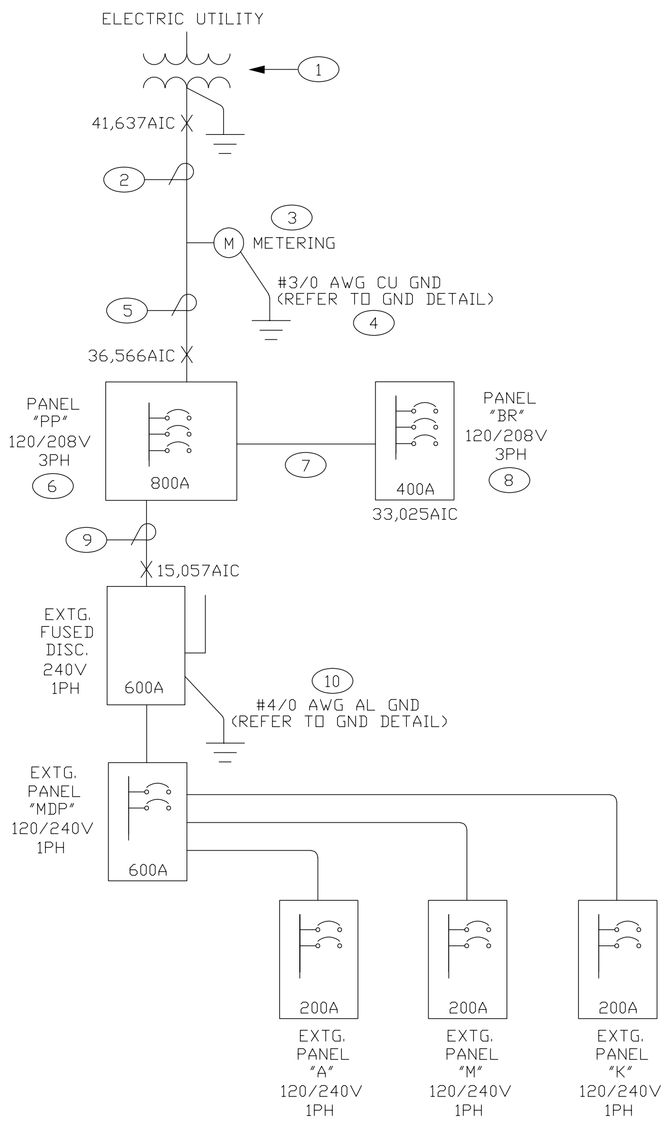
SINGLE-LINE DIAGRAM

SCALE: NONE

ITEM	ELECTRICAL NOTES:
1	120/208V, 3-PHASE UTILITY PADMOUNTED TRANSFORMER. FOR THE PURPOSE OF PROVIDING FAULT CURRENT VALUES, A 300KVA PADMOUNTED TRANSFORMER WAS USED. ACTUAL SIZE MAY VARY DEPENDING ON THE UTILITY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ACTUAL SIZE OF TRANSFORMER PLACED IN FIELD. IF NECESSARY, CONTACT THE ENGINEER FOR REVISED FAULT CURRENT AND ARC FLASH DETAILS.
2	2 RUNS OF 4-#600 AWG CU IN 3-1/2" PVC. REFERENCE TRENCH DETAIL ON SHEET E-101.
3	METERING PER UTILITY REQUIREMENTS. ELECTRICAL CONTRACTOR TO COORDINATE REQUIREMENTS WITH SPRINGER ELECTRIC COOPERATIVE, INC.
4	#3/0 AWG CU TO (2) 5/8" x 8FT GROUND RODS PER NEC 250. REFERENCE ATTACHED GROUNDING DETAIL.
5	2 RUNS OF 4-#600 AWG CU & 1-#1/0 AWG CU GND IN 3-1/2" PVC. REFERENCE TRENCH DETAIL ON SHEET E-101.
6	NEMA 3R, 800A MAIN BREAKER, 120/208V, 3PH, 4W PANEL RATED AT 42KAIC MINIMUM. REFERENCE CIRCUIT BREAKER DETAILS ON SHEET E-102.
7	4-#600 AWG CU & 1-#3 AWG CU GND IN 3-1/2" C.
8	NEMA 1, 400A MLO, 120/208V, 3PH, 4W PANEL RATED AT 42KAIC MINIMUM. REFERENCE CIRCUIT BREAKER DETAILS ON SHEET E-102.
9	2 RUNS OF 4-#500 AWG AL & 1-#2/0 AWG AL GND IN 3-1/2" PVC. REFERENCE TRENCH DETAIL ON SHEET E-101. LENGTH IS APPROXIMATELY 165FT. VDROP = 2.02%.
10	#4/0 AWG AL TO A 5/8" x 8FT GROUND ROD PER NEC 250. REFERENCE ATTACHED GROUNDING DETAIL.

Fault Current Calculations:		
Calculations performed using the following criteria:		
Transformer capacity:	300	**kVA**
Voltage:	208	**V**
Impedance:	2	**%**
Phase:	3	
Available current:	833	**A**
Transformer multiplier:	50.00	
Let-thru short circuit current:	41,637	**A**
Secondary conductor length:	20	**Ft**
Conductor Constant Value:	25000	
Number of parallel phases:	2	
"F" factor:	0.1387	
Multiplier:	0.8782	
Short circuit currents @:		
PANEL 'PP'	36,566	**A**
EXTG. 600A FUSED DISC.	15,057	**A**
PANEL 'BR'	33,025	**A**



#	WIRING NOTES:
1	ALL INTERIOR, 120V DUPLEX RECEPTACLES SHALL BE GFCI PROTECTED.
2	VERIFY MOUNTING HEIGHTS FOR ALL INTERIOR, 120V DUPLEX RECEPTACLES WITH TENANT.
3	ELECTRICAL CONTRACTOR SHALL VERIFY ALL GROUNDING COMPLIES WITH NEC ARTICLE 250.
4	ELECTRICAL CONTRACTOR SHALL FIELD-ROUTE ALL CONDUITS AND CIRCUITS.
5	ALL ELECTRICAL DEVICE LOCATIONS SHALL COMPLY WITH NEC ARTICLE 110.26.
6	VERIFY EXACT LOCATION OF ALL EQUIPMENT LOCATIONS WITH TENANT/OWNER PRIOR TO ROUGH-IN.

Location: Raton Armory Bldg
Load history provided by Springer Electric Cooperative
Meter #12994-007

Date	Actual kWh	Days	Load Factor LF	Calculated Demand kW	Current Load Avg Amps @ 240V 1-ph	Calculated Peak Amps 125%	Additional Load Amps	Removed Load Amps	Total Peak Amps
Oct-21	3120	30	0.20	21.67	90.28	112.85	160.00	0.00	272.85
Sep-21	2760	31	0.20	18.55	77.28	96.61	160.00	0.00	256.61
Aug-21	2520	31	0.20	16.94	70.56	88.21	160.00	0.00	248.21
Jul-21	3240	30	0.20	22.50	93.75	117.19	160.00	0.00	277.19
Jun-21	2640	31	0.20	17.74	73.92	92.41	160.00	0.00	252.41
May-21	2400	30	0.20	16.67	69.44	86.81	160.00	0.00	246.81
Apr-21	2520	31	0.20	16.94	70.56	88.21	160.00	0.00	248.21
Mar-21	2760	28	0.20	20.54	85.57	106.96	160.00	0.00	266.96
Feb-21	3000	31	0.20	20.16	84.01	105.01	160.00	0.00	265.01
Jan-21	2520	31	0.20	16.94	70.56	88.21	160.00	0.00	248.21
Dec-20	2280	30	0.20	15.83	65.97	82.47	160.00	0.00	242.47
Nov-20	2520	31	0.20	16.94	70.56	88.21	160.00	0.00	248.21
Oct-20	2280	30	0.20	15.83	65.97	82.47	160.00	0.00	242.47

WARNING
ARC FLASH AND SHOCK HAZARD APPROPRIATE PPE REQUIRED

EQUIPMENT TYPE:	208V PANEL
GROUNDING:	GROUNDED
WORK DISTANCE:	18 INCHES
AVAILABLE 3-PH BOLTED CURRENT:	36,566kA
FLASH PROTECTION BOUNDARY:	26 INCHES
INCIDENT ENERGY AT 18 INCHES:	2.35 CAL/cm2
PPE LEVEL:	1
EQUIPMENT NAME:	PANEL "PP"
01/08/2022	

WARNING
ARC FLASH AND SHOCK HAZARD APPROPRIATE PPE REQUIRED

EQUIPMENT TYPE:	208V PANEL
GROUNDING:	GROUNDED
WORK DISTANCE:	18 INCHES
AVAILABLE 3-PH BOLTED CURRENT:	33.025kA
FLASH PROTECTION BOUNDARY:	20 INCHES
INCIDENT ENERGY AT 18 INCHES:	1.65 CAL/cm2
PPE LEVEL:	1
EQUIPMENT NAME:	PANEL "PP"
01/08/2022	

WARNING
ARC FLASH AND SHOCK HAZARD APPROPRIATE PPE REQUIRED

EQUIPMENT TYPE:	240V DISC.
GROUNDING:	GROUNDED
WORK DISTANCE:	18 INCHES
AVAILABLE 1-PH BOLTED CURRENT:	15.057kA
FLASH PROTECTION BOUNDARY:	11 INCHES
INCIDENT ENERGY AT 18 INCHES:	0.60 CAL/cm2
PPE LEVEL:	0
EQUIPMENT NAME:	FUSED DISC.
01/08/2022	

CATEGORY	ENERGY LEVEL	TYPICAL PPE EXAMPLES
0	N/A	Non-melting, flammable materials.
1	4 cal/cm2	FR long-sleeve shirt & FR pants or FR coverall. Cotton underwear - conventional short sleeve and brief/shorts, plus FR long-sleeve shirt & pants.
2	8 cal/cm2	Cotton underwear plus FR long-sleeve shirt & pants plus FR coverall or cotton underwear plus two FR coveralls.
3	25 cal/cm2	Cotton underwear plus FR long-sleeve shirt & pants plus multilayer flash suit.
4	40 cal/cm2	

All categories require a face shield and/or safety glasses, hard hat and leather gloves. Where insulating rubber gloves are used for shock protection, leather protectors shall be worn over the rubber gloves. Leather work boots shall be worn for energy levels above 4 cal/cm2.

* CAVEAT: NFPA 70E – WORK ON ENERGIZED PARTS, INCLUDING VOLTAGE TESTING, REMOVING OR INSTALLING CIRCUIT BREAKERS OR FUSED SWITCHES OR REMOVING BOLTED COVERS TO EXPOSE BARE, ENERGIZED PARTS WOULD PLACE THIS PROJECT INTO A CATEGORY 1 FOR APPROPRIATE PPE.

ARC FLASH INFO:
SCALE: NONE

#	MECHANICAL WIRING NOTES:
MECH-1	ELECTRICAL CONTRACTOR SHALL COORDINATE THE EXACT ELECTRICAL REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
MECH-2	INSTALL A CONVENIENCE RECEPTACLE (TYPE GFCI) ADJACENT TO COOLER & FREEZER UNITS.
MECH-3	ALL MECHANICAL INFORMATION WAS PROVIDED TO ENME, INC. ENME, INC. DID NOT SIZE ANY OF THESE UNITS. ANY QUESTIONS SHALL BE DIRECTED TO THE TENANT'S OR OWNER'S MECHANICAL ENGINEER. ENME, INC. ONLY PROVIDED CIRCUIT INFORMATION FOR UNITS THAT ARE NOTED ON THE DESIGN DOCUMENTS.

#	ELECTRICAL NOTES:
E1	COORDINATE THE EXACT LOCATION OF ALL EQUIPMENT AND DEVICES WITH TENANT/OWNER PRIOR TO ROUGH-IN.
E2	CONTRACTOR SHALL COORDINATE THE EXACT LOCATION AND REQUIREMENTS OF ALL EQUIPMENT WITH EQUIPMENT PROVIDER PRIOR TO ROUGH-IN OR BID. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ELECTRICAL REQUIREMENTS REQUIRED BY EQUIPMENT PROVIDER AND/OR EQUIPMENT DRAWINGS.
E3	ELECTRICAL CONTRACTOR SHALL COORDINATE THE EXACT ELECTRICAL REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. ADJUST CIRCUITS AS REQUIRED. MAJOR CHANGES SHALL BE COORDINATED WITH ELECTRICAL ENGINEER PRIOR TO PURCHASE AND INSTALLATION/ROUGH-IN.
E4	ANY EQUIPMENT INSTALLED THAT IS NOT NOTED IN DETAIL ON THESE DESIGN DOCUMENTS SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR FOR COMPLIANCE AND COORDINATION WITH ELECTRICAL PANEL(S), ETC.

NFPA 70E: TABLE 130.7(C)(15)(A)(b) - PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE CATEGORY	PPE
1	**Arc-Rated Clothing, Minimum Arc Rating of 4 cal/cm^2 (see Note 1)** Arc-rated long-sleeve shirt and pants of arc-rated coverall Arc-rated face shield (see Note 2) or arc flash suit hood Arc-rated jacket, parka, rainwear, or hard hat liner (AN) **Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Heavy duty leather gloves (see Note 3) Leather footwear (AN)
2	**Arc-Rated Clothing, Minimum Arc Rating of 8 cal/cm^2 (see Note 1)** Arc-rated long-sleeve shirt and pants of arc-rated coverall Arc-rated flash suit hood or arc-rated face shield (see Note 2) and arc-rated balaclava Arc-rated jacket, parka, rainwear, or hard hat liner (AN) **Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Heavy duty leather gloves (see Note 3) Leather footwear (AN)
3	**Arc-Rated Clothing, Minimum Arc Rating of 25 cal/cm^2 (see Note 1)** Arc-rated long-sleeve shirt Arc-rated pants (AR) Arc-rated coverall (AR) Arc-rated arc flash suit jacket (AR) Arc-rated arc flash suit pants (AR) Arc-rated arc flash suit hood Arc-rated gloves (see Note 1) Arc-rated jacket, parka, rainwear, or hard hat liner (AN) **Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Leather footwear (AN)
4	**Arc-Rated Clothing Selected so That the System Arc Rating Meets the Required Minimum Arc Rating of 40 cal/cm^2 (see Note 1)** Arc-rated long-sleeve shirt Arc-rated pants (AR) Arc-rated coverall (AR) Arc-rated arc flash suit jacket (AR) Arc-rated arc flash suit pants (AR) Arc-rated arc flash suit hood Arc-rated gloves (see Note 1) Arc-rated jacket, parka, rainwear, or hard hat liner (AN) **Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Leather footwear (AN)

Notes:
(1) Arc rating is defined in Article 100.
(2) Face shields are to have wrap-around guarding to protect not only the face but also the forehead, ears, and neck, or, alternatively, an arc-rated arc flash suit hood is required to be worn.
(3) If rubber insulating gloves with leather protectors are used, additional leather or arc-rated gloves are not required. The combination of rubber insulating gloves with leather protectors satisfies the arc flash protection requirement.

PANEL: PP

PANELBOARD SCHEDULE

CCT NO.	LOAD DESCRIPTION:	BKR SIZE	LOAD VA	PH A	PH B	PH C	LOAD VA	BKR SIZE	LOAD DESCRIPTION:	CCT NO.
1	PANEL "BR"	400A-3P	18348	32508			14160	600A-2P	EXTG. 600A FUSED DISCONNECT ON BUILDING EXTERIOR	2
3			18828		32988		14160			4
5			19152			19152			SPACE	6
7	SPACE			0					SPACE	8
9	SPACE				0				SPACE	10
11	SPACE					0			SPACE	12
13	SPACE			0					SPACE	14
15	SPACE				0				SPACE	16
17	SPACE					0			SPACE	18
19	SPACE			0					SPACE	20
21	SPACE				0				SPACE	22
23	SPACE					0			SPACE	24
			56328	VA			28320	VA		
	TOTAL CONNECTED LOAD PER PHASE:			32508	32988	19152				
								84648	NEW CONNECTED LOAD	
								275	NEW AMPS ON MAX PHASE	
	VOLTAGE: 120/208V, 3-PH, 4W							MOUNTING:	SURFACE, NEMA 3R	
	MAINS: 800A MAIN BREAKER							FEED:	BOTTOM	
	RATING: 800A							DOOR-IN-DOOR	YES	
	AIC: 42K							LOCATION	N.E. BLDG EXTERIOR	
	GND BUS: YES							FED FROM:	UTILITY PADMOUNTED TRANSFORMER	

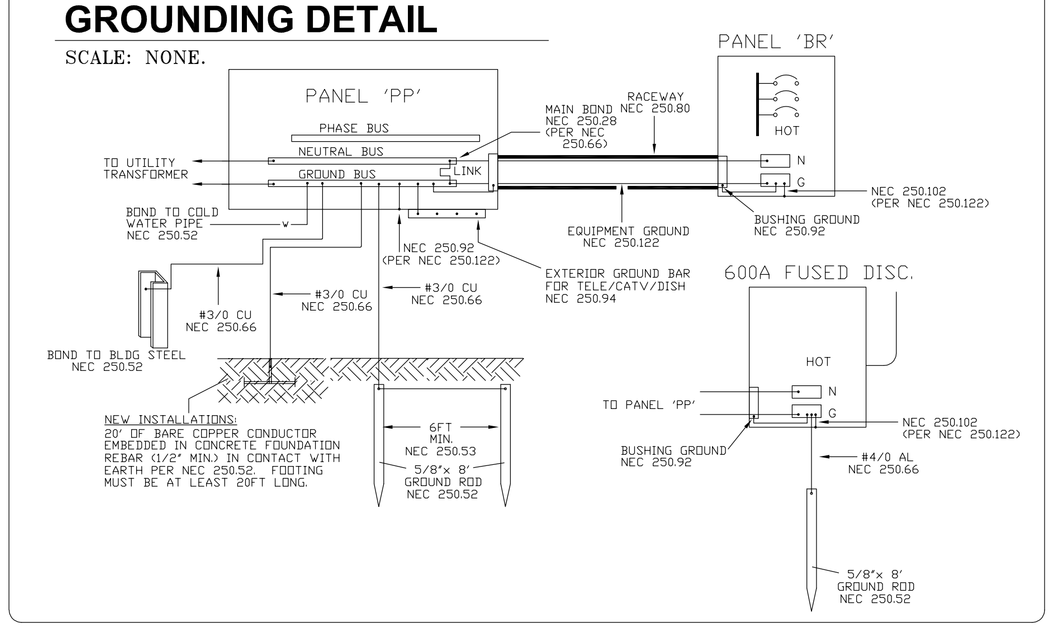
PANEL: BR

PANELBOARD SCHEDULE

CCT NO.	LOAD DESCRIPTION:	BKR SIZE	LOAD VA	PH A	PH B	PH C	LOAD VA	BKR SIZE	LOAD DESCRIPTION:	CCT NO.
1	WALK-IN COOLER	15A-3P	1320	9720			8400	TBD	STILL #1	2
3			1320		9720		8400			4
5			1320			9720	8400			6
7	SMALL COOLER CONDENSING UNIT	15A-3P	1320	1320				TBD	STILL #2 (FUTURE)	8
9			1320		1320					10
11			1320			3720	2400	25A-2P	10X20 FREEZER CONDENSER	12
13	SMALL COOLER EVAPORATOR	20A-1P	240	2640			2400			14
15	SMALL ELECTRIC GLYCOL CHILLER	20A-1P	1920		2988		1068	20A-2P	10X20 FREEZER EVAPORATOR	16
17	VFD PUMP	20A-1P	1656			2724	1068			18
19	AIR COMPRESSOR	20A-1P	1680	3600			1920	20A-2P	10X20 COOLER CONDENSER	20
21	2HP CHILLER	30A-1P	2880		4800		1920			22
23	CHILLER	20A-1P	1920			2988	1068	20A-2P	10X20 COOLERER EVAPORATOR	24
25	SPARE	20A-1P	0	1068			1068			26
27	SPARE	20A-1P	0		0				SPACE	28
29	SPARE	20A-1P	0			0			SPACE	30
31	SPARE	20A-1P	0	0					SPACE	32
33	SPACE				0				SPACE	34
35	SPACE					0			SPACE	36
37	SPACE			0					SPACE	38
39	SPACE				0				SPACE	40
41	SPACE					0			SPACE	42
			18216	VA			38112	VA		
	TOTAL CONNECTED LOAD PER PHASE:			18348	18828	19152				
								56328	NEW CONNECTED LOAD	
								160	NEW AMPS ON MAX PHASE	
	VOLTAGE: 120/208V, 3-PH, 4W							MOUNTING:	SURFACE	
	MAINS: MLO							FEED:	TOP	
	RATING: 400A							DOOR-IN-DOOR	YES	
	AIC: 42K							LOCATION	BREW AREA	
	GND BUS: YES							FED FROM:	PANEL 'PP'	

GROUNDING DETAIL

SCALE: NONE.



EQUIPMENT LIST							
ITEM	DESCRIPTION	QUANTITY	VOLTAGE	AMPERAGE	BREAKER TYPE	CONDUCTOR SIZE	MISC. INFO.
WALK-IN COOLER	8X10 WALK-IN COOLER	1	208V, 3PH	TBD	15A-3P	12 CU	INFO. PROVIDED BY OWNER. VERIFY CIRCUIT INFORMATION WITH MANUFACTURER PRIOR TO PULLING CIRCUIT.
	CHILLER	1	120V, 1PH	TBD	20A-1P	12 CU	INFO. PROVIDED BY OWNER. VERIFY CIRCUIT INFORMATION WITH MANUFACTURER'S SPECIFICATIONS PRIOR TO PULLING CIRCUIT.
	STORAGE COOLER FUTURE WHOLESALE	1	TBD	TBD	TBD	TBD	LARGE BEER KEG & PACKAGE GOODS. CIRCUIT INFORMATION NOT PROVIDED TO ENME, INC.
	STILL #1	1	208V, 3PH	70	TBD	TBD	VERIFY CIRCUIT INFORMATION WITH MANUFACTURER PRIOR TO ROUGH-IN AND PULLING CIRCUIT. ENME, INC. WAS NOT PROVIDED MANUFACTURER SPECS.
	STILL #2	1	208V, 1PH	TBD	TBD	TBD	(2) 3KW HEATING ELEMENTS. CIRCUIT INFORMATION NOT PROVIDED TO ENME, INC.
10X20 FREEZER SECTION	CONDENSING UNIT	1	208V, 1PH	20.00	25A-2P	#12 AWG CU	LARKIN HEATCRAFT, MODEL LHT0141L6BF.
	EVAPORATOR	1	208V, 1PH	8.90	20A-2P	#12 AWG CU	LARKIN HEATCRAFT, MODEL LCE6768B.
10X20 COOLER SECTION	CONDENSING UNIT	1	208V, 1PH	16.00	20A-2P	#12 AWG CU	LARKIN HEATCRAFT, MODEL LHT015X68FM.
	EVAPORATOR	1	208V, 1PH	8.90	20A-2P	#12 AWG CU	LARKIN HEATCRAFT, MODEL LCE6768B.
SMALL CHILLER	ELECTRIC GLYCOL CHILLER	1	120V	16.00	20A-1P	#12 AWG CU	UBC GROUP, MODEL EXTRA 3/4-HP.
VFD PUMP CART	VFD PUMP	1	120V	13.80	20A-1P	#12 AWG CU	BALDOR RELIANCE, CM3541. 3/4HP.
PRIMARY AIR COMPRESSOR	AIR COMPRESSOR	1	120V	14.00	20A-1P	#12 AWG CU	MODEL DC200000.
SMALL COOLER	CONDENSING UNIT	1	208V, 3PH	15.00	15A-3P	#12 AWG CU	LARKIN HEATCRAFT, MODEL MOZD08M63CF.
	EVAPORATOR	1	120V	2.00	20A-1P	#12 AWG CU	LARKIN HEATCRAFT, MODEL LSC070AEQRCSK.
2HP CHILLER	CHILLER	1	120V	24.00	30A-1P	#10 AWG CU	INFO NOT AVAILABLE. VERIFY WITH MANUFACTURER PRIOR TO INSTALLATION.
TBD: "TO BE DETERMINED" INFORMATION NOT AVAILABLE AT THE TIME THE DESIGN WAS COMPLETED. IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO VERIFY CIRCUIT DETAILS WITH MANUFACTURER PRIOR TO ROUGH-IN AND INSTALLATION.							
THE FINAL LOCATION OF ALL EQUIPMENT SHALL BE VERIFIED AND APPROVED BY THE OWNER/ARCHITECT AND THE TYPE OF CONNECTION (RECEPTACLE, DISCONNECT, J-BOX, ETC.) SHALL BE VERIFIED WITH THE MANUFACTURER'S INSTRUCTIONS PRIOR TO ROUGH-IN AND CIRCUITING.							

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ANTONIO R. SANCHEZ JR
NEW MEXICO
16463
LICENSED PROFESSIONAL ENGINEER
01/08/2022

JOB NO:
DATE: 01/08/2022
REV A
REV:

Sheet Title: ONE-LINE DIAGRAM, GROUNDING DETAIL, FAULT CALCS AND ARC FLASH INFO.
Drawn By: AS
Checked By: Antonio R. Sanchez, Jr., PE

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ENME

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US HWY 64
RATON, NEW MEXICO 87740

SHEET NO.
E-102