City of Roseburg

Phase 1 - Water System SCADA Improvements

Project No. 16WA05

FALL 2016

CONTACT PERSONNEL

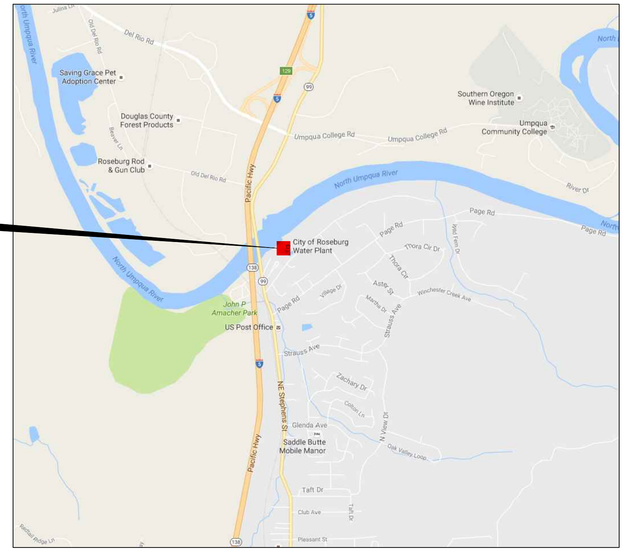
AGENCY	CONTACT	TITLE	PHONE	EXT.
CITY OF ROSEBURG	JIM MACIARIELLO, P.E.	CITY ENGINEER	541-492-6767	
CITY OF ROSEBURG	DARYN ANDERSON, P.E.	PROJECT MANAGER	541-492-6885	
RH2 ENGINEERING	JAMES SWANSON	PROJECT MANAGER	425-951-5400	5386
RH2 ENGINEERING	CHRIS ROBERTS, P.E.	PROJECT MANAGER	425-951-5400	5358
RH2 ENGINEERING	MARK BRAAKSMA, P.E.	PROJECT ENGINEER	425-951-5400	5414

PROJECT LOCATIONS

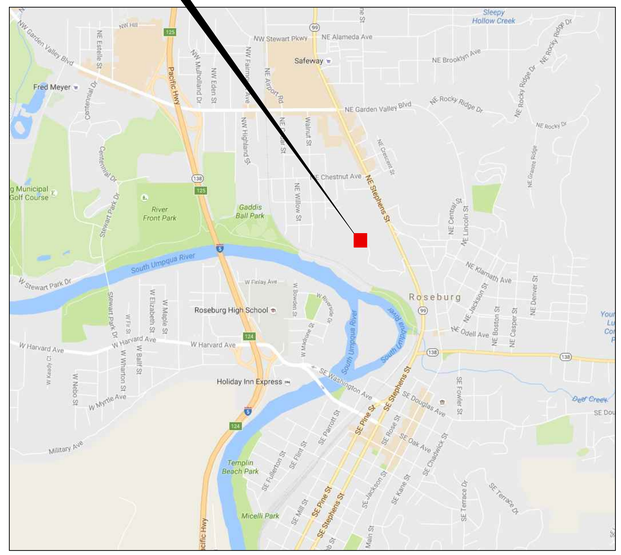
LOCATION	ADDRESS
WINCHESTER WATER TREATMENT PLANT	180 PIONEER WAY, WINCHESTER, OR
RESERVOIRS 5, 6 AND 7	618 NE BELLVIEW AVE, ROSEBURG, OR

SHEET INDEX

WINCHESTER WTP



RESERVOIRS 5, 6, 7



MAP DISCLAIMER

MAPS THIS SHEET PROVIDED BY GOOGLE.

PROJECT LOCATION MAPS

NOT TO SCALE

RH2 ENGINEERS PLANNERS SCIENTISTS

REGISTERED PROFESSIONAL ENGINEER
86610
OREGON
MARCH 13, 2012
CHRISTOPHER M. ROBERTS
SIGNED: 10/18/16

EXPIRES: 12/31/2016

ONE-LINE DIAGRAM SYMBOLS

CIRCUIT BREAKER
XXX/YY – CB SIZE & NO. OF POLES
ET – ELECTRONIC TRIP
TM – THERMAL MAGNETIC BREAKER
MCP – MOTOR CIRCUIT PROTECTOR
SE – SERVICE ENTRANCE
GFI – GROUND FAULT INTERRUPTER

FUSE

FUSED DISCONNECT SWITCH

PLUG–IN CONNECTION

RTM — RUN TIME METER

OC — MOTOR OPERATION COUNTER

SSRVS — SSRVS – SOLID STATE REDUCED VOLTAGE STARTER

VARIABLE FREQUENCY DRIVE

MOTOR STARTER

MOTOR STARTER W/ OPERATOR DEVICES
A – HAND–OFF–AUTO
B – OPERATIONAL COUNTER
C – RUN TIME METER
D – RUN LIGHT
E – FAIL LIGHT
F – EMERGENCY STOP

KIRK KEY INTERLOCK

POWER TRANSFORMER

CONTROL POWER TRANSFORMER

TRANSFORMER

CURRENT TRANSFORMER

VOLTAGE TRANSFORMER

CONTACTOR

CAPACITOR

ENGINE GENERATOR

GENERATOR CONNECTION RECEPTACLE

SOLID NEUTRAL

TB — TERMINAL BLOCK

SURGE PROTECTION DEVICE

SPD — SURGE PROTECTION DEVICE (ALTERNATIVE)

GROUNDING SYSTEM SYMBOLS

GROUND

METAL PIPE GROUND

CONNECTION POINT, EXOTHERMIC WELD. CADWELD OR APPROVED EQUAL.

GROUND ROD SIZED PER N.E.C. USE EXOTHERMIC WELD CONNECTION AT THE GROUND ROD.

PIGTAIL, BARE COPPER, LENGTH AS REQUIRED, 8' MINIMUM.

CONNECTION POINT, MECHANICAL, COMPRESSION TYPE.

ELECTRICAL SITE PLAN SYMBOLS

UTILITY POLE AND GUY WIRE

HH — MANHOLE OR HANDHOLE

P — BURIED POWER VAULT OR MANHOLE

T — TELEPHONE VAULT OR PEDESTAL

F — FIBER OPTICS VAULT OR PEDESTAL

LUMINAIRE

PAD–MOUNT TRANSFORMER

PANELBOARDS, SWITCHES, AND EQUIPMENT

SERVICE ENTRANCE, SWITCHGEAR, MOTOR CONTROL CENTER, OR PANELBOARD

SURFACE MOUNTED PANELBOARD

FLUSHED MOUNTED PANELBOARD

NXX — FIELD CONTROL STATION WITH NEMA REQUIREMENTS.
N1 – NEMA 1
N3R – NEMA 3R
N4 – NEMA 4
N4SS – NEMA 4 STAINLESS STEEL
N4F – NEMA 4 FIBERGLASS
N6 – NEMA 6
N12 – NEMA 12 GASKETED

EQUIPMENT MOUNTING STAND

HEATER, WATTAGE NOTED

EQUIPMENT CONNECTION

SINGLE PHASE MOTOR. HORSEPOWER AS NOTED

THREE PHASE MOTOR. HORSEPOWER AS NOTED

SINGLE PHASE MOTOR. HORSEPOWER AS NOTED

ELECTRICAL PLUG

DISCONNECT SWITCH

FUSED DISCONNECT SWITCH

COMBINATION MOTOR STARTER AND DISCONNECT SWITCH

RECEPTACLES AND JUNCTION BOX SYMBOLS

CEILING JUNCTION BOX

WALL JUNCTION BOX

FLOOR JUNCTION BOX

DUPLEX WALL RECEPTACLE , 120V
WP = WEATHERPROOF
G = GROUNDED
IG = ISOLATED GROUND
GF = GROUND FAULT INTERRUPTER

DOUBLE DUPLEX

SINGLE RECEPTACLE, 120V

SINGLE RECEPTACLE, 208V

DUPLEX FLOOR RECEPTACLE, 120V

SPECIAL PURPOSE WALL RECEPTACLE, RATING AS NOTED

CLOCK

TELEVISION

TELEPHONE

TELEPHONE/DATA WITH CABLE

TELEPHONE/DATA WITHOUT CABLE

SWITCH OUTLETS

S — STANDARD SWITCH, 120VAC, 20 AMP

S_3 — 3–WAY SWITCH, 120VAC, 20 AMP

S_{HOA} — 3–POSITION SWITCH, 120VAC, 20 AMP, LABEL SWITCH POSITION HAND–OFF–MOTION OR PHOTO

S_{DEE}	SINGLE–POLE	S_P	PILOT–LIGHTED
S_2	DOUBLE–POLE	S_K	KEY–OPERATED
S_3	THREE WAY	S_{LV}	LOW VOLTAGE
S_4	FOUR WAY	S_M	MASTER
S_D	DIMMER		PUSHBUTTON

LIGHTING FIXTURES/DEVICES

FLUORESCENT FIXTURE

WALL/CEILING MOUNTED FIXTURE

EMERGENCY LIGHT WITH SELF CONTAINED BATTERY

SURFACE OR PENDANT MOUNTED FIXTURE

RECESSED FIXTURE

MD — MOTION DETECTOR

PC — PHOTO CONTROL CELL

FIRE SYSTEM SYMBOLS

H — HEAT DETECTOR

S — SMOKE DETECTOR

D — FIRE ALARM DISPATCH STROBE ALARM

A — FIRE ALARM AUDIBLE/VISUAL ALARM

F — FIRE ALARM MANUAL PULL STATION

ADDITIONAL SYMBOLS

S — SOUND SYSTEM SPEAKER

V — SOUND SYSTEM VOLUME CONTROL

B — DOORBELL

VALVE SYMBOLS

PILOT VALVE SOLENOID

VALVE

CHECK VALVE

CONTROL VALVE

PID FORMAT

SUPERSCRIPT

X=MEASURED OR INITIATING VARIABLE
Y=READOUT OR FUNCTION
Z=MODIFIER
ABC=LOOP NUMBER

XYZ / ABC — INSTRUMENT BUBBLE

ISA STANDARDS FOR P&ID

	1st LETTER (MEASURED OR INITIATING VARIABLE)	2nd LETTER (READOUT OR FUNCTION)	3rd LETTER (MODIFIER)
A	ANALYSIS	ALARM	
B	BURNER (BATTERY)		(BACK)
C	COMMUNICATION	CONTROL	CLOSED
D	DENSITY	(DELAY)	
E	VOLTAGE		
F	FLOW		FAIL (FLOW)
G	GAS		GREEN BULB
H	HAND	MANUAL	HIGH
I	CURRENT (INTRUSION)	INDICATE	
J	POWER (EQUIPMENT)		
K	TIME	CONTROL STATION	
L	LEVEL	LIGHT	LOW
M	MOTION		MIDDLE
N	USERS CHOICE		
O	USERS CHOICE		OPEN
P	PRESSURE	(PUMP)	(PRESSURE)
Q	QUANTITY (EVENT)	TOTALIZE	
R	RADIATION (REQ'D)	RECORD	RED BULB
S	SPEED (SMOKE)	SWITCH	SOLENOID
T	TEMPERATURE	TRANSMITTER	(TRANSMITTER)
U	MULTI VARIABLE	MULTI FUNCTION	
V	VISCOSITY (pH)	VALVE	
W	WEIGHT		
X	UNCLASSIFIED		
Y	USERS CHOICE	RELAY (TRANSDUCER)	
Z	POSITION		

ABBREVIATIONS

SPDT – SINGLE POLE, DOUBLE THROW
SPST – SINGLE POLE, SINGLE THROW
DPST – DOUBLE POLE, SINGLE THROW
WP – WEATHER–PROOF
GFI – GROUND FAULT INTERRUPT
P – POWER
C – CONTROL
J – INSTRUMENTATION
PC – POWER & CONTROL
CJ – CONTROL & INSTRUMENTATION
CKT. – CIRCUIT
C.O. – CONDUIT ONLY
N.L. – NIGHT LIGHT
AL. – ALUMINUM
CU. – COPPER

HOA — HAND–OFF–AUTO SWITCH
ETM — RUN TIME METER
OC — OPERATION COUNTER
MRIL — MOTOR RUN INDICATION LIGHT
SFIL — SEAL FAIL INDICATION LIGHT
SFTR — SEAL FAIL TRIP RESET
OTIL — OVER TEMPERATURE INDICATION LIGHT
MOIL — MOTOR OVERLOAD INDICATION LIGHT

INDICATE TYPE BY LETTER / INSTRUMENT METER

V, AH

A – AMMETER
AH – AMPERE–HOUR
PF – POWER FACTOR
V – VOLTMETER
VA – VOLT AMMETER
VAR – VARMETER
VARH – VARHOUR METER
W – WATTMETER
WH – WATTHOUR METER

RACEWAY LEGEND

SITE PLAN LEGEND

P — PROPOSED POWER
TEL — PROPOSED TELEPHONE
TELM — PROPOSED INSTRUMENTATION
FO — PROPOSED FIBER OPTICS

BUILDING OR FACILITY PLAN LEGEND

480 VOLT EXPOSED RACEWAY

480 VOLT WIRING CONCEALED, UNDERGROUND, EMBEDDED, OR CONCRETE ENCASED RACEWAY

120/208/240 VOLT EXPOSED RACEWAY

120/208/240V WIRING CONCEALED, UNDERGROUND, EMBEDDED, OR CONCRETE ENCASED RACEWAY

CONTROL OR INSTRUMENTATION EXPOSED RACEWAY

CONTROL OR INSTRUMENTATION, UNDERGROUND, EMBEDDED, OR CONCRETE ENCASED RACEWAY

HOME RUN TO PANELBOARD OR AS INDICATED

CONDUIT RUN, BROKEN AND CONTINUED SAME SHEET OR AS NOTED

FLEXIBLE CONDUIT

CONDUIT RUN. HATCH MARKS INDICATE NUMBER OF CONDUCTORS

CALLOUT INDICATING CONDUIT SIZE, NUMBER AND SIZE OF WIRE.
½" GRC, 2–#12

XX — CALLOUT INDICATING CONDUIT PER SCHEDULE

CONDUIT BENT UP OR TOWARD

CONDUIT BENT DOWN OR AWAY

CAPPED CONDUIT

LADDER LOGIC SYMBOL LEGEND

INDICATOR LIGHT — INDICATOR LIGHT
A – AMBER G – GREEN
B – BLUE R – RED
C – CLEAR W – WHITE

RELAY (XYZ 123) — RELAY
TR – Timed relay
CR – Control relay

LIMIT SWITCH — LIMIT SWITCH, NORMALLY OPEN

FLOAT SWITCH — FLOAT SWITCH, NORMALLY OPEN

LIMIT SWITCH — LIMIT SWITCH, NORMALLY CLOSED

FLOAT SWITCH — FLOAT SWITCH, NORMALLY CLOSED

TIME DELAY CONTACT — TIME DELAY CONTACT, NORMALLY OPEN, TIME TO CLOSE

PUSHBUTTON — PUSHBUTTON, NORMALLY CLOSED

TIME DELAY CONTACT — TIME DELAY CONTACT, NORMALLY CLOSED, TIME TO OPEN

PUSHBUTTON — PUSHBUTTON, NORMALLY OPEN

TIME DELAY CONTACT — TIME DELAY CONTACT, NORMALLY OPEN, TIME TO OPEN

THERMOSTAT — THERMO SWITCH, NORMALLY OPEN

TIME DELAY CONTACT — TIME DELAY CONTACT, NORMALLY CLOSED, TIME TO CLOSE

THERMOSTAT — THERMO SWITCH, NORMALLY CLOSED

RELAY CONTACT, NC / RELAY CONTACT, NO — RELAY CONTACT, INSTANTANEOUS CHANGE

FLOWSWITCH — FLOWSWITCH, NORMALLY OPEN

PRESSURE SWITCH — PRESSURE SWITCH, NORMALLY OPEN

FLOWSWITCH — FLOWSWITCH, NORMALLY CLOSED

PRESSURE SWITCH — PRESSURE SWITCH, NORMALLY CLOSED

2 POLE SWITCH

LADDER LOGIC LINETYPES
COMPONENT INSTALLED INSIDE ENCLOSURE
COMPONENT INSTALLED ON FRONT OF ENCLOSURE
FIELD CONNECTED COMPONENT

3 POLE SWITCH

P&ID BUBBLE IDENTIFICATION CHART

EXISTING	FUNCTION
	INSTRUMENT IDENTIFICATION BUBBLE
	FIELD MOUNTED DEVICE OR INSTRUMENT
	FRONT PANEL MOUNTED INSTRUMENT OR DEVICE (LOCAL PANEL)
	BACK PANEL MOUNTED INSTRUMENT OR DEVICE (LOCAL PANEL)
	FRONT PANEL MOUNTED INSTRUMENT OR DEVICE (LAB ROOM PANEL)
	OPERATOR INTERFACE DISPLAY (LOCAL PANEL)
	OPERATOR INTERFACE DISPLAY (LAB ROOM PANEL)

GENERAL NOTES

1. THIS IS A STANDARD LEGEND. NOT ALL OF THE INFORMATION SHOWN ON THIS PAGE WILL APPEAR IN THIS SET OF PLANS.

2. THESE DRAWINGS ARE DIAGRAMMATIC ONLY; EXACT LOCATIONS OF ELECTRICAL EQUIPMENT SHALL BE DETERMINED IN THE FIELD BY THE CONTRACTOR. THE INSTALLATION OF ALL EQUIPMENT SHOWN ON THESE DRAWINGS OR DESCRIBED IN THE SPECIFICATIONS SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN THE LATEST EDITIONS OF ALL APPLICABLE CODES AND UTILITY COMPANY STANDARDS. CONTACT THE UTILITY COMPANY REPRESENTATIVES AND VERIFY THEIR REQUIREMENTS.

3. NOTIFY THE ENGINEER IMMEDIATELY IF CONFLICTS IN EQUIPMENT LOCATIONS ARE DISCOVERED OR IF PROBLEMS ARISE DUE TO FIELD CONDITIONS, LACK OF INFORMATION OR ANY OTHER REASON. NO PAYMENT WILL BE MADE FOR CHANGES WHICH HAVE NOT BEEN REVIEWED BY THE ENGINEER.

REGISTERED PROFESSIONAL ENGINEER 86610 OREGON MARCH 13, CHRISTOPHER M. ROBERTS
EXPIRES: 12/31/2016
SIGNED: 10/18/16

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RH2 ENGINEERING, INC.
www.rh2.com 1.800.720.8052
MEDFORD, OR
3523 Arrowhead Drive, Suite 200

CITY OF ROSEBURG
PHASE 1 - WATER SYSTEM SCADA IMPROVEMENTS
ELECTRICAL LEGEND

REVISIONS

NO.	DATE	DESCRIPTION	BY	REVIEW

ENGINEER: MWB
REVIEWED: CMR
SAVE DATE: Oct 31, 2016
PLOT DATE: Oct 31, 2016
CLIENT: ROS
FILENAME: ROS-D-ELEC01.DWG
JOB NO.: 916-006

SCALE: SHOWN
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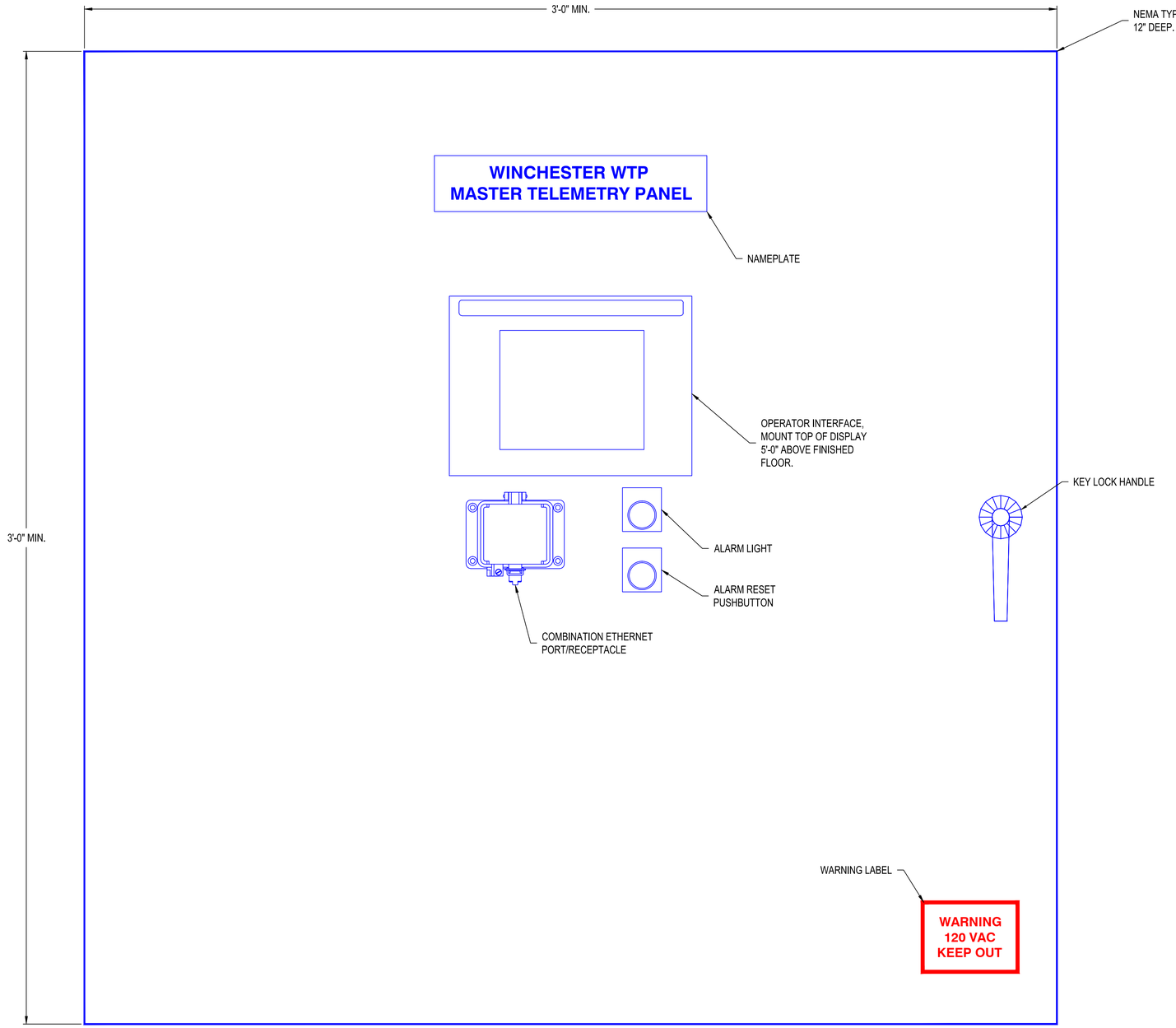
DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

DWG NO.: E01
SHEET NO.: 1 / 13



MTU PANEL EXTERIOR LAYOUT

NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
86610
OREGON
13
MARCH
CHRISTOPHER M. ROBERTS
EXPIRES: 12/31/2016
SIGNED: 10/18/16

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CITY OF ROSEBURG
PHASE 1 - WATER SYSTEM
SCADA IMPROVEMENTS

WINCHESTER WTP - TELEMETRY PANEL LAYOUT

ENGINEER: MWB
REVIEWED: CMR
SAVE DATE: Oct 31, 2016
PLOT DATE: Oct 31, 2016
CLIENT: ROS
FILENAME: ROS-D-ELEC02.DWG
JOB NO.: 916-006

REVISIONS

NO.	DESCRIPTION	DATE	BY	REVIEW

SCALE: SHOWN

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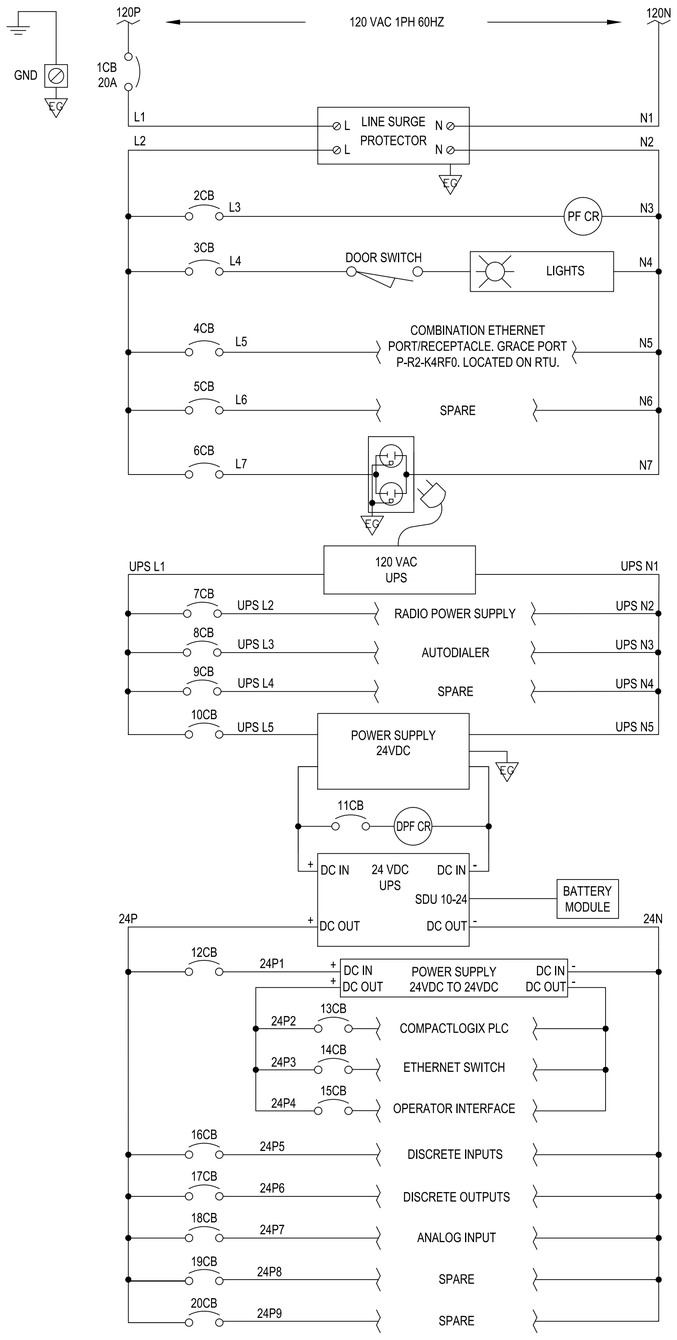
DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

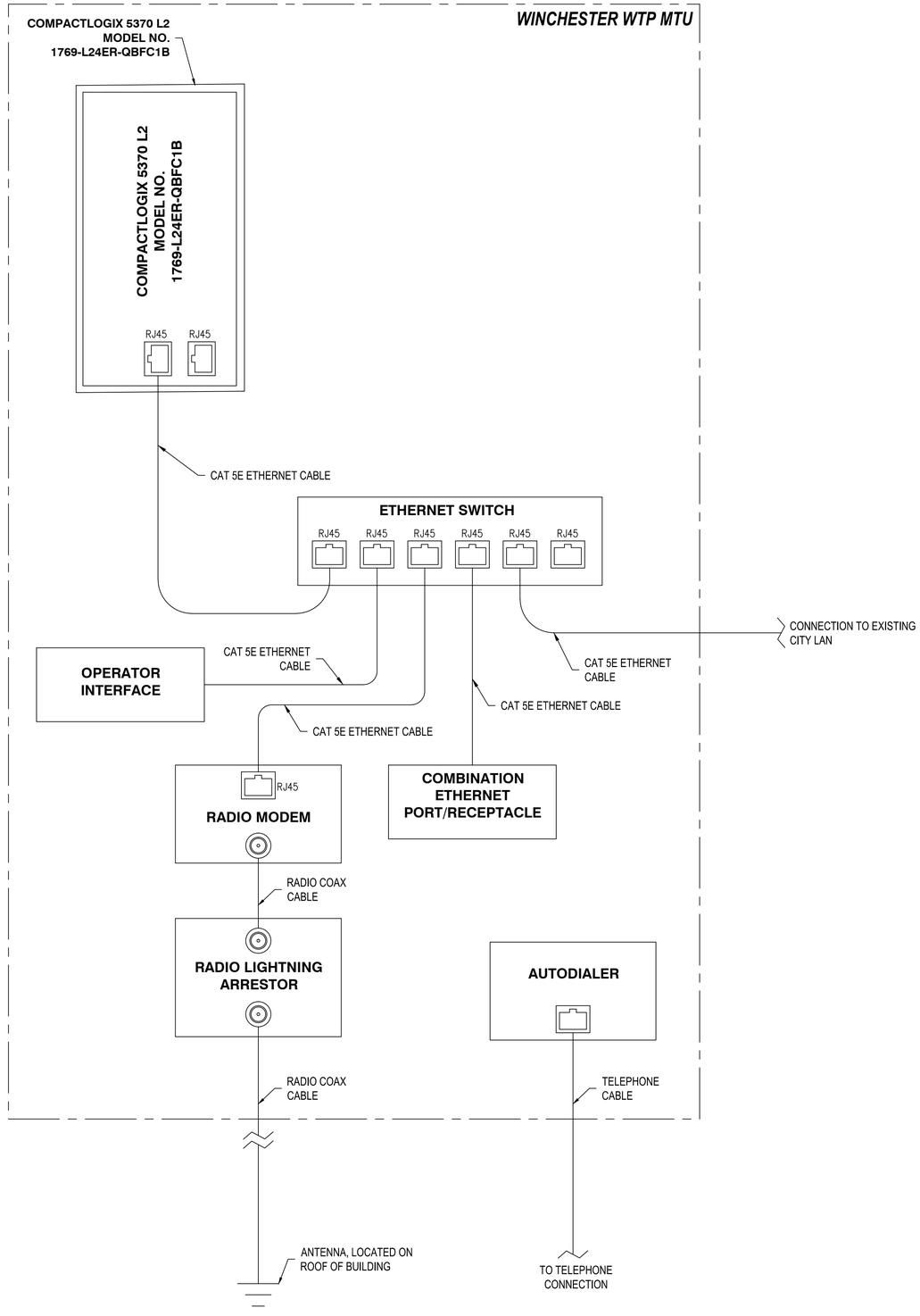
DWG NO.: E02

SHEET NO.: 2 13



POWER LAYOUT

NOT TO SCALE



COMMUNICATIONS LAYOUT

NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
86610
OREGON
13
CHRISTOPHER M. MATSCH
EXPIRES: 12/31/2016
SIGNED: 10/18/16

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CITY OF ROSEBURG
PHASE 1 - WATER SYSTEM
SCADA IMPROVEMENTS

WINCHESTER WTP - POWER AND COMMUNICATIONS DIAGRAM

ENGINEER: MWB	REVIEW
REVIEWED: CMR	BY
SAVE DATE: Oct 31, 2016	DESCRIPTION
PLOT DATE: Oct 31, 2016	DATE
CLIENT: ROS	NO.
FILENAME: ROS-D-ELEC02.DWG	
JOB NO: 916-006	

REVISIONS

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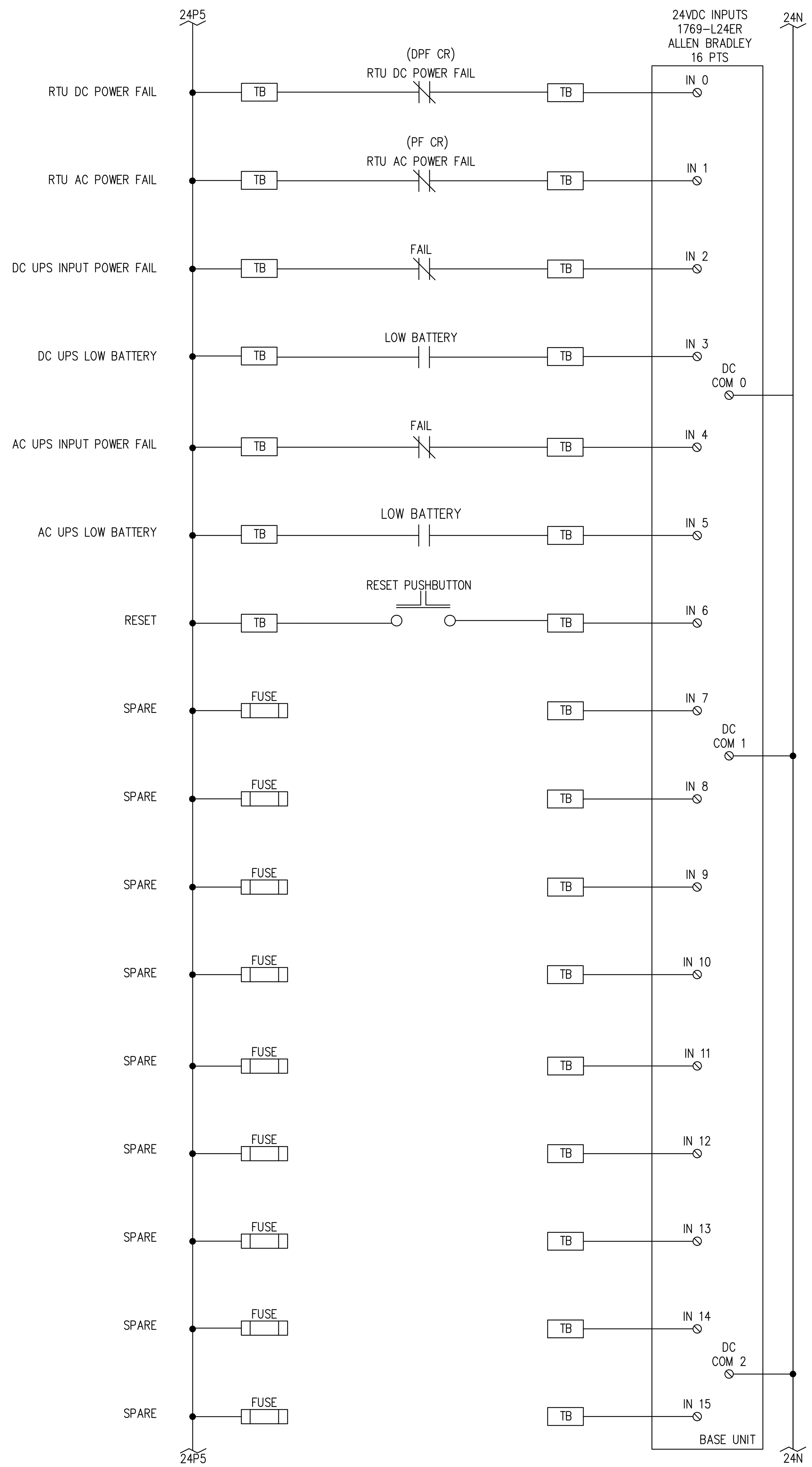
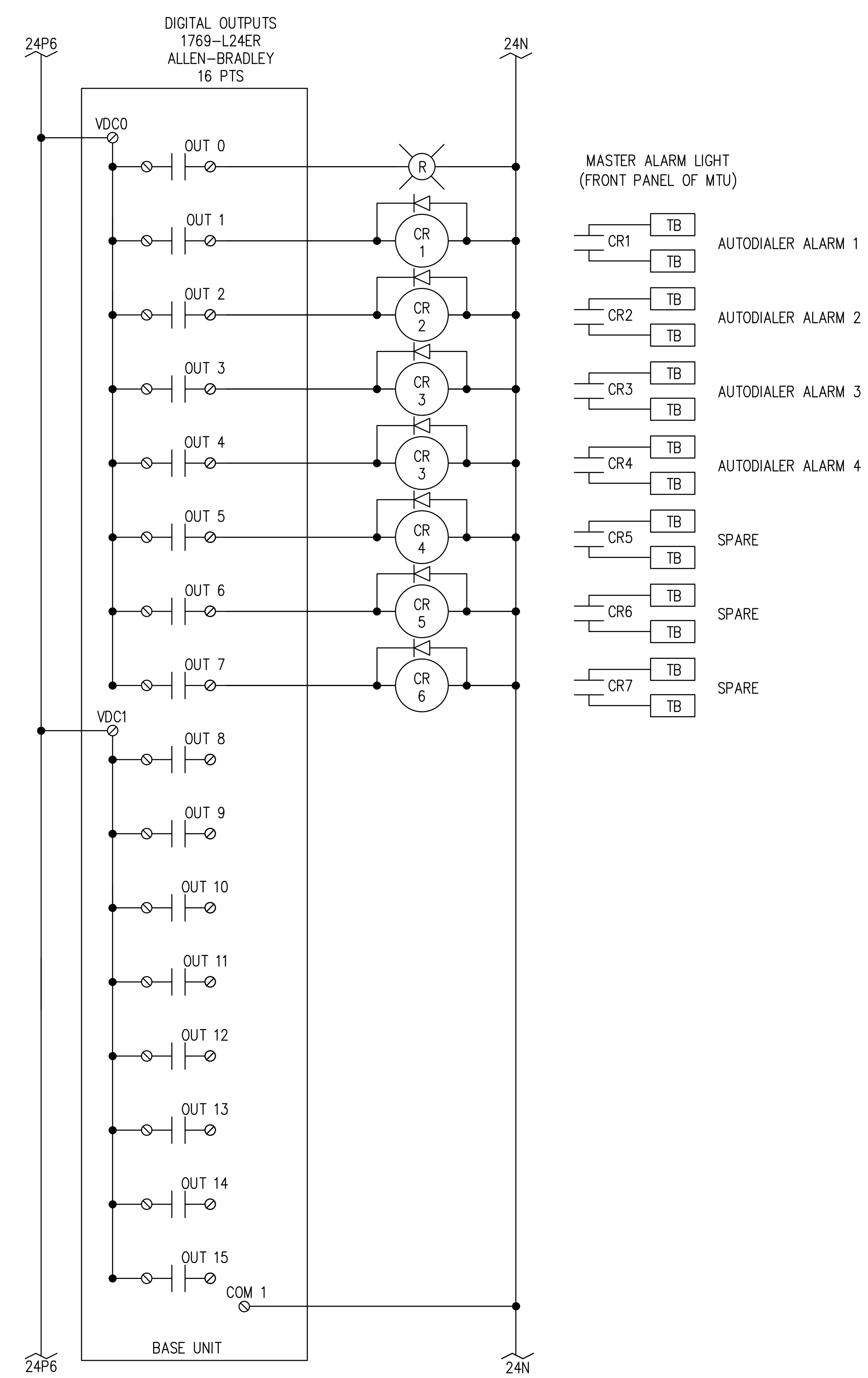


DIGITAL INPUTS, BASE UNIT

NOT TO SCALE



DIGITAL OUTPUTS, BASE UNIT

NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER 86610 OREGON MARCH 13, 2012 CHRISTOPHER M. ROBERTS
EXPIRES: 12/31/2016
SIGNED: 10/18/16

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MEDFORD, OR
3323 Arrowhead Drive, Suite 200

CITY OF ROSEBURG
PHASE 1 - WATER SYSTEM SCADA IMPROVEMENTS
WINCHESTER WTP - TELEMETRY WIRING 1

ENGINEER: MWB | REVIEWED: CMR
SAVE DATE: Oct 31, 2016 | PLOT DATE: Oct 31, 2016
CLIENT: ROS | FILENAME: ROS-D-ELEC02.DWG
JOB NO.: 916-006

REVISIONS

NO.	DATE	DESCRIPTION	BY	REVIEW

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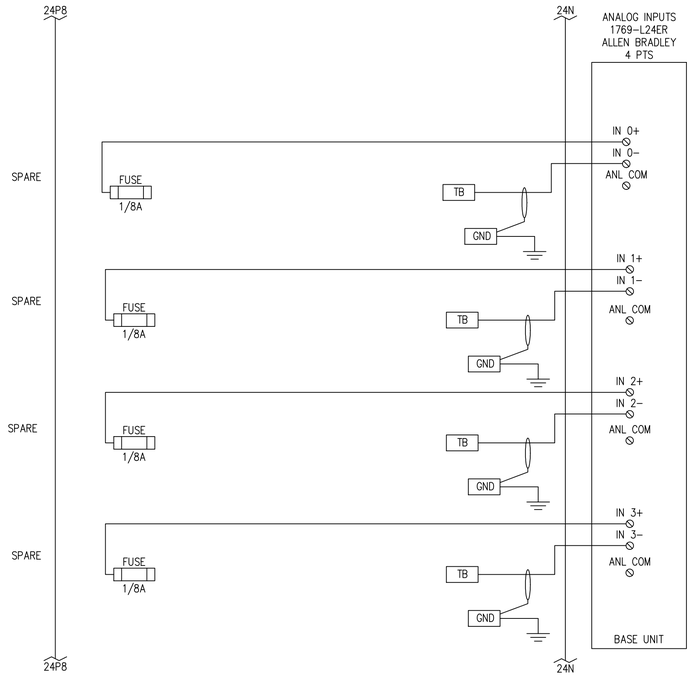
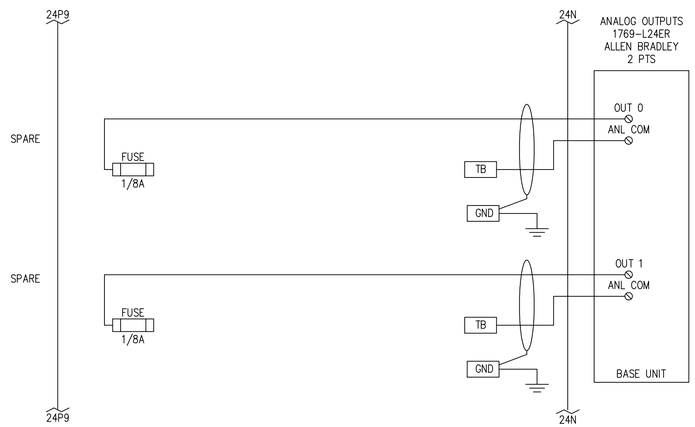
DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

DWG NO.: E04
SHEET NO.: 4 / 13



ANALOG INPUTS, BASE UNIT

NOT TO SCALE



ANALOG OUTPUTS, BASE UNIT

NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
86610
OREGON
13 MARCH 22
CHRISTOPHER M. ROBERTS

EXPIRES: 12/31/2016
SIGNED: 10/18/16

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CITY OF ROSEBURG
PHASE 1 - WATER SYSTEM
SCADA IMPROVEMENTS

WINCHESTER WTP - TELEMETRY WIRING 2

JOB NO.: 916-006
CLIENT: ROS
FILENAME: ROS-D-ELEC02.DWG
SAVE DATE: Oct 31, 2016
PLOT DATE: Oct 31, 2016
ENGINEER: MWB
REVIEWED: CMR

REVISIONS

NO.	DESCRIPTION	DATE	BY	REVIEW

SCALE: SHOWN

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DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

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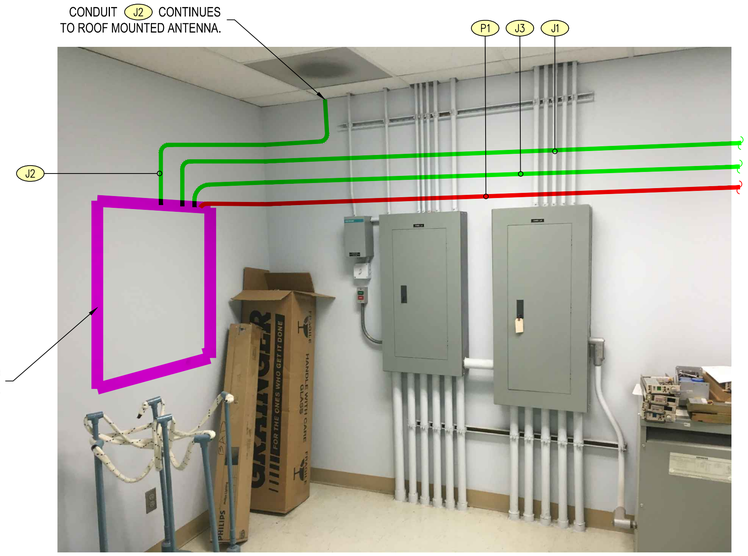
SHEET NO.: 5 13



PROPOSED TELEMETRY PANEL LOCATION

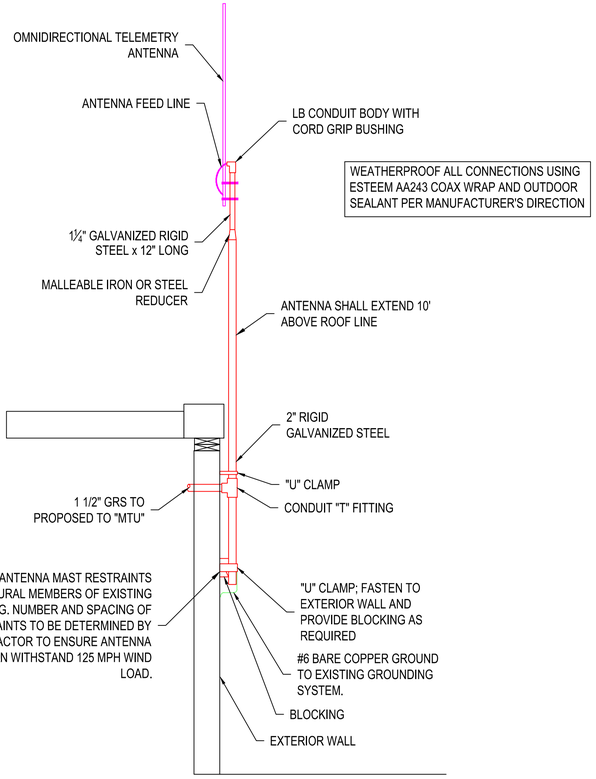
NO SCALE

CONDUIT ROUTING 1

NO SCALE

CONDUIT ROUTING 2

NO SCALE



ANTENNA INSTALLATION DETAIL

1/2" = 1'-0"

CONDUIT AND CONDUCTOR SCHEDULE

CIRCUIT	SOURCE	DESTINATION	TRADE SIZE	(QUANTITY) CONDUCTORS	NOTES
P1	LIGHTING PANEL, "LD"	TELEMETRY PANEL, "MTU"	3/4"	(2) – #12, (1) – #12 GRD	
J1	TELEMETRY PANEL, "MTU"	EXISTING CITY LAN EQUIPMENT	3/4"	(1) CAT 5E ETHERNET CABLE	
J2	TELEMETRY PANEL, "MTU"	PROPOSED ANTENNA	1 1/2"	(1) COAXIAL ANTENNA CABLE	USE LARGE RADIUS BENDS
J3	TELEMETRY PANEL, "MTU"	EXISTING TELEPHONE INTERFACE PANEL	3/4"	(1) TELEPHONE CABLE	

PROPOSED ANTENNA LOCATION

NO SCALE

REGISTERED PROFESSIONAL ENGINEER
86610
OREGON
JULY 13, 2012
MARTECH ROBERTS CHRISTOPHER M.

EXPIRES: 12/31/2016
SIGNED: 10/18/16

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CITY OF ROSEBURG
PHASE 1 - WATER SYSTEM
SCADA IMPROVEMENTS

WINCHESTER WTP - ELECTRICAL PLAN

JOB NO.: 916-006
CLIENT: ROS
FILENAME: ROS-D-ELEC02.DWG
SAVE DATE: Oct 31, 2016
PLOT DATE: Oct 31, 2016
ENGINEER: MWB
REVIEWED: CMR

REVISIONS

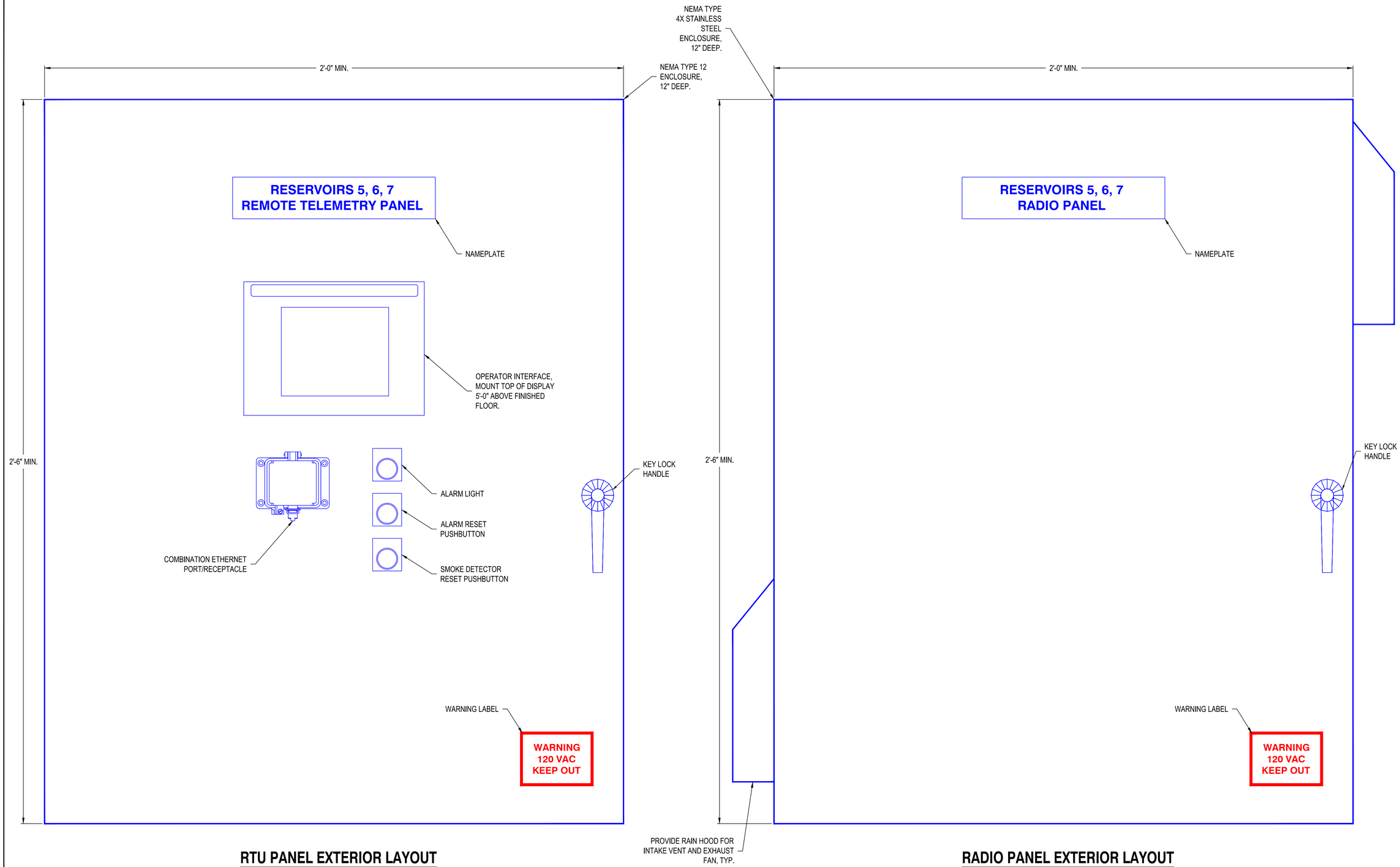
NO.	DESCRIPTION	DATE	BY	REVIEW

SCALE: SHOWN

0" 1" 2"

DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

DWG NO.: E06
SHEET NO.: 6
13



RTU PANEL EXTERIOR LAYOUT

NOT TO SCALE

RADIO PANEL EXTERIOR LAYOUT

NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER — 86610 — OREGON — 21 JAN 13 — MATSCH — CHRISTOPHER M. ROBERTS

EXPIRES: 12/31/2016
SIGNED: 10/18/16

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CITY OF ROSEBURG
PHASE 1 - WATER SYSTEM
SCADA IMPROVEMENTS

RESERVOIRS 5, 6, 7 - TELEMETRY PANEL LAYOUT

JOB NO.: 916-006
CLIENT: ROS
FILENAME: ROS-D-ELEC03.DWG
SAVE DATE: Oct 31, 2016
PLOT DATE: Oct 31, 2016
ENGINEER: MWB
REVIEWED: CMR

REVISIONS

NO.	DESCRIPTION	DATE	BY	REVIEW

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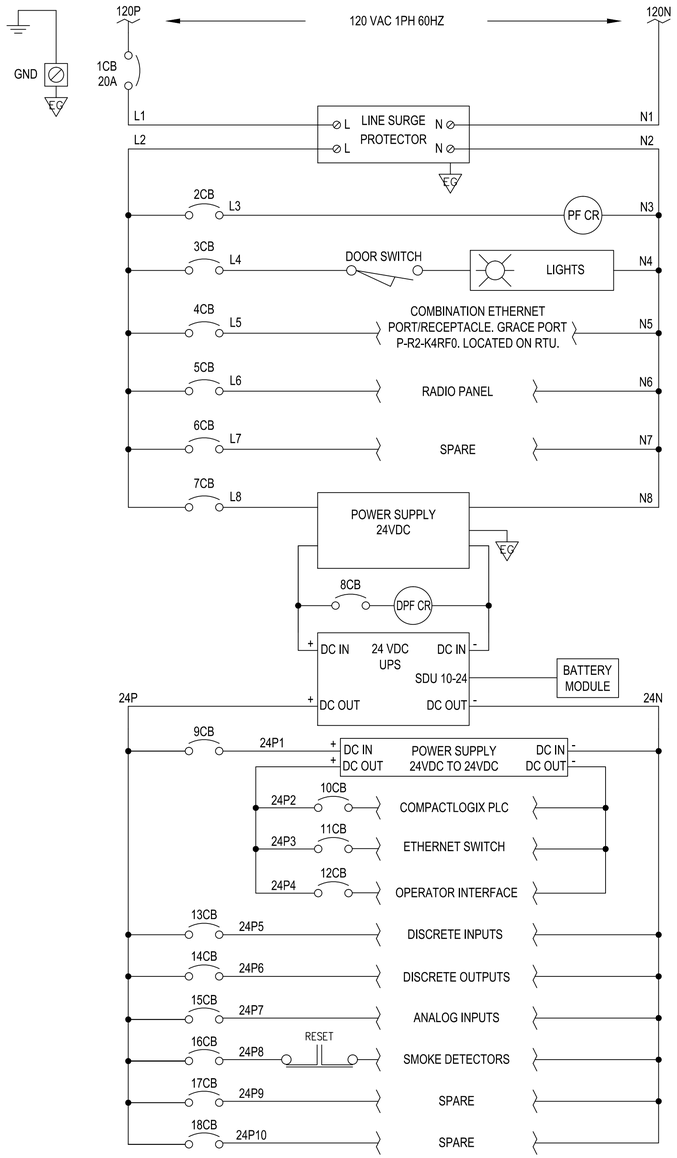
0" 1" 2"

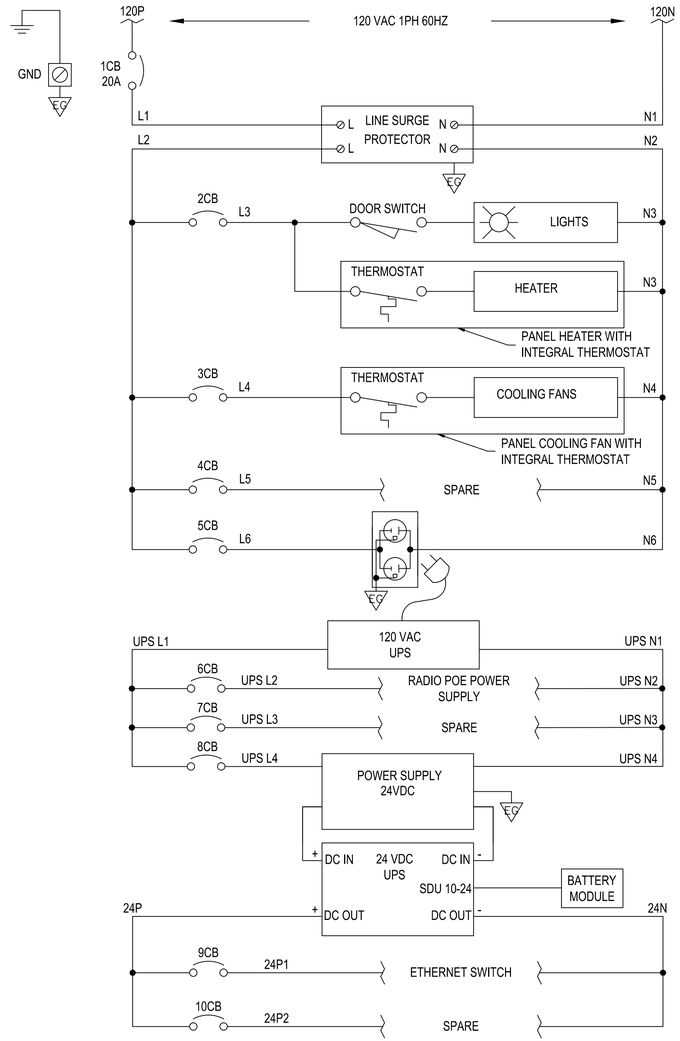
DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

DWG NO.: E07
SHEET NO.: 7 13



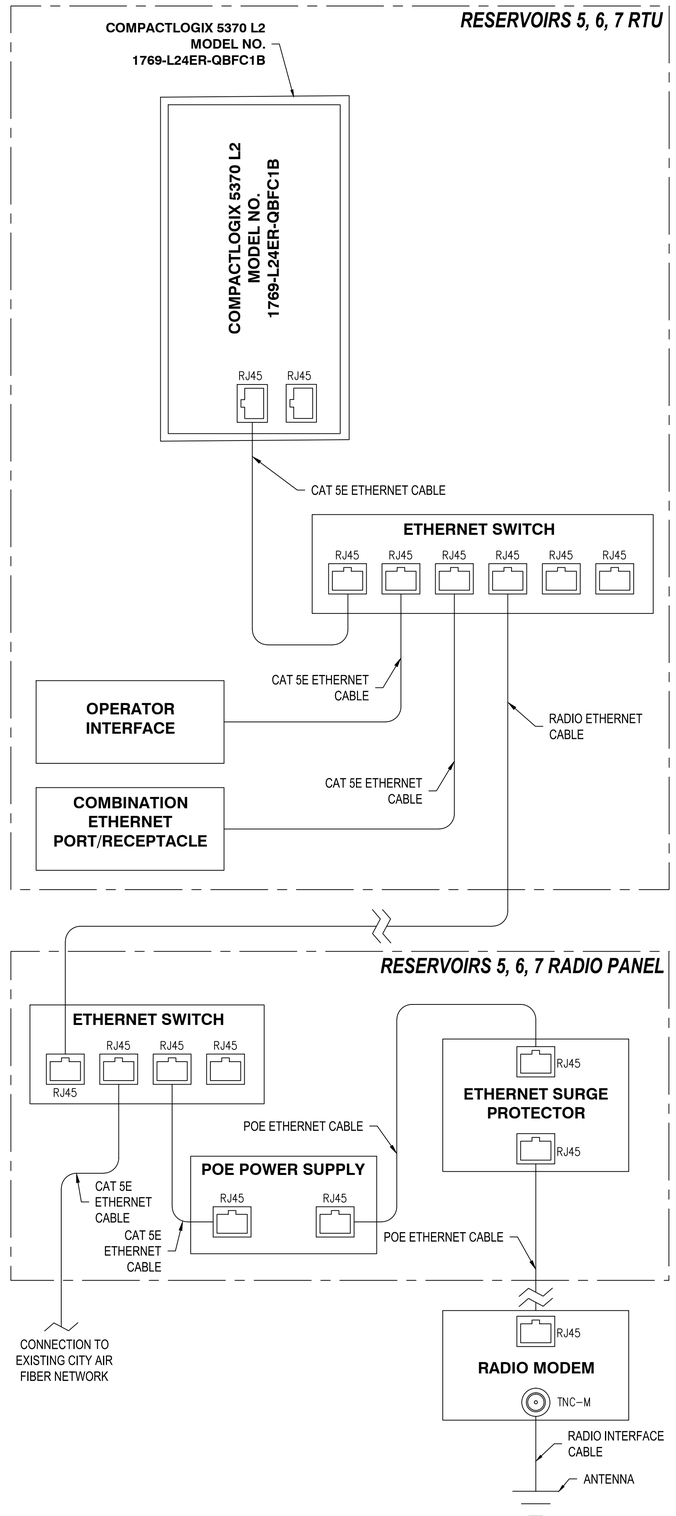
RTU POWER LAYOUT

NOT TO SCALE



RADIO PANEL POWER LAYOUT

NOT TO SCALE



COMMUNICATIONS LAYOUT

NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 13, 2012
CHRISTOPHER M. MATSCH
86610
RENEWS: 12/31/2016
SIGNED: 10/18/16

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CITY OF ROSEBURG
PHASE 1 - WATER SYSTEM
SCADA IMPROVEMENTS

RESERVOIRS 5, 6, 7 - POWER AND COMMUNICATIONS DIAGRAM

JOB NO.:	916-006
CLIENT:	ROS
FILENAME:	ROS-D-ELEC03.DWG
SAVE DATE:	Oct 31, 2016
PLOT DATE:	Oct 31, 2016
ENGINEER:	MWB
REVIEWED:	CMR

REVISIONS

NO.	DESCRIPTION	DATE	BY	REVIEW

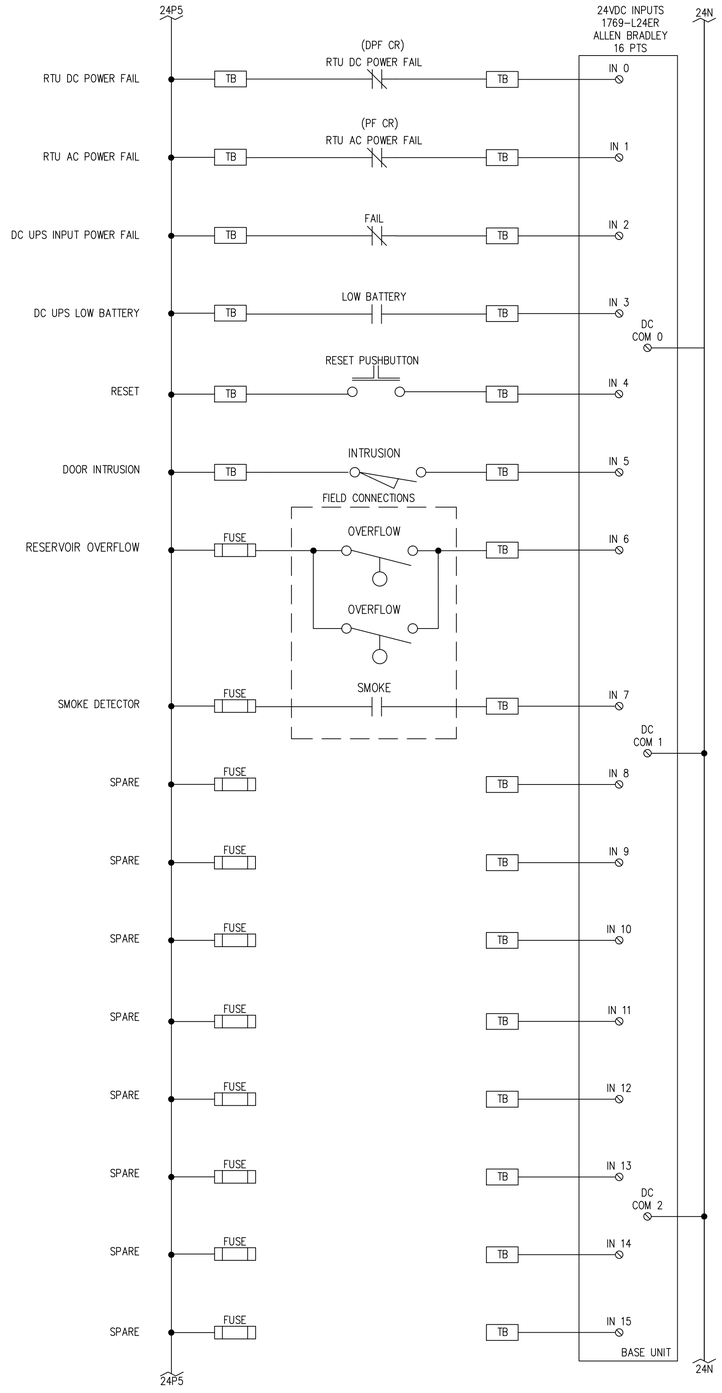
SCALE: SHOWN

0" 1" 2"

DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

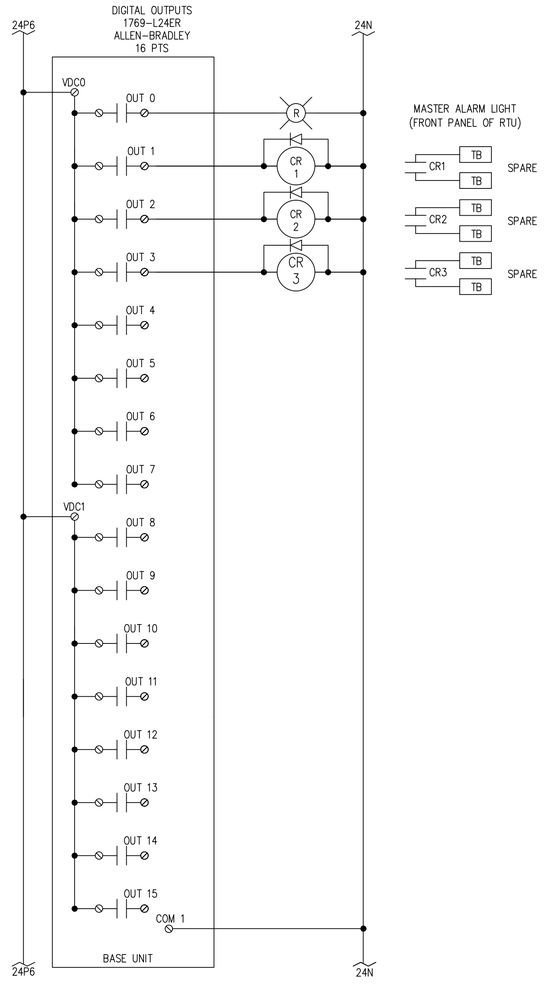
DWG NO.: E08

SHEET NO.: 8



DIGITAL INPUTS, BASE UNIT

NOT TO SCALE



DIGITAL OUTPUTS, BASE UNIT

NOT TO SCALE

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REGISTERED PROFESSIONAL ENGINEER
86610
OREGON
JULY 13, 2012
CHRISTOPHER M. MATSCH
ROBERTS

EXPIRES: 12/31/2016
SIGNED: 10/18/16

CITY OF ROSEBURG
PHASE 1 - WATER SYSTEM
SCADA IMPROVEMENTS

RESERVOIRS 5, 6, 7 - TELEMETRY WIRING 1

JOB NO.: 916-006
CLIENT: ROS
FILENAME: ROS-D-ELEC03.DWG
SAVE DATE: Oct 31, 2016
PLOT DATE: Oct 31, 2016
ENGINEER: MWB
REVIEWED: CMR

REVISIONS

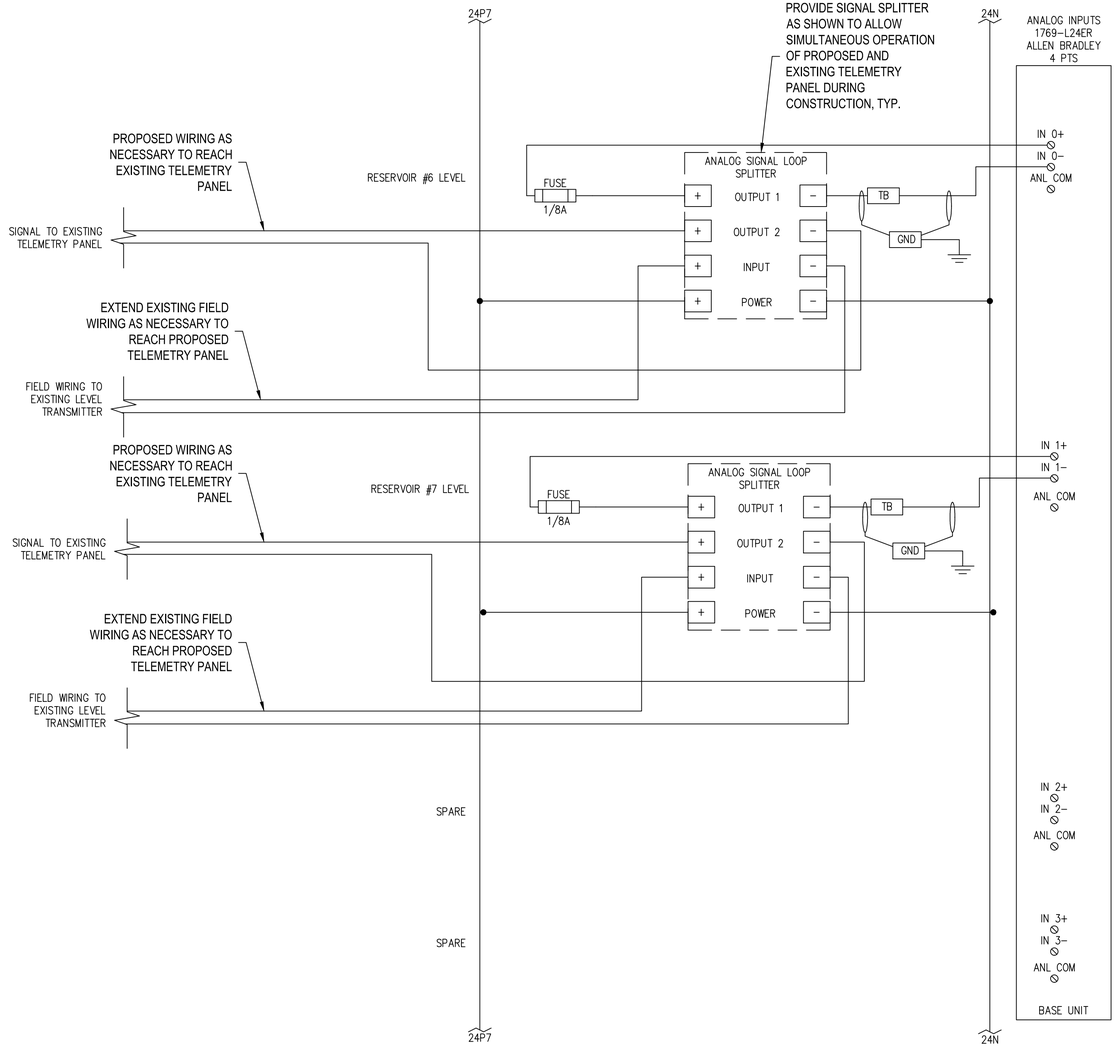
NO.	DESCRIPTION	DATE	BY	REVIEW

SCALE: SHOWN

0" 1" 2"

DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

DWG NO.: E09
SHEET NO.: 9
13



ANALOG INPUTS, BASE UNIT

NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER 86610 OREGON 12 13 MARCH CHRISTOPHER M. ROBERTS

EXPIRES: 12/31/2016
SIGNED: 10/18/16

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CITY OF ROSEBURG
PHASE 1 - WATER SYSTEM
SCADA IMPROVEMENTS

RESERVOIRS 5, 6, 7 - TELEMETRY WIRING 2

JOB NO.: 916-006
CLIENT: ROS
FILENAME: ROS-D-ELEC03.DWG
SAVE DATE: Oct 31, 2016
PLOT DATE: Oct 31, 2016
ENGINEER: MWB
REVIEWED: CMR

REVISIONS

NO.	DATE	DESCRIPTION	BY	REVIEW

SCALE: SHOWN

0" 1" 2"

DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

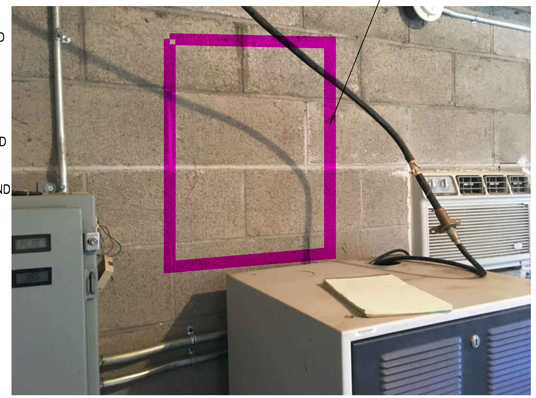
DWG NO.: E10
SHEET NO.: 10
13

INTERCEPT EXISTING SIGNAL CONDUITS AND REROUTE TO PROPOSED TELEMETRY PANEL. PROVIDE AND INSTALL PROPOSED CONDUIT AND CONDUCTORS AS NECESSARY.

INTERCEPT EXISTING SIGNAL CONDUITS AND REROUTE TO PROPOSED TELEMETRY PANEL. PROVIDE AND INSTALL PROPOSED CONDUIT AND CONDUCTORS AS NECESSARY.

EXISTING TELEMETRY PANEL

NO SCALE

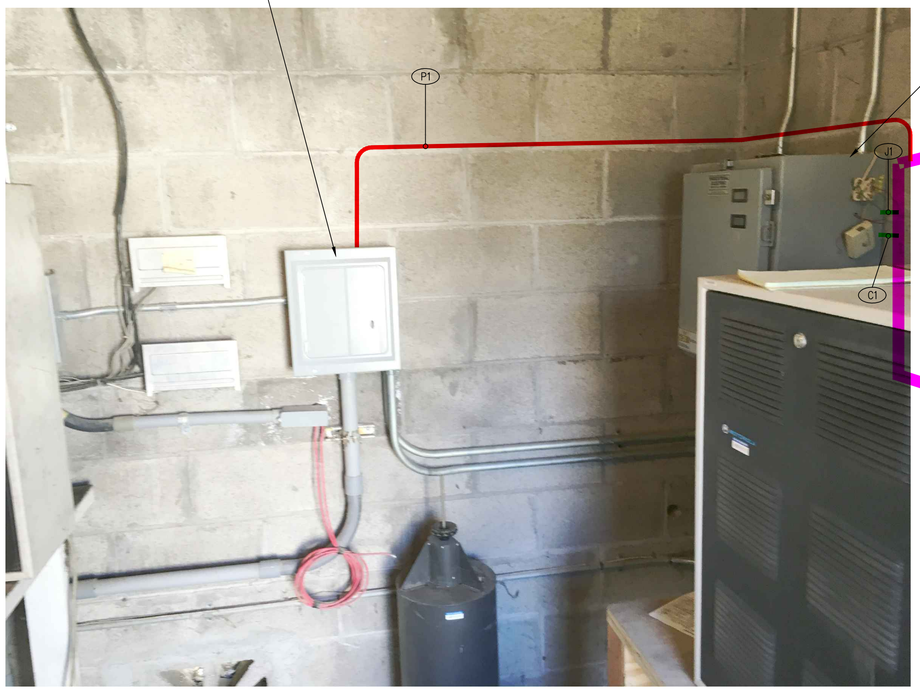


SECURE PROPOSED TELEMETRY PANEL TO BUILDING

PROPOSED TELEMETRY PANEL LOCATION

NO SCALE

INSTALL A PROPOSED 120V SINGLE POLE CIRCUIT BREAKER IN EXISTING SPACE 2 OF EXISTING LIGHTING PANEL FOR THE PROPOSED TELEMETRY PANEL CIRCUIT.



EXISTING TELEMETRY PANEL TO REMAIN FUNCTIONAL DURING AND AFTER CONSTRUCTION IS COMPLETE.

SECURE PROPOSED TELEMETRY PANEL TO BUILDING

TELEMETRY PANEL ELECTRICAL PLAN

NO SCALE

CONDUIT AND CONDUCTOR SCHEDULE

CIRCUIT	SOURCE	DESTINATION	TRADE SIZE	(QUANTITY) CONDUCTORS	NOTES
P1	EXISTING LIGHTING PANEL	PROPOSED TELEMETRY PANEL, "RTU"	3/4"	(2) – #12, (1) – #12 GRD	
P2	PROPOSED TELEMETRY PANEL, "RTU"	PROPOSED RADIO PANEL	1"	(2) – #10, (1) – #10 GRD	
C1	EXISTING TELEMETRY PANEL	PROPOSED TELEMETRY PANEL, "RTU"	3/4"	(8) – #14, (1) – #14 GRD	
J1	EXISTING TELEMETRY PANEL	PROPOSED TELEMETRY PANEL, "RTU"	1"	(2) 2–CONDUCTOR SHIELDED CABLES	
J2	PROPOSED TELEMETRY PANEL, "RTU"	PROPOSED RADIO PANEL	1"	(1) CAT 5E ETHERNET CABLE	
J3	PROPOSED RADIO PANEL	EXISTING CITY AIR FIBER EQUIPMENT	1"	(1) CAT 5E ETHERNET CABLE	

EXISTING BUILDING CONTAINING PROPOSED TELEMETRY PANEL

PROVIDE CONDUIT HANDHOLES AS REQUIRED BY SPECIFICATIONS, TYP.

EXISTING CITY AIR FIBER EQUIPMENT AND ANTENNA

PROPOSED RADIO TOWER, SEE DETAIL ON DWG NO. S01

PROPOSED RADIO PANEL, MOUNTED TO PROPOSED RADIO TOWER

ELECTRICAL SITE PLAN

1" = 20'

REGISTERED PROFESSIONAL ENGINEER — OREGON — 86610 — MARCH 13, 2012 — CHRISTOPHER M. ROBERTS

EXPIRES: 12/31/2016
SIGNED: 10/18/16

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CITY OF ROSEBURG
PHASE 1 - WATER SYSTEM
SCADA IMPROVEMENTS

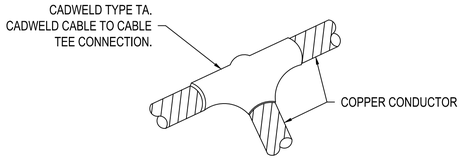
RESERVOIRS 5, 6, 7 - ELECTRICAL PLAN

REVISIONS			
NO.	DATE	DESCRIPTION	BY
			REVIEW

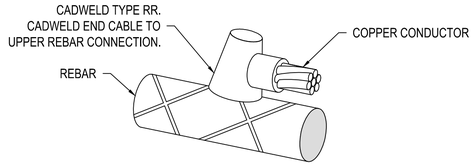
JOB NO.: 916-006
CLIENT: ROS
FILENAME: ROS-D-ELEC03.DWG
SAVE DATE: Oct 31, 2016
PLOT DATE: Oct 31, 2016
ENGINEER: MWB
REVIEWED: CMR

SCALE: SHOWN
0" 1" 2"
DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

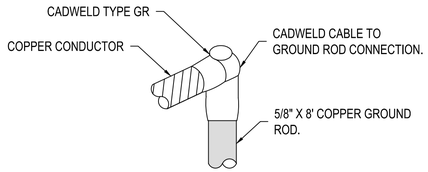
DWG NO.: E11
SHEET NO.: 11
13



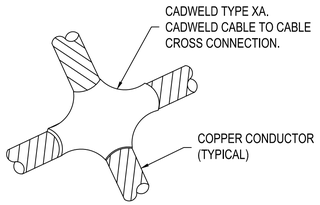
GROUND TEE DETAIL
NO SCALE



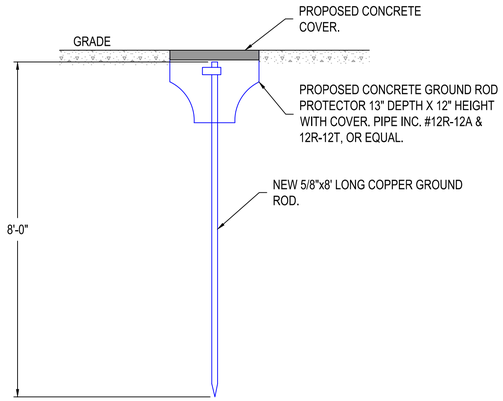
GROUND REBAR DETAIL
NO SCALE



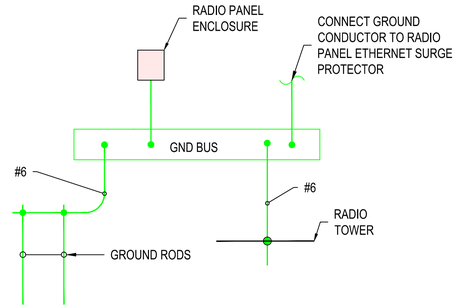
GROUND TEE DETAIL
NO SCALE



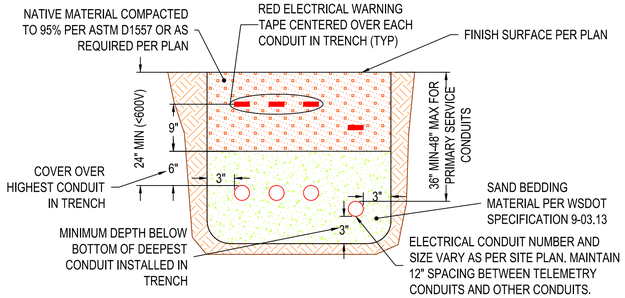
GROUNDING CROSS DETAIL
NO SCALE



GROUNDING ROD DETAIL
NO SCALE

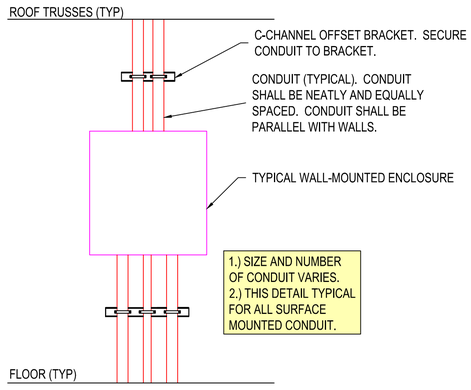


GROUNDING SCHEMATIC
NO SCALE

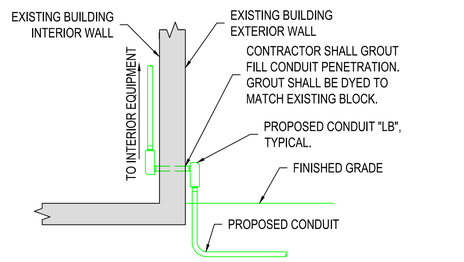


TYPICAL ELECTRICAL TRENCH DETAIL
NOT TO SCALE

NOTE: BURY DEPTH OF CONDUIT AND HORIZONTAL SPACING SHALL BE CONFIRMED WITH SERVING UTILITY BEFORE CONSTRUCTION.



SURFACE MOUNTED CONDUIT DETAIL
NOT TO SCALE



EXISTING BUILDING CONDUIT PENETRATION DETAIL
NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
86610
OREGON
12-22
ROBERT S. MUTCH
CHRISTOPHER M.
EXPIRES: 12/31/2016
SIGNED: 10/18/16

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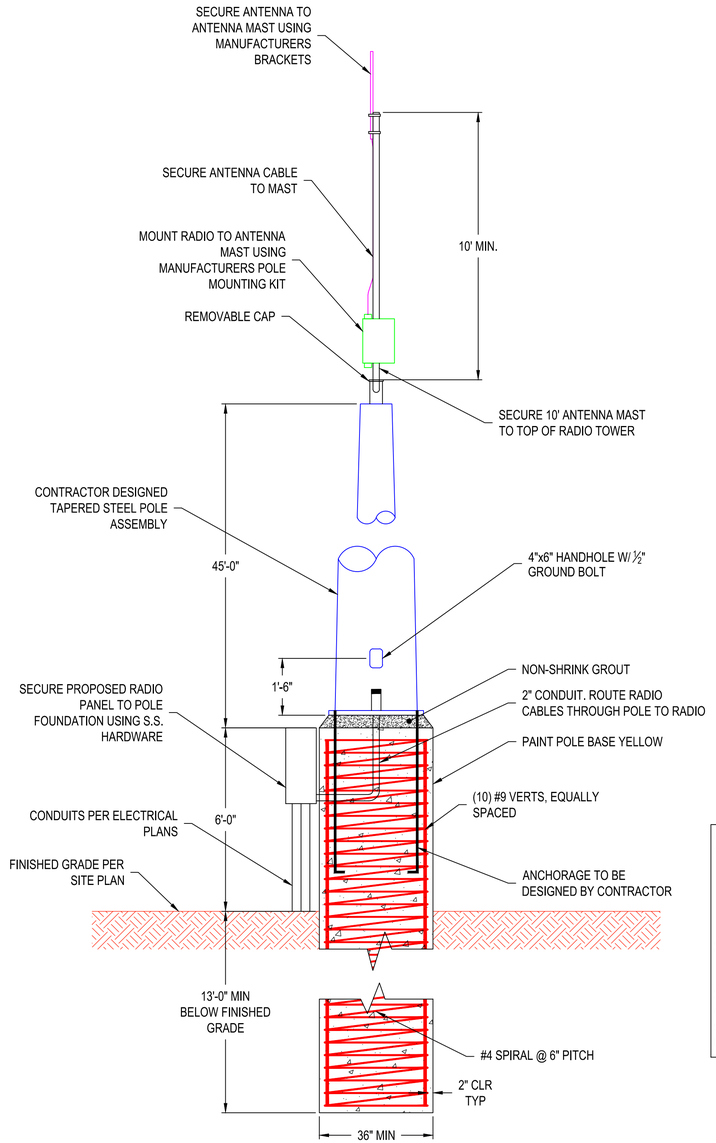
CITY OF ROSEBURG
PHASE 1 - WATER SYSTEM
SCADA IMPROVEMENTS

RESERVOIR 5, 6, 7 - ELECTRICAL DETAILS

ENGINEER: MWB	SAVE DATE: Oct 31, 2016	CLIENT: ROS	JOB NO: 916-006	NO.	REVIEW
REVIEWED: CMR	PLOT DATE: Oct 31, 2016	FILENAME: ROS-D-ELEC03.DWG	REVISIONS	DATE	BY
				DESCRIPTION	

SCALE: SHOWN
0" 1" 2"
DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

DWG NO.: E12
SHEET NO.: 12 13



RADIO TOWER POLE

½" = 1'-0"

1 TYP

RADIO TOWER NOTES:

1. CONTRACTOR SHALL UTILIZE A CASED AUGER TO DRILL TO TOWER FOUNDATION SUBGRADE. CONTRACTOR SHALL PROVIDE DEWATERING AS NECESSARY AND PLACE CONCRETE VIA TREMIE IF REQUIRED BY SITE CONDITIONS. CONTRACTOR SHALL PROVIDE ROCK BITS AND/OR HYDRAULIC CHIPPING HAMMERS TO REMOVE BEDROCK PILLOW LAVA TO REQUIRED SUBGRADE. DEPTH TO BEDROCK PILLOW LAVA UNKNOWN. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO POLE FOUNDATION SOILS AND BEDROCK WITHIN 25' RADIUS OF THE FOUNDATION. PROVIDE 7 DAY NOTIFICATION TO THE ENGINEER TO SCHEDULE INSPECTION OF POLE FOUNDATION AUGER/EXCAVATION AND TO INSPECT SUBGRADE PRIOR TO REBAR CAGE AND POLE ANCHORAGE PLACEMENT.
2. POLE FOUNDATION DESIGN IS IN ACCORDANCE WITH THE AASHTO 2009 STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS WITH INTERIMS THROUGH 2010. THE SOIL PROPERTIES ASSUMED FOR DESIGN WERE SOIL UNIT WEIGHT OF 120 PCF, SOIL SHEAR STRENGTH OF 250 PSF.
3. 3 SECOND WIND VELOCITY: 115 MPH.
4. POLE ANCHOR BOLTS SHALL BE LOCATED AND SECURED IN PLACE PRIOR TO POURING CONCRETE.
5. ALL HARDWARE TO BE ASTM A153 GALVANIZED.
6. TOWER ASSEMBLY TO BE EITHER GALVANIZED PER ASTM 153 AND/OR POWDER COAT FINISHED AND WRAPPED.

REGISTERED PROFESSIONAL ENGINEER — OREGON — MAY 13, 2014 — JON MARSHALL COMMER

EXPIRES: 12/31/2017
SIGNED: 10/18/16

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CITY OF ROSEBURG
PHASE 1 - WATER SYSTEM
SCADA IMPROVEMENTS

RESERVOIRS 5, 6, 7 - RADIO TOWER DETAILS

JOB NO.: 916-006
CLIENT: ROS
FILENAME: ROS-D-STR01.DWG
SAVE DATE: Oct 31, 2016
PLOT DATE: Oct 31, 2016
ENGINEER: XXX
REVIEWED: JMC

REVISIONS

NO.	DATE	DESCRIPTION	BY	REVIEW

SCALE: SHOWN
0" 1" 2"
DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

DWG NO.: S01
SHEET NO.: 13 of 13