ABBREVIATIONS

A	AMPERE (AMP)
AC	ALTERNATING CURRENT
AF	BREAKER FRAME SIZE (IN AMPS)
AI	ANALOG INPUT
AL	ALUMINUM
AM	AMMETER
AO	ANALOG OUTPUT
AT	BREAKER TRIP (SETTING IN AMPS)
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BKR	BREAKER
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CST	CONTROL STATION
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
DI	DISCRETE INPUT
DIST	DISTRIBUTION
DO	DISCRETE OUTPUT
DTWV	DISCHARGE–TO–WASTE VALVE
EIOM	EXTENDED I/O MODULE
ETC	ELAPSED TIME/COUNTER METER
ETM	ELAPSED TIME METER
ENCL	ENCLOSURE
EXIST	EXISTING
FDR	FEEDER
FLA	FULL LOAD AMPS
FU	FUSE
FVNR	FULL VOLTAGE NON REVERSING
FVR	FULL VOLTAGE REVERSING
FY	FLOW COMPUTATION
G	GROUND CONDUCTOR
GEC	GROUNDING ELECTRODE CONDUCTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
H	HORN
HA	HAND–AUTO
HIM	HUMAN INTERFACE MODULE
HMI	HUMAN MACHINE INTERFACE
HOA	HAND–OFF–AUTO
HOR	HAND–OFF–REMOTE
HP	HORSEPOWER
IC	INTERRUPTING CAPACITY
JCXXX	JUNCTION BOX, CONTROL
JPXXX	JUNCTION BOX, POWER
JSXXX	JUNCTION BOX, SIGNAL
kA	KILOAMPERES
kAIC	KILOAMPERES–INTERRUPTING CAPACITY
KCM	THOUSAND CIRCULAR MILLS
kV	KILOVOLT
kVA	KILOVOLT–AMPERE
kVAh	KILOVOLT–AMPERE HOUR
kVAR	KILOVAR (REACTIVE KILOVOLT–AMPERE)
KVARh	KILOVAR–HOUR
kW	KILOWATT
kWh	KILOWATT–HOUR
LA	LIGHTNING ARRESTOR
LAN	LOCAL AREA NETWORK
LFMC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT
LINE	POWER LINE/POWER BLOCK
LV	LOW VOLTAGE
M	MAGNETIC CONTACTOR
mA	MILLIAMPERES
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILLS
MCP	MOTOR CIRCUIT PROTECTOR
MOV	METAL OXIDE VARISTOR
MS	MOTOR STARTER
MSDS	MOTOR SAFETY DISCONNECT SWITCH
MTS	MANUAL TRANSFER SWITCH
MTU	MASTER TELEMETRY UNIT
mV	MILLIVOLT
MW	MEGAWATT
N	NEUTRAL CONDUCTOR
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRIC MANUFACTURERS ASSOC.
NESC	NATIONAL ELECTRICAL SAFETY CODE
NFPA	NATIONAL FIRE PROTECTION AGENCY
OCPD	OVERCURRENT PROTECTION DEVICE
OE	OVERHEAD ELECTRIC
OIU	OPERATOR INTERFACE UNIT
OL	OVERLOAD, THERMAL
OLR	OVERLOAD RELAY
P	POLE
PF	POWER FACTOR
PH	PHASE
PLC	PROGRAMMABLE LOGIC CONTROL
PMR	PHASE MONITOR RELAY
PMU	POWER MONITOR UNIT
POT	POTENTIOMETER
PVC	POLYVINYL CHLORIDE CONDUIT
RGS	RIGID GALVANIZED STEEL CONDUIT
RVSS	REDUCED–VOLTAGE SOFT START
RMC	RIGID METALLIC CONDUIT
RNC	RIGID NONMETALLIC CONDUIT
RTU	REMOTE TELEMETRY UNIT
s	SECOND
SHD	SHIELDED
SPD	SURGE PROTECTION DEVICE
SS	STAINLESS STEEL
SUSE	SUITABLE FOR USE AS A SERVICE ENTRANCE
TB	TERMINAL BLOCK
TDAD	TIME DELAY AFTER DE–ENERGIZATION
TDAE	TIME DELAY AFTER ENERGIZATION
TQS	TORQUE SWITCH
TSP	TWISTED SHIELDED PAIR
TST	TWISTED SHIELDED TRIAD
T/M	THERMAL MAGNETIC
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLT
VA	VOLT–AMPERE
VFD	VARIABLE FREQUENCY DRIVE
VMR	VOLTAGE MONITORING RELAY
W	WATT
WAN	WIDE AREA NETWORK
Wh	WATT–HOUR
WP	WEATHER PROOF
XFMR	POWER TRANSFORMER

SYMBOL LEGEND

PLAN SYMBOLS

- CONDUIT DOWN
- CONDUIT UP
- CONDUIT STUB UP/END CAP
- DISCONNECT SWITCH
- FUSED DISCONNECT SWITCH
- COMMUNICATION OUTLET
- TELEPHONE OUTLET
- SPECIAL OUTLET
- DUPLEX RECEPTACLE (ABOVE/BELOW COUNTER)
- QUAD RECEPTACLE
- QUAD RECEPTACLE (BELOW COUNTER)
- FLOOR MOUNTED RECEPTACLE
- LIGHT POLES (SINGLE OR DUAL)
- #12 AWG GROUND CONDUCTOR
- #12 AWG NEUTRAL CONDUCTOR
- #12 AWG BRANCH CONDUCTOR

CROSSMARKS INDICATE QUANTITY AND USE OF CONDUCTORS

Sx SWITCH, X =
3 = 3–WAY K = KEY
4 = 4–WAY M = MOTION

- SEAL OFF
- MOTOR X = HORSE POWER

(XX) XX=
- CV CHECK VALVE
- FE FLOW ELEMENT
- FI FLOW INDICATOR
- FIT FLOW INDICATOR/TRANSMITTER
- FS FLOW SWITCH
- FT FLOW TRANSMITTER
- HD HEAT DETECTOR
- IS INTRUSION SWITCH
- J JUNCTION BOX
- L LIMIT SWITCH
- LE LEVEL ELEMENT
- LI LEVEL INDICATOR
- LIT LEVEL INDICATOR/TRANSMITTER
- LS LEVEL SWITCH/FLOAT
- LT LEVEL TRANSDUCER
- MFM MAGNETIC FLOW METER
- PC PHOTO CELL
- PE PRESSURE ELEMENT
- PI PRESSURE INDICATOR
- PIT PRESSURE INDICATOR TRANSMITTER
- PS PRESSURE SWITCH
- PT PRESSURE TRANSMITTER
- SD SMOKE DETECTOR
- SV SOLENOID VALVE
- T THERMOSTAT

ELEMENTARY WIRING DIAGRAM SYMBOLS

- NC CONTACT
- NC CONTACTOR
- NO CONTACT
- NO CONTACTOR
- SOLID STATE CONTACTOR
- (ALT) ALTERNATING RELAY
- (CR) CONTROL RELAY
- (C) SS SOLID STATE CONTACT RELAY
- (C) CONTACTOR
- (M) MOTOR RELAY
- (TR) TIME DELAY RELAY
- LIGHT EMITTING DIODE
- DIODE
- (X) INDICATING LIGHT
  A = AMBER R = RED
  B = BLUE W = WHITE
  G = GREEN
- (X) "PUSH TO TEST" LIGHT
- H A XOO OR HAND OFF AUTO XOO HOA SWITCH OOX
- A B XO OR A B XO 2–POSITION SELECTOR SWITCH OX
- GFCI DUPLEX OUTLET
- DUPLEX OUTLET
- FUSE
- FUSE W/ LED
- WIRE CONNECTION
- DIGITAL READOUT
- RESISTOR
- POTENTIOMETER
- SOLENOID VALVE COIL
- TRANSFORMER WINDING/ REACTOR/CHOKE

- TERMINAL POINT
- MOUNTED ON OUTER DOOR
- MOUNTED ON INNER DOOR
- LOCKABLE DEVICE
- SPST SWITCH
- N.C. TEMPERATURE SWITCH
- N.O. TEMPERATURE SWITCH
- N.O. PUSHBUTTON
- N.C. PUSHBUTTON
- N.O. MUSHROOM PUSHBUTTON
- N.C. MUSHROOM PUSHBUTTON
- N.O. PRESSURE SWITCH
- N.C. PRESSURE SWITCH
- N.C. LIMIT SWITCH
- N.O. LIMIT SWITCH
- N.C. FLOW SWITCH
- N.O. FLOW SWITCH
- N.O. FLOAT SWITCH
- N.C. FLOAT SWITCH
- N.C. DIFFERENTIAL PRESSURE SWITCH
- N.O. DIFFERENTIAL PRESSURE SWITCH
- TDAE, N.O., TIME DELAY CLOSE, INSTANTANEOUS RE–OPEN
- TDAE, N.C., TIME DELAY OPEN, INSTANTANEOUS RE–CLOSE
- TDAD, N.O., INSTANTANEOUS CLOSE, TIME DELAY RE–OPEN
- TDAD, N.C., INSTANTANEOUS OPEN, TIME DELAY RE–CLOSE
- GROUND EQUIPMENT/CHASSIS
- GROUND, ISOLATED

ONE LINE SYMBOLS

- CAPACITOR
- M CIRCUIT BREAKER, MAGNETIC ONLY
- T/M CIRCUIT BREAKER, THERMAL–MAGNETIC
- CIRCUIT CONNECTION
- CONTACTOR
- CURRENT TRANSFORMER
- FUSE
- FUSIBLE DISCONNECT
- GROUND EQUIPMENT/CHASSIS
- G GENERATOR
- S/N SOLID NEUTRAL
- AM ANALOG AMMETER
- REACTOR/CHOKE
- THERMAL OVERLOAD RELAY

GENERAL SYMBOLS

- XXXXX CONDUIT
- XX XXXX XX TAG LABEL
- GFCI GFCI PANELBOARD CIRCUIT
- X AREA ID TAG
- DEMOLITION (DEMO)
- INTRINSICALLY SAFE AREA
- CLEARANCE AREA

LINETYPES

- EXPOSED CONDUIT
- UNDERGROUND (BURIED) CONDUIT
- GROUNDING ELECTRODE CONDUCTORS
- EMBEDDED CONDUIT (WALLS, CONCRETE, ETC.)

NOTE:
THIS IS A GENERAL LEDGER SHEET. ALL SYMBOLS MAY NOT APPLY.

READING DOCUMENTS:

ELEMENTARY DIAGRAMS:

1. ELEMENTARY DIAGRAMS ARE SHOWN IN LADDER LOGIC FORM WITH LINE NUMBERS FORMATTED AS:

   SS.LL WHERE SS = SHEET NUMBER AND LL = LINE NUMBER

2. RELAY COIL "TYPES" ARE INDICATED INSIDE THE COIL SYMBOL AS PER THE SYMBOL SCHEDULE ON THIS SHEET. THE COIL NUMBER IS OF THE FORMAT:

   TTSS.LL.AA WHERE TT = RELAY TYPE (PER SYMBOL SCHEDULE)
   SS.LL = AS DESCRIBED ABOVE
   AA = ASSOCIATION WITH A DRIVE, CONTROLLER, CONTROL PANEL, ETC.

3. RELAY CONTACTS ARE NUMBERED IN ASSOCIATION WITH THEIR COILS FOLLOWED BY "–X" WHERE X IS THE CONTACT POLE NUMBER.

   EXAMPLE: RELAY CONTACTS FOR A DPDT RELAY

CONTACT NUMBER	N.O. CONTACT REFERENCE	N.C. CONTACT REFERENCE
1:	12.40	NA\
2:	13.04	13.05\

   13.04 — 13 = LINE NUMBER, 04 = SHEET NUMBER

   N.O. = NORMALLY OPEN CONTACT
   N.C. = NORMALLY CLOSED CONTACT.

4. CONTACTS AND ANALOG SIGNALS CONNECTED TO PLC I/O ARE FORMATTED AS:

   *RR.SS.CC WHERE * DENOTES A PLC I/O CONNECTION
   RR = PLC RACK NUMBER
   SS = RACK SLOT NUMBER
   CC = SLOT CHANNEL NUMBER

PLCS:

1. REFERENCE CONTROL PANEL SPECIFICATION 16940.
2. WIRE ALL PLC ANALOG AND DIGITAL INPUTS AND OUTPUTS, WHETHER ASSIGNED OR SPARE, TO TERMINAL GROUPS PER SPECIFICATION.
3. ALL PLC DIGITAL OUTPUTS SHALL BE BUFFERED THROUGH INTERPOSING RELAYS. SPARE OUTPUTS AND OUTPUTS ASSIGNED OUTSIDE THE PANEL SHALL BE CONNECTED TO A FUSED TERMINAL PAIR.
4. N.O. OR N.C. CONTACTS FORMATTED AS *RR:SS:CC ARE DERIVED FROM PLC DIGITAL OUTPUT BUFFER RELAYS. THE RELAY CONTACT INDICATOR *RR:SS:CC INDICATES THE RELAY'S ASSOCIATED PLC DIGITAL OUTPUT RACK, SLOT, AND CHANNEL.

GENERAL ELECTRICAL NOTES:

SITE AND BUILDING PLANS:

1. CONDUIT ROUTING IS SHOWN FOR CLARITY. ACTUAL ROUTING MAY BE MORE DIRECT AND IS LEFT TO THE CONTRACTOR FOLLOWING SPECIFICATIONS 16130. NON–ELECTRICAL BURIED PIPING HAS ROUTING PRIORITY OVER ELECTRICAL BURIALS.
2. ALL TRENCHING SHALL BE PER (1 / ED–1).
3. THE CONTRACTOR SHALL TAKE ALL STEPS NECESSARY TO PROTECT EXISTING UTILITIES.
4. THROUGHOUT THIS DOCUMENT, THE TERM "DEMO" MEANS TO DEMOLISH, THEN WASTEHAUL OR RETURN TO THE OWNER, PER THE OWNER'S DIRECTION.

CABLE AND CONDUIT NOTES:

1. REFERENCE SPECIFICATION 16120 FOR CONDUCTORS, INSTRUMENTATION, COMMUNICATION, AND OTHER SPECIAL CABLES AND CONDUCTORS.
2. REFERENCE SPECIFICATION 16130 FOR RACEWAY AND BOXES, JUNCTION BOX TYPES, AND HANDHOLE, PULLBOX, AND VAULT CONDUIT INSTALLATIONS.
3. REFERENCE SPECIFICATIONS AND OUTDOOR INSTALLATION NOTES FOR CONDUIT COMPOSITION AND COATING.
4. CONDUIT TAGS ON PLAN SHEETS WITH A "~" (TILDE) SUFFIX REFER TO SPARE CONDUITS.
   EXAMPLE: (P0319~)
5. CABLE AND CONDUIT SCHEDULES:
   1. THE CABLE AND CONDUIT SCHEDULE PROVIDES CONDUIT NUMBER, SOURCE, DESTINATION, AND SIZE AS WELL AS CONDUCTOR AND CABLE REQUIREMENTS. REFERENCE SPECIFICATION 16130 FOR CONDUIT COMPOSITION AND COATING.

ELECTRICAL WORK SUMMARY:

THIS SUMMARY OF ELECTRICAL WORK IS INCLUDED AS A COURTESY AND IS INTENDED TO PROVIDE A GENERAL UNDERSTANDING OF ELECTRICAL DESIGN INTENT AND MAJOR ELECTRICAL CONSTRUCTION TASKS. IT IS NOT PROVIDED AS A COMPLETE LIST OF WORK AND SHALL NOT BE USED FOR BIDDING PURPOSES. REFER TO ALL PLANS AND SPECIFICATIONS.

1. THIS PROJECT HAS TWO SCHEDULES UNDER ONE COVER. SCHEDULE A IS THE SOUTH WELLFIELD, AREAS 01–04; AND SCHEDULE B, AREAS 05–09.

SOUTH WELLFIELD

2. AREAS 01–03 ARE ALSO CALLED THE WIEGARDT WELLFIELD. THIS PROJECT EQUIPS THE THREE WELLS WHICH WERE PREVIOUSLY DUG. EACH WELL WILL HAVE A SUBMERSIBLE WELL PUMP, LOCAL MOTOR DISCONNECT, LEVEL TRANSDUCER, AND A FLOW METER IN AN ADJACENT VAULT. ALL POWER DISTRIBUTION AND CONTROL WILL BE ON A STAND AT THE FIRST WELL, AREA 01.
3. WATER FROM THE SOUTH WELLFIELD IS TREATED IN AN EXISTING BUILDING, AREA 04. A NEW FILTER PACKAGE WILL BE INSTALLED IN AREA 04 AND A NEW CONTROL PANEL WILL CALL WELLS AND OPERATE THE SOUTH WELLFIELD PROCESS.

NORTH WELLFIELD

4. SEVERAL OF THE EXISTING WELL PUMPS IN THE NORTH WELL FIELD ARE BEING REPLACED BY OWNER. EACH WELL HAS A SMALL BUILDING OVER IT, THESE WILL REMAIN.
5. TWO EXISTING 240 V, 3PH SERVICES WILL BE REMOVED AND REPLACED WITH A SINGLE 480 V 3PH SYSTEM. THE NEW POWER DISTRIBUTION WILL BE IN THE EXISTING FILTER BUILDING, AREA 05.
6. A NEW MCC IN AREA 05 WILL CONTAIN THE STARTERS FOR THE UPGRADED WELLS. THIS MCC WILL FEED THE EXISTING BOOSTER BUILDING, AREA 07.
7. ALL BOOSTER MOTORS IN AREA 07 WILL HAVE THEIR LEADS RECONFIGURED FOR 480 V, 3PH SERVICE. MOTOR NAMEPLATES HAVE VERIFIED THAT ALL THE EXISTING MOTORS ARE RATED FOR THIS CHANGE.
8. THE CONTROL PANEL FOR THE NORTH WELLFIELD WILL BE IN AREA 05.
9. ELECTRICAL DEMOLITION IN AREAS 05 AND 07 WILL BE PERFORMED BY THE DISTRICT.

GENERAL

10. AN ETHERNET BASED SPREAD SPECTRUM RADIO SYSTEM WILL BE INSTALLED AT AREA 01 FOR THE WIEGARDT WELLS AND WILL CONNECT TO THE AREA 04 BOOSTER/FILTER BUILDING. ANOTHER LINK WILL CONNECT THE CONTROL PANEL AT THE SOUTH WELLFIELD TO THE CONTROL PANEL FOR THE NORTH WELLFIELD AT AREA 05.
11. ONLY ONE OF THE WELLFIELDS, NORTH OR SOUTH, IS REQUIRED FOR THE DISTRICT'S NEEDS. AS SUCH, ONE WILL BE TAKEN OFF LINE, COMPLETED, AND COMMISSIONED BEFORE WORK AT THE OTHER SITE WILL BEGIN.
12. AREAS 01 AND 05 REQUIRE NEW UTILITY SERVICES. THESE WILL BE ORDERED BY THE DISTRICT IN ADVANCE.

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DATE: FEB 2016	SCALE: NOTED	DRAWN: TMR	CHECKED: PAM	APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — 45311 — REGISTERED PROFESSIONAL ENGINEER — 12/31/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON

WATER SUPPLY AND TREATMENT PROJECT REBID

ELECTRICAL SYMBOLS, ABBREVIATIONS, GENERAL NOTES, AND WORK SUMMARY

SHEET: **E-1**
OF: **28**

JOB NO.: 13224.02
DWG: E_SYM_ABBR

SHEET LIST

SHEET	SHEET DESCRIPTION
E-1	ELECTRICAL SYMBOLS, ABBREVIATIONS, GENERAL NOTES, AND WORK SUMMARY
E-2	ELECTRICAL SHEET LIST AND DEVICE TAG LISTS
E-3	DEVICE TAG LISTS
E-4	CONTROL PANEL AND MSDS SCHEDULE AND NOTES
E-5	SCHEDULES A & B – ELECTRICAL SITE PLANS
E-6	AREA 01 – ONE LINE DIAGRAM
E-7	AREA 04 – ONE LINE DIAGRAM
E-8	AREAS 05/09 – ONE LINE DIAGRAM
E-9	AREA 07 – ONE LINE DIAGRAMS AND PANELBOARD [07 PB 02] SCHEDULE
E-10	AREAS 01/05 – PANELBOARDS [01 PB 01] AND [05 PB 01] SCHEDULES
E-11	AREA 04 – PANELBOARDS [04 PB 02-03] SCHEDULES
E-12	AREA 01 – MOTOR STARTER PANEL [01 MSP 01] ELEVATIONS
E-13	AREAS 01/02/03– MOTOR STARTERS ELEMENTARY WIRING DIAGRAM
E-14	AREA 01 – CONTROL PANEL ELEMENTARY WIRING DIAGRAM AND DETAILS
E-15	AREA 04 – CONTROL PANEL [04 CP 01] ELEVATIONS
E-16	AREA 04 – CONTROL PANEL [04 CP 01] ELEMENTARY WIRING DIAGRAM
E-17	ARAE 04 – CONTROL PANEL [04 CP 01] ELEMENTARY WIRING DIAGRAM
E-18	AREAS 05/07 – MCC ELEVATION, SPECIFICATION, AND SCHEDULE
E-19	AREAS 07/09 – MOTOR STARTERS NORTH WELL FIELD AND BOOSTER PUMPS ELEMENTARY WIRING DIAGRAM
E-20	AREA 05 – CONTROL PANEL [05 CP 01] ELEVATIONS
E-21	AREA 05 – CONTROL PANEL [05 CP 01] ELEMENTARY WIRING DIAGRAM
E-22	AREA 05 – CONTROL PANEL [05 CP 01] ELEMENTARY WIRING DIAGRAM
E-23	ANALOG LOOP DIAGRAMS
E-24	ANALOG LOOP DIAGRAMS
E-25	PLC I/O TABLES
E-26	PLC I/O TABLES
E-27	PLC I/O TABLES
E-28	NETWORK DIAGRAM
EC-1	CABLE AND CONDUIT SCHEDULES
EC-2	CABLE AND CONDUIT SCHEDULES
EC-3	CABLE AND CONDUIT SCHEDULES
ED-1	ELECTRICAL DETAILS
ED-2	ELECTRICAL DETAILS
ED-3	ELECTRICAL DETAILS
E1-1	AREAS 01/02/03 – SOUTH WELLFIELD SITE ELECTRICAL PLAN AND TYPICAL WELL PLAN
E1-2	AREAS 01/02/03 – WIEGARDT WELL NO. 1 – NO. 3 PLAN AND CONNECTION DIAGRAM
E4-1	AREA 04 – SOUTH WELLFIELD OPERATIONS BUILDING ELECTRICAL PLAN
E4-2	AREA 04 – SOUTH WELLFIELD TREATMENT BUILDING HVAC ELECTRICAL PLAN
E5-1	AREA 05 – NORTH WELLFIELD WTP MODIFIED ELECTRICAL PLAN
E7-1	AREA 07 – NORTH WELLFIELD BOOSTER STATION MODIFIED ELECTRICAL PLAN
E8-1	AREA 08 – NORTH WELLFIELD EXISTING RESERVOIR NO. 2

AREA 01 - DEVICE TAG LIST

TAG ID#	TAG DESCRIPTION	VINTAGE
01 ANT 01	ANTENNA, TELEMETRY RADIO	NEW
01 BAT 01	DC UPS BATTERY	NEW
01 CP 01	CONTROL PANEL	NEW
01 CREC 01	CONVENIENCE RECEPTACLE, [01 ENC 01]	NEW
01 CST 01	CONTROL STATION	NEW
01 DCU 01	DC UPS CONTROLLER	NEW
01 ENC 01	ENCLOSURE, [01 PB 01], [01 MSP 01], [01 CP 01]	NEW
01 ES 01	ETHERNET SWITCH	NEW
01 FE 01	FLOW ELEMENT, WELL NO. 1	NEW
01 FIT 01	FLOW INDICATOR/TRANSMITTER, WELL NO. 1	NEW
01 GREC 01	PORTABLE GENERATOR RECEPTACLE	NEW
01 HTR 01	HEATER, [01 ENC 01]	NEW
01 LIT 01	LEVEL INDICATOR/TRANSMITTER	NEW
01 LT 01	LEVEL TRANSDUCER	NEW
01 MB 01	UTILITY METER BASE	NEW
01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	NEW
01 MSDS 01	MOTOR SAFETY DISCONNECT SWITCH	NEW
01 MSP 01	MOTOR STARTER PANEL	NEW
01 MTR 01	MOTOR, WELL PUMP NO. 1	NEW
01 MTS 01	MANUAL TRANSFER SWITCH	NEW
01 PB 01	COMBINATION TRANSFORMER/PANELBOARD	NEW
01 PLC 01	PROGRAMMABLE LOGIC CONTROLLER	NEW
01 PS 01	POWER SUPPLY, 24 VDC	NEW
01 RD 01	RADIO, TELEMETRY	NEW
01 SDB 01	SERVICE DISCONNECT BREAKER (SUSE)	NEW
01 SPDC 01	SURGE PROTECTOR, CONTROL PANEL	NEW
01 UT 01	UTILITY TRANSFORMER	NEW
01 XMFR 01	STEP DOWN TRANSFORMER	NEW

AREA 02 - DEVICE TAG LIST

TAG ID#	TAG DESCRIPTION	VINTAGE
02 CST 01	CONTROL STATION	NEW
02 FE 01	FLOW ELEMENT, WELL NO. 2	NEW
02 FIT 01	FLOW INDICATOR/TRANSMITTER, WELL NO. 2	NEW
02 LIT 01	LEVEL INDICATOR/TRANSMITTER	NEW
02 LT 01	LEVEL TRANSDUCER	NEW
02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	NEW
02 MSDS 01	MOTOR SAFETY DISCONNECT SWITCH	NEW
02 MTR 01	MOTOR, WELL PUMP NO. 2	NEW

AREA 03 - DEVICE TAG LIST

TAG ID#	TAG DESCRIPTION	VINTAGE
03 CST 01	CONTROL STATION	NEW
03 FE 01	FLOW ELEMENT, WELL NO. 3	NEW
03 FIT 01	FLOW INDICATOR/TRANSMITTER, WELL NO. 3	NEW
03 LIT 01	LEVEL INDICATOR/TRANSMITTER	NEW
03 LT 01	LEVEL TRANSDUCER	NEW
03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	NEW
03 MSDS 01	MOTOR SAFETY DISCONNECT SWITCH	NEW
03 MTR 01	MOTOR, WELL PUMP NO. 3	NEW

AREA 04 - DEVICE TAG LIST

TAG ID#	TAG DESCRIPTION	VINTAGE
04 AD 01	AUTODAILER	NEW
04 ANT 01	ANTENNA, OMNI DIRECTION	NEW
04 BAT 01	BATTERY, 24 VDC POWER SUPPLY	NEW
04 CP 01	CONTROL PANEL, SOUTH WELL FIELD AND BOOSTER STATION	NEW
04 CP 02	CONTROL PANEL, CARBON FILTER SKID	NEW
04 CP 03	CONTROL PANEL, BOOSTER SKID	EXISTING
04 CREC 01	CONVENIENCE RECEPTACLE, CONTROL PANEL	NEW
04 DCU 01	DC UPS CONTROLLER	NEW
04 DH 01	DEHUMIDIFIER	NEW
04 DREC 01	DEDICATED RECEPTACLE, FERRIC CHLORIDE METERING PUMP NO. 1	NEW
04 DREC 02	DEDICATED RECEPTACLE, FERRIC CHLORIDE METERING PUMP NO. 2	NEW
04 DREC 03	DEDICATED RECEPTACLE, POTASSIUM PERMANGANATE METERING PUMP AND TANK	NEW
04 EF 01	EXHAUST FAN, CHEMICAL ROOM	NEW
04 ES 01	ETHERNET SWITCH	NEW
04 FIT 01	FLOW INDICATOR/TRANSMITTER, FINISHED WATER	NEW
04 FIT 02	FLOW INDICATOR/TRANSMITTER, BACKWASH SUPPLY	NEW
04 LIT 01	ULTRASONIC LEVEL LEVEL INDICATOR TRANSMITTER	EXISTING
04 LT 01	ULTRASONIC LEVEL TRANSDUCER	EXISTING
04 MP 01	FERRIC CHLORIDE METERING PUMP NO. 1	NEW
04 MP 02	FERRIC CHLORIDE METERING PUMP NO. 2	NEW
04 MP 03	METERING PUMP, POTASSIUM PERMANGANATE	NEW
04 OIU 01	OPERATOR INTERFACE UNIT	NEW
04 PB 01	PANELBOARD, 480/277 V, 3 PH, 225 A BUS, 42 CKT	EXISTING
04 PB 02	PANELBOARD, 240/120 V, 3 PH, 225 A BUS, 42 CKT	EXISTING
04 PLC 01	PROGRAMMABLE LOGIC CONTROLLER	NEW
04 PS 01	POWER SUPPLY, 24 VDC	NEW
04 SPDC 01	SURGE SUPPRESSOR, CONTROLS	NEW
04 SPDC 02	SURGE SUPPRESSOR, CONTROLS	NEW
04 SV 01	SOLENOID VALVE, POTASSIUM PERMANGANATE TANK	NEW
04 TMR 01	TIMER, CHEMICAL ROOM EXHAUST FAN	NEW
04 WH 01	HOT WATER HEATER	NEW

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NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
ELECTRICAL SHEET LIST AND DEVICE TAG LISTS

SHEET: E-2
OF: 28

JOB NO.: 13224.02
DWG: E_SYM_ABBR

AREA 05 - DEVICE TAG LIST

TAG ID#	TAG DESCRIPTION	VINTAGE
05 AD 01	AUTODAILER	NEW
05 ANT 01	ANTENNA, TELEMETRY RADIO	NEW
05 ATS 01	AUTOMATIC TRANSFER SWITCH	EXISTING
05 BAT 01	BATTERY, 24 VDC POWER SUPPLY	NEW
05 BKR 01	CIRCUIT BREAKER, TRANSFORMER PRIMARY	NEW
05 BV 01	BALL VALVE NO. 1, TRAIN 1, FILTER 1, RAW WATER	EXISTING
05 BV 02	BALL VALVE NO. 2, TRAIN 1, FILTER 1, BACKWASH	EXISTING
05 BV 03	BALL VALVE NO. 3, TRAIN 1, FILTER 2, RAW WATER	EXISTING
05 BV 04	BALL VALVE NO. 4, TRAIN 1, FILTER 2, BACKWASH	EXISTING
05 BV 05	BALL VALVE NO. 5, TRAIN 1, FILTER 3, RAW WATER	EXISTING
05 BV 06	BALL VALVE NO. 6, TRAIN 1, FILTER 3, BACKWASH	EXISTING
05 BV 07	BALL VALVE NO. 7, TRAIN 2, FILTER 1, RAW WATER	EXISTING
05 BV 08	BALL VALVE NO. 8, TRAIN 2, FILTER 1, BACKWASH	EXISTING
05 BV 09	BALL VALVE NO. 9, TRAIN 2, FILTER 2, RAW WATER	EXISTING
05 BV 10	BALL VALVE NO. 10, TRAIN 2, FILTER 2, BACKWASH	EXISTING
05 BV 11	BALL VALVE NO. 11, TRAIN 2, FILTER 3, RAW WATER	EXISTING
05 BV 12	BALL VALVE NO. 12, TRAIN 2 , FILTER 3, BACKWASH	EXISTING
05 BV 13	BALL VALVE NO. 13, TRAIN 3, FILTER 1, RAW WATER	EXISTING
05 BV 14	BALL VALVE NO. 14, TRAIN 3, FILTER 1, BACKWASH	EXISTING
05 BV 15	BALL VALVE NO. 15, TRAIN 3, FILTER 2, RAW WATER	EXISTING
05 BV 16	BALL VALVE NO. 16, TRAIN 3, FILTER 2, BACKWASH	EXISTING
05 BV 17	BALL VALVE NO. 17, TRAIN 3, FILTER 3, RAW WATER	EXISTING
05 BV 18	BALL VALVE NO. 18, TRAIN 3, FILTER 3, BACKWASH	EXISTING
05 BV 19	BALL VALVE NO. 19, TRAIN 4, FILTER 1, RAW WATER	EXISTING
05 BV 20	BALL VALVE NO. 20, TRAIN 4, FILTER 1, BACKWASH	EXISTING
05 BV 21	BALL VALVE NO. 21, TRAIN 4, FILTER 2, RAW WATER	EXISTING
05 BV 22	BALL VALVE NO. 22, TRAIN 4, FILTER 2, BACKWASH	EXISTING
05 BV 23	BALL VALVE NO. 23, TRAIN 4, FILTER 3, RAW WATER	EXISTING
05 BV 24	BALL VALVE NO. 24, TRAIN 4, FILTER 3, BACKWASH	EXISTING
05 CP 01	CONTROL PANEL, NORTH WELL FIELD	EXISTING
05 CT 01	CT ENCLOSURE	NEW
05 CV 01	CONTROL VALVE, TRAIN 1, FILTER 1	EXISTING
05 CV 02	CONTROL VALVE, TRAIN 1, FILTER 2	EXISTING
05 CV 03	CONTROL VALVE, TRAIN 1, FILTER 3	EXISTING
05 CV 04	CONTROL VALVE, TRAIN 2, FILTER 1	EXISTING
05 CV 05	CONTROL VALVE, TRAIN 2, FILTER 2	EXISTING
05 CV 06	CONTROL VALVE, TRAIN 2, FILTER 3	EXISTING
05 CV 07	CONTROL VALVE, TRAIN 3, FILTER 1	EXISTING
05 CV 08	CONTROL VALVE, TRAIN 3, FILTER 2	EXISTING
05 CV 09	CONTROL VALVE, TRAIN 3, FILTER 3	EXISTING
05 CV 10	CONTROL VALVE, TRAIN 4, FILTER 1	EXISTING
05 CV 11	CONTROL VALVE, TRAIN 4, FILTER 2	EXISTING
05 CV 12	CONTROL VALVE, TRAIN 4, FILTER 3	EXISTING
05 DCU 01	DC UPS CONTROLLER	NEW
05 DREC 01	DEDICATED RECEPTACLE, POTASSIUM PERMANGANATE PUMP AND TANK	NEW
05 ES 01	ETHERNET SWITCH	NEW
05 FE 01	FLOW ELEMENT, FINISHED WATER	EXISTING
05 FIT 01	FLOW INDICATOR/TRANSMITTER, FINISHED WATER	EXISTING
05 FIT 02	FLOW INDICATOR/TRANSMITTER AND ELEMENT, BACKWASH SUPPLY	EXISTING
05 FIT 04	FLOW INDICATOR/TRANSMITTER, WELL NO. 4	EXISTING
05 FIT 05	FLOW INDICATOR/TRANSMITTER, WELL NO. 5	EXISTING
05 FIT 06	FLOW INDICATOR/TRANSMITTER, WELL NO. 6	EXISTING
05 FIT 07	FLOW INDICATOR/TRANSMITTER, WELL NO. 7	EXISTING
05 FIT 08	FLOW INDICATOR/TRANSMITTER, WELL NO. 8	EXISTING
05 GCB 01	GENERATOR CIRCUIT BREAKER	NEW
05 GEN 01	GENERATOR	EXISTING
05 HH 01	HANDHOLE	NEW

(SEE NOTE)

AREA 05 - DEVICE TAG LIST

TAG ID#	TAG DESCRIPTION	VINTAGE
05 MB 01	METER BASE	NEW
05 MCC 01	MOTOR CONTROL CENTER, FILTER BUILDING	NEW
05 MLG 01	MAIN LUGS, MCC	NEW
05 MP 01	METERING PUMP, POTASSIUM PERMANGANATE	NEW
05 OIU 01	OPERATOR INTERFACE UNIT	NEW
05 PB 01	PANELBOARD, 208/120 V, 3 PH, 200 A BUS, 36 CKT	EXISTING
05 PLC 01	PROGRAMMABLE LOGIC CONTROLLER	NEW
05 PS 01	POWER SUPPLY, 24 VDC	NEW
05 SDB 01	SERVICE DISCONNECT BREAKER	NEW
05 SPD 01	SURGE PROTECTION DEVICE	NEW
05 SPDC 01	SURGE SUPPRESSOR, CONTROLS	NEW
05 SPDC 02	SURGE SUPPRESSOR, CONTROLS	NEW
05 SV 01	SOLENOID VALVE, POTASSIUM PERMANGANATE TANK	NEW
05 UT 01	UTILITY TRANSFORMER	NEW
05 XFMR 01	TRANSFORMER, 45 KVA 480 – 208/120 3PH	NEW

AREA 07 - DEVICE TAG LIST

TAG ID#	TAG DESCRIPTION	VINTAGE
07 BKR 01	BOOSTER STATION FEEDER BREAKER	NEW
07 BKR 02	BOOSTER STATION DISCONNECT BREAKER	NEW
07 BKR 03	FEEDER BREAKER, 25 KVA, 480 V – 240/120 1PH TRANSFORMER	NEW
07 FE 01	FLOW ELEMENT, BOOSTER SKID	NEW
07 FIT 01	FLOW INDICATOR/TRANSMITTER, BOOSTER SKID	NEW
07 MCC 01	MOTOR CONTROL CENTER, BOOSTER BUILDING	NEW
07 MS 01	MOTOR STARTER, BOOSTER PUMP NO. 1	EXISTING
07 MS 02	MOTOR STARTER, BOOSTER PUMP NO. 2	EXISTING
07 MS 03	MOTOR STARTER, BOOSTER PUMP NO. 3	EXISTING
07 MS 04	MOTOR STARTER, BOOSTER PUMP NO. 4	EXISTING
07 MS 05	MOTOR STARTER, BOOSTER PUMP NO. 5	EXISTING
07 MTR 01	BOOSTER PUMP NO. 1	EXISTING
07 MTR 02	BOOSTER PUMP NO. 2	EXISTING
07 MTR 03	BOOSTER PUMP NO. 3	EXISTING
07 MTR 04	BOOSTER PUMP NO. 4	EXISTING
07 MTR 05	BOOSTER PUMP NO. 5	EXISTING
07 MTR 06	BOOSTER PUMP NO. 6	EXISTING
07 MTR 07	BOOSTER PUMP NO. 7	EXISTING
07 MTR 08	BOOSTER PUMP NO. 8	EXISTING
07 PB 01	PANELBOARD, 240/120 V, 1 PH, 100 A BUS, 12 CKT	NEW
07 PB 02	PANELBOARD, 480/277 V, 3 PH, 225 A BUS, 36 CKT	NEW
07 PT 01	PRESSURE TRANSDUCER, BOOSTER SKID	NEW
07 SPD 01	SURGE PROTECTION DEVICE	NEW
07 WW 01	BOOSTER STATION WIRE WAY NO. 1	EXISTING
07 WW 02	BOOSTER STATION WIRE WAY NO. 2	EXISTING
07 XFMR 01	TRANSFORMER, 25 KVA, 480 V – 240/120 1PH	NEW

AREA 08- DEVICE TAG LIST

TAG ID#	TAG DESCRIPTION	VINTAGE
08 ANT 01	ANTENNA, TOP OF RESERVOIR NO. 2	NEW
08 LIT 01	LEVEL INDICATOR/TRANSMITTER	EXISTING
08 LT 01	ULTRASONIC LEVEL TRANSDUCER	EXISTING

AREA 09- DEVICE TAG LIST

TAG ID#	TAG DESCRIPTION	VINTAGE
09 MS 04	MOTOR STARTER, WELL NO. 4	NEW
09 MS 05	MOTOR STARTER, WELL NO. 5	NEW
09 MS 06	MOTOR STARTER, WELL NO. 6	NEW
09 MS 07	MOTOR STARTER, WELL NO. 7	NEW
09 MS 08	MOTOR STARTER, WELL NO. 8	NEW
09 MTR 04	MOTOR, WELL NO. 4	NEW
09 MTR 05	MOTOR, WELL NO. 5	NEW
09 MTR 06	MOTOR, WELL NO. 6	NEW
09 MTR 07	MOTOR, WELL NO. 7	NEW
09 MTR 08	MOTOR, WELL NO. 8	NEW
09 PB 01	PANELBOARD, 240/120 V, 3 PH, 100 A BUS, 24 CKT	EXISTING

NOTE: THERE IS NO FLOW METER [05 FIT 03]. THIS NUMBER IS SKIPPED TO ALIGN TAGS TO THE ASSOCIATED WELL.

Gray & Osborne, Inc.
CONSULTING ENGINEERS
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OLYMPIA, WA 98502 • (360) 292-7418

DATE: FEB 2016
SCALE: NOTED
DRAWN: TMR
CHECKED: PAM
APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — 21574 — REGISTERED PROFESSIONAL ENGINEER

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY
WASHINGTON

WATER SUPPLY AND TREATMENT
PROJECT REBID

DEVICE TAG LISTS

SHEET: E-3
OF: 28

JOB NO.: 13224.02
DWG: E_SYM_ABBR

CONTROL PANEL SCHEDULE

AREA	TAG NO.	DESCRIPTION	RATING	MATERIAL	FINISH	MINIMUM SIZE (INCHES) HEIGHT	WIDTH	DEPTH	TYPE A	TYPE B	HEATER	MOUNTING METHOD	NOTES/COMMENTS
01	01 CP 01	CONTROL PANEL	NEMA 12	CARBON STEEL	STANDARD FINISH	24	24	12		X		PER LINE NOTE	INSIDE [01 ENC 01], DEPTH MAY BE LESS IF ALLOWED BY DOOR MOUNTED FLOW INDICATOR/TRANSMITTER
	01 ENC 01	ENCLOSURE, [01 PB 01], [01 MSP 01], [01 CP 01]	NEMA 3R	POWDERCOAT/ENAMELED STEEL	STANDARD FINISH	60	72	18		X	X	FREE-STANDING, ON 12" RISER FEET	
	01 MSDS 01	MOTOR SAFETY DISCONNECT SWITCH	NEMA 3R	POWDERCOAT/ENAMELED STEEL	STANDARD FINISH	*PM	*PM	*PM		X		MOUNTED TO FREE-STANDING BACKPLATE, SINGLE POST	600 VAC, 30 A RATED WITH AUX CONTACTS
	01 MSP 01	MOTOR STARTER PANEL	NEMA 12	CARBON STEEL	STANDARD FINISH	30	30	8		X		PER LINE NOTE	
02	02 MSDS 01	MOTOR SAFETY DISCONNECT SWITCH	NEMA 3R	POWDERCOAT/ENAMELED STEEL	STANDARD FINISH	*PM	*PM	*PM		X		MOUNTED TO FREE-STANDING BACKPLATE, SINGLE POST	600 VAC, 30 A RATED WITH AUX CONTACTS
03	03 MSDS 01	MOTOR SAFETY DISCONNECT SWITCH	NEMA 3R	POWDERCOAT/ENAMELED STEEL	STANDARD FINISH	*PM	*PM	*PM		X		MOUNTED TO FREE-STANDING BACKPLATE, SINGLE POST	600 VAC, 30 A RATED WITH AUX CONTACTS
04	04 CP 01	CONTROL PANEL, SOUTH WELL FIELD AND BOOSTER STATION	NEMA 1 GASKETED	CARBON STEEL	STANDARD FINISH	72	30	18	X			FREE-STANDING, ON 6" RISER FEET	
05	05 CP 01	CONTROL PANEL, NORTH WELL FIELD	NEMA 1 GASKETED	CARBON STEEL	STANDARD FINISH	72	36	18	X			FREE-STANDING, ON 6" RISER FEET	

* PM IMPLIES THAT THE ENCLOSURE IS SIZED BY THE DEVICE MANUFACTURER. REFERENCE GENERAL NOTES.
**NOTE FOR WALL MOUNTED ENCLOSURES, REFERENCE GENERAL NOTE 3 AND TYPE A OR TYPE B REQUIREMENTS.

CONTROL PANEL AND MSDS SCHEDULE NOTES:

GENERAL CONTROL PANEL NOTES:

1. THE "CONTROL PANEL SCHEDULE" INCLUDES MOTOR SAFETY DISCONNECT SWITCHES IN MANUFACTURER ENCLOSURES PLUS ELECTRICAL PANELS FABRICATED BY THE CONTRACTOR. REFERENCE SPECIFICATION 16130 FOR JUNCTION AND DEVICE BOXES.
2. IN GENERAL, "TYPE A" MOUNTING REQUIREMENTS APPLY TO INDOOR PANELS AND "TYPE B" APPLIES TO PANELS MOUNTED OUTDOORS. IF THE PLANS SHOW A PANEL NOT INCLUDED IN THIS LIST, AND NOT SPECIFICALLY CALLED OUT IN A DETAIL, THEN BID THE PANEL AS TYPE B.
3. UNLESS SPECIFICALLY NOTED OTHERWISE ON THE CONTROL PANEL DETAILS, THE FOLLOWING NOTES APPLY:
   a. FOR WALL MOUNTING METHODS, REFERENCE TYPE A OR TYPE B REQUIREMENTS.
   b. PANELS LISTED AS "TYPE A" SHALL FOLLOW THE "REQUIREMENTS FOR TYPE A PANELS" LISTED TO THE RIGHT. LIKEWISE, "TYPE B" PANELS SHALL FOLLOW THE "REQUIREMENTS FOR TYPE B PANELS".
   c. MOTOR SAFETY DISCONNECT SWITCHES SHALL BE PROVIDED AS A PACKAGED SWITCH IN AN ENCLOSURE AND ARE SIZED BY THE MANUFACTURER BASED ON NEMA TYPE AND MOTOR CURRENT RATING. FOR THIS REASON, THE SIZES ARE LISTED IN THE TABLE AS "*PM" (PER MANUFACTURER).
   d. ALL ENCLOSURES SHALL BE PROVIDED WITH AN ENGRAVED NAMEPLATE CORRESPONDING TO THE ASSOCIATED TAG ID NUMBER AND TAG DESCRIPTION (SEE DETAIL A). INCLUDE THE SQUARE BREAKETS [ ] AROUND THE TAG NUMBER.
   e. ALL PANELS MOUNTED TO VIBRATING EQUIPMENT SHALL BE CONNECTED WITH LFMC CONDUIT.
   f. PANELS OF DIFFERENT METALLURGY THAN THEIR SUPPORT STRUCTURES SHALL BE ELECTRICALLY ISOLATED WITH SHOULDER WASHERS PER 6/ED-2.
   g. FOR FREE-STANDING PANELS MOUNTED ON RISER FEET, THE RISER FEET SHALL BE OF THE SAME MATERIAL AND FINISH AS THE PANEL.
   h. WHERE PANELS CONTAIN POWER FROM MULTIPLE SOURCES, PROVIDE A YELLOW SAFETY STICKER, APPROXIMATELY 2" x 3" (SEE DETAIL B).

REQUIREMENTS FOR TYPE A PANELS:

1. ALL MOUNTING HARDWARE SHALL BE GALVANIZED OR STAINLESS STEEL.
2. PANELS MOUNTED ON INTERIOR WALLS SHALL BE SUPPORTED TO THE WALL WITH 1/2-INCH (MINIMUM) GALVANIZED STEEL UNISTRUT.

REQUIREMENTS FOR TYPE B PANELS:

1. ALL MOUNTING HARDWARE SHALL BE 316L STAINLESS STEEL.
2. PANELS MOUNTED ON EXTERIOR WALLS SHALL BE SUPPORTED TO THE WALL WITH 1/2-INCH (MINIMUM) STAINLESS STEEL UNISTRUT.
3. ALL EXPOSED PORTIONS OF CONDUITS ENTERING CONTROL PANELS SHALL BE PVC-COATED RGS.
4. ALL CONNECTIONS INTO ENCLOSURES SHALL BE WATERTIGHT, MADE ONLY FROM THE BOTTOM, USING MEYER-TYPE HUBS.
5. DEVICES MOUNTED ON THE CONTROL PANEL DOOR SHALL BE OUTDOOR RATED.
6. PANELS LARGER THAN 24"H x 24"W SHALL BE PROVIDED WITH PAD-LOCKABLE 3-POINT LATCH DOOR(S).
7. PANELS WITH DOUBLE DOORS SHALL BE A RIGHT-HAND, 3-POINT LATCHING DOOR OVER A LEFT-HAND UNLATCHED DOOR. FRONT CENTER POSTS ARE NOT ALLOWED.
8. FREE-STANDING PANELS SHALL INCLUDE DOOR CATCHES ON THE BOTTOM OF THE HINGED SIDES TO HOLD THE DOORS IN THE OPEN POSITION.
9. PANELS SHALL BE PROVIDED WITH A DRIP SHIELD MATCHING THE METALLURGY AND FINISH OF THE ENCLOSURE.
10. DEVICES MOUNTED TO THE TOPS OF ENCLOSURES SUCH AS ANTENNAS, STROBE LIGHTS, AND ETC. SHALL BE PROVIDED WITH GASKETS AND SEALS THAT ARE IMMUNE TO ULTRAVIOLET LIGHT, FREEZING, WATER, AND BIOLOGICAL GROWTH.
11. PROVIDE A 120 VAC INTERIOR PANEL HEATER FOR CONTROL PANELS MARKED AS "HEATER".
12. PANELS SHOWN WITH AN INTRUSION SWITCH SHALL BE WIRED SUCH THAT THEY ARE ELECTRICALLY "OPEN" WHEN THE DOOR IS OPEN.

TAG DESCRIPTION
"[" TAG NUMBER "]"

DETAIL A

CAUTION

THIS DEVICE IS POWERED FROM SEVERAL SOURCES

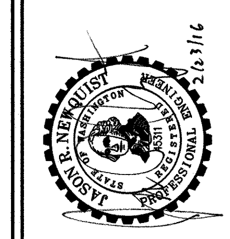
THE DISCONNECT SWITCH WILL NOT SHUT OFF ALL SOURCES OF ELECTRICAL ENERGY

DETAIL B

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

DATE: FEB 2016
SCALE: NOTED
DRAWN: TMR
CHECKED: PAM
APPROVED: JRN

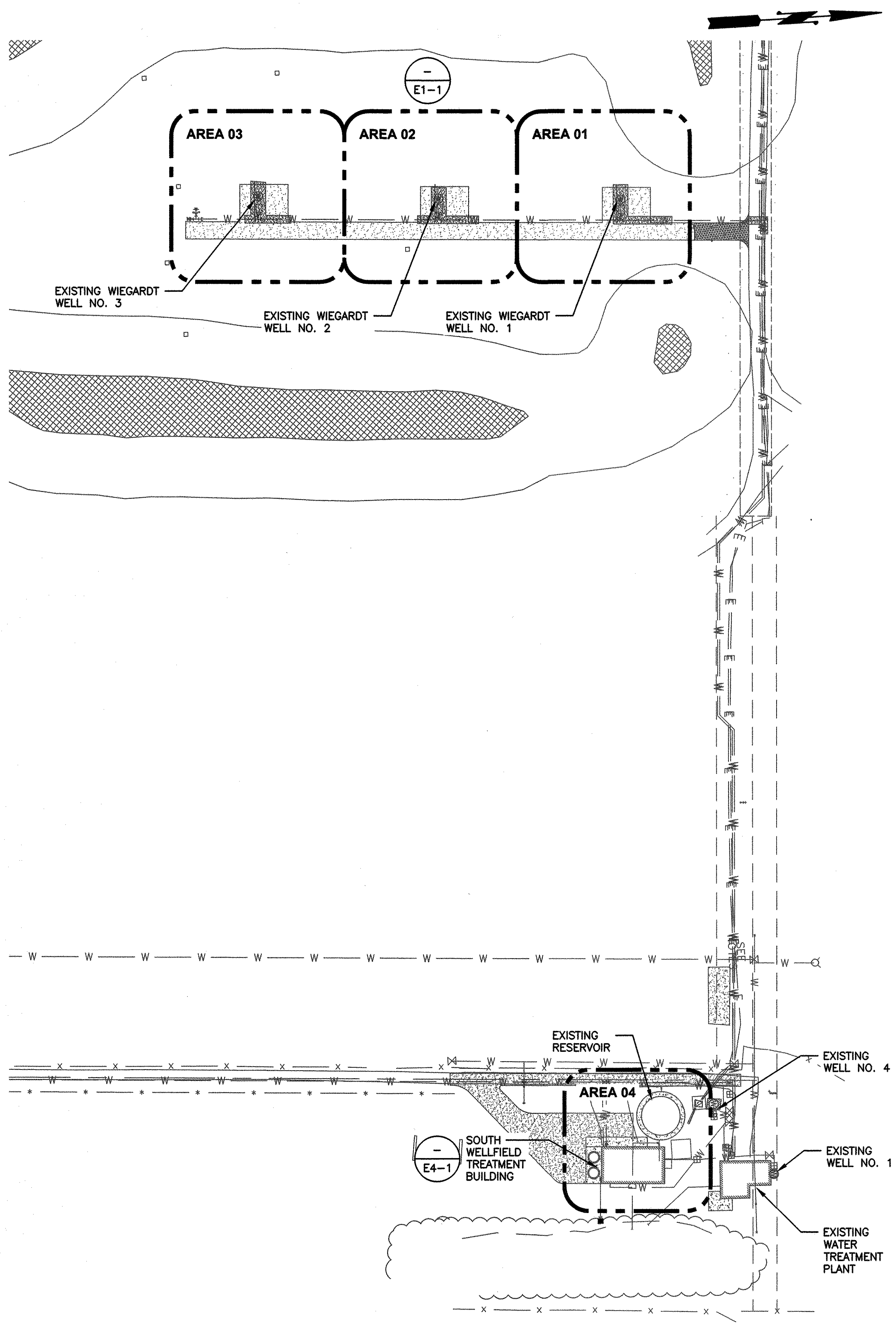
No.	REVISION	DATE	APPD



NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT PROJECT REBID
CONTROL PANEL AND MSDS SCHEDULE AND NOTES

SHEET: E-4
OF: 28

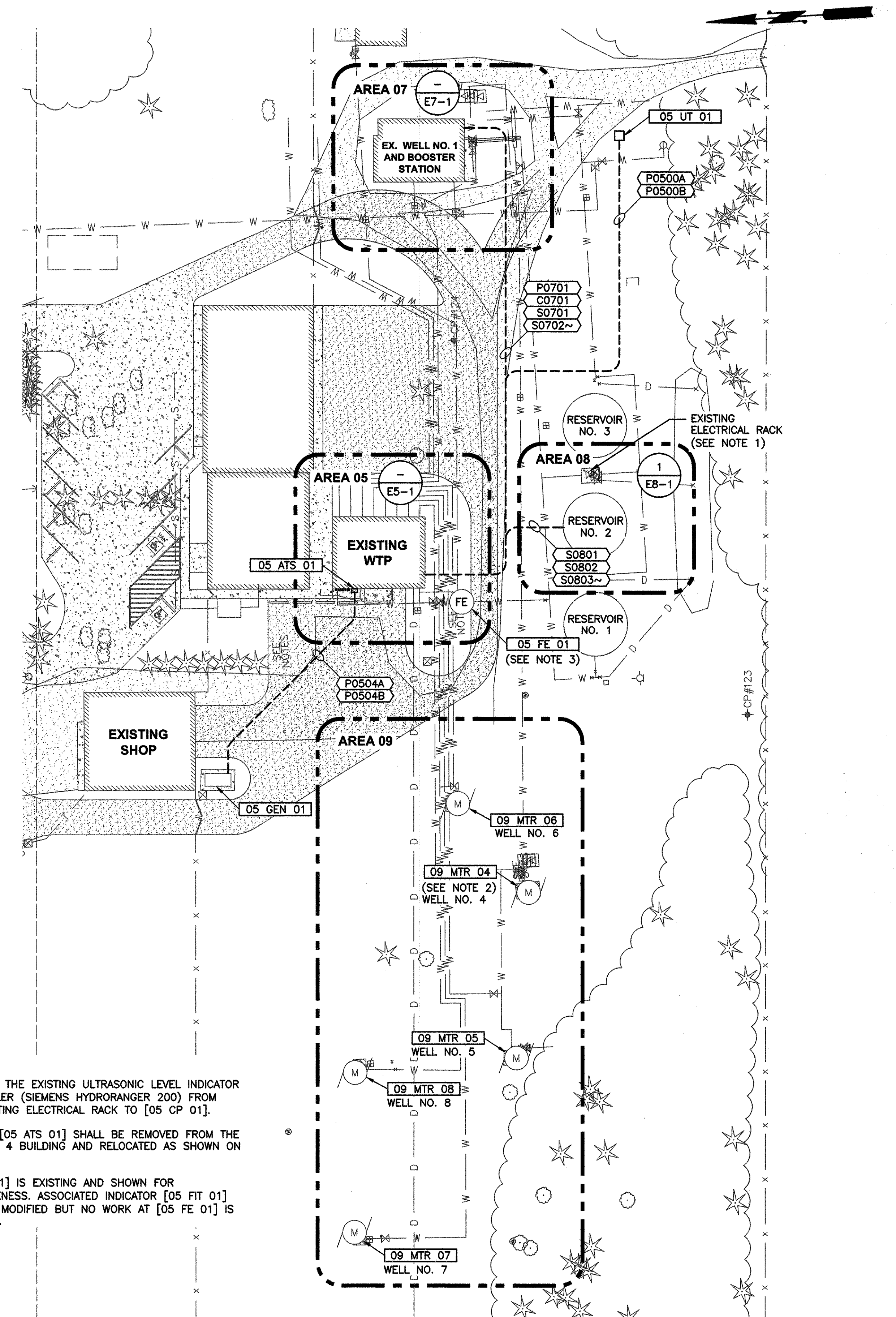
JOB NO.: 13224.02
DWG: E_SYM_ABBR



SCHEDULE A

SOUTH WELLFIELD SITE ELECTRICAL PLAN

SCALE: 1"=60'



NOTES:

1. RELOCATE THE EXISTING ULTRASONIC LEVEL INDICATOR CONTROLLER (SIEMENS HYDRORANGER 200) FROM THE EXISTING ELECTRICAL RACK TO [05 CP 01].
2. EXISTING [05 ATS 01] SHALL BE REMOVED FROM THE WELL NO. 4 BUILDING AND RELOCATED AS SHOWN ON E5-1.
3. [05 FE 01] IS EXISTING AND SHOWN FOR COMPLETENESS. ASSOCIATED INDICATOR [05 FIT 01] IS BEING MODIFIED BUT NO WORK AT [05 FE 01] IS REQUIRED.

SCHEDULE B

NORTH WELLFIELD SITE ELECTRICAL PLAN

SCALE: 1"=30'

0 1" 2"
TWO INCHES AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

Gray & Osborne, Inc.
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DATE:	FEB 2016
SCALE:	NOTED
DRAWN:	TMR
CHECKED:	PAM
APPROVED:	JRN

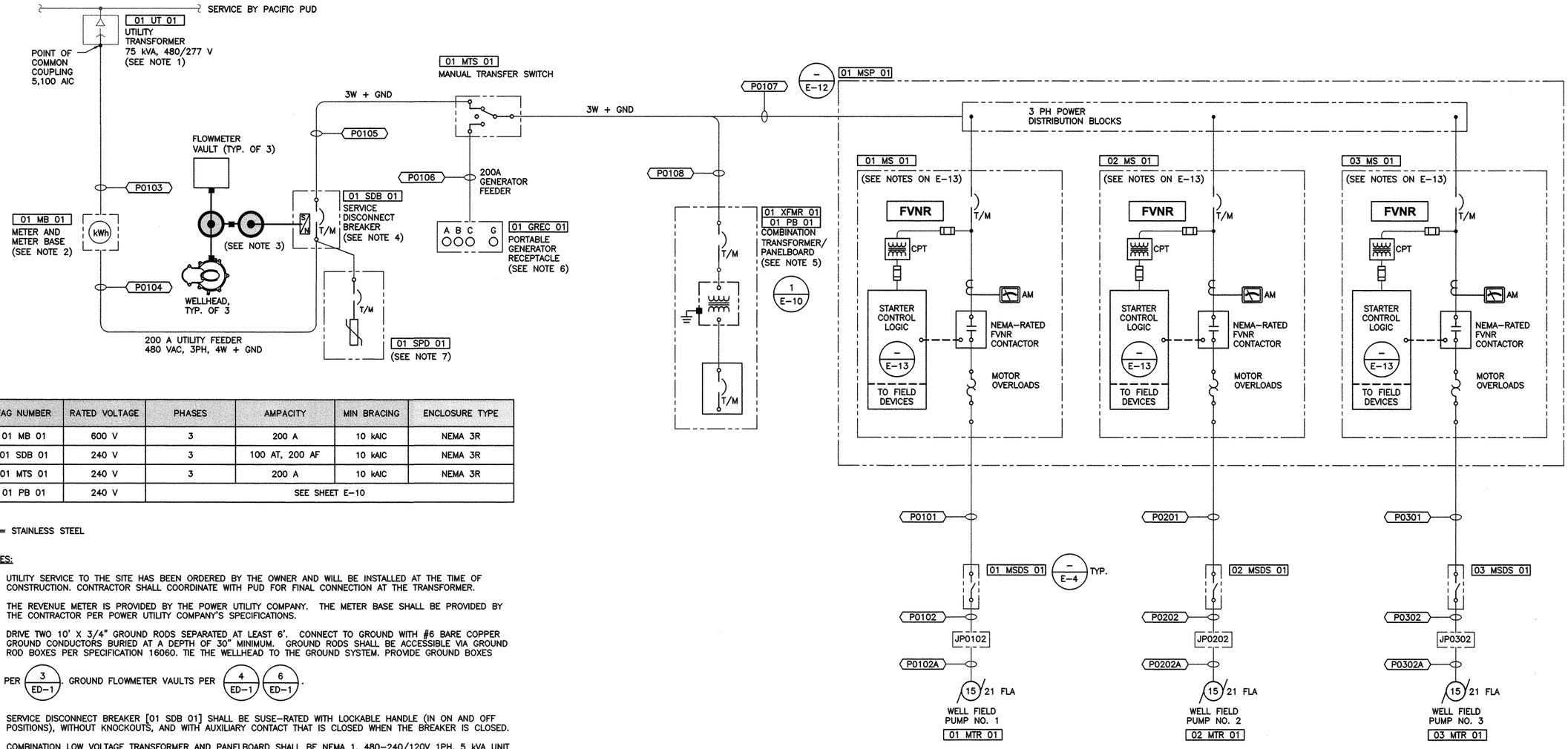
No.	REVISION	DATE	APPD

JASON R. NEWQUIST, STATE OF WASHINGTON, REGISTERED PROFESSIONAL ENGINEER, 2/23/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT PROJECT REBID
SCHEDULES A & B - ELECTRICAL SITE PLANS

SHEET: **E-5**
OF: **28**

JOB NO.: 13224.02
DWG: E_SP_SCHA



TAG NUMBER	RATED VOLTAGE	PHASES	AMPACITY	MIN BRACING	ENCLOSURE TYPE
01 MB 01	600 V	3	200 A	10 kAIC	NEMA 3R
01 SDB 01	240 V	3	100 AT, 200 AF	10 kAIC	NEMA 3R
01 MTS 01	240 V	3	200 A	10 kAIC	NEMA 3R
01 PB 01	240 V	SEE SHEET E-10			

SS = STAINLESS STEEL

NOTES:

1. UTILITY SERVICE TO THE SITE HAS BEEN ORDERED BY THE OWNER AND WILL BE INSTALLED AT THE TIME OF CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH PUD FOR FINAL CONNECTION AT THE TRANSFORMER.
2. THE REVENUE METER IS PROVIDED BY THE POWER UTILITY COMPANY. THE METER BASE SHALL BE PROVIDED BY THE CONTRACTOR PER POWER UTILITY COMPANY'S SPECIFICATIONS.
3. DRIVE TWO 10' X 3/4" GROUND RODS SEPARATED AT LEAST 6'. CONNECT TO GROUND WITH #6 BARE COPPER GROUND CONDUCTORS BURIED AT A DEPTH OF 30" MINIMUM. GROUND RODS SHALL BE ACCESSIBLE VIA GROUND ROD BOXES PER SPECIFICATION 16060. TIE THE WELLHEAD TO THE GROUND SYSTEM. PROVIDE GROUND BOXES PER (3 / ED-1). GROUND FLOWMETER VAULTS PER (4 / ED-1) (6 / ED-1).
4. SERVICE DISCONNECT BREAKER [01 SDB 01] SHALL BE SUSE-RATED WITH LOCKABLE HANDLE (IN ON AND OFF POSITIONS), WITHOUT KNOCKOUTS, AND WITH AUXILIARY CONTACT THAT IS CLOSED WHEN THE BREAKER IS CLOSED.
5. COMBINATION LOW VOLTAGE TRANSFORMER AND PANELBOARD SHALL BE NEMA 1, 480-240/120V 1PH, 5 kVA UNIT WITH PRIMARY AND SECONDARY MAIN CIRCUIT BREAKERS. SQUARE D MINI-POWER ZONE MPZ5S40F OR EQUAL.
6. GENERATOR RECEPTACLE [01 GREC 01] SHALL BE 4-WIRE WITH POSILOCK, REVERSE SERVICE, WITH STYLE 2 (PIN) GROUNDING.
7. SURGE PROTECTIVE DEVICE SHALL BE 4-WIRE, 480 V, 3PH, RATED FOR 160 kA PER PHASE, NEMA 1 RATED. EATON PTE160 OR EQUAL REFERENCE SPECIFICATION 16280.

LOAD SUMMARY

(CALCULATIONS BASED ON 480 V) — D.F. = DEMAND FACTOR

LOAD DESCRIPTION	CONNECTED LOADS STARTER	HP	kVA	UTILITY LOAD DEMAND D.F.	kVA	GENERATOR LOADS D.F	kVA
[01 MTR 01], MOTOR, WELL PUMP NO. 1	FVNR	15.0	16.7	100%	16.7	0%	0.0
[02 MTR 01], MOTOR, WELL PUMP NO. 2	FVNR	15.0	16.7	100%	16.7	0%	0.0
[03 MTR 01], MOTOR, WELL PUMP NO. 3	FVNR	15.0	16.7	100%	16.7	0%	0.0
[01 PB 01], COMBINATION TRANSFORMER/PANELBOARD			5.0	100%	5.0	0%	0.0
TOTAL kVA:			55.2		55.2		0.0
RESULTING AMPACITY AT 480 VAC, 3 PH:			69.3		69.3		0.0
SYSTEM SIZED AT: 200 A			SPARE CAPACITY:		130.7 A, 65.4%		

1 / – **AREA 01 - ONE LINE DIAGRAM**
ELECTRICAL POWER SOURCE

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

DATE: FEB 2016 | SCALE: NOTED | DRAWN: TMR | CHECKED: PAM | APPROVED: JRN

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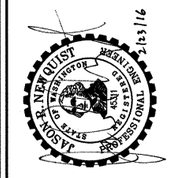
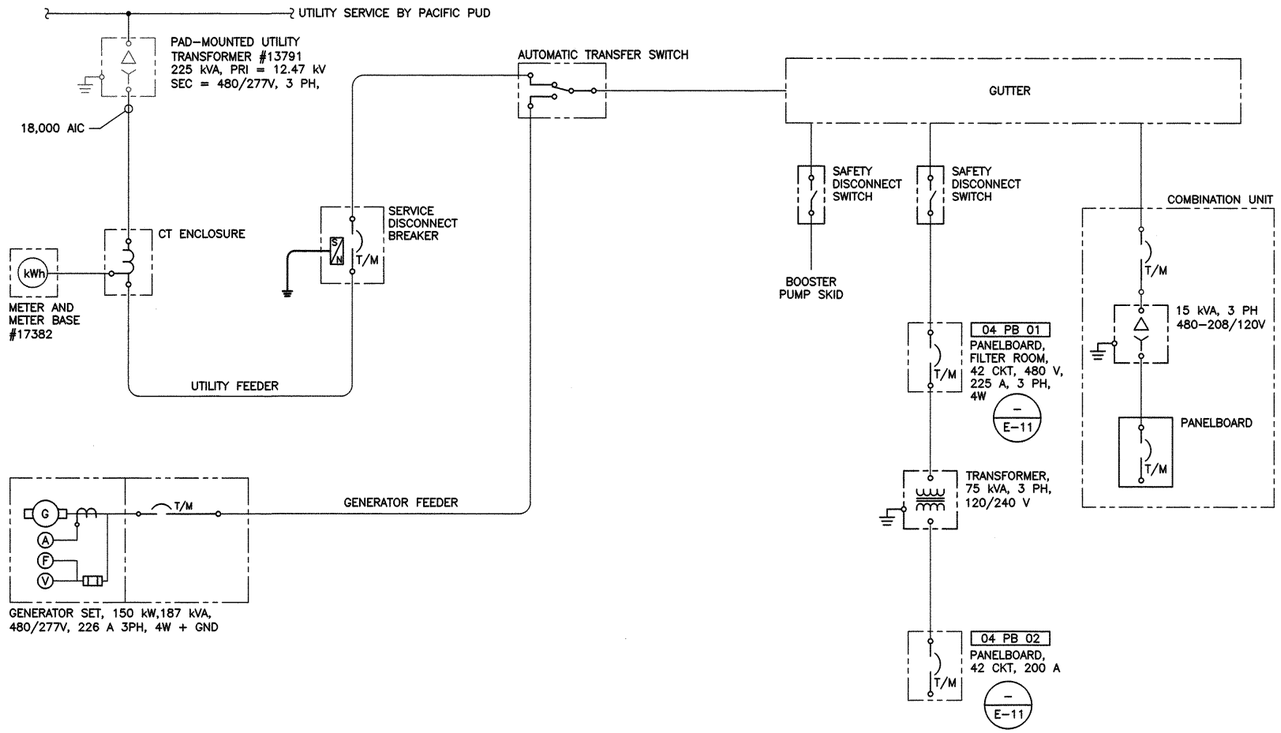


NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
AREA 01 - ONE LINE DIAGRAM

SHEET: E-6
OF: 28
JOB NO.: 13224.02
DWG: E_OLD_SCHA



NOTES:

1. ONE LINE PROVIDED FOR REFERENCE ONLY. THE ONLY POWER DISTRIBUTION CHANGES ARE AT THE PANELBOARDS.

1 / E4-1 **AREA 04 - ONE LINE DIAGRAM**
ELECTRICAL POWER SOURCE

Gray & Osborne, Inc.
CONSULTING ENGINEERS
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OLYMPIA, WA 98502 • (360) 292-7418

DATE: FEB 2016	SCALE: NOTED	DRAWN: TMR	CHECKED: PAM	APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — 14531 — REGISTERED PROFESSIONAL ENGINEER
2/13/16

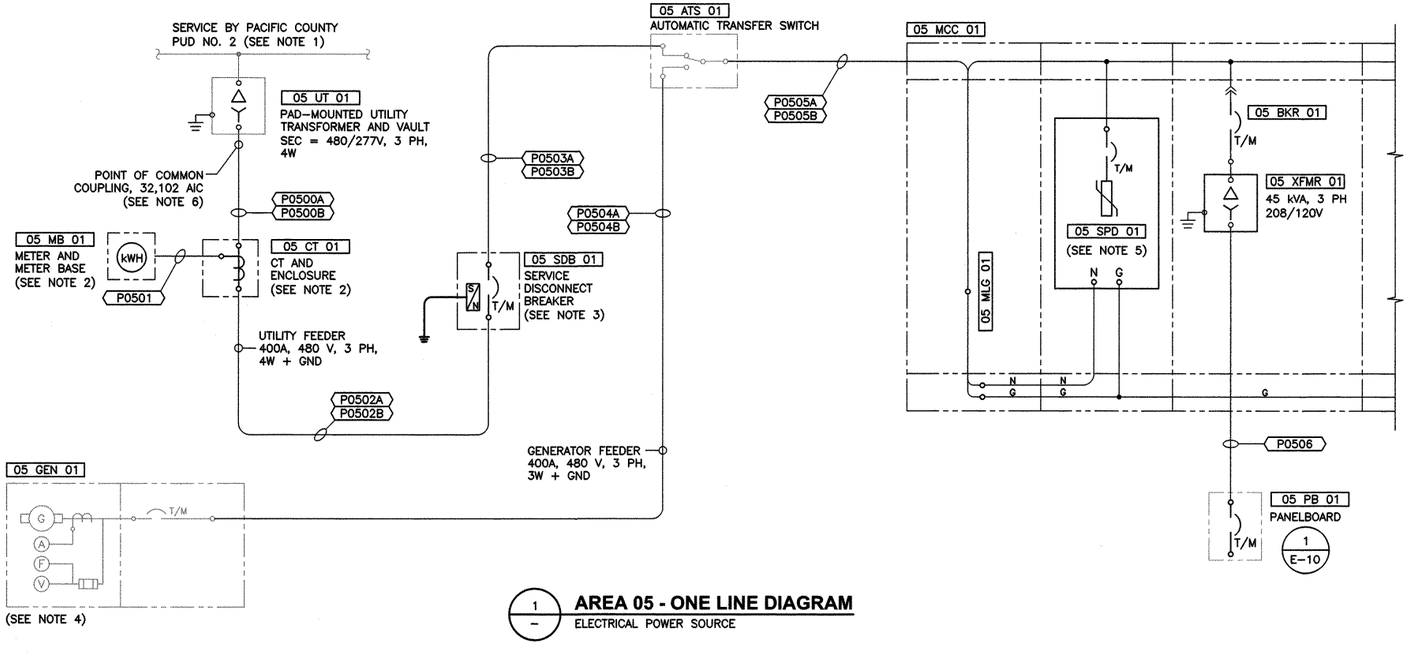
NORTH BEACH WATER DISTRICT
PACIFIC COUNTY
WASHINGTON

WATER SUPPLY AND TREATMENT
PROJECT REBID

AREA 04 - ONE LINE DIAGRAM

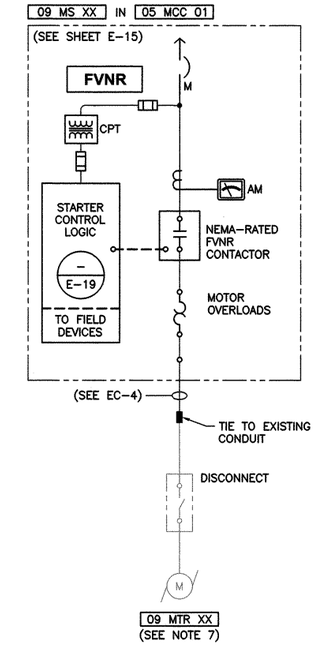
SHEET: E-7
OF: 28

JOB NO.: 13224.02
DWG: E_OLD_SCHA



1 – AREA 05 - ONE LINE DIAGRAM

ELECTRICAL POWER SOURCE

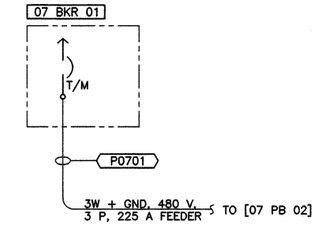


2 – AREA 09 - ONE LINE DIAGRAM

WELL NO. 4 – NO. 8

XX = 04 FOR WELL NO. 4
XX = 05 FOR WELD NO. 5
XX = 06 FOR WELL NO. 6
XX = 07 FOR WELL NO. 7
XX = 08 FOR WELL NO. 8

NOTE: REFERENCE CABLE AND CONDUIT SCHEDULES



3 – AREA 07 ONE LINE DIAGRAM

POWER SOURCE

MCC [05 MCC 01] LOAD SUMMARY

(CALCULATIONS BASED ON 480 V) — D.F. = DEMAND FACTOR

LOAD DESCRIPTION	CONNECTED LOADS STARTER	HP	kVA	UTILITY LOAD DEMAND D.F.	kVA	GENERATOR LOADS D.F	kVA
[09 MTR 04], MOTOR, WELL NO. 4	FVNR	10.0	11.2	100%	11.2	100%	11.2
[09 MTR 05], MOTOR, WELL NO. 5	FVNR	10.0	11.2	100%	11.2	100%	11.2
[09 MTR 06], MOTOR, WELL NO. 6	FVNR	7.5	8.8	0%	–	100%	8.8
[09 MTR 07], MOTOR, WELL NO. 7	FVNR	5.0	6.1	0%	–	100%	6.1
[09 MTR 08], MOTOR, WELL NO. 8	FVNR	7.5	8.8	0%	–	100%	8.8
[05 XFMR 01], TRANSFORMER, 45 KVA 480 – 240/120 1PH			45.0	80%	36.0	100%	45.0
[NORTH WELLFIELD BOOSTER BUILDING (SHEET E-9)]			140.0	NA	89.8	100%	140.0
25% LARGEST MOTOR FROM [07 MTR 04]			6.8				
TOTAL kVA:			237.7		148.2		237.7
RESULTING AMPACITY AT 480 VAC, 3 PH:			285.9		178.8		285.9
SYSTEM SIZED AT: 400 A			SPARE CAPACITY:		141 A, 35.1%		

POWER DEVICE SIZING

TAG NUMBER	RATED VOLTAGE	OPERATING VOLTAGE	POLES/ PHASES	AMPACITY	MIN. INTERRUPT AND WITHSTAND RATING	ENCLOSURE TYPE
05 BKR 01	600 V	480 V	3	100 AT, 100 AF	42 kAIC	IN [05 MCC 01]
05 CT 01	600 V	480 V	3	400/5 A	35 kAIC	NEMA 3R
05 MB 01	600 V	480 V	3	200 A	35 kAIC	NEMA 3R
05 SDB 01	600 V	480 V	3	400 AT, 400 AF	35 kAIC	NEMA 3R
05 MCC 01	SEE SHEET E-18					
07 BKR 01	600 V	480 V	3	225 AT, 250 AF	42 kAIC	IN [05 MCC 01]

NOTES:

1. THERE ARE TWO EXISTING 240 V, 3PH SERVICES FEEDING THE NORTH WELL FIELD WHICH WILL BE COMBINED UNDER ONE NEW 480 V, 3PH DISTRIBUTION. APPLICATION FOR NEW SERVICE IS BY OWNER. COORDINATE CONNECTION TO NEW SERVICES WITH THE PUD.
2. CURRENT SENSING CTs AND REVENUE METER ARE PROVIDED BY THE POWER UTILITY COMPANY. THE CT ENCLOSURE AND METER BASE SHALL BE PROVIDED BY THE CONTRACTOR PER POWER UTILITY COMPANY'S SPECIFICATIONS.
3. MAIN CIRCUIT BREAKER [05 SDB 01] SHALL BE SUSE RATED WITH AN AUXILIARY CONTACT THAT OPENS WHEN THE BREAKER IS IN ITS OPEN/TRIPPED POSITION.
4. THE EXISTING GENERATOR SHALL BE RECONFIGURED AND NEW BREAKER ADDED FOR 480 V, 3 PH SERVICE BY OWNER INDEPENDENT OF THIS CONTRACT.
5. PROVIDE A SURGE PROTECTIVE DEVICE PER SPECIFICATION 16280 AND SHEET E-18.
6. THREE PHASE SHORT CIRCUIT BOLTED FAULT CALCULATIONS ARE BASED ON INFINITE UTILITY CONTRIBUTION, +10% VARIANCE IN UTILITY VOLTAGE, –10% VARIANCE IN TRANSFORMER IMPEDANCE, AND A 300 KVA TRANSFORMER WITH 1.55% ASSUMED IMPEDANCE. FAULT CALCULATIONS ALSO INCLUDE 2,111 AIC MOTOR REGENERATIVE CONTRIBUTION FROM THE WELLS AND BOOSTER STATION MOTORS ADDED TO EACH FAULT POINT. ALL CALCULATIONS ARE BASED ON 480 V.
7. EACH WELL PUMP HAS THE SAME MOTOR STARTER DESIGN. HORSEPOWER VARIES BY MOTOR, REFER TO THE MCC LOAD SUMMARY TABLE FOR INDIVIDUAL MOTOR INFORMATION.

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DATE: FEB 2016	SCALE: NOTED	DRAWN: TMR	CHECKED: PAM	APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — 45311 — REGISTERED PROFESSIONAL ENGINEER — 9/16/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT PROJECT REBID
AREAS 05/09 - ONE LINE DIAGRAM

SHEET: E-8
OF: 28

JOB NO.: 13224.02
DWG: E_OLD_SCHB

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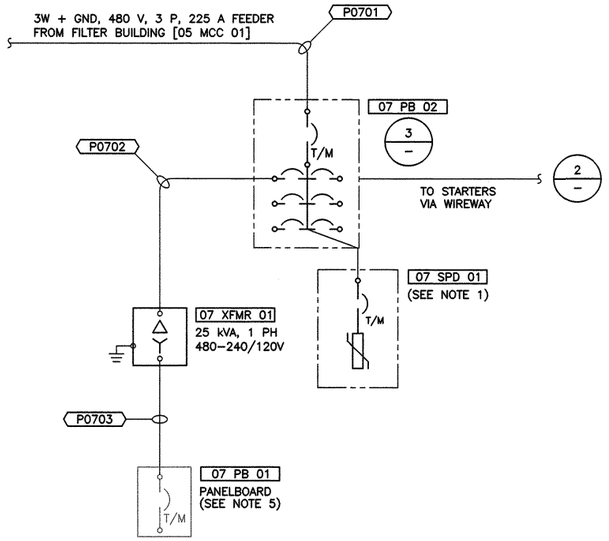
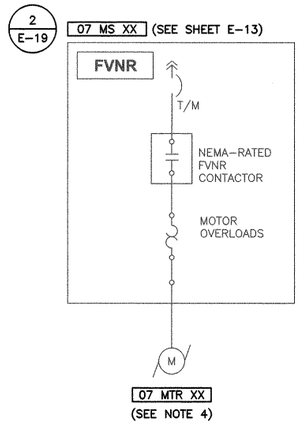


1 / – **AREA 07 - ONE LINE DIAGRAM**
POWER SOURCE



2 / – **AREA 07 - ONE LINE DIAGRAM**
TYPICAL STARTER POWER

XX = 01 FOR BOOSTER PUMP NO. 1
XX = 02 FOR BOOSTER PUMP NO. 2
XX = 03 FOR BOOSTER PUMP NO. 3
XX = 04 FOR BOOSTER PUMP NO. 4
XX = 05 FOR BOOSTER PUMP NO. 5

NOTE: REFERENCE CABLE AND CONDUIT SCHEDULES

BOOSTER BUILDING LOAD SUMMARY

(CALCULATIONS BASED ON 480 V) — D.F. = DEMAND FACTOR

LOAD DESCRIPTION	CONNECTED LOADS STARTER	HP	kVA	UTILITY LOAD DEMAND D.F.	kVA	GENERATOR LOADS D.F	kVA
[07 MTR 01], BOOSTER PUMP NO. 1	FVNR	10.0	11.2	100%	11.2	100%	11.2
[07 MTR 02], BOOSTER PUMP NO. 2	FVNR	7.5	8.8	0%	–	100%	8.8
[07 MTR 03], BOOSTER PUMP NO. 3	FVNR	15.0	16.7	100%	16.7	100%	16.7
[07 MTR 04], BOOSTER PUMP NO. 4	FVNR	25.0	27.1	100%	27.1	100%	27.1
[07 MTR 05], BOOSTER PUMP NO. 5	FVNR	25.0	27.1	0%	–	100%	27.1
[07 MTR 06], BOOSTER PUMP NO. 6 (FUTURE)	FVNR	7.5	8.8	0%	–	100%	8.8
[07 MTR 07], BOOSTER PUMP NO. 7 (FUTURE)	FVNR	7.5	8.8	0%	–	100%	8.8
[07 MTR 08], BOOSTER PUMP NO. 8 (FUTURE)	FVNR	6.5	6.7	0%	–	100%	6.7
[07 XFMR 01], TRANSFORMER, 25 KVA, 480 V – 240/120 1PH (SEE NOTE 3)			25.0	139%	34.8	139%	34.8
TOTAL kVA:			140.2		89.8		150.0
RESULTING AMPACITY AT 480 VAC, 3 PH:			168.6		108.0		180.4
SYSTEM SIZED AT: 225 A				SPARE CAPACITY: 25.3% PEAK CONNECTED DEMAND			

NOTES:

1. SURGE PROTECTIVE DEVICE SHALL BE 4–WIRE, 480 V, 3PH, RATED FOR 160 kA PER PHASE, NEMA 1 RATED. EATON PTE160 OR EQUAL REFERENCE SPECIFICATION 16280.
2. HORSEPOWER VARIES BY MOTOR, REFER TO THE MCC LOAD SUMMARY TABLE FOR INDIVIDUAL MOTOR INFORMATION.
3. 139% LOADING IS USED TO CORRECT FOR HAVING A SINGLE PHASE LOAD ON A THREE PHASE SYSTEM.
4. CONTRACTOR SHALL RECONFIGURE MOTOR LEADS FOR 480 V, 3PH POWER.
5. PROVIDE AND INSTALL GROUND/NEUTRAL KIT TO CONVERT EXISTING PANELBOARD TO A SUSE RATED DEVICE.

PANELBOARD [07 PB 02] SCHEDULE

CKT. NO.	DIRECTORY	PHASE A VA	PHASE A A	PHASE B VA	PHASE B A	PHASE C VA	PHASE C A	LOAD TYPE	BKR AMPS	BUS	BKR AMPS	LOAD TYPE	PHASE A VA	PHASE A A	PHASE B VA	PHASE B A	PHASE C VA	PHASE C A	DIRECTORY	CKT. NO.
1	[07 MS 01], MOTOR STARTER, BOOSTER PUMP NO. 1	3,718	14.0					M	3/30	A	3/20	M	2,921	11.0					[07 MS 02], MOTOR STARTER, BOOSTER PUMP NO. 2	2
3	[07 MS 01], MOTOR STARTER, BOOSTER PUMP NO. 1			3,718	14.0			M	|	B	|	M			2,921	11.0			[07 MS 02], MOTOR STARTER, BOOSTER PUMP NO. 2	4
5	[07 MS 01], MOTOR STARTER, BOOSTER PUMP NO. 1					3,718	14.0	M	|	C	|	M					2,921	11.0	[07 MS 02], MOTOR STARTER, BOOSTER PUMP NO. 2	6
7	[07 MS 03], MOTOR STARTER, BOOSTER PUMP NO. 3	5,577	21.0					M	3/40	A	3/70	M	9,030	34.0					[07 MS 04], MOTOR STARTER, BOOSTER PUMP NO. 4	8
9	[07 MS 03], MOTOR STARTER, BOOSTER PUMP NO. 3			5,577	21.0			M	|	B	|	M			9,030	34.0			[07 MS 04], MOTOR STARTER, BOOSTER PUMP NO. 4	10
11	[07 MS 03], MOTOR STARTER, BOOSTER PUMP NO. 3					5,577	21.0	M	|	C	|	M					9,030	34.0	[07 MS 04], MOTOR STARTER, BOOSTER PUMP NO. 4	12
13	[07 MS 05], MOTOR STARTER, BOOSTER PUMP NO. 5	9,030	34.0					M	3/70	A	2/80	Z	12,500	52.1					[07 XFMR 01], TRANSFORMER, 25 KVA, 480 V – 240/120 1PH	14
15	[07 MS 05], MOTOR STARTER, BOOSTER PUMP NO. 5			9,030	34.0			M	|	B	|	Z			12,500	52.1			[07 XFMR 01], TRANSFORMER, 25 KVA, 480 V – 240/120 1PH	16
17	[07 MS 05], MOTOR STARTER, BOOSTER PUMP NO. 5					9,030	34.0	M	|	C	---	Z					–	–	COVERED SPACE	18
19	COVERED SPACE	–	–					Z	---	A	---	Z	–	–					COVERED SPACE	20
21	COVERED SPACE			–	–			Z	---	B	---	Z			–	–			COVERED SPACE	22
23	COVERED SPACE					–	–	Z	---	C	---	Z					–	–	COVERED SPACE	24
25	COVERED SPACE	–	–					Z	---	A	---	Z	–	–					COVERED SPACE	26
27	COVERED SPACE			–	–			Z	---	B	---	Z			–	–			COVERED SPACE	28
29	COVERED SPACE					–	–	Z	---	C	---	Z					–	–	COVERED SPACE	30
31	COVERED SPACE	–	–					Z	---	A	---	Z	–	–					COVERED SPACE	32
33	COVERED SPACE			–	–			Z	---	B	---	Z			–	–			COVERED SPACE	34
35	COVERED SPACE					–	–	Z	---	C	---	Z					–	–	COVERED SPACE	36
	SUM OF PHASE VA, AMPS	18,325	69.0	18,325	69.0	18,325	69.0						24,451	97.1	24,451	97.1	11,951	45.0	SUM OF PHASE VA, AMPS	

[07 PB 02] ELECTRICAL AND CONSTRUCTION SPECIFICATIONS:

CONFIGURATION:	480/277 VAC, 3 PH, 60 Hz
POWER BUS:	250 A, COPPER
NEUTRAL BUS:	250 A (100% OF POWER BUS), ISOLATED FROM GROUND, SOLDERLESS CONNECTIONS
GROUND BUS:	PROVIDE PER UL 67
BUS BRACING:	14 kAIC, MINIMUM
MAIN BREAKER:	225 AT, 250 AF, 3 PH, 3 P, 14 kAIC, MOLDED CASE, VERTICAL MOUNTING
DISTRIBUTION BREAKERS:	BOLT–ON, MOLDED CASE, 14 kAIC, MINIMUM
GROUND BONDING:	GROUND AND NEUTRAL SEPARATED
ENCLOSURE:	NEMA 1
NUMBER OF CIRCUITS:	36
UNCOMMITTED CIRCUITS:	BLANK COVERS
POWER DERIVED FROM:	[05 MCC 01], MOTOR CONTROL CENTER, FILTER BUILDING
BUS BREAKERS:	3 POLE, 2x 50 A, 14 kAIC 3 POLE, 1x 30 A, 14 kAIC 3 POLE, 2x 20 A, 14 kAIC 2 POLE, 1x 80 A, 14 kAIC

LOAD DISTRIBUTION:	AMPS	VA	%
BY PHASE:			
TOTAL LOAD, PHASE A:	166.1 A	42,776 VA	37.2%
TOTAL LOAD, PHASE B:	166.1 A	42,776 VA	37.2%
TOTAL LOAD, PHASE C:	114.0 A	30,276 VA	25.6%
BY LOAD TYPE:			
TOTAL LIGHTING (L):		0 VA	0.0%
TOTAL MOTOR (M):		90,828 VA	78.4%
TOTAL HVAC (H):		0 VA	0.0%
TOTAL RECEPTACLE (R):		0 VA	0.0%
TOTAL OTHER (Z):		25,000 VA	21.6%
TOTAL CONNECTED LOAD:		115.83 kVA	100.0%

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No.	REVISION	DATE	APPD

R. NEW QUIST — STATE OF WASHINGTON — 45011 — REGISTERED PROFESSIONAL ENGINEER — 12/31/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
AREA 07 - ONE LINE DIAGRAMS AND PANELBOARD [07 PB 02] SCHEDULE

SHEET: E-9
OF: 28
JOB NO.: 13224.02
DWG: E_OLD_SCHB

PANELBOARD [01 PB 01] SCHEDULE

CKT. NO.	DIRECTORY	PHASE A VA	PHASE A A	PHASE B VA	PHASE B A	LOAD TYPE	BKR AMPS	BUS	BKR AMPS	LOAD TYPE	PHASE A VA	PHASE A A	PHASE B VA	PHASE B A	DIRECTORY	CKT. NO.
1	MAIN BREAKER, HORIZONTAL	–	–			Z	2/30	A	1/20	Z	1,500	12.5			[01 CP 01], CONTROL PANEL	2
3	MAIN BREAKER, HORIZONTAL			–	–	Z	|	B	1/20	Z			–	–	SPARE BREAKER	4
5	SPARE BREAKER	–	–			Z	1/20	A	1/20	Z	–	–			SPARE BREAKER	6
7	SPARE BREAKER			–	–	Z	1/20	B	1/20	Z			–	–	SPARE BREAKER	8
9	SPARE BREAKER	–	–			Z	1/20	A	1/20	Z	–	–			SPARE BREAKER	10
11	SPARE BREAKER			–	–	Z	1/20	B	1/20	Z			–	–	SPARE BREAKER	12
	SUM OF PHASE VA, AMPS	0	0.0	0	0.0						1,500	12.5	0	0.0	SUM OF PHASE VA, AMPS	

NOTES:

1. THE CONTRACTOR SHALL PROVIDE A TYPED PANELBOARD SCHEDULE FOR ALL ACTUAL LOAD ASSIGNMENTS.
2. DEMOLISH CONDUCTORS BETWEEN BREAKER AND EXISTING HEATER ON SHEET H4–1. PLACE BREAKER IN OFF POSITION AND LABEL AS SPARE.

1/– **PANELBOARD [01 PB 01] SCHEDULE**
100A, 240/120 VAC, 1 PH, 60 HZ.

[01 PB 01] ELECTRICAL AND CONSTRUCTION SPECIFICATIONS:

CONFIGURATION:	240/120 VAC, 1 PH, 60 Hz
POWER BUS:	100 A, COPPER
NEUTRAL BUS:	100 A (100% OF POWER BUS), ISOLATED FROM GROUND, SOLDERLESS CONNECTIONS
GROUND BUS:	PROVIDE PER UL 67
BUS BRACING:	10 kAIC, MINIMUM
MAIN BREAKER:	30 AT, 30 AF, 1 PH, 2 P, 10 kAIC, MOLDED CASE, PART OF DISTRIBUTION BREAKERS
DISTRIBUTION BREAKERS:	STAB–TYPE, 10 kAIC, MINIMUM
GROUND BONDING:	SUITABLE FOR SERVICE ENTRY
ENCLOSURE:	NEMA 3R
NUMBER OF CIRCUITS:	12
UNCOMMITTED CIRCUITS:	FILL WITH SPARE 20 A, 1 P, 10 kAIC BREAKERS
POWER DERIVED FROM:	INTEGRAL WITH ASSOCIATED TRANSFORMER
BUS BREAKERS:	2 POLE, 1x 30 A, 10 kAIC 1 POLE, 10x 20 A, 10 kAIC

PANELBOARD [05 PB 01] SCHEDULE

CKT. NO.	DIRECTORY	PHASE A VA	PHASE A A	PHASE B VA	PHASE B A	PHASE C VA	PHASE C A	LOAD TYPE	BKR AMPS	BUS	BKR AMPS	LOAD TYPE	PHASE A VA	PHASE A A	PHASE B VA	PHASE B A	PHASE C VA	PHASE C A	DIRECTORY	CKT. NO.
1	BOX SUB PANEL **(SEE NOTE 3)**	–	–					Z	3/100	A	1/20	Z	–	–					GARAGE PLUGS, LTS (OFF POSITION)	2
3	BOX SUB PANEL **(SEE NOTE 3)**			–	–			Z	|	B	---	Z			–	–			COVERED SPACE	4
5	BOX SUB PANEL **(SEE NOTE 3)**					–	–	Z	|	C	2/20	Z					–	–	HEAT IN LABS (OFF POSITION)	6
7	SUB PANEL **(SEE NOTE 3)**	–	–					Z	3/100	A	|	Z	–	–					HEAT IN LABS	8
9	SUB PANEL **(SEE NOTE 3)**			–	–			Z	|	B	---	Z			–	–			COVERED SPACE	10
11	SUB PANEL **(SEE NOTE 3)**					–	–	Z	|	C	1/20	Z					–	–	COMPUTER (OFF POSITION)	12
13	LAB SOUTH PLUGS (OFF POSITION)	–	–					R	1/20	A	1/15	Z	–	–					FRIDGE AIR PUMP (OFF POSITION)	14
15	COVERED SPACE			–	–			---	---	B	---	Z			–	–			COVERED SPACE	16
17	LAB LTS (OFF POSITION)					–	–	L	1/20	C	1/20	Z					–	–	COFFE POT (OFF POSITION)	18
19	LAB FAN (OFF POSITION)	–	–					Z	1/20	A	1/20	Z	500	4.2					[05 CP 01], CONTROL PANEL, NORTH WELL FIELD, PROCESS	20
21	SPARE BREAKER			–	–			Z	3/20	B	1/20	Z			1,000	8.3			[05 CP 01], CONTROL PANEL, NORTH WELL FIELD, ANCILLARY	22
23	SPARE BREAKER					–	–	Z	|	C	1/20	Z					475	4.0	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD, FILTER TRAINS 1 AND 2	24
25	SPARE BREAKER	–	–					Z	|	A	1/20	Z	475	4.0					[05 CP 01], CONTROL PANEL, NORTH WELL FIELD, FILTER TRAINS 3 AND 4 GFCI	26
27	COVERED SPACE			–	–			---	---	B	1/20	R			180	1.5			[05 DREC 01], DEDICATED RECEPTACLE, POTASSIUM PERMANGANATE PUMP AND TANK AND [05 SV 01]	28
29	COVERED SPACE					–	–	---	---	C	---	Z					–	–	COVERED SPACE	30
31	COVERED SPACE	–	–					---	---	A	---	Z	–	–					COVERED SPACE	32
33	COVERED SPACE			–	–			---	---	B	---	Z			–	–			COVERED SPACE	34
35	COVERED SPACE					–	–	---	---	C	---	Z					–	–	COVERED SPACE	36
	SUM OF ADDITIONAL PHASE VA, AMPS	0	0.0	0	0.0	0	0.0						975	8.1	1,180	9.8	475	4.0	SUM OF ADDITIONAL PHASE VA, AMPS	

2/– **PANELBOARD [05 PB 01] SCHEDULE**
200A, 208/120 VAC, 3 PH, 60 HZ.

[05 PB 01] ELECTRICAL AND CONSTRUCTION SPECIFICATIONS:

CONFIGURATION:	208/120 VAC, 3 PH, 60 Hz (SEE NOTE 1)
POWER BUS:	200 A, COPPER
NEUTRAL BUS:	200 A (100% OF POWER BUS), ISOLATED FROM GROUND, SOLDERLESS CONNECTIONS
MAIN BREAKER:	150 AT, 200 AF, 3 PH, 3 P, MOLDED CASE, VERTICAL MOUNTING (SEE NOTE 4)
DISTRIBUTION BREAKERS:	BOLT–ON, MOLDED CASE, 14 kAIC, MINIMUM WHERE SHOWN AS NEW
GROUND BONDING:	SUITABLE FOR SERVICE ENTRY
ENCLOSURE:	NEMA 12
NUMBER OF CIRCUITS:	36
POWER DERIVED FROM:	[05 XFMR 01], 45kVA, 480–208/120 3PH

NOTES:

1. EXISTING PANEL HAS A 240/120 3PH CONFIGURATION. AS PART OF THIS PROJECT IT WILL BE CHANGED TO A 208/120 3PH SYSTEM TO ELIMINATE THE HIGH LEG.
2. FADED CIRCUITS ARE EXISTING.
3. THE REMOTE PANELBOARD FED FROM THIS BREAKER SHALL BE DEMOLISHED BY OWNER BEFORE THE START OF THIS WORK. ALL REMOTE PANELBOARD CIRCUITS THAT NEED TO REMAIN SHALL BE RE–ROUTED TO THIS PANEL BY OWNER. AS SUCH THE SCHEDULE OF EXISTING WILL VARY TO SOME EXTENT FROM WHAT IS SHOWN AS FADED.
4. REPLACE EXISTING 200 A EXISTING MAIN BREAKER WITH NEW 150 A UNIT.
5. CIRCUITS 21, 23, 25 DISCONNECT AND DEMOLISH EXISTING CONDUCTORS FOR THE COMPRESSOR. RELABEL AS SPARE.

LEGEND:

GFCI DENOTES GFCI PANELBOARD CURCUIT BREAKER.

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JASON R. NEWQUIST — STATE OF WASHINGTON — 45311 — REGISTERED PROFESSIONAL ENGINEER — 2/23/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
AREAS 01/05 - PANELBOARDS [01 PB 01] AND [05 PB 01] SCHEDULES

SHEET: E-10
OF: 28
JOB NO.: 13224.02
DWG: E_PB

PANELBOARD [04 PB 01] SCHEDULE

CKT. NO.	DIRECTORY	PHASE A VA	PHASE A A	PHASE B VA	PHASE B A	PHASE C VA	PHASE C A	LOAD TYPE	BKR AMPS	BUS	BKR AMPS	LOAD TYPE	PHASE A VA	PHASE A A	PHASE B VA	PHASE B A	PHASE C VA	PHASE C A	DIRECTORY	CKT. NO.
1	[04 WT 01], HOT WATER HEATER	3,000	10.8					Z	3/20	A	1/20	L	–	–					FILTER ROOM LIGHTS	2
3	[04 WT 01], HOT WATER HEATER			3,000	10.8			Z	|	B	3/30	H			–	–			HEATER	4
5	[04 WT 01], HOT WATER HEATER					3,000	10.8	Z	|	C	|	H					–	–	HEATER	6
7	COVERED SPACE	–	–					Z	---	A	|	H	–	–					HEATER	8
9	COVERED SPACE			–	–			Z	---	B	---	Z			–	–			COVERED SPACE	10
11	COVERED SPACE					–	–	Z	---	C	---	Z					–	–	COVERED SPACE	12
13	COVERED SPACE	–	–					Z	---	A	---	Z	–	–					COVERED SPACE	14
15	COVERED SPACE			–	–			Z	---	B	---	Z			–	–			COVERED SPACE	16
17	COVERED SPACE					–	–	Z	---	C	---	Z					–	–	COVERED SPACE	18
19	COVERED SPACE	–	–					Z	---	A	---	Z	–	–					COVERED SPACE	20
21	COVERED SPACE			–	–			Z	---	B	---	Z			–	–			COVERED SPACE	22
23	COVERED SPACE					–	–	Z	---	C	---	Z					–	–	COVERED SPACE	24
25	COVERED SPACE	–	–					Z	---	A	---	Z	–	–					COVERED SPACE	26
27	COVERED SPACE			–	–			Z	---	B	---	Z			–	–			COVERED SPACE	28
29	COVERED SPACE					–	–	Z	---	C	---	Z					–	–	COVERED SPACE	30
31	COVERED SPACE	–	–					Z	---	A	---	Z	–	–					COVERED SPACE	32
33	COVERED SPACE			–	–			Z	---	B	---	Z			–	–			COVERED SPACE	34
35	COVERED SPACE					–	–	Z	---	C	---	Z					–	–	COVERED SPACE	36
37	COVERED SPACE	–	–					Z	---	A	3/100	Z	–	–					TRANSFORMER FEEDER BREAKER	38
39	COVERED SPACE			–	–			Z	---	B	|	Z			–	–			TRANSFORMER FEEDER BREAKER	40
41	COVERED SPACE					–	–	Z	---	C	|	Z					–	–	TRANSFORMER FEEDER BREAKER	42
	SUM OF PHASE VA, AMPS	3,000	10.8	3,000	10.8	3,000	10.8						0	0.0	0	0.0	0	0.0	**SUM OF PHASE VA, AMPS**	

[04 PB 01] ELECTRICAL AND CONSTRUCTION SPECIFICATIONS:

CONFIGURATION:	480/277 VAC, 3 PH, 60 Hz
POWER BUS:	225 A, COPPER
NEUTRAL BUS:	225 A (100% OF POWER BUS), ISOLATED FROM GROUND, SOLDERLESS CONNECTIONS
MAIN BREAKER:	MAIN LUGS ONLY (NO MAIN BREAKER)
DISTRIBUTION BREAKERS:	BOLT-ON, MOLDED CASE
GROUND BONDING:	GROUND AND NEUTRAL SEPARATED
ENCLOSURE:	NEMA 12
NUMBER OF CIRCUITS:	42

NOTES:

1. THE CONTRACTOR SHALL PROVIDE AN UPDATED, TYPED PANELBOARD SCHEDULE.
2. VA LOADS OF EXISTING CIRCUITS ARE NOT KNOWN. ONLY NEW LOADING VALUES ARE PROVIDED.

PANELBOARD [04 PB 02] SCHEDULE

CKT. NO.	DIRECTORY	PHASE A VA	PHASE A A	PHASE B VA	PHASE B A	PHASE C VA	PHASE C A	LOAD TYPE	BKR AMPS	BUS	BKR AMPS	LOAD TYPE	PHASE A VA	PHASE A A	PHASE B VA	PHASE B A	PHASE C VA	PHASE C A	DIRECTORY	CKT. NO.
1	OFFICE QUAD PLUGS	–	–					R	1/20	A	3/20	Z	–	–					NORTH BUILDING SUB-FEED	2
3	COVERED SPACE (HIGH LEG DO NOT USE)			–	–			Z	1/0	B	|	Z			–	–			NORTH BUILDING SUB-FEED	4
5	OFFICE QUAD PLUGS					–	–	R	1/20	C	|	Z					–	–	NORTH BUILDING SUB-FEED	6
7	EXHAUST FAN/ REFRIDGERATOR	–	–					Z	1/20	A	3/20	Z	–	–					SPARE BREAKER (OFF)	8
9	COVERED SPACE (HIGH LEG DO NOT USE)			–	–			Z	1/0	B	|	Z			–	–			SPARE BREAKER (OFF)	10
11	WATER HEATER					–	–	Z	1/20	C	|	Z					–	–	SPARE BREAKER (OFF)	12
13	OFFICE COMPUTER PLUGS	–	–					R	1/20	A	3/20	Z	–	–					SPARE BREAKER (OFF)	14
15	COVERED SPACE (HIGH LEG DO NOT USE)			–	–			Z	1/0	B	|	Z			–	–			SPARE BREAKER (OFF)	16
17	EAST WALL SHOP PLUGS					–	–	R	1/20	C	|	Z					–	–	SPARE BREAKER (OFF)	18
19	SOUTH WALL SHOP PLUGS	–	–					R	1/20	A	2/20	H	–	–					OFFICE HEATER	20
21	COVERED SPACE (HIGH LEG DO NOT USE)			–	–			Z	1/0	B	|	H			–	–			OFFICE HEATER	22
23	[04 CP 01], CONTROL PANEL, SOUTH WELL FIELD AND BOOSTER STATION					500	4.2	Z	1/20	C	1/20	M					667	5.8	[04 EF 01], EXHAUST FAN, CHEMICAL ROOM VIA [04 TMR 01], TIMER, CHEMICAL ROOM EXHAUST FAN	24
25	[04 CP 01], CONTROL PANEL, SOUTH WELL FIELD AND BOOSTER STATION	1,000	8.3					Z	1/20	A	1/20	Z	180	1.5					[04 DREC 01], DEDICATED RECEPTACLE, FERRIC CHLORIDE METERING PUMP NO. 1 GFCI	26
27	COVERED SPACE (HIGH LEG DO NOT USE)			–	–			Z	1/0	B	1/0	Z			–	–			COVERED SPACE (HIGH LEG DO NOT USE)	28
29	[04 CP 02], CONTROL PANEL, CARBON FILTER SKID					1,000	8.3	Z	1/20	C	1/20	Z					180	1.5	[04 DREC 02], DEDICATED RECEPTACLE, FERRIC CHLORIDE METERING PUMP NO. 2 GFCI	30
31	COVERED SPACE	–	–					Z	---	A	1/20	Z	180	1.5					[04 DREC 03], DEDICATED RECEPTACLE, POTASSIUM PERMANGANATE METERING PUMP AND TANK AND SOLENOID [04 SV 01] GFCI	32
33	COVERED SPACE (HIGH LEG DO NOT USE)			–	–			Z	1/0	B	---	Z			–	–			COVERED SPACE	34
35	COVERED SPACE					–	–	Z	---	C	---	Z					–	–	COVERED SPACE	36
37	COVERED SPACE	–	–					Z	---	A	---	Z	–	–					COVERED SPACE	38
39	COVERED SPACE (HIGH LEG DO NOT USE)			–	–			Z	1/0	B	---	Z			–	–			COVERED SPACE	40
41	COVERED SPACE					–	–	Z	---	C	---	Z					–	–	COVERED SPACE	42
	SUM OF PHASE VA, AMPS	1,000	8.3	0	0.0	1,500	12.5						360	3.0	0	0.0	847	7.3	**SUM OF PHASE VA, AMPS**	

[04 PB 02] ELECTRICAL AND CONSTRUCTION SPECIFICATIONS:

CONFIGURATION:	240/120 VAC, 3 PH, 60 Hz
POWER BUS:	225 A, COPPER
NEUTRAL BUS:	225 A (100% OF POWER BUS), ISOLATED FROM GROUND, SOLDERLESS CONNECTIONS
MAIN BREAKER:	200 AT, 200 AF, 3 PH, 3 P, 22 kAIC, MOLDED CASE, VERTICAL MOUNTING
DISTRIBUTION BREAKERS:	BOLT-ON, MOLDED CASE
GROUND BONDING:	SUITABLE FOR SERVICE ENTRY
ENCLOSURE:	NEMA 1
NUMBER OF CIRCUITS:	42

NOTES:

1. THE CONTRACTOR SHALL PROVIDE AN UPDATED, TYPED PANELBOARD SCHEDULE.
2. VA LOADS OF EXISTING CIRCUITS ARE NOT KNOWN. ONLY NEW LOADING VALUES ARE PROVIDED.

LEGEND:

GFCI DENOTES GFCI PANELBOARD CURCUIT BREAKER.

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

DATE: FEB 2016
SCALE: NOTED
DRAWN: TMR
CHECKED: PAM
APPROVED: JRN

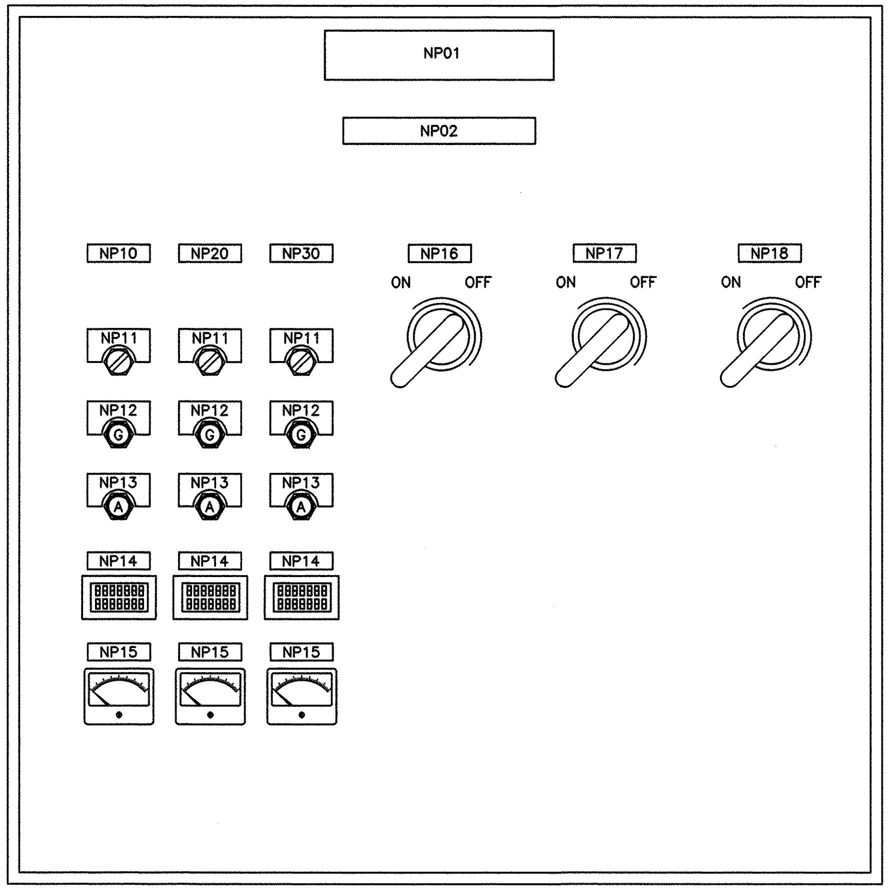
No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER — 21613 — 9/13/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
AREA 04 - PANELBOARDS [04 PB 02-03] SCHEDULES

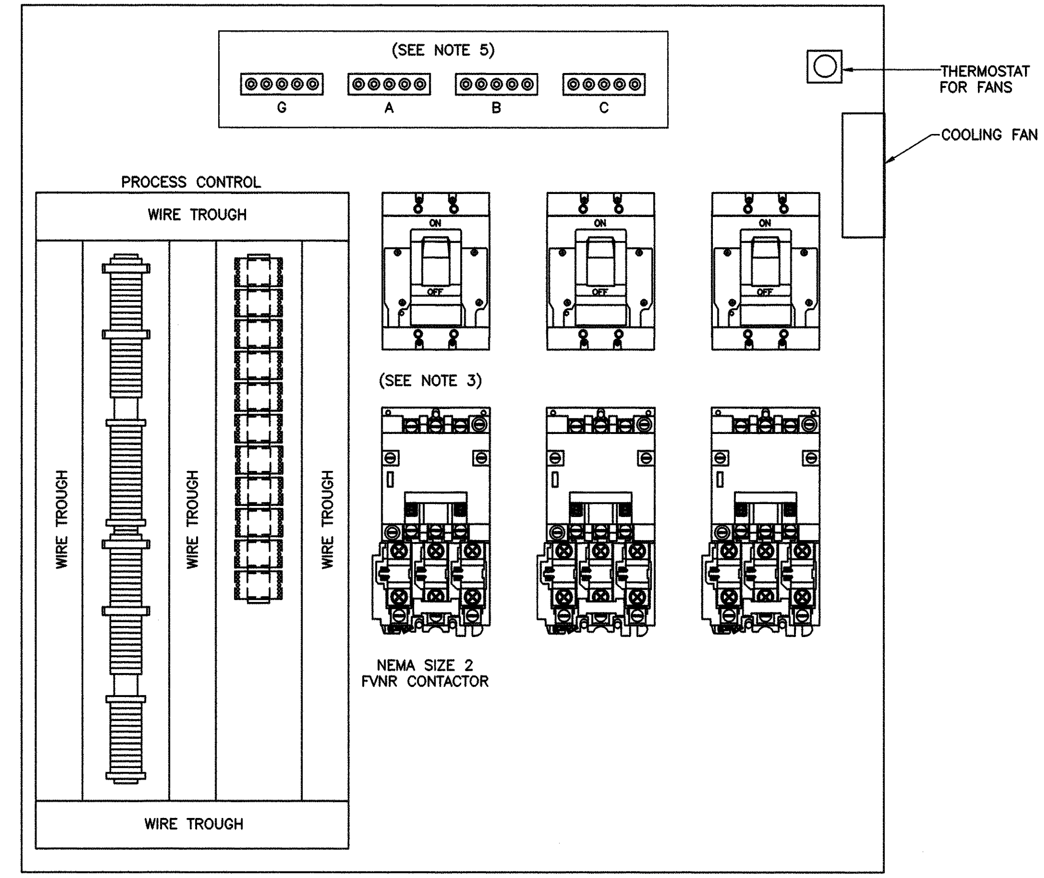
SHEET: E-11
OF: 28

JOB NO.: 13224.02
DWG: E_PB



PANEL DOOR NAMEPLATE SCHEDULE	
ITEM NUMBER	NAMEPLATE ENGRAVING
NP01	NORTH BEACH WATER DISTRICT WIEGARDT WELLFIELD MOTOR STARTER PANEL [01 MSP 01]
NP02	CAUTION 480 V, 3PH POWER
NP10	WELL NO. 1
NP20	WELL NO. 2
NP30	WELL NO. 3
NP11	HAND – OFF – AUTO
NP12	MOTOR RUNNING (PILOT, GREEN)
NP13	OVERLOAD (PILOT, AMBER)
NP14	ELAPSED TIME/COUNTER METER
NP15	AMPS
NP16	WELL NO. 1, DISCONNECT BREAKER
NP17	WELL NO. 2, DISCONNECT BREAKER
NP18	WELL NO. 3, DISCONNECT BREAKER

1 / –
MOTOR STARTER PANEL [01 MSP 01] EXTERIOR ELEVATION
NOT TO SCALE



NOTES:

1. THE COMPONENT LAYOUT IS NOT INTENDED TO REPRESENT EXACT COMPONENT PLACEMENT BUT TO INDICATE GROUPING AND GENERAL LOCATIONS.
2. CONDUITS ENTERING THE PANEL ARE NOT SHOWN ON THIS SHEET.
3. ALL BREAKERS SHALL BE PROVIDED WITH LOCKABLE HANDLES IN BOTH THE OPEN AND CLOSED POSITIONS.
4. PHYSICALLY SEPARATE 120 VAC MOTOR STARTER LOGIC FROM 480 V STARTER POWER AS MUCH AS IS PRACTICAL.
5. PROVIDE CLEAR PLASTIC COVER OVER DISTRIBUTION BLOCKS.

2 / –
MOTOR STARTER PANEL [01 MSP 01] INTERIOR ELEVATION
NOT TO SCALE

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

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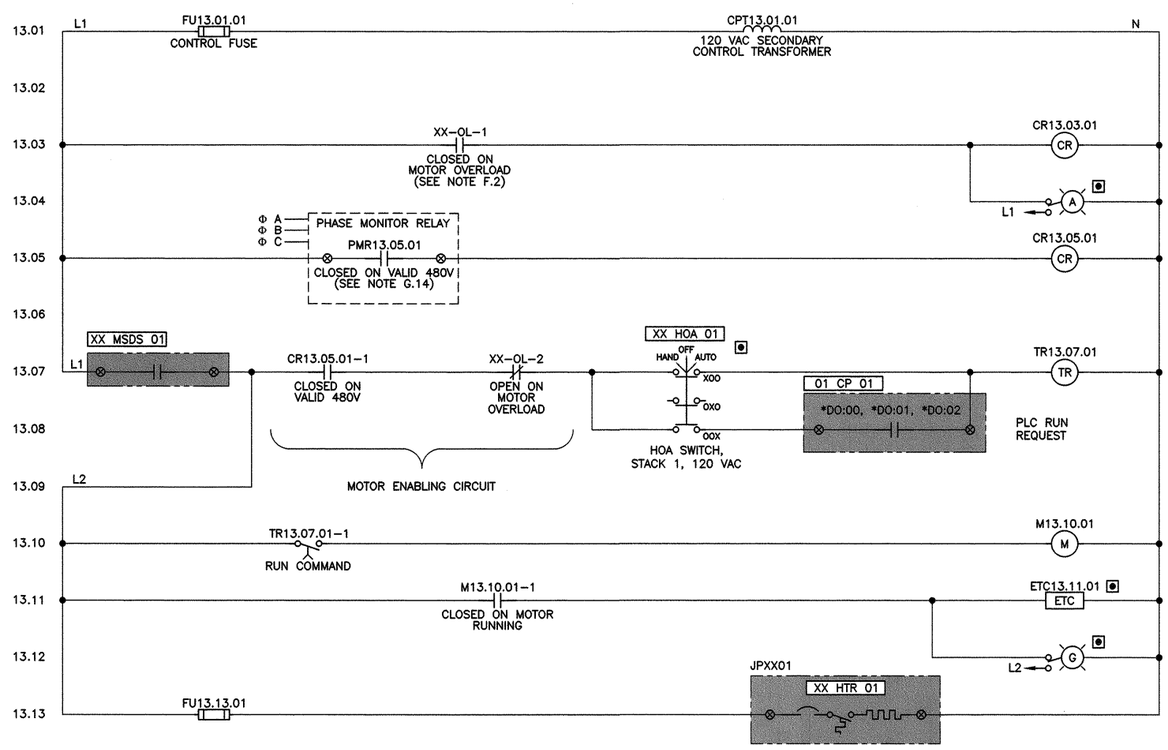
DATE: FEB 2016
SCALE: NOTED
DRAWN: TMR
CHECKED: PAM
APPROVED: JRN

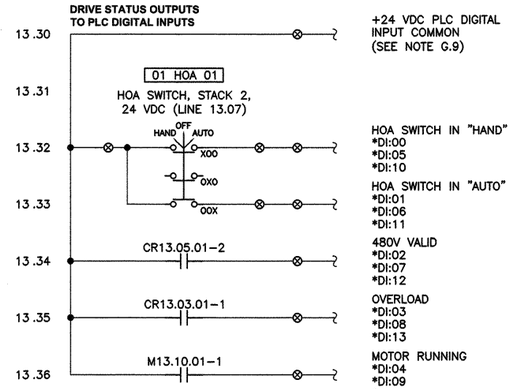
No.	REVISION	DATE	APPD

JASON R. NEWQUIST, STATE OF WASHINGTON, PROFESSIONAL ENGINEER
2/23/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT PROJECT REBID
AREA 01 - MOTOR STARTER PANEL [01 MSP 01] ELEVATIONS

SHEET: E-12
OF: 28
JOB NO.: 13224.02
DWG: E_CPEL





NOTES:

1. REFERENCE MOTOR STARTER NOTES ON THIS SHEET WHERE:

   G.n = GENERAL NOTES,
   F.n = FVNR/FVR NOTES,

2. OUTDOOR CONTROL J–BOX JPXX02 SHALL BE PROVIDED WITH PANEL HEATER [XX HTR 01] POWERED BY THE MOTOR STARTER.

SHADED DEVICES ON THIS SHEET ARE REMOTE FROM [01 MSP 01].

TIMER TABLE

AREA	TIMER	FUNCTION	TYPE	MINIMUM RANGE	INITIAL SETTING
01	TR13.07.01	START DELAY	TDAE	0–100 SECONDS	1 SECOND
02	TR13.07.01	START DELAY	TDAE	0–100 SECONDS	2 SECONDS
03	TR13.07.01	START DELAY	TDAE	0–100 SECONDS	3 SECONDS

MOTOR STARTER REFERENCE TABLE

XX	TAG	DESCRIPTION
01	[01 MS 01]	AREA 01 – MOTOR STARTER, WELL NO. 1
02	[02 MS 01]	AREA 02 – MOTOR STARTER, WELL NO. 2
03	[03 MS 01]	AREA 03 – MOTOR STARTER, WELL NO. 3

1/– MOTOR STARTER [XX MS 01] ELEMENTARY WIRING DIAGRAM

SUBMERSIBLE WELL PUMP/FVNR
XX = 01 FOR AREA 01, WELL NO. 1
XX = 02 FOR AREA 02, WELL NO. 2
XX = 03 FOR AREA 03, WELL NO. 3

MOTOR STARTER GENERAL NOTES:

G.1. REFERENCE SPECIFICATIONS 16420 AND 16940.

G.2. METAL OXIDE VARISTORS SHALL PARALLEL EACH 120 VAC CONTROL RELAY AND TIMER COIL.

G.3. ALL PILOT LIGHTS SHALL BE PUSH–TO–TEST LED STYLE.

"MOTOR RUNNING" STATUS = GREEN
ANY FAULT OR ALARM = AMBER

G.4. SET THE MOTOR OVERTEMP TIMER DELAY ACCORDING TO MOTOR MANUFACTURER'S RECOMMENDATIONS. MINIMUM = 1 SECOND.

G.5. PROVIDE AN ELECTRO–MECHANICAL ELAPSED TIME METER AND MOTOR START COUNTER ON A SINGLE METER.

G.6. SIZE STARTER CONTROL TRANSFORMERS TO HANDLE ALL DRIVE/STARTER CONTROL DEVICES AS PER REFERENCED ELEMENTARY WIRING DIAGRAMS PLUS 25%. UPSIZE FOR REMOTE PANEL HEATERS, PILOT LIGHTS, SOLENOID VALVES, INTRINSICALLY SAFE BARRIERS, COOLING FANS, AND ETC. WHERE APPLICABLE.

G.7. "RUN COMMAND" TIMERS PREVENT IMMEDIATE MOTOR STARTING ON RE–APPLICATION OF POWER AND STAGGER THE STARTING OF MOTORS WITHIN A GROUP. THIS FUNCTION SHALL NOT BE REPLACED WITH PLC LOGIC.

G.9. DRIVE MANUFACTURER SHALL PROVIDE INDEPENDENT DRY CONTACTS CONNECTED TO A CONTROL OUTPUT TERMINAL STRIP WITH A COMMON CONNECTION AS SHOWN.

G.10. FRONT PANEL DIAL–TYPE AMMETERS SHALL BE PROVIDED FOR STARTERS.

G.11. MCC MANUFACTURER SHALL SIZE MOTOR STARTER/DRIVE BREAKERS AND OVERLOAD PROTECTION SETTINGS BASED ON NEC AND MOTOR MANUFACTURER'S REQUIREMENTS.

G.12. MOTOR STARTER BREAKERS SHALL BE MAGNETIC ONLY EXCEPT FOR STARTERS [01 MS 01], [02 MS 01] AND [03 MS 01] WHICH SHALL BE THERMAL MAGNETIC.

G.13. MOTOR STARTER BREAKERS SHALL INCLUDE AN AUXILIARY CONTACT THAT OPENS WHEN THE BREAKER IS TRIPPED OR MANUALLY OPENED.

G.14. THE STARTER MANUFACTURER SHALL PROVIDE, INSTALL AND TEST INDEPENDENT PHASE LOSS RELAYS FOR EACH STARTER THAT OPEN ON PHASE LOSS, PHASE REVERSAL, PHASE IMBALANCE, AND UNDER/OVER VOLTAGE CONDITIONS.

FVNR SPECIFIC NOTES, NOT NETWORKED, BI-METALLIC OVERLOAD:

F.1. STARTER MAIN CONTACTORS SHALL BE NEMA RATED (NEMA 1 MINIMUM).

F.2. THERMAL OVERLOADS SHALL BE SET BY THE MOTOR STARTER MANUFACTURER BASED ON MOTOR NAMEPLATE DATA.

F.3. THE OVERLOAD DEVICE SHALL INCLUDE ONE N.C. DRY CONTACT (FORM B) AND ONE N.O. DRY CONTACT (FORM A) MINIMUM.

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DATE: FEB 2016	SCALE: NOTED	DRAWN: TMR	CHECKED: PAM	APPROVED: JRN

No.	REVISION	DATE	APP'D

JASON R. NEMQUIST — STATE OF WASHINGTON — 18531 — REGISTERED PROFESSIONAL ENGINEER
2/12/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON

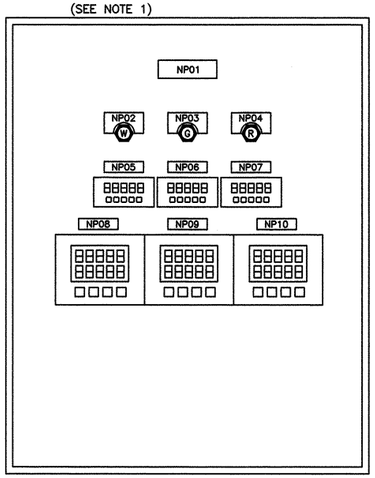
WATER SUPPLY AND TREATMENT
PROJECT REBID

AREAS 01/02/03- MOTOR STARTERS ELEMENTARY
WIRING DIAGRAM

SHEET: E-13
OF: 28

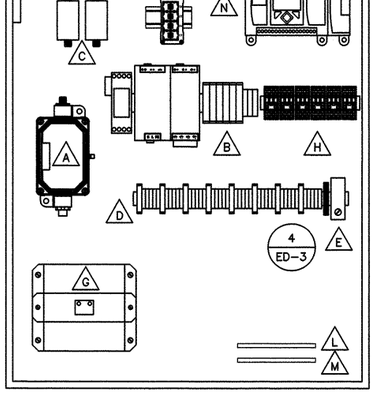
JOB NO.: 13224.02
DWG: E_MSEWD

(SEE NOTE 1)

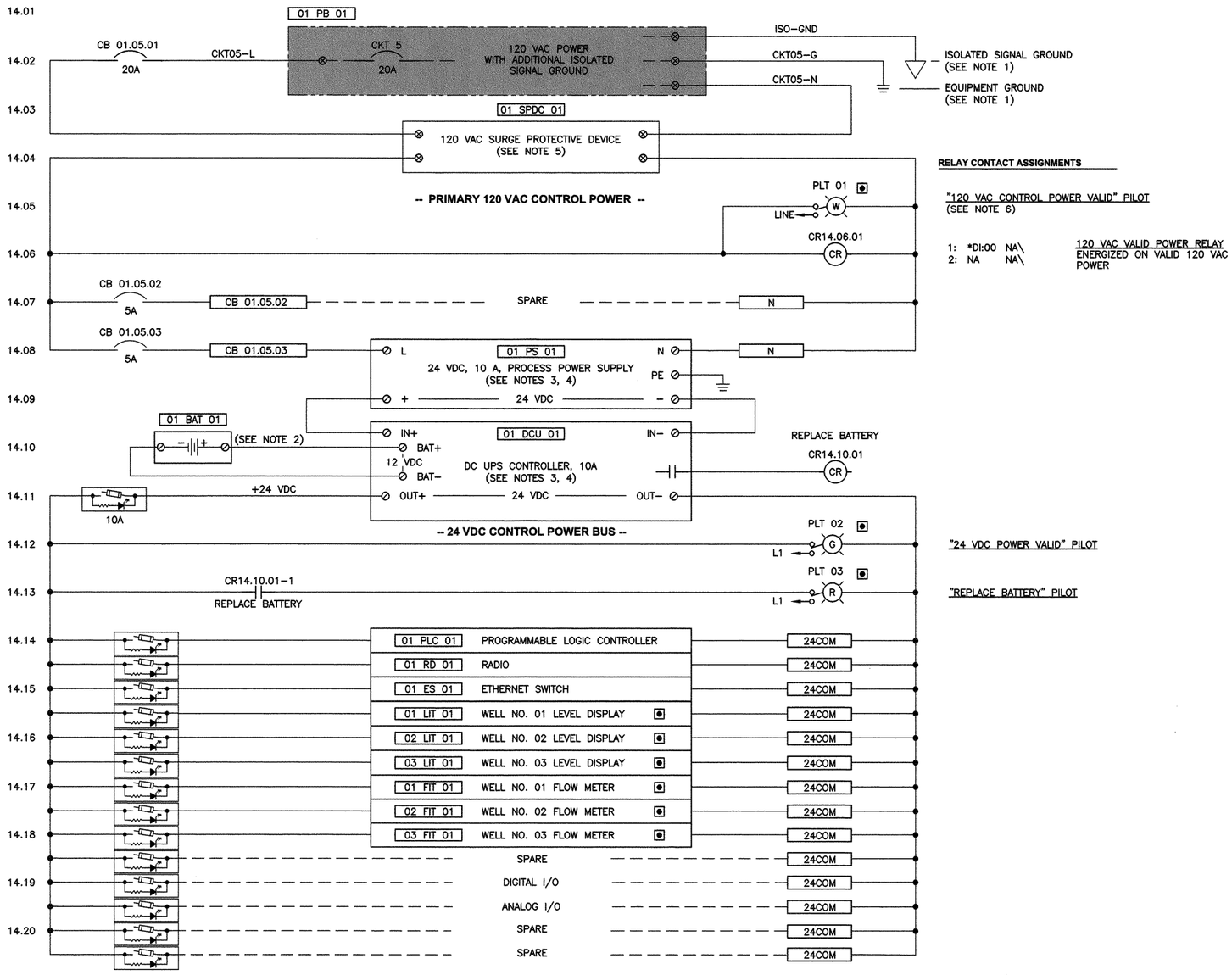


NAMEPLATE SCHEDULE	
ITEM NO.	NAMEPLATE ENGRAVING
NP01	NORTH BEACH WATER DISTRICT WIEGARDT WELLFIELD TELEMETRY PANEL [01 CP 01]
NP02	120 VAC POWER VALID (PILOT, WHITE)
NP03	24 VDC POWER VALID (PILOT, GREEN)
NP04	REPLACE BATTERY (PILOT, RED)
NP05	LEVEL INDICATOR [01 LIT 01]
NP06	LEVEL INDICATOR [02 LIT 01]
NP07	LEVEL INDICATOR [03 LIT 01]
NP08	FLOW INDICATOR/TRANSMITTER [01 FIT 01]
NP09	FLOW INDICATOR/TRANSMITTER [02 FIT 01]
NP10	FLOW INDICATOR/TRANSMITTER [03 FIT 01]

(SEE NOTE 1)



DEVICE SCHEDULE	
ITEM NO.	DEVICE OR FUNCTION
A	ETHERNET TELEMETRY RADIO
B	24 VDC POWER SUPPLY AND FUSING
C	SURGE SUPPRESSOR/ LIGHTNING ARRESTOR
D	I/O FUSING AND TERMINALS
E	HEATER AND THERMOSTAT
G	BATTERY [01 BAT 01]
H	CONTROL RELAYS
J	COOLING FAN THERMOSTAT
K	COOLING FAN
L	GROUND BUS
M	ISOLATED GROUND BUS
N	PLC [01 PLC 01]
P	ETHERNET SWITCH



NOTES:

1. CONTROL PANEL [01 CP 01] MATERIALS AND SIZE SHALL BE PER SHEET E-4.

A/- **CONTROL PANEL [01 CP 01] INTERNAL ELEVATIONS**
NOT TO SCALE

NOTES:

1. PROVIDE A DEDICATED GROUND STRIP FOR ANALOG INPUT AND OUTPUT SHIELDS. THIS GROUND IS DERIVED FROM THE GROUND BUS OF POWER PANELBOARD [01 PB 01] AND IS RUN SEPARATELY TO [01 CP 01] THROUGH A #10 AWG STRANDED COPPER CONDUCTOR WITH GREEN INSULATION. SIGNAL GROUNDS IN [01 CP 01] ARE ISOLATED FROM CHASSIS\EQUIPMENT GROUND BUT ARE AT THE SAME POTENTIAL.
2. THE INTEGRATOR SHALL CALCULATE AND SIZE THE BACK-UP BATTERY FOR 2 HOURS (MINIMUM) OF 24 VDC POWER, WITH ALL CONNECTED LOADS ACTIVE. THESE CALCULATIONS SHALL BE PRESENTED TO ENGINEERING DURING SUBMITTAL.
3. ALL POWER SUPPLIES, CONVERTERS, AND UPS DEVICES SHALL BE INDUSTRIAL, PACKAGED, MANUFACTURED, UL-LISTED, DIN-RAIL DEVICES. CUSTOM-BUILT CIRCUIT BOARDS AND LOOSE ELECTRONIC DEVICES SHALL NOT BE ALLOWED.
4. THIS 24 VDC POWER SYSTEM IS DESIGNED AROUND THE FOLLOWING DEVICES:
   a. [01 PS 01] SINGLE PHASE, 120 VAC/24 VDC, 10A, POWER SUPPLY PULS #QS10.241
   b. [01 DCU 01] 24 VDC/24 VDC, 10A, DC-UPS CONTROLLER PULS #UB10.241

   THESE UNITS MAY BE REPLACED WITH "OR EQUAL" DEVICES.
5. SURGE PROTECTIVE DEVICE IS 120 VAC, 40 kA; 1" WIDE, DIN-RAIL; INNOVATIVE TECHNOLOGY #HS-DIN-120 OR EQUIVALENT.
6. ALL PILOT LIGHTS SHALL BE PUSH-TO-TEST, LED TYPE.

SHADED DEVICES ON THIS SHEET ARE REMOTE FROM [01 CP 01].

1/- **CONTROL PANEL [01 CP 01]**
PROCESS CONTROL ELEMENTARY WIRING DIAGRAM
POWER SUPPLY AND DISTRIBUTION (SINGLE SUPPLY)

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

Gray & Osborne, Inc.
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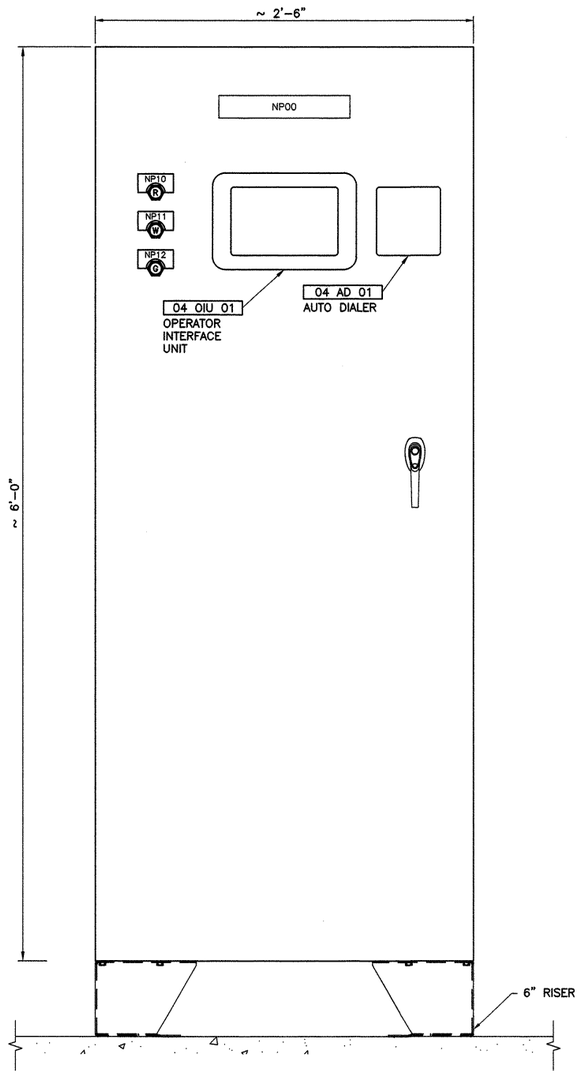
DATE: FEB 2016
SCALE: NOTED
DRAWN: TMR
CHECKED: PAM
APPROVED: JRN

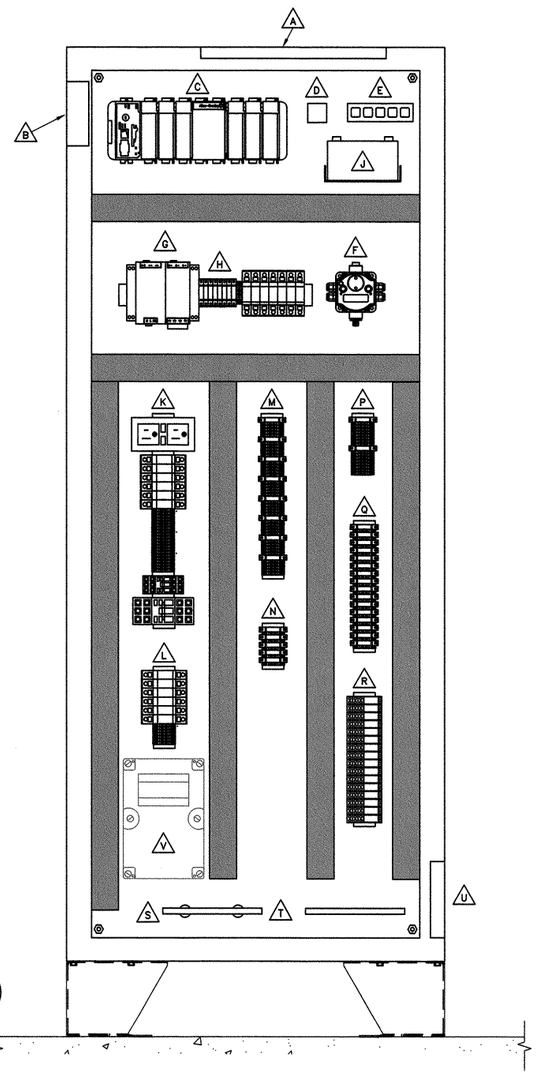
No.	REVISION	DATE	APPD

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
AREA 01 - CONTROL PANEL ELEMENTARY WIRING DIAGRAM AND DETAILS

SHEET: E-14
OF: 28
JOB NO.: 13224.02
DWG: E_CPEWD



CONTROL PANEL
[04 CP 01] EXTERIOR ELEVATION
A / –
NOT TO SCALE



CONTROL PANEL
[04 CP 01] INTERIOR ELEVATION
B / –
NOT TO SCALE

PANEL DOOR NAMEPLATE SCHEDULE		
ITEM NUMBER	TAG/DEVICE NUMBER	ITEM FUNCTION
NP00	[04 CP 01]	NORTH BEACH WATER DISTRICT SOUTH WELLFIELD CONTROL PANEL [04 CP 01]
NP10	–	PLC FAIL (PILOT, RED)
NP11	–	120 V CONTROL POWER (PILOT, WHITE)
NP12	–	24 VDC CONTROL POWER VALID (PILOT, GREEN)

CONTROL PANEL [04 CP 01] DEVICE SCHEDULE	
ITEM NUMBER	ITEM FUNCTION
A	ENCLOSURE LIGHT WITH DOOR SWITCH (NOT SHOWN)
B	ENCLOSURE EXHAUST FAN(S)
C	PLC [04 PLC 01]
D	EXHAUST FAN THERMOSTAT
E	ETHERNET SWITCH [01 ES 01]
F	RADIO
G	24VDC TELEMETRY DC POWER SUPPLY SYSTEM
H	24VDC CIRCUITS AND DISTRIBUTION
J	BATTERY [04 CP 01]
K	ANCILLARY POWER CIRCUIT BREAKERS, GFCI CONVENIENCE RECEPTACLE, RELAYS, LOUVER AND EXHAUST FAN CONTACTOR, AND TERMINALS.
L	POWER MONITORING RELAYS AND TERMINALS
M	ANALOG INPUTS FUSING AND TERMINALS
N	ANALOG OUTPUTS FUSING AND TERMINALS
P	DIGITAL INPUT FUSING AND TERMINALS
Q	DIGITAL OUTPUT FUSING AND TERMINALS
R	DIGITAL OUTPUT BUFFER RELAYS
S	ISOLATED SIGNAL GROUND BUS
T	GROUND/CHASSIS BUS
U	INLET VENT(S)
V	ULTRASONIC TRANSDUCER LEVEL INDICATOR/TRANSMITTER [04 LIT 01] (SEE NOTE 3)

NOTES:

1. REFER TO GENERAL CONTROL PANEL NOTES ON SHEET E-4.
2. DEVICE LOCATIONS ON THIS SHEET SHOW A LAYOUT INTENT AND MAY BE PLACED OTHERWISE AS REQUIRED FOR BEST FIT AND ACCESS BY THE OPERATORS.
3. [04 LIT 01] IS AN EXISTING SIEMENS HYDRORANGER 200 WHICH SHALL BE RELOCATED FROM THE ADJACENT RESERVOIR INTO THE PANEL.

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

Gray & Osborne, Inc.
CONSULTING ENGINEERS
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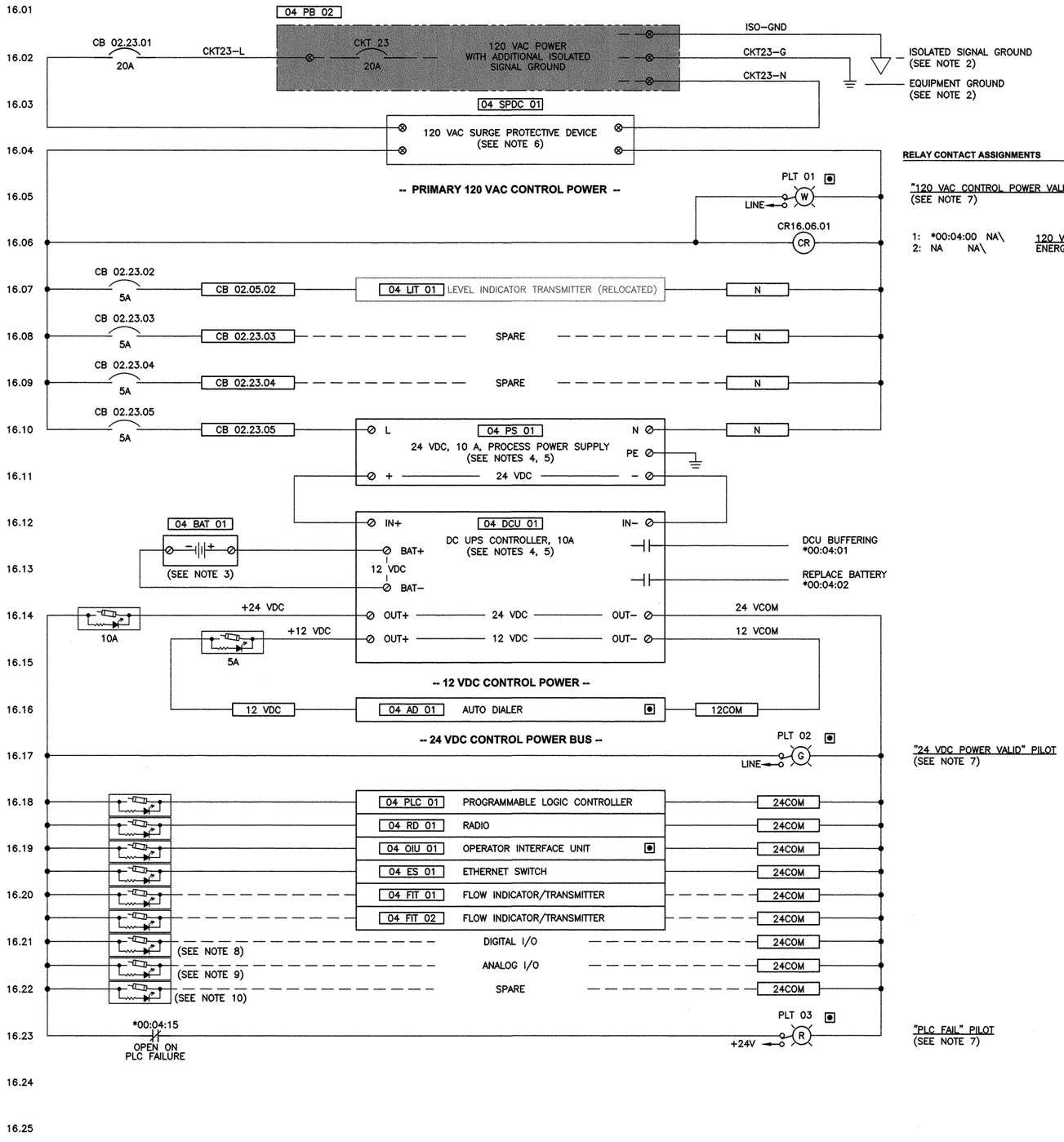
DATE: FEB 2016	SCALE: NOTED	DRAWN: TMR	CHECKED: PAM	APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEWQUIST — 45311 — REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON — 12/31/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
AREA 04 - CONTROL PANEL [04 CP 01] ELEVATIONS

SHEET: **E-15**
OF: **28**
JOB NO.: 13224.02
DWG: E_CPEL



RELAY CONTACT ASSIGNMENTS

"120 VAC CONTROL POWER VALID" PILOT
(SEE NOTE 7)

1: *00:04:00 NA\
2: NA NA\

120 VAC VALID POWER RELAY
ENERGIZED ON VALID 120 VAC POWER

NOTES:

1. REFERENCE SPECIFICATION 16940.
2. PROVIDE A DEDICATED GROUND STRIP FOR ANALOG INPUT AND OUTPUT SHIELD TERMINATIONS. THIS GROUND IS DERIVED FROM THE GROUND BUS OF POWER PANELBOARD [04 PB 01] AND IS RUN SEPARATELY TO [04 CP 01] THROUGH A #10 AWG STRANDED COPPER CONDUCTOR WITH GREEN INSULATION. SIGNAL GROUNDS IN [04 CP 01] ARE ISOLATED FROM CHASSIS\EQUIPMENT GROUND BUT ARE AT THE SAME POTENTIAL.
3. THE INTEGRATOR SHALL CALCULATE AND SIZE BACK–UP BATTERY [04 BAT 01] FOR 6 HOURS (MINIMUM) OF 24 VDC POWER, WITH ALL CONNECTED LOADS ACTIVE. THESE CALCULATIONS SHALL BE PRESENTED TO ENGINEERING DURING SUBMITTAL.
4. POWER SUPPLY, CONVERTER, AND UPS DEVICES SHALL BE INDUSTRIAL, PACKAGED, UL–LISTED, DIN–RAIL DEVICES. CUSTOM–BUILT CIRCUIT BOARDS AND LOOSE ELECTRONIC DEVICES SHALL NOT BE ALLOWED.
5. THIS 24 VDC POWER SYSTEM IS DESIGNED AROUND THE FOLLOWING DEVICES:
   a. [04 PS 01] 120 VAC – 24 VDC, 10A, POWER SUPPLY PULS #QS10.241
   b. [04 DCU 01] 24 VDC – 24/12 VDC, 10A, DC–UPS CONTROLLER PULS #UB10.245

   THESE UNITS MAY BE REPLACED WITH "OR EQUAL" DEVICES.
6. SURGE PROTECTIVE DEVICE IS 120 VAC, 40 kA; 1" WIDE, DIN–RAIL; INNOVATIVE TECHNOLOGY #HS–DIN–120 OR EQUIVALENT.
7. ALL PILOT LIGHTS SHALL BE PUSH–TO–TEST, LED TYPE.
8. FUSED DIGITAL I/O DISTRIBUTION SHOWN HERE REPRESENTS THE REQUIREMENT FOR GENERAL DIGITAL I/O POWER DISTRIBUTION. FUSE DIGITAL I/O PER SPECIFICATION 16940.
9. FUSED ANALOG I/O DISTRIBUTION SHOWN HERE REPRESENTS THE REQUIREMENT FOR GENERAL ANALOG I/O POWER DISTRIBUTION. FUSE ANALOG I/O PER SPECIFICATION 16940.
10. FUSED 24 VDC SPARE CONTROL POWER DISTRIBUTION SHOWN HERE REPRESENTS A GENERAL REQUIREMENT. PROVIDE 8 FUSED 24 VDC TERMINAL BLOCKS WITH ASSOCIATED 24 VCOM TERMINAL MOUNTED ADJACENT TO EACH FUSE.

SHADED DEVICES ON THIS SHEET ARE REMOTE FROM [04 CP 01].

CONTROL PANEL [04 CP 01]
PROCESS CONTROL ELEMENTARY WIRING DIAGRAM
1 – POWER SUPPLY AND DISTRIBUTION (SINGLE SUPPLY)

0 1" 2"
TWO INCHES AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

Gray & Osborne, Inc.
CONSULTING ENGINEERS
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OLYMPIA, WA 98502 • (360) 292–7418

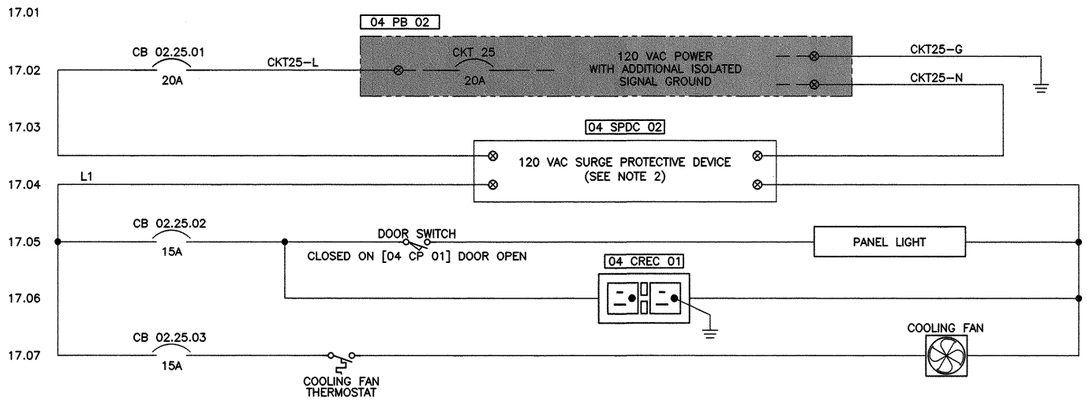
DATE: FEB 2016	SCALE: NOTED	DRAWN: TMR	CHECKED: PAM	APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — 16531 — REGISTERED PROFESSIONAL ENGINEER — 2/17/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY, WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
AREA 04 - CONTROL PANEL [04 CP 01] ELEMENTARY WIRING DIAGRAM

SHEET: E-16
OF: 28
JOB NO.: 13224.02
DWG: E_CPEWD



RELAY CONTACT ASSIGNMENTS

DOOR-ACTIVATED PANEL LIGHT FOR [04 CP 01]
(SEE NOTE 4)

GFCI CONVENIENCE RECEPTACLE FOR [04 CP 01]
(SEE NOTE 3)

COOLING FAN FOR [04 CP 01]

NOTES:

1. REFERENCE SPECIFICATION 16940.
2. SURGE PROTECTIVE DEVICE IS 120 VAC, 40 kA; 1" WIDE, DIN-RAIL; INNOVATIVE TECHNOLOGY #HS-DIN-120 OR EQUIVALENT.
3. [04 CREC 01] SHALL BE 15A, 120 VAC, GFCI, DIN-RAIL MOUNTED.
4. PROVIDE PANEL LIGHT AS 120 VAC, LED TYPE.

SHADED DEVICES ON THIS SHEET ARE REMOTE FROM [04 CP 01].

1/– CONTROL PANEL [04 CP 01] ANCILLARY CONTROL ELEMENTARY WIRING DIAGRAM

ANCILLARY CIRCUITS

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

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DATE: FEB 2016	SCALE: NOTED	DRAWN: TMR	CHECKED: PAM	APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — 45311 — REGISTERED PROFESSIONAL ENGINEER
2/3/17

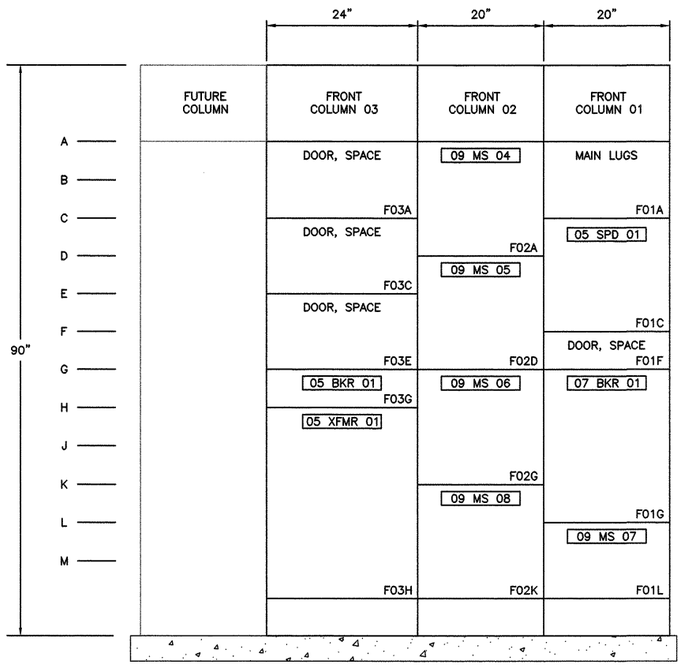
NORTH BEACH WATER DISTRICT
PACIFIC COUNTY
WASHINGTON

WATER SUPPLY AND TREATMENT
PROJECT REBID

ARAE 04 - CONTROL PANEL [04 CP 01] ELEMENTARY
WIRING DIAGRAM

SHEET: E-17
OF: 28

JOB NO.: 13224.02
DWG: E_CPEWD



1 — NOT TO SCALE

[05 MCC 01] ELEVATION

MOTOR CONTROL CENTER [05 MCC 01]	
ELECTRICAL AND CONSTRUCTION SPECIFICATION REQUIRMENTS	
BUS MATERIAL:	COPPER, TIN–PLATED (ALL BUSES)
VOLTAGE RATING:	600 VAC
CONFIGURATION:	480 VAC, 3 PH, 60 Hz, 3 W + GROUND
MAIN BUS:	600 A, HORIZONTAL, SLEEVE–WRAP INSULATED
ENTRY COLUMN VERTICAL BUS:	300 A (MINIMUM), SIZE FOR COLUMN LOAD
OTHER VERTICAL BUS:	300 A (MINIMUM), SIZE FOR COLUMN LOAD
GROUND BUS:	300 A (50% OF MAIN BUS), HORIZONTAL
BUS BRACING:	42 kAIC
WIRING:	CLASS 2B
CONTROL WIRING:	#14 AWG, MTW
MCC PHYSICALS	
STRUCTURE:	SINGLE SIDED, NEMA 1 GASKETED
SERVICE ENTRY LOCATION:	TOP, LEFT COLUMN
MCC OPTIONS	
NEUTRAL BUS:	NO
SPD:	YES; 160 kA, 3 PH, WITH STATUS LIGHTS, OCPD, AND FORM A "FAULT" CONTACT
POWER MONITOR UNIT:	NO
MAIN DISCONNECT BREAKER:	NO; MAIN LUGS ONLY
AUTOMATIC TRANSFER SWITCH:	NO

MOTOR CONTROL CENTER SCHEDULE [05 MCC 01]

SECTION	UNIT	DESCRIPTION (NAMEPLATE)	TAG ID NO.
01	A	MAIN LUGS	
01	C	SURGE PROTECTION DEVICE	05 SPD 01
01	F	BLANK UNIT DOOR	
01	G	BOOSTER STATION FEEDER BREAKER	07 BKR 01
01	L	MOTOR STARTER, WELL NO. 7	09 MS 07
02	A	MOTOR STARTER, WELL NO. 4	09 MS 04
02	D	MOTOR STARTER, WELL NO. 5	09 MS 05
02	G	MOTOR STARTER, WELL NO. 6	09 MS 06
02	K	MOTOR STARTER, WELL NO. 8	09 MS 08
03	A	BLANK UNIT DOOR	
03	C	BLANK UNIT DOOR	
03	E	BLANK UNIT DOOR	
03	G	CIRCUIT BREAKER, TRANSFORMER PRIMARY	05 BKR 01
03	H	TRANSFORMER, 45 kVA, 480 V – 208/120 3PH	05 XFMR 01

NOTES:

1. [05 MCC 01] PANEL AND STARTER LAYOUTS ARE BASED ON ROCKWELL CENTERLINE 2100 MCC DATA. IF ANOTHER MANUFACTURER IS SELECTED, THE CONTRACTOR SHALL BE RESPONSIBLE TO ASSURE THAT THE MCC OCCUPIES NO MORE THAN 84 INCHES OF WIDTH WITH 20 INCHES OF DEPTH OR LESS AND SHALL SUBMIT THE NEW DESIGN TO ENGINEERING FOR APPROVAL PRIOR TO PROCUREMENT.

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

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DATE: FEB 2016
SCALE: NOTED
DRAWN: TMR
CHECKED: PAM
APPROVED: JRN

No.	REVISION	DATE	APP'D

JASON R. NEWQUIST — STATE OF WASHINGTON — 21511 — REGISTERED PROFESSIONAL ENGINEER — 2/11/16

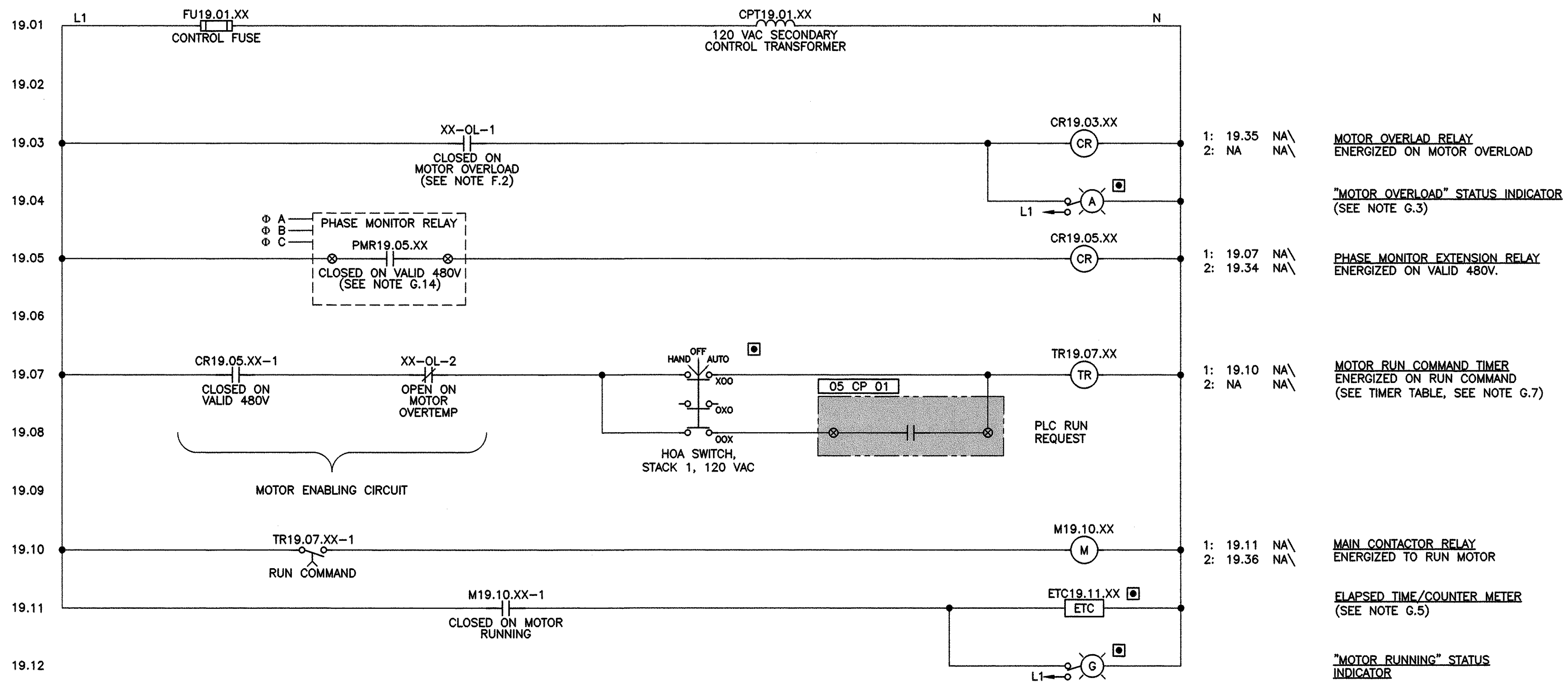
NORTH BEACH WATER DISTRICT
PACIFIC COUNTY
WASHINGTON

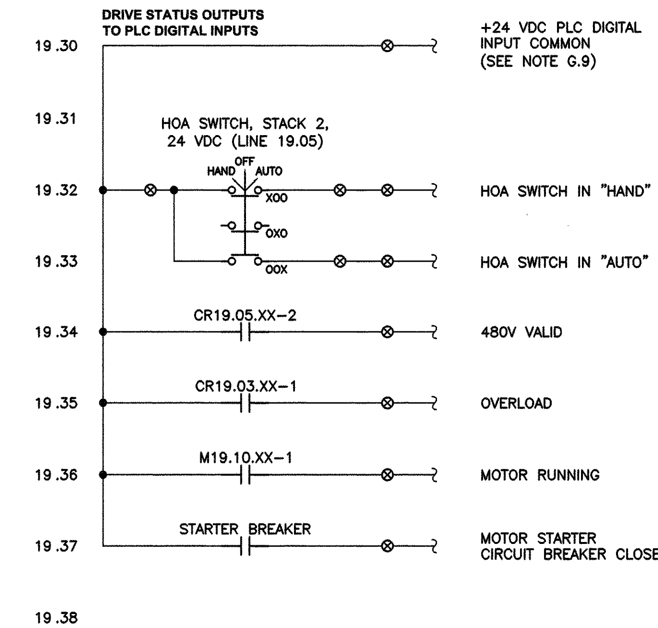
WATER SUPPLY AND TREATMENT PROJECT REBID

AREAS 05/07 - MCC ELEVATION, SPECIFICATION, AND SCHEDULE

SHEET: **E-18**
OF: **28**

JOB NO.: 13224.02
DWG: E_MCCEL





NOTES:

1. REFERENCE MOTOR STARTER NOTES ON (–/E-13) WHERE:
   G.n = GENERAL NOTES,
   F.n = FVNR/FVR NOTES,
2. EACH MOTOR STARTER SHALL HAVE THE I/O POINTS LISTED ABOVE. REFER TO (–/E-28).

19.13

MOTOR STARTER DESIGN SUMMARY					
TAG	MOTOR STARTER FOR:	TYPE	HP	FLA	AMMETER *
[09 MS 04]	WELL PUMP NO. 4	FVNR	10	14.0	0–30 A
[09 MS 05]	WELL PUMP NO. 5	FVNR	10	14.0	0–30 A
[09 MS 06]	WELL PUMP NO. 6	FVNR	7.5	11.0	0–20 A
[09 MS 07]	WELL PUMP NO. 7	FVNR	5	7.6	0–20 A
[09 MS 08]	WELL PUMP NO. 8	FVNR	7.5	11.0	0–20 A

TIMER TABLE	
TAG	DELAY
[09 MS 04]	1 SECOND
[09 MS 05]	2 SECONDS
[09 MS 06]	3 SECONDS
[09 MS 07]	4 SECONDS
[09 MS 08]	5 SECONDS

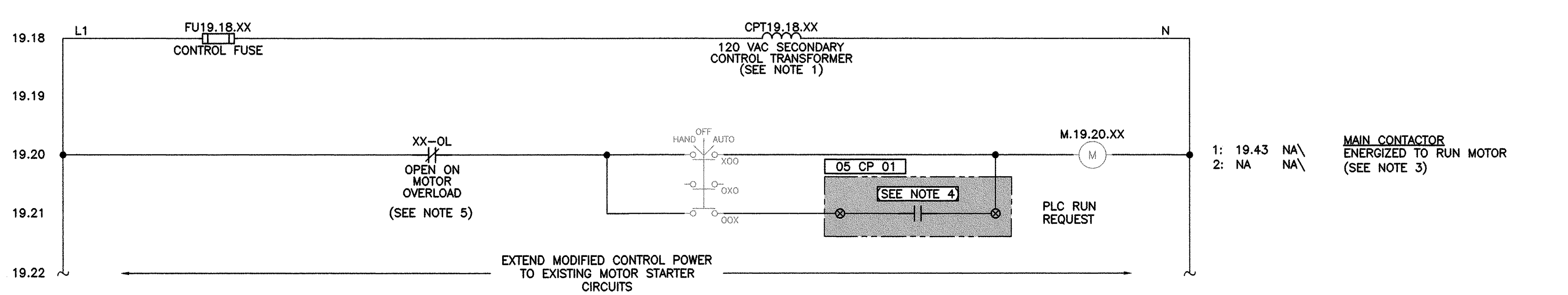
TIMER TR19.07.XX SHALL BE A START DELAY TIMER, TDAE, WITH A RANGE OF 0–60 S.

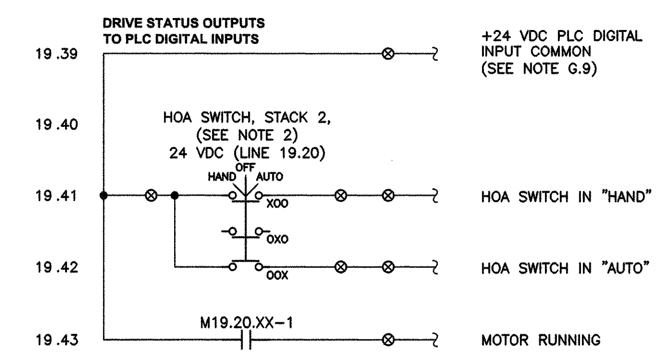
19.14
19.15
19.16

(1/–) MOTOR STARTERS NORTH WELLFIELD PUMPS ELEMENTARY WIRING DIAGRAM

SUBMERSIBLE WELL PUMP/FVNR

19.17





19.23

MOTOR STARTER DESIGN SUMMARY				
TAG	MOTOR STARTER FOR:	TYPE	HP	FLA
[07 MS 01]	BOOSTER PUMP NO. 1	FVNR	10	14.0
[07 MS 02]	BOOSTER PUMP NO. 2	FVNR	7.5	11.0
[07 MS 03]	BOOSTER PUMP NO. 3	FVNR	15	21.0
[07 MS 04]	BOOSTER PUMP NO. 4	FVNR	25	34.0
[07 MS 05]	BOOSTER PUMP NO. 5	FVNR	25	34.0

19.24
19.25

NOTES:

IN EACH OF THE CALLED EXISTING BOOSTER PUMP MOTOR STARTERS

1. INSTALL NEW CONTROL POWER TRANSFORMER TO POWER EXISTING 120 VAC CONTROLS FROM NEW 480 V 3PH POWER FEED.
2. ADD A SECOND STACK TO THE EXISTING HOA SWITCH FOR REMOTE MONITORING.
3. REUSE EXISTING FVNR CONTRACTOR, CONTACTORS HAVE BEEN VERIFIED AS SUITABLE FOR 480 V 3PH USE.
4. REMOVE ANY EXISTING AUTOMATIC START COMMAND. REWIRE SUCH THAT IN THE AUTO POSITION THE MOTOR RUNS WHEN CALLED BY THE PLC IN [05 CP 01].
5. REPLACE EXISTING MOTOR OVERLOADS IN EACH STARTER WITH NEW. REPLACEMENTS SHALL BE RESIZED FOR NEW, REDUCED MOTOR CURRENTS.

(2/–) MOTOR STARTERS NORTH WELLFIELD BOOSTER PUMPS ELEMENTARY WIRING DIAGRAM

BOOSTER PUMP/FVNR

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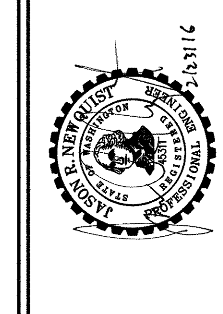
No.	REVISION	DATE	APPD

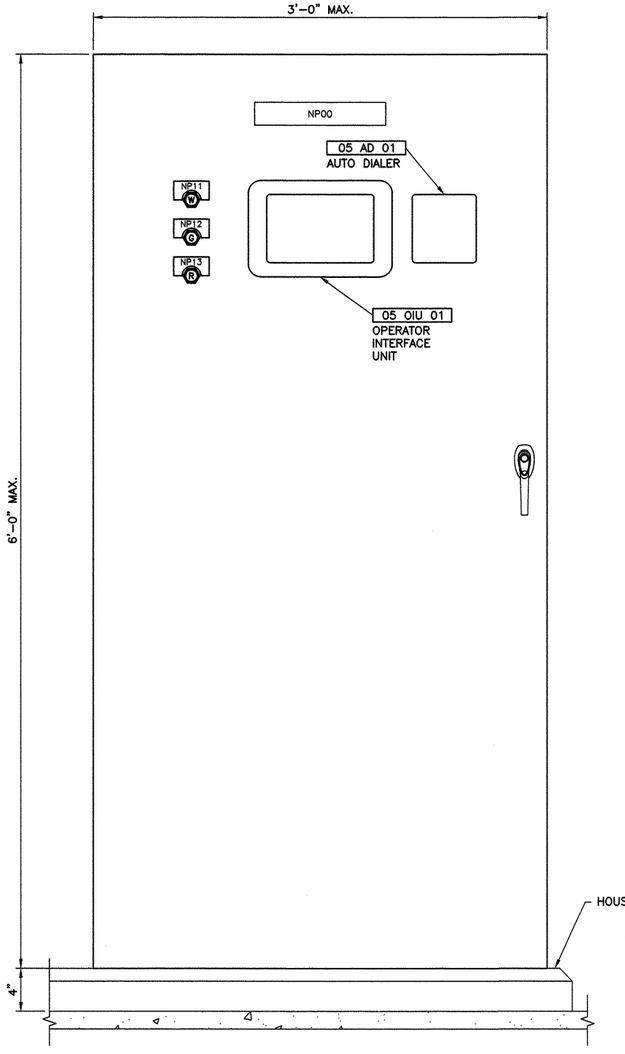


NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT PROJECT REBID
AREAS 07/09 - MOTOR STARTERS NORTH WELL FIELD AND BOOSTER PUMPS ELEMENTARY WIRING DIAGRAM

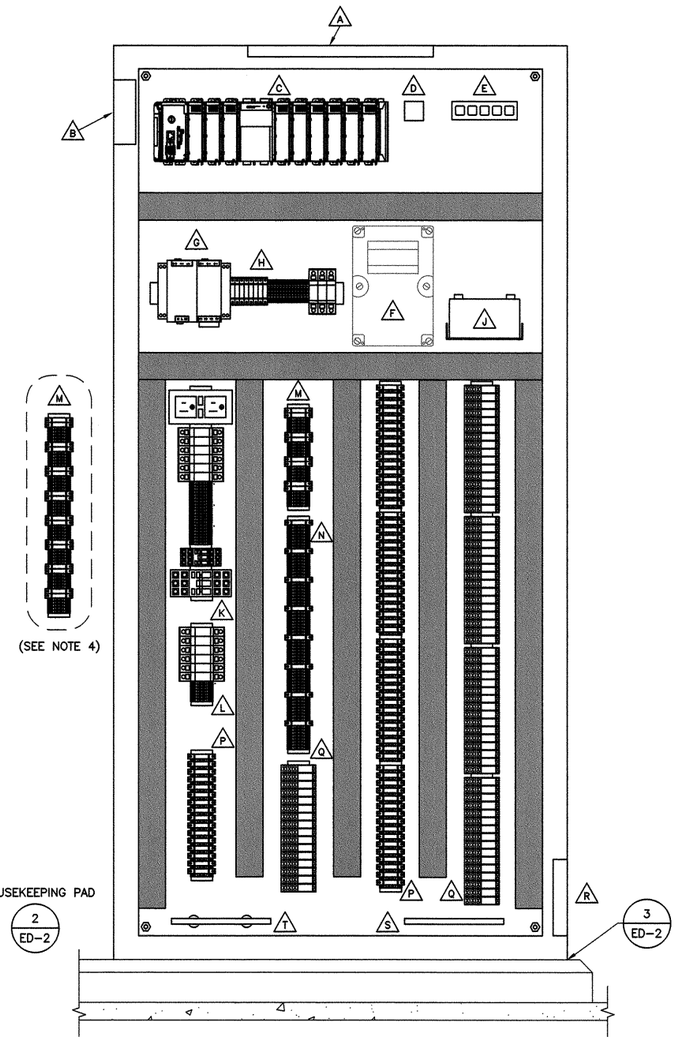
SHEET: E-19 OF: 28

JOB NO.: 13224.02
DWG: E_MSEWD

M:\North Beach WD\13224 Water Supply and Treatment\13224.02 Water Supply and Treatment\PLANSET\E-Sheets\E_MSEWD.dwg, 2/23/2016 1:59:35 PM, DWG To PDF.pc3



CONTROL PANEL
[05 CP 01] EXTERIOR ELEVATION
A / –
NOT TO SCALE



CONTROL PANEL
[05 CP 01] INTERIOR ELEVATION
B / –
NOT TO SCALE

PANEL DOOR NAMEPLATE SCHEDULE		
ITEM NUMBER	TAG/DEVICE NUMBER	ITEM FUNCTION
NP00	[05 CP 01]	NORTH WELLFIELD CONTROL PANEL [05 CP 01]
NP11	PLT 01	120 VAC VALID (PILOT, WHITE)
NP12	PLT 02	24 VDC BUS VALID (PILOT, GREEN)
NP13	PLT 03	PLC FAIL (PILOT, RED)

CONTROL PANEL [05 CP 01] DEVICE SCHEDULE	
ITEM NUMBER	ITEM FUNCTION
A	ENCLOSURE LIGHT WITH DOOR SWITCH (NOT SHOWN)
B	ENCLOSURE EXHAUST FAN(S)
C	PLC [05 PLC 01]
D	EXHAUST FAN THERMOSTAT
E	ETHERNET SWITCH [05 ES 01]
F	ULTRASONIC LEVEL INDICATOR [08 LIT 01] (SEE NOTE 3)
G	24VDC DC POWER SUPPLY SYSTEM
H	24VDC CIRCUITS AND DISTRIBUTION
J	BATTERIES
K	ANCILLARY POWER CIRCUIT BREAKERS, GFCI CONVENIENCE RECEPTACLE, RELAYS, LOUVER AND EXHAUST FAN CONTACTOR, AND TERMINALS.
L	POWER MONITORING RELAYS AND TERMINALS
M	ANALOG INPUTS FUSING AND TERMINALS
N	DIGITAL INPUT FUSING AND TERMINALS
P	DIGITAL OUTPUT FUSING AND TERMINALS
Q	DIGITAL OUTPUT BUFFER RELAYS
R	INLET VENT(S)
S	GROUND/CHASSIS BUS
T	ISOLATED SIGNAL GROUND BUS

NOTES:

1. REFER TO GENERAL CONTROL PANEL NOTES ON SHEET E-4.
2. DEVICE LOCATIONS ON THIS SHEET SHOW A LAYOUT INTENT AND MAY BE PLACED OTHERWISE AS REQUIRED FOR BEST FIT AND ACCESS BY THE OPERATORS.
3. [08 LIT 01] IS AN EXISTING SIEMENS HYDRORANGER 200 WHICH SHALL BE RELOCATED FROM THE ADJACENT RESERVOIR INTO THE PANEL.
4. USE SIDE WALLS AS NECESSARY; [05 CP 01] SHALL NOT BE MADE WIDER.

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

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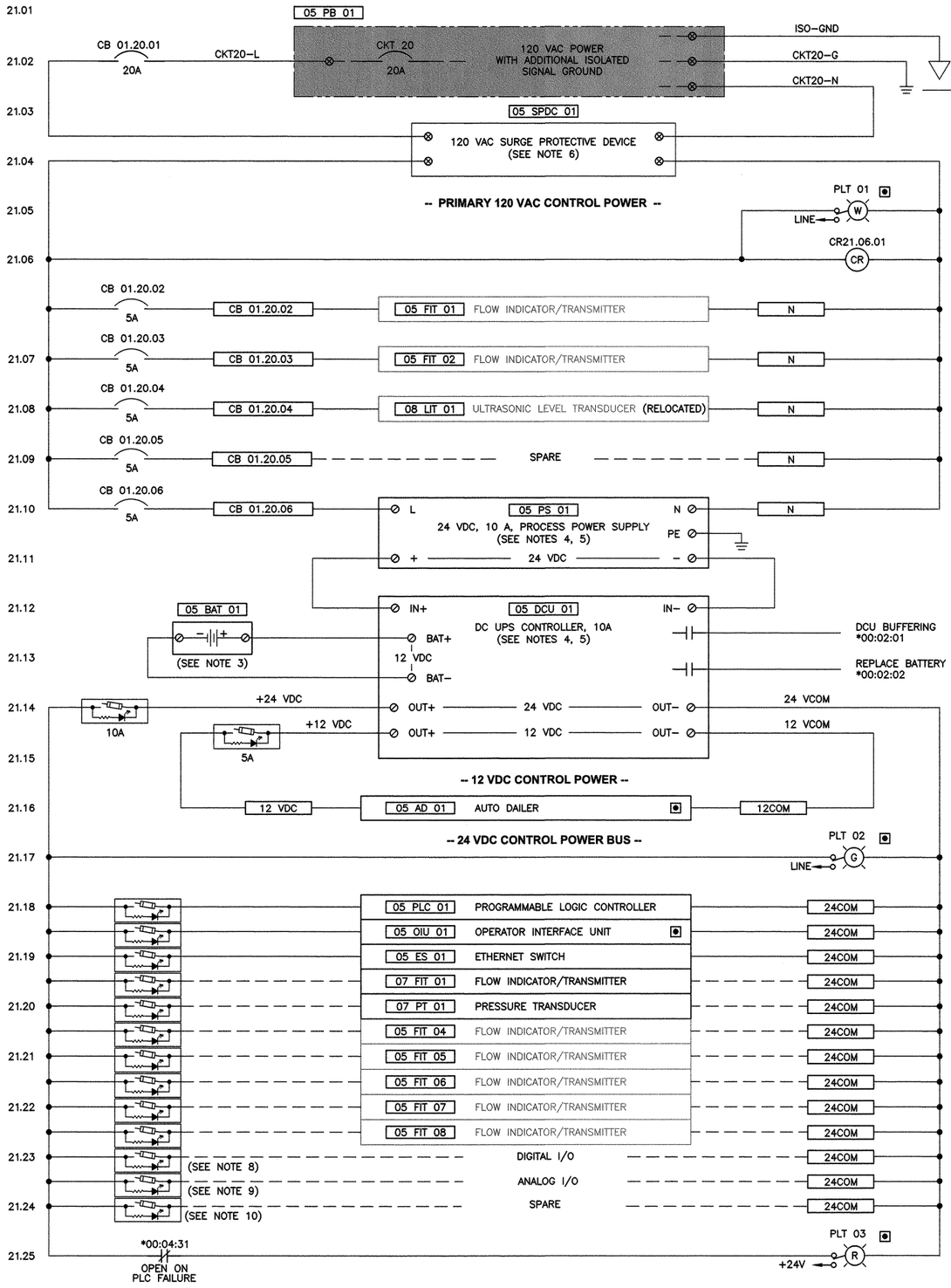
No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — 45311 — REGISTERED PROFESSIONAL ENGINEER — 9/11/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY, WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
AREA 05 - CONTROL PANEL [05 CP 01] ELEVATIONS

SHEET: E-20
OF: 28
JOB NO.: 13224.02
DWG: E_CPEL



RELAY CONTACT ASSIGNMENTS

"120 VAC CONTROL POWER VALID" PILOT
(SEE NOTE 7)

1: *00:02:00 NA\
2: NA NA\

120 VAC VALID POWER RELAY
ENERGIZED ON VALID 120 VAC POWER

NOTES:

1. REFERENCE SPECIFICATION 16940.
2. PROVIDE A DEDICATED GROUND STRIP FOR ANALOG INPUT AND OUTPUT SHIELD TERMINATIONS. THIS GROUND IS DERIVED FROM THE GROUND BUS OF POWER PANELBOARD [05 PB 01] AND IS RUN SEPARATELY TO [05 CP 01] THROUGH A #10 AWG STRANDED COPPER CONDUCTOR WITH GREEN INSULATION. SIGNAL GROUNDS IN [05 CP 01] ARE ISOLATED FROM CHASSIS\EQUIPMENT GROUND BUT ARE AT THE SAME POTENTIAL.
3. THE INTEGRATOR SHALL CALCULATE AND SIZE BACK–UP BATTERY [05 BAT 01] FOR 6 HOURS (MINIMUM) OF 24 VDC POWER, WITH ALL CONNECTED LOADS ACTIVE. THESE CALCULATIONS SHALL BE PRESENTED TO ENGINEERING DURING SUBMITTAL.
4. POWER SUPPLY, CONVERTER, AND UPS DEVICES SHALL BE INDUSTRIAL, PACKAGED, UL–LISTED, DIN–RAIL DEVICES. CUSTOM–BUILT CIRCUIT BOARDS AND LOOSE ELECTRONIC DEVICES SHALL NOT BE ALLOWED.
5. THIS 24 VDC POWER SYSTEM IS DESIGNED AROUND THE FOLLOWING DEVICES:
   a. [05 PS 01] 120 VAC – 24 VDC, 10A, POWER SUPPLY PULS #QS10.241
   b. [05 DCU 01] 24 VDC – 24/12 VDC, 10A, DC–UPS CONTROLLER PULS #UB10.245

   THESE UNITS MAY BE REPLACED WITH "OR EQUAL" DEVICES.
6. SURGE PROTECTIVE DEVICE IS 120 VAC, 40 kA; 1" WIDE, DIN–RAIL; INNOVATIVE TECHNOLOGY #HS–DIN–120 OR EQUIVALENT.
7. ALL PILOT LIGHTS SHALL BE PUSH–TO–TEST, LED TYPE.
8. FUSED DIGITAL I/O DISTRIBUTION SHOWN HERE REPRESENTS THE REQUIREMENT FOR GENERAL DIGITAL I/O POWER DISTRIBUTION. FUSE DIGITAL I/O PER SPECIFICATION 16940.
9. FUSED ANALOG I/O DISTRIBUTION SHOWN HERE REPRESENTS THE REQUIREMENT FOR GENERAL ANALOG I/O POWER DISTRIBUTION. FUSE ANALOG I/O PER SPECIFICATION 16940.
10. FUSED 24 VDC SPARE CONTROL POWER DISTRIBUTION SHOWN HERE REPRESENTS A GENERAL REQUIREMENT. PROVIDE 8 FUSED 24 VDC TERMINAL BLOCKS WITH ASSOCIATED 24VCOM TERMINAL MOUNTED ADJACENT TO EACH FUSE.

SHADED DEVICES ON THIS SHEET ARE REMOTE FROM [05 CP 01].

CONTROL PANEL [05 CP 01] PROCESS CONTROL ELEMENTARY WIRING DIAGRAM

1 / – POWER SUPPLY AND DISTRIBUTION (SINGLE SUPPLY)

0 1" 2"
TWO INCHES AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

Gray & Osborne, Inc.
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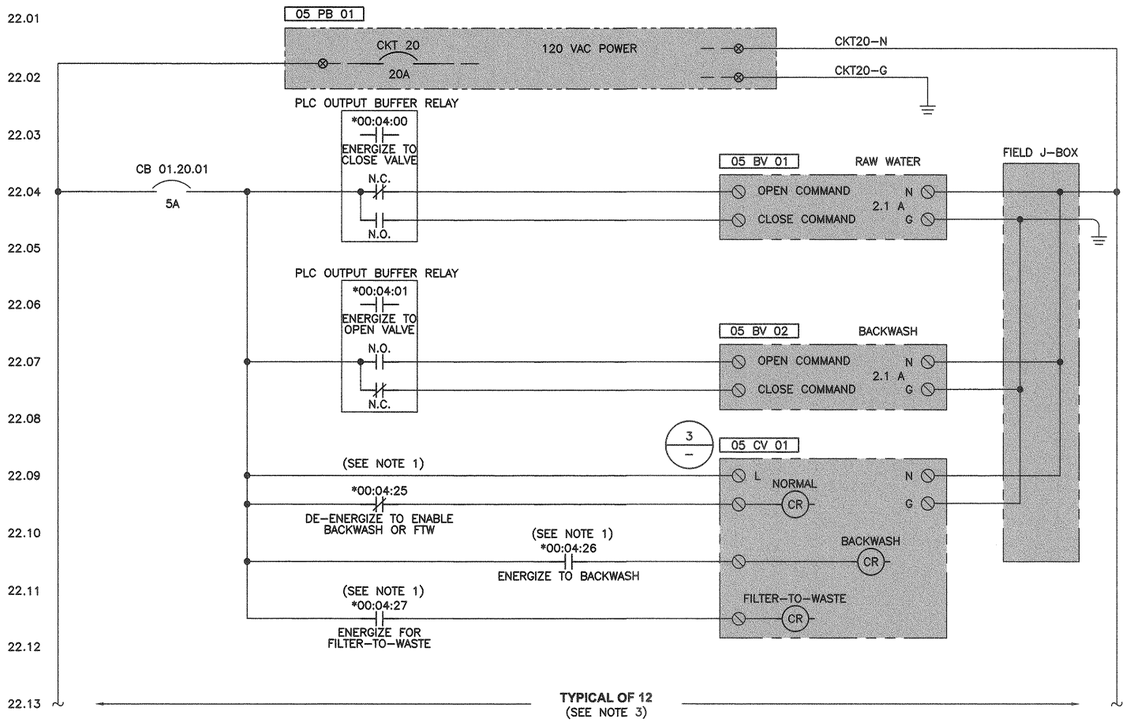
DATE: FEB 2016	SCALE: NOTED	DRAWN: TMR	CHECKED: PAM	APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEWQUIST — REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON — 19004 — 7/14/17

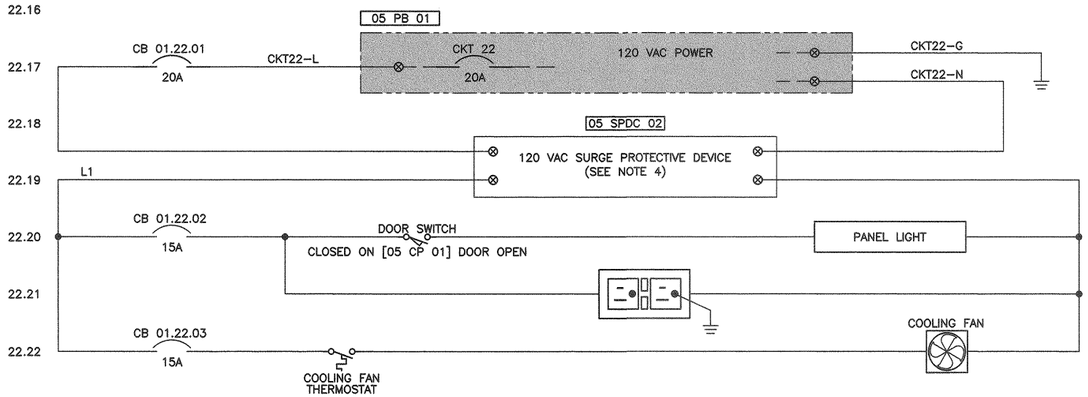
NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
AREA 05 - CONTROL PANEL [05 CP 01] ELEMENTARY WIRING DIAGRAM

SHEET: E-21
OF: 28
JOB NO.: 13224.02
DWG: E_CPEWD



1 – CONTROL PANEL [05 CP 01] FILTER TRAINS CONTROL ELEMENTARY WIRING DIAGRAM

ANCILLARY CIRCUITS



2 – CONTROL PANEL [05 CP 01] ANCILLARY CONTROL ELEMENTARY WIRING DIAGRAM

ANCILLARY CIRCUITS

NOTES:

1. REFERENCE SPECIFICATION 16940. BUFFER RELAYS SHALL BE PROVIDED ON ALL DIGITAL OUTPUTS. FOR CLARITY NOT ALL THE BUFFER RELAYS BETWEEN THE THE PLC AND THE CONTROL VALVE RELAYS ARE NOT SHOWN HERE.
2. ODD NUMBER BALL VALVES ARE FOR RAW WATER AND SHALL DEFAULT OPEN ON POWER LOSS. EVEN NUMBER BALL VALVES ARE FOR BACKWASH AND SHALL DEFAULT CLOSED ON POWER LOSS.
3. THERE ARE FOUR FILTER TRAINS EACH WITH THREE FILTERS. EACH FILTER HAS TWO BALL VALVES AND ONE CONTROL VALVE AS SHOWN HERE. ALL 18 VALVES (12 BALL, 6 CONTROL) FOR TRAINS 1 AND 2 SHALL BE POWERED FROM A SINGLE CIRCUIT (20) BROUGHT FROM THE PANELBOARD INTO THE CONTROL PANEL. TRAINS 3 AND 4 WILL BE POWERED FROM A SEPARATE CIRCUIT (22) FROM THE PANELBOARD. ONLY ONE FILTER IS BACKWASHED AT ANY TIME.
4. SURGE PROTECTIVE DEVICE IS 120 VAC, 40 kA; 1" WIDE, DIN–RAIL; INNOVATIVE TECHNOLOGY #HS–DIN–120 OR EQUIVALENT.
5. [05 CREC 01] SHALL BE 15A, 120 VAC, GFCI, DIN–RAIL MOUNTED.
6. PROVIDE PANEL LIGHT AS 120 VAC, LED TYPE.

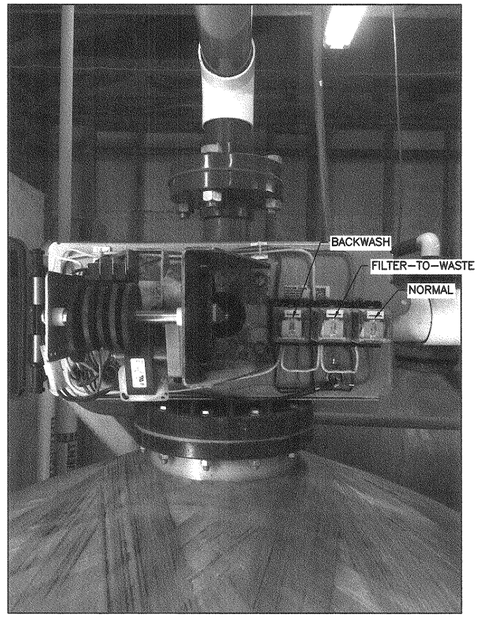
SHADED DEVICES ON THIS SHEET ARE REMOTE FROM [05 CP 01].

RELAY CONTACT ASSIGNMENTS

DOOR–ACTIVATED PANEL LIGHT FOR [05 CP 01] (SEE NOTE 6)

GFCI CONVENIENCE RECEPTACLE FOR [05 CP 01] (SEE NOTE 5)

COOLING FAN FOR [05 CP 01]



NOTES:

1. EXISTING CONTROL VALVES ARE BASED ON FLECK 3150 VALVES BUT HAVE BEEN CUSTOM WIRED SUCH THAT NO FACTORY WIRING DIAGRAMS ARE AVAILABLE. THE THREE RELAYS ARE ENERGIZED TO OPERATE THE CAM. IT IS ASSUMED THAT ENERGIZING ONE OF THE RELAYS WILL OPEN THE TWO ASSOCIATED WATER PORTS NEEDED FOR THAT FUNCTION.
2. IN NORMAL OPERATION THE ASSOCIATED RELAY ALIGNS THE CAMS SUCH THAT RAW WATER AND FINISHED WATER PORTS ARE OPEN. IN BACKWASH OPERATION THE ASSOCIATED RELAY ALIGNS THE CAMS SUCH THAT RAW WATER AND BACKWASH PORTS ARE OPEN, AND IN RINSE/FILTER TO WASTE OPERATION THE ASSOCIATED RELAY ALIGNS THE CAMS SUCH THAT RAW WATER AND FILTER TO WASTE PORTS ARE OPEN.
3. RELAYS SHOWN IN THE PHOTO ARE DUAL RATED FOR AC OR DC COIL POWER. DESIGN IS BASED ON 120 VAC COIL POWER.

3 – TYPICAL CONTROL VALVE [05 CV XX]

0 1" 2"

TWO INCHES AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

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DATE: FEB 2016
SCALE: NOTED
DRAWN: TMR
CHECKED: PAM
APPROVED: JRN

No.	REVISION	DATE	APPD

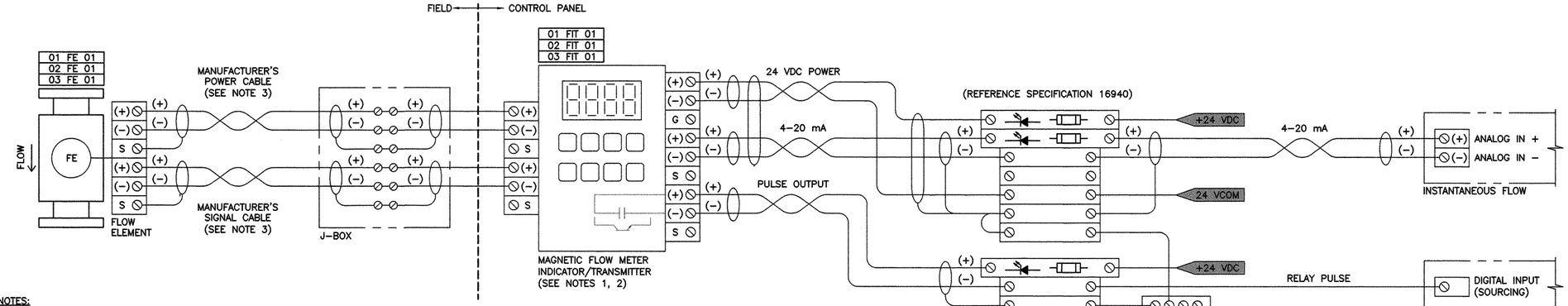
NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON

WATER SUPPLY AND TREATMENT
PROJECT REBID

AREA 05 - CONTROL PANEL [05 CP 01] ELEMENTARY WIRING DIAGRAM

SHEET: E-22
OF: 28

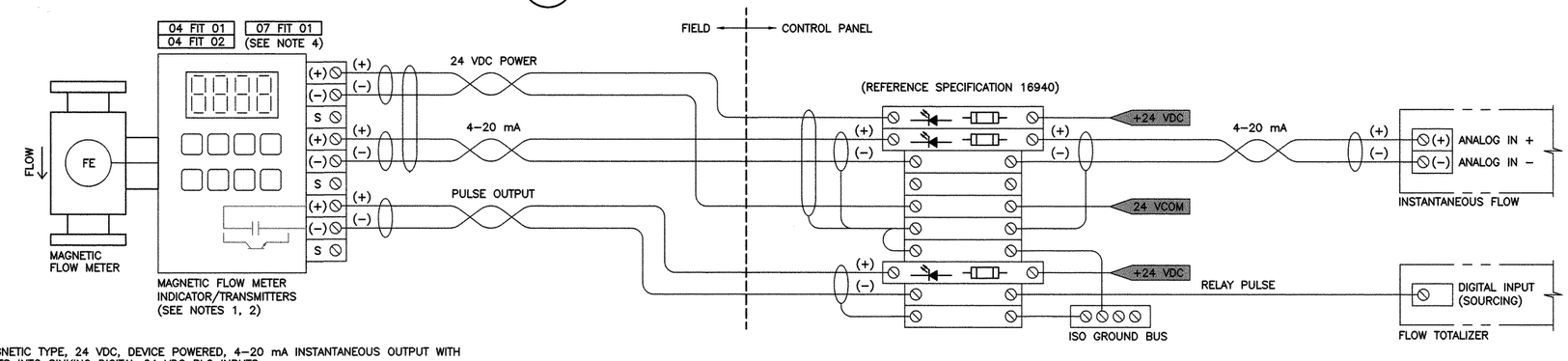
JOB NO.: 13224.02
DWG: E_CPEWD



NOTES:

1. FLOW METERS ARE MAGNETIC TYPE, 24 VDC DEVICE POWERED, WALL MOUNTED, 4–20 mA INSTANTANEOUS OUTPUT WITH PULSED DIGITAL OUTPUTS INTO SINKING DIGITAL 24 VDC PLC INPUTS.
2. FLOW INDICATOR/TRANSMITTERS ARE MOUNTED IN A REMOTE CONTROL PANEL.
3. THE CONTRACTOR SHALL CONNECT THE FLOW ELEMENTS TO THEIR ASSOCIATED INDICATOR/TRANSMITTERS USING MANUFACTURER'S RECOMMENDED CABLE(S). PROVIDE MULTIPLE INSTRUMENTATION CONDUITS BETWEEN THESE DEVICES IF REQUIRED BY THE MANUFACTURER.

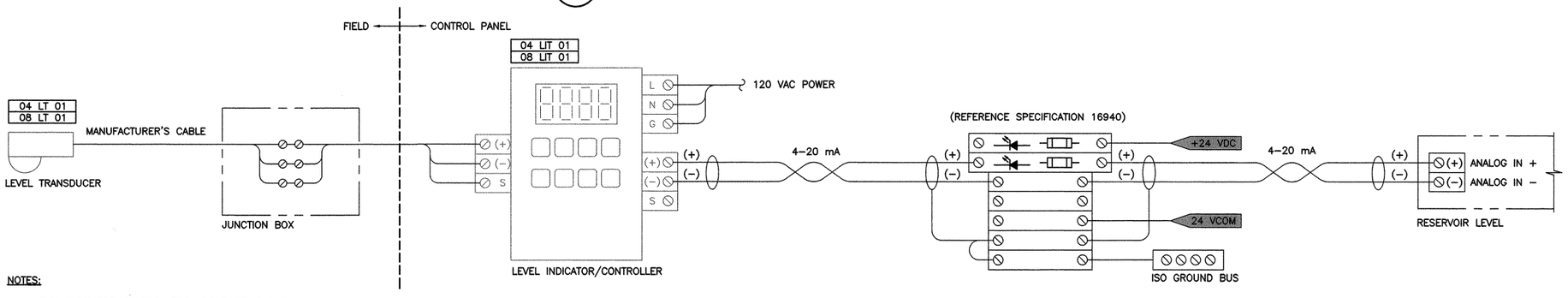
1 TYP — INSTANTANEOUS AND TOTALIZED FLOW INSTRUMENTATION CONNECTION DIAGRAM



NOTES:

1. FLOW METERS ARE MAGNETIC TYPE, 24 VDC, DEVICE POWERED, 4–20 mA INSTANTANEOUS OUTPUT WITH PULSED DIGITAL OUTPUTS INTO SINKING DIGITAL 24 VDC PLC INPUTS.
2. FLOW INDICATOR/TRANSMITTERS SHALL BE MOUNTED ON THEIR FLOW ELEMENTS.
3. FLOW METER 24 VDC POWER AND 4–20 mA INSTANTANEOUS FLOW SIGNAL SHARE A 4–CONDUCTOR TWISTED PAIR SHIELDED CABLE. REFERENCE SPECIFICATION 16120.
4. FLOW METERS [05 FIT 01] TO [05 FIT 08] ARE EXISTING. THEY SHALL BE MODIFIED TO CONNECT SIGNALS TO THE NEW CONTROL PANEL BUT WILL NOT EXACTLY MATCH THIS WIRING DIAGRAM.

2 TYP — INSTANTANEOUS AND TOTALIZED FLOW PIPE-MOUNTED, INSTRUMENTATION CONNECTION DIAGRAM



NOTES:

1. LEVEL INDICATOR/CONTROLLERS ARE EXISTING BUT SHALL BE RELOCATED FROM THE FIELD INTO THE RECEPTIVE CONTROL PANEL.

3 TYP — LEVEL TRANSDUCER INSTRUMENTATION CONNECTION DIGRAM

ULTRASONIC LEVEL TRANSDUCER

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

DATE: FEB 2016	SCALE: NOTED	DRAWN: TMR	CHECKED: PAM	APPROVED: JRN

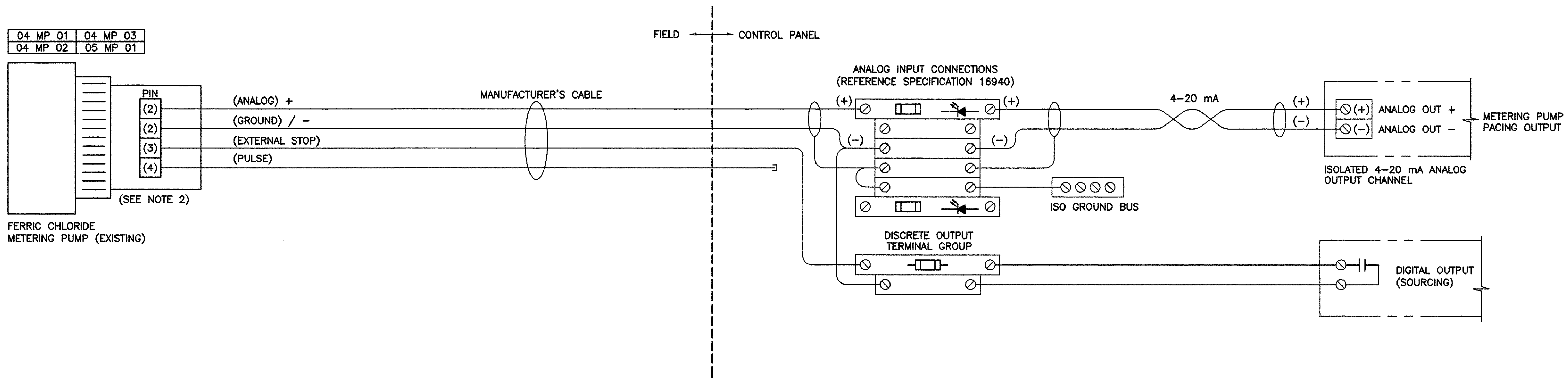
No.	REVISION	DATE	APPD

R. NEWQUIST — STATE OF WASHINGTON — 21151 — REGISTERED PROFESSIONAL ENGINEER

NORTH BEACH WATER DISTRICT
WASHINGTON
PACIFIC COUNTY
WATER SUPPLY AND TREATMENT
PROJECT REBID
ANALOG LOOP DIAGRAMS

SHEET: E-23
OF: 28

JOB NO.: 13224.02
DWG: E_ALD

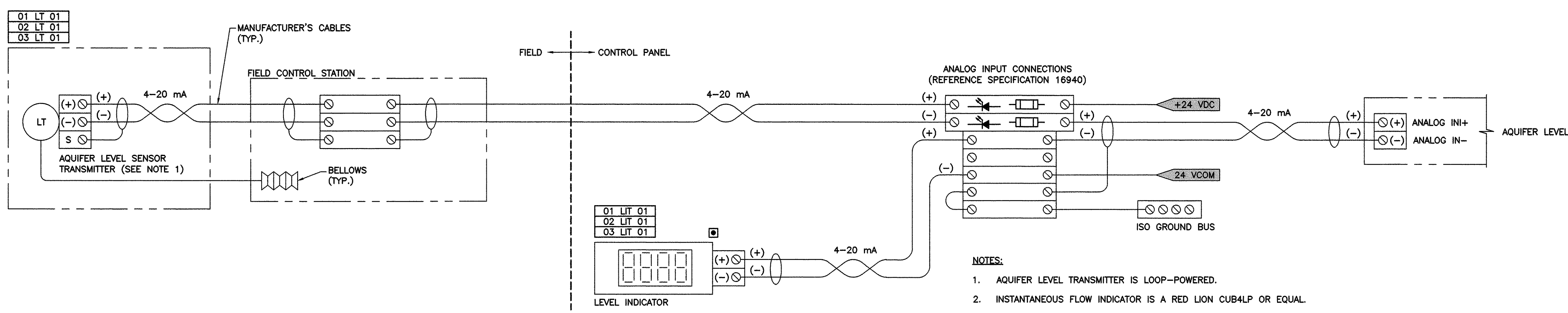


NOTES:

1. METERING SPEED OUTPUTS ARE CONTROLLED BY THE [04 PLC 01]. 4 mA = 0% SPEED, 20 mA = 100% SPEED.
2. CONTRACTOR TO FIELD VERIFY PIN LAYOUT PRIOR TO TERMINATING MANUFACTURE'S CABLE.

1 / TYP — ANALOG OUTPUT CONTROLS TO METERING PUMP, INSTRUMENTATION CONNECTION DIAGRAM

FERRIC CHLORIDE METERING PUMP



NOTES:

1. AQUIFER LEVEL TRANSMITTER IS LOOP–POWERED.
2. INSTANTANEOUS FLOW INDICATOR IS A RED LION CUB4LP OR EQUAL.

2 / TYP — LEVEL TRANSDUCER INSTRUMENTATION CONNECTION DIAGRAM

AQUIFER LEVEL TRANSDUCER

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

DATE:	FEB 2016
SCALE:	NOTED
DRAWN:	TMR
CHECKED:	PAM
APPROVED:	JRN

No.	REVISION	DATE	APPD

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON

WATER SUPPLY AND TREATMENT PROJECT REBID

ANALOG LOOP DIAGRAMS

SHEET: E-24
OF: 28

JOB NO.: 13224.02
DWG: E_ALD

SLOT 00		ANALOG INPUT CARD, 4 CHANNEL, ISOLATED, 16-BIT, 4-20 mA		
CHANNEL NO.	CHANNEL ADDRESS	TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
0	00:00	01 LIT 01	LEVEL INDICATOR/TRANSMITTER	AQUIFER LEVEL 4 MA = 0 FT, 20 MA = 150 FT
1	00:01	02 LIT 01	LEVEL INDICATOR/TRANSMITTER	AQUIFER LEVEL 4 MA = 0 FT, 20 MA = 150 FT
2	00:02	03 LIT 01	LEVEL INDICATOR/TRANSMITTER	AQUIFER LEVEL 4 MA = 0 FT, 20 MA = 150 FT
3	00:03	01 FIT 01	FLOW INDICATOR/TRANSMITTER, WELL NO. 1	WELL NO. 1 FLOW 4MA = 0 GPM, 20MA = 150 GPM

SLOT 01		ANALOG INPUT CARD, 4 CHANNEL, ISOLATED, 16-BIT, 4-20 mA		
CHANNEL NO.	CHANNEL ADDRESS	TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
0	01:00	02 FIT 01	FLOW INDICATOR/TRANSMITTER, WELL NO. 2	WELL NO. 1 FLOW 4MA = 0 GPM, 20MA = 150 GPM
1	01:01	03 FIT 01	FLOW INDICATOR/TRANSMITTER, WELL NO. 3	WELL NO. 1 FLOW 4MA = 0 GPM, 20MA = 150 GPM
2	01:02			
3	01:03			

1/– [01 PLC 01] EXTENDED I/O TABLES
SCHEDULE A

EMBEDDED DIGITAL INPUT				
CHANNEL NO.	CHANNEL ADDRESS	TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
0	DI:00	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = HOA IN HAND
1	DI:01	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = HOA IN AUTO
2	DI:02	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = 480 V POWER VALID
3	DI:03	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = MOTOR OVERLOAD
4	DI:04	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = MOTOR RUNNING
5	DI:05	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = HOA IN HAND
6	DI:06	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = HOA IN AUTO
7	DI:07	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = 480 V POWER VALID
8	DI:08	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = MOTOR OVERLOAD
9	DI:09	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = MOTOR RUNNING
10	DI:10	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = HOA IN HAND
11	DI:11	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = HOA IN AUTO
12	DI:12	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = 480 V POWER VALID
13	DI:13	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = MOTOR OVERLOAD
14	DI:14	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = MOTOR RUNNING
15	DI:15			

EMBEDDED DIGITAL OUTPUT				
CHANNEL NO.	CHANNEL ADDRESS	TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
0	DO:00	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = CALL TO RUN
1	DO:01	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = CALL TO RUN
2	DO:02	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = CALL TO RUN
3	DO:03			
4	DO:04			
5	DO:05			
6	DO:06			
7	DO:07			
8	DO:08			
9	DO:09			
10	DO:10			
11	DO:11			
12	DO:12			
13	DO:13			
14	DO:14			
15	DO:15			

2/– [01 PLC 01] EMBEDDED I/O TABLES
SCHEDULE B

NETWORKED ANALOG INPUT TO [04 PLC 01] FROM [01 PLC 01]				
CHANNEL NO.	CHANNEL ADDRESS	TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
0	NAI:00	01 LIT 01	LEVEL INDICATOR/TRANSMITTER	WELL NO. 1 AQUIFER LEVEL
1	NAI:01	02 LIT 01	LEVEL INDICATOR/TRANSMITTER	WELL NO. 2 AQUIFER LEVEL
2	NAI:02	03 LIT 01	LEVEL INDICATOR/TRANSMITTER	WELL NO. 3 AQUIFER LEVEL
3	NAI:03	01 FIT 01	FLOW INDICATOR/TRANSMITTER, WELL NO. 1	WELL NO. 1 FLOW
4	NAI:04	02 FIT 01	FLOW INDICATOR/TRANSMITTER, WELL NO. 2	WELL NO. 2 FLOW
5	NAI:05	03 FIT 01	FLOW INDICATOR/TRANSMITTER, WELL NO. 3	WELL NO. 3 FLOW

NETWORKED DIGITAL INPUT TO [04 PLC 01] FROM [01 PLC 01]				
CHANNEL NO.	CHANNEL ADDRESS	TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
0	NDI:00	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = HOA IN HAND
1	NDI:01	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = HOA IN AUTO
2	NDI:02	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = 480 V POWER VALID
3	NDI:03	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = MOTOR OVERLOAD
4	NDI:04	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = MOTOR RUNNING
5	NDI:05	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = HOA IN HAND
6	NDI:06	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = HOA IN AUTO
7	NDI:07	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = 480 V POWER VALID
8	NDI:08	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = MOTOR OVERLOAD
9	NDI:09	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = MOTOR RUNNING
10	NDI:10	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = HOA IN HAND
11	NDI:11	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = HOA IN AUTO
12	NDI:12	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = 480 V POWER VALID
13	NDI:13	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = MOTOR OVERLOAD
14	NDI:14	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = MOTOR RUNNING
15	NDI:15	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = HOA IN HAND
16	NDI:16	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = HOA IN AUTO
17	NDI:17	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = 480 V POWER VALID
18	NDI:18	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = MOTOR OVERLOAD
19	NDI:19	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = MOTOR RUNNING
20	NDI:20	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = HOA IN HAND
21	NDI:21	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = HOA IN AUTO
22	NDI:22	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = 480 V POWER VALID
23	NDI:23	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = MOTOR OVERLOAD
24	NDI:24	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = MOTOR RUNNING
25	NDI:25	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = HOA IN HAND
26	NDI:26	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = HOA IN AUTO
27	NDI:27	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = 480 V POWER VALID
28	NDI:28	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = MOTOR OVERLOAD
29	NDI:29	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = MOTOR RUNNING

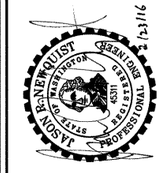
NETWORKED DIGITAL OUTPUT TO [01 PLC 01] FROM [04 PLC 01]				
CHANNEL NO.	CHANNEL ADDRESS	TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
0	NDO:00	01 MS 01	MOTOR STARTER, WELL PUMP NO. 1	TRUE = CALL TO RUN
1	NDO:01	02 MS 01	MOTOR STARTER, WELL PUMP NO. 2	TRUE = CALL TO RUN
2	NDO:02	03 MS 01	MOTOR STARTER, WELL PUMP NO. 3	TRUE = CALL TO RUN

3/– [01 PLC 01] NETWORKED I/O TABLES
SCHEDULE B

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW. BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

DATE: FEB 2016 | SCALE: NOTED | DRAWN: TMR | CHECKED: PAM | APPROVED: JRN

No.	REVISION	DATE	APPD



NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
PLC I/O TABLES

SHEET: E-25
OF: 28

JOB NO.: 13224.02
DWG: E_PLCIO

SLOT 01		ANALOG INPUT CARD, 4 CHANNEL, ISOLATED, 16-BIT, 4-20 mA		
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	01:00	04 FIT 01	FLOW INDICATOR/TRANSMITTER, BACKWASH SUPPLY	4 MA = 0 GPM, 20 MA = 500 GPM
1	01:01	04 FIT 02	FLOW INDICATOR/TRANSMITTER, BACKWASH	4 MA = 0 GPM, 20 MA = 500 GPM
2	01:02	04 FIT 03	FLOW INDICATOR/TRANSMITTER, FINISHED WATER	4 MA = 0 GPM, 20 MA = 500 GPM
3	01:03	04 LIT 01	LEVEL TRANSDUCER INDICATOR/TRANSMITTER	4 MA = 0 FT, 20 MA = 75 FT

SLOT 02		ANALOG OUTPUT CARD, 4 CHANNEL, ISOLATED, 16-BIT, 4-20 mA		
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	02:00	04 MP 01	FERRIC CHLORIDE METERING PUMP NO. 1	4 MA = 0% SPEED, 20 MA = 100% SPEED
1	02:01	04 MP 02	FERRIC CHLORIDE METERING PUMP NO. 2	4 MA = 0% SPEED, 20 MA = 100% SPEED
2	02:02	04 MP 03	METERING PUMP, POTASSIUM PERMANGANATE	4 MA = 0% SPEED, 20 MA = 100% SPEED
3	02:03			

SLOT 03		DIGITAL INPUT CARD, 16 CHANNEL, 24 VDC		
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	03:00	04 CP 01	CONTROL PANEL, SOUTH WELL FIELD AND BOOSTER STATION	TRUE = 120 VAC CONTROL POWER VALID
1	03:01	04 DCU 01	DC UPS CONTROLLER	TRUE = DCU BUFFERING
2	03:02	04 DCU 01	DC UPS CONTROLLER	TRUE = REPLACE BATTERY
3	03:04			
15	03:15			

SLOT 04		DIGITAL OUTPUT CARD, 16 CHANNEL, 24 VDC		
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	04:00	04 MP 01	FERRIC CHLORIDE METERING PUMP NO. 1	TRUE = STOP
1	04:01	04 MP 02	FERRIC CHLORIDE METERING PUMP NO. 2	TRUE = STOP
2	04:02	04 MP 03	METERING PUMP, POTASSIUM PERMANGANATE	TRUE = STOP
14	04:14			
15	04:15	04 PLC 01	PROGRAMMABLE LOGIC CONTROLLER	TRUE = PLC VALID, FALSE = PLC FAIL

1 – [04 PLC 01] EXTENDED I/O TABLES

SCHEDULE A

NETWORKED ANALOG INPUT				
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	NAI:00	04 CP 03	CONTROL PANEL, BOOSTER SKID	BOOSTER SKID PRESSURE TRANSDUCER

NETWORKED ANALOG OUTPUT				
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	NAO:00	04 CP 03	CONTROL PANEL, BOOSTER SKID	PRESSURE SETPOINT

NETWORKED DIGITAL INPUT				
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	NDI:00	04 CP 03	CONTROL PANEL, BOOSTER SKID	BOOSTER PUMP NO. 1 RUNNING
1	NDI:01	04 CP 03	CONTROL PANEL, BOOSTER SKID	BOOSTER PUMP NO. 2 RUNNING
2	NDI:02	04 CP 03	CONTROL PANEL, BOOSTER SKID	BOOSTER PUMP NO. 3 RUNNING
3	NDI:03	04 CP 03	CONTROL PANEL, BOOSTER SKID	BOOSTER PUMP NO. 4 RUNNING

NETWORKED DIGITAL OUTPUT				
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	NDO:00	04 CP 03	CONTROL PANEL, BOOSTER SKID	ENABLE/DISABLE BOOSTER SKID OPERATION

2 – [04 PLC 01] NETWORKED I/O TABLES

SCHEDULE A

SLOT 00		ANALOG INPUT CARD, 4 CHANNEL, ISOLATED, 16-BIT, 4-20 mA		
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	00:00	05 FIT 01	FLOW INDICATOR/TRANSMITTER, FINISHED WATER	4 MA = 0 GPM, 20 MA = 500 GPM
1	00:01	08 LIT 01	LEVEL INDICATOR/TRANSMITTER	4 MA = 0 FT, 20 MA = 75 FT
2	00:02	07 PT 01	PRESSURE TRANSDUCER, BOOSTER SKID	4 MA = 0 PSI, 20 MA = 150 PSI
3	00:03	07 FIT 01	FLOW INDICATOR/TRANSMITTER, BOOSTER SKID	4 MA = 0 GPM, 20 MA = 500 GPM

SLOT 01		ANALOG OUTPUT CARD, 4 CHANNEL, ISOLATED, 16-BIT, 4-20 mA		
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	01:00	05 MP 01	METERING PUMP, POTASSIUM PERMANGANATE	4 MA = 0% SPEED, 20 MA = 100% SPEED
1	01:01	05 FIT 02	FLOW INDICATOR/TRANSMITTER AND ELEMENT, BACKWASH SUPPLY	4 MA = 0 GPM, 20 MA = 500 GPM
2	01:02			
3	01:03			

(SEE NOTE 3, SHEET E-27)

SLOT 02		DIGITAL INPUT CARD, 16 CHANNEL, 24 VDC		
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	02:00	05 CP 01	CONTROL PANEL, NORTH WELL FIELD	TRUE = 120 VAC CONTROL POWER VALID
1	02:01	05 DCU 01	DC UPS CONTROLLER	TRUE = DCU BUFFERING
2	02:02	05 DCU 01	DC UPS CONTROLLER	TRUE = REPLACE BATTERY
3	02:03			
4	02:04	07 MS 01	MOTOR STARTER, BOOSTER PUMP NO. 1	TRUE = HOA IN HAND
5	02:05	07 MS 01	MOTOR STARTER, BOOSTER PUMP NO. 1	TRUE = HOA IN AUTO
6	02:06	07 MS 01	MOTOR STARTER, BOOSTER PUMP NO. 1	TRUE = MOTOR RUNNING
7	02:07	07 MS 02	MOTOR STARTER, BOOSTER PUMP NO. 2	TRUE = HOA IN HAND
8	02:08	07 MS 02	MOTOR STARTER, BOOSTER PUMP NO. 2	TRUE = HOA IN AUTO
9	02:09	07 MS 02	MOTOR STARTER, BOOSTER PUMP NO. 2	TRUE = MOTOR RUNNING
10	02:10	07 MS 03	MOTOR STARTER, BOOSTER PUMP NO. 3	TRUE = HOA IN HAND
11	02:11	07 MS 03	MOTOR STARTER, BOOSTER PUMP NO. 3	TRUE = HOA IN AUTO
12	02:12	07 MS 03	MOTOR STARTER, BOOSTER PUMP NO. 3	TRUE = MOTOR RUNNING
13	02:13	07 MS 04	MOTOR STARTER, BOOSTER PUMP NO. 4	TRUE = HOA IN HAND
14	02:14	07 MS 04	MOTOR STARTER, BOOSTER PUMP NO. 4	TRUE = HOA IN AUTO
15	02:15	07 MS 04	MOTOR STARTER, BOOSTER PUMP NO. 4	TRUE = MOTOR RUNNING
16	02:16	07 MS 05	MOTOR STARTER, BOOSTER PUMP NO. 5	TRUE = HOA IN HAND
17	02:17	07 MS 05	MOTOR STARTER, BOOSTER PUMP NO. 5	TRUE = HOA IN AUTO
18	02:18	07 MS 05	MOTOR STARTER, BOOSTER PUMP NO. 5	TRUE = MOTOR RUNNING
19	02:19	09 MS 04	MOTOR STARTER, WELL NO. 4	TRUE = HOA IN HAND
20	02:20	09 MS 04	MOTOR STARTER, WELL NO. 4	TRUE = HOA IN AUTO
21	02:21	09 MS 04	MOTOR STARTER, WELL NO. 4	TRUE = 480V VALID
22	02:22	09 MS 04	MOTOR STARTER, WELL NO. 4	TRUE = OVERLOAD
23	02:23	09 MS 04	MOTOR STARTER, WELL NO. 4	TRUE = MOTOR RUNNING
24	02:24	09 MS 04	MOTOR STARTER, WELL NO. 4	TRUE = MOTOR STARTER CIRCUIT BREAKER CLOSED
25	02:25	09 MS 05	MOTOR STARTER, WELL NO. 5	TRUE = HOA IN HAND
26	02:26	09 MS 05	MOTOR STARTER, WELL NO. 5	TRUE = HOA IN AUTO
27	02:27	09 MS 05	MOTOR STARTER, WELL NO. 5	TRUE = 480V VALID
28	02:28	09 MS 05	MOTOR STARTER, WELL NO. 5	TRUE = OVERLOAD
29	02:29	09 MS 05	MOTOR STARTER, WELL NO. 5	TRUE = MOTOR RUNNING
30	02:30	09 MS 05	MOTOR STARTER, WELL NO. 5	TRUE = MOTOR STARTER CIRCUIT BREAKER CLOSED
31	02:31			

SLOT 03		DIGITAL INPUT CARD, 16 CHANNEL, 24 VDC		
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	03:00	09 MS 06	MOTOR STARTER, WELL NO. 6	TRUE = HOA IN HAND
1	03:01	09 MS 06	MOTOR STARTER, WELL NO. 6	TRUE = HOA IN AUTO
2	03:02	09 MS 06	MOTOR STARTER, WELL NO. 6	TRUE = 480 V VALID
3	03:03	09 MS 06	MOTOR STARTER, WELL NO. 6	TRUE = OVERLOAD

CONTINUED ON SHEET E-27

3 – [05 PLC 01] EXTENDED I/O TABLES

SCHEDULE A

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

DATE: FEB 2016
SCALE: NOTED
DRAWN: TMR
CHECKED: PAM
APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — 43311 — REGISTERED PROFESSIONAL ENGINEER
9/1/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
PLC I/O TABLES

SHEET: E-26
OF: 28

JOB NO.: 13224.02
DWG: E_PLCIO

SLOT 03		DIGITAL INPUT CARD, 16 CHANNEL, 24 VDC		
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
4	03:04	09 MS 06	MOTOR STARTER, WELL NO. 6	TRUE = MOTOR RUNNING
5	03:05	09 MS 06	MOTOR STARTER, WELL NO. 6	TRUE = MOTOR STARTER CIRCUIT BREAKER CLOSED
6	03:06	09 MS 07	MOTOR STARTER, WELL NO. 7	TRUE = HOA IN HAND
7	03:07	09 MS 07	MOTOR STARTER, WELL NO. 7	TRUE = HOA IN AUTO
8	03:08	09 MS 07	MOTOR STARTER, WELL NO. 7	TRUE = 480 V VALID
9	03:09	09 MS 07	MOTOR STARTER, WELL NO. 7	TRUE = OVERLOAD
10	03:10	09 MS 07	MOTOR STARTER, WELL NO. 7	TRUE = MOTOR RUNNING
11	03:11	09 MS 07	MOTOR STARTER, WELL NO. 7	TRUE = MOTOR STARTER CIRCUIT BREAKER CLOSED
12	03:12	09 MS 08	MOTOR STARTER, WELL NO. 8	TRUE = HOA IN HAND
13	03:13	09 MS 08	MOTOR STARTER, WELL NO. 8	TRUE = HOA IN AUTO
14	03:14	09 MS 08	MOTOR STARTER, WELL NO. 8	TRUE = 480 V VALID
15	03:15	09 MS 08	MOTOR STARTER, WELL NO. 8	TRUE = OVERLOAD
16	03:16	09 MS 08	MOTOR STARTER, WELL NO. 8	TRUE = MOTOR RUNNING
17	03:17	09 MS 08	MOTOR STARTER, WELL NO. 8	TRUE = MOTOR STARTER CIRCUIT BREAKER CLOSED
18	03:18			
29	03:29			
30	03:30			
31	03:31			

SLOT 04		DIGITAL OUTPUT CARD, 16 CHANNEL, 24 VDC		
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	04:00	05 BV 01	BALL VALVE NO. 1, TRAIN 1, FILTER 1, RAW WATER	TRUE = CLOSE
1	04:01	05 BV 02	BALL VALVE NO. 2, TRAIN 1, FILTER 1, BACKWASH	TRUE = OPEN
2	04:02	05 BV 03	BALL VALVE NO. 1, TRAIN 1, FILTER 2, RAW WATER	TRUE = CLOSE
3	04:03	05 BV 04	BALL VALVE NO. 2, TRAIN 1, FILTER 2, BACKWASH	TRUE = OPEN
4	04:04	05 BV 05	BALL VALVE NO. 1, TRAIN 1, FILTER 3, RAW WATER	TRUE = CLOSE
5	04:05	05 BV 06	BALL VALVE NO. 2, TRAIN 1, FILTER 3, BACKWASH	TRUE = OPEN
6	04:06	05 BV 07	BALL VALVE NO. 1, TRAIN 2, FILTER 1, RAW WATER	TRUE = CLOSE
7	04:07	05 BV 08	BALL VALVE NO. 2, TRAIN 2, FILTER 1, BACKWASH	TRUE = OPEN
8	04:08	05 BV 09	BALL VALVE NO. 1, TRAIN 2, FILTER 2, RAW WATER	TRUE = CLOSE
9	04:09	05 BV 10	BALL VALVE NO. 2, TRAIN 2, FILTER 2, BACKWASH	TRUE = OPEN
10	04:10	05 BV 11	BALL VALVE NO. 1, TRAIN 2, FILTER 3, RAW WATER	TRUE = CLOSE
11	04:11	05 BV 12	BALL VALVE NO. 2, TRAIN 2 , FILTER 3, BACKWASH	TRUE = OPEN
12	04:12	05 BV 13	BALL VALVE NO. 1, TRAIN 3, FILTER 1, RAW WATER	TRUE = CLOSE
13	04:13	05 BV 14	BALL VALVE NO. 2, TRAIN 3, FILTER 1, BACKWASH	TRUE = OPEN
14	04:14	05 BV 15	BALL VALVE NO. 1, TRAIN 3, FILTER 2, RAW WATER	TRUE = CLOSE
15	04:15	05 BV 16	BALL VALVE NO. 2, TRAIN 3, FILTER 2, BACKWASH	TRUE = OPEN
16	04:16	05 BV 17	BALL VALVE NO. 1, TRAIN 3, FILTER 3, RAW WATER	TRUE = CLOSE
17	04:17	05 BV 18	BALL VALVE NO. 2, TRAIN 3, FILTER 3, BACKWASH	TRUE = OPEN
18	04:18	05 BV 19	BALL VALVE NO. 1, TRAIN 4, FILTER 1, RAW WATER	TRUE = CLOSE
19	04:19	05 BV 20	BALL VALVE NO. 2, TRAIN 4, FILTER 1, BACKWASH	TRUE = OPEN
20	04:20	05 BV 21	BALL VALVE NO. 1, TRAIN 4, FILTER 2, RAW WATER	TRUE = CLOSE
21	04:21	05 BV 22	BALL VALVE NO. 2, TRAIN 4, FILTER 2, BACKWASH	TRUE = OPEN
22	04:22	05 BV 23	BALL VALVE NO. 1, TRAIN 4, FILTER 3, RAW WATER	TRUE = CLOSE
23	04:23	05 BV 24	BALL VALVE NO. 2, TRAIN 4, FILTER 3, BACKWASH	TRUE = OPEN
24	04:24			
25	04:25	05 CV 01	CONTROL VALVE, TRAIN 1, FILTER 1	TRUE = DISABLE NORMAL MODE
26	04:26	05 CV 01	CONTROL VALVE, TRAIN 1, FILTER 1	TRUE = SET VALVE FOR BACKWASH
27	04:27	05 CV 01	CONTROL VALVE, TRAIN 1, FILTER 1	TRUE = SET VALVE FOR FILTER TO WASTE
28	04:28	05 CV 02	CONTROL VALVE, TRAIN 1, FILTER 2	TRUE = DISABLE NORMAL MODE
29	04:29	05 CV 02	CONTROL VALVE, TRAIN 1, FILTER 2	TRUE = SET VALVE FOR BACKWASH
30	04:30	05 CV 02	CONTROL VALVE, TRAIN 1, FILTER 2	TRUE = SET VALVE FOR FILTER TO WASTE
31	04:31	05 PLC 01	PROGRAMMABLE LOGIC CONTROLLER	TRUE = PLC VALID FALSE = PLC FAIL

NOTES:

1. I/O COMMUNICATED BETWEEN THE NORTH AND SOUTH WELLFIELDS, [04 PLC 01] AND [05 PLC 01] ARE NOT SHOWN HERE. REFER TO SPECIFICATIONS FOR PLC AND OIU PROGRAMMING.
2. REFER TO SHEET E-28 FOR AUTODAILER PROGRAMMING REQUIREMENTS.
3. ANALOG CARDS ARE FOR FLOW METERS [05 FIT 04] – [05 FIT 08] AND SHOWN AT THE END TO AVOID CHANGING NUMEROUS REFERENCES. GROUP ALL ANALOG INPUT CARDS TOGETHER.

SLOT 05		DIGITAL OUTPUT CARD, 16 CHANNEL, 24 VDC		
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	05:00	05 CV 03	CONTROL VALVE, TRAIN 1, FILTER 3	TRUE = DISABLE NORMAL MODE
1	05:01	05 CV 03	CONTROL VALVE, TRAIN 1, FILTER 3	TRUE = SET VALVE FOR BACKWASH
2	05:02	05 CV 03	CONTROL VALVE, TRAIN 1, FILTER 3	TRUE = SET VALVE FOR FILTER TO WASTE
3	05:03	05 CV 04	CONTROL VALVE, TRAIN 2, FILTER 1	TRUE = DISABLE NORMAL MODE
4	05:04	05 CV 04	CONTROL VALVE, TRAIN 2, FILTER 1	TRUE = SET VALVE FOR BACKWASH
5	05:05	05 CV 04	CONTROL VALVE, TRAIN 2, FILTER 1	TRUE = SET VALVE FOR FILTER TO WASTE
6	05:06	05 CV 05	CONTROL VALVE, TRAIN 2, FILTER 2	TRUE = DISABLE NORMAL MODE
7	05:07	05 CV 05	CONTROL VALVE, TRAIN 2, FILTER 2	TRUE = SET VALVE FOR BACKWASH
8	05:08	05 CV 05	CONTROL VALVE, TRAIN 2, FILTER 2	TRUE = SET VALVE FOR FILTER TO WASTE
9	05:09	05 CV 06	CONTROL VALVE, TRAIN 2, FILTER 3	TRUE = DISABLE NORMAL MODE
10	05:10	05 CV 06	CONTROL VALVE, TRAIN 2, FILTER 3	TRUE = SET VALVE FOR BACKWASH
11	05:11	05 CV 06	CONTROL VALVE, TRAIN 2, FILTER 3	TRUE = SET VALVE FOR FILTER TO WASTE
12	05:12	05 CV 07	CONTROL VALVE, TRAIN 3, FILTER 1	TRUE = DISABLE NORMAL MODE
13	05:13	05 CV 07	CONTROL VALVE, TRAIN 3, FILTER 1	TRUE = SET VALVE FOR BACKWASH
14	05:14	05 CV 07	CONTROL VALVE, TRAIN 3, FILTER 1	TRUE = SET VALVE FOR FILTER TO WASTE
15	05:15	05 CV 08	CONTROL VALVE, TRAIN 3, FILTER 2	TRUE = DISABLE NORMAL MODE
16	05:16	05 CV 08	CONTROL VALVE, TRAIN 3, FILTER 2	TRUE = SET VALVE FOR BACKWASH
17	05:17	05 CV 08	CONTROL VALVE, TRAIN 3, FILTER 2	TRUE = SET VALVE FOR FILTER TO WASTE
18	05:18	05 CV 09	CONTROL VALVE, TRAIN 3, FILTER 3	TRUE = DISABLE NORMAL MODE
19	05:19	05 CV 09	CONTROL VALVE, TRAIN 3, FILTER 3	TRUE = SET VALVE FOR BACKWASH
20	05:20	05 CV 09	CONTROL VALVE, TRAIN 3, FILTER 3	TRUE = SET VALVE FOR FILTER TO WASTE
21	05:21	05 CV 10	CONTROL VALVE, TRAIN 4, FILTER 1	TRUE = DISABLE NORMAL MODE
22	05:22	05 CV 10	CONTROL VALVE, TRAIN 4, FILTER 1	TRUE = SET VALVE FOR BACKWASH
23	05:23	05 CV 10	CONTROL VALVE, TRAIN 4, FILTER 1	TRUE = SET VALVE FOR FILTER TO WASTE
24	05:24	05 CV 11	CONTROL VALVE, TRAIN 4, FILTER 2	TRUE = DISABLE NORMAL MODE
25	05:25	05 CV 11	CONTROL VALVE, TRAIN 4, FILTER 2	TRUE = SET VALVE FOR BACKWASH
26	05:26	05 CV 11	CONTROL VALVE, TRAIN 4, FILTER 2	TRUE = SET VALVE FOR FILTER TO WASTE
27	05:27	05 CV 12	CONTROL VALVE, TRAIN 4, FILTER 3	TRUE = DISABLE NORMAL MODE
28	05:28	05 CV 12	CONTROL VALVE, TRAIN 4, FILTER 3	TRUE = SET VALVE FOR BACKWASH
29	05:29	05 CV 12	CONTROL VALVE, TRAIN 4, FILTER 3	TRUE = SET VALVE FOR FILTER TO WASTE
30	05:30			
31	05:31	05 MP 01	METERING PUMP, POTASSIUM PERMANGANATE	TRUE = STOP

SLOT 06		DIGITAL OUTPUT CARD, 16 CHANNEL, 24 VDC		
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	06:00	07 MS 01	MOTOR STARTER, BOOSTER PUMP NO. 1	TRUE = CALL TO RUN
1	06:01	07 MS 02	MOTOR STARTER, BOOSTER PUMP NO. 2	TRUE = CALL TO RUN
2	06:02	07 MS 03	MOTOR STARTER, BOOSTER PUMP NO. 3	TRUE = CALL TO RUN
3	06:03	07 MS 04	MOTOR STARTER, BOOSTER PUMP NO. 4	TRUE = CALL TO RUN
4	06:04	07 MS 05	MOTOR STARTER, BOOSTER PUMP NO. 5	TRUE = CALL TO RUN
5	06:05	07 MS 06	MOTOR STARTER, BOOSTER PUMP NO. 6	TRUE = CALL TO RUN
6	06:06	07 MS 07	MOTOR STARTER, BOOSTER PUMP NO. 7	TRUE = CALL TO RUN
7	06:07	07 MS 08	MOTOR STARTER, BOOSTER PUMP NO. 8	TRUE = CALL TO RUN
8	06:08	09 MS 04	MOTOR STARTER, WELL NO. 4	TRUE = CALL TO RUN
9	06:09	09 MS 05	MOTOR STARTER, WELL NO. 5	TRUE = CALL TO RUN
10	06:10	09 MS 06	MOTOR STARTER, WELL NO. 6	TRUE = CALL TO RUN
11	06:11	09 MS 07	MOTOR STARTER, WELL NO. 7	TRUE = CALL TO RUN
12	06:12	09 MS 08	MOTOR STARTER, WELL NO. 8	TRUE = CALL TO RUN
13	06:13			
14	06:14			
15	06:15			

SLOT 07	ANALOG INPUT CARD, 4 CHANNEL, ISOLATED, 16-BIT, 4-20 mA
	[05 FIT 04] – [05 FIT 07] (SEE NOTE 3)

SLOT 08	ANALOG INPUT CARD, 4 CHANNEL, ISOLATED, 16-BIT, 4-20 mA
	[05 FIT 08] (SEE NOTE 3)

1 / – **[05 PLC 01] EXTENDED I/O TABLES**
SCHEDULE A

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

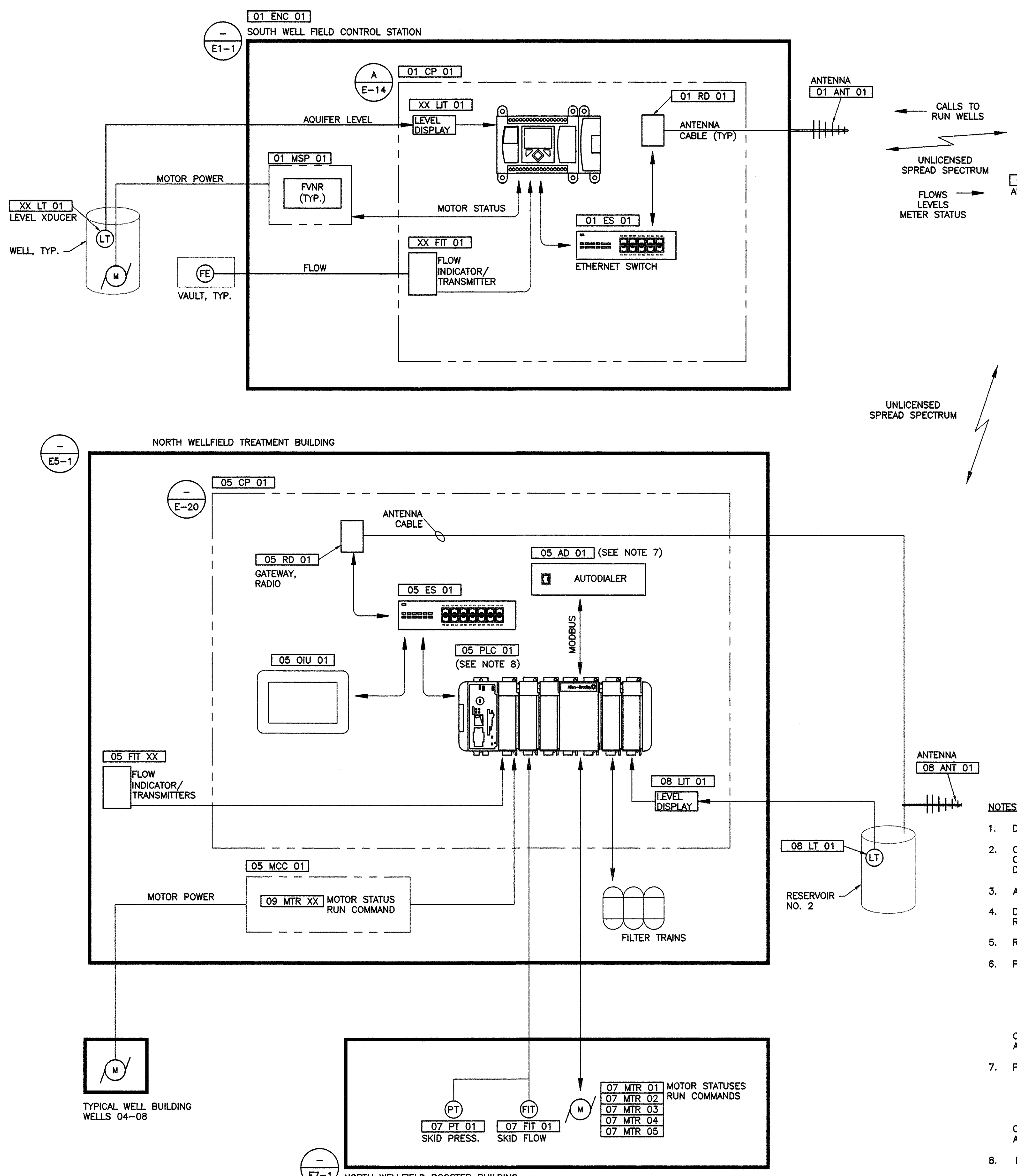
DATE: FEB 2016
SCALE: NOTED
DRAWN: TMR
CHECKED: PAM
APPROVED: JRN

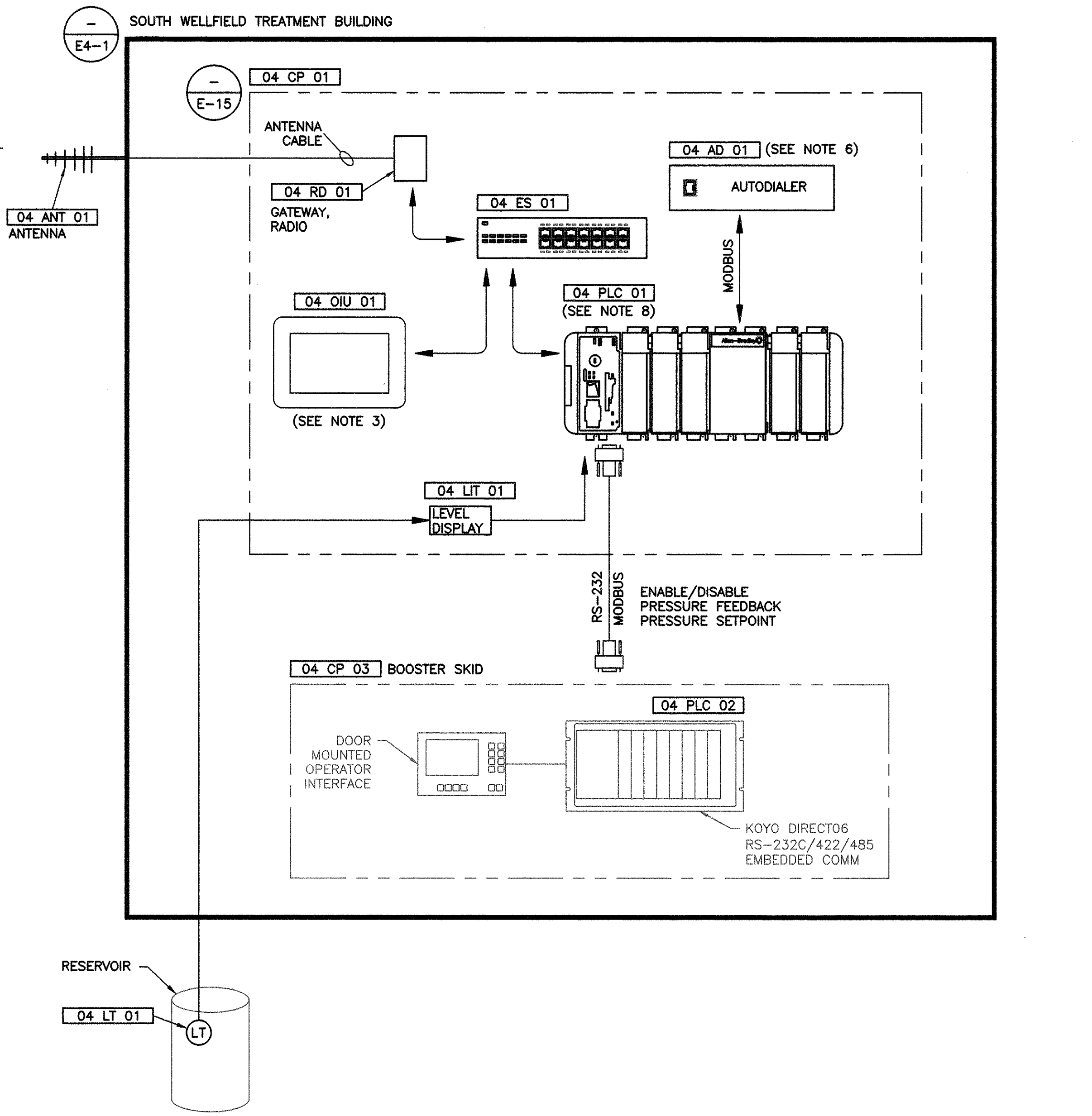
No.	REVISION	DATE	APPD

JASON R. NEWQUIST, STATE OF WASHINGTON, REGISTERED PROFESSIONAL ENGINEER 2/23/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT PROJECT REBID
PLC I/O TABLES

SHEET: E-27
OF: 28
JOB NO.: 13224.02
DWG: E_PLCIO





NOTES:

1. DIAGRAM IS FOR CONCEPTUAL CLARITY ONLY. NOT ALL CONNECTIONS OR I/O ARE SHOWN.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL EQUIPMENT SHOWN CAN COMMUNICATE AS NEEDED. ETHERNET/IP NETWORK CONNECTIONS ARE SHOWN FOR CLARITY AND MAY BE ADJUSTED BY THE INTEGRATOR BUT NO ADDITIONAL COSTS SHALL BE INCURRED FOR A MODIFIED DESIGN AND ARE SUBJECT TO THE APPROVAL OF THE ENGINEER.
3. ALL INPUTS TO [01 RD 01] ARE TRANSMITTED TO [04 PLC 01] AND SHALL BE INTEGRATED INTO THE OPERATOR INTERFACE UNIT.
4. DESIGN IS BASED ON BANNER RADIO MODELS AS NOTED IN THE SPECIFICATIONS. IF ALTERNATIVE RADIOS ARE USED CONTRACTOR SHALL PROVIDE A RADIO STUDY TO DEMONSTRATE A VALID CONNECTION WITH ALTERNATE EQUIPMENT.
5. REFERENCE TO SPECIFICATION 16490.
6. PROGRAM AUTODAILER [04 AD 01] TO ALARM FOR:
   A. LOSS OF SOURCE POWER
   B. LOSS OF COMMUNICATION WITH [01 CP 01] AFTER 10 MINUTE DELAY
   C. LOSS OF COMMUNICATION WITH [05 CP 01] AFTER 10 MINUTE DELAY
   D. CRITICAL ALARM
   E. MAJOR ALARM
   F. MINOR ALARM

   CALLING TREE TO BE PROVIDED BY OWNER. OWNER SHALL DIRECT THE CONTRACTOR AS TO WHAT IS CLASSIFIED AS A CRITICAL, MAJOR, OR MINOR ALARM. FOR BIDDING PURPOSES ASSUME THAT A CRITICAL ALARM IS ANY ONE OF 6 EVENTS TBD. LIKEWISE FOR MAJOR AND MINOR ALARMS.
7. PROGRAM AUTODAILER [05 AD 01] TO ALARM FOR:
   A. LOSS OF SOURCE POWER
   B. LOSS OF COMMUNICATION WITH [04 CP 01] AFTER 10 MINUTE DELAY
   C. CRITICAL ALARM
   D. MAJOR ALARM
   E. MINOR ALARM

   CALLING TREE TO BE PROVIDED BY OWNER. OWNER SHALL DIRECT THE CONTRACTOR AS TO WHAT IS CLASSIFIED AS A CRITICAL, MAJOR, OR MINOR ALARM. FOR BIDDING PURPOSES ASSUME THAT A CRITICAL ALARM IS ANY ONE OF 10 EVENTS TBD. LIKEWISE FOR MAJOR AND MINOR ALARMS.
8. PROVIDE MODBUS COMMUNICATION CARDS IN [04 PLC 01] AND [05 PLC 01].

1 NETWORK DIAGRAM

0 1" 2"
TWO INCHES AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

DATE:	FEB 2016
SCALE:	NOTED
DRAWN:	TMR
CHECKED:	PAM
APPROVED:	JRN

No.	REVISION	DATE	APPD

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT PROJECT REBID
NETWORK DIAGRAM

SHEET: E-28
OF: 28

JOB NO.: 13224.02
DWG: E_NTWK

AREA 01 - POWER CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
P0101	[01 MSP 01], MOTOR STARTER PANEL	[01 MSDS 01], MOTOR SAFETY DISCONNECT SWITCH	1"	3X #10 AWG XHHW-2; 1X #10 AWG XHHW-2 G; 6X #14 AWG XHHW-2	INCLUDES 2 SPARES
P0102	[01 MSDS 01], MOTOR SAFETY DISCONNECT SWITCH	J-BOX JP0102	3/4"	3X #10 AWG XHHW-2; 1X #10 AWG XHHW-2 G; 4X #14 AWG XHHW-2	INCLUDES 2 SPARES
P0102A	J-BOX JP0102	[01 MTR 01], MOTOR, WELL PUMP NO. 1	3/4"	MANUFACTURER'S CABLE FOR MOTOR AND LEVEL TRANSDUCER	
P0103	[01 UT 01], UTILITY TRANSFORMER	[01 MB 01], UTILITY METER BASE	2"	3X #3/0 AWG XHHW-2; 1X #4 AWG XHHW-2 N	
P0104	[01 MB 01], UTILITY METER BASE	[01 SDB 01], SERVICE DISCONNECT BREAKER (SUSE)	2"	3X #3/0 AWG XHHW-2; 1X #4 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G	
P0105	[01 SDB 01], SERVICE DISCONNECT BREAKER (SUSE)	[01 MTS 01], MANUAL TRANSFER SWITCH	2"	3X #3/0 AWG XHHW-2; 1X #6 AWG XHHW-2 G	
P0106	[01 MTS 01], MANUAL TRANSFER SWITCH	[01 GREC 01], PORTABLE GENERATOR RECEPTACLE	2"	3X #3/0 AWG XHHW-2; 1X #6 AWG XHHW-2 G	
P0107	[01 MTS 01], MANUAL TRANSFER SWITCH	[01 MSP 01], MOTOR STARTER PANEL	2"	3X #3/0 AWG XHHW-2; 1X #6 AWG XHHW-2 G	
P0108	[01 MTS 01], MANUAL TRANSFER SWITCH	[01 XMFR 01], STEP DOWN TRANSFORMER	3/4"	2X #10 AWG XHHW-2; 1X #10 AWG XHHW-2 N; 1X #10 AWG XHHW-2 G	

AREA 01 - INSTRUMENTATION CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
S0101	[01 CP 01], CONTROL PANEL	J-BOX JP0102	3/4"	2X MFR'S RECOMMENDED CABLES	COIL POWER AND FLOW SIGNAL BETWEEN FLOW INDICATOR/TRANSMITTER AND IT'S ASSOCIATED ELEMENT
S0101A	J-BOX JP0102	J-BOX JS0101A IN FLOW METER VAULT	3/4"	2X MFR'S RECOMMENDED CABLES	
S0101B	J-BOX JS0101A IN FLOW METER VAULT	[01 FE 01], FLOW ELEMENT, WELL NO. 1	3/4"	2X MFR'S RECOMMENDED CABLES	
S0102	[01 CP 01], CONTROL PANEL	J-BOX JP0102	3/4"	2X 2-C, 1-TP, #18 AWG, OS	INCLUDES 1 SPARE CABLE

AREA 02 - POWER CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
P0201	[01 MSP 01], MOTOR STARTER PANEL	[02 MSDS 01], MOTOR SAFETY DISCONNECT SWITCH	1"	3X #10 AWG XHHW-2; 1X #10 AWG XHHW-2 G; 6X #14 AWG XHHW-2	INCLUDES 2 SPARES
P0202	[02 MSDS 01], MOTOR SAFETY DISCONNECT SWITCH	J-BOX JP0202	3/4"	3X #10 AWG XHHW-2; 1X #10 AWG XHHW-2 G; 4X #14 AWG XHHW-2	INCLUDES 2 SPARES
P0202A	J-BOX JP0202	[02 MTR 01], MOTOR, WELL PUMP NO. 2	3/4"	MANUFACTURER'S CABLE FOR MOTOR AND LEVEL TRANSDUCER	

AREA 03 - INSTRUMENTATION CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
S0201	[01 CP 01], CONTROL PANEL	J-BOX JP0202	3/4"	2X MFR'S RECOMMENDED CABLES	COIL POWER AND FLOW SIGNAL BETWEEN FLOW INDICATOR/TRANSMITTER AND IT'S ASSOCIATED ELEMENT
S0201A	J-BOX JP0202	J-BOX JS0201A	3/4"	2X MFR'S RECOMMENDED CABLES	
S0201B	J-BOX JS0201A	[02 FE 01], FLOW ELEMENT, WELL NO. 2	3/4"	2X MFR'S RECOMMENDED CABLES	
S0202	[01 CP 01], CONTROL PANEL	J-BOX JP0202	3/4"	2X 2-C, 1-TP, #18 AWG, OS	INCLUDES 1 SPARE CABLE

AREA 03 - POWER CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
P0301	[01 MSP 01], MOTOR STARTER PANEL	[03 MSDS 01], MOTOR SAFETY DISCONNECT SWITCH	1"	3X #10 AWG XHHW-2; 1X #10 AWG XHHW-2 G; 6X #14 AWG XHHW-2	INCLUDES 2 SPARES
P0302	[03 MSDS 01], MOTOR SAFETY DISCONNECT SWITCH	J-BOX JP0302	3/4"	3X #10 AWG XHHW-2; 1X #10 AWG XHHW-2 G; 4X #14 AWG XHHW-2	INCLUDES 2 SPARES
P0302A	J-BOX JP0302	[03 MTR 01], MOTOR, WELL PUMP NO. 3	3/4"	MANUFACTURER'S CABLE FOR MOTOR AND LEVEL TRANSDUCER	

AREA 03 - INSTRUMENTATION CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
S0301	[01 MSP 01], MOTOR STARTER PANEL	J-BOX JP0302	3/4"	2X MFR'S RECOMMENDED CABLES	COIL POWER AND FLOW SIGNAL BETWEEN FLOW INDICATOR/TRANSMITTER AND IT'S ASSOCIATED ELEMENT
S0301A	J-BOX JP0302	JS0301A	3/4"	2X MFR'S RECOMMENDED CABLES	
S0301B	JS0301A	[03 FE 01], FLOW ELEMENT, WELL NO. 3	3/4"	2X MFR'S RECOMMENDED CABLES	
S0302	[01 CP 01], CONTROL PANEL	J-BOX JP0302	3/4"	2X 2-C, 1-TP, #18 AWG, OS	INCLUDES 1 SPARE CABLE

AREA 04 - POWER CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
P0401	[04 PB 02], PANELBOARD, 240/120 V, 3 PH, 225 A BUS, 42 CKT	[04 CP 01], CONTROL PANEL, SOUTH WELL FIELD AND BOOSTER STATION	1"	3X #12 AWG XHHW-2; 3X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G; 1X #10 AWG XHHW-2 G	INCLUDES 1 SPARE CIRCUIT
P0402	[04 PB 02], PANELBOARD, 240/120 V, 3 PH, 225 A BUS, 42 CKT	[04 CP 02], CONTROL PANEL, CARBON FILTER SKID	3/4"	2X #12 AWG XHHW-2; 2X #12 AWG XHHW-2 N; 2X #12 AWG XHHW-2 G	INCLUDES 1 SPARE CIRCUIT
P0403	[04 PB 02], PANELBOARD, 240/120 V, 3 PH, 225 A BUS, 42 CKT	J-BOX JP0403	3/4"	2X #12 AWG XHHW-2; 2X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
P0403A	J-BOX JP0403	[04 DREC 01], DEDICATED RECEPTACLE, FERRIC CHLORIDE METERING PUMP NO. 1	1/2"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
P0403B	J-BOX JP0403	[04 DREC 02], DEDICATED RECEPTACLE, FERRIC CHLORIDE METERING PUMP NO. 2	1/2"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
P0404	[04 PB 01], PANELBOARD, 480/277 V, 3 PH, 225 A BUS, 42 CKT	[04 WH 01], HOT WATER HEATER	3/4"	3X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 G	
P0405	[04 PB 02], PANELBOARD, 240/120 V, 3 PH, 225 A BUS, 42 CKT	J-BOX JP0405	3/4"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
P0405A	J-BOX JP0405	[04 EF 01], EXHAUST FAN, CHEMICAL ROOM	1/2"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
P0405B	J-BOX JP0405	[04 TMR 01], TIMER, CHEMICAL ROOM EXHAUST FAN	1/2"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
P0406	[04 PB 02], PANELBOARD, 240/120 V, 3 PH, 225 A BUS, 42 CKT	J-BOX JP0406	3/4"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	SPLICE IN J-BOX TO POWER [04 DREC 03] AND [04 SV 01]
P0406A	J-BOX JP0406	[04 DREC 03], DEDICATED RECEPTACLE, POTASSIUM PERMANGANATE METERING PUMP AND TANK	1/2"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
P0406B	J-BOX JP0406	[04 SV 01], SOLENOID VALVE, POTASSIUM PERMANGANATE TANK	1/2"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	

AREA 04 - CONTROL CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
C0401	[04 CP 01], CONTROL PANEL, SOUTH WELL FIELD AND BOOSTER STATION	[04 CP 02], CONTROL PANEL, CARBON FILTER SKID	3/4"	1X 8-C, 4-TP, #24 AWG, CAT5E, OS	
C0402	[04 CP 01], CONTROL PANEL, SOUTH WELL FIELD AND BOOSTER STATION	[04 CP 03], CONTROL PANEL, BOOSTER SKID	3/4"	1X (2-C, #16 AWG TP, IS + 2-C, #18 AWG TP, IS, OS)	RS-232/485 COMMUNICATION CABLE

AREA 04 - INSTRUMENTATION CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
S0401	[04 CP 01], CONTROL PANEL, SOUTH WELL FIELD AND BOOSTER STATION	J-BOX JS0401	1"	3X MANUFACTURER'S PROPRIETARY CABLE	ORDER TO LENGTH, DO NOT SPLICE.
S0401A	J-BOX JS0401	[04 MP 01], FERRIC CHLORIDE METERING PUMP NO. 1	3/4"	MANUFACTURER'S PROPRIETARY CABLE	
S0401B	J-BOX JS0401	[04 MP 02], FERRIC CHLORIDE METERING PUMP NO. 2	3/4"	MANUFACTURER'S PROPRIETARY CABLE	
S0401C	J-BOX JS0401	[04 MP 03], METERING PUMP, POTASSIUM PERMANGANATE	3/4"	MANUFACTURER'S PROPRIETARY CABLE	
S0402	[04 CP 01], CONTROL PANEL, SOUTH WELL FIELD AND BOOSTER STATION	CONDUIT "T"	1-1/2"	2X 4-C, 2-TP, #18 AWG, IS/OS; 2X 2-C, 1-TP, #18 AWG, OS	
S0402A	CONDUIT "T"	[04 FIT 01], FLOW INDICATOR/TRANSMITTER, FINISHED WATER	3/4"	1X 4-C, 2-TP, #18 AWG, IS/OS; 1X 2-C, 1-TP, #18 AWG, OS	
S0402B	CONDUIT "T"	[04 FIT 02], FLOW INDICATOR/TRANSMITTER, BACKWASH SUPPLY	3/4"	1X 4-C, 2-TP, #18 AWG, IS/OS; 1X 2-C, 1-TP, #18 AWG, OS	
S0403	[04 CP 01], CONTROL PANEL, SOUTH WELL FIELD AND BOOSTER STATION	[01 ANT 01], ANTENNA, TELEMETRY RADIO	1"	LMR-400 COAX ANTENNA CABLE	
S0404	[04 CP 01], CONTROL PANEL, SOUTH WELL FIELD AND BOOSTER STATION	J-BOX JS0404 AT BASE OF RESERVOIR	3/4"	1X 2-C, 1-TP, #18 AWG, OS	
S0404A	J-BOX JS0404 AT BASE OF RESERVOIR	J-BOX JS0404A AT TOP OF RESERVOIR	3/4"	1X 2-C, 1-TP, #18 AWG, OS	CONNECT TO MFR'S CABLE FROM TRANSDUCER
S0405	[04 CP 01], CONTROL PANEL, SOUTH WELL FIELD AND BOOSTER STATION	J-BOX JS0404 AT BASE OF RESERVOIR	3/4"	PULL WIRE	SPARE CONDUIT

NOTES:

1. AREA 04 POWER AND CONTROL CONDUITS ("P" AND "C") AT THE HEIGHT OF 10 FEET AND ABOVE MAY BE EMT. IN THE ATTIC THEY MAY BE EMT OR PVC-40.
2. EACH FILTER HAS TWO ASSOCIATED BALL VALVES AND ONE CONTROL VALVE. ALL THREE VALVES AT EACH FILTER VESSEL SHALL SHARE ONE NEUTRAL AND ONE GROUND AS CALLED IN THE CABLE AND CONDUIT SCHEDULES. TO DO THIS SPLICING SHALL BE ALLOWED IN THE NEAREST J-BOXES.
3. AREA 05 POWER AND CONTROL CONDUITS ("P" AND "C") AT THE HEIGHT OF 10 FEET AND ABOVE MAY BE EMT OR PVC-40.

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DATE: FEB 2016
SCALE: NOTED
DRAWN: TMR
CHECKED: PAM
APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEWQUIST · STATE OF WASHINGTON · REGISTERED PROFESSIONAL ENGINEER · 2/23/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY · WASHINGTON
WATER SUPPLY AND TREATMENT PROJECT REBID
CABLE AND CONDUIT SCHEDULES

SHEET: EC-1
OF: 3
JOB NO.: 13224.02
DWG: E_CCS

AREA 05 - POWER CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
P0500A	[05 UT 01], UTILITY TRANSFORMER	[05 CT 01], CT ENCLOSURE	2"	3X #3/0 AWG XHHW-2; 1X #1/0 AWG XHHW-2 N	
P0500B	[05 UT 01], UTILITY TRANSFORMER	[05 CT 01], CT ENCLOSURE	2"	3X #3/0 AWG XHHW-2; 1X #1/0 AWG XHHW-2 N	
P0501	[05 CT 01], CT ENCLOSURE	[05 MB 01], METER BASE	1"	PROVIDED BY ELECTRICAL UTILITY	
P0502A	[05 CT 01], CT ENCLOSURE	[05 SDB 01], SERVICE DISCONNECT BREAKER	2"	3X #3/0 AWG XHHW-2; 1X #1/0 AWG XHHW-2 N; 1X #3 AWG XHHW-2 G	
P0502B	[05 CT 01], CT ENCLOSURE	[05 SDB 01], SERVICE DISCONNECT BREAKER	2"	3X #3/0 AWG XHHW-2; 1X #1/0 AWG XHHW-2 N; 1X #3 AWG XHHW-2 G	
P0503A	[05 SDB 01], SERVICE DISCONNECT BREAKER	[05 ATS 01], AUTOMATIC TRANSFER SWITCH	2"	3X #3/0 AWG XHHW-2; 1X #3 AWG XHHW-2 G	
P0503B	[05 SDB 01], SERVICE DISCONNECT BREAKER	[05 ATS 01], AUTOMATIC TRANSFER SWITCH	2"	3X #3/0 AWG XHHW-2; 1X #3 AWG XHHW-2 G	
P0504A	[05 ATS 01], AUTOMATIC TRANSFER SWITCH	[05 GEN 01], GENERATOR	2"	3X #3/0 AWG XHHW-2; 1X #3 AWG XHHW-2 G	
P0504B	[05 ATS 01], AUTOMATIC TRANSFER SWITCH	[05 GEN 01], GENERATOR	2"	3X #3/0 AWG XHHW-2; 1X #3 AWG XHHW-2 G	
P0505A	[05 ATS 01], AUTOMATIC TRANSFER SWITCH	[05 MCC 01], MOTOR CONTROL CENTER, FILTER BUILDING	2"	3X #3/0 AWG XHHW-2; 1X #3 AWG XHHW-2 G	
P0505B	[05 ATS 01], AUTOMATIC TRANSFER SWITCH	[05 MCC 01], MOTOR CONTROL CENTER, FILTER BUILDING	2"	3X #3/0 AWG XHHW-2; 1X #3 AWG XHHW-2 G	
P0506	[05 MCC 01], MOTOR CONTROL CENTER, FILTER BUILDING	[05 PB 01], PANELBOARD, 208/120 V, 3 PH, 200 A BUS, 36 CKT	2-1/2"	3X 250 KCM XHHW-2; 1X #1/0 AWG XHHW-2 N; 1X #3 AWG XHHW-2 G	
P0507	[05 PB 01], PANELBOARD, 208/120 V, 3 PH, 200 A BUS, 36 CKT	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	3/4"	2X #12 AWG XHHW-2; 2X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G; 1X #10 AWG XHHW	
P0508	[05 PB 01], PANELBOARD, 208/120 V, 3 PH, 200 A BUS, 36 CKT	J-BOX JP0508	3/4"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	SPLICE IN J-BOX TO POWER [05 DREC 01] AND [05 SV 01]
P0508A	J-BOX JP0508	[05 DREC 01], DEDICATED RECEPTACLE, POTASSIUM PERMANGANATE PUMP AND TANK	1/2"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
P0508B	J-BOX JP0508	[05 SV 01], SOLENOID VALVE, POTASSIUM PERMANGANATE TANK	1/2"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	

AREA 05 - CONTROL CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
C0501	[05 MCC 01], MOTOR CONTROL CENTER, FILTER BUILDING	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	2"	55X #14 AWG XHHW-2	INCLUDES 10 SPARES
C0502	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	[05 FIT 01], FLOW INDICATOR/TRANSMITTER, FINISHED WATER	3/4"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0503	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	[05 FIT 02], FLOW INDICATOR/TRANSMITTER AND ELEMENT, BACKWASH SUPPLY	3/4"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0504~	[05 MCC 01], MOTOR CONTROL CENTER, FILTER BUILDING	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	1"	PULL WIRE	SPARE CONDUIT
C0505	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	J-BOX JC0505	1-1/4"	24X #12 AWG XHHW-2; 3X #12 AWG XHHW-2 N; 3X #12 AWG XHHW-2 G	SEE NOTE 2.
C0505A	J-BOX JC0505	[05 BV 01], BALL VALVE NO. 1, TRAIN 1, FILTER 1, RAW WATER	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0505B	J-BOX JC0505	[05 CV 01], CONTROL VALVE, TRAIN 1, FILTER 1	3/4"	4X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0505C	J-BOX JC0505	[05 BV 02], BALL VALVE NO. 2, TRAIN 1, FILTER 1, BACKWASH	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0505D	J-BOX JC0505	J-BOX JC0505D	1-1/4"	16X #12 AWG XHHW-2; 2X #12 AWG XHHW-2 N; 2X #12 AWG XHHW-2 G	SEE NOTE 2.
C0505E	J-BOX JC0505D	[05 BV 03], BALL VALVE NO. 3, TRAIN 1, FILTER 2, RAW WATER	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0505F	J-BOX JC0505D	[05 CV 02], CONTROL VALVE, TRAIN 1, FILTER 2	3/4"	4X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0505G	J-BOX JC0505D	[05 BV 04], BALL VALVE NO. 4, TRAIN 1, FILTER 2, BACKWASH	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0505H	J-BOX JC0505D	J-BOX JC0505H	3/4"	8X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	SEE NOTE 2.
C0505J	J-BOX JC0505H	[05 BV 05], BALL VALVE NO. 5, TRAIN 1, FILTER 3, RAW WATER	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0505K	J-BOX JC0505H	[05 CV 03], CONTROL VALVE, TRAIN 1, FILTER 3	3/4"	4X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0505L	J-BOX JC0505H	[05 BV 06], BALL VALVE NO. 6, TRAIN 1, FILTER 3, BACKWASH	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	

AREA 05 - CONTROL CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
C0506	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	J-BOX JC0506	1-1/4"	24X #12 AWG XHHW-2; 3X #12 AWG XHHW-2 N; 3X #12 AWG XHHW-2 G	SEE NOTE 2.
C0506A	J-BOX JC0506	[05 BV 07], BALL VALVE NO. 7, TRAIN 2, FILTER 1, RAW WATER	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0506B	J-BOX JC0506	[05 CV 04], CONTROL VALVE, TRAIN 2, FILTER 1	3/4"	4X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0506C	J-BOX JC0506	[05 BV 08], BALL VALVE NO. 8, TRAIN 2, FILTER 1, BACKWASH	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0506D	J-BOX JC0506	J-BOX JC0506D	1-1/4"	16X #12 AWG XHHW-2; 2X #12 AWG XHHW-2 N; 2X #12 AWG XHHW-2 G	SEE NOTE 2.
C0506E	J-BOX JC0506D	[05 BV 09], BALL VALVE NO. 9, TRAIN 2, FILTER 2, RAW WATER	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0506F	J-BOX JC0506D	[05 CV 05], CONTROL VALVE, TRAIN 2, FILTER 2	3/4"	4X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0506G	J-BOX JC0506D	[05 BV 10], BALL VALVE NO. 10, TRAIN 2, FILTER 2, BACKWASH	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0506H	J-BOX JC0506D	J-BOX JC0506H	3/4"	8X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	SEE NOTE 2.
C0506J	J-BOX JC0506H	[05 BV 11], BALL VALVE NO. 11, TRAIN 2, FILTER 3, RAW WATER	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0506K	J-BOX JC0506H	[05 CV 06], CONTROL VALVE, TRAIN 2, FILTER 3	3/4"	4X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0506L	J-BOX JC0506H	[05 BV 12], BALL VALVE NO. 12, TRAIN 2 , FILTER 3, BACKWASH	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0507	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	J-BOX JC0507	1-1/4"	24X #12 AWG XHHW-2; 3X #12 AWG XHHW-2 N; 3X #12 AWG XHHW-2 G	SEE NOTE 2.
C0507A	J-BOX JC0507	[05 BV 13], BALL VALVE NO. 13, TRAIN 3, FILTER 1, RAW WATER	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0507B	J-BOX JC0507	[05 CV 07], CONTROL VALVE, TRAIN 3, FILTER 1	3/4"	4X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0507C	J-BOX JC0507	[05 BV 14], BALL VALVE NO. 14, TRAIN 3, FILTER 1, BACKWASH	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0507D	J-BOX JC0507	J-BOX JC0507D	1-1/4"	16X #12 AWG XHHW-2; 2X #12 AWG XHHW-2 N; 2X #12 AWG XHHW-2 G	SEE NOTE 2.
C0507E	J-BOX JC0507D	[05 BV 15], BALL VALVE NO. 15, TRAIN 3, FILTER 2, RAW WATER	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0507F	J-BOX JC0507D	[05 CV 08], CONTROL VALVE, TRAIN 3, FILTER 2	3/4"	4X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0507G	J-BOX JC0507D	[05 BV 16], BALL VALVE NO. 16, TRAIN 3, FILTER 2, BACKWASH	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0507H	J-BOX JC0507D	J-BOX JC0507H	3/4"	8X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	SEE NOTE 2.
C0507J	J-BOX JC0507H	[05 BV 17], BALL VALVE NO. 17, TRAIN 3, FILTER 3, RAW WATER	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW N; 1X #12 AWG XHHW G	
C0507K	J-BOX JC0507H	[05 CV 09], CONTROL VALVE, TRAIN 3, FILTER 3	3/4"	4X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0507L	J-BOX JC0507H	[05 BV 18], BALL VALVE NO. 18, TRAIN 3, FILTER 3, BACKWASH	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0508	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	J-BOX JC0508	1-1/4"	24X #12 AWG XHHW-2; 3X #12 AWG XHHW-2 N; 3X #12 AWG XHHW-2 G	SEE NOTE 2.
C0508A	J-BOX JC0508	[05 BV 19], BALL VALVE NO. 19, TRAIN 4, FILTER 1, RAW WATER	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0508B	J-BOX JC0508	[05 CV 10], CONTROL VALVE, TRAIN 4, FILTER 1	3/4"	4X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0508C	J-BOX JC0508	[05 BV 20], BALL VALVE NO. 20, TRAIN 4, FILTER 1, BACKWASH	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0508D	J-BOX JC0508	J-BOX JC0508D	1-1/4"	16X #12 AWG XHHW-2; 2X #12 AWG XHHW-2 N; 2X #12 AWG XHHW-2 G	SEE NOTE 2.
C0508E	J-BOX JC0508D	[05 BV 21], BALL VALVE NO. 21, TRAIN 4, FILTER 2, RAW WATER	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0508F	J-BOX JC0508D	[05 CV 11], CONTROL VALVE, TRAIN 4, FILTER 2	3/4"	4X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0508G	J-BOX JC0508D	[05 BV 22], BALL VALVE NO. 22, TRAIN 4, FILTER 2, BACKWASH	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0508H	J-BOX JC0508D	J-BOX JC0508H	3/4"	8X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0508J	J-BOX JC0508H	[05 BV 23], BALL VALVE NO. 23, TRAIN 4, FILTER 3, RAW WATER	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0508K	J-BOX JC0508H	[05 CV 12], CONTROL VALVE, TRAIN 4, FILTER 3	3/4"	4X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
C0508L	J-BOX JC0508H	[05 BV 24], BALL VALVE NO. 24, TRAIN 4, FILTER 3, BACKWASH	1/2"	2X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	

<u>NOTE:</u> REFERENCE NOTES ON EC-1.

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No.	REVISION	DATE	APP'D

JASON R. NENQUIST, STATE OF WASHINGTON, PROFESSIONAL ENGINEER

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY, WASHINGTON
WATER SUPPLY AND TREATMENT PROJECT REBID
CABLE AND CONDUIT SCHEDULES

SHEET: EC-2
OF: 3
JOB NO.: 13224.02
DWG: E_CCS

AREA 08 - INSTRUMENTATION CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
S0501	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	[05 MP 01], METERING PUMP, POTASSIUM PERMANGANATE	3/4"	1X MANUFACTURER'S PROPRIETARY CABLE	ORDER TO LENGTH, DO NOT SPLICE
S0502	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	[05 FIT 01], FLOW INDICATOR/TRANSMITTER, FINISHED WATER	3/4"	2X 2-C, 1-TP, #18 AWG, OS	INCLUDES 1 SPARE CABLE
S0503	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	[05 FIT 02], FLOW INDICATOR/TRANSMITTER AND ELEMENT, BACKWASH SUPPLY	3/4"	2X 2-C, 1-TP, #18 AWG, OS	INCLUDES 1 SPARE CABLE
S0504	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	[05 FIT 04], FLOW INDICATOR/TRANSMITTER, WELL NO. 4	3/4"	2X 2-C, 1-TP, #18 AWG, OS	24VDC POWER AND FLOW SIGNAL
S0505	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	[05 FIT 05], FLOW INDICATOR/TRANSMITTER, WELL NO. 5	3/4"	2X 2-C, 1-TP, #18 AWG, OS	24VDC POWER AND FLOW SIGNAL
S0506	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	[05 FIT 06], FLOW INDICATOR/TRANSMITTER, WELL NO. 6	3/4"	2X 2-C, 1-TP, #18 AWG, OS	24VDC POWER AND FLOW SIGNAL
S0507	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	[05 FIT 07], FLOW INDICATOR/TRANSMITTER, WELL NO. 7	3/4"	2X 2-C, 1-TP, #18 AWG, OS	24VDC POWER AND FLOW SIGNAL
S0508	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	[05 FIT 08], FLOW INDICATOR/TRANSMITTER, WELL NO. 8	3/4"	2X 2-C, 1-TP, #18 AWG, OS	24VDC POWER AND FLOW SIGNAL

AREA 07 - POWER CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
P0701	[05 MCC 01], MOTOR CONTROL CENTER, FILTER BUILDING	[07 PB 02], PANELBOARD, 480/277 V, 3 PH, 225 A BUS, 36 CKT	2-1/2"	3X #4/0 AWG XHHW-2; 1X #4 AWG XHHW-2 G	
P0702	[07 PB 02], PANELBOARD, 480/277 V, 3 PH, 225 A BUS, 36 CKT	[07 XFMR 01], TRANSFORMER, 25 KVA, 480 V - 240/120 1PH	1"	2X #3 AWG XHHW-2; 1X #6 AWG XHHW-2 N; 1X #8 AWG XHHW-2 G	
P0703	[07 XFMR 01], TRANSFORMER, 25 KVA, 480 V - 240/120 1PH	[07 PB 01], PANELBOARD, 240/120 V, 1 PH, 100 A BUS, 12 CKT	1"	2X #3 AWG XHHW-2; 1X #6 AWG XHHW-2 N; 1X #8 AWG XHHW-2 G	
P0704	[07 PB 02], PANELBOARD, 480/277 V, 3 PH, 225 A BUS, 36 CKT	[07 WW 01], BOOSTER STATION WIRE WAY NO. 1	1"	3X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 G; 3X #10 AWG XHHW-2; 2X #10 AWG XHHW-2 G; 3X #8 AWG XHHW-2	
P0704A	[07 WW 01], BOOSTER STATION WIRE WAY NO. 1	[07 MS 01], MOTOR STARTER, BOOSTER PUMP NO. 1	3/4"	6X #10 AWG XHHW-2; 2X #10 AWG XHHW-2 G	EXISTING CONDUIT
P0704B	[07 WW 01], BOOSTER STATION WIRE WAY NO. 1	[07 MS 02], MOTOR STARTER, BOOSTER PUMP NO. 2	3/4"	6X #12 AWG XHHW-2; 2X #12 AWG XHHW-2 G	EXISTING CONDUIT
P0704C	[07 WW 01], BOOSTER STATION WIRE WAY NO. 1	[07 MS 03], MOTOR STARTER, BOOSTER PUMP NO. 3	1"	6X #8 AWG XHHW-2; 2X #10 AWG XHHW-2 G	EXISTING CONDUIT
P0705	[07 WW 01], BOOSTER STATION WIRE WAY NO. 1	[07 WW 02], BOOSTER STATION WIRE WAY NO. 2	1"	3X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 G; 3X #10 AWG XHHW-2; 2X #10 AWG XHHW-2 G; 3X #8 AWG XHHW-2	
P0705A	[07 WW 02], BOOSTER STATION WIRE WAY NO. 2	[07 MTR 01], BOOSTER PUMP NO. 1	3/4"	3X #10 AWG XHHW-2; 1X #10 AWG XHHW-2 G	EXISTING CONDUIT
P0705B	[07 WW 02], BOOSTER STATION WIRE WAY NO. 2	[07 MTR 02], BOOSTER PUMP NO. 2	3/4"	3X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 G	EXISTING CONDUIT
P0705C	[07 WW 02], BOOSTER STATION WIRE WAY NO. 2	[07 MTR 03], BOOSTER PUMP NO. 3	3/4"	3X #8 AWG XHHW-2; 1X #10 AWG XHHW-2 G	EXISTING CONDUIT
P0706	[07 PB 02], PANELBOARD, 480/277 V, 3 PH, 225 A BUS, 36 CKT	[07 WW 01], BOOSTER STATION WIRE WAY NO. 1	1-1/4"	6X #4 AWG XHHW-2; 2X #8 AWG XHHW-2 G	
P0706A	[07 WW 01], BOOSTER STATION WIRE WAY NO. 1	[07 MS 04], MOTOR STARTER, BOOSTER PUMP NO. 4	1-1/4"	6X #4 AWG XHHW-2; 2X #8 AWG XHHW-2 G	
P0706B	[07 WW 01], BOOSTER STATION WIRE WAY NO. 1	[07 MS 05], MOTOR STARTER, BOOSTER PUMP NO. 5	1-1/4"	6X #4 AWG XHHW-2; 2X #8 AWG XHHW-2 G	
P0707	[07 WW 01], BOOSTER STATION WIRE WAY NO. 1	[07 WW 02], BOOSTER STATION WIRE WAY NO. 2	1-1/2"	6X #4 AWG XHHW-2; 1X #8 AWG XHHW-2 G	
P0707A	[07 WW 02], BOOSTER STATION WIRE WAY NO. 2	[07 MTR 04], BOOSTER PUMP NO. 4	1"	3X #4 AWG XHHW-2; 1X #8 AWG XHHW-2 G	EXISTING CONDUIT
P0707B	[07 WW 02], BOOSTER STATION WIRE WAY NO. 2	[07 MTR 05], BOOSTER PUMP NO. 5	1"	3X #4 AWG XHHW-2; 1X #8 AWG XHHW-2 G	EXISTING CONDUIT

AREA 07 - CONTROL CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
C0701	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	[07 WW 01], BOOSTER STATION WIRE WAY NO. 1	2"	36X #14 AWG XHHW-2 WITH PULL WIRE	INCLUDES 6 SPARES

AREA 07 - INSTRUMENTATION CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
S0701	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	J-BOX JS0701	1"	1X 4-C, 2-TP, #18 AWG, IS/OS; 2X 2-C, 1-TP, #18 AWG, OS	
S0701A	J-BOX JS0701	[07 PT 01], PRESSURE TRANSDUCER, BOOSTER SKID	1/2"	1X 2-C, 1-TP, #18 AWG, OS	
S0701B	J-BOX JS0701	[07 FIT 01], FLOW INDICATOR/TRANSMITTER, BOOSTER SKID	3/4"	1X 4-C, 2-TP, #18 AWG, IS/OS; 1X 2-C, 1-TP, #18 AWG, OS	
S0702	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	J-BOX JS0701	3/4"	PULL WIRE	

AREA 08 - INSTRUMENTATION CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
S0801	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	J-BOX JS0801 AT BASE OF RESERVOIR NO. 2	3/4"	1X 2-C, 1-TP, #18 AWG, OS	
S0801A	J-BOX JS0801 AT BASE OF RESERVOIR	J-BOX JS0801A AT TOP OF RESERVOIR NO. 2	3/4"	1X 2-C, 1-TP, #18 AWG, OS	CONNECT TO MFR'S CABLE FROM TRANSDUCER
S0802	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	J-BOX JS0801 AT BASE OF RESERVOIR NO. 2	1"	LMR-400 COAX ANTENNA CABLE	
S0802A	J-BOX JS0801	[08 ANT 01], ANTENNA, TOP OF RESERVOIR NO. 2	1"	LMR-400 COAX ANTENNA CABLE	
S0803	[05 CP 01], CONTROL PANEL, NORTH WELL FIELD	J-BOX JS0801 AT BASE OF RESERVOIR NO. 2	1"	PULL WIRE	SPARE CONDUIT

AREA 09 - POWER CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	
P0901	[05 PB 01], PANELBOARD, 208/120 V, 3 PH, 200 A BUS, 36 CKT	J-BOX JP0901	1-1/2"	3X #6 AWG XHHW-2; 3X #6 AWG XHHW-2 N; 3X #6 AWG XHHW-2 G	CONVENIENCE RECEPTACLES AT WELL BUILDINGS
P0902	[05 PB 01], PANELBOARD, 208/120 V, 3 PH, 200 A BUS, 36 CKT	J-BOX JP0901	1"	2X #8 AWG XHHW-2; 2X #8 AWG XHHW-2 N; 2X #8 AWG XHHW-2 G	CONVENIENCE RECEPTACLES AT WELL BUILDINGS
P0903	[05 MCC 01], MOTOR CONTROL CENTER, FILTER BUILDING	J-BOX JP0901	1"	3X #8 AWG XHHW-2; 1X #8 AWG XHHW-2 G	UPSIZED FOR VOLTAGE DROP
P0903A	J-BOX JP0901	[05 HH 01], HANDHOLE	3/4"	3X #8 AWG XHHW-2; 1X #8 AWG XHHW-2 G; 1X #6 AWG XHHW-2; 1X #6 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G	
P0904	[05 MCC 01], MOTOR CONTROL CENTER, FILTER BUILDING	J-BOX JP0901	1"	3X #8 AWG XHHW-2; 1X #8 AWG XHHW-2 G	UPSIZED FOR VOLTAGE DROP
P0904A	J-BOX JP0901	[05 HH 01], HANDHOLE	1-1/2"	3X #8 AWG XHHW-2; 1X #8 AWG XHHW-2 G; 1X #6 AWG XHHW-2; 1X #6 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G	
P0905	[05 MCC 01], MOTOR CONTROL CENTER, FILTER BUILDING	J-BOX JP0901	1"	3X #8 AWG XHHW-2; 1X #8 AWG XHHW-2 G	UPSIZED FOR VOLTAGE DROP
P0905A	J-BOX JP0901	[05 HH 01], HANDHOLE	1-1/2"	3X #8 AWG XHHW-2; 1X #8 AWG XHHW-2 G; 1X #6 AWG XHHW-2; 1X #6 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G	
P0906	[05 MCC 01], MOTOR CONTROL CENTER, FILTER BUILDING	J-BOX JP0901	3/4"	3X #10 AWG XHHW-2; 1X #10 AWG XHHW-2 G	
P0906A	J-BOX JP0901	[05 HH 01], HANDHOLE	1"	3X #10 AWG XHHW-2; 1X #10 AWG XHHW-2 G; 1X #8 AWG XHHW-2; 1X #8 AWG XHHW-2 N; 1X #8 AWG XHHW-2 G	
P0907	[05 MCC 01], MOTOR CONTROL CENTER, FILTER BUILDING	J-BOX JP0901	3/4"	3X #10 AWG XHHW-2; 1X #10 AWG XHHW-2 G	
P0907A	J-BOX JP0901	[05 HH 01], HANDHOLE	1"	3X #10 AWG XHHW-2; 1X #10 AWG XHHW-2 G; 1X #8 AWG XHHW-2; 1X #8 AWG XHHW-2 N; 1X #8 AWG XHHW-2 G	

NOTE: REFERENCE NOTES ON EC-1.

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DATE: FEB 2016	SCALE: NOTED	DRAWN: TMR	CHECKED: PAM	APPROVED: JRN

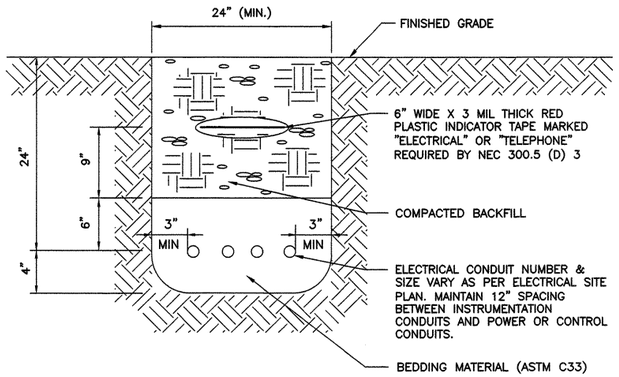
No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — 21511 — REGISTERED PROFESSIONAL ENGINEER — 9/15/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
CABLE AND CONDUIT SCHEDULES

SHEET: EC-3
OF: 3

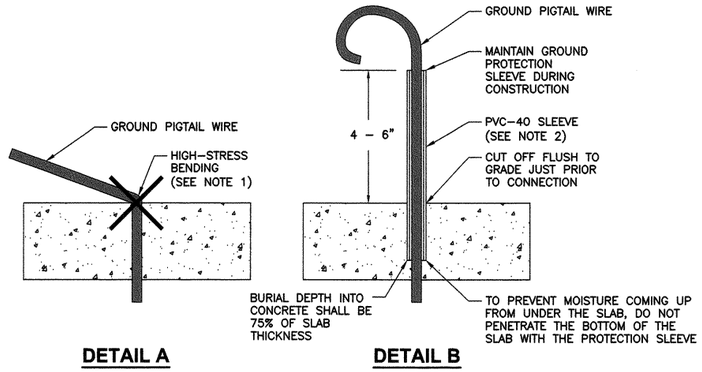
JOB NO.: 13224.02
DWG: E_CCS



NOTE:

1. SPACING BETWEEN CONDUITS AND OTHER UTILITIES SHALL BE IN COMPLIANCE WITH THE UTILITIES OR 24 INCHES MINIMUM, WHICHEVER IS THE GREATER.

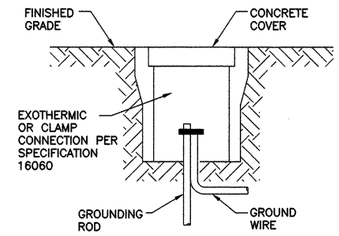
1 / TYP — **ELECTRICAL TRENCHING DETAIL**
NOT TO SCALE



NOTES:

1. BARE COPPER GROUND WIRES SHALL NOT PENETRATE DIRECTLY OUT OF CONCRETE FLOORS. CONSTRUCTION ACTIVITIES CAN CAUSE TIGHT WIRE BENDING AND POSSIBLE GROUND WIRE DEGRADATION. DETAIL "A" IS NOT ACCEPTABLE.
2. PROTECT THE GROUND PIGTAIL DURING CONSTRUCTION WITH A PVC-40 SLEEVE INSTALLED AS DESCRIBED IN DETAIL "B".
3. JUST PRIOR TO SETTING EQUIPMENT OVER, OR MAKING THE FINAL CONNECTION OF THE GROUND WIRE, CUT OFF THE SLEEVE FLUSH TO THE FLOOR TAKING CARE NOT TO CUT INTO THE GROUND WIRE.

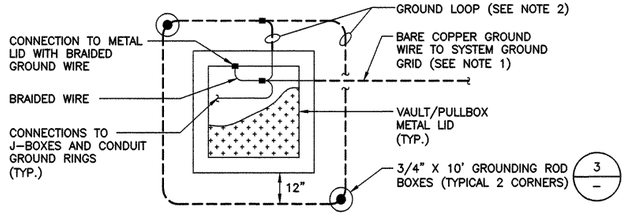
2 / TYP — **GROUND PIGTAIL CONTRUCTION PROTECTION SLEEVE DETAIL**
NOT TO SCALE



NOTES:

1. GROUND ROD BOX SHALL BE FOGTITE GROUND ROD BOX WITH ROAD RATING EQUAL TO THE DEVICE OR STRUCTURE IT SUPPORTS (H20 MINIMUM).

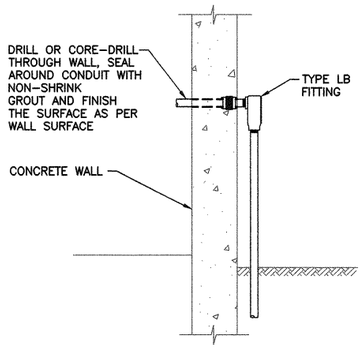
3 / TYP — **GROUND ROD BOX DETAIL**
NOT TO SCALE



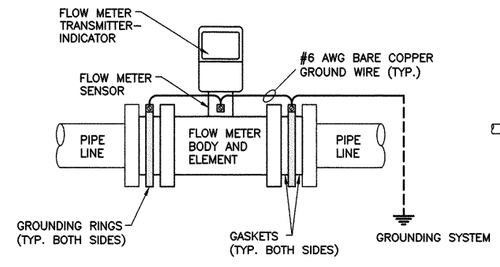
NOTES:

1. PROVIDE AND SIZE GROUND CONDUCTOR FROM SYSTEM GROUND DISTRIBUTION PER – / E-6.
2. PROVIDE BARE COPPER GROUND LOOP AROUND THE VAULT/PULLBOX 12-INCHES OUT AND 12-INCHES DEEP.
3. GROUND ALL METAL COMPONENTS AS PER "VAULT AND PULLBOX GROUNDING" IN SPECIFICATION 16060.
4. ALL GROUND CONDUCTORS SHALL BE STRANDED WITH THE EXCEPTION OF THE FLEXIBLE BRAIDED GROUND CONDUCTOR TO THE METAL HATCH LIDS.

4 / TYP — **METAL LID GROUNDING DETAIL**
NOT TO SCALE



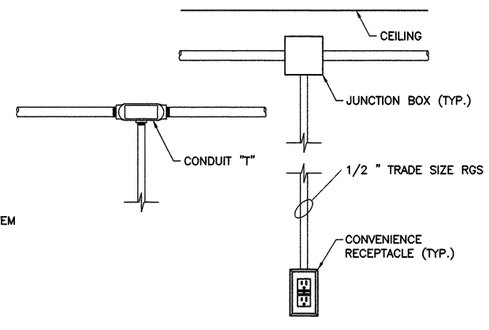
5 / TYP — **INDOOR TO UNDERGROUND TRANSITION**
NOT TO SCALE



NOTES:

1. CONTRACTOR SHALL PROVIDE AND INSTALL INSULATING GASKETS AND MANUFACTURER'S GROUND RINGS TO EACH SIDE OF THE FLOW METER BODY. THE GROUND RINGS AND FLOW METER SENSOR SHALL BE TIED TO THE SYSTEM GROUND WITH A #6 AWG GROUNDING WIRE. CONNECT AS SHOWN OR PER MANUFACTURER'S REQUIREMENTS.

6 / TYP — **FLOW METER GROUNDING DETAIL**
NOT TO SCALE



7 / TYP — **JUNCTION BOX AND RECEPTACLE DETAIL**
NOT TO SCALE

0 1" 2"
TWO INCHES AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

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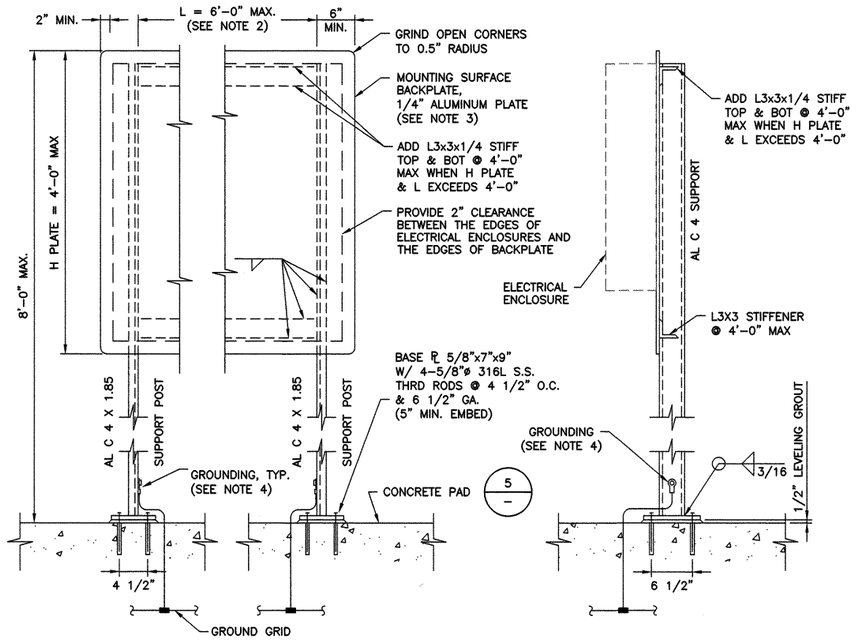
No.	REVISION	DATE	APP'D

JASON R. NEMQUIST — STATE OF WASHINGTON — 47432 — REGISTERED PROFESSIONAL ENGINEER — 9/13/16

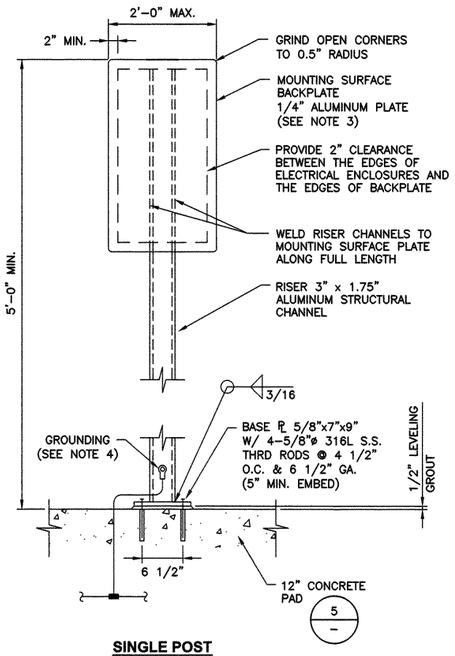
NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT PROJECT REBID
ELECTRICAL DETAILS

SHEET: **ED-1**
OF: **3**
JOB NO.: 13224.02
DWG: E_DET



MULTIPLE POST FRONT VIEW

MULTIPLE POST SIDE VIEW



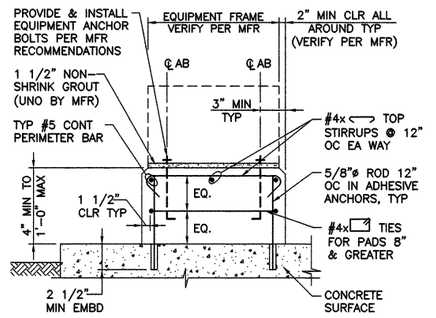
SINGLE POST FRONT VIEW

NOTES:

1. MOUNT ELECTRICAL ENCLOSURES TO BACKPLATE MOUNTING SURFACE USING 1/2" 316L STAINLESS STEEL BOLTS. INSULATE BOLTS FROM MOUNTING SURFACE AND ELECTRICAL ENCLOSURES USING SHOULDER AND FLAT WASHERS. (6 / –)
2. WIDTH AND HEIGHT OF THE BACKPLATE AND THE SPACING BETWEEN SUPPORT POSTS ARE DEPENDENT ON THE SPECIFIC APPLICATION. SUPPORT POSTS SHALL NOT EXCEED 6'-0". FOR WIDER BACKPLATES, PROVIDE ADDITIONAL EQUAL SPACED SUPPORT POST.
3. ALUMINUM PLATES SHALL COMPLY WITH ASTM B209, ALLOY 5052. ALUMINUM BARS AND RODS SHALL COMPLY WITH ASTM B221, ALLOY 6061-6.
4. GROUND BACKPLATE SUPPORT STRUCTURE WITH A BARE COPPER GROUNDING ELECTRODE CONDUCTOR THE SAME SIZE AS THE GROUND GRID CONDUCTORS AT THE EQUIPMENT LOCATION. CONNECTION POINT SHALL BE MADE NO MORE THAN 6" ABOVE THE PAD.

1 / TYP — FREE-STANDING BACKPLATE MOUNTING DETAIL

NOT TO SCALE

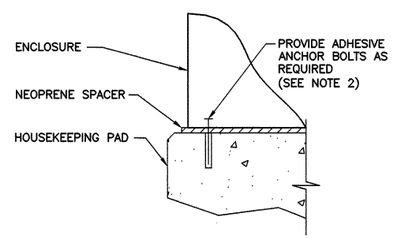


NOTES:

1. CHAMFER ALL EXPOSED CORNERS OF HOUSEKEEPING PADS AND EQUIPMENT PIERS.

2 / TYP — TYP HOUSEKEEPING PAD DETAILS

NOT TO SCALE

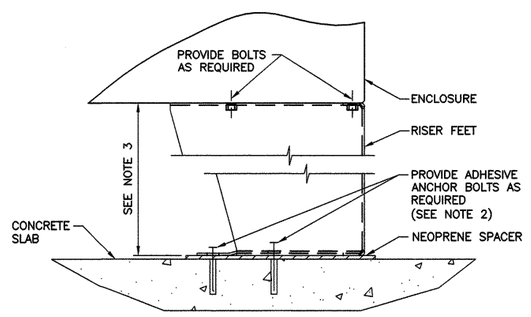


NOTES:

1. PROVIDE A 1/8" NEOPRENE SPACER BETWEEN THE ENCLOSURE BASE PLATE AND THE CONCRETE SURFACE. OVERSIZE THE SPACER BY 1/4" ON ALL SIDES. EPOXY THE SPACER TO THE BOTTOM OF THE BASE PLATE PRIOR TO INSTALLATION.
2. ANCHOR BOLTS AND HARDWARE SHALL BE 1/2"ø 316L STAINLESS STEEL WITH 3" EMBEDMENT.

3 / TYP — FREE-STANDING ENCLOSURE HOUSEKEEPING PAD MOUNTING DETAIL

NOT TO SCALE

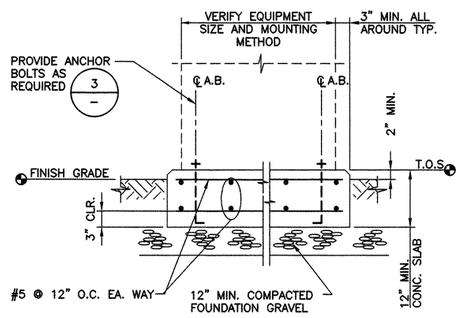


NOTES:

1. PROVIDE A 1/8" NEOPRENE SPACER BETWEEN THE ENCLOSURE BASE PLATE AND THE CONCRETE SURFACE. OVERSIZE THE SPACER BY 1/4" ON ALL SIDES. EPOXY THE SPACER TO THE BOTTOM OF THE BASE PLATE PRIOR TO INSTALLATION.
2. ANCHOR BOLTS AND HARDWARE SHALL BE 1/2"ø 316L STAINLESS STEEL WITH 4" EMBEDMENT.
3. PROVIDE 6" OR 12" RISERS PER CONTROL PANEL SCHEDULE ON SHEET E-4.

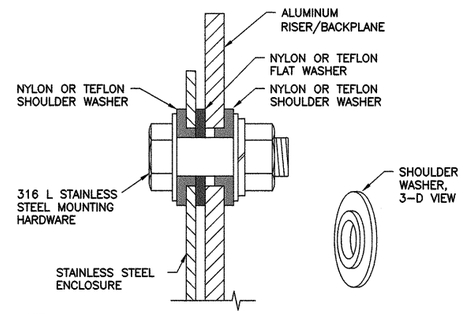
4 / TYP — FREE-STANDING ENCLOSURE RISER FEET MOUNTING DETAIL

NOT TO SCALE



5 / TYP — 12" CONCRETE PAD DETAIL

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



NOTE:

1. PROVIDE TEFLON OR NYLON SHOULDER WASHERS BETWEEN STAINLESS STEEL MOUNTING HARDWARE AND STRUCTURES/ENCLOSURES. SEPARATE STAINLESS STEEL ENCLOSURES FROM ALUMINUM RISERS OR BACKPLANES WITH A FLAT TEFLON OR NYLON WASHER AS SHOWN.

6 / TYP — SHOULDER WASHER MOUNTING DETAIL

NOT TO SCALE

0 1" 2"

TWO INCHES AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

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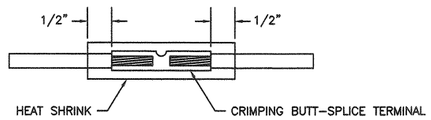
No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — 9114 — REGISTERED PROFESSIONAL ENGINEER

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY
WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
ELECTRICAL DETAILS

SHEET: ED-2
OF: 3

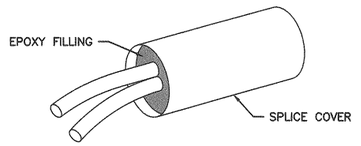
JOB NO.: 13224.02
DWG: E_DET



NOTES:

1. TRIMMED PORTION OF WIRES SHALL PENETRATE TO THE FULL DEPTH SPLICE TERMINAL AND BE CRIMPED PER MANUFACTURER'S RECOMMENDATIONS.
2. HEAT SHRINK OVERLAY SHALL BE 1/2" MINIMUM, THEN WRAPPED WITH ELECTRICAL TAPE TO PROVIDE INSULATION LEVEL TO CODE.

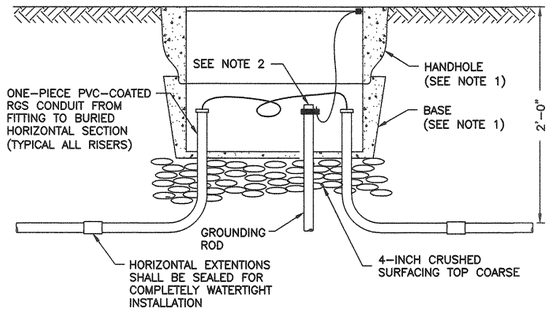
1 TYP **BUTT-SPLICE TERMINATING DETAIL**
NOT TO SCALE



NOTES:

1. PROVIDE CRIMPED SPLICE INSIDE THE SLICE COVER.
2. FILL WITH EXOPY PER MANUFACTURER'S RECOMMENDATIONS.
3. SUBMERGE THE SPLICE AND TEST FOR WATER-TIGHT INTEGRITY.

2 TYP **WATER-TIGHT EXPOXIED SPLICE KIT DETAIL**
NOT TO SCALE

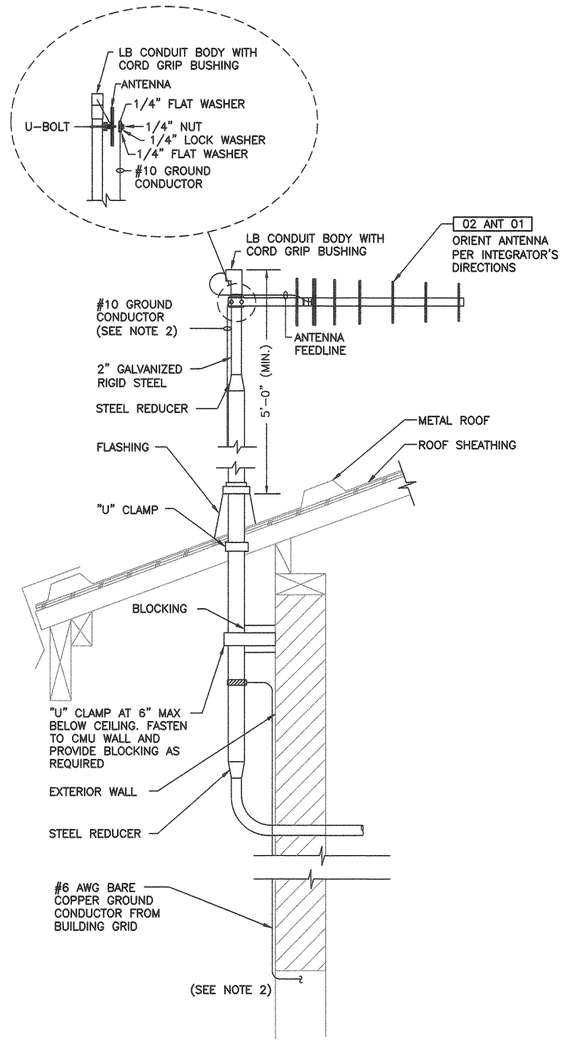


NOTES:

1. FOGTITE INC. #2SL HANDHOLE COMPLETE WITH GALVANIZED STEEL LID, RATED H-20 LOADING, WITH POSITIVE LOCK, AND WITH #2SL BASE. FURNISH AND INSTALL PULL BOX ASSEMBLY ON TOP OF 4-INCH THICK CRUSHED SURFACING TOP COURSE. PROVIDE LID WITH "POWER" LEGEND.
2. PROVIDE GROUND ROD AND BRAID INSIDE HANDHOLE WITH METAL PARTS OR METAL LID. REFERENCE SPECIFICATION 16060.

3 TYP **HANDHOLE DETAIL**
NOT TO SCALE

4 E4-1 **AREA 04 - EXISTING SOUTH WELLFIELD FIELD OPERATIONS BLDG. LIGHTING**
NOT TO SCALE



NOTES:

1. PROVIDE WEATHER SEAL AT ANTENNA / ANTENNA FEED LINE CONNECTION.
2. EXOTHERMICALLY WELD GROUND CONDUCTOR DIRECTLY TO GROUND ROD. TIE CABLE GROUND CONDUCTOR TO MAST EVERY 2'-0". CONNECT TO GROUNDING SYSTEM AS SHOWN ON GROUNDING ONE LINE DIAGRAM.
3. THE ANTENNA IS EXISTING AND SHALL BE REUSED FROM THE PREVIOUS RTU. THE CONTRACTOR SHALL PROVIDE AND INSTALL A NEW MAST, CABLE, AND MOUNTING HARDWARE PER MANUFACTURER'S RECOMMENDATIONS. THE INTEGRATOR SHALL CONNECT THE CABLES AND DIRECT THE ANTENNA.

5 TYP **ANTENNA MOUNTING DETAIL**
NOT TO SCALE

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

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CONSULTING ENGINEERS
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OLYMPIA, WA 98502 • (360) 292-7418

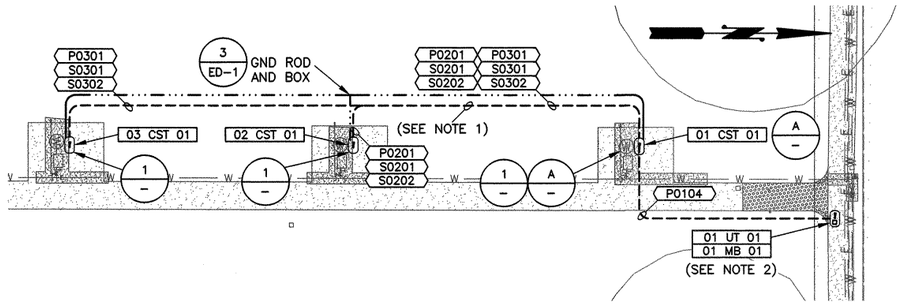
DATE: FEB 2016	SCALE: NOTED	DRAWN: TMR	CHECKED: PAM	APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — 15251 — REGISTERED PROFESSIONAL ENGINEER — 2/13/17

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT PROJECT REBID
ELECTRICAL DETAILS

SHEET: **ED-3**
OF: **3**
JOB NO.: 13224.02
DWG: E_DET

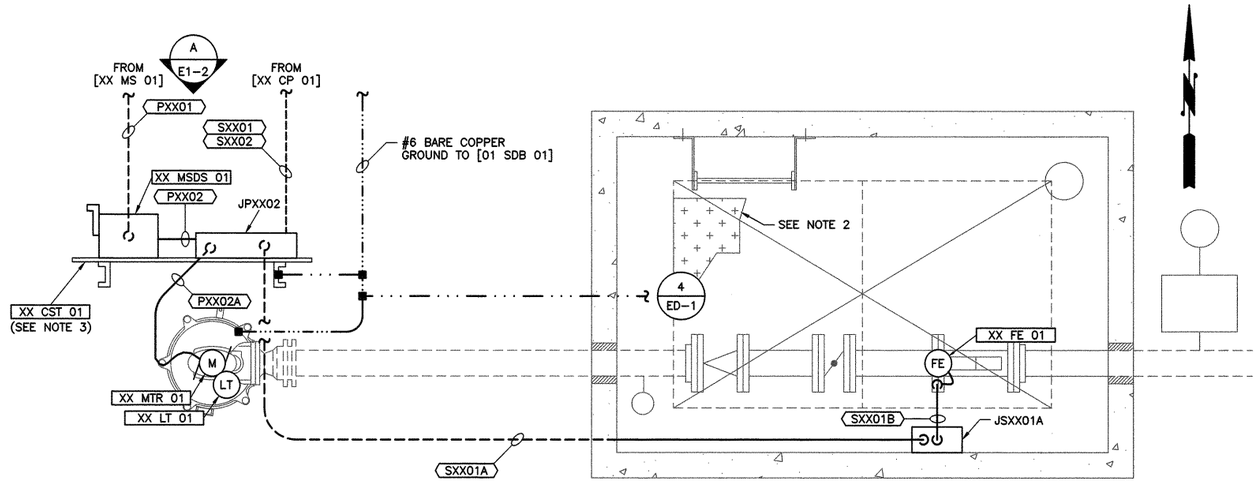


SOUTH WELLFIELD SITE ELECTRICAL PLAN

SCALE: 1"=40'

NOTES:

1. RUN BARE #6 AWG GROUNDING ELECTRODE CONDUCTOR FOR THE WELLHEADS IN THE SAME TRENCH AS THE CONDUITS FOR POWER AND SIGNAL.
2. MOUNT THE METERBASE ON NEW UNISTRUT FRAME WITH CONCRETE BASE PER (5 / ED-2).



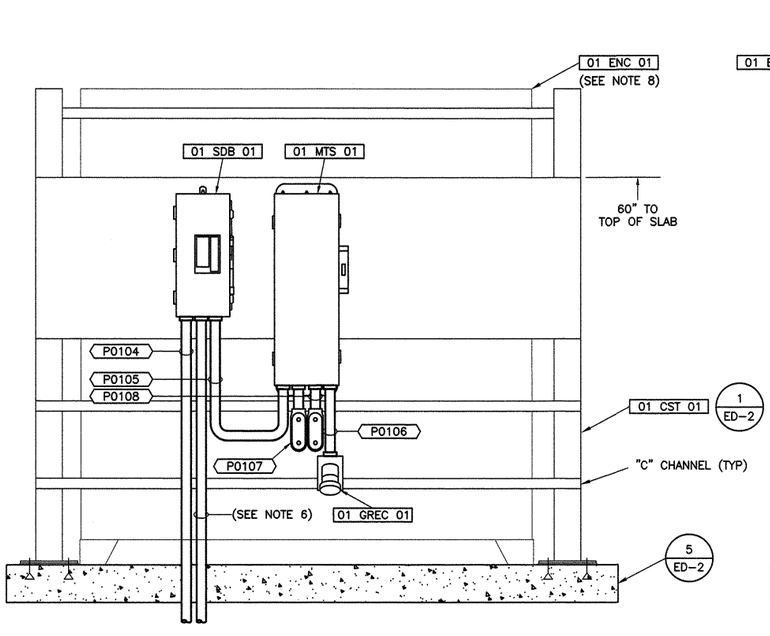
NOTES:

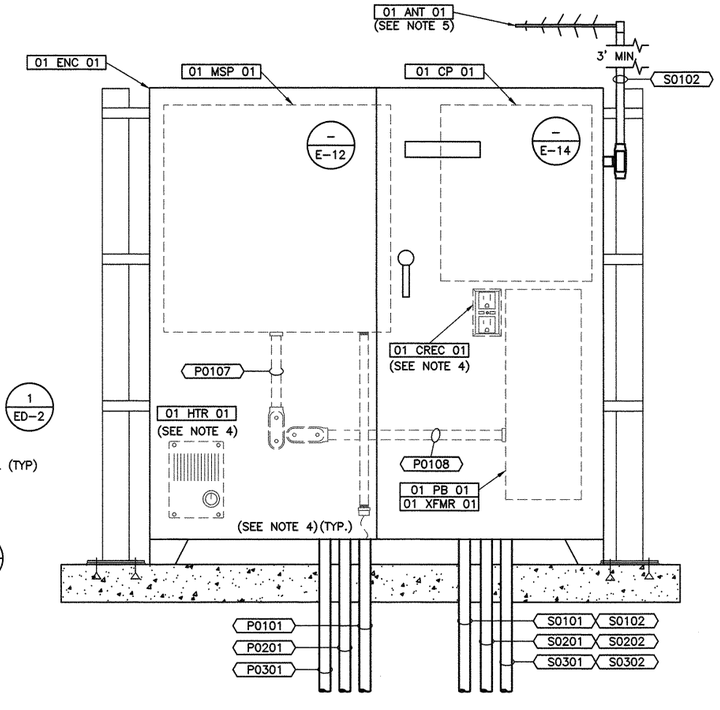
1. THIS IS A TYPICAL PLAN AND SITES MAY VARY. REFERENCE M-SHEETS.
2. ALL GROUNDING SHALL BE PER SPECIFICATION 16060. WELL HEAD GROUND SHALL ENTER AND EXIT GRADE IN PVC-80 (A / E1-2).
3. IN AREA 01 [01 MSDS 01] AND JP0102 ARE SHOWN ON SEPARATE CONTROL STATIONS FOR CLARITY ONLY AND MAY BE MOUNTED ON THE POWER DISTRIBUTION RACK.

(1 / TYP.) AREAS 01/02/03 - WIEGARDT WELLS NO. 1, NO. 2 AND NO. 3 PLAN

SCALE: 1"=1'-0"

XX = 01 FOR AREA 01, WELL NO. 1
XX = 02 FOR AREA 02, WELL NO. 2
XX = 03 FOR AREA 03, WELL NO. 3





NOTES:

1. CONDUITS SHALL ENTER AND EXIT FROM THE BOTTOM OF ENCLOSURES. WHERE THIS IS NOT POSSIBLE, CONNECT CONDUITS TO ENCLOSURES WITH MEYERS HUBS. ALL CONDUIT CONNECTIONS SHALL BE RAINTIGHT.
2. DEVICES SHALL BE NEMA RATED AS CALLED ON SHEET E-4.
3. DEVICES INSIDE ENCLOSURE [01 ENC 01] ARE SHOWN FADED HERE FOR CLARITY, BUT SHALL BE PROVIDED BY CONTRACTOR.
4. CONDUITS ARE SHOWN FOR CLARITY, INTEGRATOR MAY USE METALLIC WIREWAYS (GUTTERS) FOR ROUTING CONDUITS IN [01 ENC 01]. CONDUIT/WIREWAY CONNECTIONS TO RECEPTACLE [01 CREC 01] AND HEATER [01 HT 01] ARE NOT GIVEN CONDUIT NUMBERS.
5. MOUNT A 2" MAST TO THE SIDE OF ENCLOSURE [01 ENC 01] FOR THE ANTENNA. PLACE AND ORIENT ANTENNA PER INTEGRATOR'S DIRECTION.
6. BARE SYSTEM GROUND WIRE EMERGING FROM CONCRETE SHALL BE PROTECTED WITH PVC SCHEDULE 80 TO 2' BELOW FINISHED GRADE.
7. GROUNDING OF CONTROL STATION AND CONNECTION TO THE GROUND SYSTEM NOT SHOWN HERE.
8. IN AREA 01 THE POWER DISTRIBUTION RACK MAY BE MODIFIED TO HOLD [01 MSDS 01] AND JP0102. SEPARATE CONTROL STATIONS ARE SHOWN FOR CLARITY ONLY.

(A / TYP.) CONTROL STATION [01 CST 01] ELEVATIONS

NOT TO SCALE

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

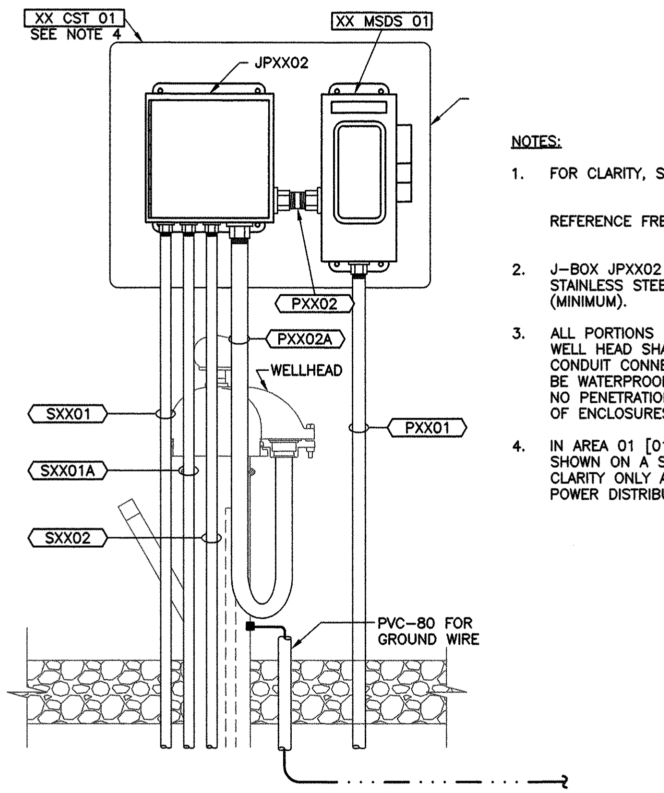
DATE: FEB 2016
SCALE: NOTED
DRAWN: TMR
CHECKED: PAM
APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEW QUIST
STATE OF WASHINGTON
21931
REGISTERED
PROFESSIONAL
ENGINEER
7/12/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT
PROJECT REBID
AREAS 01/02/03 - SOUTH WELLFIELD SITE
ELECTRICAL PLAN AND TYPICAL WELL PLAN

SHEET: E1-1
OF: 2
JOB NO.: 13224.02
DWG: E_SP_A123



NOTES:

1. FOR CLARITY, SUPPORT POSTS ARE NOT SHOWN.

   REFERENCE FREESTANDING BACKPLANE 1/ED-2.

2. J-BOX JPXX02 SHALL BE NEMA 4X, 304 STAINLESS STEEL, 12" H x 12" W x 6" D (MINIMUM).

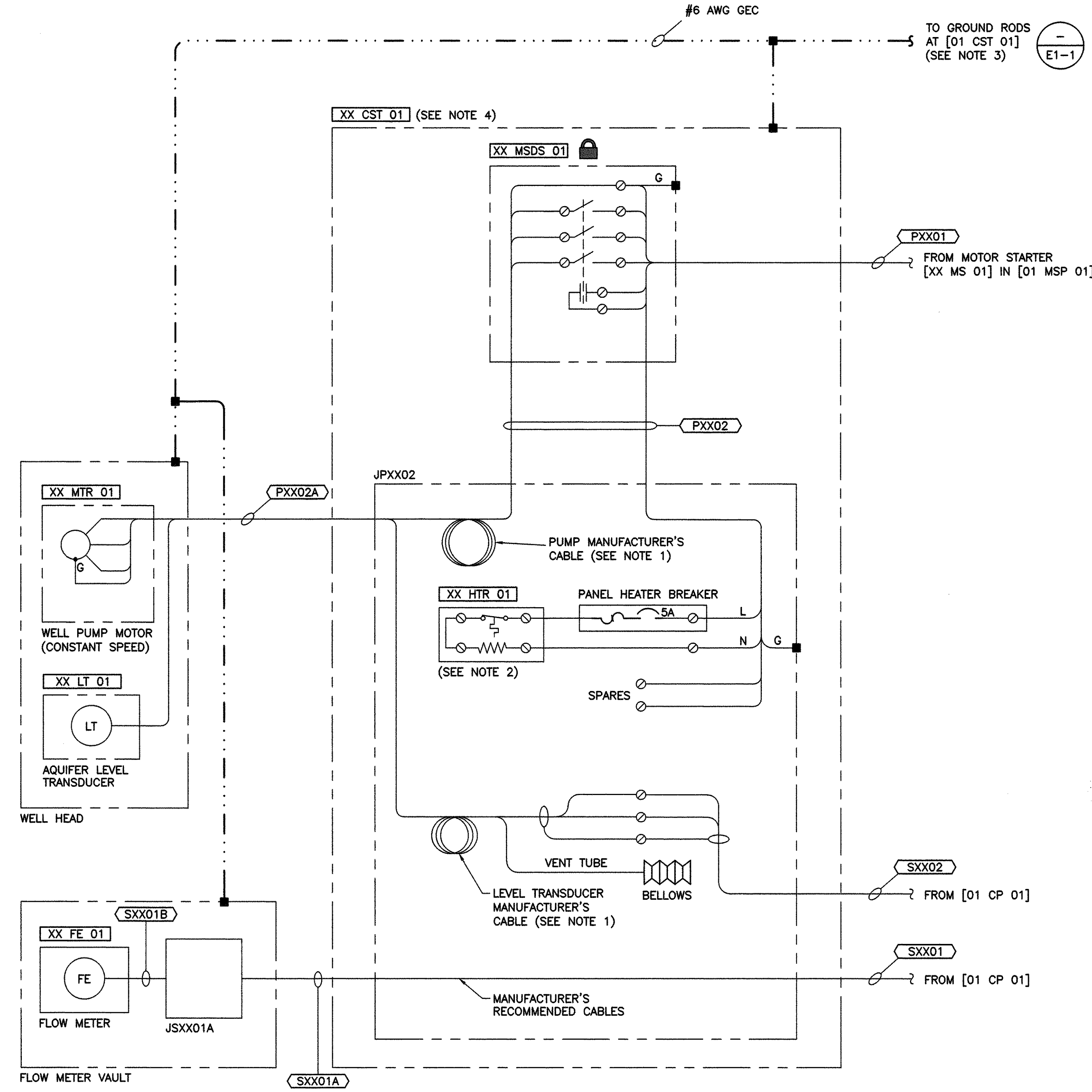
3. ALL PORTIONS OF EXPOSED CONDUIT AT THE WELL HEAD SHALL BE PVC-COATED RGS. ALL CONDUIT CONNECTIONS INTO ENCLOSURES SHALL BE WATERPROOF THROUGH MYER-TYPE HUBS. NO PENETRATIONS SHALL BE MADE INTO THE TOP OF ENCLOSURES.

4. IN AREA 01 [01 MSDS 01] AND JP0102 ARE SHOWN ON A SEPARATE CONTROL STATION FOR CLARITY ONLY AND MAY BE MOUNTED ON THE POWER DISTRIBUTION RACK.

A/– WELL PUMP CONTROL STATION [XX CST 01]

SCALE: 1" = 1'-0"

XX = 01 FOR AREA 01, WELL NO. 1
XX = 02 FOR AREA 02, WELL NO. 2
XX = 03 FOR AREA 03, WELL NO. 3



NOTES:

1. COIL 36 INCHES OF EXTRA LENGTHS OF PUMP MOTOR AND AQUIFER LEVEL TRANSDUCER MANUFACTURER'S CABLES IN JPXX01.
2. 120 VAC POWER TO [XX HTR 01] IS DERIVED FROM THE CONTROL POWER CIRCUIT OF [XX MS 01].
3. RUN #6 AWG BARE COPPER GROUND WIRE TO WELL HEAD AND CONTROL STATION STRUCTURE.
4. IN AREA 01 [01 MSDS 01] AND JP0102 ARE SHOWN ON A SEPARATE CONTROL STATION FOR CLARITY ONLY AND MAY BE MOUNTED ON THE POWER DISTRIBUTION RACK.

3/– CONTROL STATION [XX CST 01] CONNECTION DIAGRAM

NOT TO SCALE

XX = 01 FOR AREA 01, WELL NO. 1
XX = 02 FOR AREA 02, WELL NO. 2
XX = 03 FOR AREA 03, WELL NO. 3

0 1" 2"
TWO INCHES AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

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CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

DATE: FEB 2016
SCALE: NOTED
DRAWN: TMR
CHECKED: PAM
APPROVED: JRN

No.	REVISION	DATE	APP'D

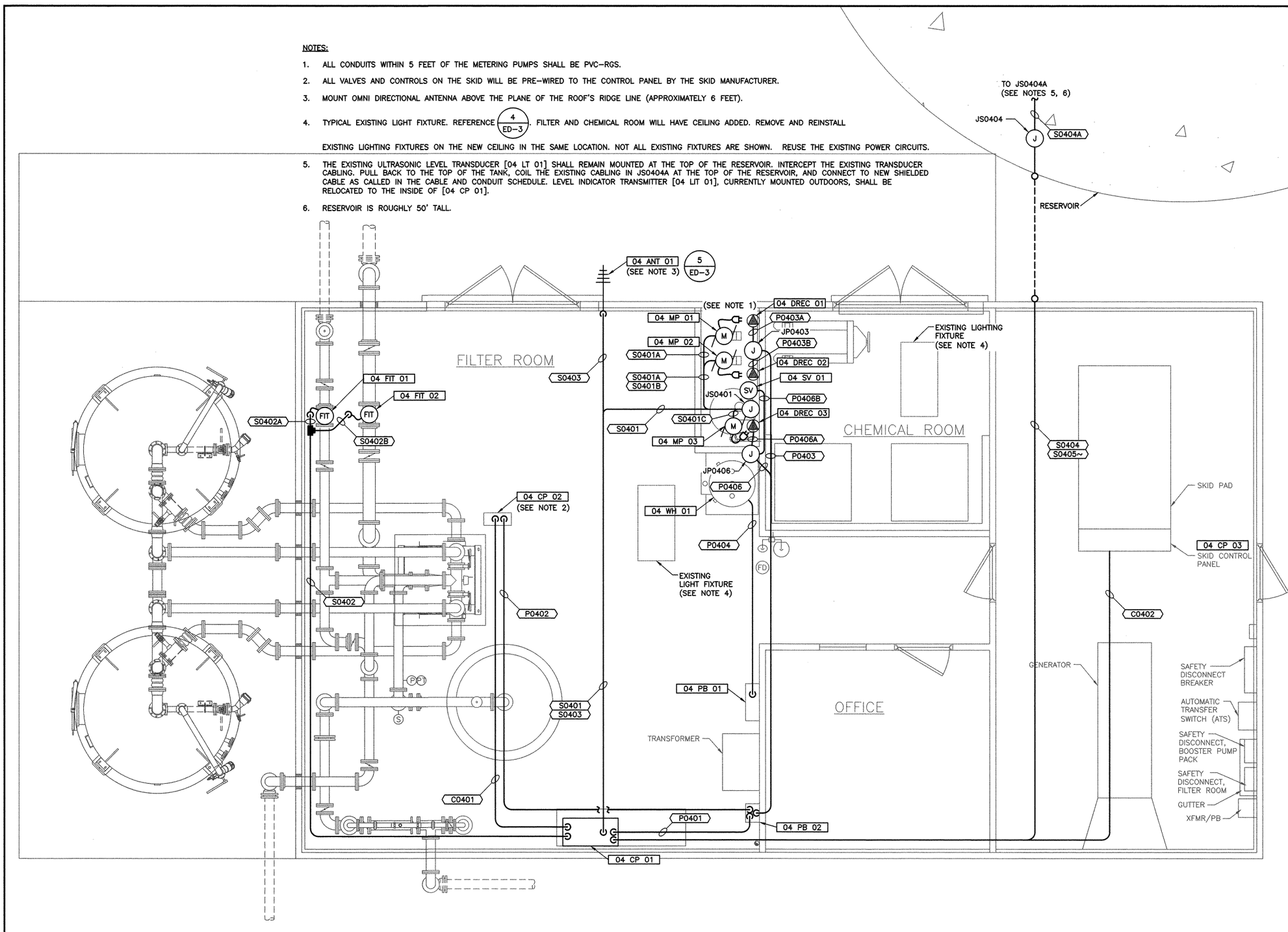
JASON R. NEWQUIST, STATE OF WASHINGTON, REGISTERED PROFESSIONAL ENGINEER 2/23/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY, WASHINGTON
WATER SUPPLY AND TREATMENT PROJECT REBID
AREAS 01/02/03 - WIEGARDT WELL NO. 1 - NO. 3 PLAN AND CONNECTION DIAGRAM

SHEET: E1-2
OF: 2
JOB NO.: 13224.02
DWG: E_A123_PLN

NOTES:

1. ALL CONDUITS WITHIN 5 FEET OF THE METERING PUMPS SHALL BE PVC-RGS.
2. ALL VALVES AND CONTROLS ON THE SKID WILL BE PRE-WIRED TO THE CONTROL PANEL BY THE SKID MANUFACTURER.
3. MOUNT OMNI DIRECTIONAL ANTENNA ABOVE THE PLANE OF THE ROOF'S RIDGE LINE (APPROXIMATELY 6 FEET).
4. TYPICAL EXISTING LIGHT FIXTURE. REFERENCE 4/ED-3. FILTER AND CHEMICAL ROOM WILL HAVE CEILING ADDED. REMOVE AND REINSTALL EXISTING LIGHTING FIXTURES ON THE NEW CEILING IN THE SAME LOCATION. NOT ALL EXISTING FIXTURES ARE SHOWN. REUSE THE EXISTING POWER CIRCUITS.
5. THE EXISTING ULTRASONIC LEVEL TRANSDUCER [04 LT 01] SHALL REMAIN MOUNTED AT THE TOP OF THE RESERVOIR. INTERCEPT THE EXISTING TRANSDUCER CABLING. PULL BACK TO THE TOP OF THE TANK, COIL THE EXISTING CABLING IN JS0404A AT THE TOP OF THE RESERVOIR, AND CONNECT TO NEW SHIELDED CABLE AS CALLED IN THE CABLE AND CONDUIT SCHEDULE. LEVEL INDICATOR TRANSMITTER [04 LIT 01], CURRENTLY MOUNTED OUTDOORS, SHALL BE RELOCATED TO THE INSIDE OF [04 CP 01].
6. RESERVOIR IS ROUGHLY 50' TALL.



1/– AREA 04 - SOUTH WELLFIELD OPERATIONS BUILDING ELECTRICAL PLAN

SCALE: 3/8"=1'-0"

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

Gray & Osborne, Inc.
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DATE: FEB 2016
SCALE: NOTED
DRAWN: TMR
CHECKED: PAM
APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — 21903 — REGISTERED PROFESSIONAL ENGINEER
2/13/14

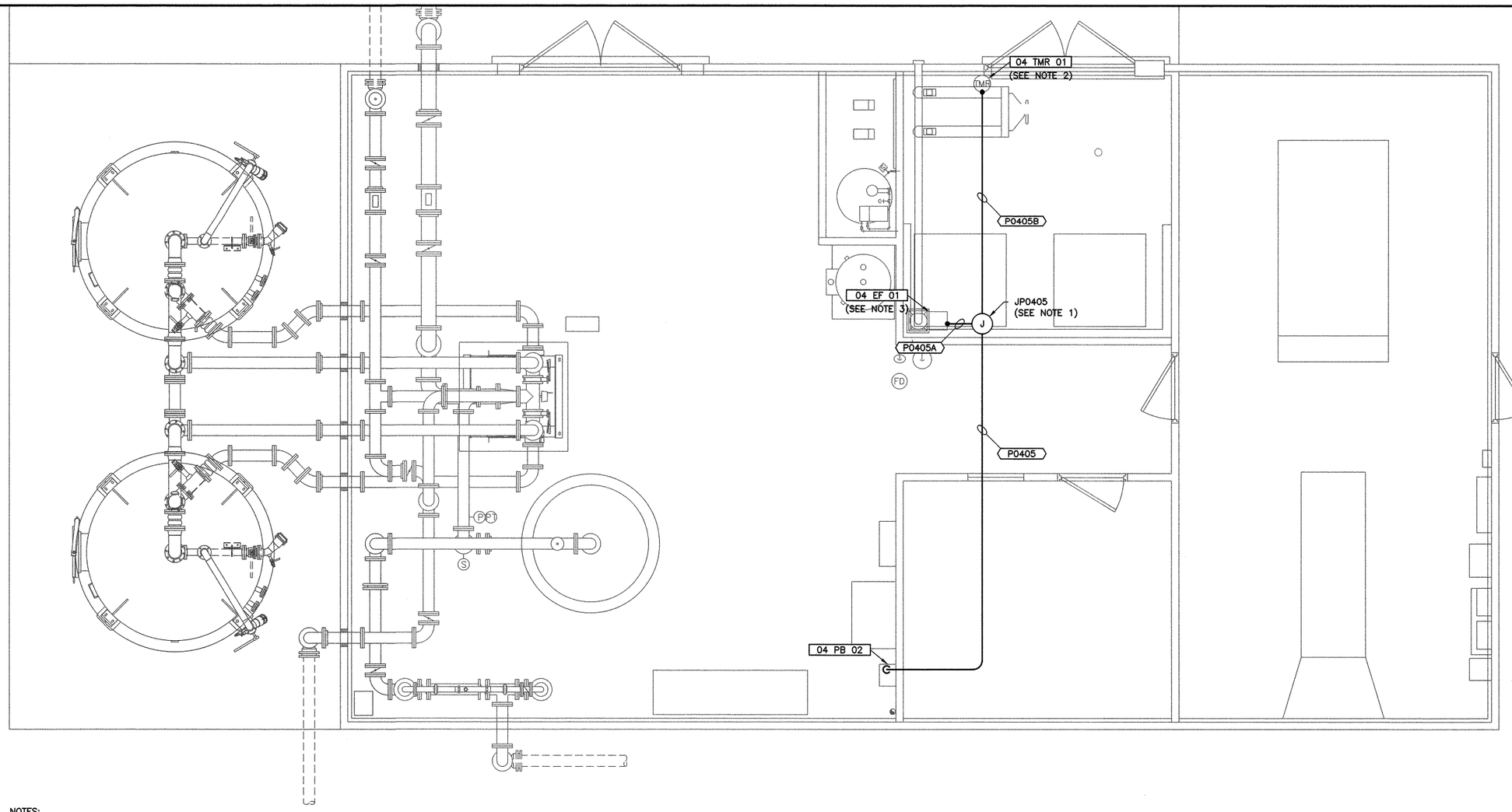
NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON

WATER SUPPLY AND TREATMENT
PROJECT REBID

AREA 04 - SOUTH WELLFIELD OPERATIONS
BUILDING ELECTRICAL PLAN

SHEET: E4-1
OF: 2

JOB NO.: 13224.02
DWG: E_A4_BLDG



NOTES:

1. SPLICING SHALL BE ALLOWED IN JP0405. (2 / ED-3)
2. [04 TMR 01] SWITCHES THE POWER TO [04 EF 01].
3. IF NOT PROVIDED AS INTEGRAL TO THE UNIT PROVIDE MOTOR RATED SNAP SWITCH TO SERVE AS A MOTOR SAFETY DISCONNECT FOR [04 EF 01].

(1 / –) AREA 04 - SOUTH WELLFIELD TREATMENT BUILDING HVAC ELECTRICAL PLAN

SCALE: 3/8"=1'-0"

0 1" 2"

TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

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DATE:	FEB 2016
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No.	REVISION	DATE	APPD

JASON R. NEWQUIST — STATE OF WASHINGTON — 19151 — REGISTERED PROFESSIONAL ENGINEER — 2/23/16

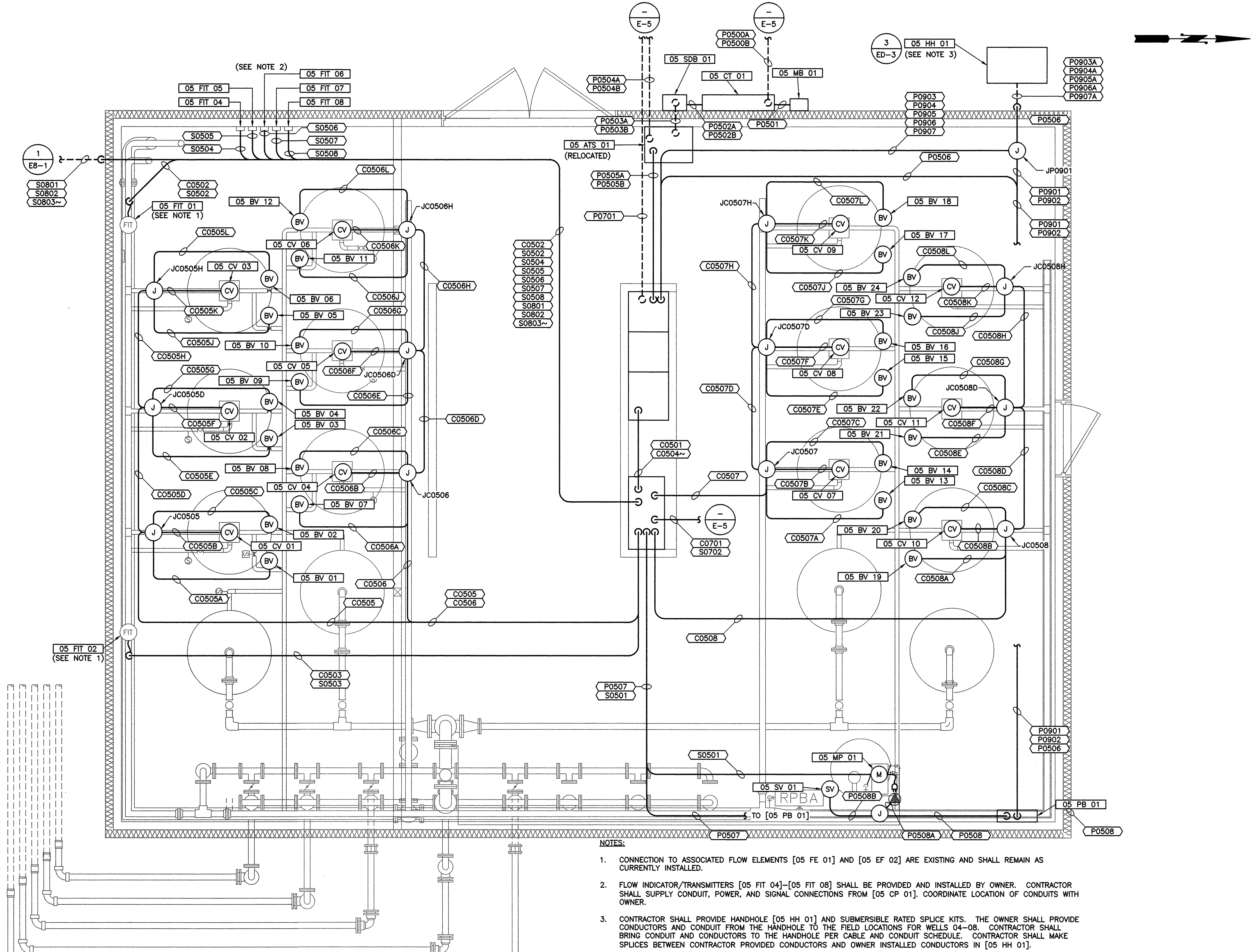
NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON

WATER SUPPLY AND TREATMENT
PROJECT REBID

AREA 04 - SOUTH WELLFIELD TREATMENT BUILDING
HVAC ELECTRICAL PLAN

SHEET: E4-2
OF: 2

JOB NO.: 13224.02
DWG: E_A4_BLDG



NOTES:

1. CONNECTION TO ASSOCIATED FLOW ELEMENTS [05 FE 01] AND [05 EF 02] ARE EXISTING AND SHALL REMAIN AS CURRENTLY INSTALLED.

2. FLOW INDICATOR/TRANSMITTERS [05 FIT 04]-[05 FIT 08] SHALL BE PROVIDED AND INSTALLED BY OWNER. CONTRACTOR SHALL SUPPLY CONDUIT, POWER, AND SIGNAL CONNECTIONS FROM [05 CP 01]. COORDINATE LOCATION OF CONDUITS WITH OWNER.

3. CONTRACTOR SHALL PROVIDE HANDHOLE [05 HH 01] AND SUBMERSIBLE RATED SPLICE KITS. THE OWNER SHALL PROVIDE CONDUCTORS AND CONDUIT FROM THE HANDHOLE TO THE FIELD LOCATIONS FOR WELLS 04-08. CONTRACTOR SHALL BRING CONDUIT AND CONDUCTORS TO THE HANDHOLE PER CABLE AND CONDUIT SCHEDULE. CONTRACTOR SHALL MAKE SPLICES BETWEEN CONTRACTOR PROVIDED CONDUCTORS AND OWNER INSTALLED CONDUCTORS IN [05 HH 01].

1 / – **AREA 05 - NORTH WELLFIELD WTP MODIFIED ELECTRICAL PLAN**

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

0 1" 2"
TWO INCHES AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

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DATE:	FEB 2016
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DRAWN:	TMR
CHECKED:	PAM
APPROVED:	JRN

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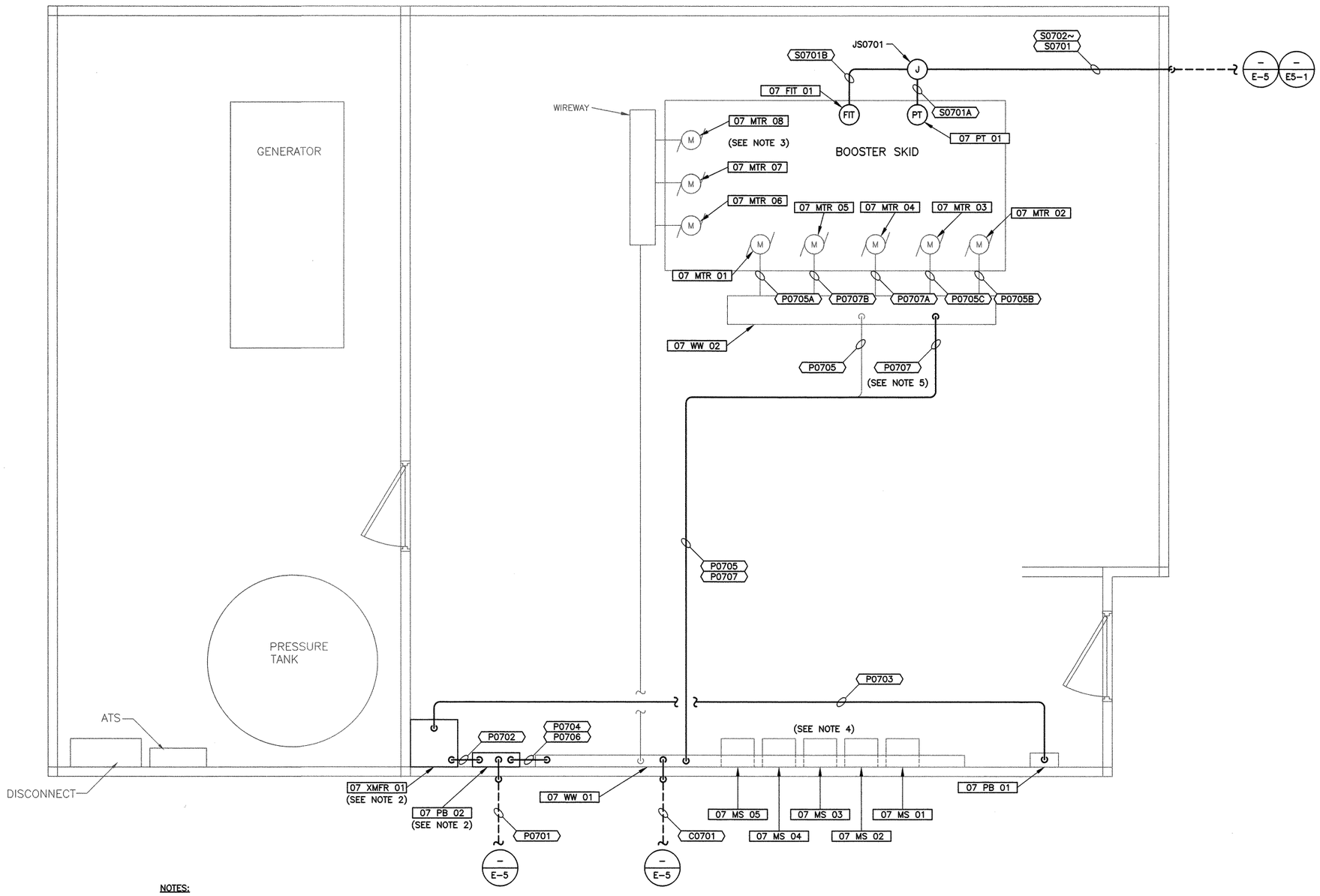
NORTH BEACH WATER DISTRICT
PACIFIC COUNTY WASHINGTON
WATER SUPPLY AND TREATMENT PROJECT REBID
AREA 05 - NORTH WELLFIELD WTP MODIFIED ELECTRICAL PLAN

SHEET: E5-1
OF: 1

JOB NO.: 13224.02
DWG: E_A5_BLDG



NOTES:

1. BUILDING DIMENSIONS AND DEVICE POSITIONS ARE APPROXIMATE.
2. DEMOLITION TO MAKE ROOM AND CODE REQUIRED CLEARANCES FOR THE TRANSFORMER AND NEW PANELBOARD [07 PB 02] SHALL BE BY OWNER.
3. BOOSTER SKID MOTORS 06-08 ARE NOT IN USE. THEY ARE SHOWN FOR REFERENCE ONLY.
4. FOR CLARITY, CONDUITS BETWEEN THE EXISTING MOTOR STARTERS AND THE EXISTING WIREWAY ABOVE THEM ARE NOT SHOWN HERE. REFER TO THE CABLE AND CONDUIT SCHEDULE.
5. NEW CONDUIT P0707 IS REQUIRED FOR CODE COMPLIANCE.

1 / – **AREA 07 - NORTH WELLFIELD BOOSTER STATION MODIFIED ELECTRICAL PLAN**
SCALE: 1/2"=1'-0"

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

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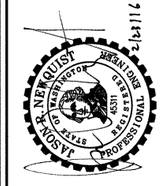

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY
WASHINGTON

WATER SUPPLY AND TREATMENT
PROJECT REBID

AREA 07 - NORTH WELLFIELD BOOSTER STATION
MODIFIED ELECTRICAL PLAN

SHEET: E7-1
OF: 1

JOB NO.: 13224.02
DWG: E_A7_BLDG

NOTES:

1. THE EXISTING ULTRASONIC LEVEL TRANSDUCER [08 LT 01] SHALL REMAIN MOUNTED AT THE TOP OF THE RESERVOIR. INTERCEPT THE EXISTING TRANSDUCER CABLING. PULL BACK TO THE TOP OF THE TANK, COIL THE EXISTING CABLING IN JS0801A AT THE TOP OF THE RESERVOIR, AND CONNECT TO NEW SHIELDED CABLE AS CALLED IN THE CABLE AND CONDUIT SCHEDULE. LEVEL INDICATOR TRANSMITTER [08 LIT 01], CURRENTLY MOUNTED OUTDOORS, SHALL BE RELOCATED TO THE INSIDE OF [05 CP 01].

5. RESERVOIR IS ROUGHLY 50' TALL.

1 / – **AREA 08 - RESERVOIR NO. 2**

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

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DATE: FEB 2016	SCALE: NOTED	DRAWN: TMR	CHECKED: PAM	APPROVED: JRN

No.	REVISION	DATE	APPD

JASON R. NEMQUIST
STATE OF WASHINGTON
REGISTERED
16311
PROFESSIONAL
ENGINEER
2/23/16

NORTH BEACH WATER DISTRICT
PACIFIC COUNTY
WASHINGTON

WATER SUPPLY AND TREATMENT
PROJECT REBID

AREA 08 - NORTH WELLFIELD EXISTING RESERVOIR NO. 2

SHEET: E8-1
OF: 1

JOB NO.: 13224.02
DWG: E_A9_WELL4