— W		WASTE
— V		VENT
— GW		GREASE WASTE
— FW		PRESSURIZED WASTE
— IW		INDIRECT WASTE
— BD		BUILDING DRAIN
— BS		BUILDING SEWER
— SD		STORM DRAIN
— OD		OVERFLOW DRAIN (STORM)
— SOD		SEDIMENT & OIL DRAIN
— G		NATURAL GAS
— MFG		MEDIUM PRESSURE NATURAL GAS
— LPG		PROPANE GAS
— D		DRAIN
— CD		CONDENSATE DRAIN
— F		FIRE SPRINKLER
— CA		COMPRESSED AIR
— GEO		GEOEXCHANGE SOURCE
— SWS/R		SOLAR WATER SUPPLY/RETURN
— (E)		EXISTING
— (UG)		UNDERGROUND
PUMP SYMBOLS		
		INLINE WET ROTOR PUMP
		INLINE WET ROTOR PUMP (W/ INTEGRAL CHECK)
		INLINE CLOSE-COUPLED PUMP
		BASE MOUNTED END SUCTION PUMP

GENERAL LEGEND	
	CARBON MONOXIDE SENSOR
	CARBON DIOXIDE SENSOR
	HUMIDISTAT
	DEHUMIDISTAT
	NITROGEN DIOXIDE SENSOR
	OCCUPANT SENSOR (RE: ELECTRICAL)
	ERY PUSH BUTTON CONTROLLER (LIGHTED)
	ERY PERCENT TIMER CONTROLLER (LIGHTED)
	SENSOR
	SNOWMELT SENSOR (TEKMAR 091/094)
	STATIC PRESSURE SENSOR
	THERMOSTAT
	WALL ON/OFF CONTROL SWITCH
	WALL TIMER SWITCH
	VARIABLE SPEED CONTROL
AIR DEVICE DESIGNATION KEY:	
<p>SIZE (INCHES)</p> <p>NOTE: FOR STANDARD MODULE SIZE REGISTERS, SIZE GIVEN IS NECK SIZE. REFER TO AIR DEVICE SCHEDULE SHEET FOR MODULE SIZE.</p> <p>• AIR QUANTITY (CFM)          CA - COMB. AIR          OA - OUTSIDE AIR          RA - RETURN AIR          EA - EXHAUST AIR          MA - MIXED AIR          MUA - MAKE-UP AIR</p> <p>TYPE OF AIR DEVICE.          RE: SCHEDULE SHEET</p>	
RISER DESIGNATION KEY:	
<p>DUCTING:          OA - OUTSIDE AIR          EA - EXHAUST AIR</p> <p>GENERAL:          US - UTILITY SHAFT</p> <p>PIPING:          CW - CHILLED WATER          DW - DOMESTIC WATER          HW - HEATING WATER          G - GAS          R - REFRIGERANT          SD - STORM DRAIN          SM - SNOWMELT          OD - OVERFLOW DRAIN          UW - WASTE &amp; VENT</p> <p>RISER NUMBER</p>	
AIR TERMINAL UNIT DESIGNATION KEY:	
<p>TERMINAL TYPE</p> <p>CV - CONSTANT VOLUME BOX (SERIES)          FP - FAN POWERED BOX (PARALLEL)          VV - VARIABLE VOLUME          VR - VARIABLE VOLUME W/ REHEAT</p> <p>COOLING AIR QUANTITY (CFM)          MINIMUM AIR QUANTITY (CFM) FOR VENTILATION OR HEATING.          PRIMARY AIR VALVE SIZE</p>	
REMODEL LEGEND	
	POINT OF DISCONNECTION
	POINT OF NEW CONNECTION
(A)	ABANDON
(D)	DEMO
(E)	EXISTING
(N)	NEW
(R)	RELOCATE

PLAN ABBREVIATIONS	
AAV	AIR ADMITTANCE VALVE (STUDOR OR EQUAL)
AFF	ABOVE FINISHED FLOOR
ABV	ABOVE
BLW	BELOW
CFM	CUBIC FEET PER MINUTE (AIR QUANTITY)
CLG	CEILING
CO	CLEANOUT
CONC	CONCRETE
COTG	CLEAN-OUT TO GRADE
DN	DOWN
DMPR	DAMPENER
EA	EACH
EC	ELECTRICAL CONTRACTOR
ER / EG	EXHAUST REGISTER / EXHAUST GRILLE
ETR	EXISTING TO REMAIN
EXH	EXHAUST
FCO	FLOOR CLEAN-OUT
FD	FIRE DAMPER OR FLOOR DRAIN
FPC	FIRE PROTECTION CONTRACTOR
GFM	GALLONS PER MINUTE (WATER FLOW RATE)
LD	SUPPLY DIFFUSER (LINEAR)
MC	MECHANICAL CONTRACTOR
MOD	MOTOR OPERATED DAMPER
OA (OR OSA)	OUTSIDE AIR
PC	PLUMBING CONTRACTOR
PLNM	PLENUM
FR	PIPE RISER
RA (OR R/A)	RETURN AIR
RR	RETURN REGISTER
RG (RAG)	RETURN AIR GRILLE
SA (OR S/A)	SUPPLY AIR
S. DMPR	SMOKE DAMPER
SR	SUPPLY REGISTER (SIDEWALL OR DUCT MOUNTED)
SV	STUDOR VENT (SIZED BY CONTRACTOR)
TYP	TYPICAL
TRANS	TRANSITION
T/A	THROW AWAY
UNO	UNLESS NOTED OTHERWISE
US	UTILITY SHAFT
VTR	VENT THROUGH ROOF
W/	WITH
WCO	WALL CLEAN-OUT
XFER	TRANSFER
EQUIPMENT ABBREVIATIONS	
AHU	AIR HANDLING UNIT
AS	AIR SEPARATOR
B	BOILER (HOT WATER)
CH	CHILLER
CC	COILING COIL
CH	CABINET HEATER
CT	COOLING TOWER CELL
CV	CONSTANT VOLUME BOX
DEF	DISHWASHER EXHAUST FAN
EBH	ELECTRIC BASEBOARD HEATER
ECU	EVAPORATIVE COOLING UNIT
EF	EXHAUST FAN
ERV	ENERGY RECOVERY VENTILATOR (AIR TO AIR EX)
ET	EXPANSION TANK
FC	FAN COIL
FP	FAN POWERED BOX
GF	GLYCOL FEEDER
HC	HEATING COIL
HP	HEAT PUMP
HX	HEAT EXCHANGER
H	HUMIDIFIER
KEF	KITCHEN EXHAUST FAN
MV	MIXING VALVE
P	PUMP (SEE PIPING LEGEND FOR DETAILS)
RF	RETURN/RELIEF AIR FAN
SF	SUPPLY FAN
TEF	TOILET EXHAUST FAN
TMV	THERMOSTATIC MIXING VALVE
UH	UNIT HEATER
VV	VARIABLE VOLUME BOX
VR	VARIABLE VOLUME BOX W/ REHEAT
WH	WATER HEATER

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**SSRC ALPINE COASTER**  
 2305 MT. WERNER CIRCLE  
 STEAMBOAT SPRINGS, COLORADO

Issued For		
No.	Date	Comment
1	8/12/16	COORDINATION
2	8/23/16	CONSTRUCTION

MECHANICAL COVER SHEET

Project No.	Scale:
16053.00	N/A
Drawn By:	Checked By:
DRC	JDR

**M0.0**

RADIANT ZONE SCHEDULE - LOWER BUILDING												
MARK	ROOM(S)	EFFECTIVE AREA (SF)	BTU/H	BTU/H PER SF	GPM	TUBE CENTERS	TOTAL LENGTH	# OF LOOPS	LOOP LENGTHS	GPM/LOOP	P.D. (FT)	FLOOR COVERINGS
RZ-1	OPERATOR/ EQUIP	132	3100	23	0.4	6	264	1	264	0.4	1.9	3/4" CONC
RZ-2	STORAGE	713	10000	14	1.1	12	713	4	178	0.3	0.9	3/4" CONC
TOTALS		845	13100	16	1.5		977	5				

NOTES:  
SEE MECHANICAL ZONING PLANS FOR DETAILED ZONE LAYOUTS.  
U.N.O. ZONES INCLUDE ASSOCIATED BATHS, CLOSETS & HALLS.

FLOOR COVERINGS  
C = CARPET S = STONE CONC = CONCRETE  
W = WOOD T = TILE

SNOWMELT AREA SCHEDULE														
SNOWMELT ZONE	SNOWMELT AREA	DESCRIPTION	EFFECTIVE AREA (SF)	BTU/H	BTU/H PER SF	GPM	TUBE CENTERS	TOTAL LENGTH	# OF LOOPS	LOOP LENGTHS	GPM/LOOP	P.D. (FT)	MANIFOLD SIZE	TUBING SIZE
SZ-1	SA-1a	LOADING AREA	644	160	103040	7.8	9	859	4	225	2.0	14.4	1"	5/8"
	SA-1b	UNLOADING AREA	364	160	58240	4.4	9	485	2	253	2.2	20.3	1"	5/8"
SZ-2	SA-2	UPPER RAMP	629	160	100640	7.6	9	839	4	220	1.9	13.5	1"	5/8"
SZ-3	SA-3	MIDDLE RAMP	393	160	62880	4.8	9	524	3	185	1.6	8.1	1"	5/8"
SZ-4	SA-4	LOWER RAMP	652	160	104320	7.9	9	869	4	227	2.0	14.9	1"	5/8"
TOTALS			2682		429120	32.6		3576						

BOILERS							ACCESSORIES				
SYM. (SERVES)	TYPE	S.L. INPUT MBH	ALT OUTPUT MBH	FUEL	DELTA T	GPM	ELEC.	MANUFACTURER & MODEL	EFF	ACCESSORIES	
B-1 & 2 (CENTRAL)	WALL MOUNT STAINLESS STEEL CONDENSING	285	221	NAT. GAS	30	120/1 2 A	120/1 2 A	LOCHINVAR WHN 285	95%	1, 2, 3, 4, 5, 6	

EQUALS: LOCHINVAR, BUDERUS, BURNHAM, TRIANGLE TUBE, WEIL-McLAIN

AIR SEPARATOR						
SYM.	SERVES	RECOMMENDED MAX GPM	GPM	P.D. (FT.)	MANUF. & MODEL	REMARKS
AS-1	CENTRAL BOILER SYSTEM	40	VARIABLE	1	SPIROTHERM VJR-200TM	2"

EQUALS: SPIROTHERM, TACO, BELL & GOSSETT.

EXPANSION TANK						
SYM.	SERVES	MOUNTING	ACCEPT. VOL. (GALS)	TOTAL VOL. (GALS)	MANUF. & MODEL	REMARKS
ET-1	CENTRAL BOILER SYSTEM	PIPE	6	15	FLEXCON HTX 90	3/4" MNPT

EQUALS: FLEXCON, WEGSEL6, TACO, AMTRON.

GLYCOL FEEDER						
SYM.	SERVES	VOLT/PH	ELEC NOTES	AMPS	MANUF. & MODEL	REMARKS
GF-1	CENTRAL BOILER SYSTEM	115/1	3-PHONG PLUG FURNISHED STANDARD	0.4	AXIOM MF200	6.6 GALLONS, LOW LEVEL ALARM PANEL WITH REMOTE MONITORING DRY CONTACTS

EQUALS: AXIOM, NEPTUNE.

CONDENSATE NEUTRALIZATION TANK						
SYM.	SERVES	MAXIMUM MBH	MAXIMUM GPH	PIPE CONN. SIZE	MANUF. & MODEL	REMARKS
CNT-1	CENTRAL BOILER SYSTEM	1,000	4.8	1" NPT	AXIOM NT25	FURNISH WITH NEUTRALIZING MEDIA

PUMPS										
SYM.	GPM	TDH (FT.)	HP	VOLT/PH	MANUFACTURER & MODEL NO.	DESCRIPTION	CHECK	SPEED	MATERIAL	CONTROL
P-1	17	11	1/6	115/1	GRUNDFOS UPS 26-93 FC	B-1 BOILER	A	2	A	1
P-2	17	11	1/6	115/1	GRUNDFOS UPS 26-93 FC	B-2 BOILER	A	2	A	1
P-3	2	20	1/6	115/1	GRUNDFOS UPS 26-93 FC	SPACE HEATING (LOWER BUILDING RADIANT FLOORS)	A	1	A	1
P-4	12	32	1/2	115/1	GRUNDFOS UPS 26-150 F	SZ-1 SNOWMELT ZONE	B	2	A	1
P-5	8	37	1/2	115/1	GRUNDFOS UPS 26-150 F	SZ-2 SNOWMELT ZONE	B	2	A	1
P-6	5	38	1/2	115/1	GRUNDFOS UPS 26-150 FC	SZ-3 SNOWMELT ZONE	B	2	A	1
P-7	8	37	1/2	115/1	GRUNDFOS UPS 26-150 F	SZ-4 SNOWMELT ZONE	B	2	A	1

CHECK VALVE:  
A. INTEGRAL CHECK VALVE  
B. EXTERNAL CHECK VALVE

SPEED:  
1. 3-SPEED PUMP, OPERATE ON SPEED 1  
2. 3-SPEED PUMP, OPERATE ON SPEED 2  
3. 3-SPEED PUMP, OPERATE ON SPEED 3  
4. ON/OFF  
5. VARIABLE SPEED VIA INTEGRAL CONTROL  
6. VARIABLE SPEED VIA TEKMAR CONTROL

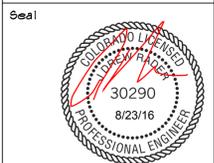
MATERIAL:  
A. CAST IRON  
B. BRONZE

CONTROL:  
1. RE. SEQUENCE OF OPERATION

GAS PRESSURE REGULATORS				
SYM.	DESCRIPTION	CAPACITY	MANUF. & MODEL	REMARKS
GPR-1	GAS PRESSURE REGULATOR (B-1)	778 CFH 20 PSIG INLET MAX 10 PSIG INLET MIN	PIETRO FIORENTINI GOVERNOR 30052	8-11" WC. OUTLET, BLACK SPRING, 3/4" BODY INLET, 3/4" BODY OUTLET 341 CFH GAS LOAD
GPR-2	GAS PRESSURE REGULATOR (B-2)	778 CFH 20 PSIG INLET MAX 10 PSIG INLET MIN	PIETRO FIORENTINI GOVERNOR 30052	8-11" WC. OUTLET, BLACK SPRING, 3/4" BODY INLET, 3/4" BODY OUTLET 341 CFH GAS LOAD

ELECTRIC UNIT HEATER					
SYM.	DESCRIPTION	CAPACITY	ELECTRIC	MANUF. & MODEL	REMARKS
EUH-1	ELECTRIC UNIT HEATER	6824 BTU/H	240/1, 2000 W	OUELLET OAEU2000T	BUILT-IN THERMOSTAT

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**SSRC ALPINE COASTER**  
2305 MT. WERNER CIRCLE  
STEAMBOAT SPRINGS, COLORADO

Issued For		
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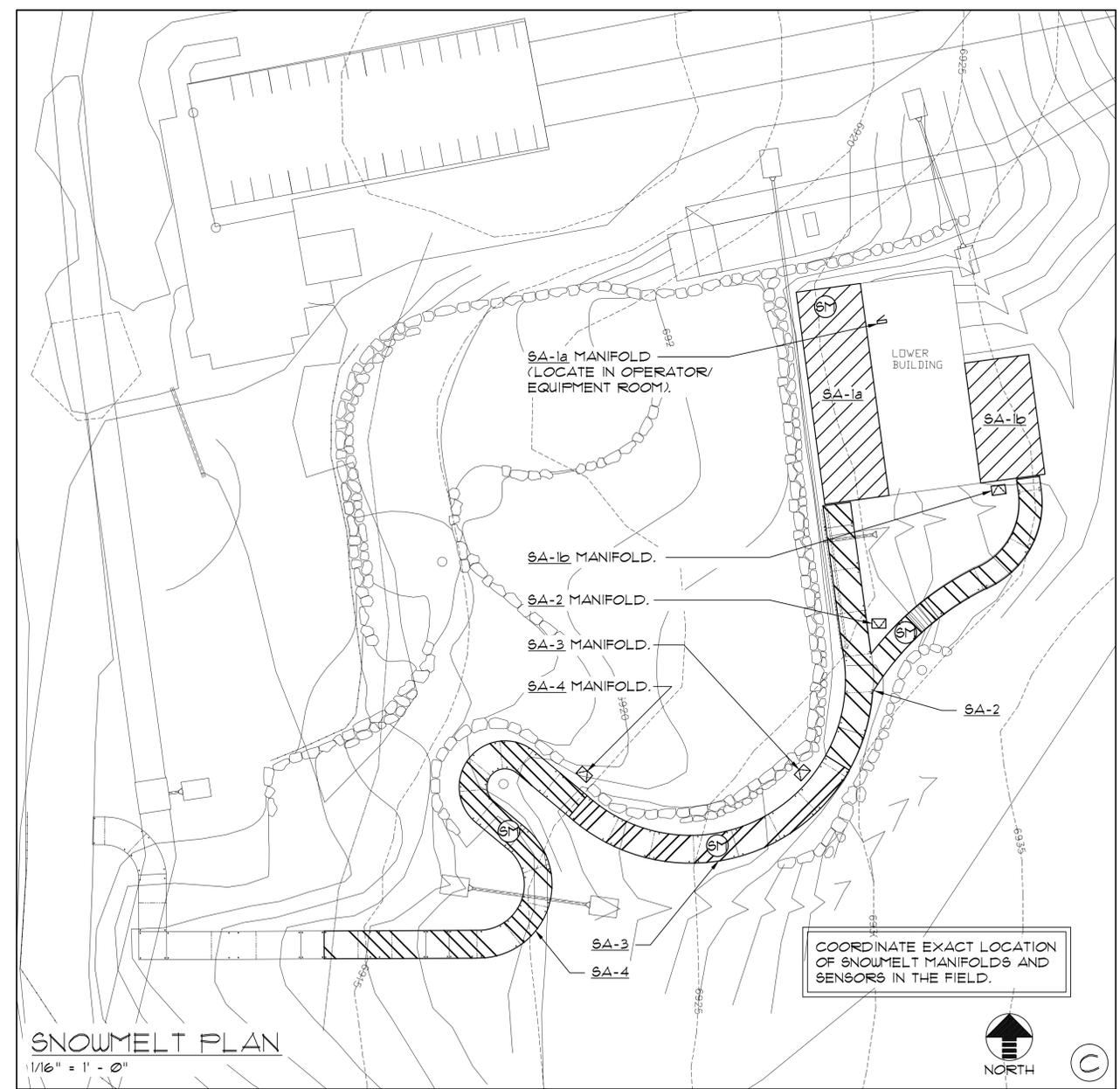
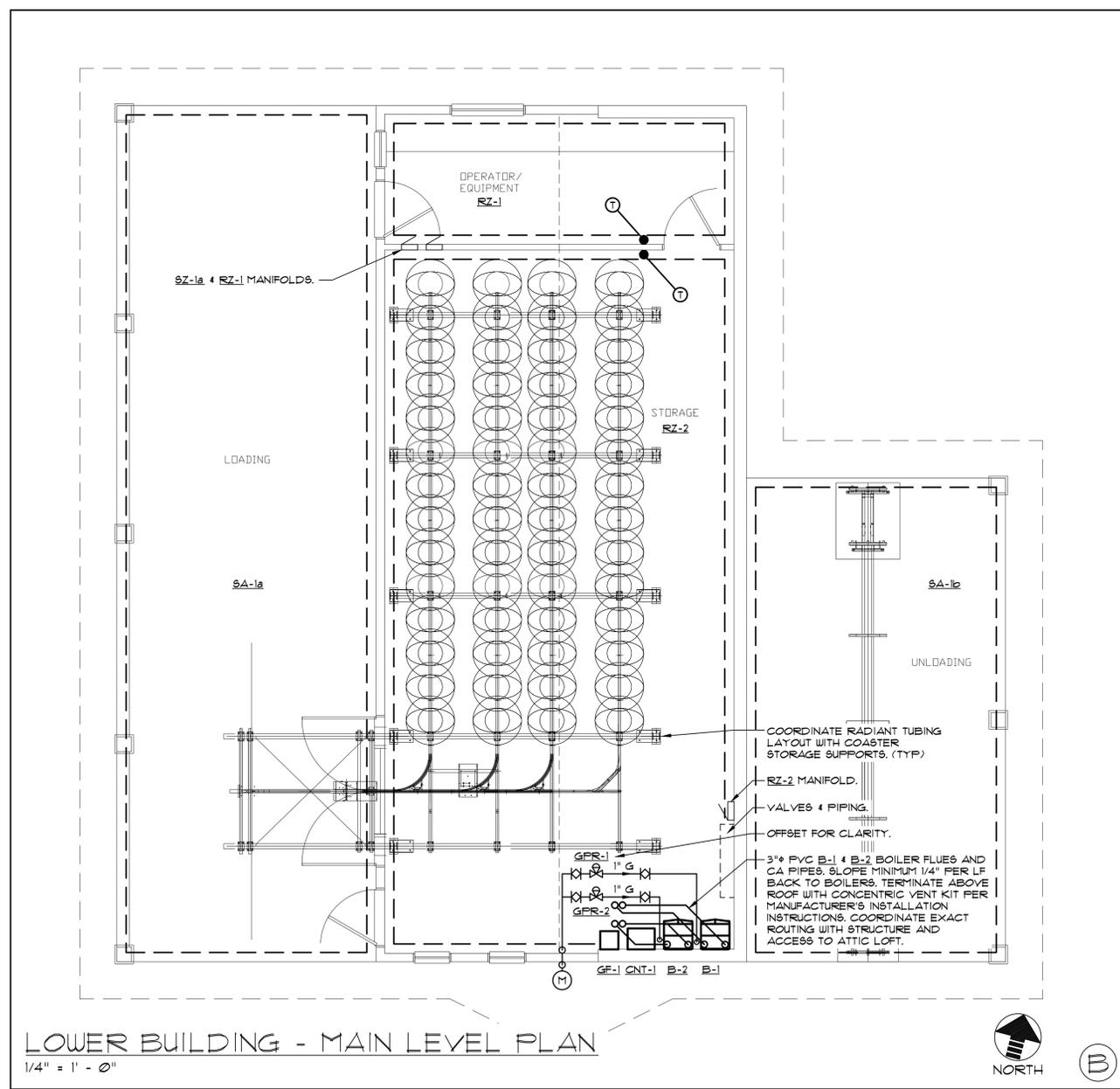
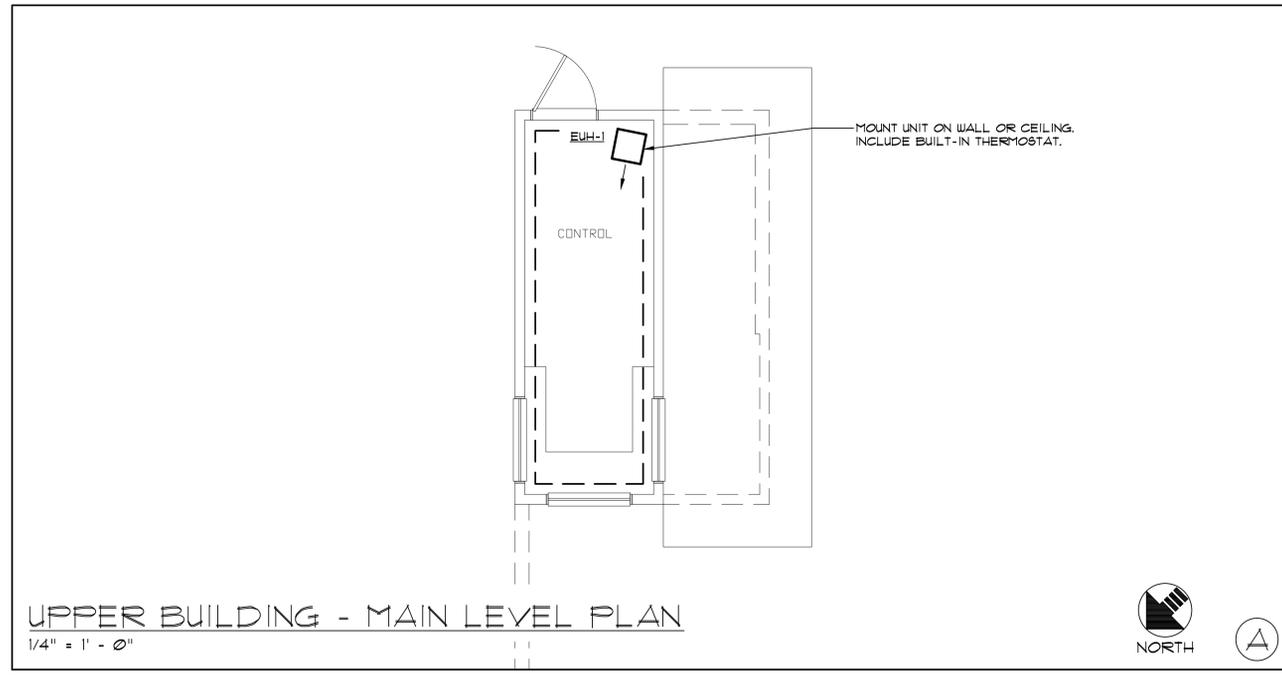
MECHANICAL SCHEDULES

Project No. 16053.00	Scale: N/A
Drawn By: DRC	Checked By: JDR

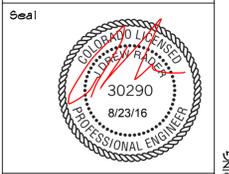
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SHEET LEGEND		
(CO)	CARBON MONOXIDE SENSOR	[ ] HEATING ZONE
(HD)	DEHUMIDISTAT	
(H)	HUMIDISTAT	[ / ] SNOWMELT ZONE #1
HP	HEAT PUMP (GROUND SOURCE)	
IRH	INFRARED RADIANT HEATER	[ \ ] SNOWMELT ZONE #2
MUA	MAKE-UP AIR UNIT	
(OS)	OCCUPANCY SENSOR	[ / \ ] SNOWMELT ZONE #3
(PB)	PUSH BUTTON CONTROL WITH DELAY OFF	
(PT)	PERCENT TIMER CONTROL	[ \ / ] SNOWMELT ZONE #4
RZ	RADIANT ZONE	
(S)	SLAB TEMPERATURE SENSOR	
SA	SNOWMELT AREA	
(SM)	SNOW / ICE SENSOR (TEKMAR 091/094)	
(T)	THERMOSTAT / WALL SENSOR	
(T)	WALL TIMER SWITCH	



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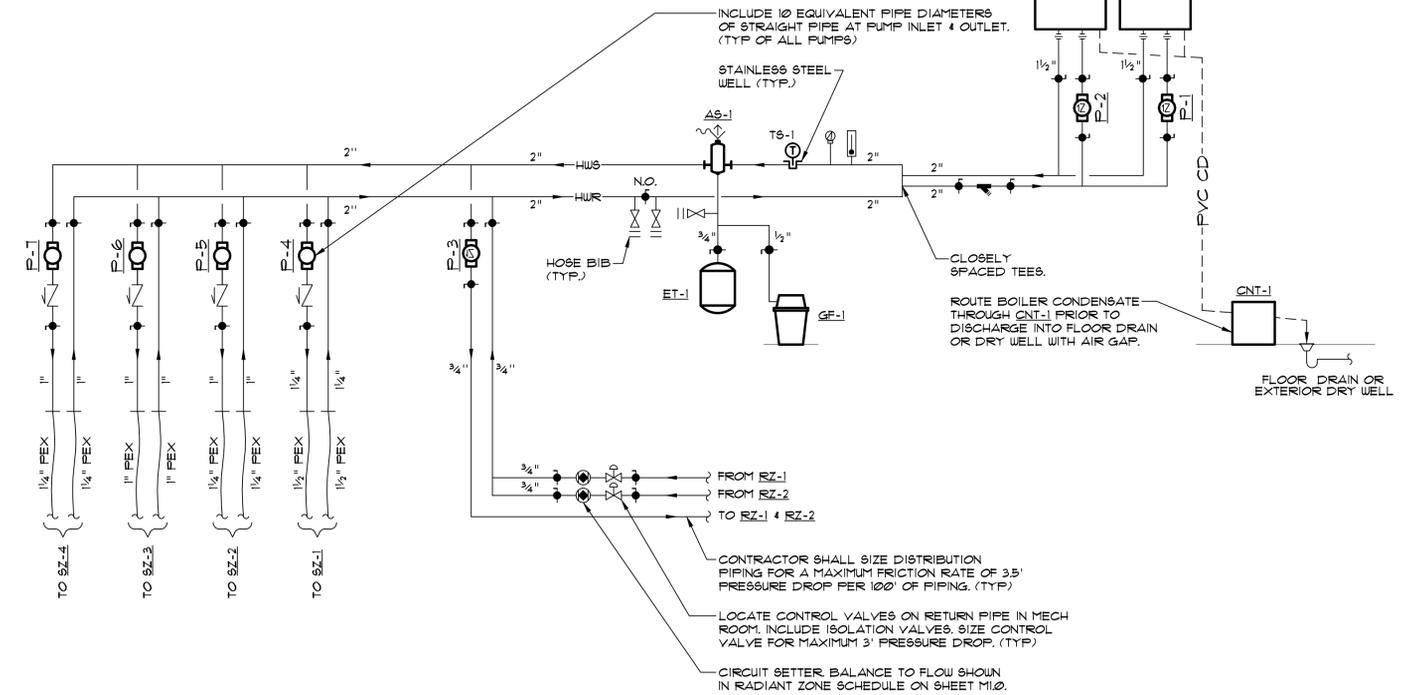
MECHANICAL PLANS

Project No. 16053.00 Scale: RE: FLANS  
 Drawn By: DRC Checked By: JDR

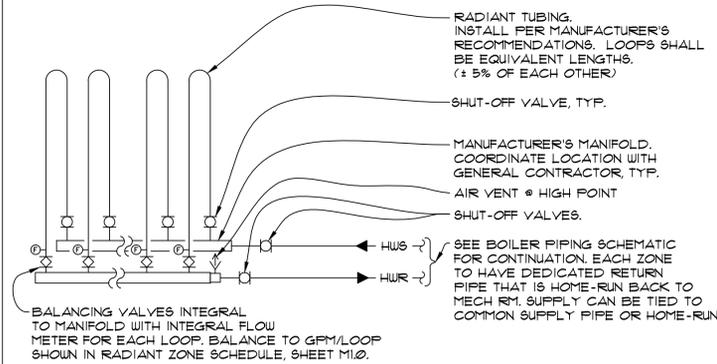
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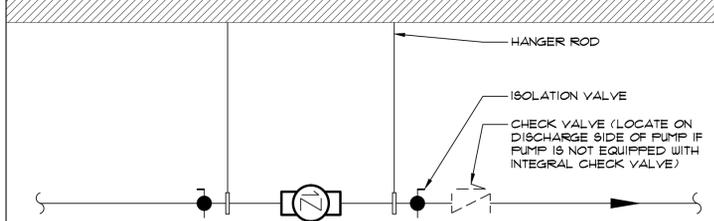
THIS BOILER SYSTEM SERVES LOWER BUILDING SPACE HEATING AND SNOWMELTING.



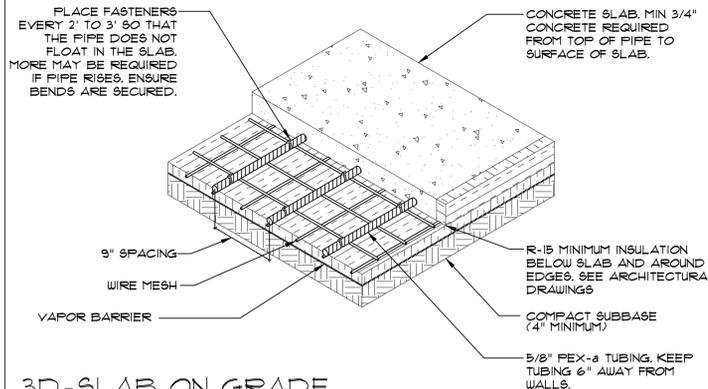
**CENTRAL BOILER PIPING SCHEMATIC**  
NO SCALE



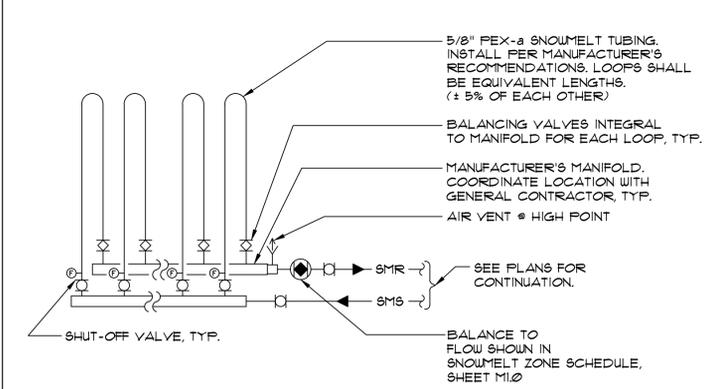
**RADIANT MANIFOLD SCHEMATIC**  
NO SCALE



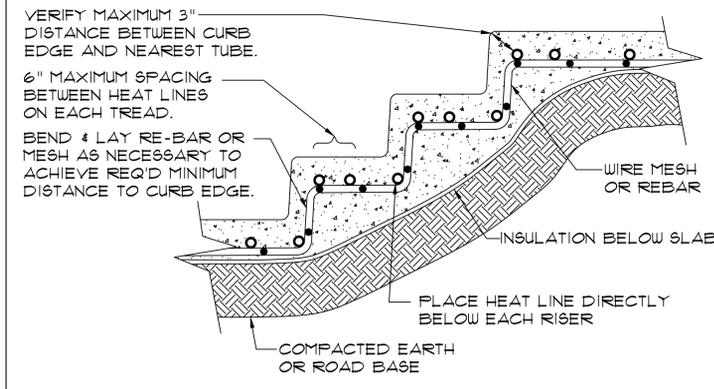
**TYPICAL INLINE WET ROTOR PUMP DETAIL**  
NO SCALE



**3D-SLAB ON GRADE SNOWMELT TUBING INSTALLATION SCHEMATIC**  
NO SCALE



**SNOWMELT MANIFOLD PIPING SCHEMATIC**  
NO SCALE



**STAIR SNOWMELT TUBING SCHEMATIC**  
NO SCALE



**SSRC ALPINE COASTER**  
**2305 MT. WERNER CIRCLE**  
**STEAMBOAT SPRINGS, COLORADO**

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MECHANICAL SCHEMATICS

Project No. 16053.00	Scale: N/A
Drawn By: DRC	Checked By: JDR

**M3.0**

