

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)		3.8
GLASS U-VALUE (AVG)		0.45
ELECTRICAL POWER AVAILABLE		120/1, 240/1 480/3

SHEET INDEX

<u>SHEET</u>	<u>DESCRIPTION</u>
M00	MECHANICAL COVER SHEET
M10	MECHANICAL SCHEDULES
M20	MECHANICAL PLANS
M30	MECHANICAL SCHEMATICS
M40	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 GFM
			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
	OR		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 KEYLARK)
			PIPE UNION
			QUICK CONNECT (GAS) OR HOSE BIB (WATER)
	OR		RADIANT OR SNOWMELT MANIFOLD WITH ACCESS
	OR		PIPE UP OR PIPE UP & DOWN
			PIPE DOWN
			FLOOR DRAIN
			FLOOR SINK
			HORIZONTAL CLEANOUT
	OR		FLOOR CLEAN-OUT
			METER

PIPING DESIGNATIONS

CWS/R	CHILLED WATER SUPPLY/RETURN
C&R	CONDENSER WATER SUPPLY/RETURN
HWS/R	HEATING WATER SUPPLY/RETURN
HWS/R(HT)	HEATING WATER SUPPLY/RETURN HIGH TEMP
HWS/R(LT)	HEATING WATER SUPPLY/RETURN LOW TEMP
SMR/R	SNOWMELT SUPPLY/RETURN
R&L	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
PW	PRESSURIZED WASTE
IW	INDIRECT WASTE
BD	BUILDING DRAIN
BS	BUILDING SEWER
SD	STORM DRAIN
OD	OVERFLOW DRAIN (STORM)
S	SEDIMENT & OIL DRAIN
G	NATURAL GAS
MPG	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

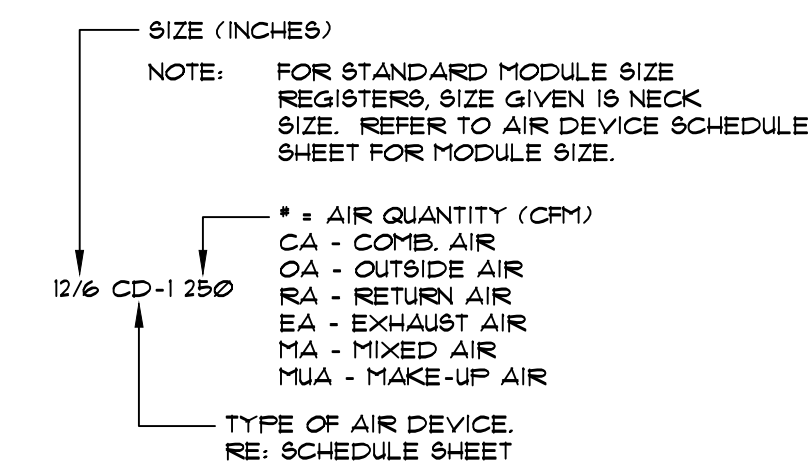
PUMP SYMBOLS

	INLINE WET ROTOR PUMP
	INLINE WET ROTOR PUMP (W/ INTEGRAL CHECK)
	INLINE CLOSE-COUPLED PUMP
	BASE MOUNTED END SUCTION PUMP

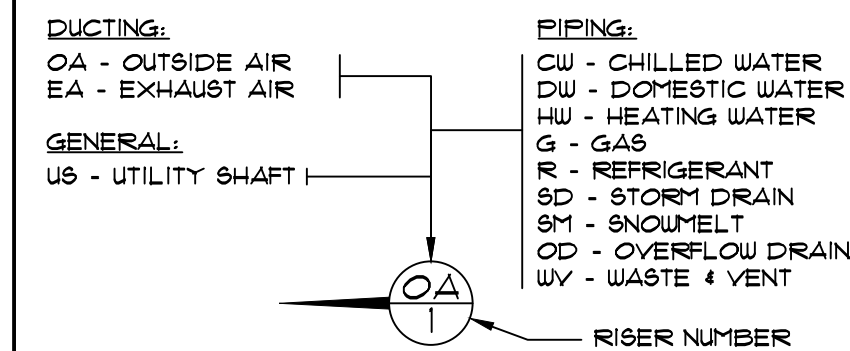
GENERAL LEGEND

(C ₀)	CARBON MONOXIDE SENSOR
(C ₂)	CARBON DIOXIDE SENSOR
(H)	HUMIDISTAT
(H) _D	DEHUMIDISTAT
(N ₂) _D	NITROGEN DIOXIDE SENSOR
(OC)	OCCUPANT SENSOR (RE: ELECTRICAL)
(PB)	ERV PUSH BUTTON CONTROLLER (LIGHTED)
(PT)	ERV PERCENT TIMER CONTROLLER (LIGHTED)
(S)	SENSOR
(SM)	SNOWMELT SENSOR (TERMIAR 031/034)
(SP)	STATIC PRESSURE SENSOR
(T)	THERMOSTAT
\$	WALL ON/OFF CONTROL SWITCH
\$ _T	WALL TIMER SWITCH
\$ _V	VARIABLE SPEED CONTROL

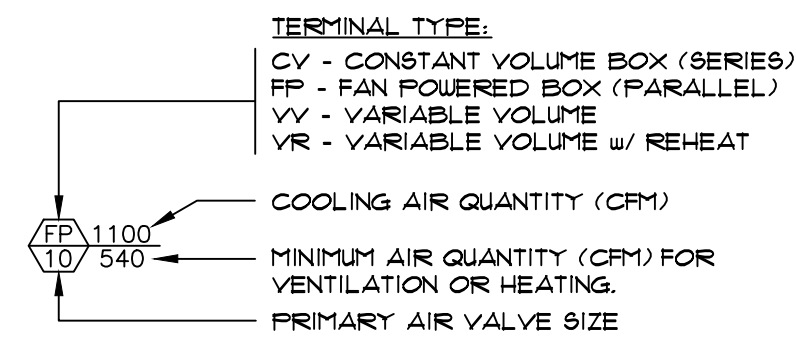
AIR DEVICE
DESIGNATION KEY:





RISER
DESIGNATION KEY:



AIR TERMINAL UNIT
DESIGNATION KEY:



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)
AFB	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
DMFR	DAMPER
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
FFC	FIRE PROTECTION CONTRACTOR
GPM	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
FLNM	FLENUM
PR	PIPE RISER
RA (OR R/A)	RETURN AIR
RR	RETURN REGISTER
RG (RAG)	RETURN AIR GRILLE
SA (OR S/A)	SUPPLY AIR
S. DMFR	SMOKE DAMPER
S/R	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

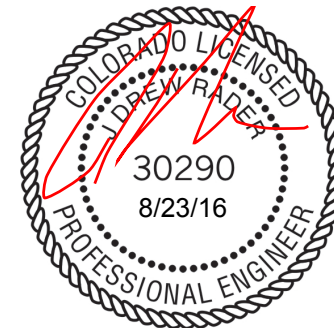
EQUIPMENT ABBREVIATIONS

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 HX)
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



40690 HIGHWAY 6, SUITE E1
P.O. BOX 8610 AVON, CO. 81620
(970) 845-7910 / FAX: (970) 845-7522

Sea



SSRC ALPINE COASTER

2305 MT. WERNER CIRCLE
STEAMBOAT SPRINGS, COLORADO

Issued For

[illegible]MECHANICAL
COVER SHEET

Project No.
16053.00

Scale:
N/A

Drawn B
DR

Checked By:	JDR
-------------	-----

M0.0

ANY CHANGES AND/OR DEVIATIONS FROM THESE PLANS WITHOUT WRITTEN APPROVAL BY THE ENGINEER RELEASE THE ENGINEER FROM ANY FUTURE LIABILITY OR RESPONSIBILITY TO THIS BUILDING.
COPYRIGHT ENGINEERING, INC. EXPRESSLY RESERVE THE COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS TO THESE PLANS. THIS DRAWING MAY NOT BE REPRODUCED OR PRODUCTIONS THEREOF USED WITHOUT WRITTEN PERMISSION FROM THE ENGINEER.
(C) COPYRIGHT 2015 RAE ENGINEERING, INC.

MARK	ROOM(S)	EFFECTIVE AREA (SF)	BTU/H	BTU/H PER SF	GPM	TUBE CENTERS	TOTAL LENGTH	# OF LOOPS	LOOP LENGTH(S)	GPM/LOOP	(F.T.)	HEADER SIZE	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:						FLOOR COVERINGS							
SEE MECHANICAL ZONING PLANS FOR DETAILED ZONE LAYOUTS.						C = CARPET							
U.N.O. ZONES INCLUDE ASSOCIATED BATHS, CLOSETS & HALLS.						W = WOOD							
						S = STONE							
						T = TILE							
						CONC = CONCRETE							

SNOWMELT AREA SCHEDULE														
SNOWMELT ZONE	SNOWMELT AREA	DESCRIPTION	EFFECTIVE AREA (SF)	BTU/H PER SF	BTU/H	GPM	TUBE CENTERS	TOTAL LENGTH	# OF LOOPS	LOOP LENGTHS	GPM/LOOP	P.D. (FT)	MANIFOLD SIZE	TUBING SIZE
SZ-1	SA-1a	LOADING AREA	6.44	160	103040	7.8	9	659	4	225	2.0	14.4	1"	5/8"
	SA-1b	UNLOADING AREA	3.64	160	58240	4.4	9	485	2	225	2.0	10.3	1"	5/8"
SZ-2	SA-2	UPPER RAMP	2.99	160	100640	7.6	9	839	4	220	1.9	13.5	1"	5/8"
SZ-3	SA-3	MIDDLE RAMP	3.23	160	62880	4.8	9	524	3	185	1.6	8.1	1"	5/8"
SZ-4	SA-4	LOWER RAMP	6.52	160	104320	7.9	9	869	4	227	2.0	14.9	1"	5/8"
TOTALS			26.82		429120	32.6		3576						

BOILERS						ACCESSORIES				
						1 - HIGH ALTITUDE KIT 2 - CSPD - CONTROLS 3 - ASME RATED (H-6 STAMP)	4 - FLOW SWITCH 5 - LOW WATER CUTOFF 6 - 50% PROPYLENE GLYCOL	ELEC.	MANUFACTURER & MODEL	EFF.
SYM. (SERVES)	TYPE	S.L. INPUT MBH	ALT OUTPUT MBH	FUEL	DELTA T	GPM F/D				
B-1 # 2 (CENTRAL)	WALL MOUNTED STAINLESS STEEL CONDENSING	285	221	NAT. GAS	30	7 1/2	120/1 2 A	LOCHINVAR UHN 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	VARIES	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 30	3/4" MNPT

EQUALS: FLEXCON, WESSELS, TACO, AMTROL.

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 ALARM1 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 26-99 FC	B-1 BOILER	A	2	A	1
P-2	17	11	1/6	115/1	GRUNDFOS UPS 26-99 FC	B-2 BOILER	A	2	A	1
P-3	2	20	1/6	115/1	GRUNDFOS UPS 26-99 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 TERMIAR CONTROL

MATERIAL:

A. CAST IRON

B. BRONZE

CONTROL:

1. RS SEQUENCE OF OPERATION


GAS PRESSURE REGULATORS				
SYM.	DESCRIPTION	CAPACITY	MANUF. & MODEL	REMARKS
GPR-1	GAS PRESSURE REGULATOR (B-1)	175 CFH 2.0 PSI INLET MAX 1.0 PSI 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)	175 CFH 2.0 PSI INLET MAX 1.0 PSI 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

RADER
ENGINEERING • COMFORT SYSTEMS

40630 HIGHWAY 6, SUITE E1
P.O. BOX 8610 AVON, CO. 81620
(970) 845-1910 / FAX: (970) 845-1522

Seal



SSRC ALPINE COASTER

2305 MT. WERNER CIRCLE STEAMBOAT SPRINGS, COLORADO

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

M1.0

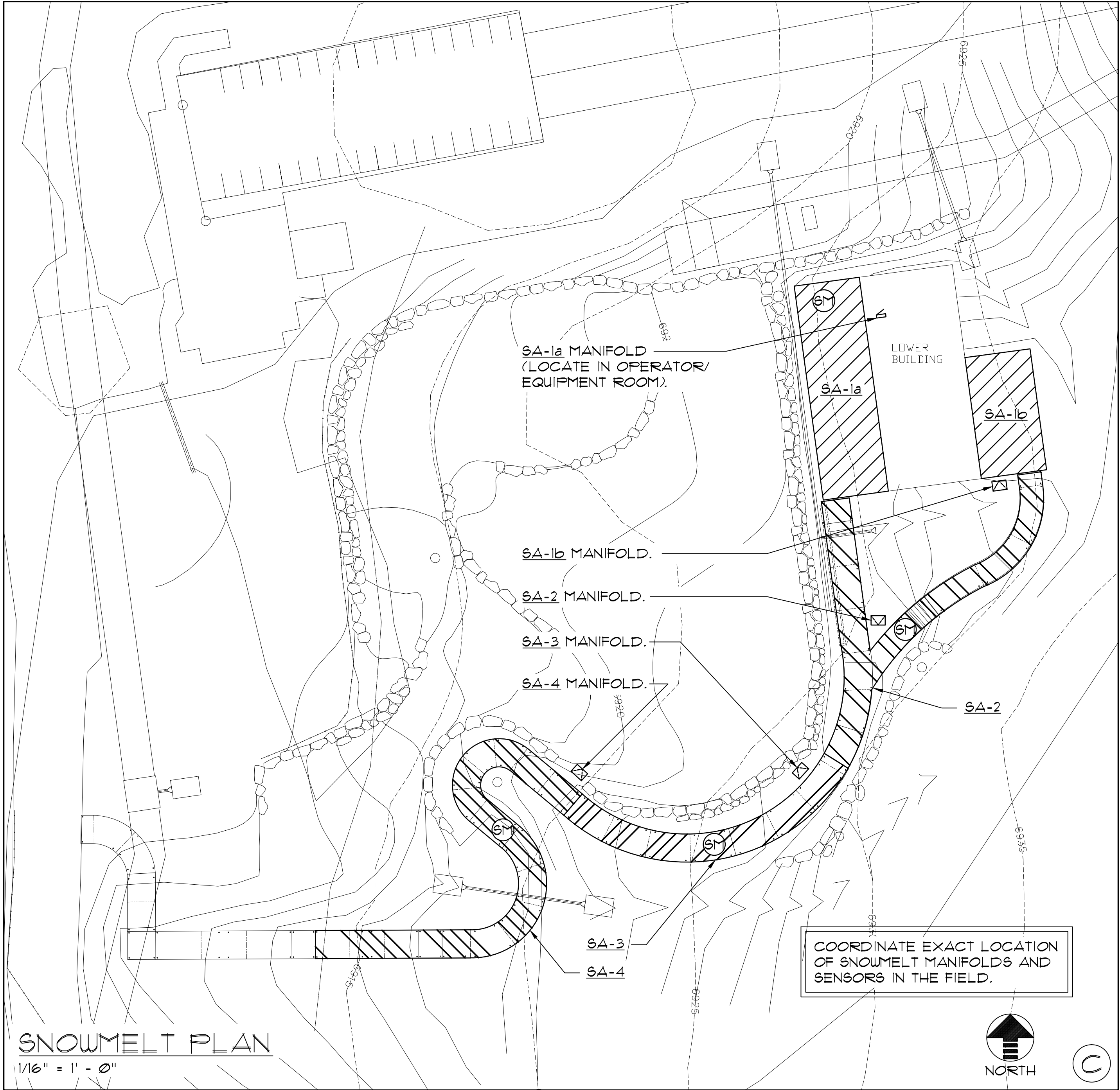
ANY CHANGES AND/OR DEVIATIONS FROM THESE PLANS WITHOUT WRITTEN APPROVAL BY THE ENGINEER RELEASE THE ENGINEER FROM ANY FUTURE LIABILITY OR RESPONSIBILITY TO THIS BUILDING.
RADER ENGINEERING, INC. EXPRESSLY RESERVE THE COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS TO THESE PLANS. THIS DRAWING MAY NOT BE REPRODUCED OR PRODUCTIONS THEREOF USED WITHOUT WRITTEN PERMISSION FROM THE ENGINEER.
© COPYRIGHT 2015 RADER ENGINEERING, INC.

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

UPPER BUILDING - MAIN LEVEL PLAN
1/4" = 1' - 0"



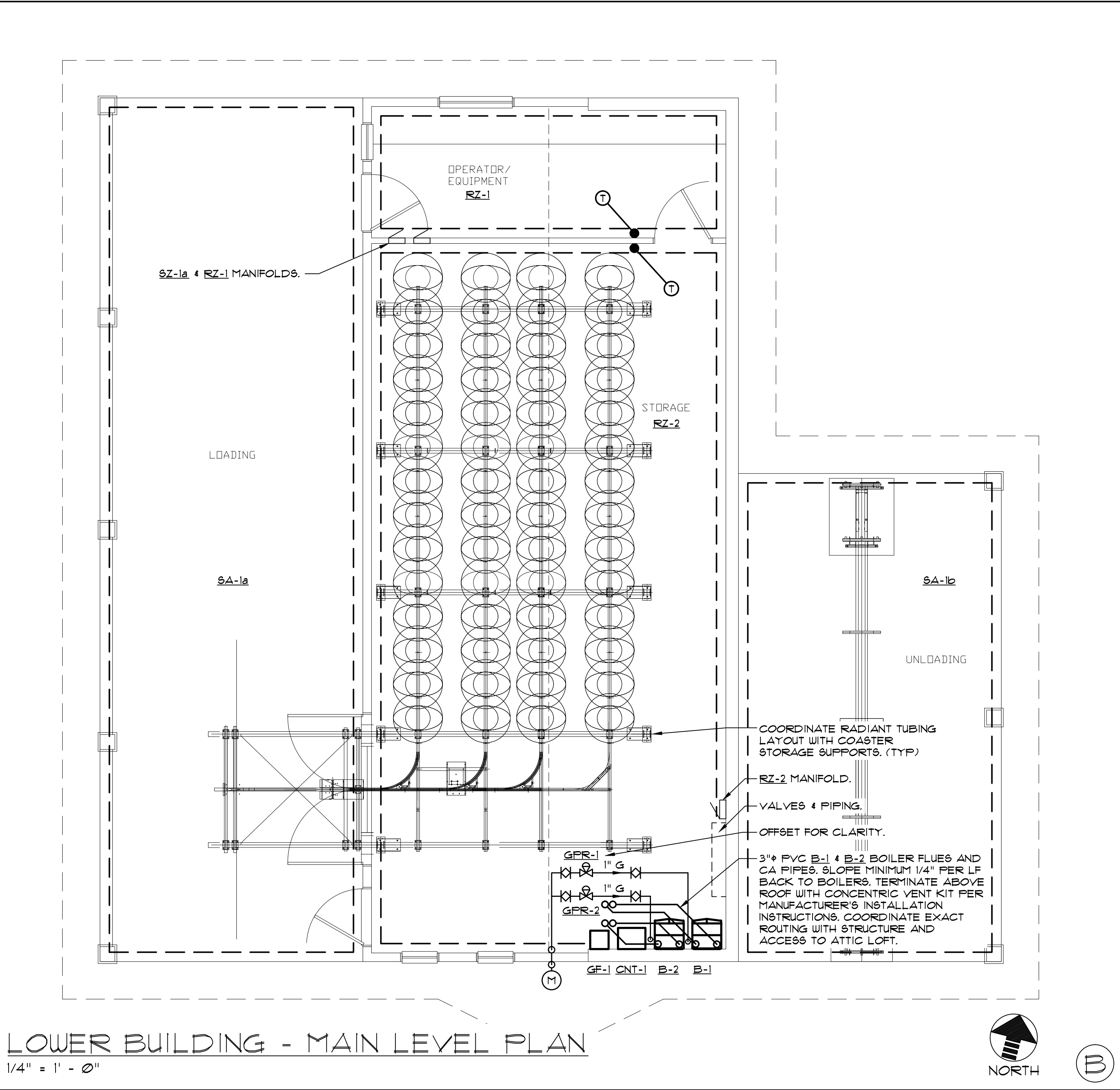
A



SNOWMELT PLAN
1/16" = 1' - 0"



C



LOWER BUILDING - MAIN LEVEL PLAN
1/4" = 1' - 0"



B

Seal



SSRC ALPINE COASTER

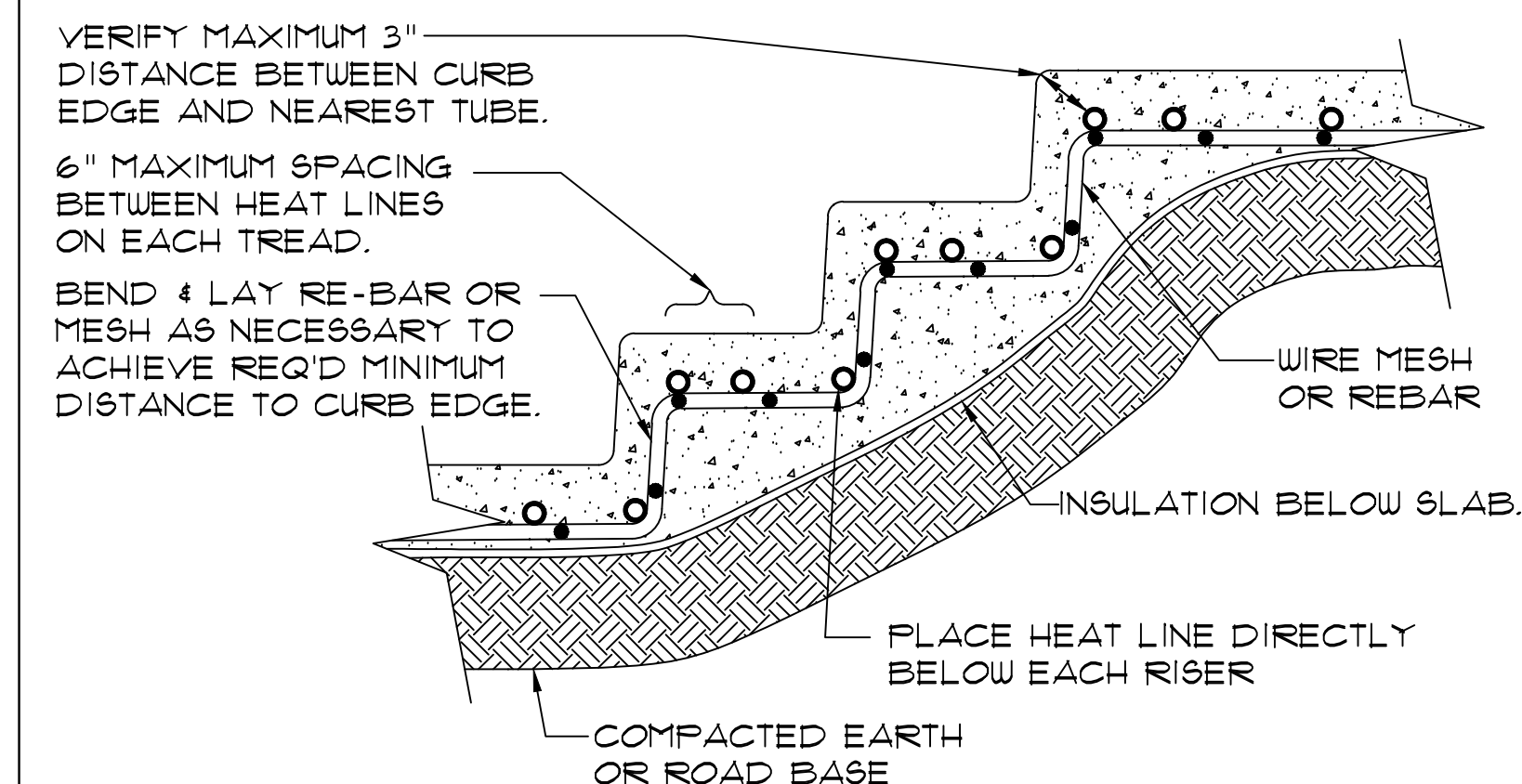
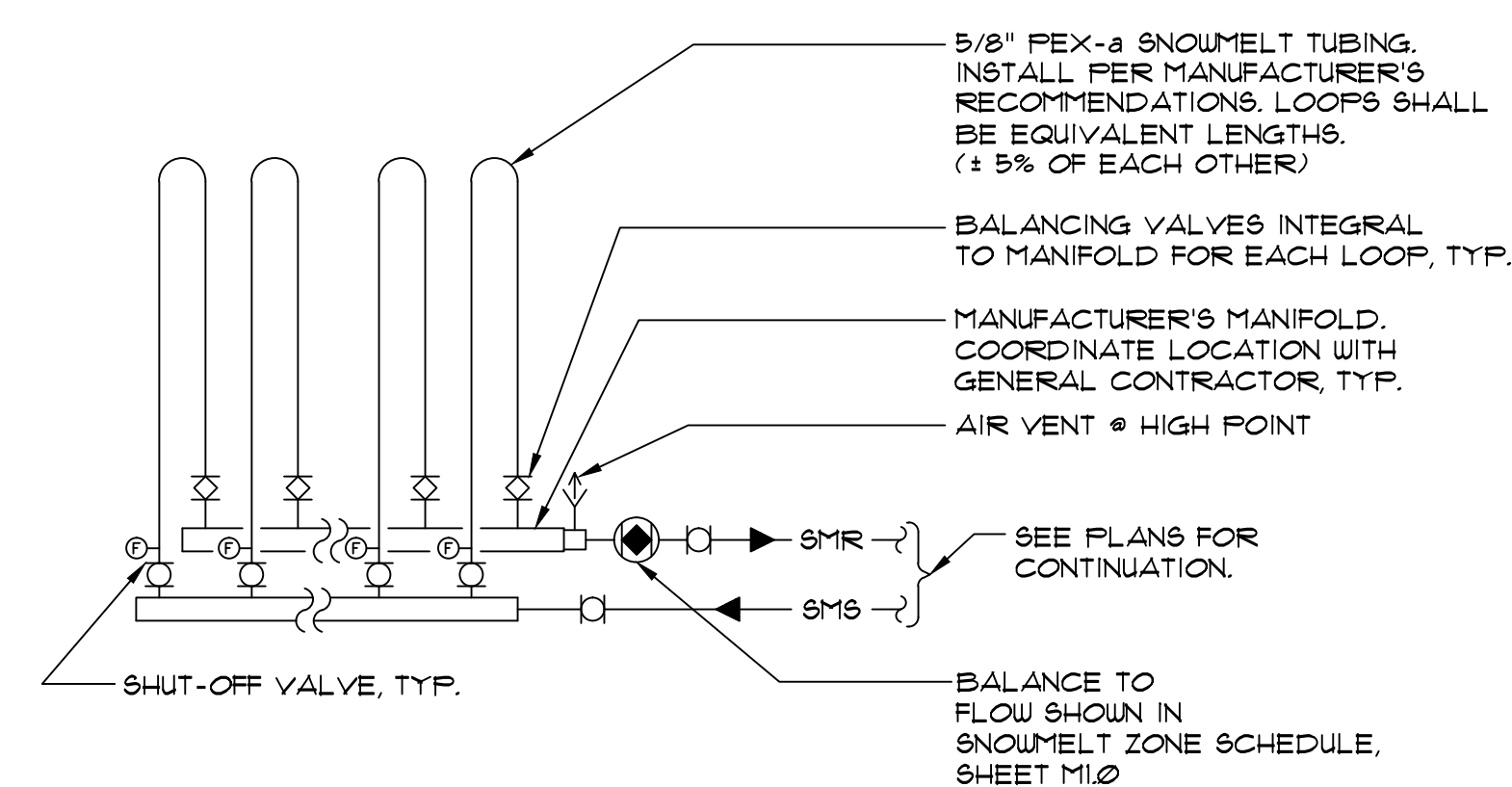
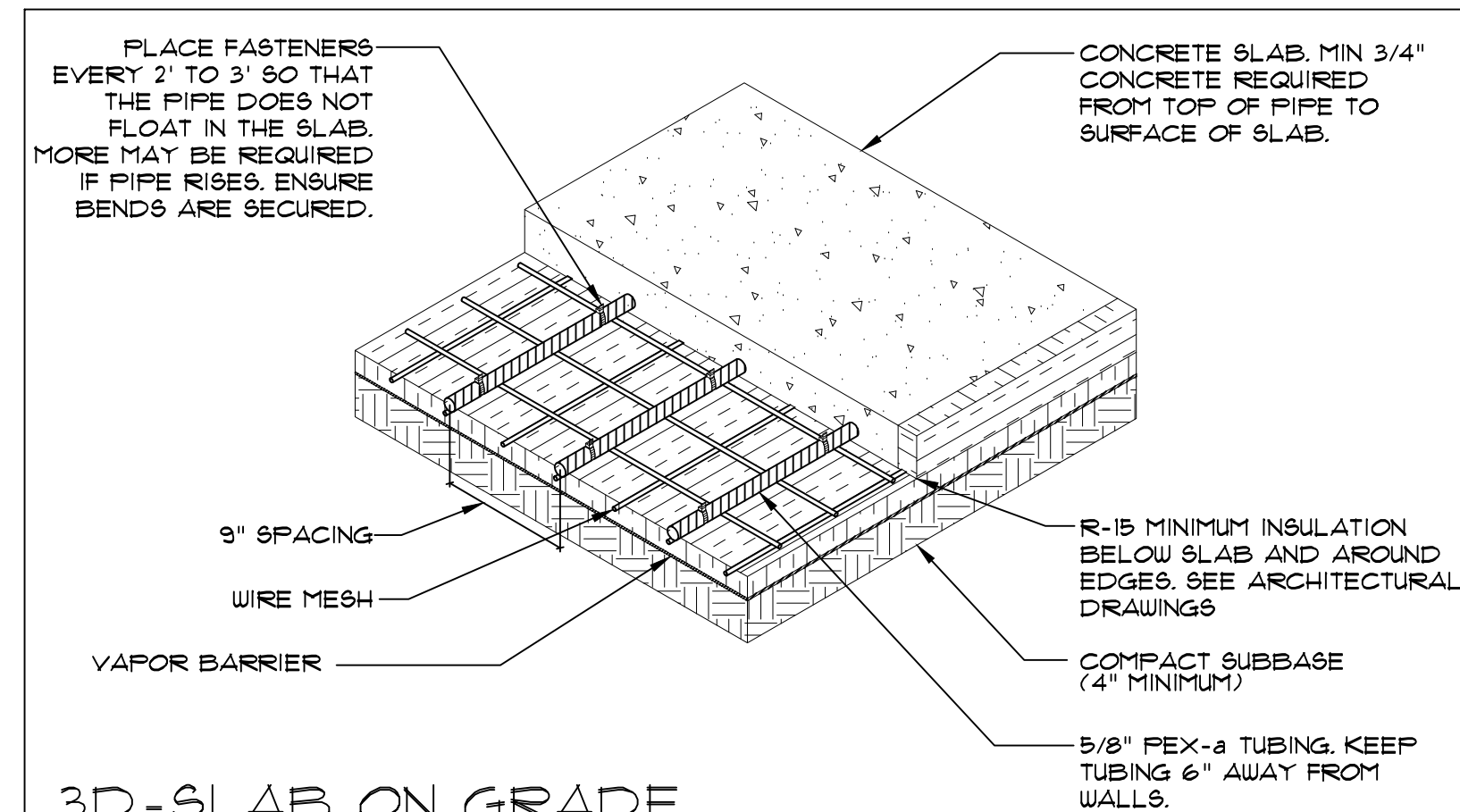
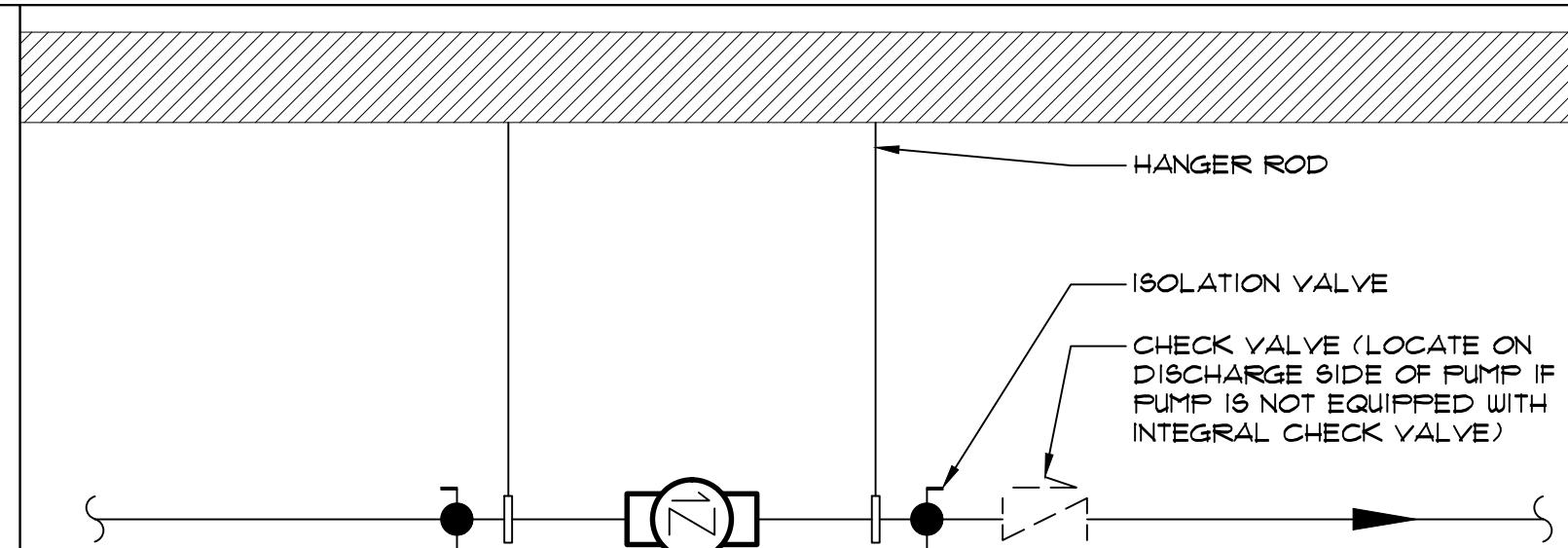
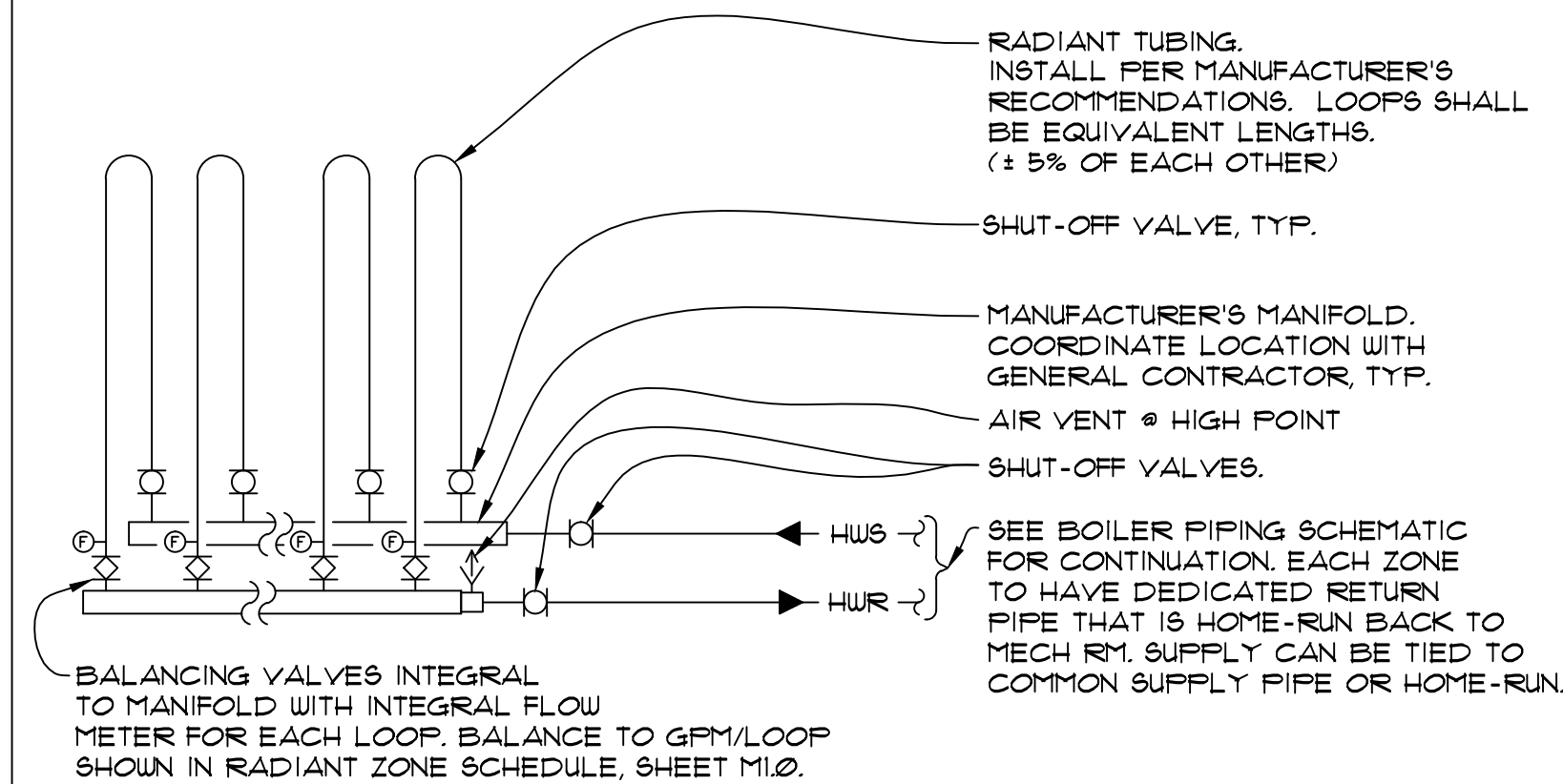
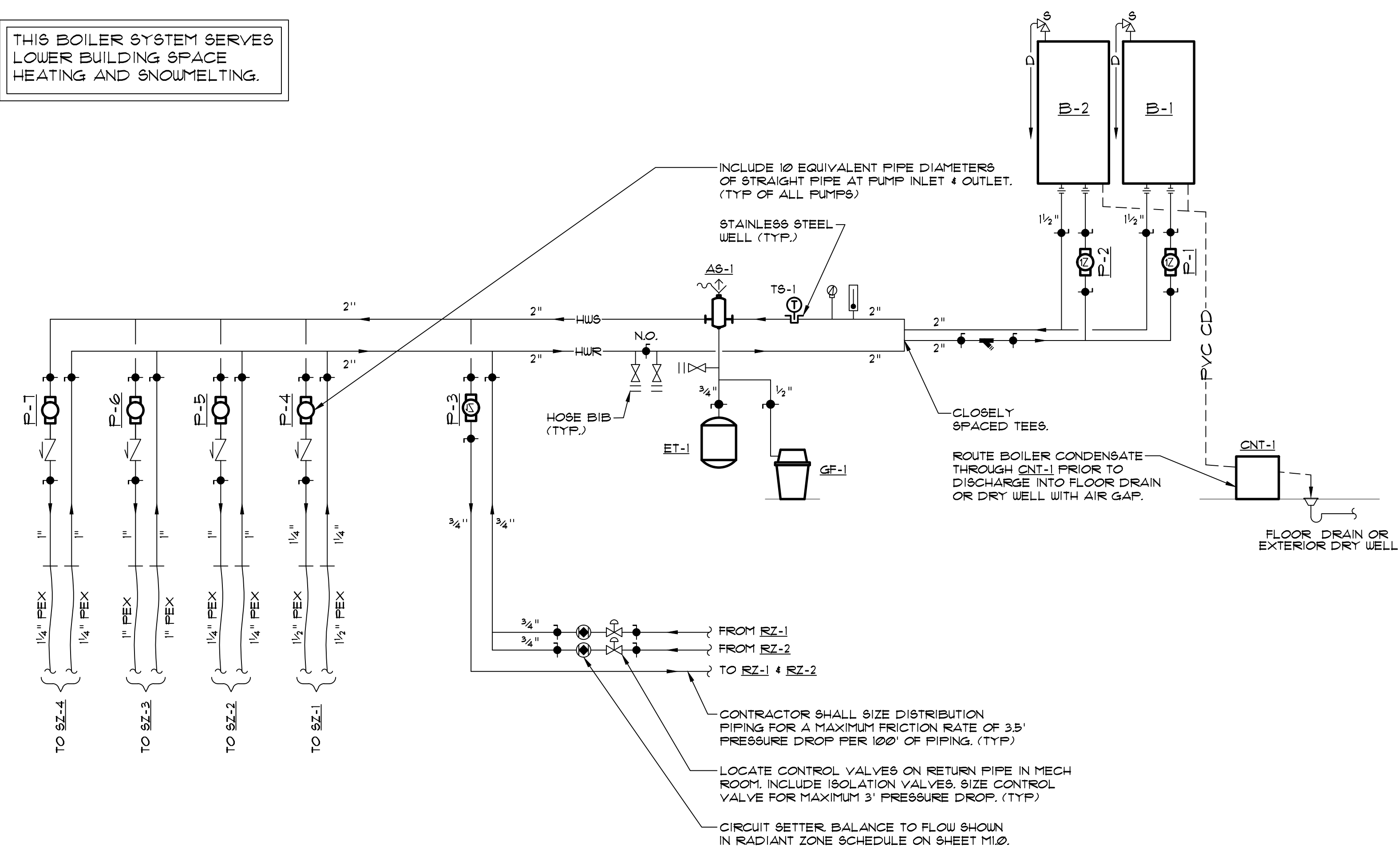
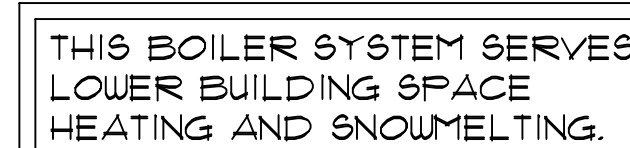
**2305 MT. WERNER CIRCLE
STEAMBOAT SPRINGS, COLORADO**

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

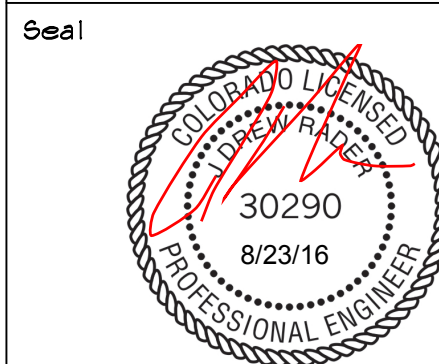
MECHANICAL
PLANS

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

M2.0



40690 HIGHWAY 6, SUITE E1
P.O. BOX 8610 AVON, CO. 81620
(970) 845-7910 / FAX: (970) 845-7522



SSRC ALPINE COASTER

2305 MT. WERNER CIRCLE
STEAMBOAT SPRINGS, COLORADO

[illegible]MECHANICAL
SCHEMATICS

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

M3.0

ANY CHANGES AND/OR DEVIATIONS FROM THESE PLANS WITHOUT WRITTEN APPROVAL BY THE ENGINEER RELEASE THE ENGINEER FROM ANY FUTURE LIABILITY OR RESPONSIBILITY TO THIS BUILDING.
 © COPYRIGHT 2015, NC EXPRESSLY RESERVE THE COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS TO THESE PLANS. THIS DRAWING MAY NOT BE REPRODUCED OR PRODUCTIONS THEREOF USED WITHOUT WRITTEN PERMISSION FROM THE ENGINEER.
 © COPYRIGHT 2015, NC EXPRESSLY RESERVE THE COMMON LAW COPYRIGHT AND OTHER PROPERTY RIGHTS TO THESE PLANS. THIS DRAWING MAY NOT BE REPRODUCED OR PRODUCTIONS THEREOF USED WITHOUT WRITTEN PERMISSION FROM THE ENGINEER.

