



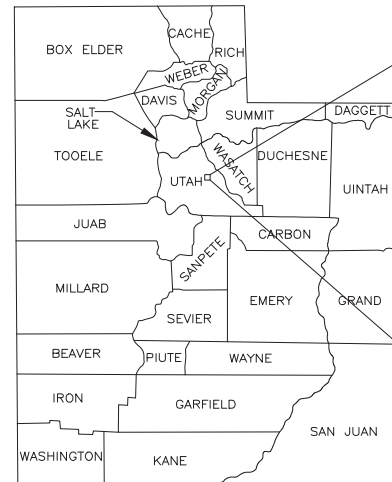
**OREM ECONOMIC DEVELOPMENT**

# CITY OF OREM

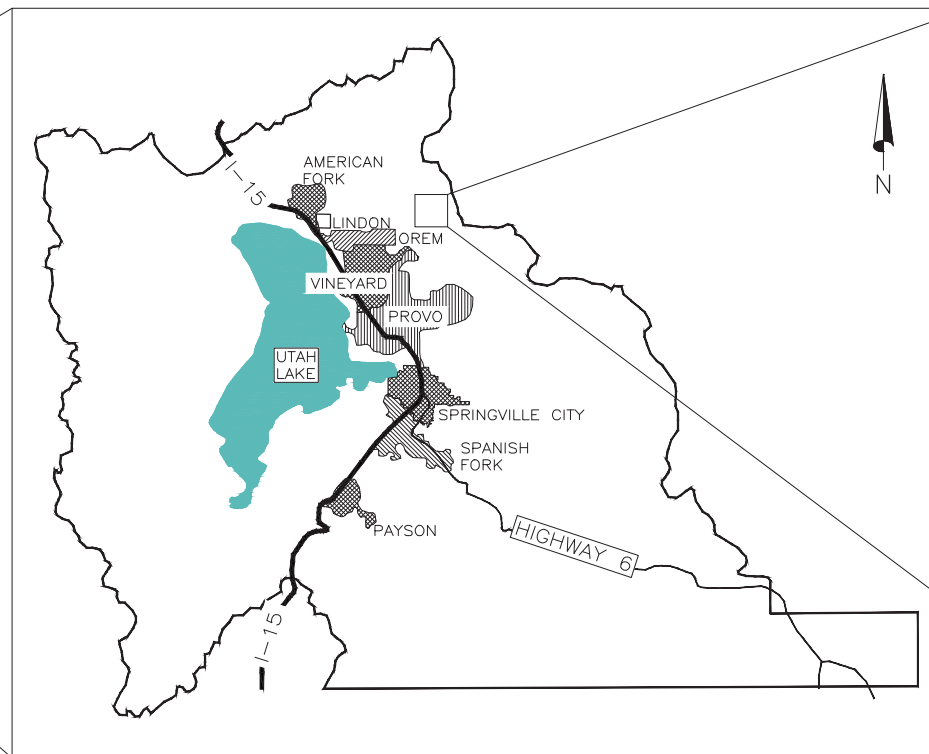
## WELL HOUSE #10

NOVEMBER 2024

RELEASED FOR BIDDING



STATE OF UTAH



VICINITY MAP



PROJECT LOCATION

### HANSEN, ALLEN & LUCE DESIGN TEAM

MARV E. ALLEN, P.E. – PRINCIPAL IN CHARGE  
BENJAMIN D. MINER, P.E. – PROJECT MANAGER/TECH ADVISOR  
JACOB K. NIELSEN, P.E. – PROJECT ENGINEER

ROBERT CONDER, S.E. – STRUCTURAL  
(CONDER ENGINEERING)

KEITH B. HEGERHORST, P.E. – ELECTRICAL  
(HEGERHORST POWER ENGINEERING, INC.)

TAYLOR GROBERG, P.E. – HVAC  
(BLUEFIELD ENGINEERING)

JAY McQUIVEY, P.E. – GEOTECHNICAL ENGINEER  
(AGEC)

### OREM CITY

LANE GRAY – CAPITAL PROJECTS MANAGER  
QUINN FENTON – WATER DIVISION MANAGER  
JEREMY SLATER – WATER SUPPLY FIELD SUPERVISOR

CITY OF OREM ECONOMIC DEVELOPMENT  
56 N STATE STREET  
OREM, UT 84057



859 W. SOUTH JORDAN PKWY,  
STE. 200  
SOUTH JORDAN, UTAH 84095  
(801) 566-5599



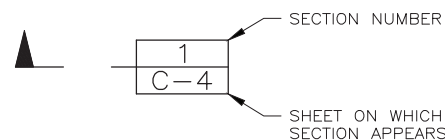
**SECTION, DETAIL & ELEVATION IDENTIFICATION**

**NOTES:**

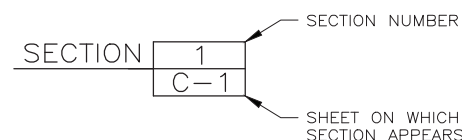
- IF SECTION CUT AND SECTION OR DETAIL CALL-OUT AND DETAIL ARE SHOWN ON SAME SHEET, SHEET NUMBER IS REPLACED BY A LINE.
- DETAIL LETTERS "I" AND "O" NOT USED.

**SECTION IDENTIFICATION**

SECTION CUT ON SHEET C-1:

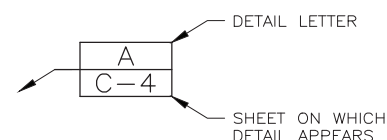


ON SHEET C-4, THIS SECTION IS IDENTIFIED AS:

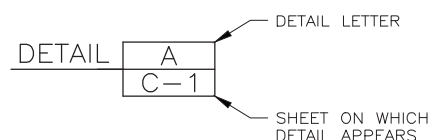


**DETAIL IDENTIFICATION**

DETAIL CALL-OUT ON SHEET C-1:

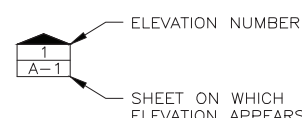


ON SHEET C-4, THIS DETAIL IS IDENTIFIED AS:

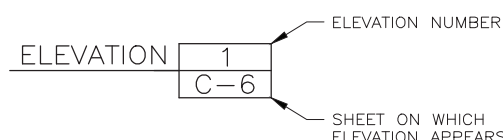


**ELEVATION IDENTIFICATION**

ELEVATION CALL-OUT ON SHEET C-6:



ON SHEET A-1, THIS ELEVATION IS IDENTIFIED AS:



**LEGEND**

**EXISTING**

4-G	EXISTING GAS LINE W/ SIZE
GS	EXISTING GAS SERVICE
10-W	EXISTING WATER LINE W/ SIZE
WS	EXISTING WATER SERVICE
15-SS	EXISTING SANITARY SEWER W/ SIZE
SL	EXISTING SANITARY SEWER LATERAL
24-SD	EXISTING STORM DRAIN W/ SIZE
12-IRR	EXISTING IRRIGATION W/ SIZE
FO-UG	EXISTING FIBER OPTIC LINE
T-UG	EXISTING UNDERGROUND TELEPHONE
C-TV-UG	EXISTING CABLE TV
P-UG	EXISTING UNDERGROUND POWER LINE
P-OH	EXISTING OVERHEAD POWER LINE
X	EXISTING FENCE LINE
TBC	EXISTING TOP BACK OF CURB
LOG	EXISTING LIP OF GUTTER
	EXISTING RAILROAD TRACKS
---	EXISTING PROPERTY LINE
---	EXISTING RIGHT-OF-WAY
///	EXISTING ASPHALT
- - - - -	EXISTING MAJOR CONTOUR
- - - - -	EXISTING MINOR CONTOUR

	EXISTING FIRE HYDRANT		EXISTING SANITARY SEWER MANHOLE
	EXISTING POWER POLE		EXISTING STORM DRAIN MANHOLE
	EXISTING POWER / LIGHT POLE COMBO		EXISTING WATER MANHOLE
	EXISTING LIGHT POLE		EXISTING GAS MANHOLE
	EXISTING GUY WIRE		EXISTING POWER MANHOLE
	EXISTING POWER BOX		EXISTING TELEPHONE MANHOLE
	EXISTING TELEPHONE BOX		EXISTING FIBER OPTICS MANHOLE
	EXISTING FIBER OPTIC BOX		EXISTING IRRIGATION MANHOLE
	EXISTING CABLE BOX		EXISTING WATER METER
	EXISTING SIGNAL POLE		EXISTING SEWER CLEANOUT
	EXISTING SIGNAL / LIGHT POLE COMBO		EXISTING VALVES
	EXISTING SIGNAL BOX		EXISTING REDUCERS
	EXISTING TRAFFIC LOOP		EXISTING SD CATCH BASIN
	EXISTING TRAFFIC BOX		EXISTING SD CATCH BASIN / JUNCTION BOX
	EXISTING IRRIGATION BOX		EXISTING SD JUNCTION BOX
	EXISTING SIGN		EXISTING SD CLEANOUT BOX
	EXISTING TREE		EXISTING SD COMBO CATCH BASIN / CLEANOUT BOX

**CONTROL SYMBOLS**

	EXISTING BENCH MARK		EXISTING SURVEY MONUMENT
	EXISTING HORIZONTAL CONTROL POINT		EXISTING SECTION MONUMENT
	EXISTING VERTICAL CONTROL POINT		GEOTECHNICAL BORING
	EXISTING HORIZONTAL & VERTICAL CONTROL POINT		

**NOTE:**  
SURVEY OF EXISTING RING & COVER IS FROM CENTER OF THE COVER.

**NEW**

	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	NEW UTILITY LINE
	PERMANENT EASEMENT
	CONSTRUCTION EASEMENT
	RIDGE LINE
	GRADE BREAK
	FLOW LINE
	RETAINING WALL

	NEW MANHOLE		NEW WATER VALVE
	NEW STORM DRAIN BOX		NEW GATE VALVE
	NEW INLET BOX		NEW BUTTERFLY VALVE
	NEW FIRE HYDRANT		NEW PLUG VALVE
			NEW CAP

**HATCHING**

	CONCRETE (PLAN)		GRATING
	CONCRETE (SECTION)		EARTH
	GROUT		AGGREGATE
	BRICK (PLAN)		GRAVEL
	CMU (PLAN)		RIPRAP
	CMU (SECTION)		SAND
	STEEL (SECTION)		ASPHALT

**MISCELLANEOUS**

	ROOM NUMBER		FITTING SCHEDULE
	DOOR NUMBER		KEY NOTES
	WINDOW NUMBER		COORDINATE POINT
	METER SCHEDULE		DIAMETER
	PUMP SCHEDULE		ANGLE
	VALVE SCHEDULE		CENTERLINE
	NEW FIRE EXTINGUISHER TYPE (1, 2, 3, OR 4)		
	CATHODIC TEST STATION		

**INDEX OF DRAWINGS**

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C-2	FLOOR PLAN
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C-5	FITTING, METER, PUMP & VALVE SCHEDULE
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C-7	MISCELLANEOUS DETAILS I
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CHEMICAL	
CF-1	CHEMICAL FEED SECTIONS & DETAILS
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S-1	STRUCTURAL NOTES
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S-3	SPECIAL INSPECTION SCHEDULE
S-4	FOOTING & FOUNDATION PLAN
S-5	WALL PLAN
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S-8	ROOFING DETAILS
S-9	NOT USED
S-10	TYPICAL MASONRY DETAILS
S-11	MISCELLANEOUS STRUCTURAL DETAILS I
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E-2.1	SCHEDULES
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H-7	MECHANICAL & PLUMBING SPECIFICATIONS
H-8	MECHANICAL & PLUMBING SPECIFICATIONS

FILE NAME: PROJECTS\119 - OREM\08.100 - WELL #10 WELL HOUSE\CAD\G-2 INDEX - LEGEND & SYMBOLS.DWG  
FILE DATE: 11.6.2024 08:44:43 (BKC)



DESIGNED	JKN	3
DRAFTED	BKC	2
CHECKED	BDM	1
DATE	NOVEMBER 2024	NO.

NO.	DATE	REVISIONS	BY	APVD.

SCALE  
NONE



WELL HOUSE #10  
GENERAL  
DRAWING INDEX, LEGEND & SYMBOLS

SHEET  
G-2  
119.08.100

POWER ONE-LINE SYMBOLS	
	ANTENNA
	EQUIPMENT GROUND CONNECTION
	TRANSFER SWITCH ATS: AUTOMATIC TRANSFER SWITCH MTS: MANUAL TRANSFER SWITCH
	VARIABLE FREQUENCY DRIVE MOTOR CONTROLLER
	FUSED DISCONNECT SWITCH
	NON-FUSED DISCONNECT SWITCH
	COMBINATION STARTER
	MAGNETIC CONTROLLER
	MOTOR (HP SHOWN)
	GENERATOR
	CONDUCTOR WITH CALLOUT REFERENCE (SEE CONDUIT/CONDUCTOR SCHEDULE)
	POWER FACTOR CAPACITOR
	CIRCUIT BREAKER
	POWER FEED
	CONNECTION POINT
	LUG
	DELTA WYE

GENERAL DRAWING SYMBOLS	
	REFERENCE NOTE
	DEMOLITION NOTE
	REVISION NOTE
	IDENTIFICATION NOTE
	PHOTO REFERENCE
	EQUIPMENT REFERENCE
	WIRE SIZE REFERENCE
	PHOTO REFERENCE
	SECTION/ELEVATION REFERENCE
	EQUIPMENT ID TAG

WIRING DEVICES	
	20 AMP RATED RECEPTACLE SINGLE STROKE = SINGLE DOUBLE STROKE = DUPLEX RECEPTACLE MODIFIERS: X-X = CIRCUIT NUMBER AF = ARC FAULT CIRCUIT INTERRUPTER S = SURFACE MOUNTED IG = ISOLATED GROUND WP = WEATHER PROOF
	EXISTING RECEPTACLE
	220V RECEPTACLE
	GFCI RECEPTACLE
	ELECTRICAL CONNECTION
	JUNCTION BOX
	PHOTOELECTRIC CONTROL UNIT
	THERMOSTAT LOCATION
	CARD READER (ENTRY KEY PAD)

LIGHT SWITCHES	
	SINGLE POLE SWITCH
	GANGED SWITCHES IN COMMON BOX WITH COMMON COVER PLATE
	SWITCH SUPERScript MODIFIER, LOWER CASE LETTER INDICATES CIRCUIT CONTROLLER -- a,b,c ETC. MAY BE COMBINED WITH CIRCUIT NUMBER. EXAMPLE: 1a, 3b
	SWITCH SUBSCRIPT MODIFIER, UPPER CASE LETTER OR NUMBER: 2 = DOUBLE POLE 3 = THREE WAY 4 = FOUR WAY K = KEY OPERATED M = HORSEPOWER RATED MANUAL STARTER MC = MOMENTARY CONTACT, THREE POSITION MS = MANUAL (STARTER) OR SWITCH D = DIMMER S = SURFACE F = FLUSH WP = WEATHER PROOF

LIGHTING SYMBOLS	
	DESIGNATES FIXTURE NUMBER -- REFER TO FIXTURE SCHEDULE
	PHOTOCELL
	LED FIXTURES
	SURFACE OR RECESSED 1X4 FIXTURE
	WALL PAK FIXTURE

MOTOR AND EQUIPMENT	
	MOTOR (HP SHOWN)
	FRACTIONAL HORSEPOWER MOTOR
	WEATHERPROOF THERMAL DISCONNECT SWITCH
	MOTOR STARTER, INDIVIDUAL, NOT LOCATED IN A MOTOR CONTROL CENTER (MCC) OR SIMILAR GROUP ASSEMBLY
	COMBINATION MOTOR STARTER ASSEMBLY, NOT LOCATED IN AN MCC OR SIMILAR ASSEMBLY
	MAGNETIC CONTACTOR ASSEMBLY, NOT LOCATED IN AN MCC OR SIMILAR ASSEMBLY
	DISCONNECT, NON-FUSED, 3 POLE, 100A RATED
	FUSED DISCONNECT SWITCH
	FIELD CONNECTION OR ELECTRICAL TERMINATION AT A FIELD DEVICE
	EQUIPMENT DESIGNATION

CONTROL ONE-LINE SYMBOLS	
	ENCLOSURE OR CONTROL PANEL
	HOME RUN TO POWER PANEL "A" CIRCUIT "XX"
	LIGHT A: AMBER LENS G: GREEN LENS R: RED LENS W: WHITE LENS
	COMBINATION MOTOR STARTER F: FUSED BLANK: CIRCUIT BREAKER
	EQUIPMENT IDENTIFICATION TAG
	ELECTRICAL CONNECTION POINT
	SINGLE RECEPTACLE

PLAN SYMBOLS	
	CIRCUIT DISTRIBUTION PANELBOARD SURFACE MOUNTED
	CIRCUIT DISTRIBUTION PANELBOARD RECESSED
	POWER DISTRIBUTION PANELBOARD SURFACE OR FLOOR MOUNTED DOORS DESIGNATE FRONT OF PANEL MDP DESIGNATES MAIN DISTRIBUTION PANEL
	CONTROL PANEL ENCLOSURE
	LIGHTING CONTROL PANEL
	DISCONNECT
	COMBO STARTER/DISCONNECT
HVAC EQUIPMENT	
	UNIT HEATER, WALL MOUNTED
	UNIT HEATER, CEILING MOUNTED
	CONDENSING UNIT, PAD MOUNTED, SIDE DISCHARGE
	CONDENSING UNIT, PAD MOUNTED, UP FLOW
	ROOFTOP MOUNTED EQUIPMENT

CONDUIT AND RACEWAYS	
	RACEWAY OR WIRING SYSTEM IN OR UNDER FLOOR OR CONCEALED IN WALL OR BEHIND STRUCTURE OR EQUIPMENT OR CONDUIT ROUTED BELOW GRADE IN CONCRETE ENCASUREMENT
	FLEX CONDUIT
	RACEWAY OR WIRING SYSTEM ABOVE FLOOR LEVEL BELOW CEILING, EXPOSED
	HOMERUN: DESIGNATIONS INDICATE A ONE-LINE DIAGRAM OR PANELBOARD SCHEDULE REFERENCE
	JUNCTION BOX
	RACEWAY OR WIRING SYSTEM TURNED TOWARD THE VIEWER (UP ON PLAN DRAWINGS)
	RACEWAY OR WIRING SYSTEM TURNED AWAY FROM THE VIEWER (DOWN ON PLAN DRAWINGS)
	RACEWAY OR WIRING SYSTEM CHANGE IN ELEVATION OR DISTANCE FROM VIEWER
	CONDUIT STUB AND CAP

GROUNDING SYMBOLS	
	GROUND ROD (3/4" x 10' COPPER COATED STEEL)
	GROUND ROD (3/4" x 10' COPPER COATED STEEL) IN WELL
	BOLTED GROUND CONNECTION (ABOVE GROUND)
	WELDED GROUND CONNECTION (BELOW GRADE)
	GROUND CONDUCTOR

- GENERAL NOTES:**
- VERIFY ALL EQUIPMENT DIMENSIONS AND LOCATIONS BEFORE BEGINNING ROUGH-IN. CONSULT ALL APPLICABLE CONTRACT DRAWINGS AND SHOP DRAWINGS TO ENSURE NEC CODE CLEARANCE REQUIRED AROUND ALL ELECTRICAL EQUIPMENT.
  - CONTRACTOR SHALL VERIFY ALL ELECTRICAL LOADS (VOLTAGE, PHASE, CONNECTION REQUIREMENTS, ETC.) OF EQUIPMENT FURNISHED BEFORE BEGINNING ROUGH-IN.
  - SEE APPLICABLE SHOP DRAWINGS FOR ROUGH-IN LOCATION OF ALL EQUIPMENT, WIRING DEVICES, ETC.
  - THE ELECTRICAL CONTRACTOR SHALL NOTIFY AND COOPERATE WITH THE MECHANICAL CONTRACTOR SUCH THAT NO PIPING, OR EQUIPMENT FOREIGN TO THE OPERATION OF THE ELECTRICAL EQUIPMENT SHALL BE PERMITTED TO BE INSTALLED IN, ENTER OR PASS THROUGH ELECTRICAL ROOMS OR SPACES; OR ABOVE OR BELOW ELECTRICAL EQUIPMENT IN THE OTHER AREAS.
  - ALL PENETRATIONS OF FLOORS, WALLS AND CEILINGS SHALL BE SEALED WITH APPROVED MATERIAL.
  - FOR PACKAGE EQUIPMENT PROVIDED ON THE PROJECT, SOME CONDUITS AND WIRES ARE SHOWN ON THE DRAWINGS, BUT IT IS EXPECTED THAT SOME ADDITIONAL CONDUITS AND WIRES MAY BE REQUIRED BY EQUIPMENT MANUFACTURERS TO COMPLETE INSTALLATION. IT IS INCUMBENT UPON THE GENERAL CONTRACTOR TO COORDINATE THIS REQUIREMENT WITH HIS SUBCONTRACTORS TO MAKE SURE THAT EQUIPMENT SUPPLIER PROVIDED ALL NECESSARY ELECTRICAL INFORMATION TO ELECTRICAL SUBCONTRACTOR FOR INCLUSION WHETHER SHOWN OR NOT SHOWN ON THE DRAWINGS.
  - IF OTHER THAN FIRST NAMED EQUIPMENT IS USED, IT SHALL BE CAREFULLY CHECKED FOR ELECTRICAL REQUIREMENTS AND CONTROL REQUIREMENTS OF ALTERNATE EQUIPMENT. SHOULD CHANGES OR ADDITIONS OCCUR IN ELECTRICAL WORK, OR THE WORK OF OTHER CONTRACTORS BE REVISED BY THE ALTERNATE EQUIPMENT, THE COST OF ALL CHANGES SHALL BE BORNE BY THE ELECTRICAL CONTRACTOR.

Sheet List Table	
Sheet Number	Sheet Title
E1.1	LEGEND
E1.2	TABLES
E2.1	SCHEDULES
E3.1	POWER ONE-LINE DIAGRAM
E3.2	INST. AND CONTROL ONE-LINE DIAGRAM
E3.3	TYPICAL RVSS CONTROL DIAGRAM
E3.4	CP-1 TYP CONTROL DIAGRAM, SHT. 1
E3.5	CP-1 TYP CONTROL DIAGRAM, SHT. 2
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E6.1	DETAILS, SHT. 1
E6.2	DETAILS, SHT. 2
E6.3	DETAILS, SHT. 3

7/04  
 FILE NAME:  
 FILE DATE:



**HANSEN ALLEN & LOUGHEE ENGINEERS**

DESIGNED KBH	3				SCALE	
DRAFTED KBH	2				NONE	
CHECKED KBH	1					
PROJECT ENGINEER	DATE	JANUARY 2024	NO.	DATE	REVISIONS	BY

**OREM**

WELL HOUSE #10  
 ELECTRICAL  
 LEGEND SHEET  
 E1.1  
 119.08.100

**CONDUIT/CONDUCTOR SCHEDULE  
THHN, THWN, THWN-2**

AMP RATING	DRAWING ID TAG.	CONDUCTOR QTY.*	CONDUCTOR SIZE	MIN. CONDUIT SIZE	EXCEPTIONS
20** 20+	212	2	#12	3/4"	
	312	3		3/4"	
	412	4		3/4"	
30** 30+	20	2	#10	3/4"	
	30	3		3/4"	
	40	4		3/4"	
40** 50+	28	2	#8	3/4"	
	38	3		3/4"	
	48	4		3/4"	
55** 65+	26	2	#6	3/4"	
	36	3		3/4"	
	46	4		3/4"	1"(C9)
70** 85+	24	2	#4	3/4"	1"(C2,C9)
	34	3		1"	3/4"(C4),1-1/4"(C9)
	44	4		1"	1-1/4"(C9)
95** 115+	22	2	#2	1"	
	32	3		1"	1-1/4"(C9)
	42	4		1-1/4"	
110** 130+	21	2	#1	1-1/4"	1"(C3,C4)
	31	3		1-1/4"	1"(C3)
	41	4		1-1/4"	1-1/2"(C2,C9,C10)
150	210	2	1/0	1-1/4"	
	310	3		1-1/4"	1-1/2"(C3,C9)
	410	4		1-1/2"	2"(C9)
175	220	2	2/0	1-1/4"	1-1/2"(C3,C4,C9)
	320	3		1-1/2"	
	420	4		2"	
200	230	2	3/0	1-1/2"	1-1/4"(C4)
	330	3		1-1/2"	2"(C3,C9)
	430	4		2"	
230	240	2	4/0	1-1/2"	2"(C3)
	340	3		2"	
	440	4		2"	2-1/2"(C9)
255	225	2	250 KCMIL	2"	1-1/2"(C4)
	325	3		2"	2-1/2"(C1,C8)
	425	4		2-1/2"	2"(C4)
310	235	2	350 KCMIL	2"	2-1/2"(C9)
	335	3		2-1/2"	2"(C4)
	435	4		3"	2-1/2"(C1,C4)
380	250	2	500 KCMIL	2-1/2"	2"(C4)
	350	3		3"	2-1/2"(C1,C4)
	450	4		3"	3-1/2"(C9)
475	275	2	750 KCMIL	3"	
	375	3		3-1/2"	3"(C1,C7,C8)
	475	4		4"	3-1/2"(C1,C4,C8)

\* CONDUCTOR QUANTITY DOES NOT INCLUDE GROUNDING CONDUCTORS. SEE EQUIPMENT GROUNDING CONDUCTORS FOR WIRE SIZES.

WHERE: C1 = ELECTRICAL METALLIC TUBING      "\*\*\*" = 60°C RATING  
 C2 = ELECTRICAL NON-METALLIC TUBING    "+" = 75°C RATING  
 C3 = FLEXIBLE STEEL CONDUIT  
 C4 = INTERMEDIATE METALLIC CONDUIT  
 C7 = LIQUIDTIGHT FLEXIBLE METAL CONDUIT  
 C8 = RIGID METALLIC CONDUIT  
 C9 = PVC SCHEDULE 80 CONDUIT  
 C10 = PVC SCHEDULE 40 CONDUIT  
 "\*\*\*" = RATED AMPACITY AT 60°C  
 "+" = RATED AMPACITY AT 75°C  
 USE 60°C CONDUCTOR RATING WHEN TERMINATION RATINGS ARE NOT PUBLISHED

**GROUNDING ELECTRODE  
CONDUCTOR SERVICE  
ENTRANCE OR SEPARATELY  
DERIVED SYSTEM**

COPPER CONDUCTOR	WIRE SIZE
#2 OR SMALLER	#8
1 OR 1/0	#6
2/0 OR 3/0	#4
>3/0 THRU 350 KCMIL	#2
>350 KCMIL THRU 600 KCMIL	1/0

**WELL TAG LIST  
HVAC EQUIPMENT**

TAG	DESCRIPTION	LOCATION	POWER SOURCE	SUPPLIED BY	INSTALLED BY
CU-1	CONDENSING UNIT	BUILDING EXTERIOR	H-8,10,12	CONTRACTOR	CONTRACTOR
AH-1	AIR HANDLER	PUMP ROOM	H-14,16,18	CONTRACTOR	CONTRACTOR
EUH-1	ELECTRIC UNIT HEATER	PUMP ROOM	H-1,3,5	CONTRACTOR	CONTRACTOR
EUH-2	ELECTRIC UNIT HEATER	PUMP ROOM	H-7,9,11	CONTRACTOR	CONTRACTOR
EUH-3	ELECTRIC UNIT HEATER	CHLORINE ROOM	H-13,15,17	CONTRACTOR	CONTRACTOR
EUH-4	ELECTRIC UNIT HEATER	PUMP ROOM	H-19,21,23	CONTRACTOR	CONTRACTOR
ML-1	MOTORIZED LOUVER	CHLORINE ROOM	CP-2	CONTRACTOR	CONTRACTOR
EF-1	EXHAUST FAN	CHLORINE ROOM	CP-2	CONTRACTOR	CONTRACTOR

**SWITCHES**

TAG	DESCRIPTION	LOCATION	POWER SOURCE	SUPPLIED BY	INSTALLED BY
ZS-1A	DOOR POSITION SWITCH	W. ROOM VESTIBULE	CP-1	CONTRACTOR	CONTRACTOR
ZS-1B	DOOR POSITION SWITCH	W. ROOM VESTIBULE	CP-1	CONTRACTOR	CONTRACTOR
ZS-2A	DOOR POSITION SWITCH	PUMP ROOM	CP-1	CONTRACTOR	CONTRACTOR
ZS-2B	DOOR POSITION SWITCH	PUMP ROOM	CP-1	CONTRACTOR	CONTRACTOR
ZS-3	DOOR POSITION SWITCH	CHLORINE ROOM	CP-1	CONTRACTOR	CONTRACTOR
ZS-4	HATCH POSITION SWITCH	PUMP ROOM	CP-1	CONTRACTOR	CONTRACTOR
ZS-5A	SYSTEM VALVE (VA-1) POSITION SWITCH	PUMP ROOM	CP-1	CONTRACTOR	CONTRACTOR
ZS-5B	SYSTEM VALVE (VA-1) POSITION SWITCH	PUMP ROOM	CP-1	CONTRACTOR	CONTRACTOR
ZS-6A	WASTE VALVE (VA-4) POSITION SWITCH	PUMP ROOM	CP-1	CONTRACTOR	CONTRACTOR
ZS-6B	WASTE VALVE (VA-4) POSITION SWITCH	PUMP ROOM	CP-1	CONTRACTOR	CONTRACTOR
PSH-1	WELL HIGH DISCHARGE PRESSURE	PUMP ROOM	RVSS-1	CONTRACTOR	CONTRACTOR
LSH-1	FLOOR HIGH WATER LEVEL SWITCH	PUMP ROOM	CP-1	CONTRACTOR	CONTRACTOR

**VALVES**

TAG	DESCRIPTION	LOCATION	POWER SOURCE	SUPPLIED BY	INSTALLED BY
VA-4	WASTE VALVE ACTUATOR	PUMP ROOM	H-26,28,30	CONTRACTOR	CONTRACTOR
VA-1	SYSTEM VALVE ACTUATOR	PUMP ROOM	H-20,22,24	CONTRACTOR	CONTRACTOR
SV-1	OIL-LUBE SOLENOID VALVE	PUMP ROOM	CP-1	CONTRACTOR	CONTRACTOR
SV-2	CHLORINATION SOLENOID VALVE	PUMP ROOM	CP-1	CONTRACTOR	CONTRACTOR

**PUMP AND EQUIPMENT**

TAG	DESCRIPTION	LOCATION	POWER SOURCE	SUPPLIED BY	INSTALLED BY
CP-1	MAIN CONTROL PANEL	PUMP ROOM	L-2	OWNER	CONTRACTOR
CP-2	SMALL MOTOR CONTROL PANEL	PUMP ROOM	L-13	CONTRACTOR	CONTRACTOR
MDP	MAIN DISTRIBUTION PANELBOARD	PUMP ROOM	MSD	CONTRACTOR	CONTRACTOR
MSD	MAIN SERVICE DISCONNECT	BUILDING EXTERIOR	SITE POWER	CONTRACTOR	CONTRACTOR
PNL-H	POWER PANELBOARD	PUMP ROOM	MDP-1	CONTRACTOR	CONTRACTOR
P-1	WELL PUMP MOTOR	PUMP ROOM	RVSS-1	CONTRACTOR	CONTRACTOR
PNL-L	POWER PANELBOARD	PUMP ROOM	XFMR-L	CONTRACTOR	CONTRACTOR
RVSS-1	WELL MOTOR CONTROLLER	PUMP ROOM	MDP-2	CONTRACTOR	CONTRACTOR
XFMR-L	TRANSFORMER L	PUMP ROOM	H-2,4	CONTRACTOR	CONTRACTOR
AL-1	ALARM LIGHT	BUILDING EXTERIOR	CP-1	CONTRACTOR	CONTRACTOR

**INSTRUMENTATION**

TAG	DESCRIPTION	LOCATION	POWER SOURCE	SUPPLIED BY	INSTALLED BY
FE-1	WELL FLOW ELEMENT	PUMP ROOM	FIT-1	CONTRACTOR	CONTRACTOR
FIT-1	WELL FLOW INDICATOR/TRANSMITTER	PUMP ROOM	L-4	CONTRACTOR	CONTRACTOR
LT-1	WELL LEVEL TRANSDUCER	PUMP ROOM	CP-1	CONTRACTOR	CONTRACTOR
TT-1	TEMPERATURE INDICATOR/TRANSMITTER	PUMP ROOM	CP-1	CONTRACTOR	CONTRACTOR
TT-2	TEMPERATURE INDICATOR/TRANSMITTER	CHLORINE ROOM	CP-1	CONTRACTOR	CONTRACTOR
WIT-1A/1B	DUAL CHLORINE WEIGHT SCALE	CHLORINE ROOM	L-10	CONTRACTOR	CONTRACTOR
WE-1A	CHLORINE SCALE 1A WEIGHT ELEMENT	CHLORINE ROOM	WIT-1	CONTRACTOR	CONTRACTOR
WE-1B	CHLORINE SCALE 1B WEIGHT ELEMENT	CHLORINE ROOM	WIT-1	CONTRACTOR	CONTRACTOR
WIT-2A/2B	DUAL CHLORINE WEIGHT SCALE	CHLORINE ROOM	L-14	CONTRACTOR	CONTRACTOR
WE-2A	CHLORINE SCALE 2A WEIGHT ELEMENT	CHLORINE ROOM	WIT-2	CONTRACTOR	CONTRACTOR
WE-2B	CHLORINE SCALE 2B WEIGHT ELEMENT	CHLORINE ROOM	WIT-2	CONTRACTOR	CONTRACTOR
ASH-1	CHLORINE GAS DETECTOR	PUMP ROOM	L-6	CONTRACTOR	CONTRACTOR
AE-1	CHLORINE GAS PROBE	PUMP ROOM	ASH-1	CONTRACTOR	CONTRACTOR
PT-1	SYSTEM PRESSURE TRANSMITTER	PUMPL ROOM	CP-1	CONTRACTOR	CONTRACTOR

**EQUIPMENT GROUNDING  
CONDUCTORS**

FUSE OR CB SIZE	SIZE (COPPER)
15	14
20	12
30	10
40	10
60	10
100	8
200	6
300	4
400	3
500	2
600	1
800	1/0
1000	2/0
1200	3/0
1600	4/0
2000	250
2500	350

**FIXTURE SCHEDULE**

TYPE	DESCRIPTION	MANUFACTURER		FIX VA	LAMP	LUMENS	KELVIN	MOUNTING	NOTES:
		NAME	CATALOG NO.						
F1	4' LED ENCLOSED INDUSTRIAL, FIBERGLASS HOUSING, DAMP LOCATION, MVOLT	METALUX	4VT2-LD5-11-DR-W-UNV-L840-CD-1-U	82.4	LED	11000	4000	SURFACE	
F2	4' LED ENCLOSED INDUSTRIAL, FIBERGLASS HOUSING, DAMP LOCATION, MVOLT	METALUX	4VT2-LD5-6-DR-W-UNV-L840-CD-1-U	52	LED	6000	4000	SURFACE	
F3	LED WALL MOUNTED FULL CUTOFF MINI AREA WALL PACK FOR WET LOCATIONS	LUMARK	XTOR2B-W-PC1	18	LED	1472	4000	WALL	1)

NOTES: 1) BUILT-IN PHOTOCELL

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 HPE PROJECT:21.122  
 FOR INFORMATION ABOUT THIS JOB, PLEASE CONTACT: KEITH HEGERHORST ©2024

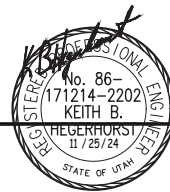
**GENERAL NOTES:**

1. NOT USED.

**SHEET KEYNOTES:**

1. NOT USED.

7/04



DESIGNED KBH	3
DRAFTED KBH	2
CHECKED KBH	1
DATE JANUARY 2024	NO.

NO.	DATE	REVISIONS	BY	APVD.

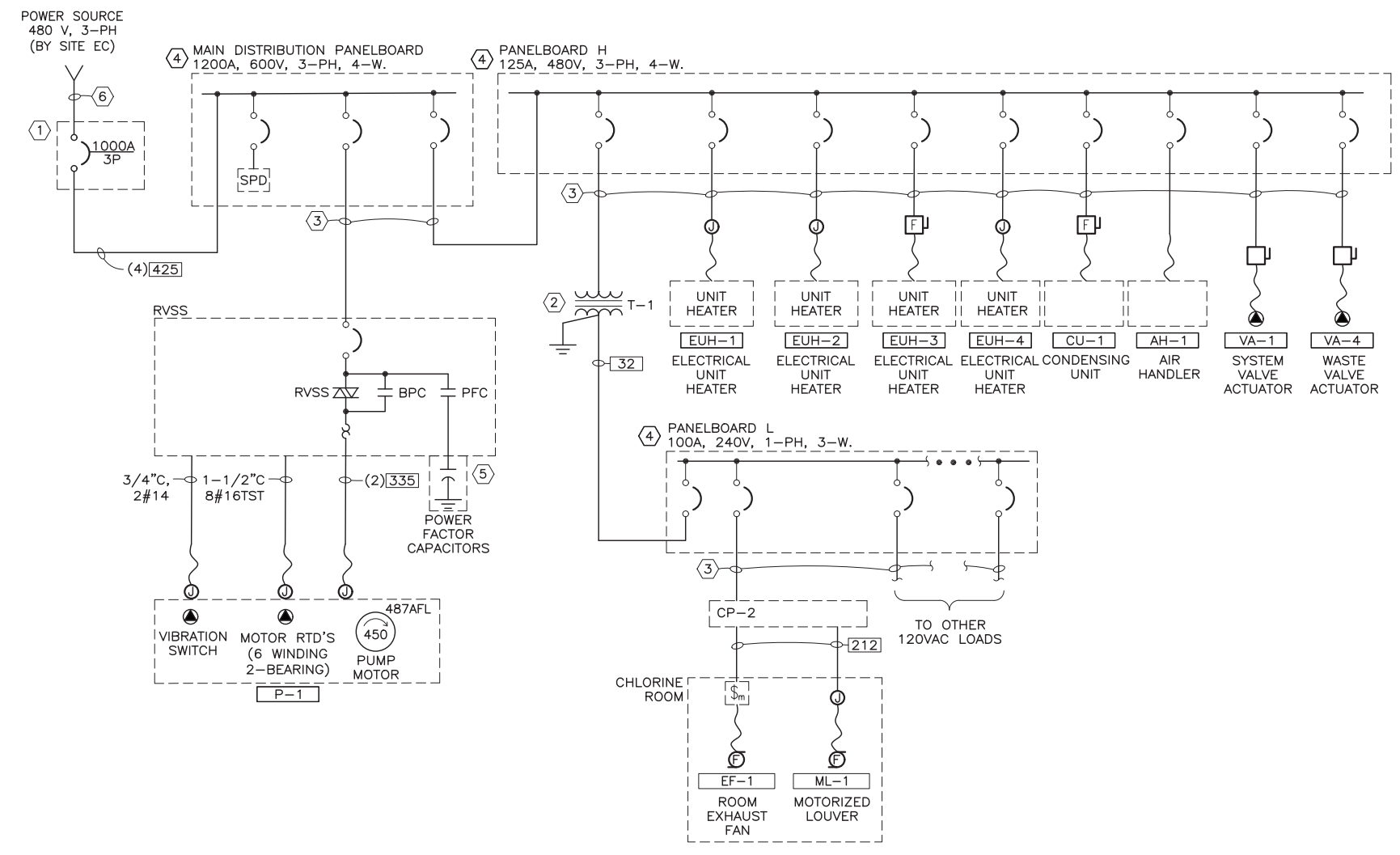
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WELL HOUSE #10  
ELECTRICAL  
TABLES

SHEET  
E1.2  
119.08.100





POWER ONE-LINE DIAGRAM

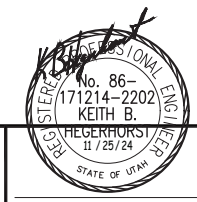
GENERAL NOTES:

1. REFER TO CONDUIT/CONDUCTOR TABLE FOR WIRE AND CONDUIT REQUIREMENTS.
2. REFER TO ELECTRICAL PLANS FOR ELECTRICAL EQUIPMENTS LOCATIONS.
3. REFER TO THE ELECTRICAL UTILITY INSTALLATION TABLE FOR CONTRACTOR AND UTILITY RESPONSIBILITIES.

SHEET KEYNOTES:

1. MAIN SERVICE DISCONNECT: 480VAC, 1000A, 3-POLE CIRCUIT BREAKER IN NEMA 3R ENCLOSURE. LABEL AS "MAIN SERVICE DISCONNECT" AND AS REQUIRED BY NEC 110.24.
2. TRANSFORMER T-1: 10 KVA, 480VAC PRIMARY, 240/120V SECONDARY.
3. REFER TO PANELBOARD SCHEDULE FOR WIRE IDENTIFICATION.
4. REFER TO PANELBOARD SCHEDULES FOR CIRCUIT ID, THEN THE WIRE/CONDUIT REQUIREMENTS ARE IN THE CONDUIT/CONDUCTOR TABLE ON E1.2.
5. CONTRACTOR MAY LOCATE POWER FACTOR CORRECTION CAPACITORS ON TOP OF THE MOTOR CONTROLLER.
6. REFER TO TANK/BOOSTER/WELL SITE PLAN FOR WIRE AND CONDUIT REQUIREMENTS.

FILE NAME:  
FILE DATE:



PROJECT ENGINEER

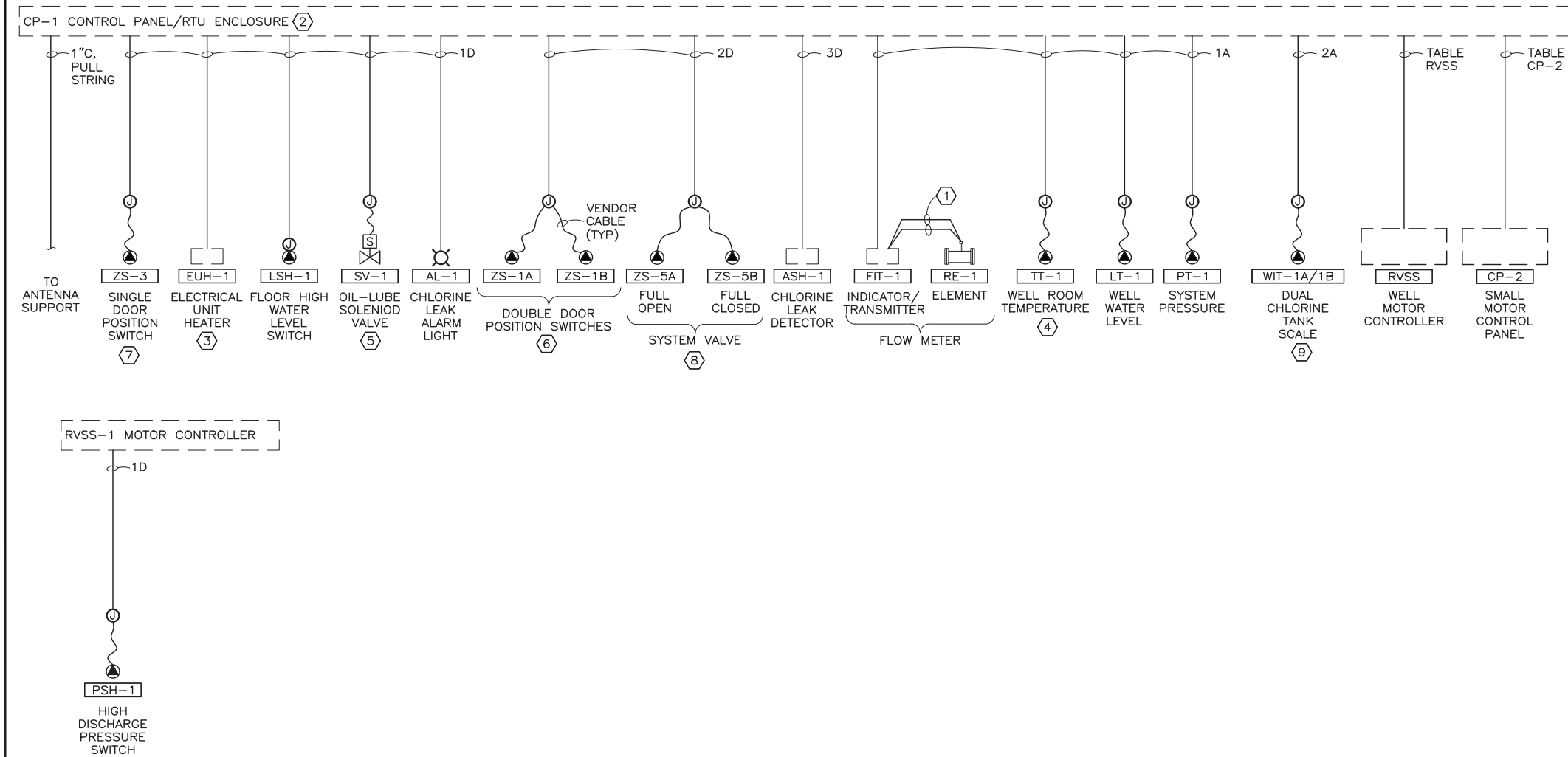
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DRAFTED	KBH	2			
CHECKED	KBH	1			
DATE	JANUARY 2024	NO.	DATE	REVISIONS	BY APVD.

SCALE  
NONE



WELL HOUSE #10  
ELECTRICAL  
POWER ONE-LINE DIAGRAM

SHEET  
E3.1  
119.08.100



**INSTRUMENTATION AND CONTROL  
 ONE-LINE DIAGRAM**

**GENERAL NOTES:**

- INSTRUMENTS AND CONTROL DEVICES SHOWN ON E2.2. HVAC EQUIPMENT SHOWN ON E2.4.
- FOR WIRE AND CONDUIT REQUIREMENTS, REFER TO THE TABLES ON THIS SHEET.

**SHEET KEYNOTES:**

- CABLE SUPPLIED WITH FLOW METER. VERIFY CONDUIT SIZE WITH SUPPLIER PRIOR TO ROUGH-IN. DO NOT COMBINE SIGNAL AND DATA CABLE IN THE SAME CONDUIT.
- CP-1 PROVIDED BY OWNER AND INSTALLED BY CONTRACTOR. CP-1 TERMINATIONS BY CONTRACTOR AS REQUIRED BY OWNER. CP-1 PLC I/O LIST PROVIDED ON E5.1 AND PLC PROGRAMMED BY OWNER.
- SHOWN FOR ELECTRICAL UNIT HEATER EUH-1. DUPLICATE FOR ELECTRICAL UNIT HEATER EUH-2, EUH-3 AND EUH-4.
- SHOWN FOR WELL ROOM TEMPERATURE TRANSMITTER TT-1. DUPLICATE FOR CHLORINE ROOM TEMPERATURE TRANSMITTER TT-2.
- SHOWN FOR PRE-LUBE SOLENIOD VALVE SV-1. DUPLICATE FOR CHLORINE SYSTEM SOLENIOD VALVE SV-2.
- SHOWN FOR DOUBLE DOOR POSITION SWITCHES ZS-1A/1B. DUPLICATE FOR DOUBLE DOOR POSITION SWITCHES ZS-2A/2B.
- SHOWN FOR SINGLE DOOR SWITCH ZS-3. DUPLICATE FOR ROOF HATCH POSITION SWITCH ZS-4.
- SHOWN FOR SYSTEM VALVE VA-1 POSITION SWITCHES ZS-5A/5B. DUPLICATE FOR WASTE VALVE VA-4 POSITION SWITCHES ZS-6A/6B.
- SHOWN FOR WEIGHT SCALE 1A/1B. DUPLICATE FOR WEIGHT SCALE 2A/2B.

**I&C WIRE/CONDUIT TABLE**

IDENT.	CONDUIT SIZE	CONDUCTOR QTY	CONDUCTOR SIZE	SIGNAL DESCRIPTION
1A	3/4"	1	#18TSP	1 ANALOG SIGNAL
2A	3/4"	2	#18TSP	2 ANALOG SIGNALS
3A	3/4"	3	#18TSP	3 ANALOG SIGNALS
IDENT.	CONDUIT SIZE	CONDUCTOR QTY	CONDUCTOR SIZE	SIGNAL DESCRIPTION
1D	3/4"	2	#14	1 SIGNAL
2D	3/4"	3	#14	1 COMMON, 2 DISCRETE SIG.
3D	3/4"	4	#14	VARIES
4D	3/4"	5	#14	VARIES

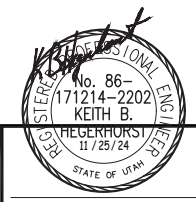
**TABLE RVSS (CP-1 TO RVSS)**

CONDUIT SIZE	CONDUCTOR QTY	CONDUCTOR SIZE	SIGNAL DESCRIPTION
1"	1	#14	COMMON INPUT
	1	#14	COMMON OUTPUT
	1	#14	MOTOR HIGH TEMP ALARM
	1	#14	MOTOR HIGH VIBRATION
	1	#14	WELL BACKSPIN TIME DELAY
	1	#14	WELL COMMAND RUN
	1	#14	WELL HIGH PRESS. SHUTDOWN
	1	#14	WELL LOW LEVEL SHUTDOWN
	1	#14	WELL PUMP RUNNING
	1	#14	WELL RVSS FAULT
	1	#14	WELL RVSS IN AUTO
	1	#14	WELL RVSS IN HAND
	4	#14	SPARE
3/4"	1	CAT 6U	POWER MONITOR
3/4"	1	PS	SPARE W/PULL STRING

**TABLE CP2 (CP-1 TO CP-2)**

CONDUIT SIZE	CONDUCTOR QTY	CONDUCTOR SIZE	SIGNAL DESCRIPTION
3/4"	1	#14	COMMON INPUT
	1	#14	COMMON OUTPUT
	1	#14	EF-1 COMMAND RUN
	1	#14	EF-1 HOA IN AUTO
	1	#14	EF-1 HOA IN HAND
	1	#14	EF-1 RUNNING
	4	#14	SPARE

FILE NAME:  
 FILE DATE:



**HANSEN ALLEN & LUCE ENGINEERS**  
 PROJECT ENGINEER

DESIGNED KBH 3  
 DRAFTED KBH 2  
 CHECKED KBH 1  
 DATE: JANUARY 2024 NO. DATE

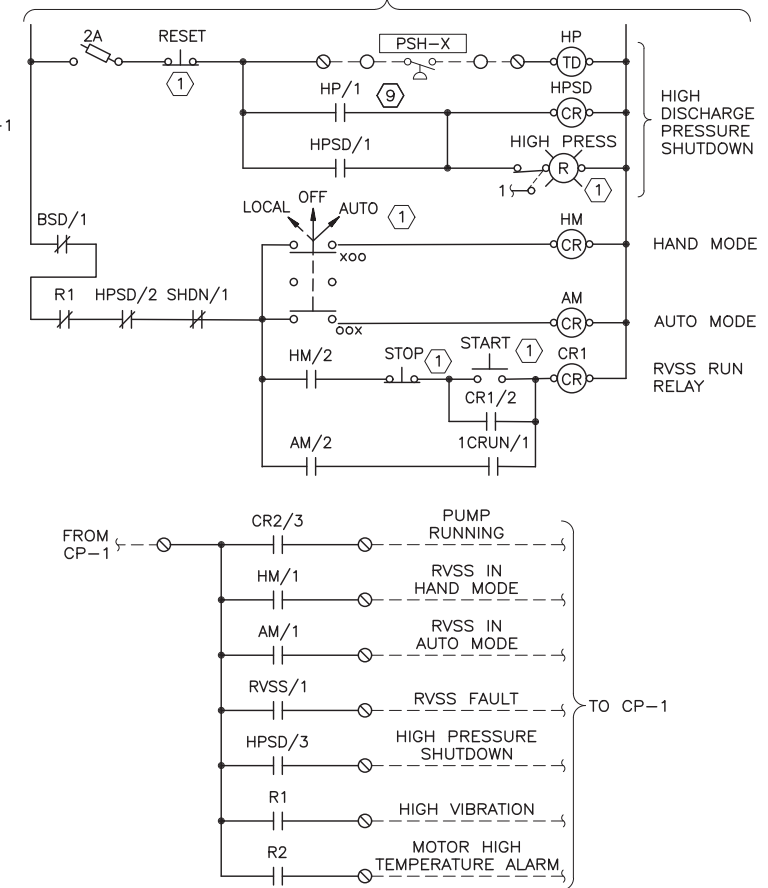
NO.	DATE	REVISIONS	BY	APVD.

SCALE: NONE

WELL HOUSE #10  
 ELECTRICAL  
 INST. AND CONTROL ONE-LINE DIAGRAM

SHEET E3.2  
 119.08.100

CONTINUED FROM LOWER LEFT COLUMN



TYPICAL RVSS WIRING DIAGRAM

TERMINAL LEGEND:

- CP-1 MAIN CONTROL PANEL.
- ▣ CP-2 SMALL MOTOR CONTROL PANEL
- RVSS MOTOR CONTROLLER
- FIELD TERMINAL

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GENERAL NOTES:

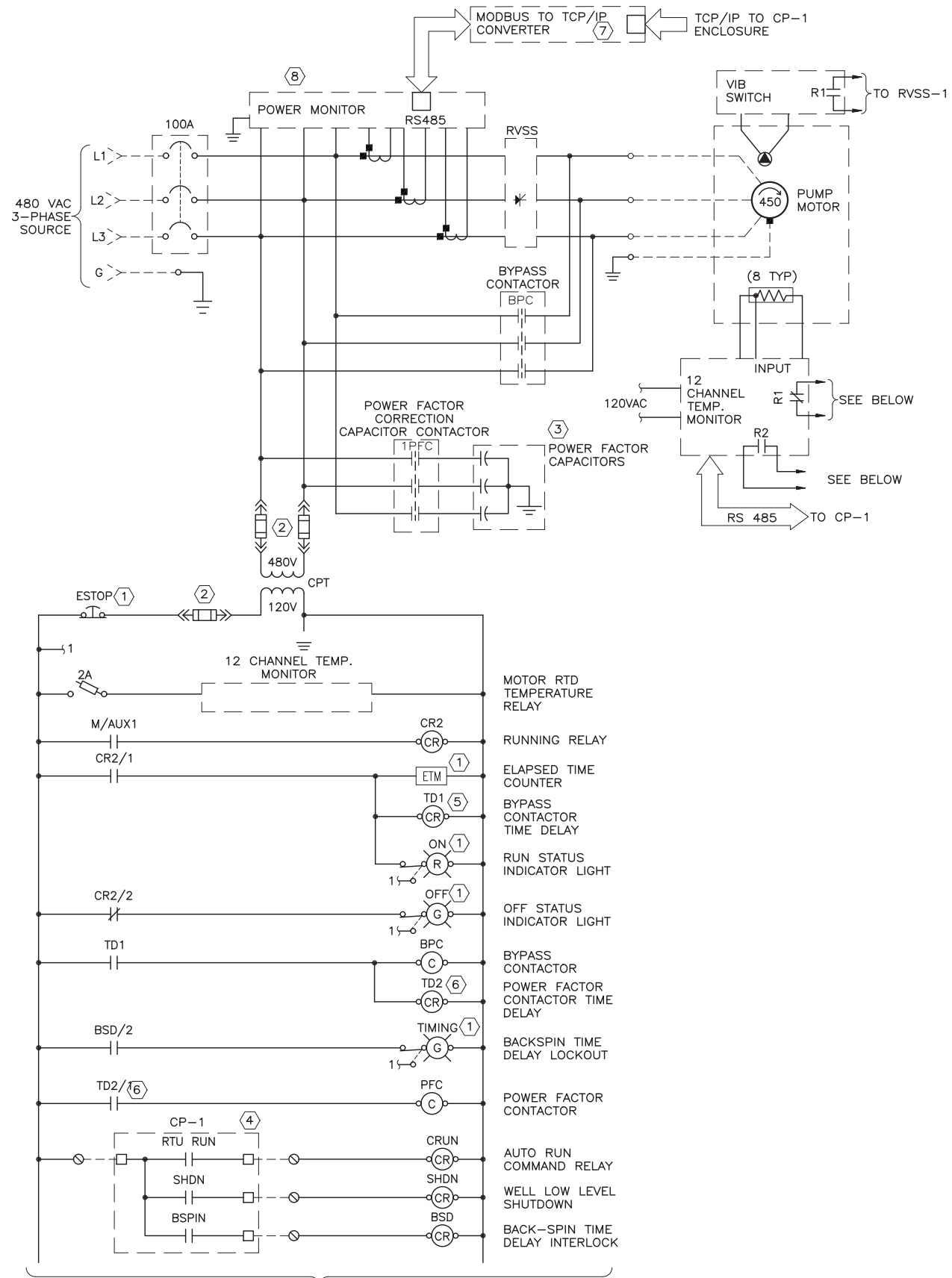
1. THIS IS A TYPICAL WIRING DIAGRAM. CONTRACTOR SHALL MODIFY AS REQUIRED FOR THE RVSS AND OTHER COMPONENTS PROVIDED.
2. CONTRACTOR SHALL PROVIDE TERMINAL, WIRE AND OVERCURRENT DEVICE NUMBERS AS REQUIRED.
3. THE RVSS SHALL STOP ON WELL LOW LEVEL.

SHEET KEYNOTES:

1. DEVICE SHALL BE LOCATED ON ENCLOSURE DOOR AVAILABLE TO THE OPERATOR.
2. FUSES SIZED BY EQUIPMENT MANUFACTURER.
3. POWER FACTOR CAPACITORS MAY BE INSTALLED ON THE TOP OF THE RVSS MOTOR CONTROLLER ENCLOSURE.
4. DEVICE LOCATED IN CP-1. COORDINATE WITH THE PANEL MANUFACTURER FOR RELAY INFORMATION.
5. TIME DELAY MAY BE PROVIDED WITH THE RVSS MOTOR CONTROLLER. MODIFY AS REQUIRED.
6. POWER FACTOR CAPACITORS SHALL BE ENERGIZED AFTER THE PUMP IS RUNNING ON THE BYPASS CONTACTOR. TYPICAL TIME DELAY 5 SECONDS.
7. PROVIDE AN RS485 TO ETHERNET CONVERTER AND POWER SUPPLY AS REQUIRED.
8. POWER MONITOR SHOWN WITHOUT FUSING. CONTRACTOR SHALL PROVIDE FUSING AS REQUIRED BY MANUFACTURER.
9. CONTACTS TO CLOSE AFTER 3 SECOND DELAY.

TABLE RVSS (CP-1 TO RVSS)

CONDUIT SIZE	CONDUCTOR QTY	CONDUCTOR SIZE	SIGNAL DESCRIPTION
1"	1	#14	COMMON INPUT
	1	#14	COMMON OUTPUT
	1	#14	MOTOR HIGH TEMP ALARM
	1	#14	MOTOR HIGH VIBRATION
	1	#14	WELL BACKSPIN TIME DELAY
	1	#14	WELL COMMAND RUN
	1	#14	WELL HIGH PRESS. SHUTDOWN
	1	#14	WELL LOW LEVEL SHUTDOWN
	1	#14	WELL PUMP RUNNING
	1	#14	WELL RVSS FAULT
	1	#14	WELL RVSS IN AUTO
	1	#14	WELL RVSS IN HAND
	4	#14	SPARE
	3/4"	1	CAT 6U
3/4"	1	PS	SPARE W/PULL STRING



CONTINUED TOP RIGHT COLUMN



FILE NAME:  
FILE DATE:



DESIGNED KBH 3  
 DRAFTED KBH 2  
 CHECKED KBH 1  
 DATE JANUARY 2024 NO. DATE

NO.	DATE	REVISIONS	BY	APVD.

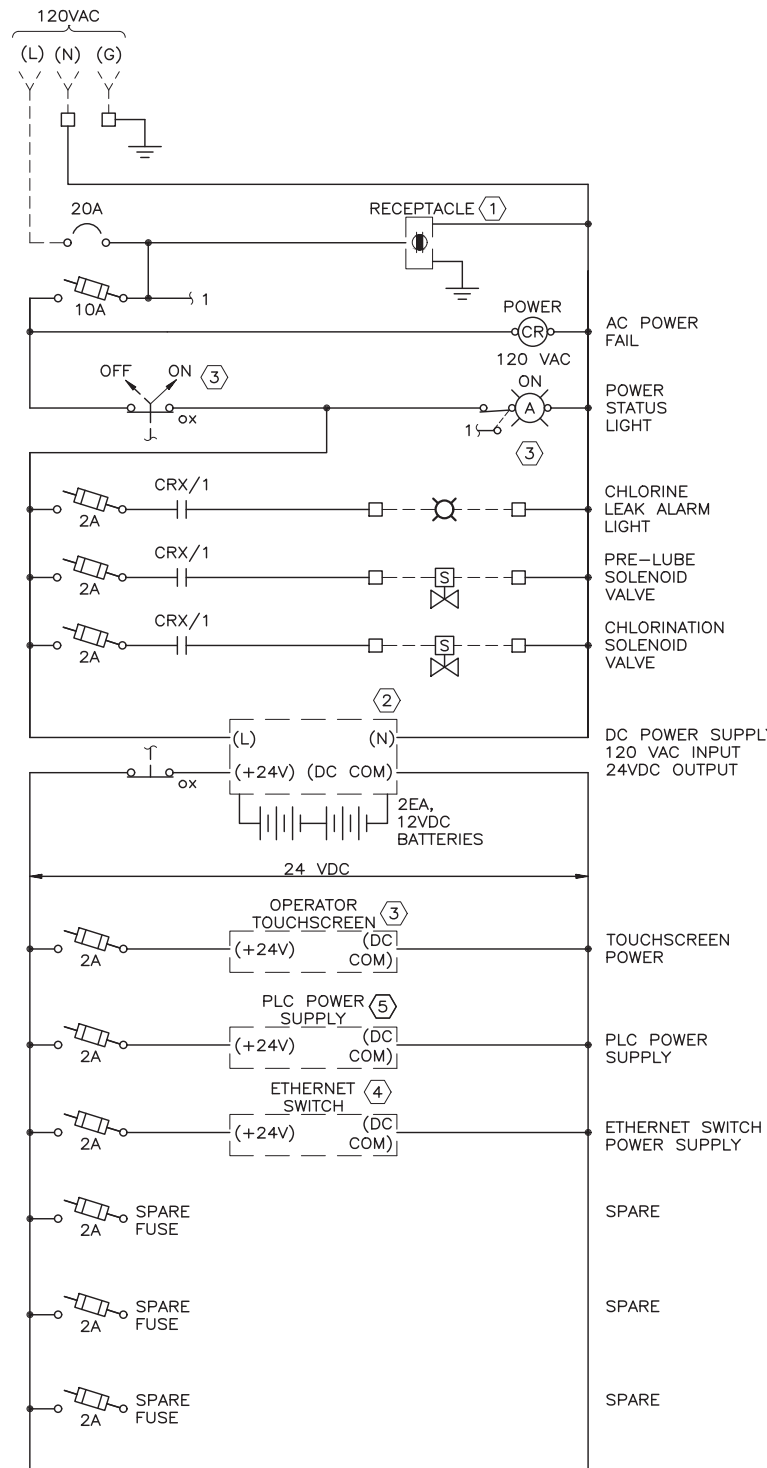
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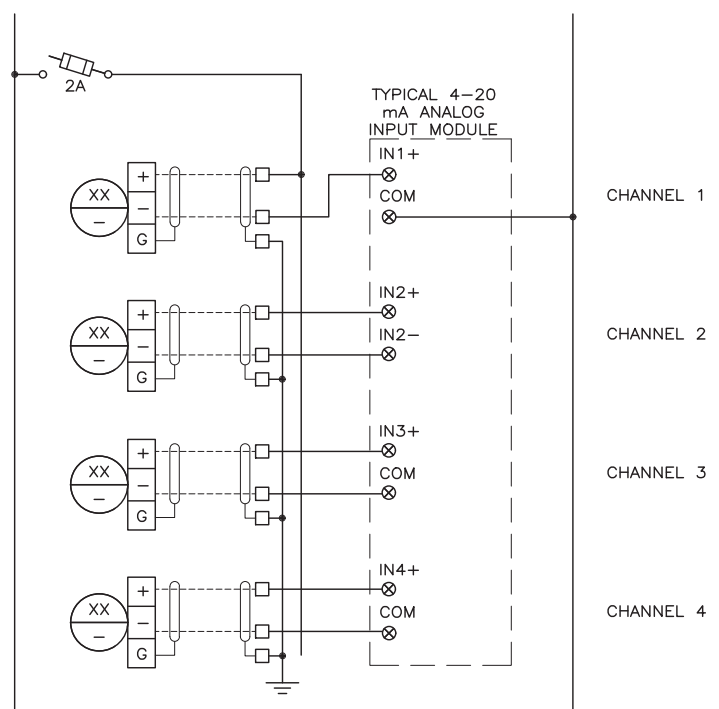
WELL HOUSE #10  
 ELECTRICAL  
 TYPICAL RVSS CONTROL DIAGRAM

SHEET  
E3.3  
119.08.100

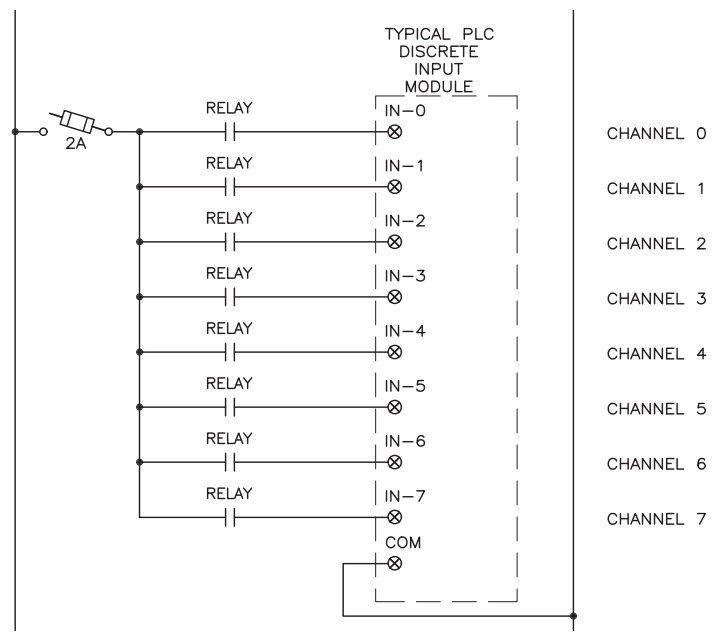




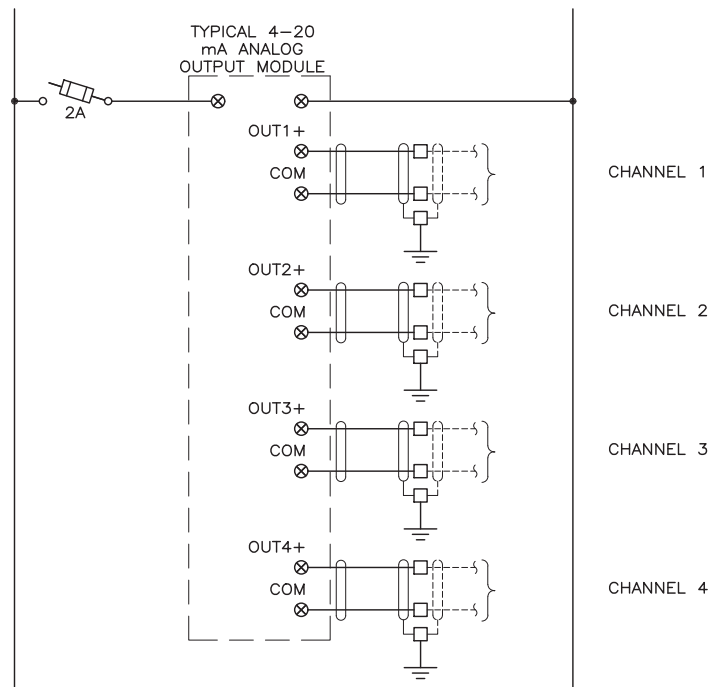
TYPICAL POWER LOGIC WIRING



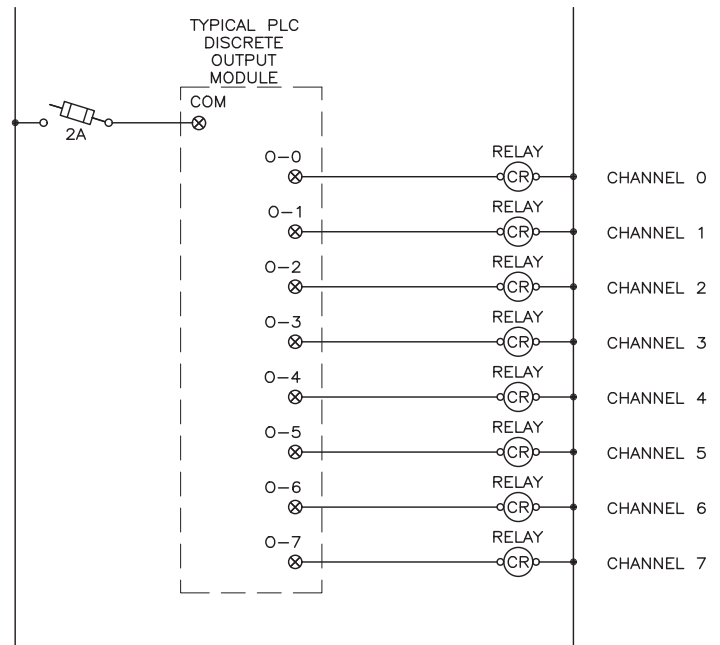
TYPICAL ANALOG INPUT MODULE WIRING



TYPICAL DISCRETE INPUT MODULE WIRING



TYPICAL ANALOG OUTPUT MODULE WIRING



TYPICAL DISCRETE OUTPUT MODULE WIRING

**GENERAL NOTES:**

1. THIS DIAGRAM IS TYPICAL AND INDICATES THE BASIC CONTROL PANEL CONTROL DIAGRAM. THE CONTRACTOR SHALL MODIFY AS REQUIRED FOR THE DEVICES AND PLC MODULES USED. FOUR OR EIGHT CHANNEL MODULES HAVE BEEN SHOWN. PROVIDED MULTI-CHANNEL I/O MODULES AS REQUIRED.
2. OWNER SHALL PREPARE A CONTROL DIAGRAM, INCLUDING WIRE, FUSE AND TERMINAL NUMBERS AS REQUIRED. THE PLC I/O SHOWN IS GENERIC.

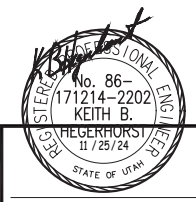
**SHEET KEYNOTES:**

1. PROVIDE A DUPLEX GFCI RECEPTACLE IN THE ENCLOSURE.
2. PROVIDE A 120VAC:24VDC POWER SUPPLY/BATTERY CHARGER COMPLETE WITH BATTERY CAPACITY TO PROVIDE 2 HOURS OF PANEL OPERATION UPON THE LOSS OF UTILITY POWER OR PROVIDE 120VAC UNINTERRUPTIBLE POWER SUPPLY.
3. DEVICE SHALL BE INSTALLED IN THE ENCLOSURE DOOR AND AVAILABLE TO THE OPERATOR.
4. OWNER TO PROVIDE A MULT-PORT ETHERNET SWITCH AS REQUIRED. PROVIDE A MINIMUM OF 2 SPARE PORTS.

**TERMINAL LEGEND:**

- CP-1 MAIN CONTROL PANEL.
- ▣ CP-2 SMALL MOTOR CONTROL PANEL
- ⊗ RVSS MOTOR CONTROLLER
- FIELD TERMINAL

FILE NAME:  
FILE DATE:



DESIGNED	KBH	3									
DRAFTED	KBH	2									
CHECKED	KBH	1									
DATE	JANUARY 2024	NO.		DATE		REVISIONS		BY	APVD.		

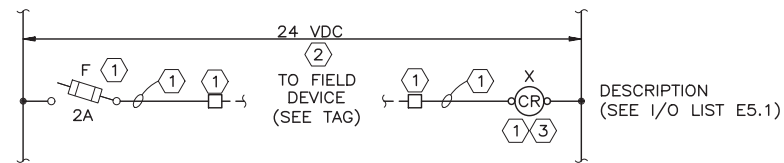
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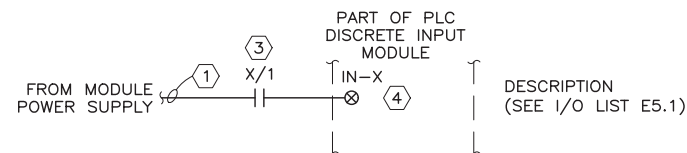
WELL HOUSE #10  
 ELECTRICAL  
 CP-1 TYP CONTROL DIAGRAM, SHT. 1

**NOTES:**

1. CONTRACTOR SHALL ASSIGN FUSE, RELAY, TERMINAL AND WIRE NUMBERS AS REQUIRED.
2. CONTRACTOR MAY COMBINE CONDUCTORS IN COMMON CONDUIT TO DEVICES IN SAME PROXIMITY.
3. PROVIDE AN INTERPOSING RELAY AND WIRE RELAY CONTACT TO PLC INPUT AS INDICATED.
4. CONTRACTOR SHALL ASSIGN PLC MODULE AND CHANNEL.



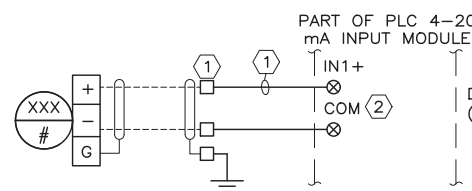
**INTERPOSE RELAY LOGIC**



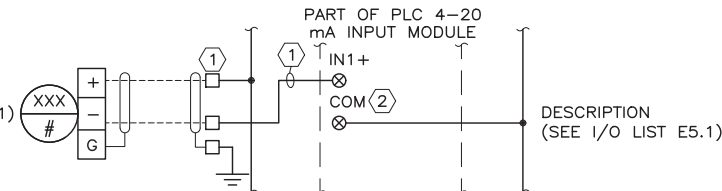
**PLC DISCRETE INPUT LOGIC**

**NOTES:**

1. CONTRACTOR SHALL ASSIGN FUSE, RELAY, TERMINAL AND WIRE NUMBERS AS REQUIRED.
2. CONTRACTOR SHALL ASSIGN PLC MODULE AND CHANNEL.



**PLC ANALOG INPUT TYPE 1**



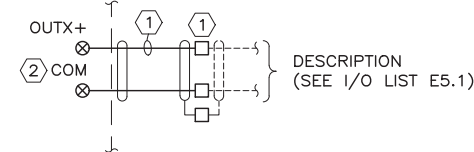
**PLC ANALOG INPUT TYPE 2**

**TYPICAL INPUT AND OUTPUT SIGNAL WIRING**

**NOTES:**

1. CONTRACTOR SHALL ASSIGN FUSE, RELAY, TERMINAL AND WIRE NUMBERS AS REQUIRED.
2. CONTRACTOR SHALL ASSIGN PLC MODULE AND CHANNEL.

PART OF PLC 4-20 mA OUTPUT MODULE

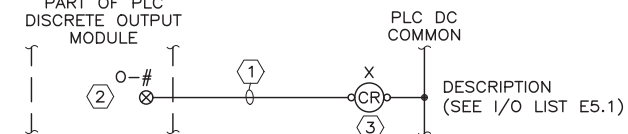


**PLC ANALOG OUTPUT**

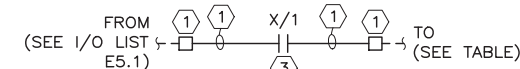
**NOTES:**

1. CONTRACTOR SHALL ASSIGN FUSE, RELAY, TERMINAL AND WIRE NUMBERS AS REQUIRED.
2. CONTRACTOR SHALL ASSIGN PLC MODULE AND CHANNEL.
3. PROVIDE AN INTERPOSING RELAY AND WIRE RELAY CONTACT TO PLC INPUT AS INDICATED.

PART OF PLC DISCRETE OUTPUT MODULE



**PLC DISCRETE OUTPUT LOGIC**



**INTERPOSE RELAY LOGIC**

**GENERAL NOTES:**

1. REFER TO E-2.4 FOR GENERAL NOTES.

**SHEET KEYNOTES:**

1. KEYNOTES ARE SHOWN IN EACH DIAGRAM.

FILE NAME:  
FILE DATE:



DESIGNED	KBH	3							
DRAFTED	KBH	2							
CHECKED	KBH	1							
DATE	JANUARY 2024	NO.		DATE		REVISIONS		BY	APVD.

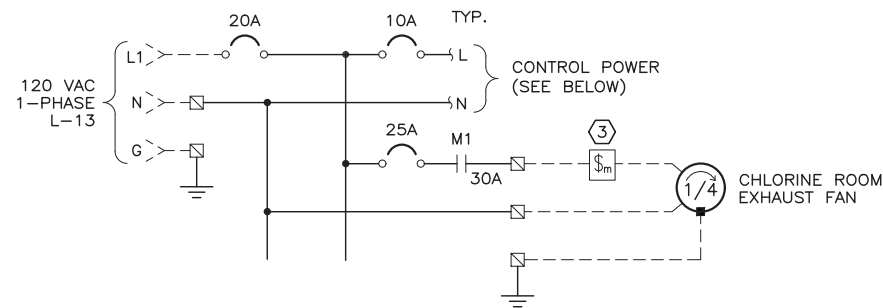
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WELL HOUSE #10  
ELECTRICAL  
CP-1 TYP CONTROL DIAGRAM, SHT. 2

SHEET  
E3.5

119.08.100



**TERMINAL LEGEND:**

- CP-1 MAIN CONTROL PANEL.
- ▣ CP-2 SMALL MOTOR CONTROL PANEL
- ⊙ RVSS MOTOR CONTROLLER
- FIELD TERMINAL

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**GENERAL NOTES:**

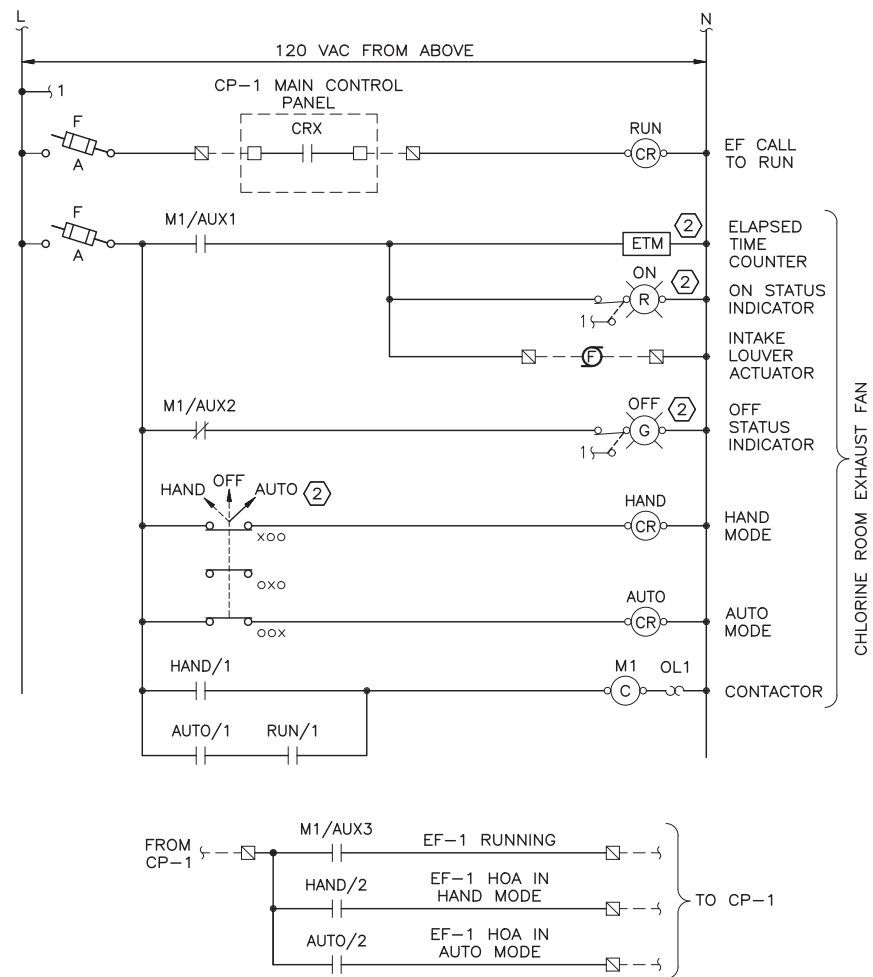
- REFER TO E5.2 FOR TYPICAL ENCLOSURE ARRANGEMENT.
- CONTRACTOR SHALL PROVIDE FUSE, TERMINAL AND WIRE NUMBERS AS REQUIRED.
- DIAGRAM IS CONCEPTUAL AND SHALL BE MODIFIED FOR THE PROVIDED DEVICES.

**TABLE CP2 (CP-1 TO CP-2)**

CONDUIT SIZE	CONDUCTOR		SIGNAL DESCRIPTION
	QTY	SIZE	
3/4"	1	#14	COMMON INPUT
	1	#14	COMMON OUTPUT
	1	#14	EF-1 COMMAND RUN
	1	#14	EF-1 HOA IN AUTO
	1	#14	EF-1 HOA IN HAND
	1	#14	EF-1 RUNNING
	4	#14	SPARE

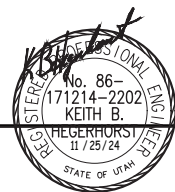
**SHEET KEYNOTES:**

- FUSE RATINGS DETERMINED BY CONTRACTOR.
- DEVICE SHALL BE INSTALLED IN ENCLOSURE DOOR AND AVAILABLE TO THE OPERATOR.
- PROVIDE A 1-POLE MANUAL STARTER AS THE MOTOR DISCONNECT. FIELD LOCATE NEAR MOTOR, AND LABEL AS "EXHAUST FAN DISCONNECT".



**CP-2 WIRING DIAGRAM**

FILE NAME:  
FILE DATE:



DESIGNED KBH 3  
 DRAFTED KBH 2  
 CHECKED KBH 1  
 DATE JANUARY 2024 NO. DATE

NO.	DATE	REVISIONS	BY	APVD.

SCALE  
NONE



WELL HOUSE #10  
ELECTRICAL  
CP-2 CONTROL DIAGRAM

SHEET  
E3.6  
119.08.100

**POWER PLAN ITEMS (E4.1)**

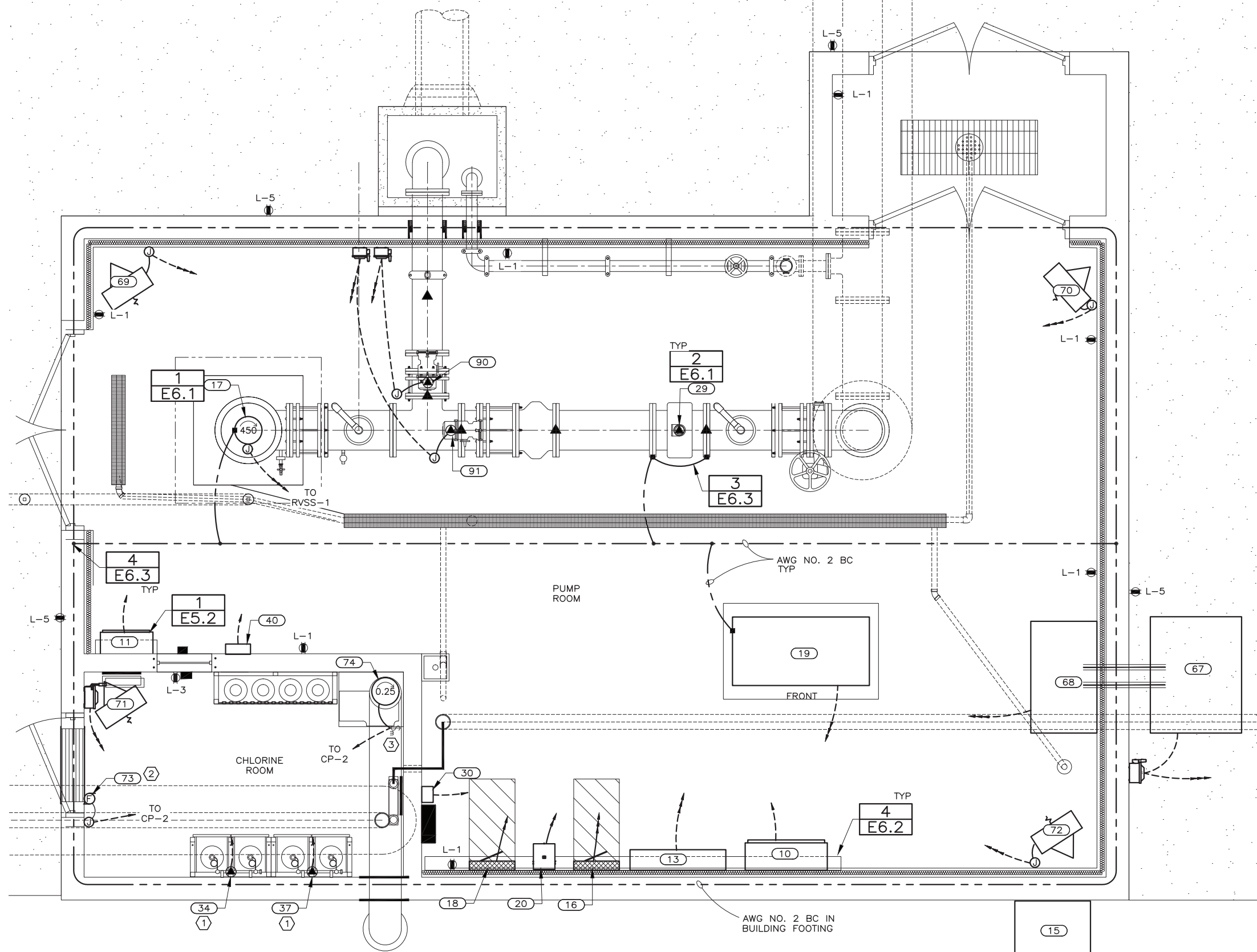
DRAWING ID	TAG	DESCRIPTION	POWER SOURCE	LOCATION
10	CP-1	MAIN CONTROL PANEL	L-2	PUMP ROOM
11	CP-2	SMALL MOTOR CONTROL PANEL	L-13	PUMP ROOM
13	MDP	MAIN DISTRIBUTION PANELBOARD	MSD	PUMP ROOM
15	MSD	MAIN SERVICE DISCONNECT	SITE POWER	BUILDING EXTERIOR
16	PNL-H	POWER PANELBOARD	MDP-1	PUMP ROOM
17	P-1	WELL PUMP MOTOR	RVSS-1	PUMP ROOM
18	PNL-L	POWER PANELBOARD	XFMR-L	PUMP ROOM
19	RVSS-1	WELL MOTOR CONTROLLER	MDP-2	PUMP ROOM
20	XFMR-L	TRANSFORMER L	H-2,4	PUMP ROOM
29	FE-1	WELL FLOW ELEMENT	FIT-1	PUMP ROOM
30	FIT-1	WELL FLOW INDICATOR/TRANSMITTER	L-4	PUMP ROOM
34	WIT-1A/1B	DUAL CHLORINE WEIGHT SCALE	L-10	CHLORINE ROOM
37	WIT-2A/2B	DUAL CHLORINE WEIGHT SCALE	L-14	CHLORINE ROOM
40	ASH-1	CHLORINE GAS DETECTOR	L-6	PUMP ROOM
67	CU-1	CONDENSING UNIT	H-8,10,12	BUILDING EXTERIOR
68	AH-1	AIR HANDLER	H-14,16,18	PUMP ROOM
69	EUH-1	ELECTRIC UNIT HEATER	H-1,3,5	PUMP ROOM
70	EUH-2	ELECTRIC UNIT HEATER	H-7,9,11	PUMP ROOM
71	EUH-3	ELECTRIC UNIT HEATER	H-13,15,17	CHLORINE ROOM
72	EUH-4	ELECTRIC UNIT HEATER	H-19,21,23	PUMP ROOM
73	ML-1	MOTORIZED LOUVER	CP-2	CHLORINE ROOM
74	EF-1	EXHAUST FAN	CP-2	CHLORINE ROOM
90	VA-4	WASTE VALVE ACTUATOR	H-26,28,30	PUMP ROOM
91	VA-1	SYSTEM VALVE ACTUATOR	H-20,22,24	PUMP ROOM

**GENERAL NOTES:**

- POWER SOURCE OR "HOME RUN" IS LISTED IN THE ITEM TABLE ON THIS SHEET. REFER TO POWER ONE-LINE DIAGRAM FOR CIRCUIT ID, THEN THE WIRE AND CONDUIT REQUIREMENTS ARE IN THE CONDUIT/CONDUCTOR TABLE ON E1.2
- INSTALL ALL INTERIOR RECEPTACLES AT +36-IN ABOVE FINISHED FLOOR. INSTALL ALL EXTERIOR RECEPTACLES AT +18-IN AND PROVIDE IN-SERVICE W/P COVER PLATE.

**SHEET KEYNOTES:**

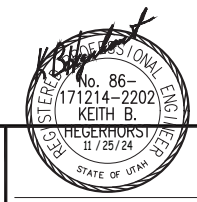
- INSTALL OUTLET FOR CHLORINE WEIGHT SCALES 6-IN ABOVE TOP OF INDICATOR/TRANSMITTERS.
- VERIFY LOCATION OF LOUVER ACTUATOR PRIOR TO CONDUIT ROUGH-IN.
- FIELD LOCATE MANUAL STARTER. LABEL AS CHLORINE EF MOTOR DISCONNECT.



**POWER PLAN**



FILE NAME: 7/04  
FILE DATE:



DESIGNED	KBH	3					
DRAFTED	KBH	2					
CHECKED	KBH	1					
DATE	JANUARY 2024	NO.		DATE		REVISIONS	BY APVD.

SCALE  
AS SHOWN



WELL HOUSE #10  
ELECTRICAL  
POWER PLAN

SHEET  
E4.1  
119.08.100

INSTR. & CONTROL PLAN ITEMS (E4.2)

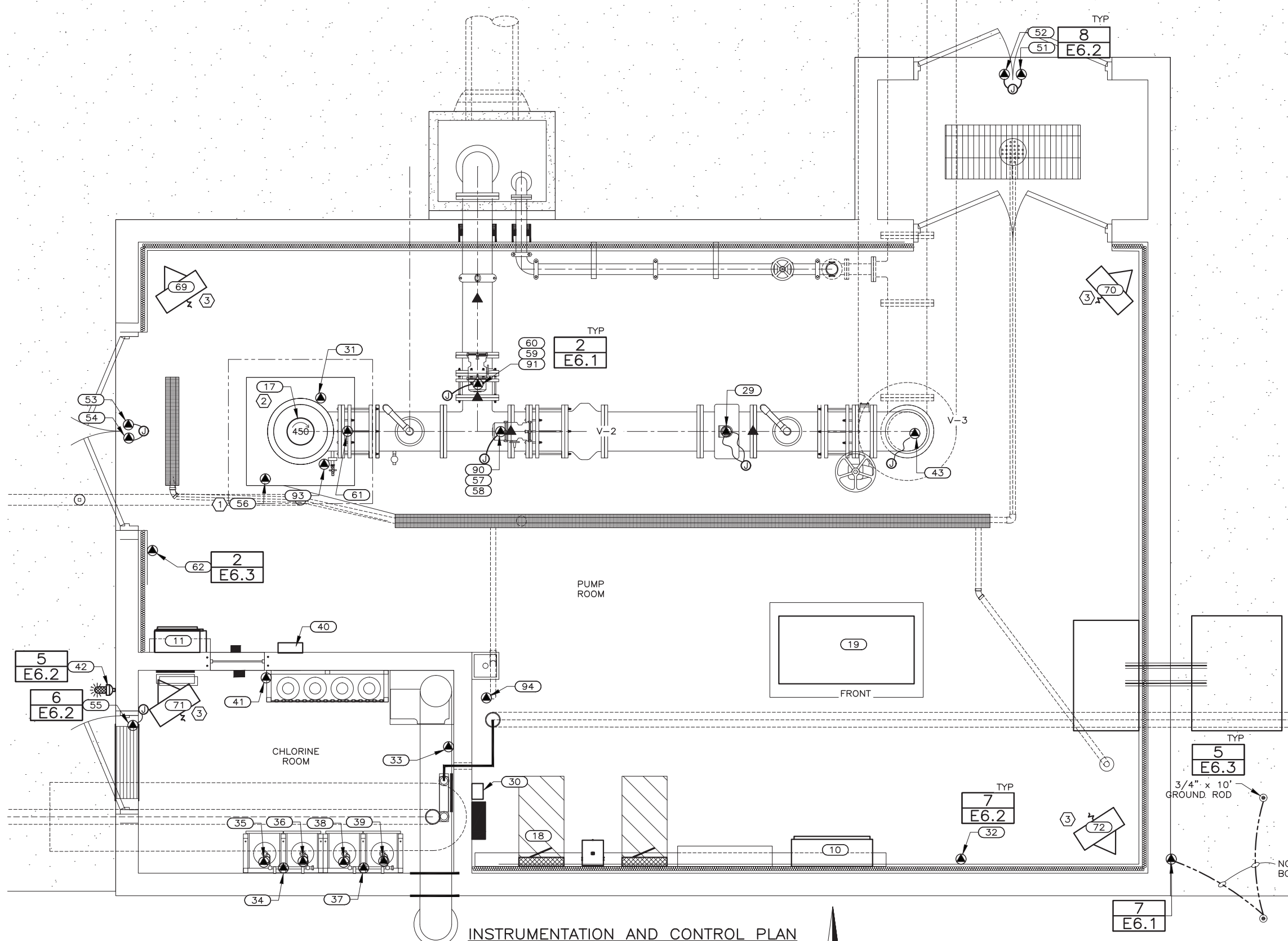
DRAWING ID	TAG	DESCRIPTION	POWER SOURCE	LOCATION
10	CP-1	MAIN CONTROL PANEL	L-2	PUMP ROOM
11	CP-2	SMALL MOTOR CONTROL PANEL	L-13	PUMP ROOM
17	P-1	WELL PUMP MOTOR	RVSS-1	PUMP ROOM
18	PNL-L	POWER PANELBOARD	XFMR-L	PUMP ROOM
19	RVSS-1	WELL MOTOR CONTROLLER	MDP-2	PUMP ROOM
29	FE-1	WELL FLOW ELEMENT	FIT-1	PUMP ROOM
30	FIT-1	WELL FLOW INDICATOR/TRANSMITTER	L-4	PUMP ROOM
31	LT-1	WELL LEVEL TRANSDUCER	CP-1	PUMP ROOM
32	TT-1	TEMPERATURE INDICATOR/TRANSMITTER	CP-1	PUMP ROOM
33	TT-2	TEMPERATURE INDICATOR/TRANSMITTER	CP-1	CHLORINE ROOM
34	WIT-1A/1B	DUAL CHLORINE WEIGHT SCALE	L-10	CHLORINE ROOM
35	WE-1A	CHLORINE SCALE 1A WEIGHT ELEMENT	WIT-1	CHLORINE ROOM
36	WE-1B	CHLORINE SCALE 1B WEIGHT ELEMENT	WIT-1	CHLORINE ROOM
37	WIT-2A/2B	DUAL CHLORINE WEIGHT SCALE	L-14	CHLORINE ROOM
38	WE-2A	CHLORINE SCALE 2A WEIGHT ELEMENT	WIT-2	CHLORINE ROOM
39	WE-2B	CHLORINE SCALE 2B WEIGHT ELEMENT	WIT-2	CHLORINE ROOM
40	ASH-1	CHLORINE GAS DETECTOR	L-6	PUMP ROOM
41	AE-1	CHLORINE GAS PROBE	ASH-1	PUMP ROOM
42	AL-1	ALARM LIGHT	CP-1	BUILDING EXTERIOR
43	PT-1	SYSTEM PRESSURE TRANSMITTER	CP-1	PUMPL ROOM
51	ZS-1A	DOOR POSITION SWITCH	CP-1	W. ROOM VESTIBULE
52	ZS-1B	DOOR POSITION SWITCH	CP-1	W. ROOM VESTIBULE
53	ZS-2A	DOOR POSITION SWITCH	CP-1	PUMP ROOM
54	ZS-2B	DOOR POSITION SWITCH	CP-1	PUMP ROOM
55	ZS-3	DOOR POSITION SWITCH	CP-1	CHLORINE ROOM
56	ZS-4	HATCH POSITION SWITCH	CP-1	PUMP ROOM
57	ZS-5A	SYSTEM VALVE (VA-1) POSITION SWITCH	CP-1	PUMP ROOM
58	ZS-5B	SYSTEM VALVE (VA-1) POSITION SWITCH	CP-1	PUMP ROOM
59	ZS-6A	WASTE VALVE (VA-4) POSITION SWITCH	CP-1	PUMP ROOM
60	ZS-6B	WASTE VALVE (VA-4) POSITION SWITCH	CP-1	PUMP ROOM
61	PSH-1	WELL HIGH DISCHARGE PRESSURE	CP-1	PUMP ROOM
62	LSH-1	FLOOR HIGH WATER LEVEL SWITCH	CP-1	PUMP ROOM
69	EUH-1	ELECTRIC UNIT HEATER	H-1,3,5	PUMP ROOM
70	EUH-2	ELECTRIC UNIT HEATER	H-7,9,11	PUMP ROOM
71	EUH-3	ELECTRIC UNIT HEATER	H-13,15,17	CHLORINE ROOM
72	EUH-4	ELECTRIC UNIT HEATER	H-19,21,23	PUMP ROOM
90	VA-4	WASTE VALVE ACTUATOR	H-26,28,30	PUMP ROOM
91	VA-1	SYSTEM VALVE ACTUATOR	H-20,22,24	PUMP ROOM
93	SV-1	OIL-LUBE SOLENOID VALVE	CP-1	PUMP ROOM
94	SV-2	CHLORINATION SOLENOID VALVE	CP-1	PUMP ROOM

GENERAL NOTES:

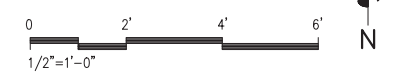
- REFER TO THE INSTRUMENTATION AND CONTROL ONE-LINE DIAGRAM FOR WIRE AND CONDUIT REQUIREMENTS.
- DEVICES LOCATED AT WELL ARE DIAGRAMMATIC. PRIOR TO CONDUIT ROUGH-IN REFER TO CIVIL DRAWINGS FOR DEVICE LOCATIONS.

SHEET KEYNOTES:

- LOCATE DEVICE AT ROOF HATCH.
- LOCATIONS FOR MOTOR RTD J-BOX AND THE VIBRATION SWITCH ARE NOT SHOWN ON THIS PLAN. COORDINATE WITH MOTOR SUPPLIER FOR LOCATIONS PRIOR TO CONDUIT ROUGH-IN.
- UNIT HEATERS CONTROLLED BY PLC IN CP-1 AND THE ROOM TEMPERATURE TRANSMITTER.



INSTRUMENTATION AND CONTROL PLAN



FILE NAME:  
 FILE DATE:  
  
 PROJECT ENGINEER

DESIGNED	KBH	3					
DRAFTED	KBH	2					
CHECKED	KBH	1					
DATE	JANUARY 2024	NO.					
REVISIONS			BY	APVD.			

SCALE  
 AS SHOWN



WELL HOUSE #10  
 ELECTRICAL  
 INSTRUMENTATION AND CONTROL PLAN

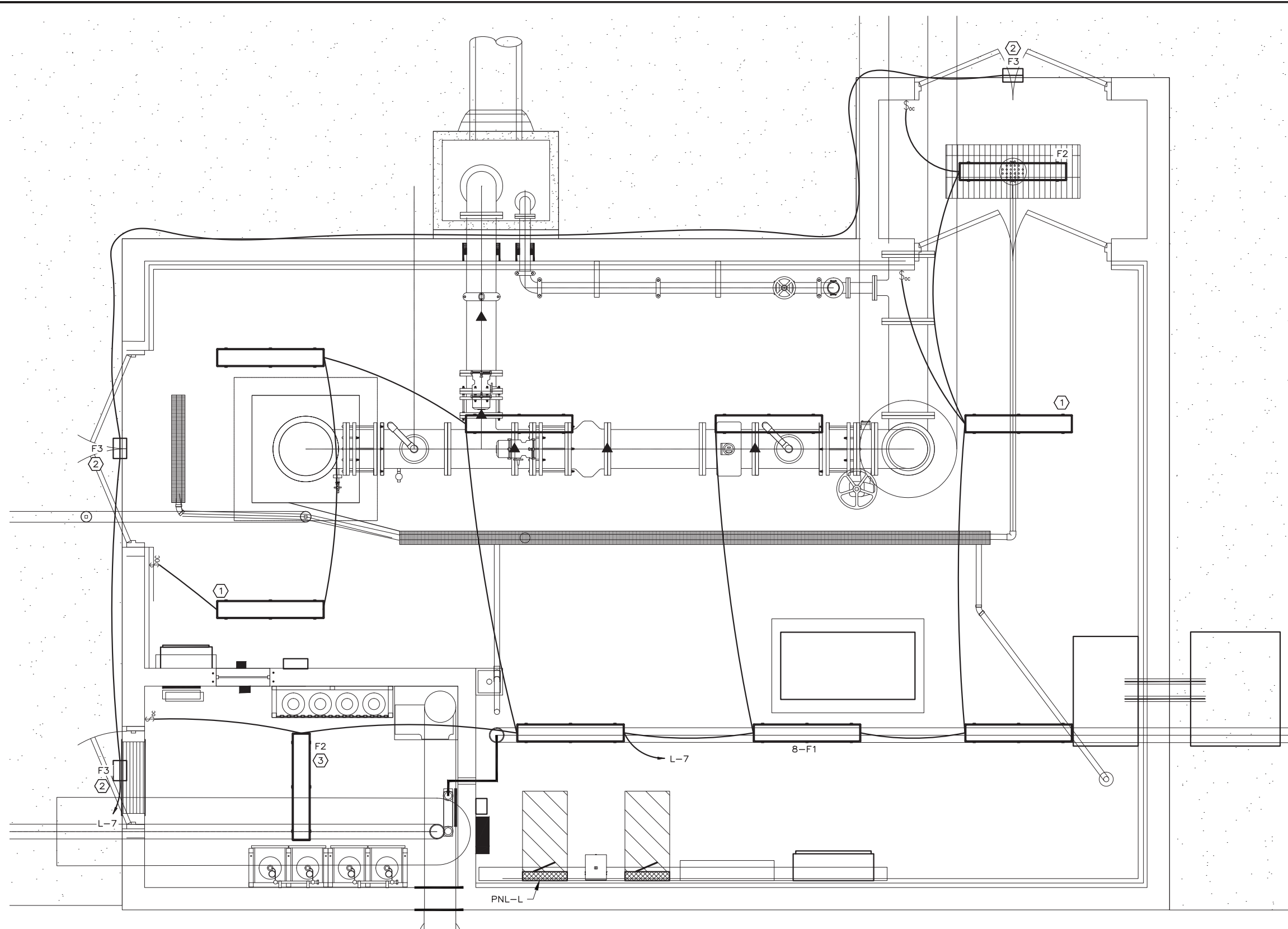
SHEET  
 E4.2  
 119.08.100

**GENERAL NOTES:**

1. REFER TO POWER ONE-LINE DIAGRAM FOR CIRCUIT ID, THEN THE WIRE AND CONDUIT REQUIREMENTS ARE IN THE CONDUIT/CONDUCTOR TABLE ON E1.2
2. REFER TO THE ELECTRICAL UTILITY INSTALLATION TABLE FOR CONTRACTOR AND UTILITY RESPONSIBILITIES.
3. FIXTURE SCHEDULE ON E1.2.

**SHEET KEYNOTES:**

1. PROVIDE A 90-MINUTE BATTERY IN THIS FIXTURE.
2. INSTALL FIXTURE 6-IN ABOVE TOP OF DOOR.
3. CHLORINE ROOM LIGHT SHALL BE CONTROLLED WITH PUMP ROOM LIGHTS.



**LIGHTING PLAN**



FILE NAME:  
FILE DATE:



PROJECT ENGINEER

DESIGNED	KBH	3
DRAFTED	KBH	2
CHECKED	KBH	1
DATE	JANUARY 2024	NO.

DATE		DATE
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REVISIONS

BY	APVD.
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SCALE  
AS SHOWN



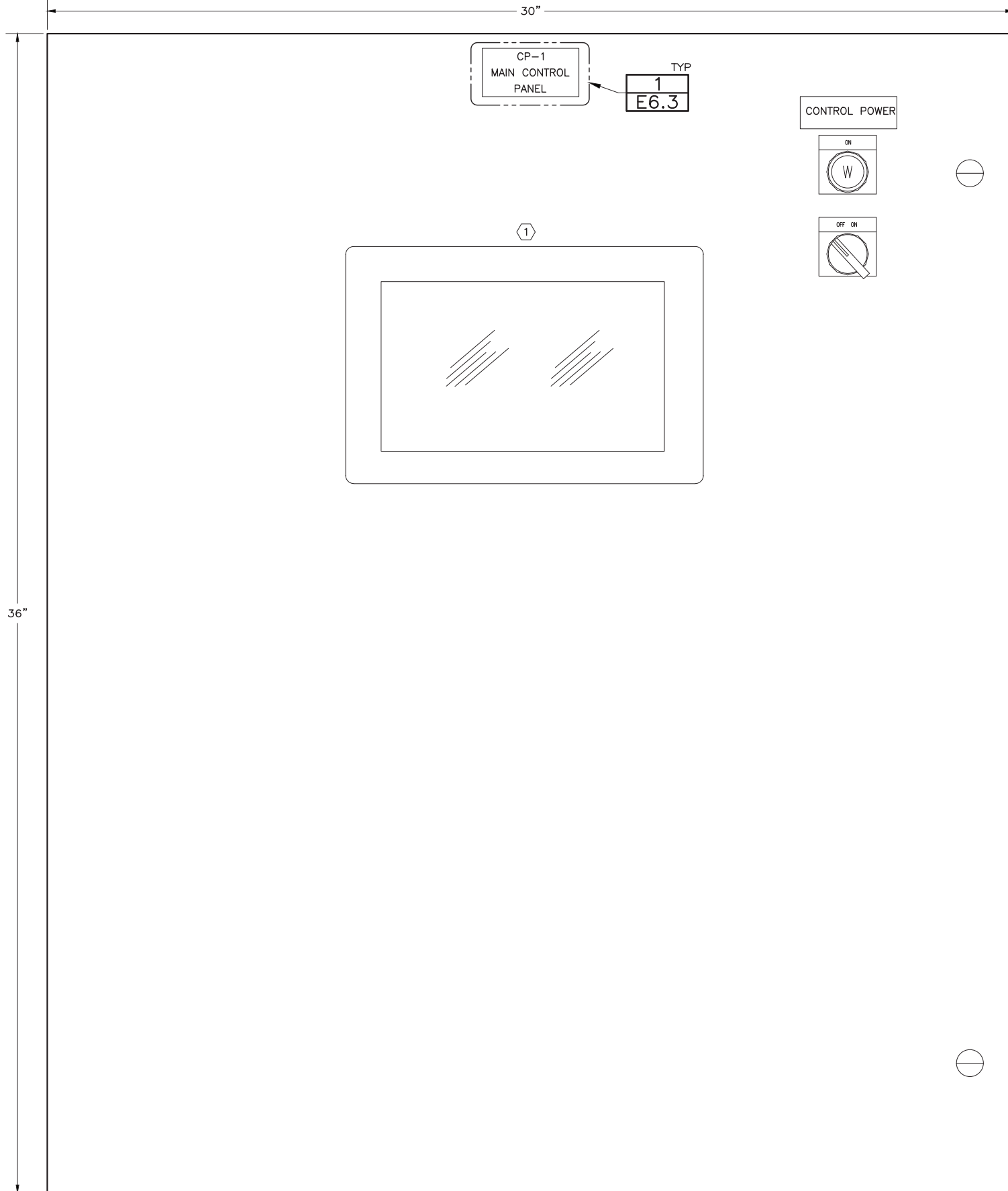
WELL HOUSE #10  
ELECTRICAL  
LIGHTING PLAN

SHEET  
E4.3  
119.08.100

OREM WELL 10 INPUT/OUTPUT LIST

TYPE	DESCRIPTION	FROM DEVICE	TO DEVICE
AI	CHLORINE ROOM TEMPERATURE	TT-2	CP-1
AI	CHLORINE TANK #1A WEIGHT	WIT-1	CP-1
AI	CHLORINE TANK #1B WEIGHT	WIT-1	CP-1
AI	CHLORINE TANK #2A WEIGHT	WIT-1	CP-1
AI	CHLORINE TANK #2B WEIGHT	WIT-1	CP-1
AI	PUMP ROOM TEMPERATURE	TT-1	CP-1
AI	SYSTEM FLOW	FIT-1	CP-1
AI	SYSTEM PRESSURE	PT-1	CP-1
AI	WELL LEVEL	LT-1	CP-1
DI	CHLORINE LEAK	ASH-1	CP-1
DI	CHLORINE RM. EF-1 HOA IN AUTO	CP-2	CP-1
DI	CHLORINE RM. EF-1 HOA IN HAND	CP-2	CP-1
DI	CHLORINE RM. EF-1 RUNNING	CP-2	CP-1
DI	CHLORINE ROOM DOOR NOT CLOSED	ZS-3	CP-1
DI	PUMP ROOM DOOR 1A NOT CLOSED	ZS-1A	CP-1
DI	PUMP ROOM DOOR 1B NOT CLOSED	ZS-1B	CP-1
DI	PUMP ROOM DOOR 2A NOT CLOSED	ZS-2A	CP-1
DI	PUMP ROOM DOOR 2B NOT CLOSED	ZS-2B	CP-1
DI	PUMP ROOM FLOOR HIGH WATER	LSH-1	CP-1
DI	PUMP ROOM ROOF HATCH NOT CLOSED	ZS-4	CP-1
DI	RVSS FAULT	RVSS-1	CP-1
DI	RVSS HOA IN AUTO	RVSS-1	CP-1
DI	RVSS HOA IN HAND	RVSS-1	CP-1
DI	RVSS RUNNING	RVSS-1	CP-1
DI	SYSTEM VALVE FULL CLOSED	ZS-5B	CP-1
DI	SYSTEM VALVE FULL OPEN	ZS-5A	CP-1
DI	WASTE VALVE FULL CLOSED	ZS-6B	CP-1
DI	WASTE VALVE FULL OPEN	ZS-6A	CP-1
DI	WELL MOTOR HIGH TEMPERATURE ALARM	RVSS-1	CP-1
DI	WELL MOTOR HIGH VIBRATION	RVSS-1	CP-1
DI	WELL HIGH DISCHARGE PRESSURE SHDN	RVSS-1	CP-1
DI	WELL HIGH DISCHARGE PRESSURE SHUTDOWN	RVSS-1	CP-1
DI	WELL ROOM HIGH FLOOR WATER LEVEL	LSH-1	CP-1
DO	CHLORINE EF-1 COMMAND RUN	CP-1	CP-2
DO	CHLORINATION SOLENOID VALVE CMD OPEN	CP-1	SV-2
DO	CHLORINE LEAK ALARM LIGHT CMD ON	CP-1	AL-1
DO	LEAK DETECTOR REMOTE RESET	CP-1	ASH-1
DO	UNIT HEATER COMMAND ON	CP-1	EUH-1
DO	UNIT HEATER COMMAND ON	CP-1	EUH-2
DO	UNIT HEATER COMMAND ON	CP-1	EUH-3
DO	UNIT HEATER COMMAND ON	CP-1	EUH-4
DO	WELL BACKSPIN TIME DELAY	CP-1	RVSS-1
DO	WELL COMMAND RUN	CP-1	RVSS-1
DO	WELL LOW LEVEL SHUTDOWN	CP-1	RVSS-1
DO	WELL PRELUBE SOLENOID CMD OPEN	CP-1	SV-1
ETHERNET	RVSS POWER QUALITY METER	CP-1	RVSS-1

36"



CP-1 EXTERIOR ARRANGEMENT 1  
6" = 1'-0" E4.1

H.P.E. INC. ELECTRICAL ENGINEERS  
POWER SYSTEMS, CONTROL & INSTRUMENTATION SYSTEMS  
HEGERHORST POWER ENGINEERING INCORPORATED (801) 642-2051  
708 EAST 50 SOUTH AMERICAN FORK, UT 84003 FAX (801) 642-2154  
HPE PROJECT:21.122 ©2023  
FOR INFORMATION ABOUT THIS JOB, PLEASE CONTACT: KEITH HEGERHORST

- GENERAL NOTES:**
- REFER TO E3.4 AND E3.5 FOR TYPICAL CP-1 CONTROL DIAGRAMS.
  - ENCLOSURE DIMENSIONS SHOWN ARE ANTICIPATED. ENCLOSURE DIMENSIONS SHALL BE DETERMINED BY THE CONTRACTOR FOR THE REQUIRED DEVICES.
  - CP-1 ENCLOSURE, INTERNAL COMPONENTS, ASSEMBLY AND WIRING PROVIDED BY CONTRACTOR. OWNER WILL PROVIDE PLC AND OPERATOR DISPLAY PROGRAMMING DURING CONSTRUCTION.
  - CONTRACTOR SHALL DETERMINE TERMINAL, OVERCURRENT, AND WIRE NUMBERS AS REQUIRED.

- SHEET KEYNOTES:**
- PROVIDE A 10-IN COLOR TOUCH SCREEN FOR THE OPERATOR INTERFACE.

FILE NAME:  
FILE DATE:  
7/04



PROJECT ENGINEER

DESIGNED	KBH	3
DRAFTED	KBH	2
CHECKED	KBH	1
DATE	JANUARY 2024	NO.

NO.	DATE	REVISIONS	BY	APVD.

SCALE  
AS SHOWN



WELL HOUSE #10  
ELECTRICAL  
CP-1 MAIN CP ARRANGEMENT

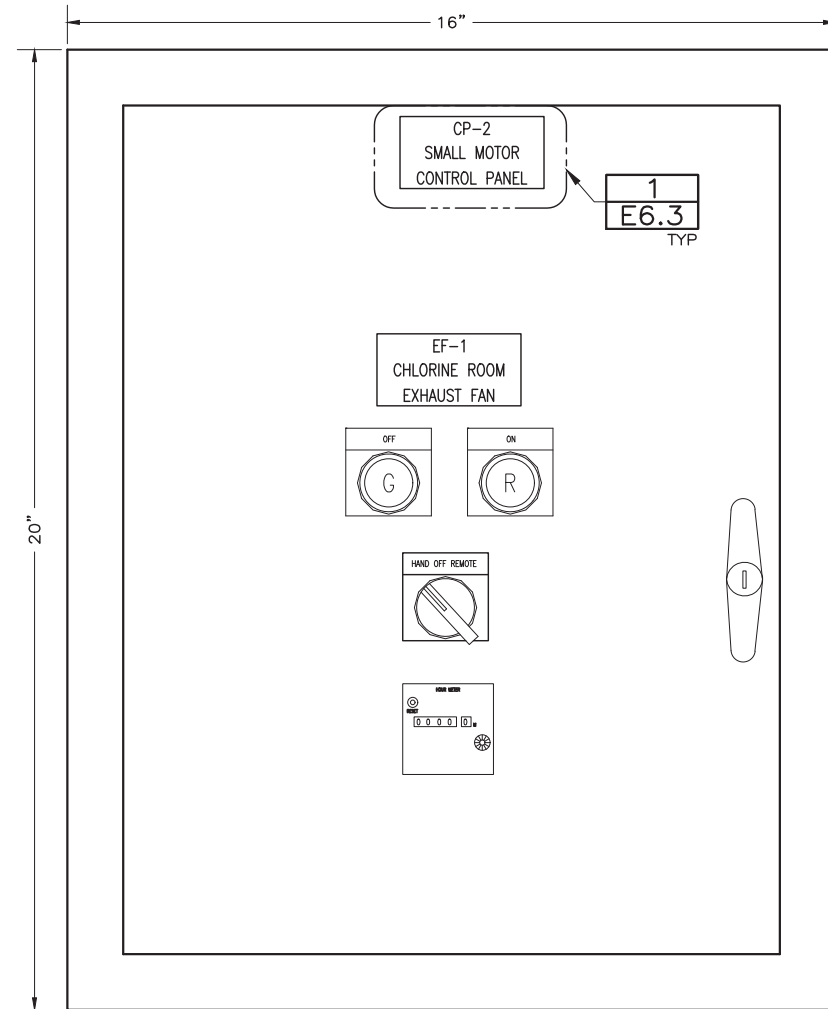
SHEET  
E5.1  
119.08.100

**GENERAL NOTES:**

1. TYPICAL CONTROL DIAGRAM SHOWN ON E2.4.
2. ENCLOSURE DIMENSIONS ARE AS ANTICIPATED. DIMENSIONS SHALL BE DETERMINED BY THE CONTRACTOR FOR THE SELECTED COMPONENTS.

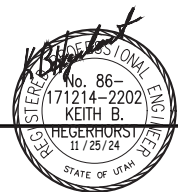
**SHEET KEYNOTES:**

1. NOT USED.



**CP-2 EXTERIOR ARRANGEMENT** 1  
 6" = 1'-0" E4.1

FILE NAME:  
FILE DATE:



DESIGNED	KBH	3							
DRAFTED	KBH	2							
CHECKED	KBH	1							
DATE	JANUARY 2024	NO.		DATE		REVISIONS		BY	APVD.

SCALE  
AS SHOWN



WELL HOUSE #10  
 ELECTRICAL  
 CP-2 SMALL MOTOR CONTROL PANEL

SHEET  
**E5.2**  
 119.08.100

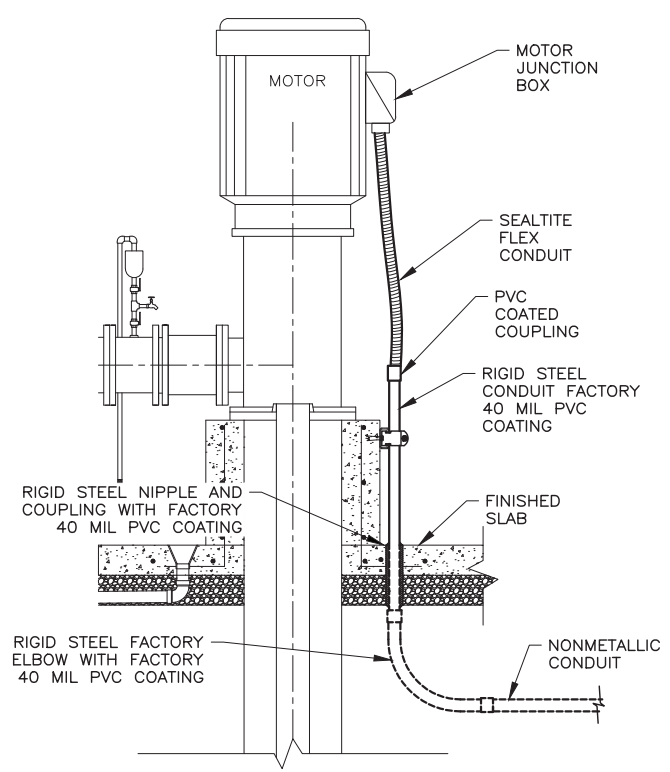


**GENERAL NOTES:**

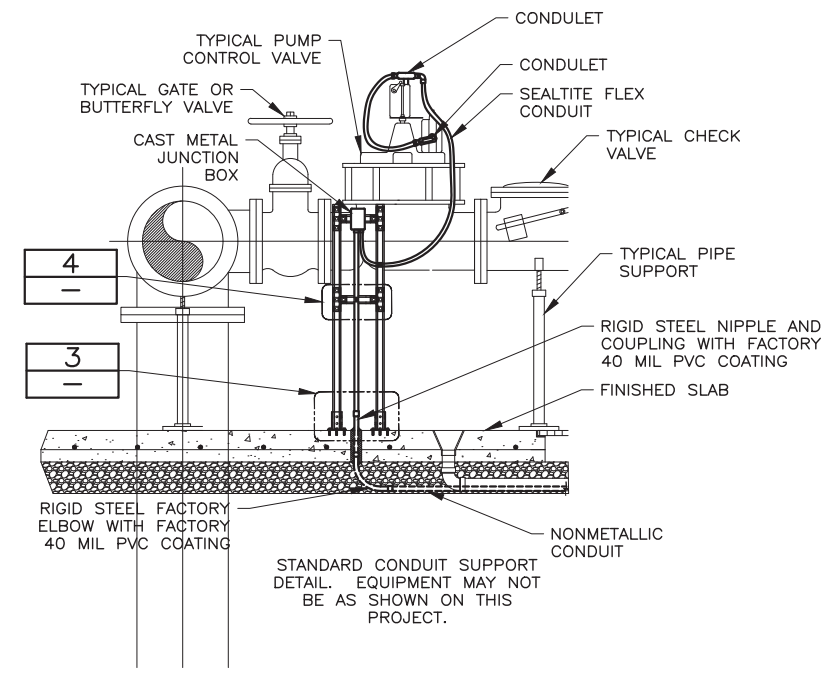
1. NOT USED.

**SHEET KEYNOTES:**

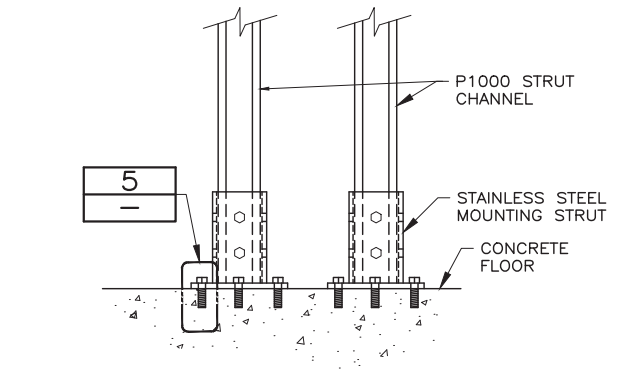
1. NOT USED.



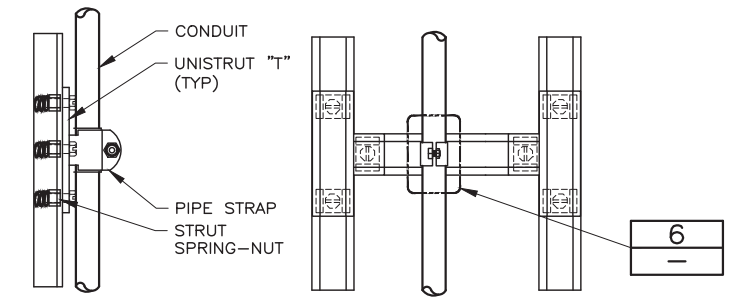
**TYPICAL MOTOR CONDUIT INSTALLATION** 1  
 3/8" = 1'-0" E4.1



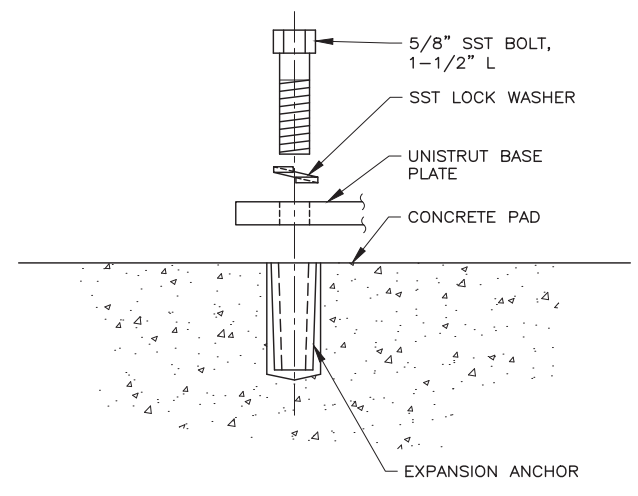
**TYPICAL CONDUIT SUPPORT INSTALLATION** 2  
 3/4" = 1'-0" E4.2



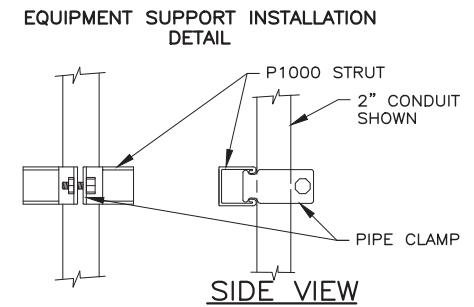
**CONDUIT SUPPORT INSTALLATION** 3  
 3" = 1'-0" -



**CONDUIT SUPPORT DETAIL** 4  
 3" = 1'-0" -



**SUPPORT ANCHOR** 5  
 6" = 1'-0" -

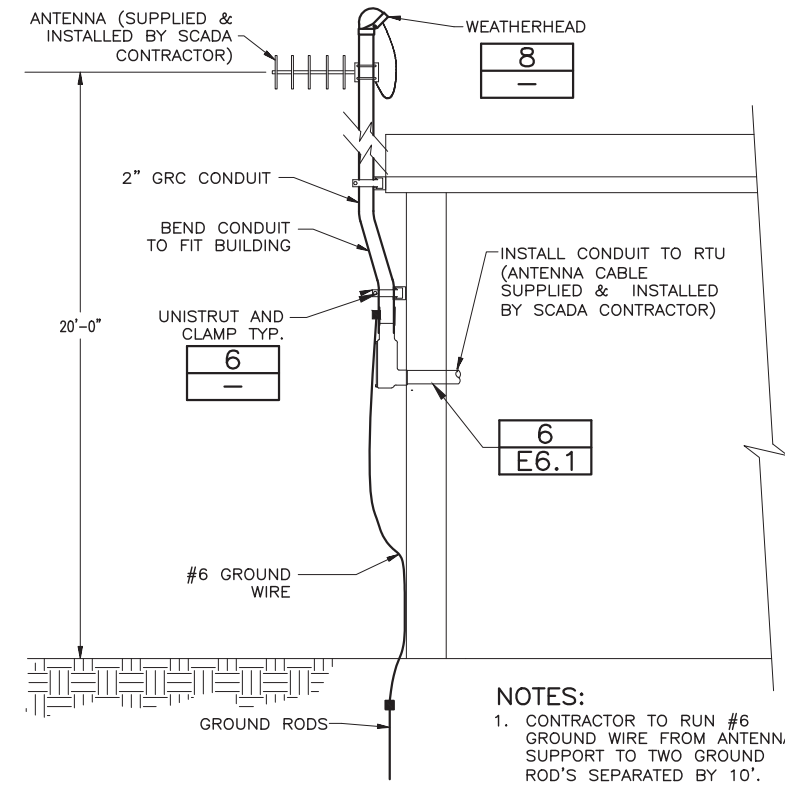


**CONDUIT PIPE CLAMPS\***

SIZE	EMT	RGS	EMT/RGS
1/2"	P1426	P1111	-
3/4"	P1427	P1112	P1212
1"	P1428	P1113	P1213
1-1/4"	P1429	P1114	P1214
1-1/2"	P1430	P1115	P1215
2"	P1431	P1117	P1217
2-1/2"	P1118	P1118	-
3"	P1119	P1119	-
3-1/2"	P1120	P1120	-
4"	P1121	P1121	-

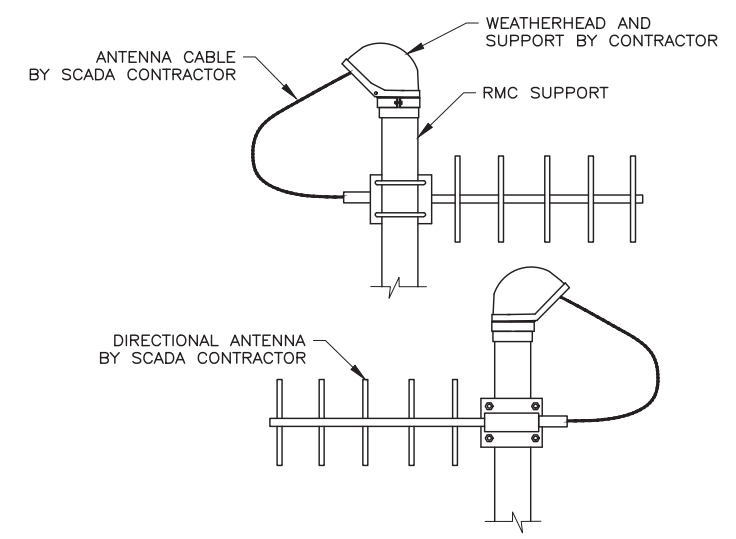
\* = SUPPLIED WITH SLOTTED HEAD SCREW AND NUT

**CONDUIT CLAMP** 6  
 3" = 1'-0" -



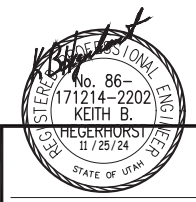
**SCADA ANTENNA SUPPORT** 7  
 1' = 1'-0" E4.2

**NOTES:**  
 1. CONTRACTOR TO RUN #6 GROUND WIRE FROM ANTENNA SUPPORT TO TWO GROUND ROD'S SEPARATED BY 10'.



**ANTENNA WEATHERHEAD INSTALLATION** 8  
 3" = 1'-0" -

FILE NAME: FILE DATE:



DESIGNED	KBH	3
DRAFTED	KBH	2
CHECKED	KBH	1

PROJECT ENGINEER DATE JANUARY 2024 NO. DATE

REVISIONS

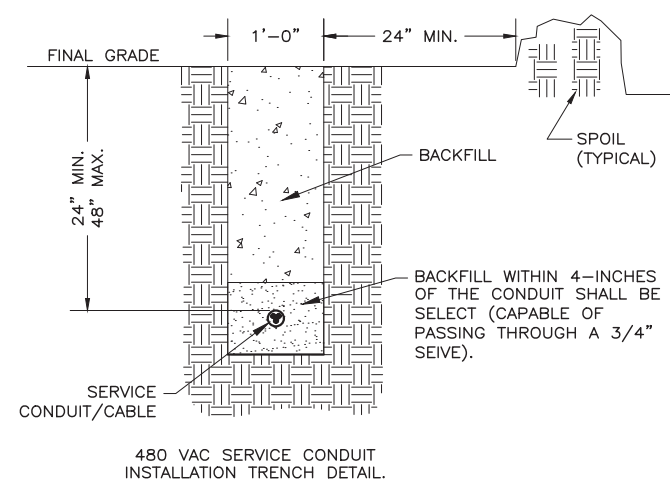
BY: APVD:

SCALE AS SHOWN



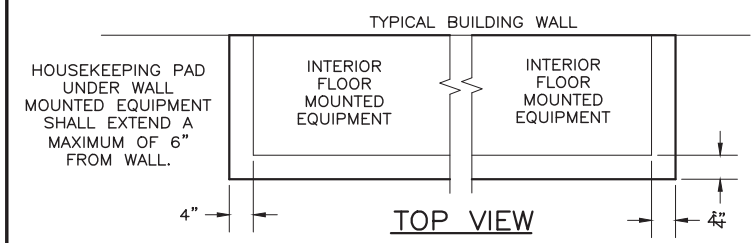
WELL HOUSE #10 ELECTRICAL DETAILS, SHT. 1

SHEET E6.1 119.08.100

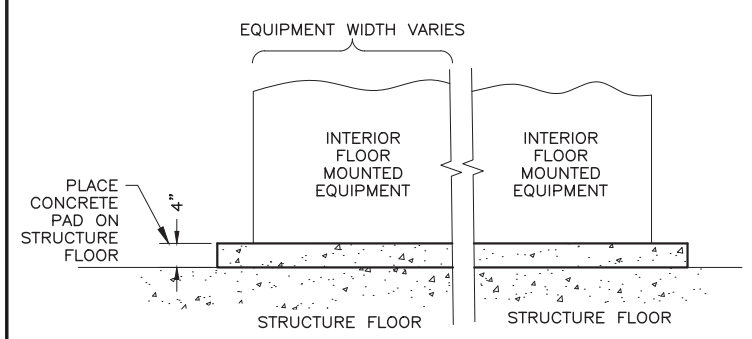


SERVICE TRENCH (ONLY) SECTION DETAIL

SERVICE CONDUIT TRENCH	1
1" = 1'-0"	—

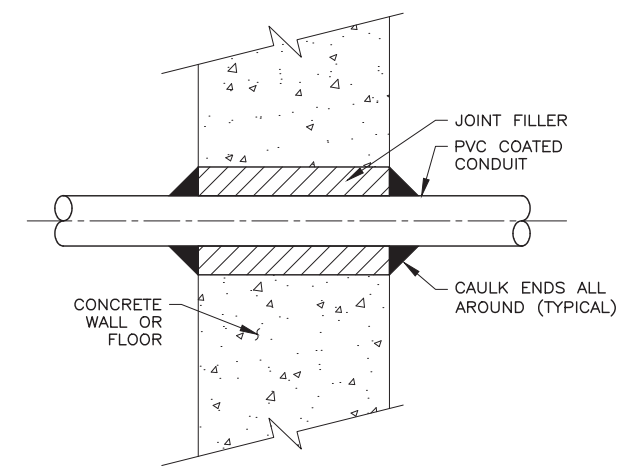


TOP VIEW

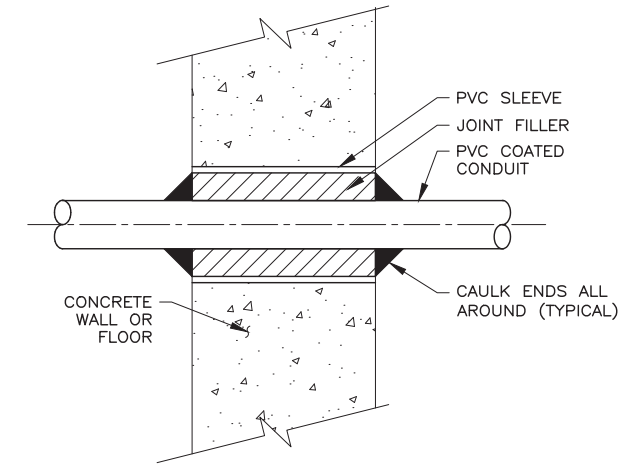


ELEVATION VIEW

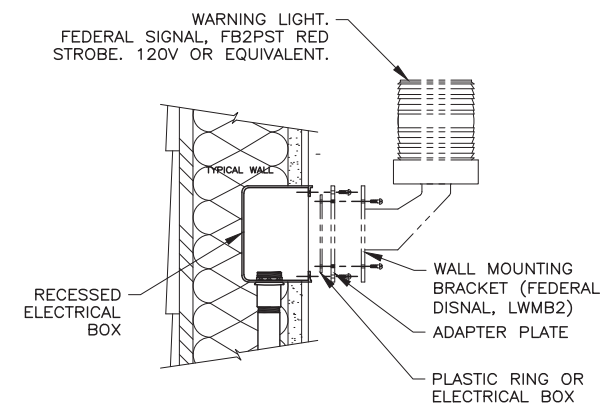
INTERIOR EQUIPMENT HOUSEKEEPING PAD	4
3/4" = 1'-0"	E4.1



CONDUIT PENETRATION THRU EXISTING CONCRETE OR WALL

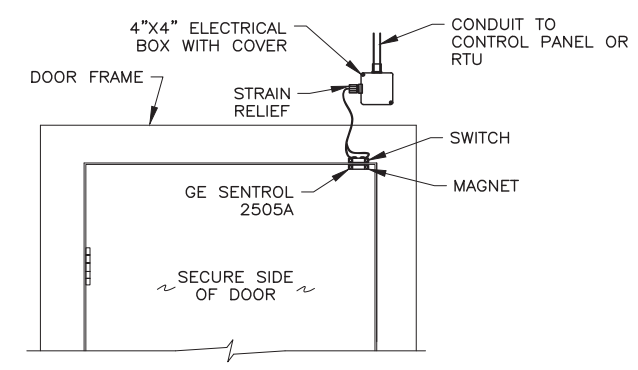


CONDUIT PENETRATION THRU NEW CONCRETE OR WALL



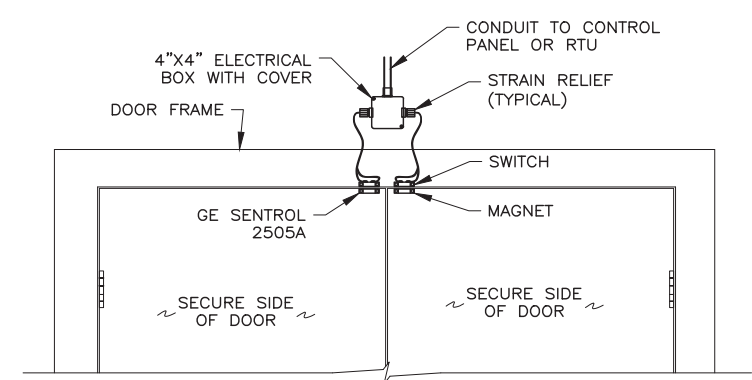
ALARM LIGHT INSTALLATION

5
3" = 1'-0"
E4.2



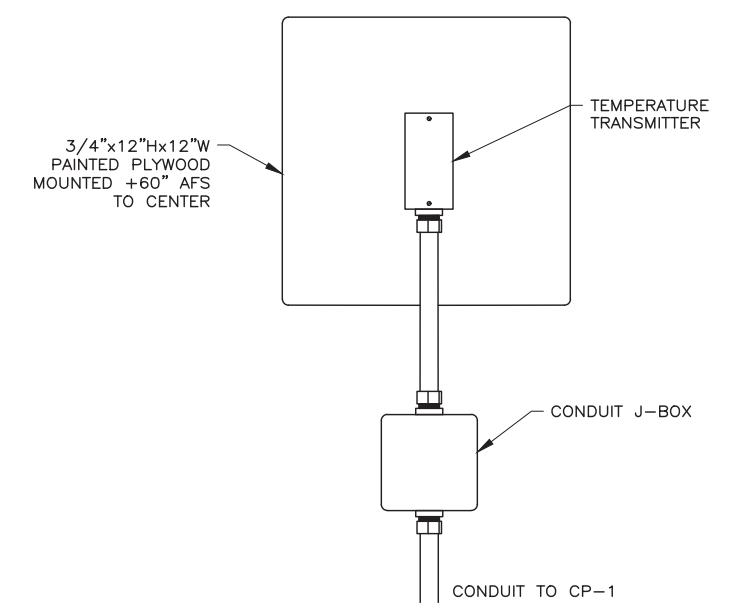
SINGLE DOOR POSITION SWITCH

6
1" = 1'-0"
E4.2



DOUBLE DOOR POSITION SWITCH

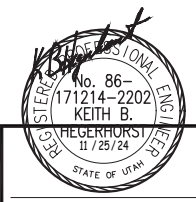
8
1" = 1'-0"
E4.2



TEMPERATURE TRANSMITTER

7
3" = 1'-0"
E4.2

FILE NAME:  
FILE DATE:



DESIGNED	KBH	3
DRAFTED	KBH	2
CHECKED	KBH	1
DATE	JANUARY 2024	NO.
DATE		

NO.	DATE	REVISIONS	BY	APVD.

SCALE  
AS SHOWN



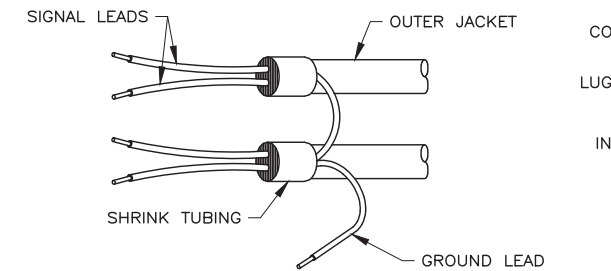
WELL HOUSE #10  
ELECTRICAL  
DETAILS, SHT. 2

**GENERAL NOTES:**

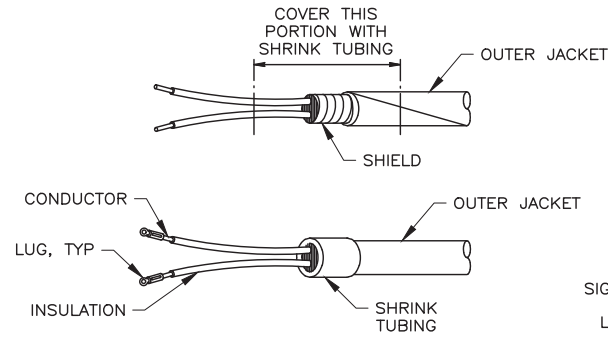
1. NOT USED.

**SHEET KEYNOTES:**

1. NOT USED.

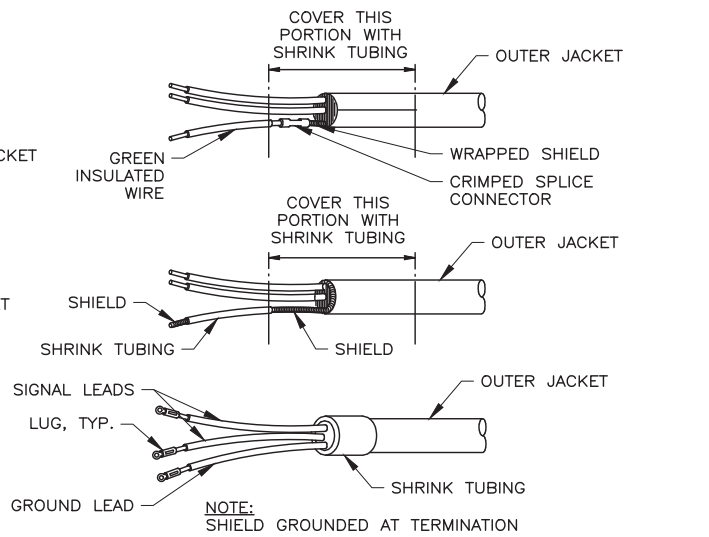


**UNACCEPTABLE METHOD OF GROUNDING CONTROL CABLE SHIELD** NTS

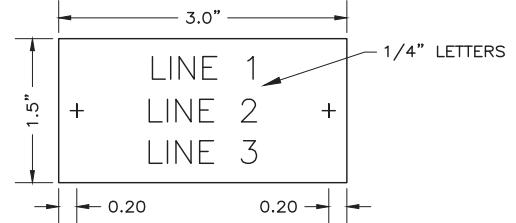
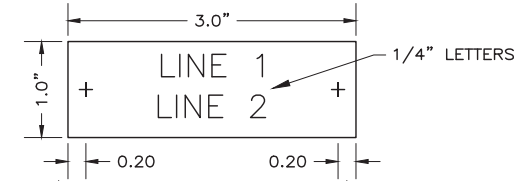
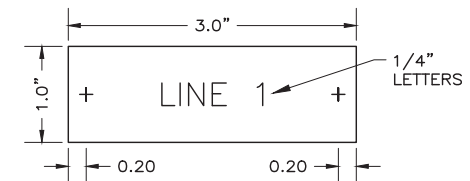


**TERMINATION OF SHIELDED CONTROL CABLE** NTS

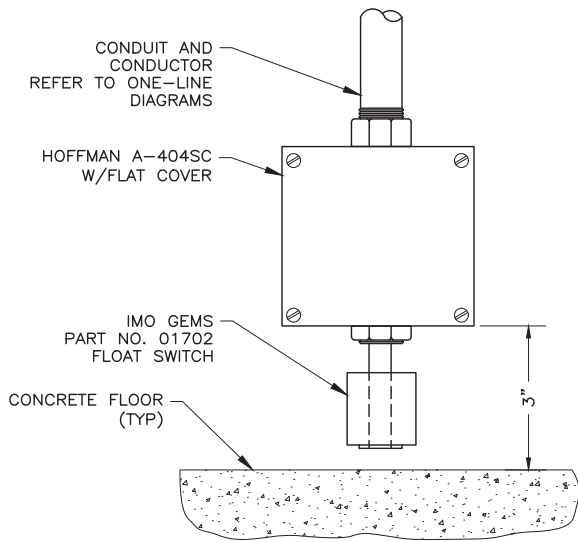
**SIGNAL WIRE TERMINATIONS**



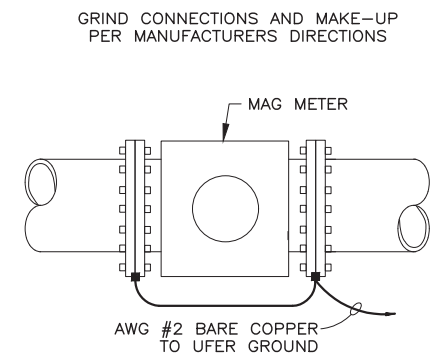
**TERMINATION OF SHIELDED CONTROL CABLE** NTS



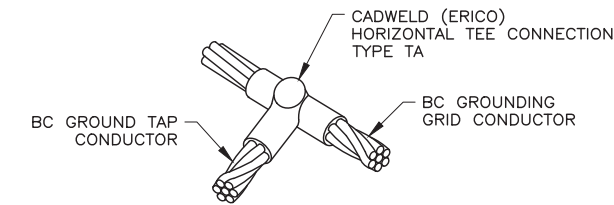
**NAMEPLATE DETAIL** 1 1  
 1' = 1'-0" E5.1 E5.2



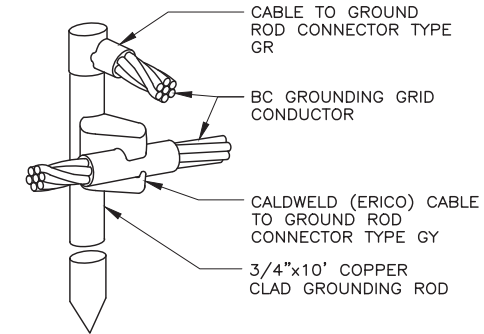
**FLOOR FLOOD SWITCH** 2  
 6" = 1'-0" E4.2



**MAG METER GROUNDING** 3  
 1 1/2" = 1'-0" E4.1



**WELDED GROUND TEE CONNECTION** 4  
 6" = 1'-0" E4.1



**GROUND ROD CONNECTION** 5  
 6" = 1'-0" E4.2

FILE NAME:  
 FILE DATE:



DESIGNED	KBH	3
DRAFTED	KBH	2
CHECKED	KBH	1
DATE	JANUARY 2024	NO.

NO.	DATE	REVISIONS	BY	APVD.

SCALE  
 AS SHOWN



WELL HOUSE #10  
 ELECTRICAL  
 DETAILS, SHT. 3

SHEET  
 E6.3  
 119.08.100