

### LEGAL DESCRIPTION

SE4SE4, TRS IN NE4SE4, SW4SE4, SE4SW4 SEC. 22-6-84, NE4NE4, TRS IN NW4NE4 SECT. 27-6-84

### RCRBD **RECORD SET**

### CODE STUDY

ZONING: OR - OPEN SPACE & RECREATION

CONSTRUCTION TYPE: V-B

OCCUPANCY CLASSIFICATION: GROUP S-2

NO. STORIES: (1) W/ STORAGE ATTIC

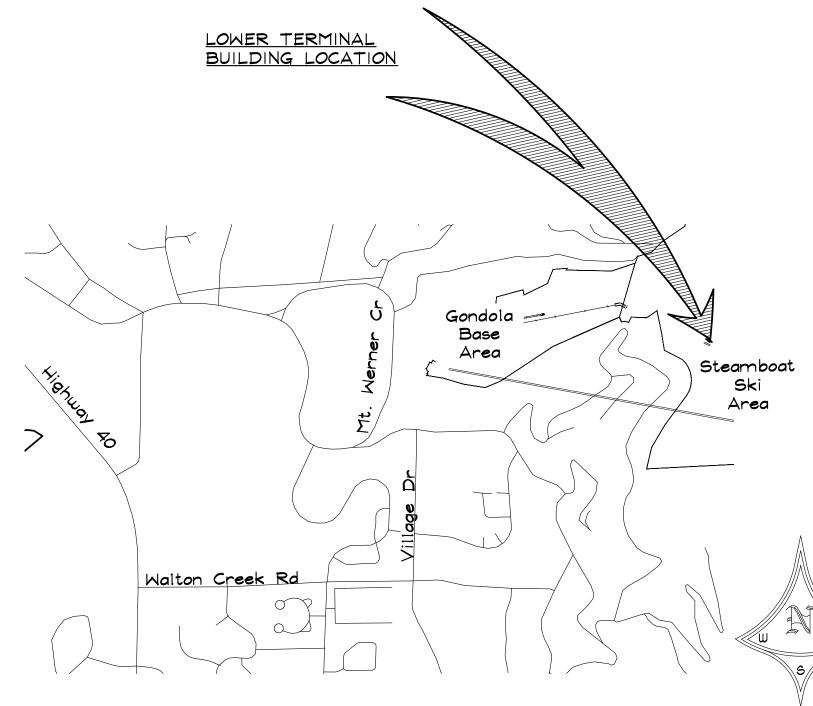
SIZE OF BUILDING: 1,472 SQ. FT.

OCCUPANCY LOAD: 5 PEOPLE (1,472 SQ. FT./300)

SIZE OF LOT: 197.0 ACRES

BLDG. HEIGHT: APH: 18'-0", 22'-0" ALLOWED OH: 22'-4" MAX, 34'-0" ALLOWED

SHEET SCHEDULE					
SHEET	<u>CONTENTS</u>				
C-1	OVERALL SITE PLAN \$ VICINITY MAP				
A-1	MAIN LEVEL FLOOR PLAN # ARCH. NOTES				
A-2	STORAGE LEVEL FLOOR PLAN # ROOF PLAN				
A-3	BUILDING ELEVATIONS				
A-4	BUILDING SECTION - COMBINED ARCH & STRUC.				
S-1	FOUNDATION PLAN & STRUCTURAL NOTES				
S-1.1	FOUNDATION SECTIONS				
S-1.2	FOUNDATION SECTIONS				
S-2	ROOF FRAMING PLAN & SECTIONS				
S-3	ROOF FRAMING PLAN & SECTIONS				
S-4	OVERALL ADA RAMP PLAN				
S-4.1	ADA RAMP PLAN - ZONE SA-5				
S-4.2	ADA RAMP PLAN - ZONES SA-4 \$ SA-3				
S-4.3	ADA RAMP PLAN - ZONE SA-2				



SJM/JEM PROJECT # 16020 OVERALL SITE PLAN # VICINITY MAP

DRAWN BY:

CONCEPTUAL 06 . 13 . 16

PRICING SET 07 . 27 . 16 REVISED

PRICING SET 08 . 01 . 16 PERMIT 08 . 03 . 16

SHEET 1 of 14

All work must comply with state and local codes, based on the Routt County Zoning Regulations, the 2009 International Building Code, the 2009 International Residential Code, the International Plumbing Code, the International Mechanical Code, the Energy Conservation Code and the International Electric code. The contractor shall comply with all laws, ordinances, rules and regulations of any public authority bearing on the performance of the work, including O.S.H.A.

Location of the utilities (electrical, telephone, cable TV, gas, water, sewer) shall be verified before construction begins.

All on site construction safety and construction means and methods are the responsibility of the contractor. There is no implication of the construction safety requirements or building methods contained in these drawings.

All interior and exterior dimensions are to face of stud or face of concrete, U.N.O.

Do not scale drawings.

Actual site conditions may require that some of the components of the work should be done differently than shown on these drawings. All dimensions and conditions to be verified by the contractor prior to construction. Verify changes with the designer and engineer.

These drawings represent a simplified builder's set of plans. Additional detailing may be required of the engineer during construction.

If any discrepancies are found in these drawings notify engineer and/or designer immediately.

Any variation which requires a physical change from these plans must be brought to the attention of the designer and engineer in order to maintain the design intent of the project.

All work connected with this project by any trade involved shall be of the highest quality attainable in accordance with the professional practice of the trade.

Open sides of stairways, landings, ramps, balconies and porches which are more than 30" above grade shall be protected by a guardrail. All guardrails must be 36" above finished floor and shall allow no more than a 4" diameter sphere to pass through any portion of the railing per 2009 IRC R312.

Habitable spaces within dwelling units shall have natural light provided by exterior openings equal to 8% of the floor area. Natural ventilation shall be provided by

means of operable exterior openings equal to 4% of the floor area.

The water closet stool shall be located in a clear space of not less than 30" in width. The clear space in front of the water closet stool shall be not less than

All exterior walls are nominal 2x6 stud construction, U.N.O. All interior walls are nominal 2x4 stud construction, U.N.O.

The surface of exterior stairs shall be slip resistant.

Provide Grace lice and water shield, or equivalent product, from the edge of roof overhangs to the ridge.

Walls and ceilings of enclosed usable space under stairs requires 1/2" gypsum wallboard. The door to access such spaces need not be rated.

Provide smoke detection per 2009 IRC section R314.

### RCRBD **RECORD SET**

### COMMERCIAL ENERGY CODE STANDARDS

Re: 2009 International Energy Conservation Code Table 502.2(1) BUILDING ENVELOPE REQUIREMENTS - OPAQUE BUILDINGS

		<u>Roofs</u>			<u> Walls Ab</u>	ove Grade		<u> Walis Below Grade</u>	<u>F1</u>	<u>oors</u>	Slab-on-Gro	ade Floors	<u>Opaque</u>	Doors
Climate Zone 7	Insulation entirely above deck	Metal buildings (w/ r-5 thermal blocks) <sup>b</sup>	Attic \$ other	Mass	Metal Building <sup>b</sup>	Metal Framed	Wood Framed \$ Other	Below grade wall <sup>d</sup>	Mass	Joists/ Framing	Unheated Slabs	Heated Slabs	Swinging	Roll up or Sliding
Group R	R-25ci	R-19 + R-10	R-38	R-15.2ci	R-19 + R-5.6ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-10ci	R-16.7ci		R-15 for 24in. below	R-20 for 48in. below	U-0.50	U-0.50
All other	R-25ci	R-13 + R-19	R-38	R-15.2ci	R-13 + R-5.6ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-7.5ci	R-15ci		R-15 for 24in. below	R-20 for 24in. below	U-0.50	U-0.50

Thermal blocks are a minimum R-5 of rigid insulation, which extends 1 inch beyond the width of the purlin on each side, perpendicular to the purlin.

Assembly descriptions can be found in Table 502.2(2) R-5.7 ci may be substituted with concrete block walls complying with ASTM C 90, ungrouted or partially grouted at 32 inches or less on center vertically and 48 inches or less on center horizontally, with ungrouted cores filled with material having a maximum thermal conductivity of 0.44 Btu-in./h-f<sup>2</sup>F.

When heated slabs are placed below grade, below grade walls must meet the exterior insulation requirements for perimeter insulation according to the heated slab-on-grade construction.

Insulation is not required for mass walls in Climate Zone 3A located below the "Warm-Humid" line, and in Zone 3B.

### A DOOR # HARDWARE SCHEDULE

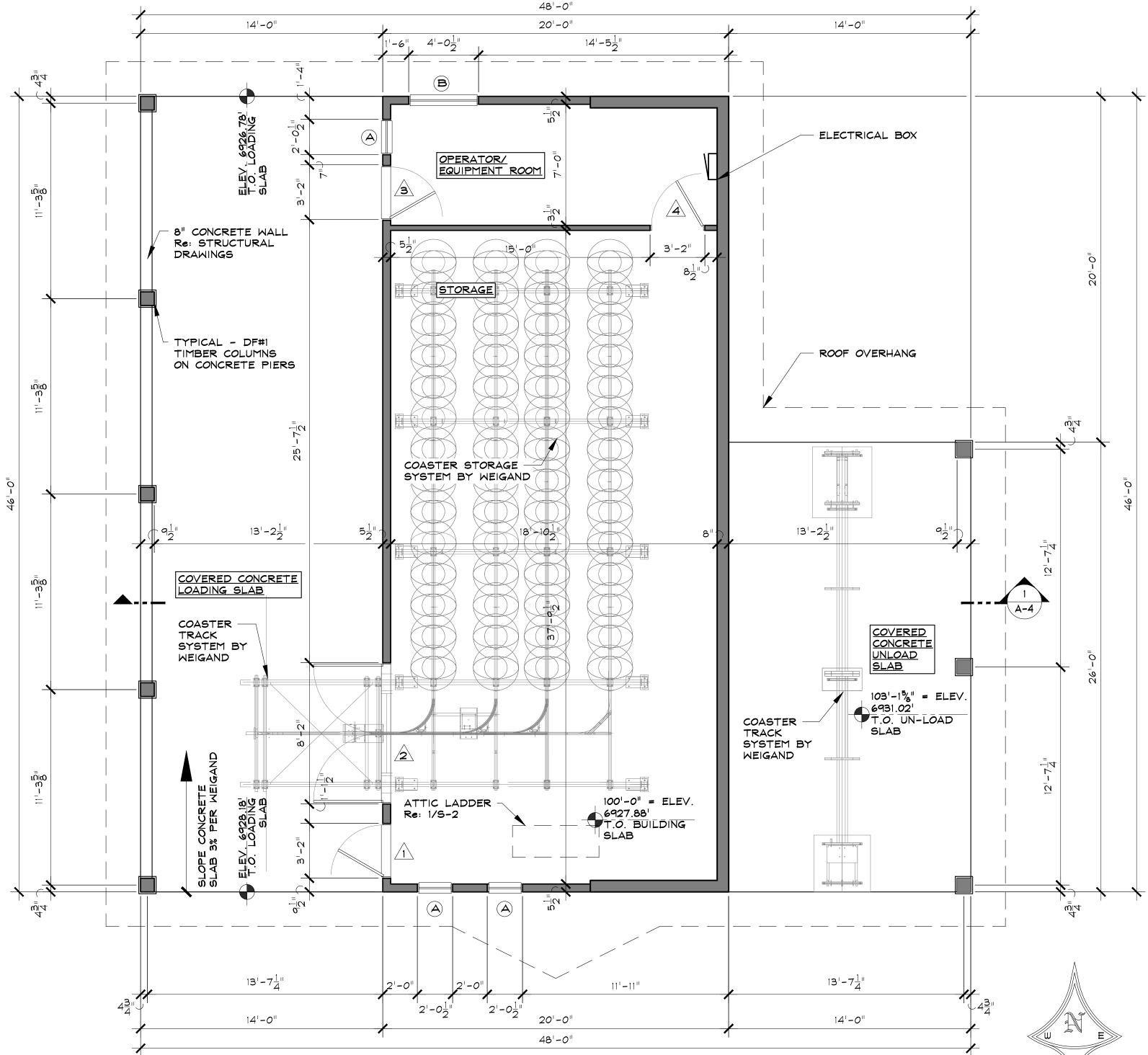
NO.	LOCATION	ROUGH (	ROUGH OPENING		JAMB		FIRE	FRAME	DOOR	REMARKS
		WIDTH	HEIGHT	SIZE	THICK.	RATING		HAND		
1	STORAGE ROOM	3'-2"	6'-10"	3068	6 9/16"	N/A	STAIN GRADE WOOD	LEFT	EXT. w/ CLAD FRAME	
2	STORAGE ROOM	8'-2"	6'-10"	8068	6 9/16"	N/A	STAIN GRADE WOOD	FRENCH	EXT. w/ CLAD FRAME	
3	EQUIPMENT ROOM	3'-2"	6'-10"	3068	6 9/16"	N/A	STAIN GRADE WOOD	RIGHT	EXT. w/ CLAD FRAME	
4	EQUIPMENT ROOM	3'-2"	6'-10"	3068	6 9/16"	N/A	STAIN GRADE WOOD	RIGHT	INT. w/ CLAD FRAME	
5	UPPER FLOOR STORAGE	4'-2"	6'-10"	4068	6 9/16"	N/A	STAIN GRADE WOOD	SLIDING BARN DOOR	EXT. w/ CLAD FRAME	

NOTE: VERIFY ALL ROUGH OPENINGS

### # WINDOW SCHEDULE

NO.	MANUFACTURER		UNIT DI	MENSION	ROUGH (	OPENING	FUNCTION	DIRECTION	воттом	REMARKS
		QTY.	WIDTH	HEIGHT	W DTH	HEIGHT		(HAND)	OF HEADER	
Α	T.B.D.	3	2'-0"	2'-0"	2'-01/2"	2'-01/2"	AWNING	N/A	6'-10" ABV. PLYWD.	
В	Т.В.D.	1	4'-0"	3'-0"	4'-01/2"	3'-01/2"	SLIDER	N/A	6'-10" ABV. PLYWD.	

NOTE: VERIFY ALL ROUGH OPENINGS



MAIN LEVEL FLOOR PLAN

SCALE:  $\frac{1}{4}$ " = 1'-0"

<u>PLAN</u>



CONCEPTUAL

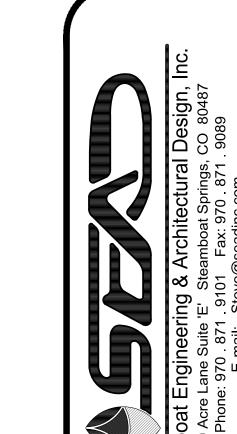
06 . 13 . 16 PRICING SET 07 . 27 . 16 REVISED PRICING SET 08 . 01 . 16 PERMIT

08 . 03 . 16

DRAWN BY: SJM/JEM PROJECT # 16020

LOWER LEVEL FLOOR PLAN \$ NOTES

SHEET 2 of 14



CONCEPTUAL 06 . 13 . 16 PRICING SET 07 . 27 . 16 REVISED PRICING SET 08 . 01 . 16 PERMIT 08 . 03 . 16

DRAWN BY: SJM/JEM

PROJECT # 16020 ROOF \$ UPPER FLOOR PLANS

4'-0"

6'-0"

6'-0"

12'-11" 4'-2" [ ] [ ] [ ] [ ] \_\_\_ STORAGE 111'-2\%" T.O. PLYWD. 12'-0" CLEAR WALL BELOW Re: 1/A-1 ROOF OVERHANG — ABOVE Re: 1/A-2 4'-412" 4'-2" 3'-61"

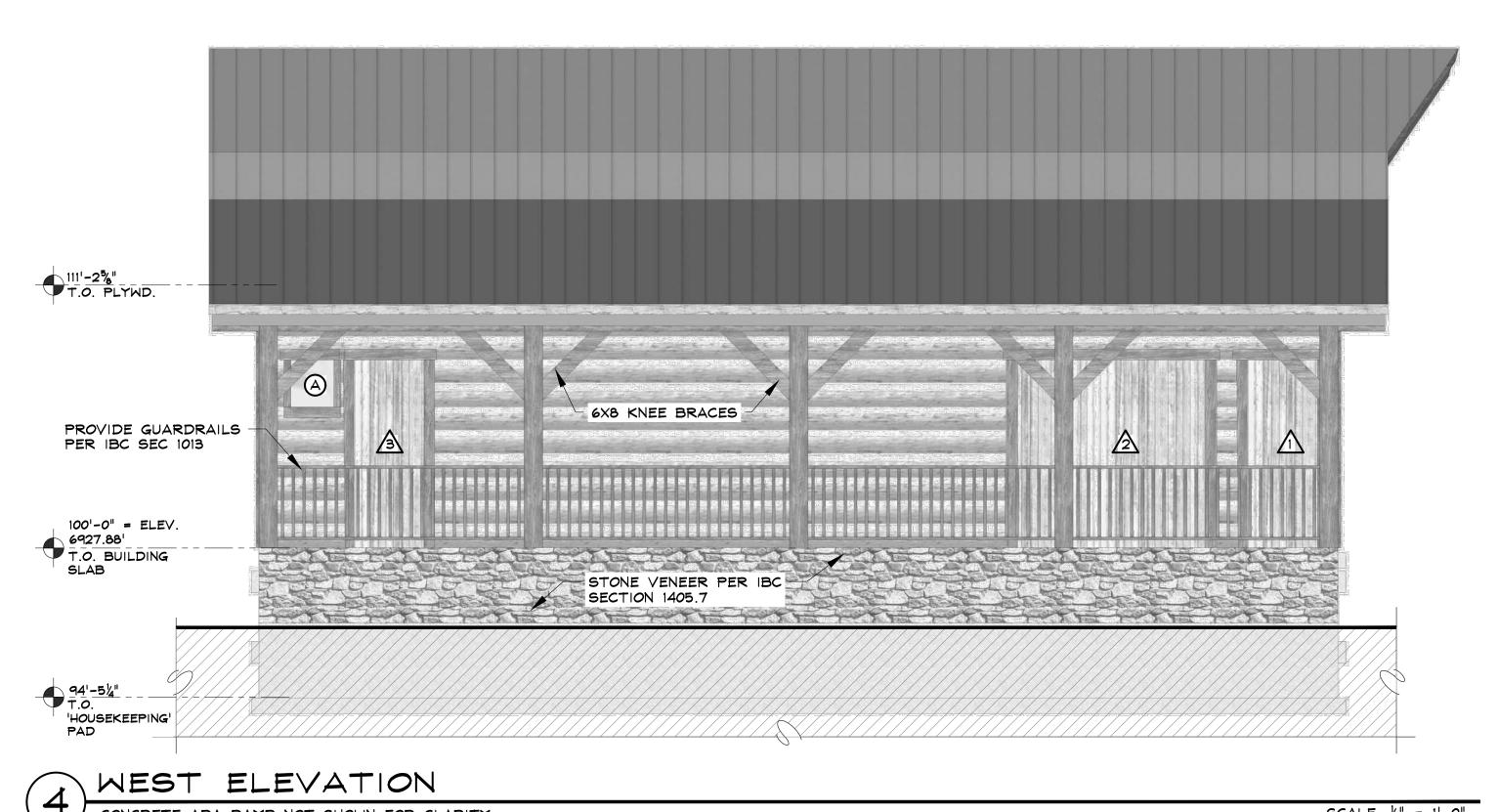
UPPER FLOOR PLAN

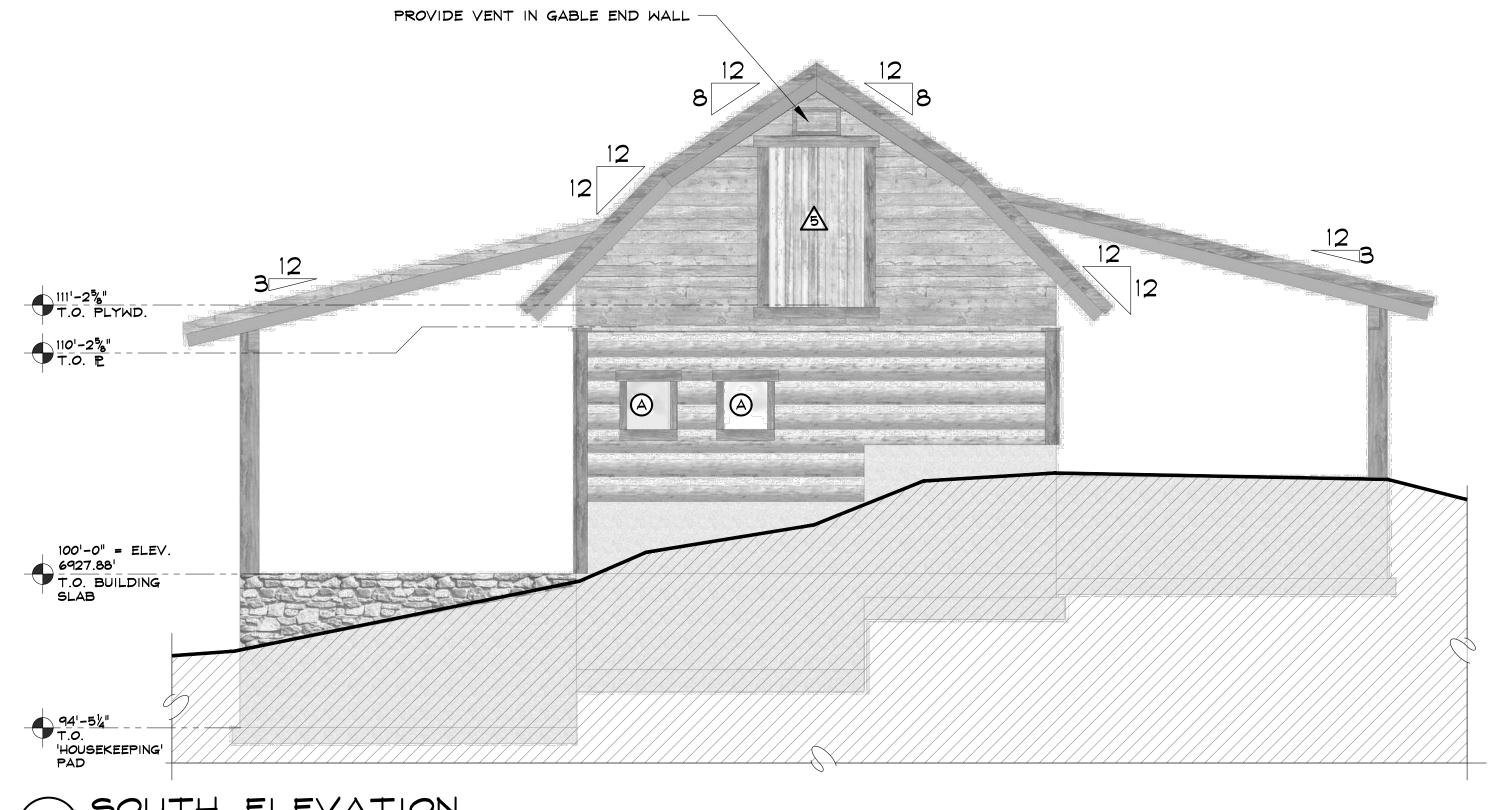
SCALE:  $\frac{1}{4}$  = 1'-0"

<u>PLAN</u>

4'-0" 2'-0" O.H.

TYPICAL ROOF - STANDING METAL SEAM OVER %" ROOF SHEATHING w/ 100% HIGH TEMPERATURE ICE & WATER SHIELD ON ENTIRE SURFACE OVER TRUSSES/ LOOKOUTS PER STRUCTURAL DRAWINGS





6X8 KNEE BRACES 99'-15g" T.O. 'HOUSEKEEPING' PAD EAST ELEVATION

CONCRETE ADA RAMP NOT SHOWN FOR CLARITY

IXIO BEETLE KILL PINE SHIP — LAP HORIZONTAL SIDING OVER OVER %" ROOF SHEATHING W/ 100% HIGH TEMPERATURE ICE & WATER SHIELD ON ENTIRE SURFACE OVER TRUSSES, RAFTERS OR LOOKOUTS PER STRUCTURAL ½" CORA-VENT BREATHER STRIPS @ UPPER LEVEL DRAWINGS 110'-25%" T.O. P TYPICAL - METAL CLAD WOOD WINDOW - INSTALL PER MANUFACTURER TYPICAL - DF#1
TIMBER COLUMNS ON CONCRETE PIERS Re: 1/S-1 - 10"¢ LOG SIDING @ LOWER LEVEL - STAIN BROWN 103'-15/8" T.O. UNLOAD SLAB 2X6 CORNER BOARDS STONE VENEER PER IBC 100'-0" = ELEV. SECTION 1405.7 99'-1%" T.O. 'HOUSEKEEPING' PAD 6927.881 T.O. BUILDING SLAB CONCRETE FOUNDATION PER STRUCTURAL DRAWINGS 'HOUSEKEEPING'

NORTH ELEVATION

SCALE:  $\frac{1}{4}$ " = 1'-0"

NOTES THIS ELEVATION TYPICAL
Re: SHEET A-1 FOR DOOR/WINDOW SCHEDULE
FINAL DOOR & WINDOW SIZES TO BE DETERMINED BY OWNER & CONTRACTOR
CONCRETE ADA RAMP NOT SHOWN FOR CLARITY

PROVIDE VENT IN GABLE END WALL

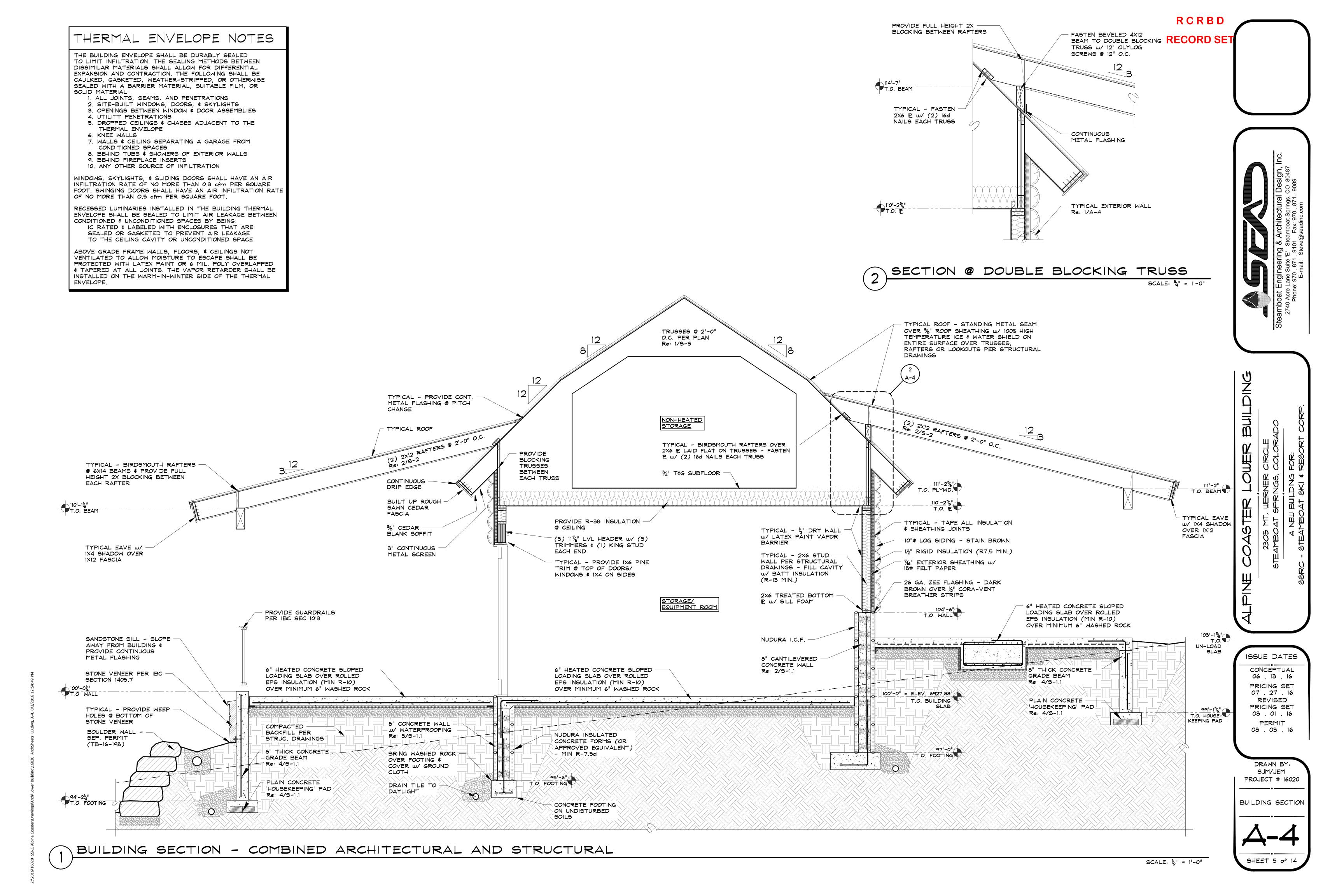
SCALE: ¼" = 1'-0"

TYPICAL ROOF - STANDING METAL SEAM

ISSUE DATES CONCEPTUAL 06 . 13 . 16 PRICING SET 07 . 27 . 16 REVISED PRICING SET 08 . 01 . 16 PERMIT 08 . 03 . 16

DRAWN BY: SJM/JEM PROJECT # 16020 ELEVATIONS

SCALE:  $\frac{1}{4}$ " = 1'-0"



Design Live Loads:

Roofs 110 psf Floors 40 psf

Wind 120 mph, Exposure B, ASCE 7-10
Seismic Design Category B, Soil Type D, 2009 IBC

Foundation Criteria:

A. Design of continuous and individual footings is based on a maximum allowable soil bearing pressure of 3,000 psf dead load plus full live load and a minimum 800 psf dead load placed on the natural undisturbed soils below frost depth. This is an assumed value based on a recommendation from Northwest Colorado Consultants, Inc.

Reinforced Concrete:

A. Structural concrete shall be Type 1, and have a minimum 28 day strength of 3,000 psi, Exterior concrete slabs shall be Type I and have a minimum 28 day strength of 4,000 psi w/ min 6% entrained air B. Reinforcing bars shall conform to ASTM spec. A615-79 and shall be Grade 60.

C. All concrete work shall conform to the requirements of AC1318 and 301, latest edition. D. At splices, lap bars a minimum of 34 diameters. At corners and intersections, make horizontal continuous or provide matching corner bars. Around openings in walls and slabs, provide (2) #5 bars

extending a minimum of 2 feet beyond the edge of the opening. E. Concrete cover shall conform to ACI 318-08, 7.7. Unless a greater cover is required, concrete cast against earth shall have 3in. min. cover, concrete exposed to earth or weather shall have 11/2 in. min. cover for No. 5 bars \$ smaller \$ 2in. min. cover for No. 6 bars \$ greater. Concrete not exposed to weather shall have 3/1 min. cover for No. 11 bars \$ smaller.

Structural Steel:

A. All bolts, including anchor bolts, shall conform to ASTM spec. A307

B. Structural steel rolled shapes, including plates and angles, shall be ASTM A36. C. Expansion bolts called for on the drawings shall be Simpson "Weg-All", "Strong-Bolt 2" or approved

wedge type anchors with the following minimum embedments: 3/4" diameter bolts - 33/4", 5/8" diameter

bolts –  $2\frac{3}{4}$ ", 1/2" diameter bolts –  $2\frac{1}{4}$ ". D. All epoxy shall be Simpson "Set-XP" and shall be installed per the "Anchoring and Fastening Systems For Concrete and Masonry" Simpson catalog #C-SAS-2012 by qualified personnel.

E. Field welded connections must be inspected by the Engineer Of Record of approved 3rd party.

F. Fillet welds indicated on the plans shall be of E70xx electrodes and shall be the minimum size

specified in the AISC Manual of Steel Construction. Table J2.4.

Structural Wood Framina:

A. Unless noted otherwise, all 2" lumber shall be Douglas Fir S4S No. 2 and better. All solid timber beams and posts shall be DF-L No. 1 or better.

B. Unless noted otherwise, minimum nailing shall be provided as specified in Table No. 2304.9.1, "Fastening Schedule", of the 2009 IBC or Table No. R602.3(1), "Fastener Schedule For Structural Members", of the

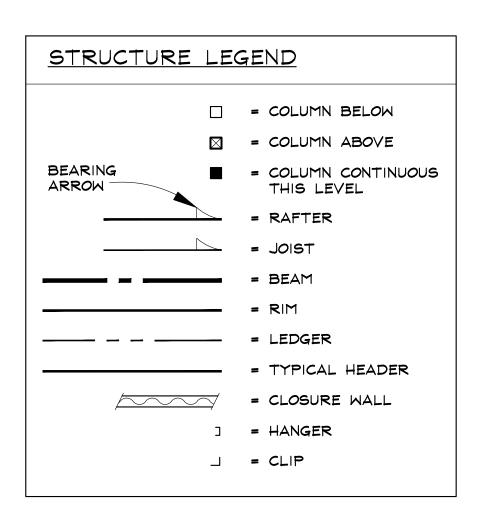
C. Wall and floor sheathing shall be APA rated with exterior glue and graded in accordance with APA standards. Panel identification and thickness shall be as noted on the drawings.

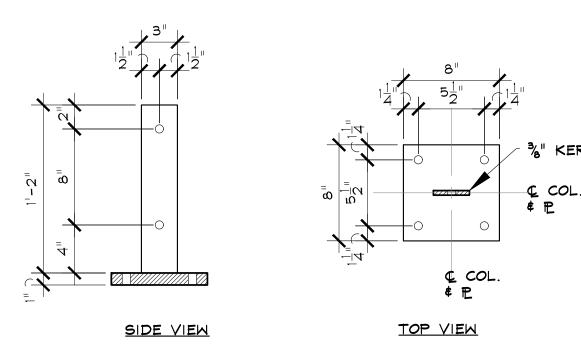
D. Where light gauge framing anchors are shown or required, they shall be Simpson "Strong Tie" (or equal approved by ICBO). They shall be installed with the number and type of fasteners recommended by the manufacturer to develop the rated capacity.

E. Laminated Veneer Lumber shall be of such stress grade to provide an allowable bending stress of 2,600 psi, allowable shear stress parallel to the glue line of 285 psi and a modulus of elasticity of 1,900,000 psi.

É. Glue laminated timber shall be stress grade marked 24F-V4 for simple spans \$ 24F-V8 for multiple spans. G. Roof trusses shall be designed by a Colorado Registered Professional Engineer to support the full live load and dead loads of the roof, ceiling, and any other superimposed loads. Calculations and shop drawings, including member sizes, lumber species, and grade and substantiating data for connector capacities and truss bearing, shall be submitted to the Architect or Engineer for review and approval prior to fabrication. H. Floor joists shall be plant fabricated I series with LVL or solid wood flanges and plywood or OSB webs, and shall carry ICBO approval for a complete section. Joists shall be designed to carry full live and

dead loads of the roof(s), floor(s), and any superimposed loads. 1. Roof overframing shall be 2x6 rafters @ 24" O.C. w/ 2x6 studs @ 24" O.C. to stack over rafters or purlins below.





3" KERF P

SCALE:  $1\frac{1}{2}$ " =  $1^{1}-0$ "

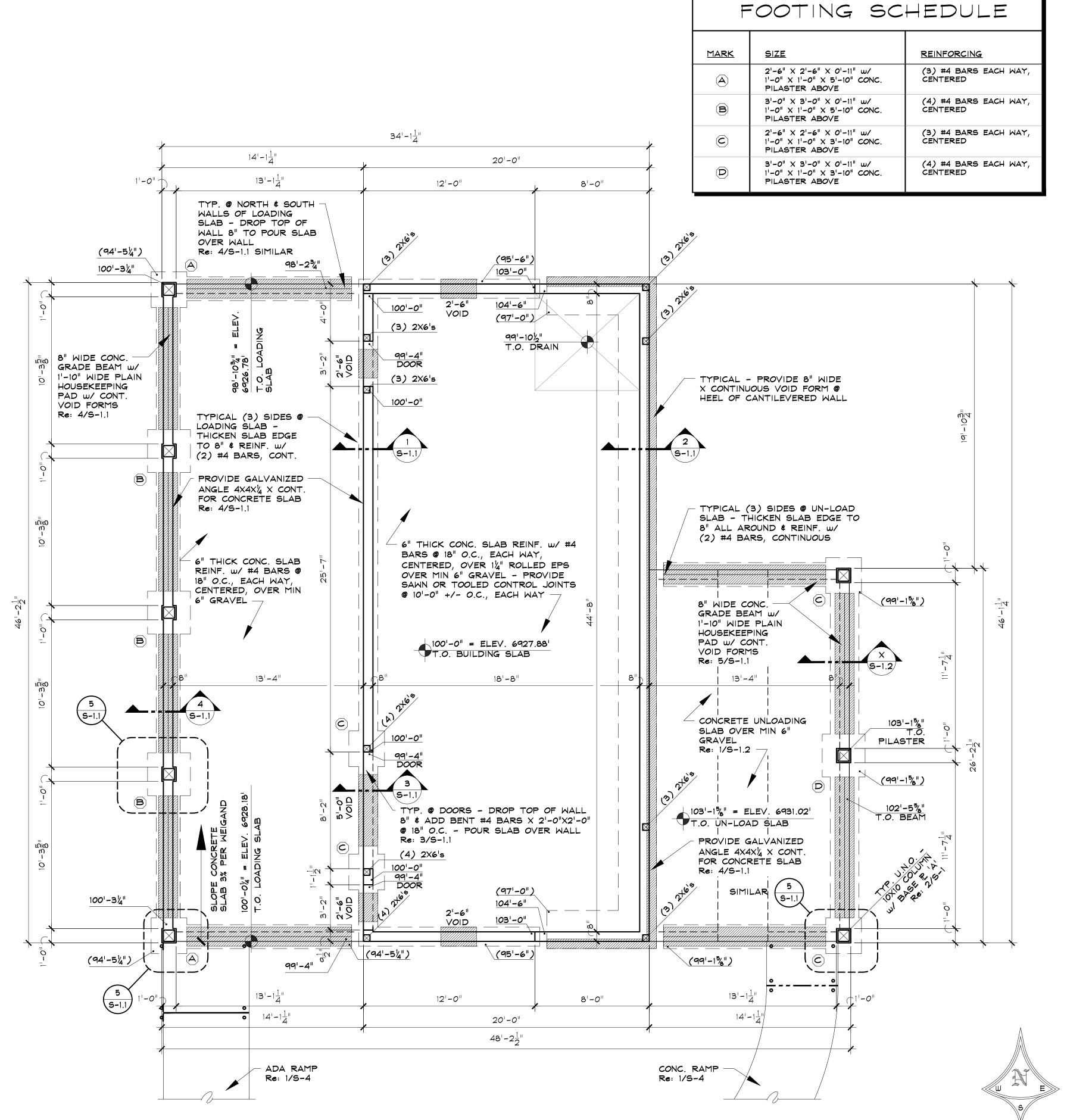


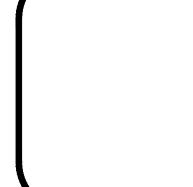
PROVIDE (8) EACH 1" THICK STEEL BASE P, 3" THICK KERF P

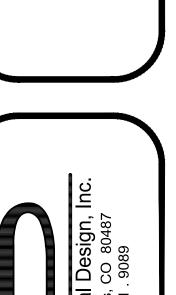
TYPICAL - ELEVATION @ TOP OF CONCRETE WALL INDICATED THUS: ELEV/ TYPICAL - ELEVATION @ TOP OF CONCRETE FOOTING INDICATED THUS: (ELEV)/ TYPICAL - COLUMNS THAT BEGIN THIS LEVEL ARE INDICATED ON PLAN

FOUNDATION PLAN

### RCRBD **RECORD SET**







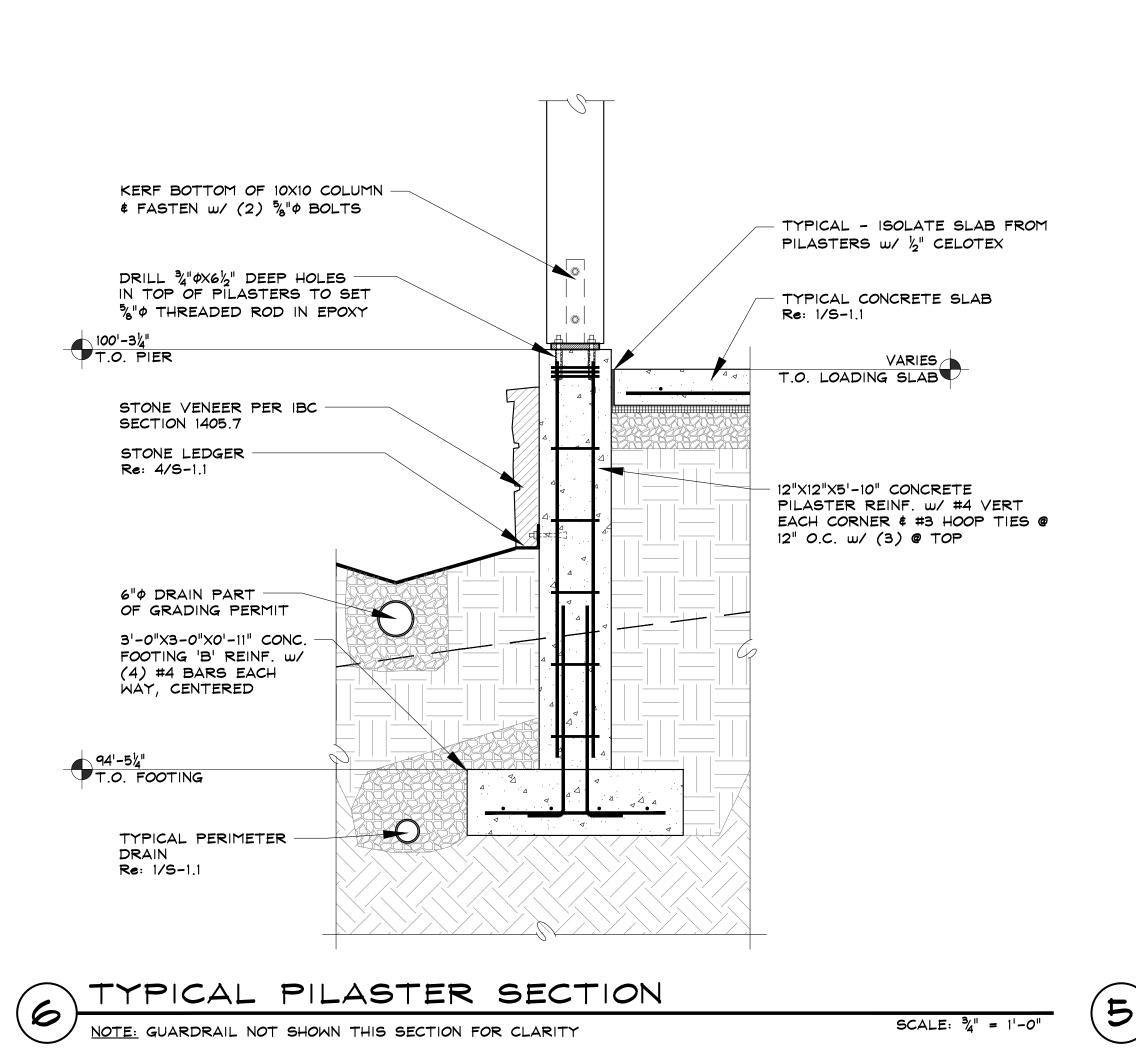
SSUE DATES CONCEPTUAL 06 . 13 . 16 PRICING SET 07 . 27 . 16 REVISED PRICING SET 08 . 01 . 16 PERMIT

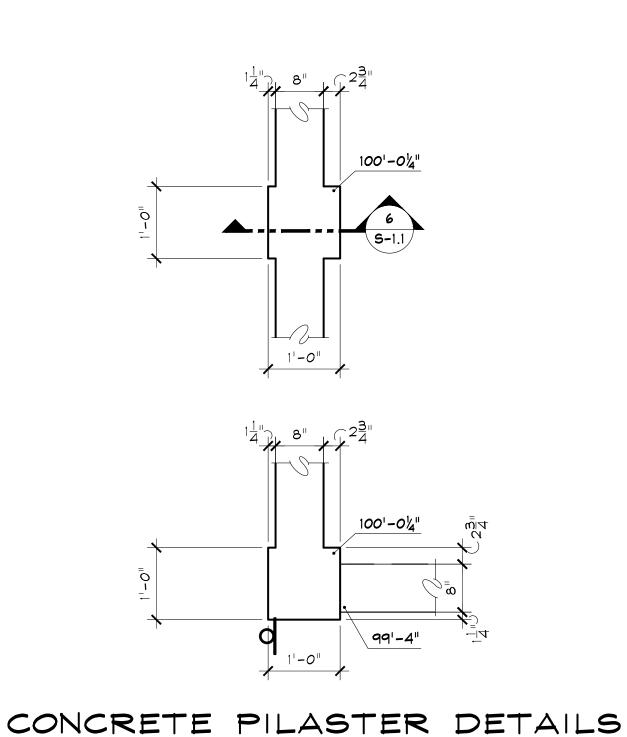
08 . 03 . 16

DRAWN BY: SJM/JEM PROJECT # 16020 FOUNDATION PLAN & NOTES

SHEET 6 of 1

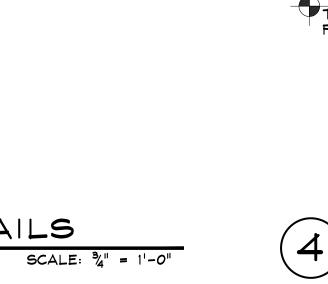
SCALE:  $\frac{1}{4}$ " = 1'-0"

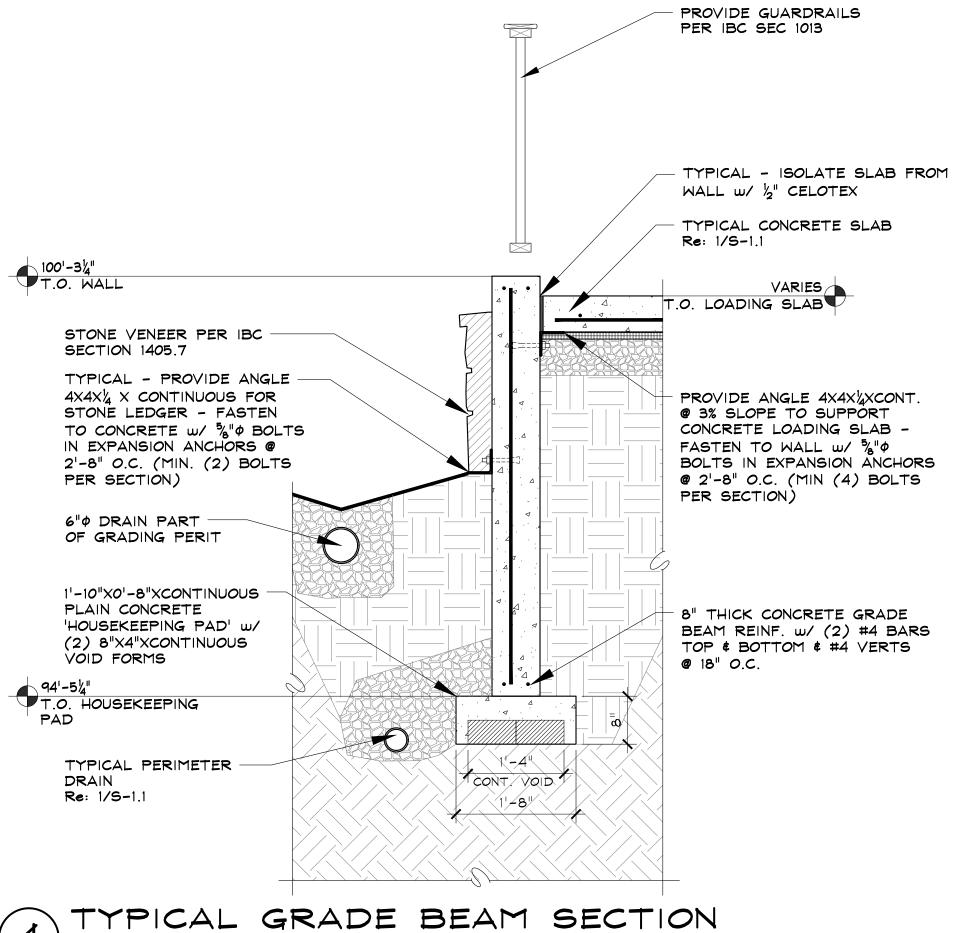




FOOTINGS AND VOID FORMS NOT SHOWN THIS DETAIL

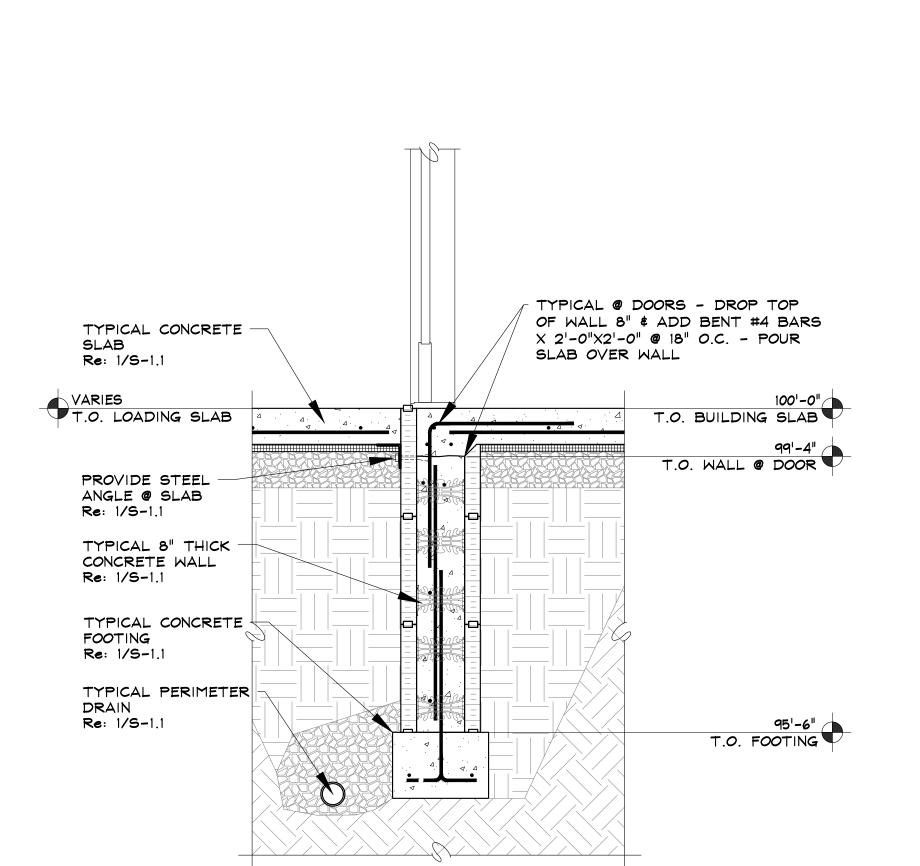
FOR CLARITY

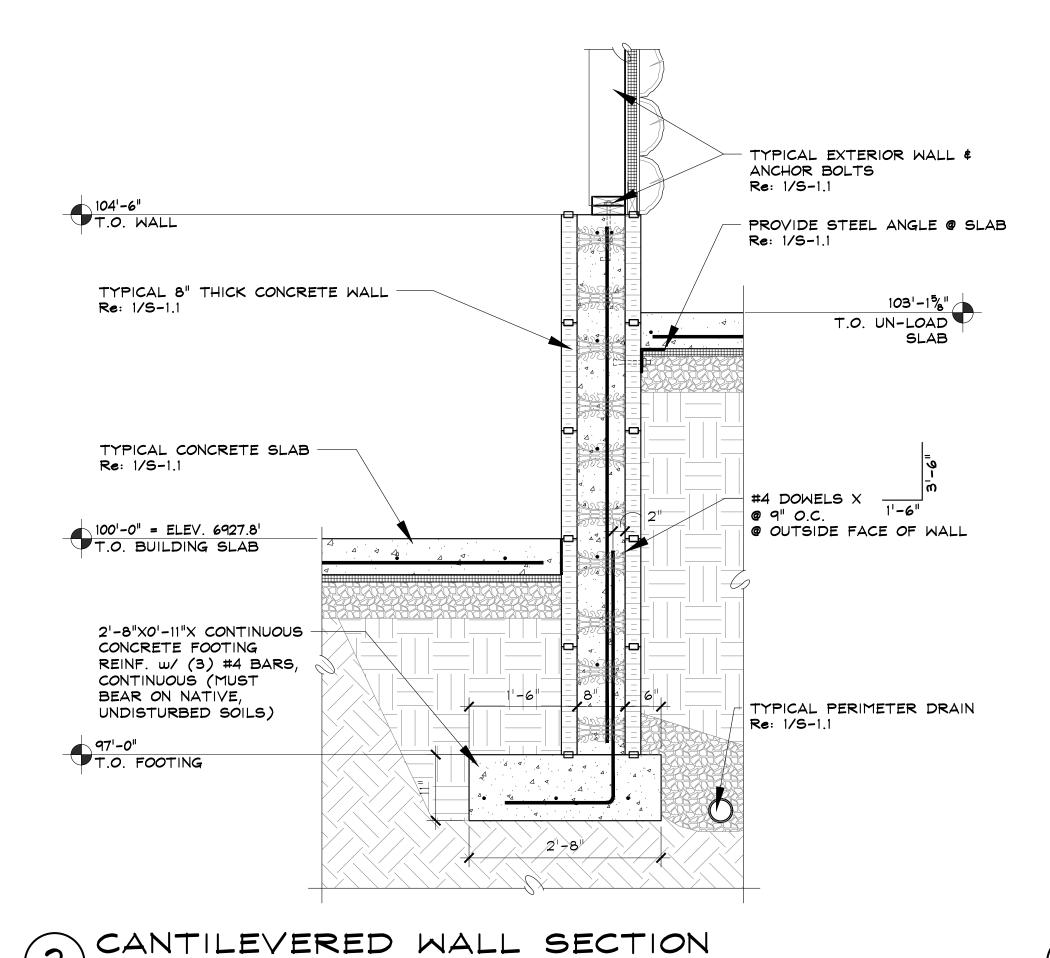




RCRBD

**RECORD SET** 





SHEATHING OVER 2X6 @ 16 TYPICAL - INSULATION & SIDING O.C. FRAMED WALLS PER ARCHITECTURAL DRAWINGS Re: 1/A-4 6" THICK CONC. SLAB REINF. w/ #4 BARS @ 18" TYPICAL - 1/2" \$\phi X10" GALV. ANCHOR BOLTS @ 4'-0" O.C. IN TRTD. 2X6 O.C., EACH WAY, PLATE - DO NOT COUNTERSINK CENTERED, OVER 14" ROLLED EPS OVER MIN 6" GRAVEL - PROVIDE SAWN OR TOOLED CONTROL TYPICAL 6" THICK -JOINTS @ 10'-0" +/- O.C., CONCRETE SLAB EACH WAY VARIES
T.O. LOADING SLAB 100'-0" = ELEV. 6927.8' T.O. BUILDING SLAB TYPICAL - PROVIDE ANGLE TYPICAL WALL - FORM 4X4X1/4 X CONTINUOUS FOR WALLS w/ 8"X18" STANDARD NUDURA STONE LEDGER - FASTEN INSULATED CONCRETE TO CONCRETE  $\omega$ /  $\frac{\pi}{9}$  BOLTS FORM (OR APPROVED IN EXPANSION ANCHORS @ EQUIVALENT) - REINF. W/ 2'-8" O.C. (MIN. (2) BOLTS (2) #4 BARS, TOP \$ #4 PER SECTION) BARS @ 18" O.C. EACH TYPICAL - BACKFILL -WAY, CENTERED WALL W/ ON-SITE SOILS TYPICAL - #4 DOWELS TYPICAL PERIMETER DRAIN -× 2'-10" × 6" @ 18" O.C., 4"Φ PERF. PVC PIPE - SLOPE ALT. BENDS IN FTG. %"/FT. TO DAYLIGHT -SURROUND W/ 1 CU. FT./LIN FT. WASHED ROCK IN MIRAFI T.O. FOOTING 140 N FABRIC ENVELOPE TYPICAL FOOTING - 1'-4" X 11" CONC. FTG. REINF. w/ (2) #4 BARS, CONT. (MUST BEAR ON NATIVE, UNDISTURBED SOILS)

TYPICAL FOUNDATION SECTION

SHEET 7 of 14

ISSUE DATES

CONCEPTUAL

06 . 13 . 16

PRICING SET

07 . 27 . 16

REVISED

PRICING SET

08 . 01 . 16

PERMIT

08 . 03 . 16

DRAWN BY:

SJM/JEM

PROJECT # 16020

FOUNDATION

SECTIONS

TYPICAL WALL SECTION @ DOORS

SCALE:  $\frac{3}{4}$ " = 1'-0"

SCALE:  $\frac{3}{4}$ " = 1'-0"

SCALE:  $\frac{3}{4}$ " = 1'-0"

TYPICAL EXTERIOR WALL

1/4" APA RATED EXP. 1

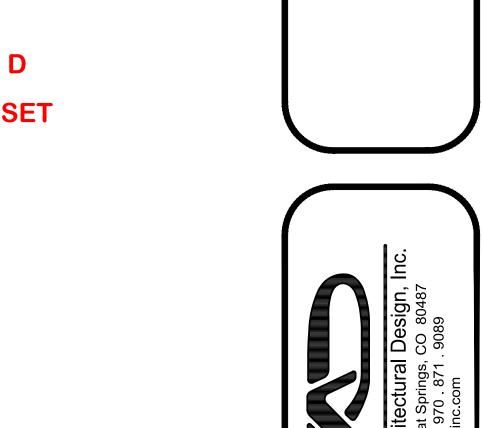
TYPICAL CONCRETE SLAB Re: 1/S-1.1

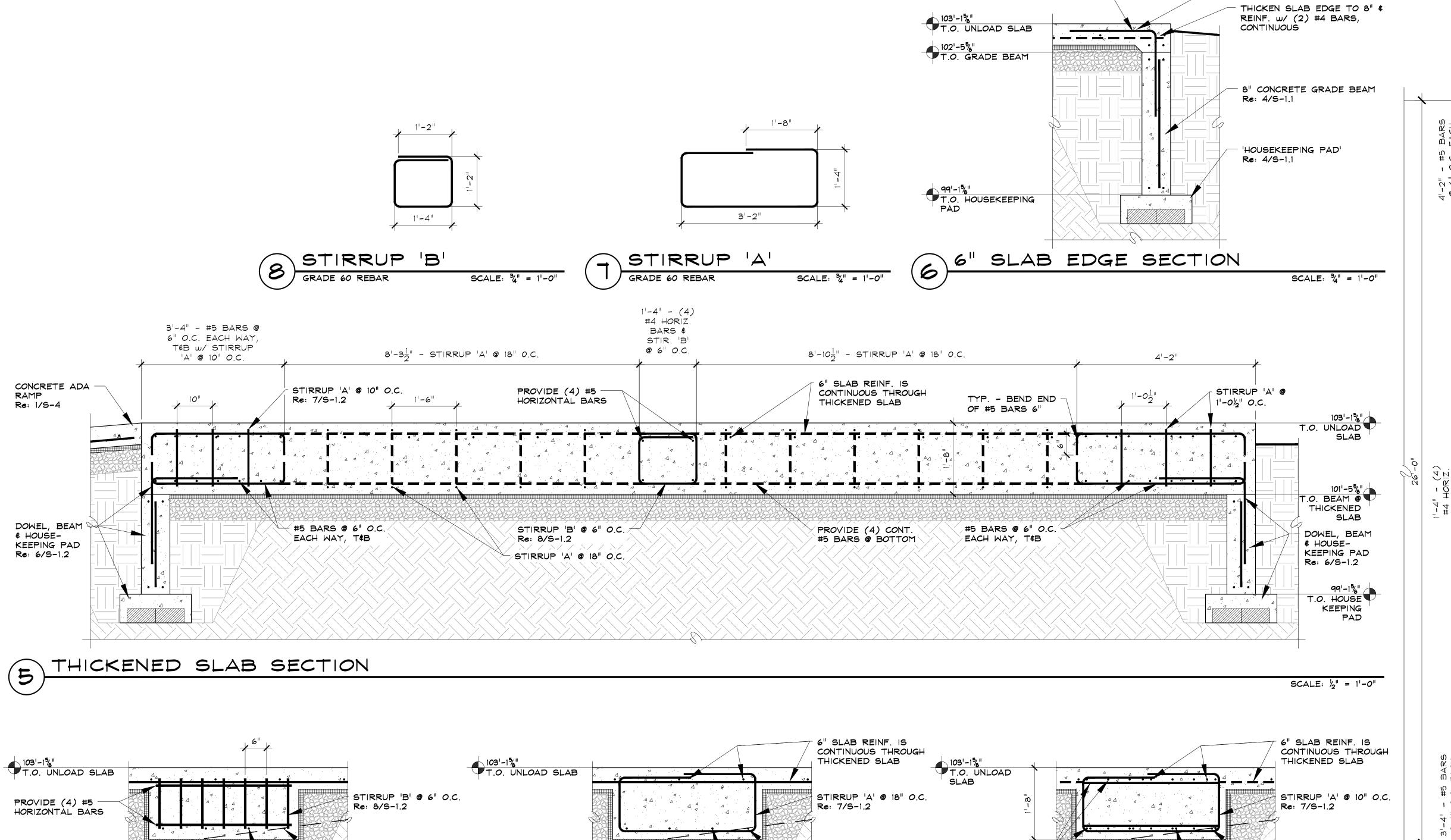
PROVIDE BENT #4 BARS - X2'-0"X2'-0" @ 18" O.C.

#5 BARS @ 6" O.C. EACH WAY, T&B

PROVIDE (4) CONT. #5 BARS @ BOTTOM 43461

THICKENED SLAB SECTION

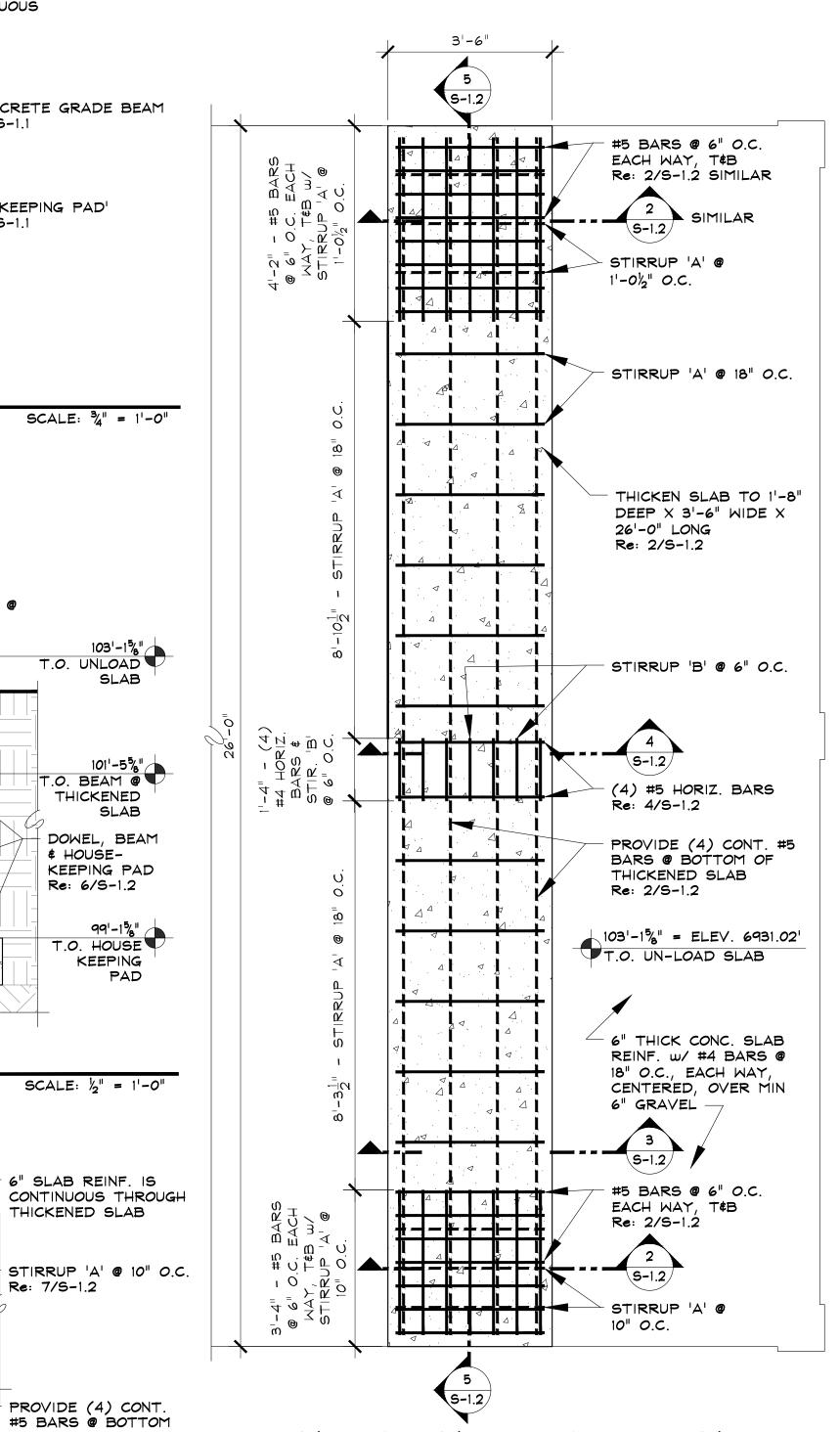




THICKENED SLAB SECTION

PROVIDE (4) CONT. #5 BARS @ BOTTOM

THICKENED SLAB SECTION



UNLOADING SLAB REINF.

BEAM/HOUSEKEEPING PAD NOT SHOWN THIS DETAIL FOR CLARITY

NOTE: 6" THICK SLAB REINF. & GRADE

THICKENED SLAB

SCALE:  $\frac{1}{2}$  = 1'-0"



CONCEPTUAL
06 . 13 . 16

PRICING SET
07 . 27 . 16

REVISED
PRICING SET
08 . 01 . 16

PERMIT
08 . 03 . 16

DRAWN BY:
SJM/JEM
PROJECT # 16020

UNLOADING
SLAB DETAILS
\$ SECTIONS

\$ SECTIONS

5-1.2

SHEET 8 of 14

COLUMN LEGEND

- ☐ = COLUMN BELOW □ = COLUMN ABOVE
- = COLUMN CONTINUOUS THIS LEVEL

ISSUE DATES

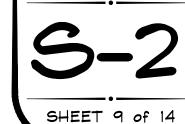
CONCEPTUAL 06 . 13 . 16 PRICING SET 07 . 27 . 16 REVISED PRICING SET 08 . 01 . 16

PERMIT

08 . 03 . 16

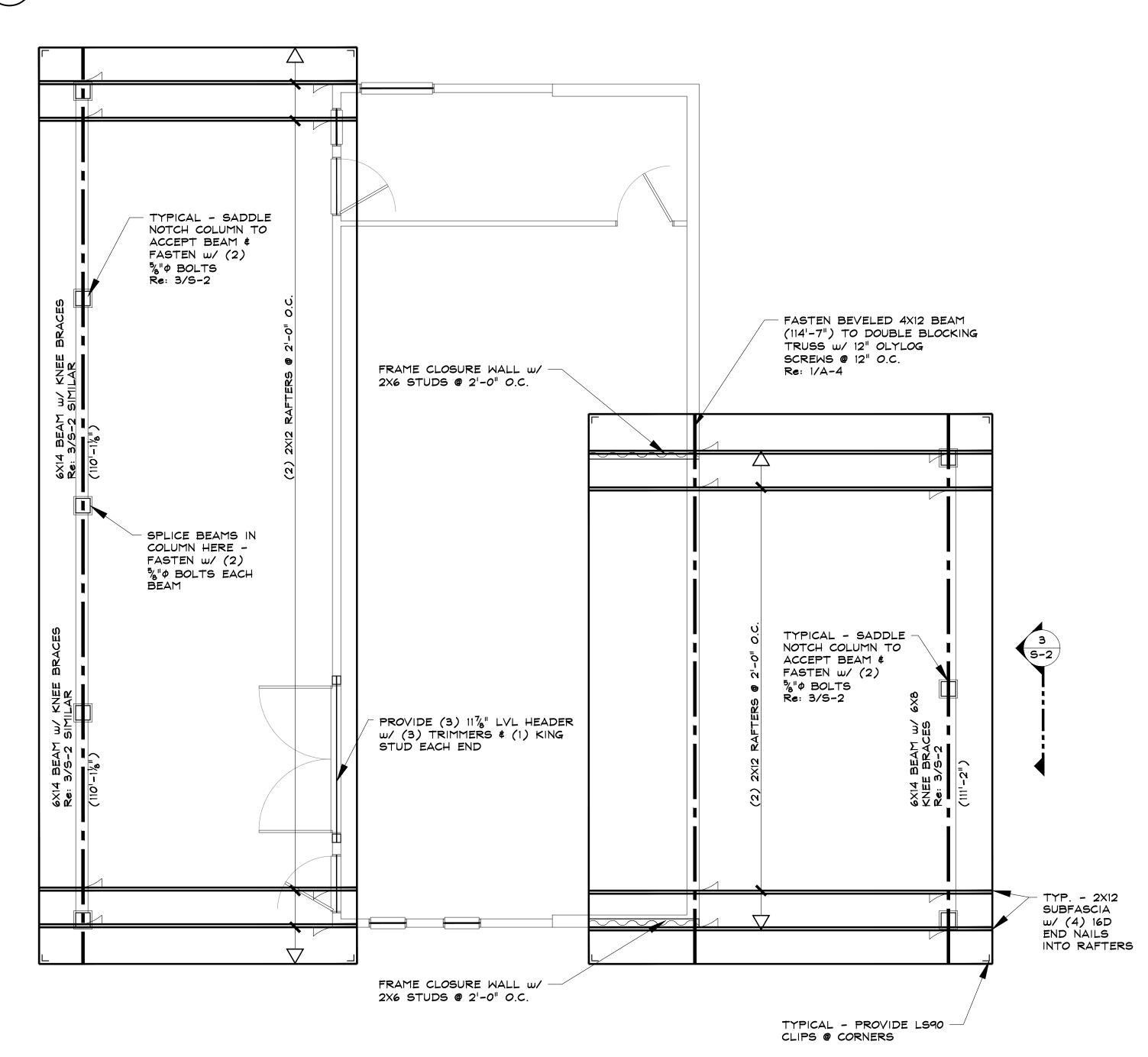
DRAWN BY: SJM/JEM PROJECT # 16020

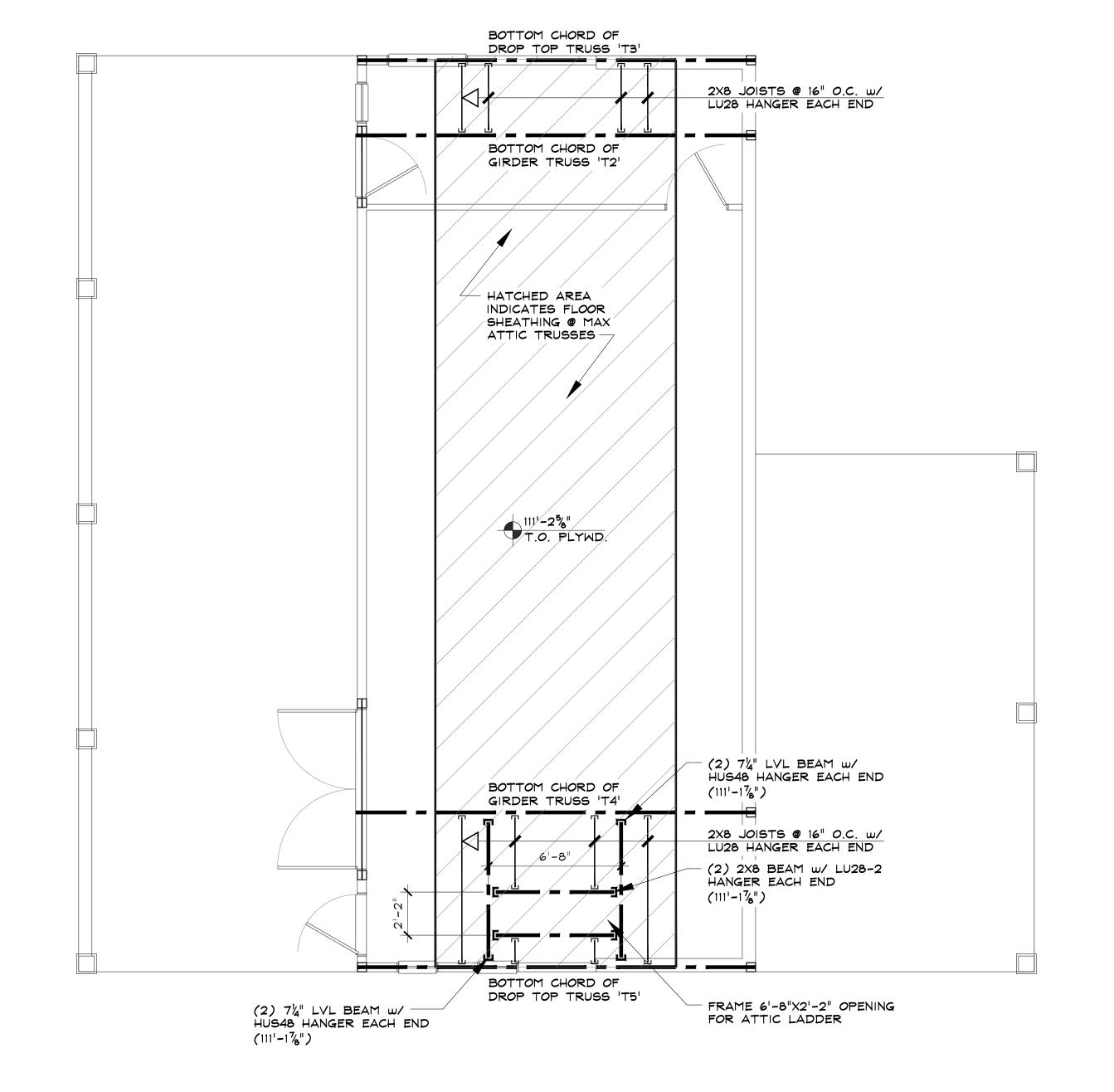
STORAGE LOFT # RAFTER ROOF FRAMING PLANS



TYPICAL KNEE BRACE SECTION

SCALE: 1/2" = 1'-0"



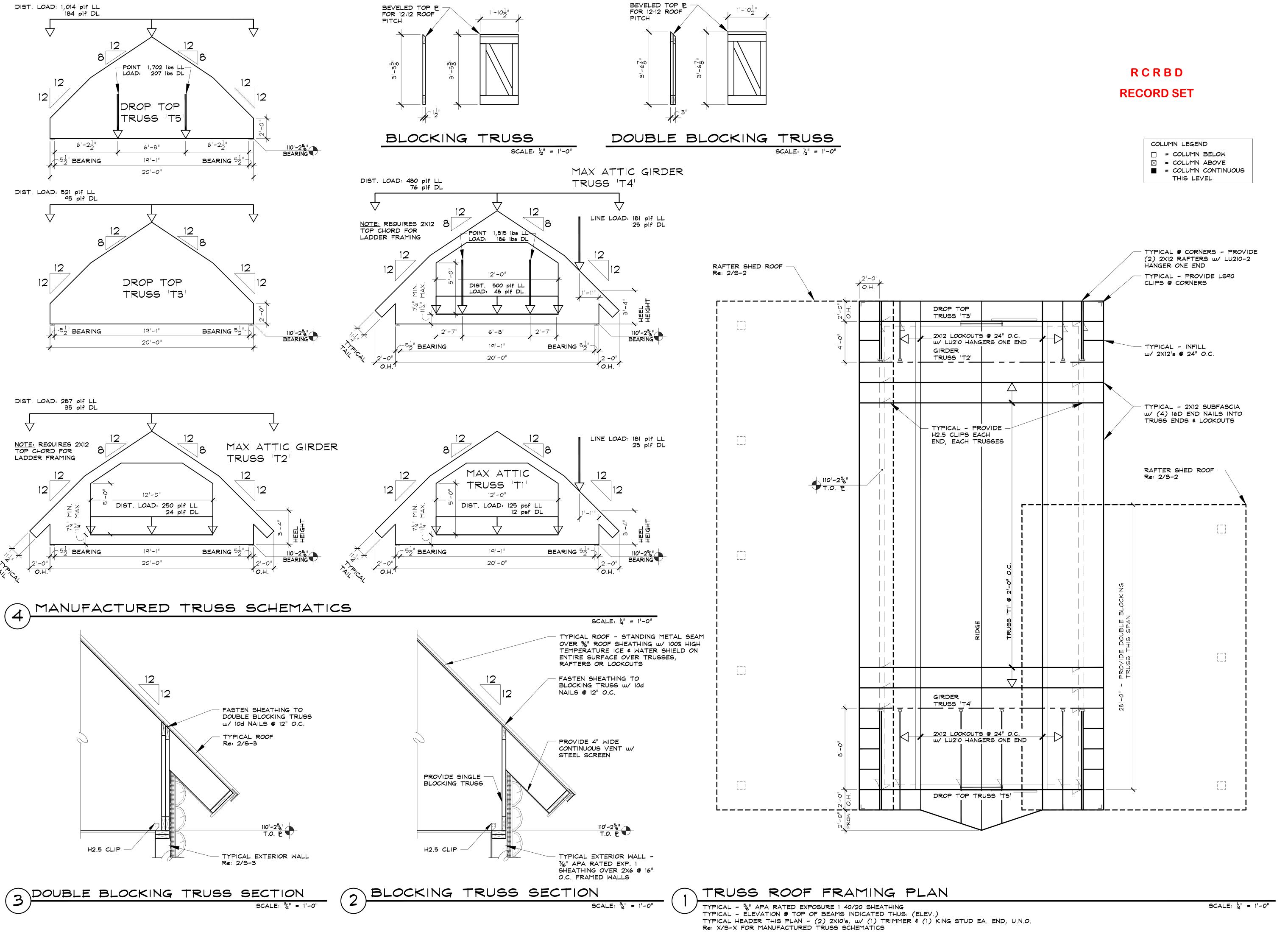


RAFTER ROOF FRAMING PLAN

TYPICAL -  $\frac{5}{8}$ " APA RATED EXPOSURE 1 40/20 SHEATHING TYPICAL - ELEVATION @ TOP OF BEAMS INDICATED THUS: (ELEV.) TYPICAL HEADER THIS PLAN - (2) 2XIO's, w/ (2) TRIMMERS \$ (1) KING STUD EA. END, U.N.O.

STORAGE LOFT FRAMING PLAN

TYPICAL - 3/4" APA RATED EXPOSURE 1 T&G STURD-1-FLOOR SHEATHING TYPICAL - ELEVATION @ TOP OF BEAMS INDICATED THUS: (ELEV.) TYPICAL HEADER THIS PLAN - (2) 2X10's,  $\omega$ / (1) TRIMMER  $\hat{}$  (1) KING STUD EA. END, U.N.O. Re: X/S-X FOR MANUFACTURED TRUSS SCHEMATICS SCALE:  $\frac{1}{4}$ " = 1'-0"



BEVELED TOP P

DIST. LOAD: 1,014 plf LL

所の

ISSUE DATES CONCEPTUAL

06 . 13 . 16 PRICING SET 07 . 27 . 16 REVISED PRICING SET 08 . 01 . 16 PERMIT

08 . 03 . 16

DRAWN BY: SJM/JEM PROJECT # 16020

ROOF FRAMING PLAN # TRUSS SCHEMATICS



A. Structural concrete shall be Type 1, and have a minimum 28 day strength of 4,000 psi w/ min 6% entrained air for durability.

B. Reinforcing bars shall conform to ASTM spec. A615-79 and shall be Grade 60. C. All concrete work shall conform to the requirements of AC1318 and 301, latest edition.

D. At splices, lap bars a minimum of 34 diameters. At corners and intersections, make horizontal continuous or provide matching corner bars. Around openings in walls and slabs, provide (2) #5 bars extending a minimum of 2 feet beyond the edge of the opening.

E. Concrete cover shall conform to ACI 318-08, 7.7. Unless a greater cover is required, concrete cast

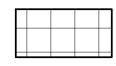
against earth shall have 3in. min. cover, concrete exposed to earth or weather shall have 1½in. min. cover for No. 5 bars \$ smaller \$ 2in. min. cover for No. 6 bars \$ greater. Concrete not exposed to weather shall have  $\frac{3}{4}$ " min. cover for No. 11 bars \$ smaller.

D. Backfill as required under concrete ramp with on-site soils in maximum 12" lifts compacted to minimum 95% of the maximum standard proctor density test (ASTM D698).

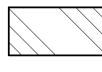
### KEY

= CONCRETE ZONE SA-2

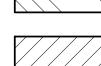
CONCRETE RAMP NOTES



= CONCRETE ZONE SA-3



= CONCRETE ZONE SA-4



= CONCRETE ZONE SA-5



= CONTROL JOINT w/ SMOOTH DOWELS

ELEV. 6914.0' T.O. RAMP LANDING

= TOOLED CONTROL JOINT

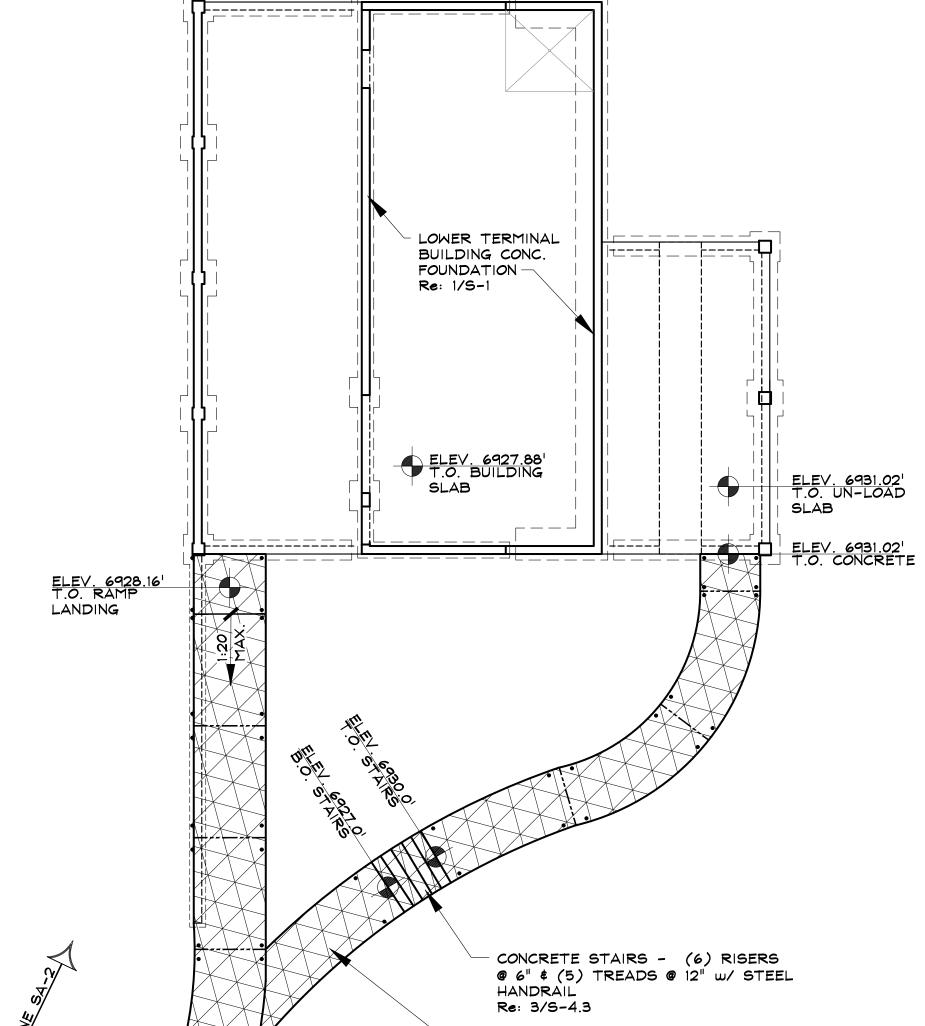
\( \frac{1}{\sqrt{1}} \)	TERIALS	LIST	•
<u>ZONE</u>	CONCRETE VOLUME (yds.3)	ROLLED EPS (ft.2)	REINFORCING BAR (linear feet)
SA-2	19	596	816
SA-3	16	436	862
SA-4	16	654	948
SA-5	11	N/A	674
TOTALS	64	1,686	3,300
NOTES			

(NO HEAT) ZONE SA-4

NOTES:

1. VALUES ARE ESTIMATES ONLY.

2. REINFORCING BAR SHALL BE #4 BARS.



- FIELD FIT CONCRETE RAMP SLOPE @ TOP & BOTTOM OF STAIRS TO MATCH SPECIFIED STAIR/UNLOADING SLAB ELEVATIONS (MAX. 8% SLOPE)

ISSUE DATES CONCEPTUAL 06 . 13 . 16

PRICING SET 07 . 27 . 16 REVISED PRICING SET 08 . 01 . 16 PERMIT 08 . 03 . 16

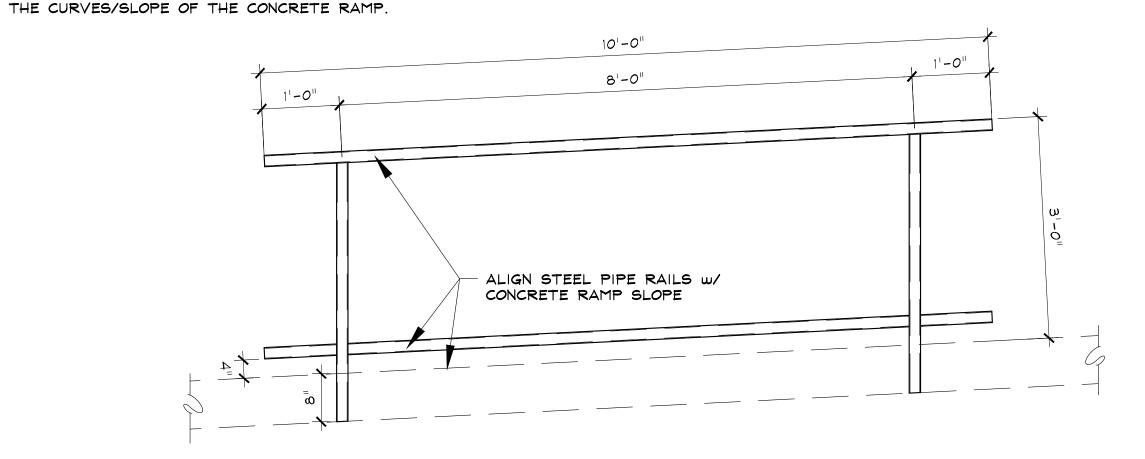
DRAWN BY: SJM/JEM PROJECT # 16020

ADA RAMP PLAN # SECTIONS

OVERALL CONCRETE ADA RAMP PLAN W/ HEATING ZONES - CORDINATE W/ MECHANICAL DRAWINGS BY RADER ENGINERRING

**RECORD SET** 

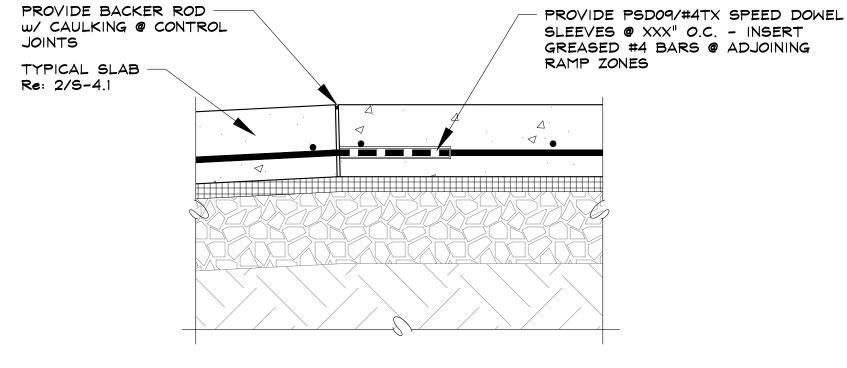
NOTE: THIS SECTION REPRESENTS A GENERIC SECTION OF GUARDRAIL - ACTUAL GUARDRAILS SHALL BE FIELD FIT BASED ON LOCATION OF SLEEVES \$ TO ACCOMMODATE



TYPICAL HANDRAIL SECTION CONSTRUCT HANDRAILS  $\omega$ / GALVANIZED  $1\frac{1}{2}$ " $\phi$  STANDARD PIPE

ELEV. 6911.5' T.O. RAMP

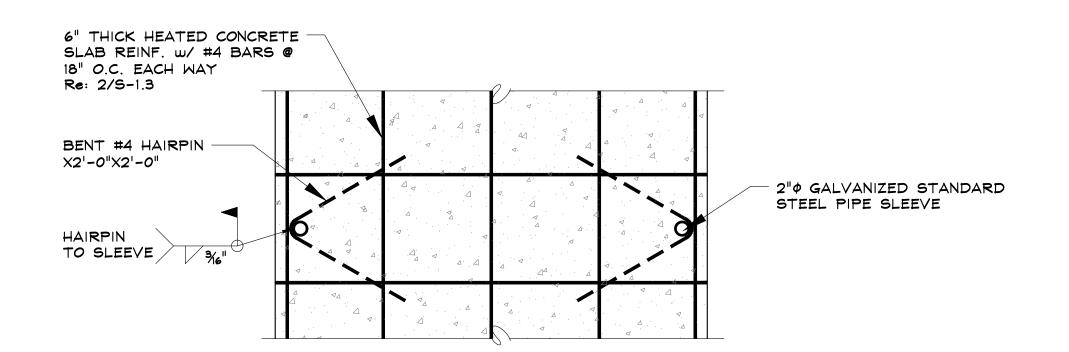
SCALE:  $\frac{3}{4}$ " = 1'-0"



PICAL DOWEL CONTROL JOINT SECTION

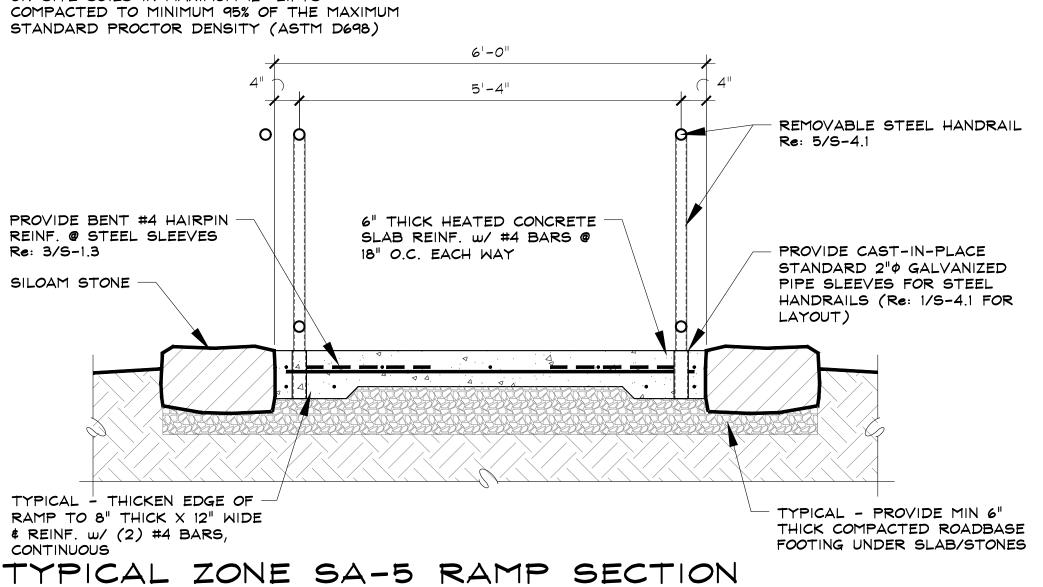
SCALE:  $\frac{3}{4}$ " = 1'-0"

SCALE:  $\frac{3}{4}$ " = 1'-0"



RAMP REINF. DETAIL @ HANDRAIL SLEEVE

BACKFILL AS REQUIRED BELOW SLAB W/ ON-SITE SOILS IN MAXIMUM 12" LIFTS



SCALE:  $\frac{3}{4}$ " = 1'-0" NOTE: NO IN SLAB HEAT THIS ZONE, NO INSULATION REQUIRED UNDER SLAB

TYPICAL - PROVIDE CAST-IN-PLACE 2"\$ GALVANIZED STEEL SLEEVE OFFSET 12" FROM CONTROL JOINT, U.N.O. TYPICAL - PHANTOM 6'-0" TYPICAL LINE INDICATES TOOLED RAMP WIDTH CONTROL JOINT 3'-10" 12'-0" 3'-10" ELEV. 6914.01 T.O. RAMP LANDING 1:12 TYPICAL @ FLAT LANDINGS -TYPICAL @ FLAT LANDINGS TYPICAL - SOLID LINE PROVIDE CAST-IN-PLACE 2"\$ INDICATES DOWELED S-1.3 GALVANIZED STEEL SLEEVE PROVIDE 2" # GALVANIZED STEEL SLEEVE OFFSET 4" FROM CONTROL JOINTS CONTROL JOINT OFFSET 4" FROM CONTROL

Re: 4/S-4.1

JOINTS

29'-0" - 1:12 SLOPE

ENHANCED CONCRETE ADA RAMP PLAN @ ZONE SA-5

6'-0" FLAT

LANDING

NOTE: NO IN SLAB HEAT THIS ZONE, NO INSULATION REQUIRED UNDER SLAB REFER TO MECHANICAL DRAWINGS BY RADER ENGINEERING FOR RAMP HEAT ZONES & INFORMATION

ISSUE DATES CONCEPTUAL 06 . 13 . 16 PRICING SET 07 . 27 . 16 REVISED PRICING SET

DRAWN BY: SJM/JEM PROJECT # 16020

08 . 01 . 16

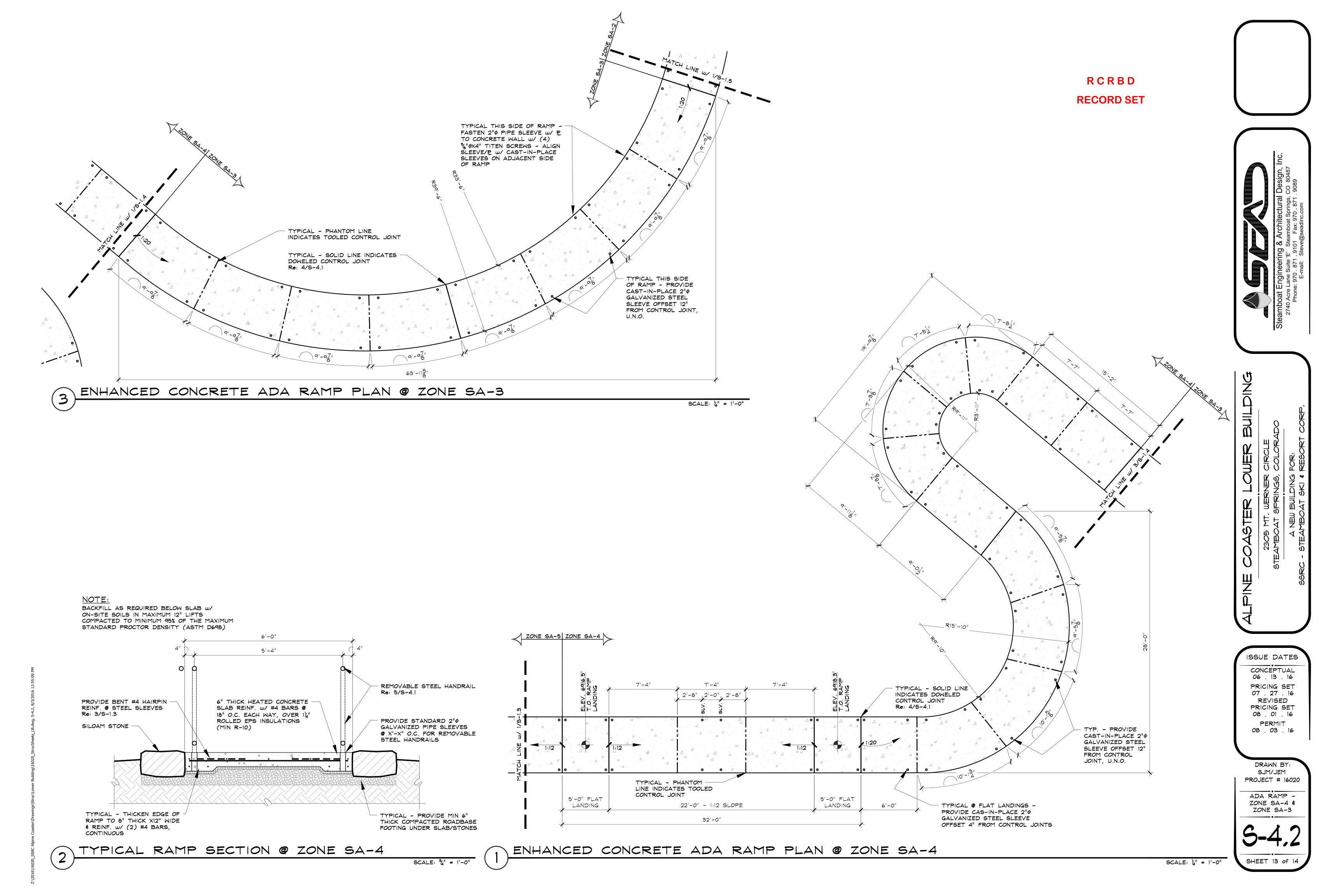
PERMIT

08 . 03 . 16

ADA RAMP -ZONE SA-5

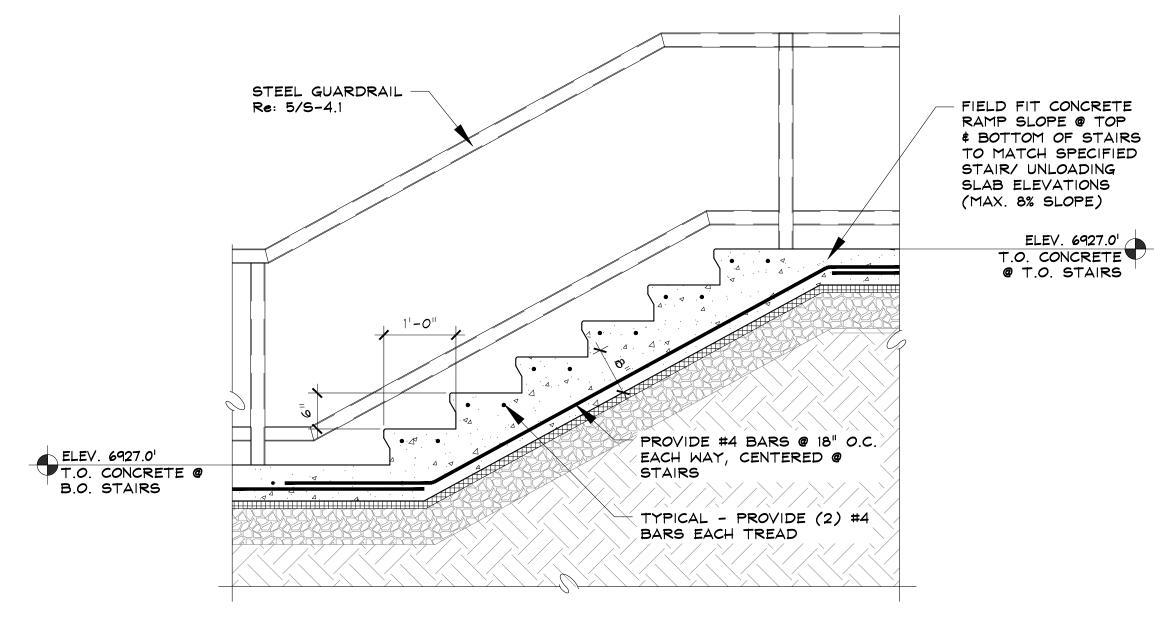
5'-0" FLAT

LANDING



STEEL SLEEVE #

TYPICAL - PROVIDE  $\frac{7}{6}$ "\$\phi\$ HOLES FOR  $\frac{3}{6}$ "\$\phi\$ BOLTS SCALE:  $\frac{1}{2}$ " = 1'-0" 2"\$\phi\$ STANDARD STEEL PIPE FOR SLEEVE  $\frac{1}{4}$ " THICK STEEL PLALL BE GALVANIZED PROVIDE (28) EACH



SECTION @ CONCRETE STAIRS

SCALE:  $\frac{3}{4}$ " = 1'-0" BACKFILL AS REQUIRED BELOW SLAB w/ ON-SITE SOILS IN MAXIMUM 12" 6'-1" LIFTS COMPACTED TO MINIMUM 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY (ASTM D698) 5'-9" REMOVABLE STEEL HANDRAIL Re: 5/S-4.1 6" THICK HEATED CONCRETE FASTEN STEEL SLEEVE -SLAB REINF. w/ #4 BARS @ w/ ₱ (Re: 4/5-4.3) TO 18" O.C. EACH WAY, OVER 14" ROLLED EPS INSULATIONS CONCRETE w/ (4) SILOAM STONE (MIN R-10) VARIES T.O. RAMP 8" BELOW RAMP T.O. BEAM STONE VENEER PER IBC SECTION 1405.7 PROVIDE ANGLE 4X4X1/4 X -CONT. FOR STONE LEDGER TYPICAL - PROVIDE MIN 6" - FASTEN TO CONCRETE W/ THICK COMPACTED ROADBASE FOOTING UNDER SLAB/STONES "φ BOLTS IN EXPANSION ANCHORS @ 2'-8" O.C. (MIN. (2) BOLTS PER SECTION) 8 THICK CONCRETE GRADE BEAM REINF. w/ (2) #4 BARS TOP & BOTTOM & #4 VERTS @ 18" O.C. 1'-10"X0'-8"XCONTINUOUS PLAIN CONCRETE 'HOUSEKEEPING PAD'  $\omega/$ (2) 8"X4"XCONTINUOUS VOID FORMS VARIES T.O. HOUSEKEEPING TYP. PERIMETER DRAIN 4"Φ PERF. PVC PIPE -SLOPE %"/FT. TO

**RECORD SET** ELEV. 6927.88' T.O. BUILDING SLAB ELEV. 6931.02' T.O. CONCRETE ELEV. 6928.161 T.O. RAMP LANDING TYPICAL - SOLID LINE INDICATES
DOWELED CONTROL JOINT Re: 4/S-4.1 TYPICAL - PHANTOM LINE INDICATES TOOLED CONTROL JOINT TYPICAL THIS SIDE OF RAMP - PROVIDE CAST-IN-PLACE 2" GALVANIZED STEEL SLEEVE OFFSET 12" FROM CONTROL JOINTS, U.N.O. FIELD FIT CONCRETE RAMP SLOPE @ TOP & BOTTOM OF STAIRS TO MATCH SPECIFIED STAIR/UNLOADING TYPICAL @ RETAINING WALL SLAB ELEVATIONS (MAX. 8% SLOPE) FASTEN 2"Φ PIPE SLEEVE ω/ P TO CONCRETE WALL w/ (4) %"ΦX4" TITEN SCREWS - ALIGN SLEEVE/P w/ CAST-IN-PLACE SLEEVES ON ADJACENT SIDE OF RAMP CONCRETE STAIRS - (6) RISERS @ 6" \$ (5) TREADS @ 12" w/ STEEL HANDRAIL Re: 3/S-4.3 PROVIDE SLEEVES OFFSET 4" FROM CONTROL JOINT THIS LOCATION 12'-7<u>1</u>" 23'-10<sup>3</sup>" R331-6"

it Springs, CO 80487 970 . 871 . 9089 nc.com

RCRBD

Steamboat Engineering & Architectural Design, 2740 Acre Lane Suite 'E' Steamboat Springs, CO 80487 Phone: 970 . 871 . 9101 Fax: 970 . 871 . 9089 E-mail: Steve@seadinc.com

PINE COASTER LOWER BUILDING

CONCEPTUAL
06 . 13 . 16
PRICING SET
07 . 27 . 16
REVISED
PRICING SET
08 . 01 . 16

DRAWN BY: SJM/JEM PROJECT # 16020

PERMIT

08 . 03 . 16

ADA RAMP -ZONE SA-2

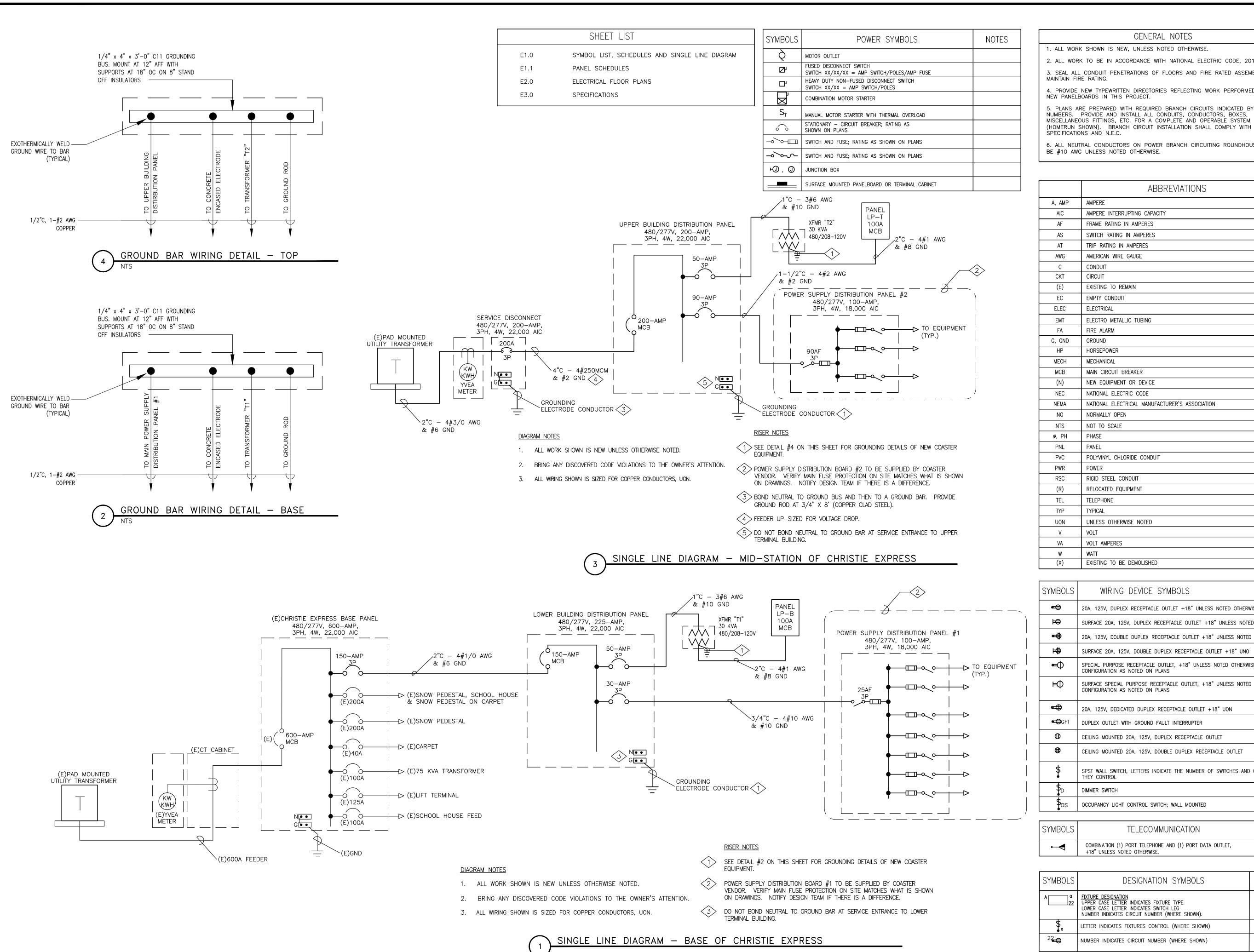
S-4,3

TYPICAL SECTION @ ZONES SA-3 & SA-2

DAYLIGHT - SURROUND W/ 1 CU. FT./LIN FT. WASHED ROCK IN MIRAFI 140 N FABRIC ENVELOPE

SCALE: 3/4" = 1'-0"

ENHANCED CONCRETE ADA RAMP PLAN @ ZONE SA-2



### GENERAL NOTES

- 1. ALL WORK SHOWN IS NEW, UNLESS NOTED OTHERWISE.
- 2. ALL WORK TO BE IN ACCORDANCE WITH NATIONAL ELECTRIC CODE, 2014 EDITION. 3. SEAL ALL CONDUIT PENETRATIONS OF FLOORS AND FIRE RATED ASSEMBLIES TO
- 4. PROVIDE NEW TYPEWRITTEN DIRECTORIES REFLECTING WORK PERFORMED FOR ALL NEW PANELBOARDS IN THIS PROJECT.
- 5. PLANS ARE PREPARED WITH REQUIRED BRANCH CIRCUITS INDICATED BY CIRCUIT NUMBERS. PROVIDE AND INSTALL ALL CONDUITS, CONDUCTORS, BOXES, MISCELLANEOUS FITTINGS, ETC. FOR A COMPLETE AND OPERABLE SYSTEM
- SPECIFICATIONS AND N.E.C. 6. ALL NEUTRAL CONDUCTORS ON POWER BRANCH CIRCUITING ROUNDHOUSES TO
- BE #10 AWG UNLESS NOTED OTHERWISE.

	ABBREVIATIONS	NOTES
A, AMP	AMPERE	
AIC	AMPERE INTERRUPTING CAPACITY	
AF	FRAME RATING IN AMPERES	
AS	SWITCH RATING IN AMPERES	
AT	TRIP RATING IN AMPERES	
AWG	AMERICAN WIRE GAUGE	
С	CONDUIT	
CKT	CIRCUIT	
(E)	EXISTING TO REMAIN	
EC	EMPTY CONDUIT	
ELEC	ELECTRICAL	
EMT	ELECTRO METALLIC TUBING	
FA	FIRE ALARM	
G, GND	GROUND	
HP	HORSEPOWER	
MECH	MECHANICAL	
MCB	MAIN CIRCUIT BREAKER	
(N)	NEW EQUIPMENT OR DEVICE	
NEC	NATIONAL ELECTRIC CODE	
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION	
NO	NORMALLY OPEN	
NTS	NOT TO SCALE	
ø, PH	PHASE	
PNL	PANEL	
PVC	POLYVINYL CHLORIDE CONDUIT	
PWR	POWER	
RSC	RIGID STEEL CONDUIT	
(R)	RELOCATED EQUIPMENT	
TEL	TELEPHONE	
TYP	TYPICAL	
UON	UNLESS OTHERWISE NOTED	
V	VOLT	
VA	VOLT AMPERES	
W	WATT	
(X)	EXISTING TO BE DEMOLISHED	

SYMBOLS	WIRING DEVICE SYMBOLS
•	20A, 125V, DUPLEX RECEPTACLE OUTLET +18" UNLESS NOTED OTHERWISE
Ħ	SURFACE 20A, 125V, DUPLEX RECEPTACLE OUTLET +18" UNLESS NOTED OTHERWISE
•	20A, 125V, DOUBLE DUPLEX RECEPTACLE OUTLET +18" UNLESS NOTED OTHERWISE
⊭	SURFACE 20A, 125V, DOUBLE DUPLEX RECEPTACLE OUTLET +18" UNO
SPECIAL PURPOSE RECEPTACLE OUTLET, +18" UNLESS NOTED OTHERWISE, NEMA CONFIGURATION AS NOTED ON PLANS	
⊨Ф	SURFACE SPECIAL PURPOSE RECEPTACLE OUTLET, +18" UNLESS NOTED OTHERWISE, NEMA CONFIGURATION AS NOTED ON PLANS
•	20A, 125V, DEDICATED DUPLEX RECEPTACLE OUTLET +18" UON
<b>€</b> GFI	DUPLEX OUTLET WITH GROUND FAULT INTERRUPTER
Ф	CEILING MOUNTED 20A, 125V, DUPLEX RECEPTACLE OUTLET
<b>#</b>	CEILING MOUNTED 20A, 125V, DOUBLE DUPLEX RECEPTACLE OUTLET
\$ SPST WALL SWITCH, LETTERS INDICATE THE NUMBER OF SWITCHES AND OUTLETS THEY CONTROL	
<b>\$</b> D	DIMMER SWITCH
<b>₽</b>	

SYMBOLS	TELECOMMUNICATION
1	COMBINATION (1) PORT TELEPHONE AND (1) PORT DATA OUTLET, +18" UNLESS NOTED OTHERWISE.

SYMBOLS	DESIGNATION SYMBOLS	NOTES
Aa	FIXTURE DESIGNATION UPPER CASE LETTER INDICATES FIXTURE TYPE. LOWER CASE LETTER INDICATES SWITCH LEG NUMBER INDICATES CIRCUIT NUMBER (WHERE SHOWN).	
<b>\$</b> °	LETTER INDICATES FIXTURES CONTROL (WHERE SHOWN)	
<sup>22</sup>	NUMBER INDICATES CIRCUIT NUMBER (WHERE SHOWN)	

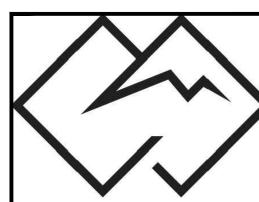
### SSRC ALPINE **COASTER**

2305 Mt. Werner Circle Steamboat Springs, CO

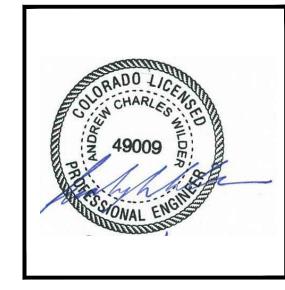
### STEAMBOAT SKI & RESORT CORP

2305 Mt. Werner Circle Steamboat Springs, CO

> RCRBD **RECORD SET ELECTRICAL**



WILDER ENGINEERING LLC Andrew Wilder PE 1170 Blue Sage Drive Steamboat Springs, CO 80487 P: 970-819-7848 E: andy@wilder-eng.com



Issue	By Date & Issue Description	Ву
-	PERMIT SET - 8.29.16	AW

Scale:
24x36 NTS
Description: LEGEND, SINGLE LINE DIAGS
Project Name: ALPINE COASTER
Project Number: 201658
Sheet No.
E1.0

TYPE	SYMBOL	DESCRIPTION	MANUFACTURER	ALTERNATE MANUFACTURER
F1		SURFACE LED FIXTURE	LITHONIA ZL1F-348-3000LM-MDD-MVOLT-35K -80CRI-WH	APPROVED EQUAL
F2	Q	LED FLOODLIGHT	LITHONIA DSXF2-LED-4-A530/30K-MVOLT-THK -DMG-UBV-DDBXD	APPROVED EQUAL
F3		INDUSTRIAL LED STRIPLIGHT	LITHONIA XWMLED	APPROVED EQUAL
F4	Q	LED FLOODLIGHT	LITHONIA OLBF-8-305-DDB	APPROVED EQUAL
X1	\$	EXIT SIGN WITH BATTERY BACKUP EGRESS LIGHTING	LITHONIA — COMBO EXIT SIGN LHQM-S-W-X-G-N	APPROVED EQUAL

### SCHEDULE NOTES

1. ALL LAMPS SHALL BE PROVIDED BY THE CONTRACTOR.

2. CONTRACTOR TO SUBMIT FIXTURE TYPES TO OWNER AND ENGINEER PRIOR TO PURCHASE AND INSTALLATION.

3 LIGHTING FIXTURE SCHEDULE

NTS

ØA     ØB     ØC     DESCRIPTION     E T L K I K I R R R R E G C         B C G G E R R R R R R R R R R R R R R R R R	BUS OLT AM ØB	PS
VOLT AMPS         R         L         O         B         C         C         B         O         L         R         L         N           ØA         ØB         ØC         DESCRIPTION         C         G         E         T         L         K         I         I         K         L         T         E         DESCRIPTION         ØA		1
ØA ØB ØC DESCRIPTION C G E R R R R E G C DESCRIPTION ØA	ØB	0.0
		ØC
348   LIGHTING   1 20 1 A 2 30 2   EUH-1 1000		
720 OPERATOR ROOM 4 1 20 3 B 4	1000	
1000 APPLIANCE 1 20 5 C 6 20 1 SPARE		
1000   APPLIANCE   1 30 7 A 8 20 1   SPARE		
540 RECEPTS 3 1 20 9 B 10 20 1 SPARE		
360 RECEPTS 2 1 20 11 C 12 SPACE		
360 RECEPTS 2 1 20 13 A 14 SPACE		
SPARE   1 20 15 B 16   SPACE		
SPARE   1 20 17 C 18   SPACE		
SPARE   1 20 19 A 20   SPACE		
SPACE 21 B 22 SPACE		
SPACE         23         C         24         SPACE		
SPACE         25 A 26         SPACE		
SPACE         27         B         28         SPACE		
SPACE         29         C         30         SPACE		
SPACE 31 A 32 SPACE		
SPACE 33 B 34 SPACE		
SPACE         35         C         36         SPACE		
SPACE 37 A 38 SPACE		
SPACE 39 B 40 SPACE		
SPACE 41 C 42 SPACE		
1708 1260 1360 VA/LINE 1000	1000	
Ø A= 2708 Ø B= 2260 Ø C=		
CONTINUOUS LOADS NON-CONTINUOUS LOADS		
UP TO 10 kVA 1980 x1.00= 1980  RECEPTACLES CHARAINDER x0.50= OTHER 4000	_ x1.00	4000
TOTAL DESIGN kVA= 6 TOTAL DESIGN AMPS= 18		

	LOAD SUMMARY - UPPER BUILD kVA									
Load	Cont	Rec	Other	Total	A					
PANEL LP-T	.3	2.0	4.0	6.4						
PANEL POWER SUPPLY 2			46.0	60.8	7					
SubTotal	.3	2.0	50.0	52.4	kVA					
25% of Largest Motor				14.8	kVA					
Total				67.2	kVA					
			80.8	Amps at	480 V					
25% Growth/Spare			101.0	Amps at	480 V					

WILDER ENGINEERING LLC
Andrew Wilder PE
1170 Blue Sage Drive
Steamboat Springs, CO 80487
P: 970-819-7848
E: andy@wilder-eng.com

SSRC ALPINE

COASTER

2305 Mt. Werner Circle Steamboat Springs, CO

STEAMBOAT SKI

& RESORT CORP

RCRBD

**RECORD SET** 

**ELECTRICAL** 

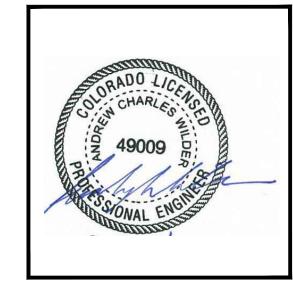
2305 Mt. Werner Circle Steamboat Springs, CO

PANEL SCHEDULES - TOP

NTS

208/	/120	VOLTS	3 PHASE	4	WII	RE			M	AIN		100	) A				BUS	100 A
VOLT AMPS		R	L	O	В	C		С	В	O	L	R		VOLT AMPS		PS		
ØΑ	ØВ	ØС	DESCRIPTION	E C	T G	L E	K R	I R		I R	K R	L E	T G	E C	DESCRIPTION	ØA	ØВ	ØС
540			LOFT RECEPTS	3		1	20	1	A	2	15	3			MINI GOLF PUMP	830		
	720		OPERATOR ROOM	1 4		1	20	3	В	4	-	-			-		830	
		833	LIGHTING			1	20	5	С	6		_			-			830
1000			OPERATOR APP			1	30	7	A	8	20	3			MINI GOLF PUMP	1320		
	1000		OPERATOR APP			1	20	9	В	10		_			-		1320	
		720	RECEPTS	4		1	20	11	C	12	_	_			-			1320
540			RECEPTS	3		1	20	13	A	14	15	1			BOILERS	540		
	1000		WORKBENCH			1	20	15	В	16	15	1			PUMP-1		528	
		1000	WORKBENCH			1	20	17	C	18	15	1			PUMP-2			528
1000			WORKBENCH			1	20	19	A	20	15	1			PUMP-3	528		
	540		RECEPTS	3		1	20	21	В	22	20	1			PUMP-4		1176	
		1000	FUTURE SITE LTG	;		1	20	23	C	24	20	1			PUMP-5			1176
			SPARE			1	20	25	A	26	20	1			PUMP-6	1176		
			SPARE			1	20	27	В	28	20	1			PUMP-7		1176	
			SPARE			1	20	29	C	30	20	1			SPARE			
			SPACE					31	A	32	20	1			SPARE			
			SPACE					33	В	34	20	1			SPARE			
			SPACE					35	C	36					SPACE			
			SPACE					37	A	38					SPACE			
			SPACE					39	В	40					SPACE			
			SPACE					41	C	42					SPACE			
3080	3260	3553						V	A/LIN	ΙΕ						4394	5030	3854
ØA=	7474						ØB=	82	290							ØC=	7407	•
CO	NTINUC	OUS LOA											UOU	SLC	DADS			
						kVA	30	60	X	1.00=	30	60						
1833	x1.25=	2291	-		AIN										OTHER	18278	x1.00	18278

	kVA									
Load	Cont	Rec	Other	Total	A					
PANEL LP-B	1.8	3.1	18.3	23.6	28					
PANEL POWER SUPPLY 1			9.0	9.8	12					
(E)CARPET			16.6	16.6	20					
(E)75 KVA TRANSFORMER			50.0	50.0	60					
(E)LIFT TERMINAL			20.8	20.8	25					
(E)SCHOOL HOUSE FEED			50.0	50.0	60					
(E)SNOW PEDESTAL			100.0	100.0	120					
(E)SNOW PEDESTAL			100.0	100.0	120					
SubTotal	1.8	3.1	364.7	370.0	kVA					
25% of Largest Motor				0.8	kVA					
Total				370.8	kVA					
			446.1	Amps at	480 V					

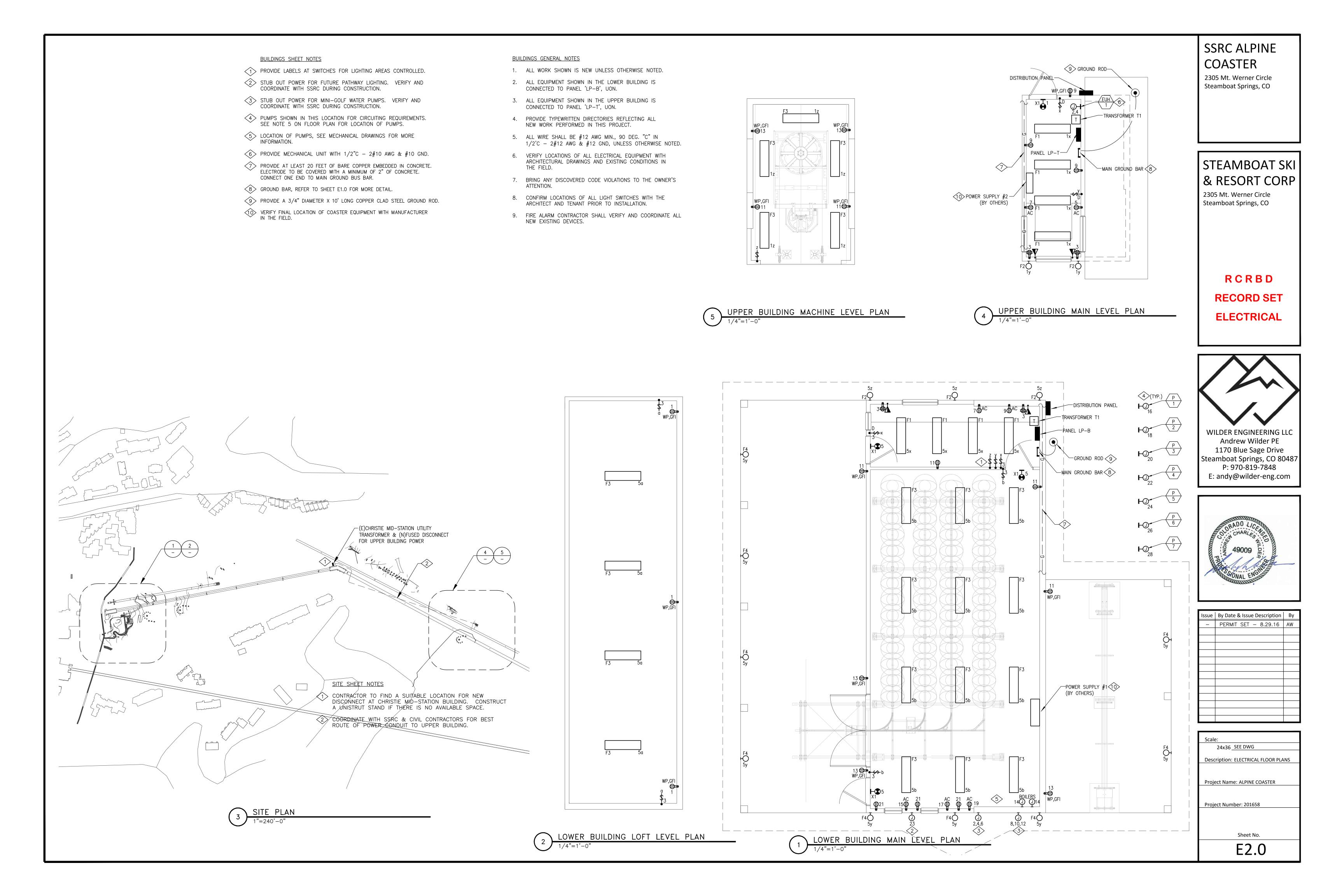


Issue	By Date & Issue Description	Ву
1	PERMIT SET - 8.29.16	AW

Scale:
24x36 NTS
Description: PANEL SCHEDULES
Project Name: ALPINE COASTER
Project Number: 201658
Sheet No.
Г1 1
E1.1

PANEL SCHEDULES - BASE

NTS



### **SECTION 16010 - BASIC ELECTRICAL REQUIREMENTS**

### 1) PART 1 GENERAL

### a) POWER AND CONTROL WIRING

i) Provide power system conduit and wiring to mechanical equipment. Controls system conduit and wiring for mechanical systems is included under Division 15. "Power" wiring includes line voltage wiring from distribution apparatus to disconnecting means provided or installed under this section, and from such disconnecting means to motors, and to terminal boxes of 'package' equipment. "Controls" wiring includes wiring, regardless of voltage, which provides start-stop control for mechanical equipment and/or which is used to monitor functions of mechanical systems. Where line voltage wiring is extended from a local disconnecting means to relays, thermostats, by-pass timers, starter coils or the like, or from mechanical control panels or motor control centers to control devices, such extensions are considered "control" wiring.

### b) MOUNTING HEIGHTS

i) Mounting heights and locations: verify the exact location of equipment with architect prior to installation. Wall mounted devices requiring operational access shall be mounted a minimum of 15 inches above finished floor to bottom of device and a maximum of 48 inches above finished floor to top of device. Visual alarms shall be mounted not less than 80 inches to the bottom or 96 inches to the top of the device.

### c) REGULATORY REQUIREMENTS

### i) Conform to:

(1) NFPA-70 - National Electric Code.

ii) Comply with the current applicable codes, ordinances, and regulations of the authority or authorities having jurisdiction, the Owner's insurance underwriter, and applicable base building standards.

iii) When conflict exists between two or more governing codes, comply with the stricter requirement.

iv)Obtain permits, and request inspections from authority having jurisdiction.

### d) PROJECT/SITE CONDITIONS

i) Install Work in locations shown on Drawings, unless prevented by Project conditions. Coordinate installation of work in available space with work furnished under other Divisions.

a) Where manufacturer's model or series numbers are specified or shown, these indicate generally acceptable types required. Furnish products which comply with all requirements, as specified or shown.

b) When more than one unit of the same class of equipment is required, provide units produced by a single manufacturer.

### a) Furnish test equipment, facilities, and technical personnel required to perform field tests.

b) At completion of job, check voltage at several points of utilization on the system. Energize all loads installed.

### 4) CLEANING

2) PRODUCTS

a) Clean all fixtures and equipment at the completion of the project. Wipe clean exposed lighting fixture reflectors and trim pieces with a non-abrasive cloth just prior to occupancy.

a) Upon completion of the Work, deliver to Architect and up-to-date set of "as-built" record drawings on a reproducible medium including AutoCAD.

### 6) DEMOLITION a) Remove, relocate, and reroute existing electrical equipment to facilitate new construction or remodeling work.

b) Examine the site to observe and note existing conditions prior to submitting a bid.

### c) Schedule demolition in advance. Schedule work to avoid disruption of normal operations.

d) Reconnect circuits serving equipment required to remain in service to other panelboards, motor control centers, or other appropriate distribution equipment. Provide additional panelboards, motor control centers, or other appropriate distribution equipment where there is insufficient available capacity in remaining existing equipment for reconnection.

f) Where a circuit is interrupted by removal of a device or fixture from that circuit, provide additional conduit and wire to restore service to the remaining devices and fixtures on that circuit.

e) Remove existing conduit and wire back to panelboard, motor control center, or other distribution source.

g) Electrical equipment to be removed that is in good working order shall be carefully removed and offered to the Owner. Items rejected by the Owner shall be removed from the project site and properly disposed of.

### **SECTION 16100 - BASIC MATERIALS AND METHODS**

### 1) PART 1 GENERAL a) REFERENCES

i) All equipment and installations shall meet or exceed minimum requirements of ADA, ANSI, ASTM, IEEE, IES, NEC, NEMA, NETA, NFPA, OSHA, SMACNA, UL, and the State Fire Marshal. Equipment shall be certified for use in the State of the project and shall meet the State energy code. Provide products and materials that are new, clean, free of defects, and free of damage and corrosion.

### b) PERFORMANCE REQUIREMENTS

c) QUALITY ASSURANCE

i) Provide support system for equipment and conduit, including wiring, with a minimum safety factor of 4. For empty conduits, include weight of 4 type XHHW wires of maximum permissible size.

i) All equipment and installations shall meet or exceed minimum requirements of ADA, ANSI, ASTM, IEEE, IES, NEC. NEMA. NETA, NFPA, OSHA, SMACNA, UL, and the State Fire Marshal. Equipment shall be certified for use in the State of the project and shall meet the State energy code. Provide products and materials that are new, clean, free of defects, and free of damage and corrosion.

### 2) PART 2 PRODUCTS

### a) CONDUIT

### i) General

(1) Exposed Dry and Damp Locations:

### (a)Use electrical metallic tubing.

(2) Concealed Locations: (a)Furred, Ceiling Spaces and Stud Walls: Use electrical metallic tubing.

(b) Connections to Lighting Fixtures in Accessible Ceilings: Use flexible conduit.

### (3) Equipment Connections:

(a)Connections to Liquid-Handling Equipment in Dry Locations: Use liquid-tight flexible conduit. (4) Equipment for Dry Systems in Dry Locations: Use flexible conduit.

ii) Electrical Metallic Tubing:

(1) Continuous, seamless steel tubing, galvanized or sherardized on exterior, coated on interior with smooth hard finish of lacquer, varnish or enamel, with steel, set screw or compression type fittings. Provide concrete type

(2) Use for general purpose feeders and branch circuits.

### iii)Flexible Steel Conduit:

(1) Single strip, continuous, flexible interlocked double-wrapped steel, hot dip galvanized inside and out forming smooth internal wiring channel, with steel, compression type fittings.

(2) Use in dry locations only, connections to lighting fixtures in suspended ceilings, connections to equipment installed above suspended ceilings, transformer connections, busway plug in units, and connections to equipment where vibration isolation is required, maximum length of 6 feet.

### iv)Liquid Tight Flexible Steel Conduit:

(1) Same as flexible steel conduit except with tough, inert, watertight plastic outer jacket. Fittings shall be cast malleable iron body and gland nut, cadmium plated with one-piece brass grounding bushings threaded to interior of conduit. Spiral molded vinyl sealing ring between gland nut and bushing and nylon insulated throat.

(2) Use same as flexible steel conduit in damp or wet locations and at motor connections.

### b) BUILDING WIRE AND CABLE

i) Provide wire with a minimum insulating rating of 600 volts, except for wire used in low voltage (below 50 volts) control or signal systems. The use of teflon (multi-conductor) for low tension systems may be permitted for fire alarm, signal and communication systems (voice and data) as approved on shop drawings by engineers and where permitted by local codes and union practice.

### (1) Electrical grade, annealed copper, and fabricated in accordance with ASTM standards. Minimum size number 12 AWG for branch circuits; number 14 AWG for control wiring.

(2) Unless otherwise specified, all wires numbers 10 and smaller shall be solid.

(3) All wires number 8 and larger shall be stranded in accordance with ASTM Class B stranding designations.

(4) Control wires shall be stranded in accordance with ASTM Class B stranding designations. (5) Cables for low tension systems shall be multi-conductor, 16 gauge, color coded and insulated in armored cable

assembly, with number of conductors as required. (6) All 600 volt wire and cables unless otherwise specified shall be single conductor suitable for use in wet and dry

### iii) Connectors

(1) Make connections, splices, taps and joints with solderless devices, mechanically and electrically secure. Protect exposed wires and connecting devices with electrical tape or insulation to provide insulation values not less than on conductor.

### iv) Cables (No. 8 and Larger):

and locations.

(1) Use set screw or compression type connectors, taps and splices specifically designed for the particular connection. Insulate splice either by taping or by use of "Bakelite" covers designed to fit around splice.

v) Branch Circuit Wires (Number 10 and Smaller): Use any of the following types of terminals and connecting devices: (1) Hand Applied: Coiled, tapered, spring wound devices with a conducting corrosion-resistant coating over the spring steel and a plastic cover and skirt providing full insulation for splice and wired ends. Screw connector on by

(2) Tool Applied: Steel cap, with conduction and corrosion resistant metallic plating, open at both ends, fitted around the twisted ends of the wire and compressed or crimped by means of a special die designed for the purpose. Specifically fitted plastic or rubber insulating cover wrap over each connector.

### i) Pressed steel, galvanized or cadmium-plated, 4 inches minimum octagonal or square with galvanized cover or extension

ii) Back-to-back outlets in the same wall, or "through-wall" type boxes are not permitted. Provide 12 inch minimum spacing for outlets shown on opposite sides of a common wall. Provide acoustical potting compound on all outlet

### d) WIRING DEVICES

i) Switches and Receptacles: Arrow Hart, Hubbell, Leviton, Pass & Seymour, or Slater.

### ii) Wall Dimmers: Lutron.

iii) Occupancy Sensors: Mytech, Novitas, or Watt Stopper.

### iv) Floor Boxes and Fittings:

(1) Poke through type: Wiremold Legrand.

(2) Recessed flush floor box type: Steel City or Wiremold Legrand.

### v) Plugstrip: Wiremold.

vi)Device and cover plate colors shall be as selected by Architect.

i) Support raceways on accepted types of wall brackets, specialty steel clips, or hangers, ceiling trapeze hangers, or malleable iron straps. Plumber's perforated straps are not permitted. Acceptable manufacturers' brackets or hangers are Kindorf, Elcan, Binkley, Multi-Frame, Power-Strut, or Unistrut. Do not suspend raceways or equipment from other raceways, steam, water, or other piping or ductwork, except as otherwise permitted. Provide independent and secure support methods. f) PANELBOARDS

i) Acceptable Manufacturers: Cutler-Hammer/Westinghouse, General Electric, Siemens, or Square D/Groupe Schneider. ii) AIC Rating: Branch panelboards and overcurrent protection devices shall have a minimum short circuit rating of 10,000 RMS symmetrical amperes minimum interrupting capacity (120/208V) or 14,000 RMS symmetrical amperes minimum interrupting capacity (277/480V).

iii) AIC Rating: Distribution panelboards and overcurrent protection devices shall have a minimum short circuit rating of 42,000 RMS symmetrical amperes minimum interrupting capacity (120/208V) or 200,000 RMS symmetrical amperes minimum interrupting capacity (277/480V).

iv) Enclosures: Corrosion resistant galvanized (zinc finished) sheet steel. Fronts shall be cold rolled steel, finish coated with ANSI 61 grey enamel over a rust inhibitor. Panel locks shall be keyed alike.

v) Doors: One piece bolt on front with a lockable hinged door over the overcurrent protection devices.

vi)Bus Bars: Silver plated aluminum or copper. Neutral bus shall be full size. Neutral bus shall be 200% rated when supplied from a double neutral feeder. Provide an equipment ground bus in each panelboard. In addition to the equipment ground bus, provide an isolated ground bus when supplied from a feeder which includes an isolated grounding conductor.

### vii) Overcurrent Protection Devices: Molded case circuit breakers for branch panelboards and 120/208V rated distribution panels, and fusible switch units for 277/480V rated distribution panels.

### g) MOTOR STARTERS

i) Acceptable Manufacturers: Eaton/Cutler-Hammer, General Electric, Siemens, or Square D/Groupe Schneider.

### ii) Manual Motor Starters

iii)Fractional Horsepower Manual Starter: General-purpose, Class A, manually operated, full-voltage controller for fractional horsepower induction motors, with thermal overload unit, and toggle operator.

### iv) Voltage, Rating and Thermal Element: As required by motor controller.

### v) Enclosure: NEMA ICS 6; Type 1. h) PULL LINE

### i) 1/8 inch diameter braided yellow polypropylene.

### 3) PART 3 EXECUTION

### a) INSTALLATION i) Conduit

(1) Install conduit in accordance with NECA "Standard of Installation".

- (2) Do not combine individual homeruns into common conduit.
- (3) Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
- (4) Arrange conduit to maintain headroom and present neat appearance.
- (5) Use conduit hubs to fasten conduit to cast boxes.
- (6) Provide insulated equipment ground conductor in flexible conduit.
- (7) Install conduit to preserve fire resistance rating of partitions and other elements.

### (8) Do not attach conduit to ceiling support wires. ii) Building Wire and Cable

- (1) Use conductor not smaller than 12 AWG for power and lighting circuits.
- (2) Neatly train and lace wiring inside boxes, equipment, and panelboards.
- (3) Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise. (4) Use hardened and tempered steel, tin-plated or stainless steel Belleville washer with slightly larger tin-plated
- mild steel flat washer for aluminum lugs.

### (5) Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 8 AWG and

(1) Install electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.

### (2) Install electrical boxes to maintain headroom and to present neat mechanical appearance.

- (3) Install boxes to preserve fire resistance rating of partitions and other elements; arrange boxes to meet regulatory requirements.
- (4) Align adjacent wall-mounted outlet boxes for switches, thermostats, and similar devices to each other. (5) Do not use through-walls boxes or install flush mounting boxes back-to-back in walls; provide minimum 6 inch
- separation. Provide minimum24 inches separation in acoustic rated walls.
- (6) Use stamped steel bridges in bar hanger assemblies to fasten flush mounting outlet box between studs. (7) Use adjustable steel channel fasteners for hung ceiling outlet box.
- (8) Do not fasten boxes to ceiling support wires.
- (9) Support steel metal boxes independently of conduit.
- (10) Use gang box where more than one device is mounted together, including floor boxes. Do not use sectional
- (11) Plaster Rings: Use for all concealed work; depth of rings as required to reach finished surfaces.
- (12) Coordinate trimming of openings for outlet boxes in partitions to achieve neat, closely-fitting openings.
- iv) Wiring Devices

multiple devices.

### (1) Install devices plumb, level, and rigidly in place.

(13) Install knockout closure in unused box opening.

- (2) Install switches 2 inches to 8 inches from trim on the strike side.
- (3) Install decorative plates on switch, receptacle, and blank outlets in finished areas. Use multi-gang plates for
- (4) Connect wiring devices by wrapping conductor around screw terminal.
- (1) Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using expansion
- anchors, beam clamps, steel ramset fasteners. (2) Use toggle bolts or hollow wall fasteners in plaster or gypsum board partitions and walls; sheet metal screws or
- spring steel bar retainer clips in sheet metal studs. (3) Do not fasten supports to piping, ductwork, mechanical equipment, or conduit.
- (4) Do not use powder-actuated anchors without specific permission.
- (5) Do not drill structural steel members without specific permission.
- (6) Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under nuts. vi)Electrical Identification
- (1) Provide wire markers on each conductor in panelboard gutters, pull boxes, and at load connection. Identify with branch circuit for power and lighting circuits, and with control wire number as indicated on equipment manufacturer's shop drawings for control wiring. If more than one neutral conductor is present, mark each with
- related circuit numbers. (2) Color code all secondary branch circuit and feeder conductors as follows:
- (a)Four Wire, Three Phase, Grounded Wye System: For 120/208 volt systems, use one black, one red, one blue,
- one white (neutral). For 277/480 volt systems, use one brown, one orange, one yellow and one gray (neutral). (3) Use wire with insulation of required color. For sizes of wire, which may not be available in specified colors use
- self-adhesive wrap around, markers of solid colors to color code conductors. (4) Color code conductors at accessible locations.
- (5) Pull Rope Marking: Affix label identifying termination point at each end of pull rope.
- (1) Install disconnect switches shown mounted on walls at +4'-6" to centerline of switch.
- (2) Install disconnect switches shown on or adjacent to equipment on field fabricated galvanized steel frames. viii) Panelboards
- (1) Provide filler plates for unused spaces in panelboards. (2) Provide typed circuit directory in plastic holder for each branch circuit panelboard.
- ix)Motor Starters
- (1) Install motor control equipment in accordance with manufacturer's instructions. (2) Select and install heater elements in motor starters to match installed motor characteristics.
- x) Pull Line: Provide in each empty conduit except sleeves and nipples; leave 8 inches of slack at each outlet. xi)Firestopping: Provide firestopping around all pipes, conduits, sleeves, etc., which pass through rated walls, partitions

### END OF SECTION

vii) Disconnect Switches

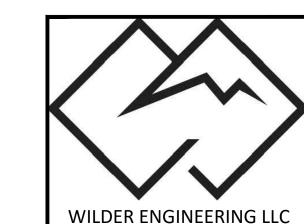
### SSRC ALPINE **COASTER**

2305 Mt. Werner Circle Steamboat Springs, CO

### STEAMBOAT SK & RESORT CORP

2305 Mt. Werner Circle Steamboat Springs, CO

> RCRBD RECORD SET **ELECTRICAL**



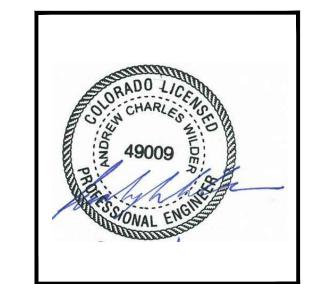
Andrew Wilder PE

1170 Blue Sage Drive

Steamboat Springs, CO 80487

P: 970-819-7848

E: andy@wilder-eng.com



Issue	By Date & Issue Description	Ву
_	PERMIT SET - 8.29.16	AW

Scale:
24x36 NTS
Description: SPECIFICATIONS
Project Name: ALPINE COASTER
Project Number: 201658

Sheet No.

### RCRBD

### DESIGN CONDITIONS WINTER DESIGN TEMPERATURES: INDOOR: 70 F DB OUTDOOR: -21 F DB ELEVATION 6900' FEET

WALL R-YALUE (AYG) 13 (CAY.) 7.5 (CONT.) ROOF R-VALUE (AVG) 38 GLASS U-VALUE (AVG) Ø.45 ELECTRICAL POWER AVAILABLE 120/1, 240/1 480/3

### SHEET INDEX

SHEET	DESCRIPTION
MØ.Ø	MECHANICAL COVER SHEET
M1.Ø	MECHANICAL SCHEDULES
M2.Ø	MECHANICAL PLANS
M3.Ø	MECHANICAL SCHEMATICS
M4.Ø	MECHANICAL SPECIFICATIONS AND SEQUENCE OF OPERATION

Dl	JCTWORK LEGENI	
SINGLE LINE	DESCRIPTION	DOUBLE LINE
)	90° ELBOW DOWN	81 0
	90° ELBOW UP	81 (1)
_) <del>_</del>	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	
<b>—</b>	SIZE OR SHAPE TRANSITION	
<i>─</i> //////	ROUND FLEXIBLE DUCT	
	90° ELBOW DOWN	
DROP/ RISE	90° ELBOW UP	DROP/ RISE
<del> </del>	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	777
	SPLIT BRANCH TAKE-OFF WITH SQUARE ELBOW & SPLITTER DAMPER  SPLIT BRANCH TAKE-OFF	74-
	WITH RADIUS ELBOW & SPLITTER DAMPER	——————————————————————————————————————
	BRANCH TAKE-OFF WITH RADIUS HEEL AND DAMPER	T
	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 SUPPY GRILLE OR REGISTER WITH	
2 2 1/2 2	AIR EXTRACTOR  STATIC PRESSURE CLASS OR STATIC PRESSURE CLASS CHANGE	2 2 1/2 2
	(INCHES WATER COLUMN)  SUPPLY DUCT RISER	
	RETURN, EXHAUST OR OUTSIDE AIR DUCT RISER	
→	CEILING RETURN AIR GRILLE OR REGISTER	~~~
- <del></del>	DOOR GRILLE	4-
<del>.</del>	MANUAL BALANCING DAMPER	
+	MOTORIZED DAMPER	
+0	SMOKE DAMPER	
+•	FIRE DAMPER	
F/S	COMBINATION FIRE AND SMOKE DAMPER	F/S
+	CEILING RADIATION DAMPER	
+	GRAVITY BACKDRAFT DAMPER	
5	DUCT MOUNTED SMOKE DETECTOR	5
	CEILING ACCESS PANEL	
	IIIALL CAP - BATH OR DRYFR FXHAUST	

WALL CAP - BATH OR DRYER EXHAUST

WITH INTEGRAL BACKDRAFT DAMPER

**─** 

### PIPING LEGEND → OR → GATE VALVE OR CHECK VALVE —O— OR — → | BALL VALVE BUTTERFLY YALVE PLUG VALVE - GPM CIRCUIT SETTER WITH GPM $-\infty$ GLOBE VALVE N OR STRAINER (Y-TYPE) WITH BLOW-DOWN \_\$\_ or \_**\$**\_ TWO-WAY AUTOMATIC CONTROL VALV THREE-WAY AUTOMATIC DIVERTING V —Ā— or —**Ā** \_\_X\_\_ *o*r \_\_**I**\_ SOLENOID VALVE —\$— or —₩ PRESSURE REGULATOR (OR REDUCING M TWO-WAY MODULATING CONTROL VALV THREE-WAY MODULATING MIXING VALVE THERMOSTATIC MIXING VALVE (TMV) DP. DIFFERENTIAL PRESSURE VALVE OR PRESSURE RELIEF YALVE MANUAL AIR VENT $\sqrt{1}$ AUTOMATIC AIR VENT VACUUM BREAKER OF OF PRESSURE GAUGE WITH GAUGE COCK PRESSURE SENSOR \_\_\_\_\_ PRESSURE / TEMPERATURE TEST PORT Ф TEMPERATURE SENSOR THERMOMETER WELL THERMOMETER /-\\_**B** BTU METER (FLOW & TEMPERATURE DIF FLOW METER FŞ FLOW SWITCH AQUASTAT BRAIDED TYPE FLEXIBLE PIPE CONNE ELASTOMERIC PIPING ISOLATOR (WITH -|-PIPE UNION QUICK CONNECT (GAS) OR HOSE BIB OR \( \) RADIANT OR SNOWMELT MANIFOLD WITH $\bigcirc$ PIPE UP OR PIPE UP & DOWN FLOOR DRAIN HORIZONTAL CLEANOUT — OR — O FLOOR CLEAN-OUT METER PIPING DESIGNATIONS ------CWS/R------- CHILLED WATER SUPPLY/RETURN -HWS/R------HEATING WATER SUPPLY/RETURN ----- HWS/R(HT) ----- HEATING WATER SUPPLY/RETURN HIGH ------HWS/R(LT)-------- HEATING WATER SUPPLY/RETURN LOW -----SMS/R------- SNOWMELT SUPPLY/RETURN -----DCW----- DOMESTIC COLD WATER (DCW) ------DHW------ DOMESTIC HOT WATER (DHW) BUILDING DRAIN BUILDING SEWER STORM DRAIN OVERFLOW DRAIN (STORM) SEDIMENT & OIL DRAIN NATURAL GAS -MPG----- MEDIUM PRESSURE NATURAL GAS ----- CONDENSATE DRAIN ---- FIRE SPRINKLER -CA----- COMPRESSED AIR ---GEO------- GEOEXCHANGE SOURCE 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

	GENER
	<u>©</u> <u>©</u> 2
	(H)
	(H) <sub>D</sub>
	N2
	600
	(PB)
√E	(S)
/ALVE	(SM)
	(6P)
* VALVE)	Ť
∕E ∕E	\$
Æ	\$ \$ <sub>T</sub>
	\$
	DESIG
	SIZE (INC
	NOTE:
Τ	
	12/6 CD-1 250
FERENCE)	
	TY
	RE
ECTOR	
KEVLAR)	
	DESIG
(WATER)	DUSTING
H ACCESS	<u>DUCTING:</u> OA - OUTSIDE AIR EA - EXHAUST AIR
	GENERAL:
	US - UTILITY SHAFT
	AIR TE
	DESIG
l	<u> </u>
H TEMP W TEMP	I C F
)	
,	
	FP 1100 10 540
	REMOI
	POINT C
	POINT O
	(A) ABANDO (D) DEMO
	(E) EXISTING

### GENERAL LEGEND CARBON MONOXIDE SENSOR CARBON DIOXIDE SENSOR HUMIDISTAT DEHUMIDISTAT NITROGEN DIOXIDE SENSOR OCCUPANY SENSOR (RE: ELECTRICAL) ERY PUSH BUTTON CONTROLLER (LIGHTED) ERY PERCENT TIMER CONTROLLER (LIGHTED) SENSOR SNOWMELT SENSOR (TEKMAR @91/@94) STATIC PRESSURE SENSOR THERMOSTAT WALL ON/OFF CONTROL SWITCH WALL TIMER SWITCH YARIABLE SPEED CONTROL AIR DEVICE DESIGNATION KEY: SIZE (INCHES) FOR STANDARD MODULE SIZE REGISTERS, SIZE GIVEN IS NECK SIZE. REFER TO AIR DEVICE SCHEDULE SHEET FOR MODULE SIZE.

### RISER DESIGNATION KEY:

- # = AIR QUANTITY (CFM)

CA - COMB. AIR

RA - RETURN AIR

EA - EXHAUST AIR

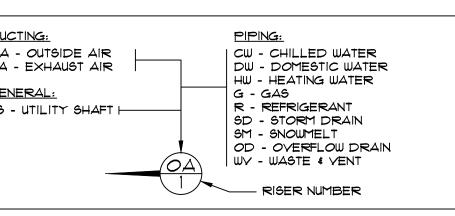
MA - MIXED AIR

- TYPE OF AIR DEVICE.

RE: SCHEDULE SHEET

MUA - MAKE-UP AIR

OA - OUTSIDE AIR



### AIR TERMINAL UNIT DESIGNATION KEY:

TERMINAL TYPE: CY - CONSTANT YOLUME BOX (SERIES) FP - FAN POWERED BOX (PARALLEL) VV - VARIABLE VOLUME VR - VARIABLE VOLUME W/ REHEAT - COOLING AIR QUANTITY (CFM) - MINIMUM AIR QUANTITY (CFM) FOR VENTILATION OR HEATING. --- PRIMARY AIR VALVE SIZE

### REMODEL LEGEND

-	
	POINT OF DISCONNECTION
•	POINT OF NEW CONNECTION
(A)	ABANDON
(D)	DEMO
(E)	EXISTING
(N)	NEW
(R)	RELOCATE

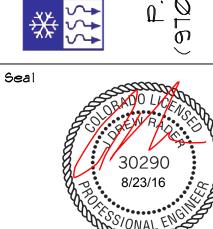
### **RECORD SET**



### EQUIPMENT ABBREVIATIONS

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 EWMP  HX HEAT EXCHANGER  H HUMIDIFIER  KEF KITCHEN EXHAUST FAN  MV MIXING VALVE  P PUMP (SEE PIPING LEGEND FOR DETAILS)  FF TOILET EXHAUST FAN  TTO THERMOSTATIC MIXING VALVE  UH UNIT HEATER  VV VARIABLE VOLUME BOX W/ REHEAT  WATER HEATER	АНИ	AIR HANDLING UNIT
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  MY MIXING VALVE  P PUMP (SEE PIPING LEGEND FOR DETAILS)  RF RETURN/RELIEF AIR FAN  SF SUPPLY FAN  TIEF TOILET EXHAUST FAN  TIMY THERMOSTATIC MIXING VALVE  UNIT HEATER  VV VARIABLE VOLUME BOX WI REHEAT	AS	AIR SEPARATOR
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 FUMP HX HEAT EXCHANGER H HUMIDIFIER KEF KITCHEN EXHAUST FAN MV MIXING VALVE P PUTP (SEE PIPING LEGEND FOR DETAILS) RF RETURN/RELIEF AIR FAN SF SUPPLY FAN TIEF TOILET EXHAUST FAN TMY THERMOSTATIC MIXING VALVE UH UNIT HEATER VV VARIABLE VOLUME BOX W REHEAT	В	BOILER (HOT WATER)
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  TIEF TOILET EXHAUST FAN  TMV THERMOSTATIC MIXING VALVE  UH UNIT HEATER  VV VARIABLE VOLUME BOX W/ REHEAT	СН	CHILLER
CT COOLING TOWER CELL  CV CONSTANT VOLUME BOX  DEF DISHWASHER EXHAUST FAN  EBH ELECTRIC BASEBOARD HEATER  ECU EYAPORATIVE 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  THE MOSTATIC MIXING VALVE  UH UNIT HEATER  VV VARIABLE VOLUME BOX W/ REHEAT	cc	COILING COIL
CV CONSTANT VOLUME BOX  DEF DISHUASHER 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  TMY THERMOSTATIC MIXING VALVE  UH UNIT HEATER  VV VARIABLE VOLUME BOX W/ REHEAT	CH	CABINET HEATER
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 EXCHANGER H HUMIDIFIER KEF KITCHEN EXHAUST FAN MV MIXING VALVE P PUMP (SEE PIPING LEGEND FOR DETAILS) FF RETURN/RELIEF AIR FAN SF SUPPLY FAN TMY THERMOSTATIC MIXING VALVE UH UNIT HEATER VV VARIABLE VOLUME BOX W/ REHEAT	СТ	COOLING TOWER CELL
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)  FF RETURN/RELIEF AIR FAN  SF SUPPLY FAN  TEF TOILET EXHAUST FAN  TMY THERMOSTATIC MIXING VALVE  UNIT HEATER  VV VARIABLE VOLUME BOX W/ REHEAT	CY	CONSTANT VOLUME BOX
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 EXCHANGER  H HUMIDIFIER  KEF KITCHEN EXHAUST FAN  MY MIXING VALVE  P PUMP (SEE PIPING LEGEND FOR DETAILS)  RF RETURN/RELIEF AIR FAN  9F SUPPLY FAN  TEF TOILET EXHAUST FAN  TMY THERMOSTATIC MIXING VALVE  UH UNIT HEATER  VV VARIABLE VOLUME BOX W/ REHEAT	DEF	DISHWASHER EXHAUST FAN
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 W/ REHEAT	EBH	ELECTRIC BASEBOARD HEATER
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 W/ REHEAT	ECU	EVAPORATIVE COOLING UNIT
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 W/ REHEAT	EF	EXHAUST FAN
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 W/ REHEAT	ERV	ENERGY RECOVERY VENTILATOR (AIR TO AIR HX)
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  VY VARIABLE VOLUME BOX  VR VARIABLE VOLUME BOX W/ REHEAT	ET	EXPANSION TANK
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 W/ REHEAT	FC	FAN COIL
HC HEATING COIL  HP HEAT PUMP  HX HEAT EXCHANGER  H HUMIDIFIER  KEF KITCHEN EXHAUST FAN  MY 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 W/ REHEAT	FP	FAN POWERED BOX
HP HEAT PUMP  HX HEAT EXCHANGER  H HUMIDIFIER  KEF KITCHEN EXHAUST FAN  MY MIXING VALVE  P PUMP (SEE PIPING LEGEND FOR DETAILS)  RF RETURN/RELIEF AIR FAN  SF SUPPLY FAN  TEF TOILET EXHAUST FAN  TMY THERMOSTATIC MIXING VALVE  UH UNIT HEATER  VV VARIABLE VOLUME BOX W/ REHEAT	GF	GLYCOL FEEDER
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 W/ REHEAT	НС	HEATING COIL
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	HP	HEAT PUMP
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  THERMOSTATIC MIXING VALVE  UH UNIT HEATER  VV VARIABLE VOLUME BOX W/ REHEAT	H×	HEAT EXCHANGER
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	H	HUMIDIFIER
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	KEF	KITCHEN EXHAUST FAN
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	MV	MIXING VALVE
SF SUPPLY FAN  TEF TOILET EXHAUST FAN  TMV THERMOSTATIC MIXING VALVE  UH UNIT HEATER  VV VARIABLE VOLUME BOX  VR VARIABLE VOLUME BOX W/ REHEAT	P	PUMP (SEE PIPING LEGEND FOR DETAILS)
TEF TOILET EXHAUST FAN  TMV THERMOSTATIC MIXING VALVE  UH UNIT HEATER  VV VARIABLE VOLUME BOX  VR VARIABLE VOLUME BOX W/ REHEAT	RF	RETURN/RELIEF AIR FAN
TMV THERMOSTATIC MIXING VALVE  UH UNIT HEATER  VV VARIABLE VOLUME BOX  VR VARIABLE VOLUME BOX W/ REHEAT	SF	SUPPLY FAN
UH UNIT HEATER  VV VARIABLE VOLUME BOX  VR VARIABLE VOLUME BOX W/ REHEAT	TEF	TOILET EXHAUST FAN
VARIABLE VOLUME BOX  VARIABLE VOLUME BOX W/ REHEAT	TMV	THERMOSTATIC MIXING VALVE
VR VARIABLE VOLUME BOX W/ REHEAT	ин	UNIT HEATER
	<b>YY</b>	VARIABLE VOLUME BOX
WH WATER HEATER	<b>∀</b> R	VARIABLE VOLUME BOX W/ REHEAT
	WH	WATER HEATER





TER

INE

SRC

### AD0 CIRCLE COLOR WERNER SPRINGS, 2305 AMB(

Issued For No. | Date | Comment 1 8/12/16 COORDINATION 2 8/23/16 CONSTRUCTION MECHANICAL COVER SHEET

Checked By: JDR

Project No.

Drawn By:

16053.00

DRC

M0.0

	RADIANT ZONE SCHEDULE - LOWER BUILDING												
MARK	ROOM(S)	EFFECTIVE	BTU/H	BTU/H	GPM	TUBE	TOTAL	# OF	LOOP	GPM/LOOP	P.D.	HEADER	FLOOR
		AREA (SF)		PER SF		CENTERS	LENGTH	LOOPS	LENGTHS		(FT)	SIZE	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	T.1	12	713	4	178	0.3	0.9	3/4"	CONC
TOTALS	TOTALS 845 13100 16 1.5 977 5												
NOTES:	OTES: FLOOR COVERINGS												
SEE MECHANICAL	ZONING PLANS FOR DETA	AILED ZONE L	AYOUTS.			C = CARF	PET		S = STON	IE		CONC =	CONCRETE

U.N.O. ZONES INCLUDE ASSOCIATED BATHS, CLOSETS \$ HALLS.

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

W = WOOD

T = TILE

### RCRBD

### **RECORD SET**

								ACC	ESSORIES		
	BC		1 - HIGH ALTITUDE KIT 4 - FLOW SWITCH 2 - CSD-1 CONTROLS 5 - LOW WATER CUTOFF 3 - ASME RATED (H-STAMP) 6 - 50% PROPYLENE GLYCOL					CUTOFF			
SYM. (SERVES)	TYPE	S.L. INPUT MBH	ALT OUTPUT MBH	FUEL	DELTA T	E R	ELEC.	MANUFAC # MOI		EFF	ACCESSORIES
B-1 \$ 2 (CENTRAL)	WALL MOUNT STAINLESS STEEL CONDENSING	285	227	NAT. GAS	3Ø	\$\( \)	12 <i>Ø</i> /1 2 A	LOCHIN WHN 285		95%	1, 2, 3, 4, 5, 6

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

EQUALS:	SPIROTHERM,	TACO,	BELL #	GC	SSETT.

	EXPANSION TANK										
SYM.	SERVES	MOUNTING	ACCEPT. YOL. (GALS)	TOTAL VOL. (GALS)	MANUF. & MODEL	REMARKS					
ET-1	CENTRAL BOILER SYSTEM	PIPE	6	15	FLEXCON HTX 90	3/4" MNPT					
EOUAL & EL	EXCON HESSELS TACO AMT	201	•	•	•	•					

EQUALS: FLEXCON, WESSELS, TACO, AMTROL.

SYM. SERVES VOLT/PH ELEC NOTES AMPS MANUF. & MODEL REMARKS	GLYCOL FEEDER										
	ê										
GF-1   CLITTICAL DOTLLIN   115/1   FURNISHED   0.4   TOTAL DOTLLIN   ALARM PANE	S, LOW LEVEL EL WITH REMOTE ORY CONTACTS										

CHECK VALVE:

A. INTEGRAL CHECK VALVE

B. EXTERNAL CHECK VALVE

	CONDENSATE NEUTRALIZATION TANK									
SYM.	SERVES	MAXIMUM MBH	MAXIMUM GPH	PIPE CONN. SIZE	MANUF. & MODEL	REMARKS				
CNT-1	CENTRAL BOILER SYSTEM	7 <i>,000</i>	4.8	1" NPT	AXIOM NT25	FURNISH WITH NEUTRALIZING MEDIA				

	PUMPS												
SYM.	GPM	TDH (FT.)	HP	VOLT/PH	MANUFACTURER & MODEL NO.	DESCRIPTION	A SHA	S. S	Y A A A A A A A A A A A A A A A A A A A	2			
P-1	17	11	1/6	115/1	GRUNDFOS UPS 26-99 FC	B-I BOILER	A	2	A	1			
₽-2	17	11	1/6	115/1	GRUNDFOS UPS 26-99 FC	B-2 BOILER	Д	2	Д	1			
P-3	2	2Ø	1/6	115/1	GRUNDFOS UPS 26-99 FC	SPACE HEATING (LOWER BUILDING RADIANT FLOORS)	Д	1	Д	1			
P-4	12	32	1/2	115/1	GRUNDFOS UPS 26-150 F	<u>6Z-1</u> SNOWMELT ZONE	В	2	Д	1			
P-5	8	37	1/2	115/1	GRUNDFOS UPS 26-150 F	<u>SZ-2</u> SNOWMELT ZONE	В	2	Д	1			
P-6	5	38	1/2	115/1	GRUNDFOS UPS 26-150 FC	<u>SZ-3</u> SNOWMELT ZONE	В	2	Д	1			
P-7	8	37	1/2	115/1	GRUNDF05 UPS 26-150 F	<u>SZ-4</u> SNOWMELT ZONE	В	2	Д	1			

	GAS PRESSURE REGULATORS										
SYM.	DESCRIPTION	CAPACITY	MANUF. # MODEL	REMARKS							
GPR-1	GAS PRESSURE REGULATOR (B-1)	178 CFH 2.0 PSI INLET MAX 1.0 PSI INLET MIN	PIETRO FIORENTINI GOVERNOR 30052	8-11" W.C. OUTLET, BLACK SPRING, 3/4" BODY INLET, 3/4" BODY OUTLET 341 CFH GAS LOAD							
GPR-2	GAS PRESSURE REGULATOR (B-2)	178 CFH 2.0 PSI INLET MAX 1.0 PSI INLET MIN	PIETRO FIORENTINI GOVERNOR 30052	8-11" W.C. OUTLET, BLACK SPRING, 3/4" BODY INLET, 3/4" BODY OUTLET 341 CFH GAS LOAD							

<u>MATERIAL:</u> A. CAST IRON B. BRONZE

<u>CONTROL:</u>
1. RE: SEQUENCE OF OPERATION

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

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	





### WERNER SPRINGS, 2305 MT. STEAMBOAT SSRC

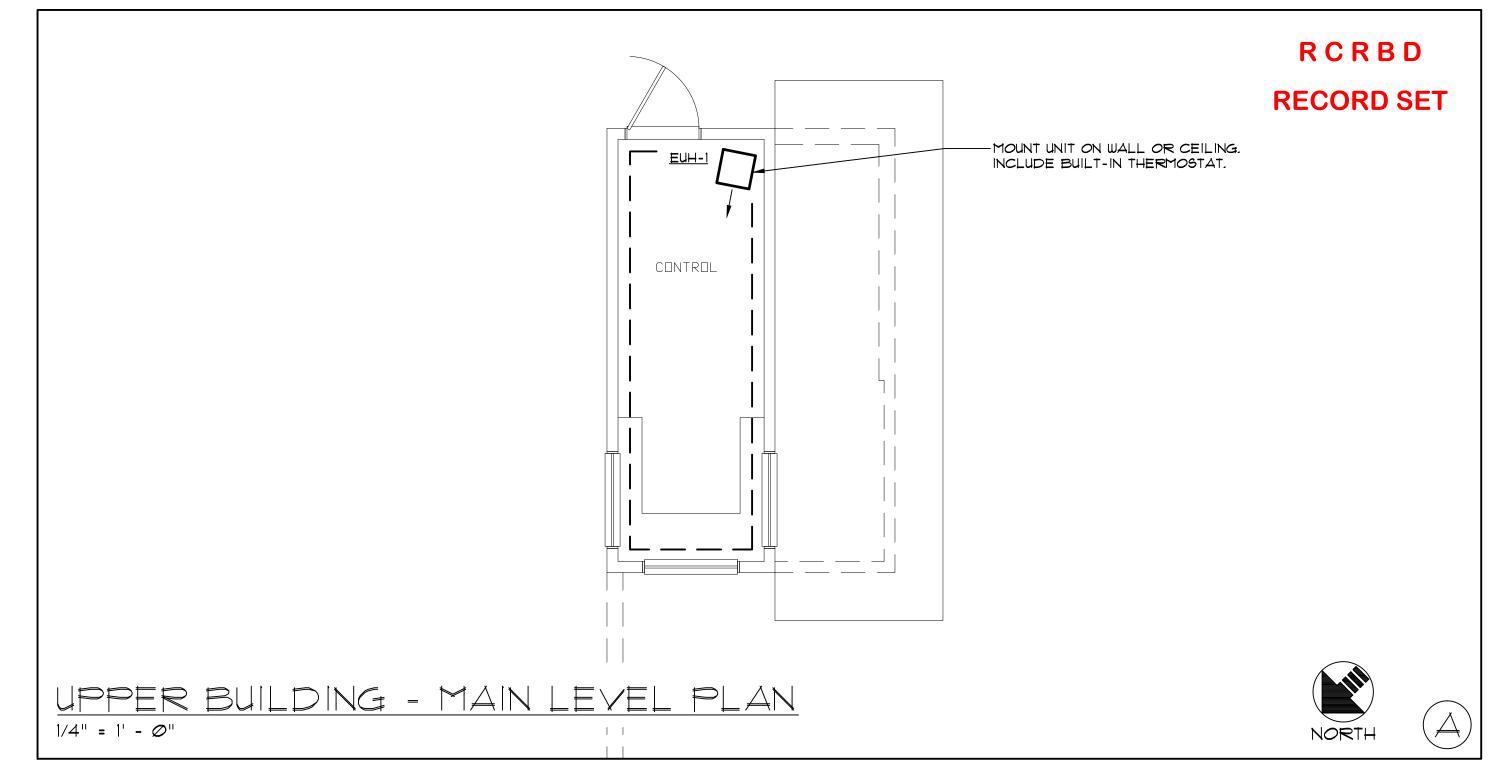
• 1		
lssue	ed For	
No.	Date	Comment
1	8/12/16	COORDINATION
2	8/23/16	CONSTRUCTION

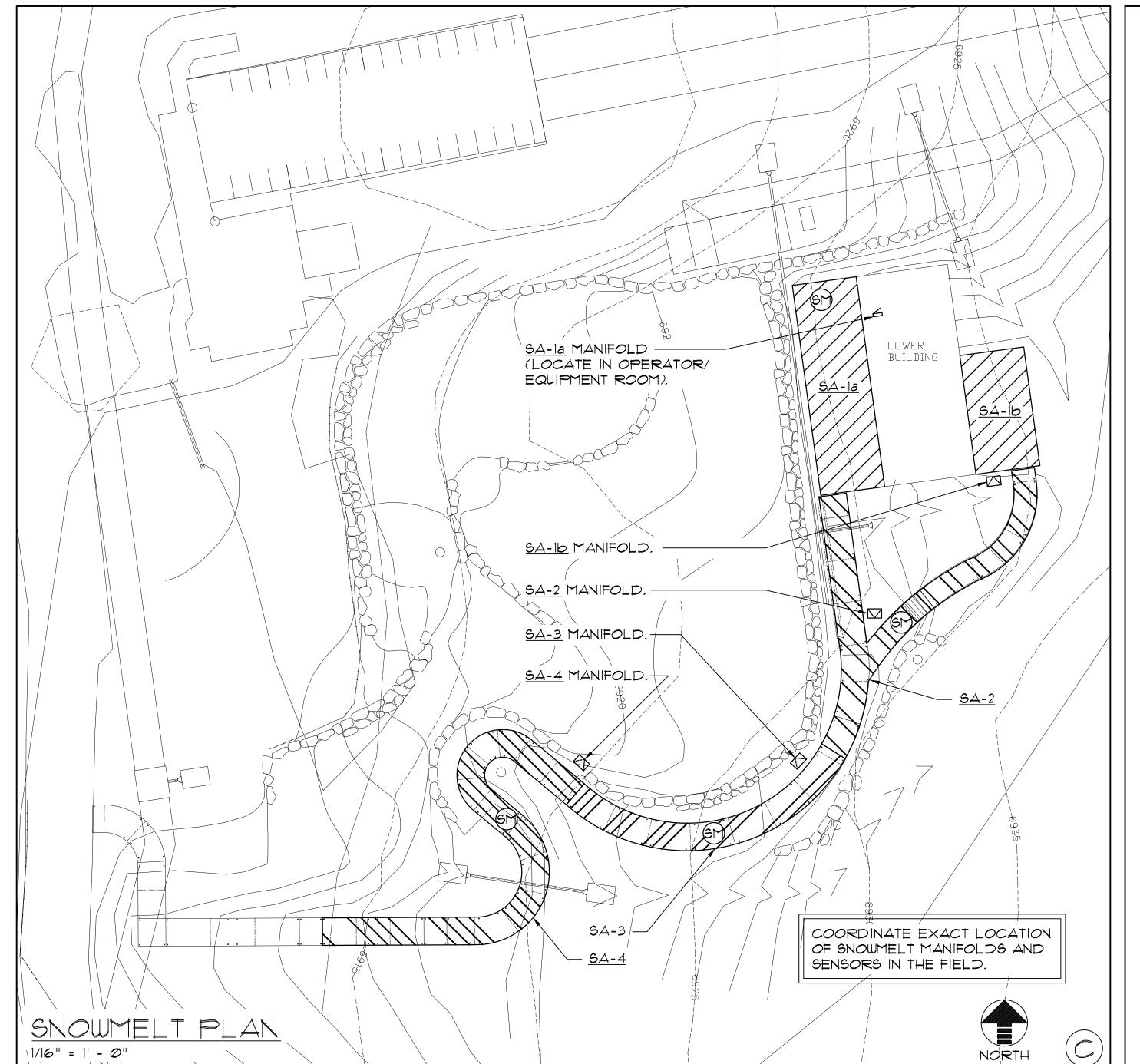
MECHANICAL SCHEDULES

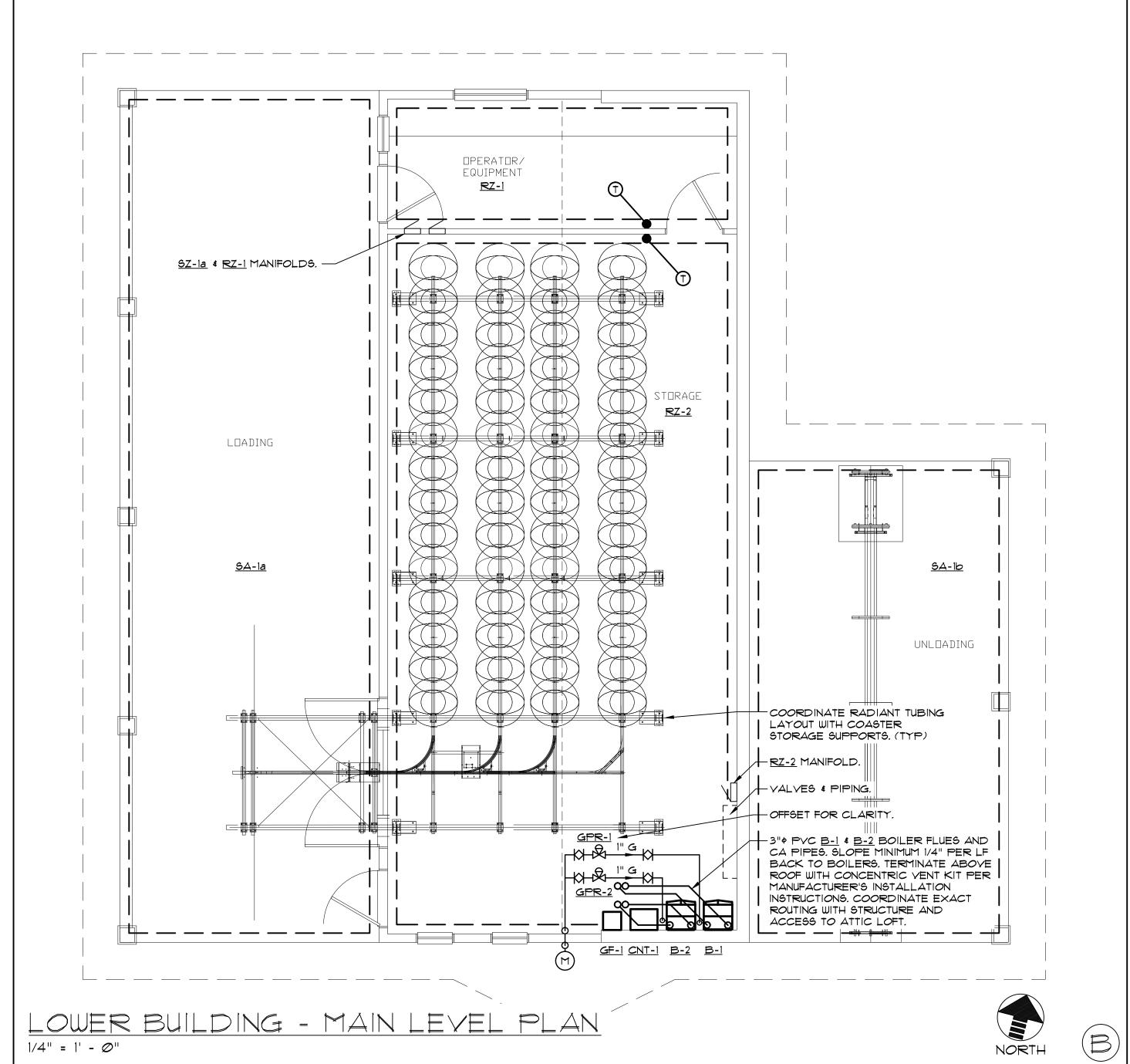
Project No. | Scale: 16053.00 Drawn By: Checked By: JDR DRC

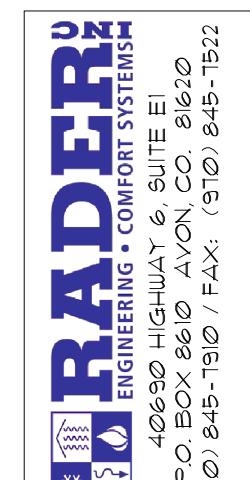
M1.0

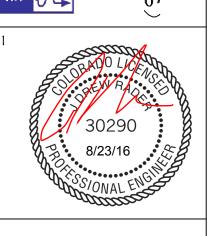
SHEET LEGEND				
(0)	CARBON MONOXIDE SENSOR			
HD	DEHUMIDISTAT	HEATING ZONE		
H	HUMIDISTAT			
HP	HEAT PUMP (GROUND SOURCE)			
RH	INFRARED RADIANT HEATER	SNOWMELT ZONE #1		
MUA	MAKE-UP AIR UNIT			
<u>OS</u>	OCCUPANCY SENSOR			
PB	PUSH BUTTON CONTROL WITH DELAY OFF	SNOWMELT ZONE #2		
PT	PERCENT TIMER CONTROL			
RZ	RADIANT ZONE			
(5)	SLAB TEMPERATURE SENSOR	SNOWMELT ZONE #3		
SA	SNOWMELT AREA			
SM	SNOW / ICE SENSOR (TEKMAR @91/@94)			
(†)	THERMOSTAT/ WALL SENSOR	SNOWMELT ZONE *4		
\$ 7	WALL TIMER SWITCH			





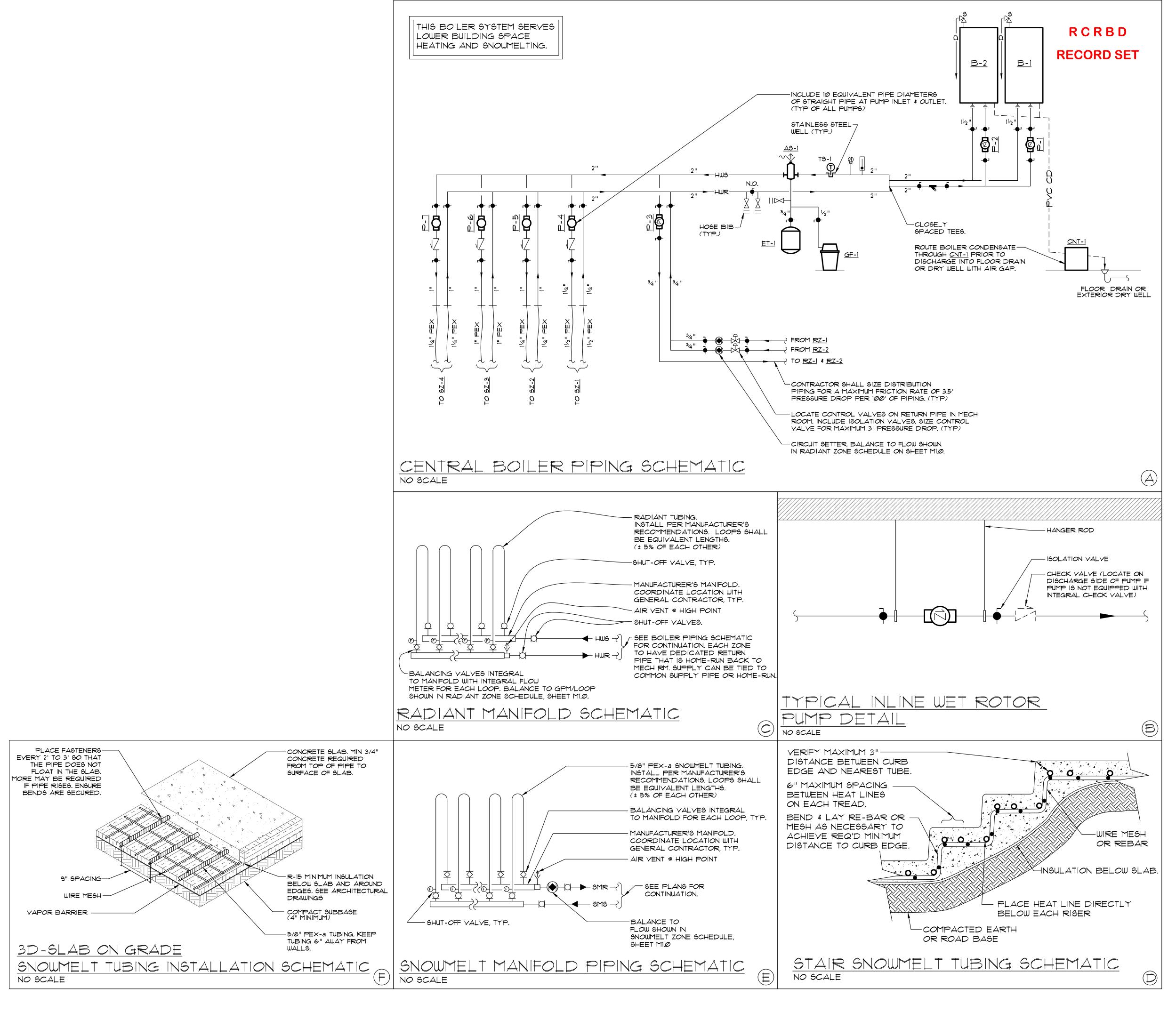


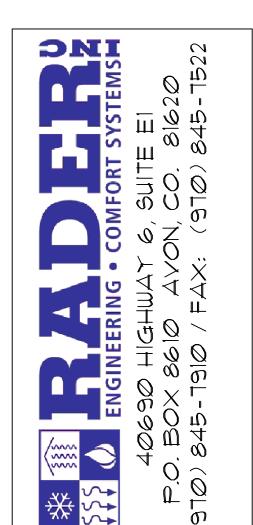




# SSRC ALPINE COASTER 2305 MT. WERNER CIRCLE STEAMBOAT SPRINGS, COLORADO

,			22
			VATIONS FROM THESE PLANS WITHOUT WRITTEN APPROVAL BY THE ENGINEER
Issue	ed For		
No.	Date	Comment	]
1	8/12/16	COORDINATION	] #
2	8/23/16	CONSTRUCTION	₹
			m
			] বৃ
			ģ
			#
			<b>₹</b>
			] 🖆
			<b>₩</b>
			┤┇
			] 호
			<u>‡</u>
			မြ
			₹ 
ΜE	CHANI	CAL	III
PL	ANS		 
			=
			\ \bar{\bar{\bar{\bar{\bar{\bar{\bar{
			11.
			8
			\
	ect No.	Scale:	ם מ
160	053 <i>.00</i>		$ \check{Q} $
	in By:	Checked By:	] }
1	ORC	JDR	် မြို့
		•	] ÿ
	7 /	[2.0]	IY CHANGES AND/OR DE
	<b>TA</b> ]	LZ.U	>
			17







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

Issue	ed For			
No.	Date	Co	omment	
1	8/12/16		PRDINAT	
2	8/23/16	CON	ISTRUCT	<u>ION</u>
ME	CHANI	<u> </u>		
	UHAN HEMAT			
		100	,	
	ect No.	S	cale:	
Proj	CCC 140.	-		
-	053.00	- 1	N/A	7

DRC

JDR

M3.0

### Mechanical Specifications

### General

- 1. Immediately notify the Engineer of any discrepancies.
- 2. It shall be assumed that all subcontractors are experienced and thoroughly knowledgeable in their respective areas of the construction industry and shall perform in a responsible manner in an appropriate construction sequence.
- 3. Do not scale drawings. Verify dimensions in field prior to commencement of work.
- 4. It is the intent of these drawings and specifications to establish a standard of quality. The Engineer reserves the right to take exceptions to approve methods and materials not reflected herein.
- 5. Failure to order, or release order, for materials and/or equipment will not be accepted as a reason to substitute alternate materials, equipment, or installation methods.
- 6. Work shall be performed in a workmanlike manner to the satisfaction of the Architect & the Engineer.
- 7. Labor, materials, and equipment shall conform to the latest applicable editions of local, State of Colorado, and National Codes and ordinances. If conflict between those publications exists, the most stringent requirement shall apply.
- 8. The drawings show the intent of the mechanical systems but do not show all details required. It is the responsibility of the Contractors to install complete & operable systems, which conform to the manufacturers' installations instructions & industry standards.
- 9. Systems shall be tested for proper operation. If tests show work is defective, Contractor shall make corrections necessary at no cost to Owner.
- 10. It is the Contractors' and manufacturers' responsibility to assure themselves that the code authorities will approve any product to be installed on the project.
- 11. Provide necessary trenching, backfill, excavation, supports, piping, insulation, saw cutting and patching, concrete/paving, etc., as required. Backfill trenches in 6" layers and to 90% compaction and patch to match existing grade.
- 12. Coordinate architectural, structural, electrical, landscaping, and fire protection drawings with mechanical drawings prior to installation.
- 13. Verify exact locations of existing and new underground utilities, piping, and raceway systems prior to trenching. Contractor shall obtain and verify exact utility company drawings and requirements.

### **Electrical**

- 14. Contractor must carefully verify electrical service voltage and phase available before ordering any equipment.
- 15. The following are to be furnished by MC and wired by EC: equipment motors, magnetic starters, line voltage thermostats, factory disconnect switches (if specified as part of factory wired equipment) resistance heaters, fire and smoke detectors.
- 16. The following are to be furnished and wired by EC: disconnect switches, thermal overload switches, manual operating switches and contactors.
- 17. The following are to be furnished and wired by MC: low voltage thermostats, control transformers, control relays, control panels, motorized valves, motorized dampers, pilot lights, multi-speed switches and interlocks.

### **Insulation**

18. Piping Insulation Schedule:

Service	Thickness (in.)
HWS/R (less than 1.5" pipe)	1.5
HWS/R (1.5" pipe and greater)	2.0
SMS/R (less than 1.5" pipe)	1.5
SMS/R (1.5" pipe and greater)	2.0

Piping insulation exposed inside shall be U.L. approved, white, all service, glass fiber, snap-on, pipe insulation. Insulate fittings with glass fiber blanket insulation and premolded PVC covers.

- 19. Insulation shall be installed under all radiant heated floors on slab. Insulation shall have a minimum R-value of 10 at a mean testing temperature of 75 F.
- 20. Insulation shall be installed under all exterior snowmelt areas. Insulation shall be Dow Styrofoam Highload extruded polysterene foam board insulation that has an R-10 insulation value. Insulation must have pressure rating suitable for application.
- 21. All buried snowmelt piping shall be either A) Pre-insulated PEX piping, Urecon or equivalent or B) Insulated with Armaflex or equivalent and run inside a watertight conduit. Product must meet requirements of ASTM C 534. Insulation shall have a maximum thermal conductivity of 0.27 Btu-in/h-ft2F at 75 F mean temperature.
- 22. Insulation for all types of piping shall be carried full size through pipe hangers or pipes shall be supported with vibration clamps.

### **Piping**

- 23. Heating Water piping For non-buried piping, type 'L' copper, wrought copper fittings, and no lead solder.
- 24. Snowmelt distribution piping buried underground outdoors shall be sized per plans and shall be PEX-a crosslinked polyethylene with an oxygen diffusion barrier, manufactured by the Engle method.
- 25. Condensing Boiler Condensate shall be neutralized via a neutralization basin before discharge into building drainage system. Condensate piping shall be PVC or other approved material suitable for pH levels of 3.
- 26. Gas Piping Schedule 40 black steel pipe, 150 lb. malleable iron screwed fittings on above ground pipe, welded fittings with all piping coated and wrapped on buried pipe. CSST pipe is permitted for final connections only.
- 27. Underground Gas Piping shall be Gastite Polyethylene plastic conforming to ASTM D 2513, or approved equal. Pipe shall be marked "Gas" and "ASTM D 2513".
- 28. Gas Valves Lubricated plug valve 175 lb. W.O.G. iron screwed or flanged.
- 29. Gas Pressure Regulator (GPR) Valves Install GPR's where specified and/or shown on plans. Include shut-off valve upstream of valve and capped tees upstream and downstream of valve for pressure testing. For modulating condensing boilers, install a minimum of 10' of gas piping downstream of regulator to serve as a buffer during start-up. Refer to boiler manufacturer installation instructions for additional requirements. Install vent limiting device or vent pipe to the outside, as required.

30. Copper pipe Valves and Specialties:

Gate Valves:
Bronze, Class 125, 200 lb. W.O.G.
Ball Valves:
Bronze, Class 125, 200 lb. W.O.G.
Check Valves:
Bronze, Class 125, 200 lb. W.O.G.

Balancing Valves: 125 psig w.p. for 250F service tight shut-off, Illinois dual-purpose, balancing/shut-off valve,

Hoffman, Sarco, or equivalent.

- 31. Support pipe with rod and clevis or clamps. No pipe tape allowed.
- 32. Dielectric Unions Furnish and install a dielectric union at all connections where non-ferrous material is in contact with ferrous material and fluid is not protected with corrosion inhibitors.
- 33. Grade and valve all heating water piping with ¾" hose end valves to permit drainage of the system. Vent all high points in equipment rooms as necessary with automatic air vents piped to convenient drain. All high points in system outside of equipment rooms with manual air vents as required to relieve air in the system.

### **Boiler Flue & Combustion Air Piping**

34. Boiler flue piping and combustion air piping shall be PVC, complying with ASTM D1785.

### **Antifreeze Solutions**

- 35. DILUTION WATER QUALITY: Contractor shall be responsible for testing the water and submitting a report to the Owner & Engineer, prior to system fill. "Hard" water shall not be used. The water used to dilute the concentrated inhibited glycol-based heat transfer fluid must be either distilled, deionized, or contain less than 25 ppm of chloride, 25 ppm of sulfate, 50 ppm of calcium, and 50 ppm of magnesium, with a total hardness not to exceed 100 ppm. If good quality water is unavailable, the manufacturer of the glycol product will provide the heat transfer fluid and water to meet the specifications of the system.
- 36. Fill heating water system with 50% propylene glycol / 50% water solution, by volume, for freeze protection to -28°F and burst protection to -60°F. Include corrosion inhibitors.

### Controls

- 37. Mount all thermostats 5'-0" above finished floor unless integral to equipment.
- 38. Thermostats shall not be installed above heat emitting equipment, including wall mounted touch screen controls. Do not mount on exterior walls.
- 39. All thermostats shall have a temperature range suitable for the application and have adjustable set points. The thermostats shall be able to display temperature setpoint and room temperature. All thermostats shall be approved by the Owner.
- 40. Install emergency gas shutoff switch inside mechanical rooms containing boilers. Switch plate shall be red in color and labeled "GAS BURNER EMERGENCY SWITCH". Switch shall be compliant with Section 1006.8 of the 2009 IMC. Refer to electrical drawings for additional information.
- 41. See Sequence of Operation for additional control information.

### **Radiant Floor Heating**

- 42. Radiant tubing shall be 1/2" nominal diameter. Tubing shall be PEX-a crosslinked polyethylene with an oxygen diffusion barrier, manufactured by the Engle method.
- 43. Piping shall be installed in continuous loops, no splices allowed. Tube centers and the maximum loop lengths are specified in the Radiant Zone Schedule on the plans.
- 44. Tubing loops off each manifold shall be installed in equivalent lengths (+/- 5%).
- 45. The Contractor shall install manifolds as provided by the tubing manufacturer. The manifolds shall consist of a return header (including: balancing valve for each loop, compression fitting to receive tubes and air vent) and supply header (including: manual shut-off valve for each loop and compression fitting to receive tubes).

### **Snowmelt**

- 46. Snowmelt tubing shall be 5/8" nominal diameter. Tubing shall be PEX-a crosslinked polyethylene with an oxygen diffusion barrier, manufactured by the Engle method.
- 47. Piping shall be installed in continuous loops, no splices allowed. Tube centers and the maximum loop lengths are specified in the Snowmelt Zone Schedule on the plans.
- 48. Tubing loops off each manifold shall be installed in equivalent lengths (+/- 5%).
- 49. The Contractor shall install manifolds as provided by the tubing manufacturer. The manifolds shall consist of a return header (including: balancing valve for each loop, compression fitting to receive tubes and air vent) and supply header (including: manual shut-off valve for each loop and compression fitting to receive tubes).
- 50. Snowmelt distribution piping shall be sized per plans. Piping shall be PEX-a crosslinked polyethylene with an oxygen diffusion barrier, manufactured by the Engle method.
- 51. Secure piping in snowmelt areas by attaching tubing to wire mesh using plastic tie straps, every 3' on straight runs and at apex of turn for any change of direction. No metal wiring shall be used.
- 52. Snowmelt system shall be pressure tested in accordance with tubing manufacturer's instructions as required for warranty protection. In the absence of manufacturer's instruction, pressurize the entire snowmelt system with compressed air. Charge system to a pressure of not less than 80 psig or more than 100 psig. Pressure test shall last for 24 hours with not less than a 2 psig drop. With system air charged, soap test all joint on and within the manifolds. After hydrostatic test pressure has been applied, examine piping, joints and connections for leakage. Eliminate any leaks as necessary & re-test. Any portion of tubing layout that rises as a result of being pressurized shall be re-secured to be at the proper level within the slab structure when poured.
- 53. Entire snowmelt system shall be left pressurized with monitoring pressure gauge throughout installation of concrete. Continually monitor pressure on system to make certain tubing system remains intact with no leaks or punctures.
- 54. Manifolds shall be tagged to identify area served. Each connection on supply & return manifolds shall be permanently labeled with loop number.
- 55. Prior to final system fill and commissioning, the PEX tubing system and manifolds shall be chemically cleaned as

prescribed by the tubing manufacturer. Supply all tools, connections, labor, and accessories necessary to properly remove all foreign material, chemical, and residue within the tubing system before permanently charging system and placing into operation.

56. After entire system has been properly cleaned and flushed, fill system with clean water to proper cold fill pressure. Add propylene glycol to the snowmelt system to the concentration specified using a positive displacement pump. Antifreeze fluid shall include corrosion inhibitors. Purge each individual loop to eliminate air pockets in the system. After purging remove fill connection to any potable water lines to prevent any possibility of contamination.

### END OF SPECIFICATIONS

R C R B D
RECORD SET

### -Sequence of Operation

### 1. B-1 & B-2 Boilers

- a. Integral boiler controls shall stage, modulate, and rotate <u>B-1</u> & <u>B-2</u> boilers to maintain heating water setpoint at temperature sensor **TS-1**.
- b. Set up boilers for lead/lag operation.
- c. Heating water supply temperature setpoint shall be reset based on outside air temperatures (120°F @ -20°F to 90°F @ 60°F).
  d. HWS setpoint shall be ramped up to 120°F on a call for snowmelting.

### . . .

- 2. <u>GF-1</u> Glycol Feeder

  a. Unit shall be controlled by integral controls.
  - Controlled by integral controls.
- b. Set pressure setting so that <u>GF-1</u> automatically maintains closed loop system pressure at approximately 15 psi (adj.).

### 3. Radiant Floor Heating

a. Upon a call for heating, on/off zone valve on heating water return pipe shall open to flow zone, boilers shall be enabled, and P-3 heating water pump shall run.

### 4. Snowmelting

- a. Provide (4) **Tekmar 091/094** snow/ice sensors and sockets, one for each snowmelt zone. Refer to M2.0/C for sensor locations.
- b. Provide (4) **Tekmar 654** snowmelt controls with manual override, one for each snowmelt zone.
- c. Upon a call for snowmelting from snow/ice sensor, associated snowmelt zone pump shall start and boilers shall be enabled.
  d. Tekmar system shall be set up for WWSD (warm weather shut down) at approximately 45°F (adj.). Snowmelt system shall not operate if outdoor temperature is above this setting.

### 5. Pumps

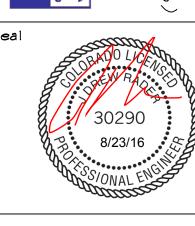
- a. P-1 B-1 Boiler Pump: on whenever boiler is called to fire.
- b. P-2 B-2 Boiler Pump: on whenever boiler is called to fire.
- c. P-3 Space Heating Pump: on whenever there is a call for space heating.
- d. P-4 SZ-1 Snowmelt Pump: on whenever there is a call for snowmelting from sensor located in SA-1a.
   e. P-5 SZ-2 Snowmelt Pump: on whenever there is a call for snowmelting from sensor located in SA-2.
- f.  $\overline{P-6}$  SZ-3 Snowmelt Pump: on whenever there is a call for snowmelting from sensor located in SA-3.
- g. P-7 SZ-4 Snowmelt Pump: on whenever there is a call for snowmelting from sensor located in SA-4.

### 6. **EUH-1** Electric Unit Heater

a. Electric Unit Heater shall be controlled by built-in thermostat.

END OF SEQUENCE OF OPERATION





## 2305 MT. WERNER CIRCLE STEAMBOAT SPRINGS, COLORADO

INE

RC

S

Issued For

No. Date Comment

1 8/12/16 COORDINATION

2 8/23/16 CONSTRUCTION

MECHANICAL
SPECIFICATIONS AND
SEQUENCE OF
OPERATION

Project No. Scale:

16053.00 N/A

Drawn By: Checked By:

DRC JDR

M4.0