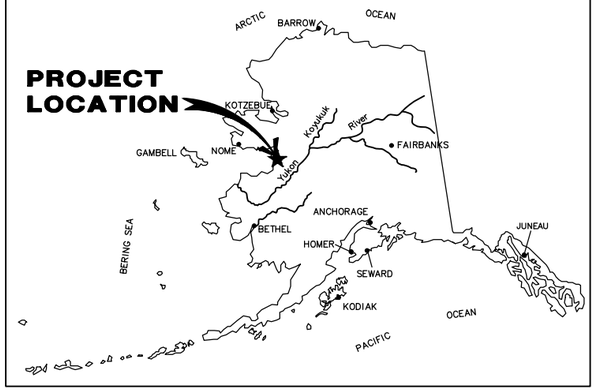
# CITY OF UNALAKLEET, ALASKA
# SANITATION IMPROVEMENTS

# WATER TREATMENT PLANT 2019 UPGRADES

In Cooperation with the State of Alaska
Department of Environmental Conservation
Village Safe Water Program




## LOCATION MAP

PROJECT NUMBER (CONSULTANT) 80901.02 (VSW) _____
VSW PROJECT MANAGER AARON WHEATALL
CONSTRUCTION FOREMAN _____
FINAL DESIGN (DATE) 8/2019
ADEC APPROVAL (DATE) 6/2020
CONSTRUCTION PERIOD (FROM) _____ (To) _____
AS-BUILTS (DATE) _____

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## CONSULTANT

STATUS:
ISSUED FOR CONSTRUCTION

DATE:
JULY 2020

## PROJECT STATUS

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NOTE:
MAJOR PORTIONS OF THE WORK UNDER THIS PROJECT ARE SHOWN WITHIN CLOUDED AREAS. REFER TO PLANS FOR DETAILS AND EXTENT OF ACTUAL REQUIREMENTS.

POWERS CREEK
PUMP HOUSE
IV-101
FIT 101 METER
FIT-101
NEW TURBIDITY TAP LOCATION
NEW FLOW SWITCH
FS 101
FS-101
REPLACE RAW WATER ADD HEAT SYSTEM, SEE MECHANICAL
IV-105
IV-106
IV-104
BOOSTER PUMP
50 MICRON
COAGULANT INJECTION
ILSM-101
IV-151
CYCLONE
AIT 120
SCD
MCV-101
MCV-102
FI-110
AS 100 TURB
AIA 100
NEW TURBIDITY CONTROLLER
IV-102 FLUSH TO WASTE
AIT 200
F1 TURBIDITY
F2 TURBIDITY
IV-230
IV-241
CKV-241
PI-241
TI-241
FI-241
PRV-241
NEW RAW WATER BYPASS PANEL
BY PASS
AIA 300 TURBIDITY FLOW
240V/3Φ
MS-240
AIR BLOWER AB-240
CARV-211
CARV-221
72" DIA. FILTER
MMF-210
MMF-220
IV-214
IV-213
IV-223
IV-224
FIT 251
IV-211
IV-221
IV-212
IV-222
DPI-210
AS 221
FI-221
BACKWASH TO WASTE
TO SANITARY SEWER
FI-211
TURB
AS 211
IV-302
CKV-302
FE 251
AS-221 NO. 3
IV-305
IV-306
AE 321
NEW pH SENSOR AND TAP
IV-301 FILTER TO WASTE
LSA 000
NEW SUMP FLOAT SWITCH
DRAIN SUMP
TO SANITARY SEWER
FI-301
120V
AS 301
FIT 311
AIT 321 pH
NEW pH METER
FE 311
BACKFLOW PREVENTER BFP-251
REPLACE FLOW SWITCH
FS 321
LI-401
LI
FI-312
IV-307
EXISTING 1,000,000 GALLON POTABLE WATER
HWS
HWR
TANK WATER CIRCULATION PUMP
240V/3Φ
MS-252
120V
IV-252
PI-251
BACKWASH PUMP
BW-252
IV-251
REPLACE WST HEAT EXCHANGER AND PUMPS. SEE MECHANICAL
IV-400
FI-411
PRESSURE PUMPS
TV
HOT WATER
COLD WATER
WATER HEATER
FAA LOOP PUMPS
SE LOOP PUMPS
NE LOOP PUMPS
WEST LOOP PUMPS
SCHOOL LOOP PUMPS
WATER TREATMENT PLANT

CHEMICAL FEED ROOM
FP-100
FP-120
MX-120
120V
IV-111
LS 120
LS-120
NEAT COAGULANT
DILUTE COAGULANT
MX-310
FP-310
CHLORINE MIX TANK
CHLORINE SOLUTION TANK
FP-320
IV-321
MX-320
SODA ASH
BACKFLOW PREVENTER BFP-411
EYE WASH STATION AND DRENCH HOSE
OR 000
HONEYWELL
DATA CAB

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STATE OF ALASKA
49TH
William M. McDonald
CS-14218
7/6/2020
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

UNALAKLEET WTP UPGRADES
PROCESS AND INSTRUMENTATION DIAGRAM

DATE: JULY 2020
STATUS: ISSUED FOR CONSTRUCTION
PROJECT NO: 80901.02

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| REVISION | | | |

SCALE N/A
HOR. N/A
VER. N/A
DESIGNED BY TLM
DRAWN BY EME
CHECKED BY KRH
APPROVED BY –

SHEET NO.
D-001

PLOT DATE: 7/10/2020 8:23 AM
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## PIPING LEGEND

| EXISTING | DEMO | PROPOSED | |
|---|---|---|---|
| ——— | - - - - - - - | ——— | COLD WATER |
| — — — — — | - - - - - - - | — — — — | HEATING GLYCOL RETURN |
| — — — — — | ——— | — — — — | HEATING GLYCOL SUPPLY |
| WHGR | - - - - - - - | WHGR | RECOVERED HEAT RETURN |
| WHGR | - - - - - - - | WHGS | RECOVERED HEAT SUPPLY |
| HWS | ——— | HWS | HOT WATER SUPPLY |
| HWR | ——— | HWR | HOT WATER RETURN |
| FOR | ——— | FOR | FUEL OIL RETURN |
| FOS | ——— | FOS | FUEL OIL SUPPLY |

## PIPING SYMBOL LEGEND

- PIPE DOWN
- PIPE UP
- TEE DOWN
- TEE UP
- UNION
- REDUCER

## PIPING SYMBOL LEGEND (CONTINUED)

- ISOLATION VALVE
- CHECK VALVE
- PRESSURE TEMPERATURE/RELIEF
- CAP
- PRESSURE GAUGE
- SIGHT FLOW INDICATOR
- THERMOMETER
- BALANCE VALVE
- STRAINER WITH BLOWDOWN
- PUMP
- AUTOMATIC AIR VENT WITH ISOLATION VALVE
- FLEX PIPE CONNECTION
- ISOLATION FLANGE
- BUTTERFLY VALVE

## LOGIC LEGEND

- CONNECTION POINT
- SHEET NOTE (#)
- ELECTROMAGNETIC FLOWMETER (M)

## P&ID LEGEND

- EXISTING CONTROL PANEL (XX)
- PROPOSED CONTROL PANEL (PLC) (XX / XX)
- FIELD INSTRUMENT (XX / XX)
- INSTRUMENT (BACK OF DOOR) (XX / XX)
- INSTRUMENT INSIDE PANEL (XX / XX)
- PANEL MOUNTED INSTRUMENT (XX / XX)
- INSTRUMENT CONTROLLER (XX / XX)
- ELECTRICAL POWER TO DEVICE
- ANALOG SIGNAL/DATA (A)
- DIGITAL SIGNAL(S) (D)
- DATA BUS (INTERNAL LOGIC PATH)
- DATA HIGHWAY (BETWEEN PLC's)
- 120 — C(X) CONTACTOR x = PANEL
- MS(X) MAGNETIC MOTOR STARTER x = PANEL

## ABBREVIATIONS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AAV | AUTOMATIC AIR VENT | CONT | CONTINUED | FLA | FULL LOAD AMPS | HOA | HAND OFF AUTOMATIC SWITCH | N/A | NOT APPLICABLE | UH–X | UNIT HEATER DESIGNATOR |
| AFF | ABOVE FINISHED FLOOR | CP–X | CIRCULATION PUMP DESIGNATOR | FOR | FUEL OIL RETURN | HP | HORSEPOWER | N.O. | NORMALLY OPEN | UL | UNDERWRITERS LABORATORIES |
| AMP | AMPERES | CPVC | CHLORINATED POLYVINYL CHLORIDE | FOS | FUEL OIL SUPPLY | HR | HOUR | NTS | NOT TO SCALE | UPC | UNIFORM PLUMBING CODE |
| ARCH | ARCHITECTURAL | CU | COPPER | FPT | FEMALE PIPE THREAD | HX–X | HEAT EXCHANGER DESIGNATOR | OD | OUTSIDE DIAMETER | UVEC | UNALAKLEET VALLEY ELECTRICAL COOPERATIVE |
| ASME | AMERICAN SOCIETY OF MECHANICAL ENGINEERS | DEG | DEGREE | FST | FUEL STORAGE TANK | HWR | HOT WATER RETURN | PD | PRESSURE DROP | | |
| ASTM | AMERICAN SOCIETY FOR TESTING AND MATERIALS | DIA / ⌀ | DIAMETER | FT | FEET | HWS | HOW WATER SUPPLY | PG | PROPYLENE GLYCOL | VAC | VOLT–AC |
| AS–X | AIR SEPARATOR DESIGNATOR | DIM | DIMENSION | GA | GAUGE | IN | INCHES | PH | PHASE | VDC | VOLT–DC |
| BLDG | BUILDING | DN | DOWN | GAL | GALLONS | MAX | MAXIMUM | PRV | PRESSURE RELIEF VALVE | VFD | VARIABLE FREQUENCY DRIVE |
| BTUH | BRITISH THERMAL UNIT/HOUR | EG | ETHYLENE GLYCOL | GPM | GALLONS PER MINUTE | MCV | MOTORIZED CONTROL VALVE | PSI | POUNDS PER SQUARE INCH | W/ | WITH |
| B–X | BOILER DESIGNATOR | ET–X | EXPANSION TANK DESIGNATOR | GT–X | GLYCOL FILL TANK DESIGNATOR | MBH | THOUSAND BTUH | PSIG | POUNDS PER SQUARE INCH GAUGE | WHGR | RECOVERED HEAT RETURN |
| CAP | CAPACITY | EUH–X | ELECTRIC UNIT HEATER DESIGNATOR | HD | HEAD | MIN | MINIMUM | PVC | POLYVINYL CHLORIDE | WHGS | RECOVERED HEAT SUPPLY |
| CIRC | CIRCULATING | EXIST/(E) | EXISTING | HGR | HEATING GLYCOL RETURN | MPT | MALE PIPE THREAD | T'STAT | THERMOSTAT | WST | WATER STORAGE TANK |
| CONN | CONNECTION | F | FAHRENHEIT | HGS | HEATING GLYCOL SUPPLY | N.C. | NORMALLY CLOSED | TYP | TYPICAL | WTP | WATER TREATMENT PLANT |

## TAG NUMBERS

| TAG DEFINITIONS | |
|---|---|
| TAG | DEFINITION |
| AIA | ANALYSIS INDICATOR ALARM |
| AIT | ANALYSIS INDICATOR TRANSMIT |
| AS | ANALYSIS SENSOR (TURBIDITY) |
| CP | CONTROL PANEL |
| FI | FLOW INDICATOR |
| FIT | FLOW INDICATOR TRANSMITTER |
| FE | FLOW ELEMENT |

| | |
|---|---|
| FS | FLOW SWITCH |
| LS | LEVEL SWITCH |
| LSA | LEVEL SWITCH ALARM |
| NE | PH ELEMENT |
| PI | PRESSURE INDICATOR |
| TE | TEMPERATURE ELEMENT |
| TI | TEMPERATURE INDICATOR |
| TC | TEMPERATURE CONTROLLER |
| TS | TEMPERATURE SWITCH |

TYPICAL FORMAT: LIT–250 – INSTRUMENT IDENTIFICATION OR TAG NUMBER
- LIT – FUNCTIONAL IDENTIFICATION
- L – FIRST–LETTER
- IT – SUCCEEDING–LETTER(S)
- 250 – LOOP NUMBER


EXPANDED FORMAT: LIT–250 A — TAG NUMBER — OPTIONAL SUFFIX

## CONTROL VALVE SCHEDULE

| TAG NO. | SERVICE | OPERATION | FLOW (GPM) | DEL P (PSI) | CV | SIZE (IN) | REMARKS |
|---|---|---|---|---|---|---|---|
| PRV–101 | HX–A PRESSURE RELIEF | –– | 41 | –– | –– | 3/4 | PRESSURE RELIEF VALVE 30 PSI |
| PRV–102 | HX–B PRESSURE RELIEF | –– | 30 | –– | –– | 3/4 | PRESSURE RELIEF VALVE 30 PSI. |
| PRV–103 | HX–C PRESSURE RELIEF | –– | 42 | –– | –– | 3/4 | PRESSURE RELIEF VALVE 30 PSI |
| PRV–104 | HX–D PRESSURE RELIEF | –– | 28 | –– | –– | 3/4 | PRESSURE RELIEF VALVE 30 PSI |
| MCV–101 | RAW WATER BYPASS | –– | 100 | –– | –– | 4 | MOTORIZED CONTROL VALVE, NSF 61 CERTIFIED. BRAY SERIES 31, SEE ELECTRICAL FOR ACTUATOR. |
| MCV–102 | RAW WATER BYPASS | –– | 100 | –– | –– | 4 | MOTORIZED CONTROL VALVE, NSF 61 CERTIFIED. BRAY SERIES 31, SEE ELECTRICAL FOR ACTUATOR. |


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STATE OF ALASKA — 49TH — ENGINEER — REGISTERED PROFESSIONAL — Loyl L. McKeon — ME-11388 — 7/6/2020

PROJECT NO. – | CITY GRID – | WATER GRID – | SEWER GRID –

UNALAKLEET WTP UPGRADES
MECHANICAL LEGEND, ABBREVIATIONS, AND SCHEDULES (1 OF 3)

PROJECT NO: 80901.02

STATUS: ISSUED FOR CONSTRUCTION

DATE: JULY 2020

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE: HOR. N/A VER. N/A | DESIGNED BY TLM | DRAWN BY EME | CHECKED BY KRH | APPROVED BY –

SHEET NO.

**M-000**

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## PUMP SCHEDULE

| SYMBOL | MANUFACTURER | MODEL | FUNCTION/LOCATION | PUMPED MEDIUM | GPM | TOTAL HEAD (FT) | W | MOTOR DATA (VOLTS/PH) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| CP-A | GRUNDFOS | MAGNA3 40-80F | MAIN CIRCULATION | 50% PG | 35 | 6 | 285 | 120/1 | PUMP TO BE PROVIDED WITH INTEGRAL DRY RUN PROTECTION AND VFD, SEALS TO BE SUITABLE FOR PROPYLENE GLYCOL |
| CP-B | GRUNDFOS | MAGNA3 32-100 F | RAW WATER HEAT ADD | 50% PG | 28 | 5 | 178 | 120/1 | PUMP TO BE PROVIDED WITH INTEGRAL DRY RUN PROTECTION AND VFD, SEALS TO BE SUITABLE FOR PROPYLENE GLYCOL. PROVIDE WITH TEMPERATURE SENSOR MODEL RPI+T2 |
| CP-C | GRUNDFOS | MAGNA3 32-100F | BOILER HEAT INJECTION | 50% PG | 28 | 5 | 178 | 120/1 | PUMP TO BE PROVIDED WITH INTEGRAL DRY RUN PROTECTION AND VFD, SEALS TO BE SUITABLE FOR PROPYLENE GLYCOL |
| CP-D | GRUNDFOS | MAGNA3 32-60 F | WST HEAT ADD | 50% PG | 28 | 4 | 106 | 120/1 | PUMP TO BE PROVIDED WITH INTEGRAL DRY RUN PROTECTION AND VFD, SEALS TO BE SUITABLE FOR PROPYLENE GLYCOL |
| CP-E | GRUNDFOS | MAGNA3 32-60 FN | WST HEAT ADD | WATER | 24 | 6 | 106 | 120/1 | PUMP TO BE PROVIDED WITH INTEGRAL DRY RUN PROTECTION AND VFD, SUITABLE FOR POTABLE WATER, NSF 61 CERTIFIED |
| CP-F | GRUNDFOS | UPS 15-42 | WTP HEAT LOOP | 50% PG | -- | -- | 85 | 120/1 | REPLACE EXISTING PUMP WITH SAME MODEL NUMBER, SEALS TO BE SUITABLE FOR PROPYLENE GLYCOL |

## HEAT EXCHANGERS SCHEDULE

| SYMBOL | MANUFACTURER | MODEL | FUNCTION/SERVICE | CAPACITY BTUH | HOT SIDE | | | | | COLD SIDE | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | FLUID | TEMP IN (DEG F) | TEMP OUT (DEG F) | FLOW (GPM) | PD (PSI) | FLUID | TEMP IN (DEG F) | TEMP OUT (DEG F) | FLOW (GPM) | PD (PSI) | |
| HX-A | SWEP | BDW35TDWM4x229 | SYSTEM ISOLATION | 460,000 | 50% EG | 180 | 150 | 35 | 0.5 | 50% PG | 140 | 170 | 35 | 0.5 | DOUBLE WALL BRAZED PLATE HEAT EXCHANGER, FLANGED CONNECTIONS, PROVIDE WITH FLOOR MOUNTING KIT. |
| HX-B | SWEP | BDW35TDWM4x36 | RAW WATER HEAT ADD | 252,000 | 50% PG | 170 | 150 | 28 | 1.5 | WATER | 35 | 50 | 33 | 1.5 | DOUBLE WALL BRAZED PLATE HEAT EXCHANGER, NSF 61 COMPLIANT |
| HX-C | SWEP | B120THX164 | WTP BOILER HEAT ADD | 320,000 | 50% PG | 170 | 145 | 28 | 0.5 | WATER | 140 | 165 | 26 | 0.5 | SINGLE WALL BRAZED PLATE HEAT EXCHANGER, FLANGED CONNECTIONS |
| HX-D | SWEP | BDW35TDMW4x42 | WST HEAT ADD | 240,000 | 50% PG | 160 | 140 | 28 | 1 | WATER | 40 | 60 | 24 | 1 | DOUBLE WALL BRAZED PLATE HEAT EXCHANGER, NSF 61 COMPLIANT |

## AIR SEPARATOR SCHEDULE

| SYMBOL | MANUFACTURER | MODEL | SIZE (IN) | CONNECTION | MATERIAL | FLUID | REMARKS |
|---|---|---|---|---|---|---|---|
| AS-A | SPIROTHERM | VDN250 | 2-1/2" | FLANGED | STEEL | 50% PG | LESS THAN 1 FOOT PRESSURE DROP, 35 GPM, REMOVABLE HEAD FOR CLEANING. AIR AND DIRT SEPARATOR |

## EXPANSION TANK SCHEDULE

| SYMBOL | MANUFACTURER | MODEL | FUNCTION | MEDIUM | MATERIAL | TANK VOLUME | | DIMENSIONS (IN) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | TOTAL (GAL) | ACCEPTANCE (GAL) | | |
| ET-A | AMTROL | AX-40 | HEAT RECOVERY | 50% PG | STEEL | 21.7 | 11.3 | 16 DIA X 30 H | PRECHARGE TO 12 PSIG |

## GLYCOL TANK SCHEDULE

| SYMBOL | MANUFACTURER | MODEL | FUNCTION | MEDIUM | MATERIAL | TANK CAPACITY (GAL) | DIMENSIONS (IN) | MOTOR DATA (VOLTS/PH) | AMP | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| GT-A | AXIOM | MF300 | GLYCOL MAKE UP | 50% PG | -- | 19 | 11.75 W x 11.75 L x 36 D | 115/1 | -- | PACKAGED UNIT WITH CONTROLS, SELF PRIMING TO 7 FT, PLUG AND CORD |

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STATE OF ALASKA — 49TH — ENGINEER — REGISTERED PROFESSIONAL — Troy L. McKeon — ME-11388 — 7/6/2020

PROJECT NO. -
CITY GRID -
WATER GRID -
SEWER GRID -

DATE: JULY 2020

UNALAKLEET WTP UPGRADES
MECHANICAL SCHEDULES (2 OF 3)

PROJECT NO: 80901.02

STATUS: ISSUED FOR CONSTRUCTION

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| REVISION | | | |

SCALE
HOR: N/A
VER: N/A
DESIGNED BY TLM
DRAWN BY EWE
CHECKED BY KRH
APPROVED BY -

SHEET NO.
**M-001**

## INSTRUMENTATION SCHEDULE

| LOOP | TAG NO | LOCATION | SERVICE | POWER | LIMITS | REMARKS |
|---|---|---|---|---|---|---|
| -- | OR-000 | WTP | FILTRATION | -- | -- | EXISTING DATA RECORDER. |
| -- | LSA-000 | WTP | FILTRATION | 120/1/13A | | TETHERED FLOAT SWITCH, DAYTON 6PNV7 |
| 100 | AS-100 | WTP | FILTRATION | -- | -- | EXISTING NEPHELOMETRIC TURBIDITY UNIT SENSOR |
| 100 | AIA-100 | WTP | FILTRATION | -- | -- | HACH SC200 WITH ANALOG INPUT MODULE P/N 9012800. FOR INSTALLATION, SEE ELECTRICAL. SERVE WITH FLOWMETER FIT-101 VIA 4-20mA. |
| | FIT-101 | WTP | FILTRATION | | | EXISTING RAW WATER FLOW METER |
| 100 | FS-101 | WTP | FILTRATION | -- | -- | FCI FLT93B WITH SADDLE FITTINGS AND PROBE LENGTH SET TO PLACE SENSOR AT CENTER OF PIPE. FOR INSTALLATION, SEE ELECTRICAL. |
| 200 | AIA-200 | WTP | FILTRATION | -- | -- | EXISTING FILTER 1 AND FILTER 2 TURBIDIMETER. USE RELAY OUTPUT FOR BYPASS. |
| 200 | AE-211 | WTP | FILTRATION | -- | -- | EXISTING FILTER 1 NEPHELOMETRIC TURBIDITY UNIT SENSOR. |
| 200 | AE-212 | WTP | FILTRATION | -- | -- | EXISTING FILTER 2 NEPHELOMETRIC TURBIDITY UNIT SENSOR. |
| 300 | AE-300 | WTP | FILTRATION | -- | -- | EXISTING NEPHELOMETRIC TURBIDITY UNIT SENSOR. |
| 300 | AIA-300 | WTP | FILTRATION | -- | -- | EXISTING CFE TURBIDIMETER. USE RELAY OUTPUT FOR BYPASS. |
| 300 | FE-311 | WTP | FILTRATION | -- | -- | EXISTING FLOW METER – RELOCATE PER ELECTRICAL. |
| 300 | FIT-311 | WTP | FILTRATION | -- | -- | EXISTING FLOW TRANSMITTER. |
| 300 | AIT-321 | WTP | FILTRATION | -- | -- | ROSEMOUNT 1056-02-10-38-AN-UL ANALYZER/TRANSMITTER. FOR INSTALLATION, SEE ELECTRICAL. |
| 300 | AE-321 | WTP | FILTRATION | -- | -- | ROSEMOUNT 3900-01-12 PH/ORP PROBE WITH LOW FLOW PANEL, PN SQP10077. FOR INSTALLATION, SEE ELECTRICAL. |
| 300 | FS-321 | WTP | FILTRATION | 120/1 | -- | FCI FLT93B WITH SADDLE FITTINGS AND PROBE LENGTH SET TO PLACE SENSOR AT CENTER OF PIPE. FOR INSTALLATION, SEE ELECTRICAL. |
| 500 | PI-500A,B,C,D,E,F G,H,I,J,K,L,M,N,O,P,Q,R,S | WTP | HEAT RECOVERY SYSTEM | -- | 0-60 PSI | PRESSURE GAUGE WEKSLER MODEL UA35, LOWER MOUNT, ±2-3% ACCURACY, 3-1/2" DIAL |
| 500 | TC-500 | WTP | HEAT RECOVERY SYSTEM | 24 V | -- | TEKMAR 156 TEMPERATURE CONTROLLER, PROVIDE WITH TE-100 AND TE-300 |
| 500 | TE-500 | WTP | HEAT RECOVERY SYSTEM | -- | -- | TEKMAR TEMPERATURE SENSOR, PROVIDED WITH TC-100 |
| 500 | TI-500A,B,C,D,E,F,G,H,I,J,K | WTP | HEAT RECOVERY SYSTEM | -- | -- | SOLAR POWERED THERMOMETER WIKA TYPE TI.D01, ADJUSTABLE WITH THERMOWELL |
| 600 | PI-600A,B,C,D | WTP | HEAT RECOVERY SYSTEM | -- | 0-60 PSI | PRESSURE GAUGE WEKSLER MODEL UA25-X82, SUITABLE FOR POTABLE WATER, LOWER MOUNT, ±2-3% ACCURACY, 2-1/2" DIAL |
| 600 | TI-600A,B, | WTP | HEAT RECOVERY SYSTEM | -- | -- | SOLAR POWERED THERMOMETER WIKA TYPE TI.D01, ADJUSTABLE WITH THERMOWELL |
| 600 | TE-600 | WTP | HEAT RECOVERY SYSTEM | -- | 30-240 DEG F | GRUNDFOS TEMPERATURE SENSOR MODEL RPI+T2. PROVIDE WITH CP-B |
| 700 | PI-700A,B | WTP | HEAT RECOVERY SYSTEM | -- | 0-60 PSI | PRESSURE GAUGE WEKSLER MODEL UA35, LOWER MOUNT, ±2-3% ACCURACY, 3-1/2" DIAL |
| 700 | TI-700A,B | WTP | HEAT RECOVERY SYSTEM | -- | -- | SOLAR POWERED THERMOMETER WIKA TYPE TI.D01, ADJUSTABLE WITH THERMOWELL |
| 700 | TE-700 | WTP | HEAT RECOVERY SYSTEM | -- | -- | TEKMAR TEMPERATURE SENSOR, PROVIDED WITH TC-100 |
| 800 | PI-800A,B,C,D | WTP | HEAT RECOVERY SYSTEM | -- | 0-60 PSI | PRESSURE GAUGE WEKSLER MODEL UA25-X82, SUITABLE FOR POTABLE WATER, LOWER MOUNT, ±2-3% ACCURACY, 2-1/2" DIAL |
| 800 | TI-800A,B | WTP | HEAT RECOVERY SYSTEM | -- | -- | SOLAR POWERED THERMOMETER WIKA TYPE TI.D01, ADJUSTABLE WITH THERMOWELL |
| 800 | TS-800 | WTP | HEAT RECOVERY SYSTEM | 120/1 | -- | TEMPERATURE SWITCH, HONEYWELL 678A |

CRW ENGINEERING GROUP LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE (907) 677-3520
AECC-882-AK

STATE OF ALASKA 49TH
ENGINEER
Roy L. McKeon
ME-11388
7/6/2020
REGISTERED PROFESSIONAL

PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

UNALAKLEET WTP UPGRADES
MECHANICAL SCHEDULES (3 OF 3)

DATE: JULY 2020

STATUS: ISSUED FOR CONSTRUCTION

PROJECT NO: 80901.02

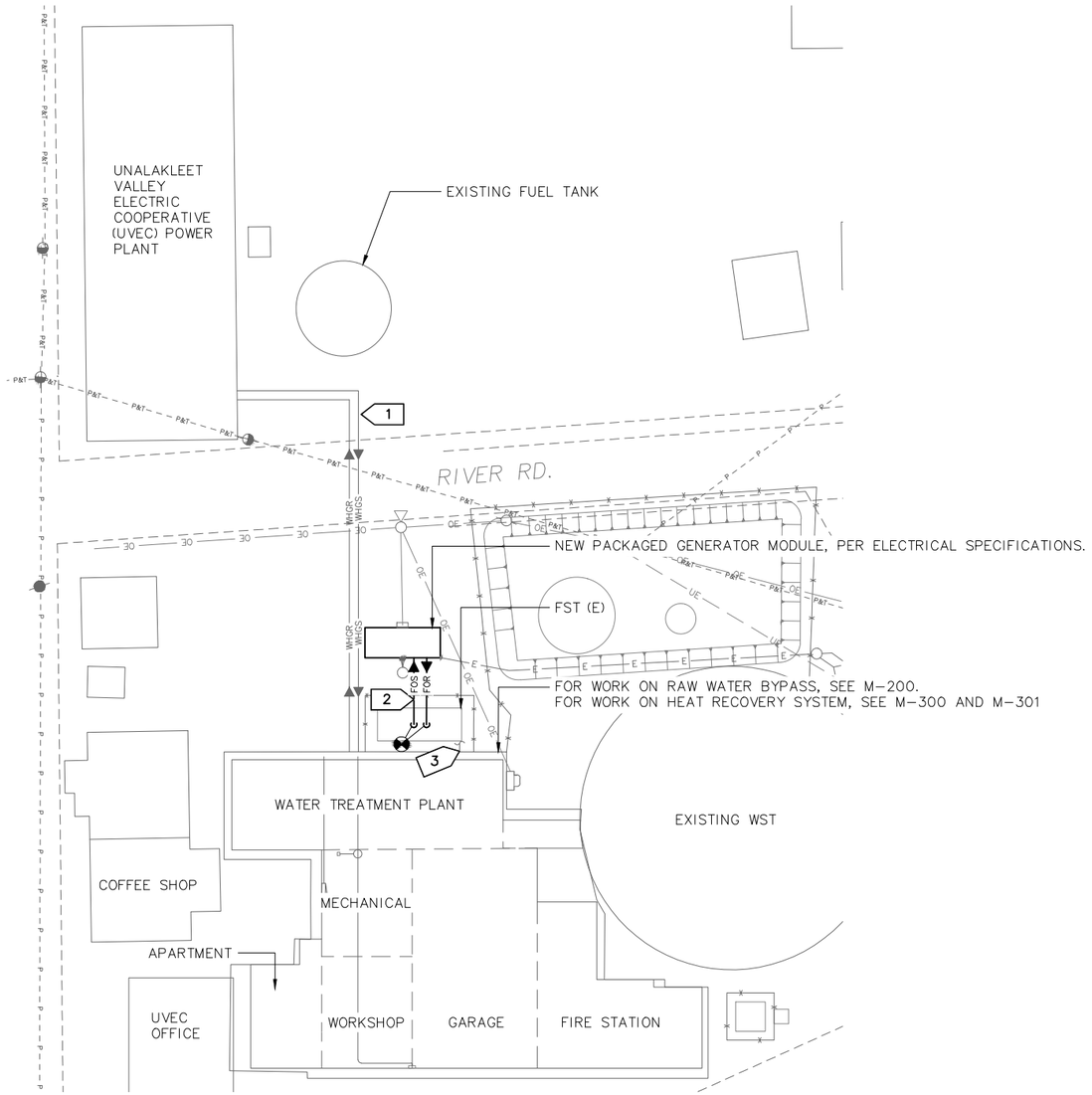
| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | | |

REVISION

SCALE
HOR. N/A
VER. N/A

DESIGNED BY TLM
DRAWN BY EME
CHECKED BY KRH
APPROVED BY –

SHEET NO.
M-002




1 **MECHANICAL SITE PLAN**

1" = 20'

20' 0 20' 40'

PROJECT NARRATIVE:

THIS PROJECT INCLUDES THE FOLLOWING IMPROVEMENTS:

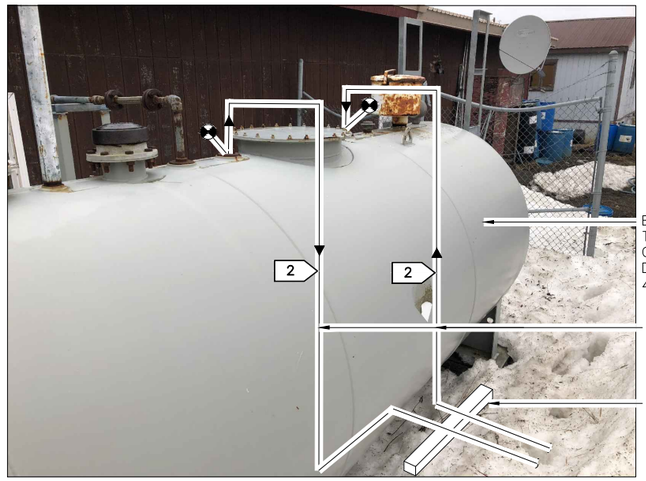
1. NEW TREATED WATER HIGH TURBIDITY ALARM AND RAW WATER BYPASS SYSTEM TO DIVERT RAW WATER TO WASTE WHEN TURBIDITY SETPOINTS ARE EXCEEDED.

2. NEW PRE-ENGINEERED GENERATOR MODULE AND ASSOCIATED FUEL SUPPLY/RETURN LINES.

3. NEW RECOVERED HEAT SYSTEM COMPONENTS WITHIN EXISTING WATER TREATMENT PLANT BUILDING ENVELOPE.

SHEET NOTES:

1. EXISTING HEAT RECOVERY PIPING, ROUTING IS APPROXIMATE AND SHOWN FOR REFERENCE ONLY.
2. NEW 1" FOS AND 1" FOR PIPING FROM EXISTING FUEL TANK TO GENERATOR MODULE. SUPPORT WITH TIMBER SLEEPERS PER DETAIL 3/M-504. SPACE TIMBER SLEEPERS AT MAXIMUM 5 FEET APART. CONNECT INTO GENERATOR SUBBASE FUEL TANK PER DETAIL 5/M-504. COORDINATE FINAL FOS/FOR CONNECTION LOCATION WITH FINAL GENERATOR SELECTION.
3. EXISTING 4" RAW WATER LINE.




2 **FUEL TANK TIE-IN**

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE (907) 677-3520
AECC-882-JV

STATE OF ALASKA
49TH
REGISTERED PROFESSIONAL ENGINEER
Jay L. Mckeon
ME-11388
7/9/2020

PROJECT NO. -
CITY GRID -
WATER GRID -
SEWER GRID -

UNALAKLEET WTP UPGRADES
MECHANICAL SITE PLAN

PROJECT NO: 80901.02

DATE: JULY 2020

STATUS: ISSUED FOR CONSTRUCTION

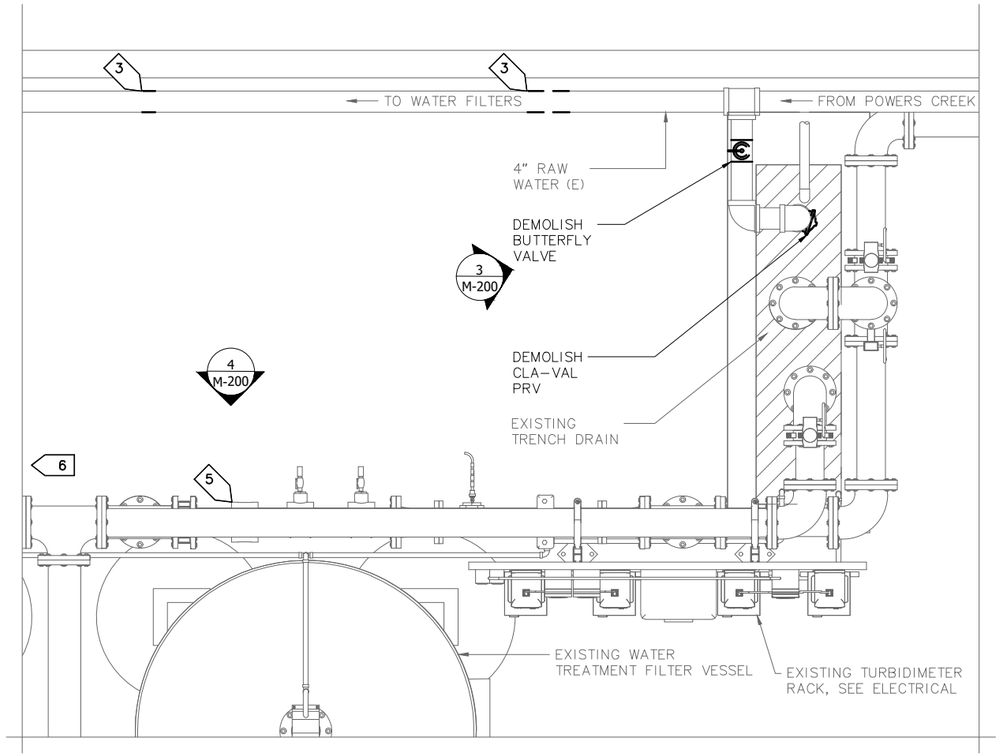
| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| REVISION | | | |

SCALE
HOR. 1" = 20'
VER. 1" = 20'

DESIGNED BY TLM
DRAWN BY EME
CHECKED BY KRH
APPROVED BY -

SHEET NO.
M-100

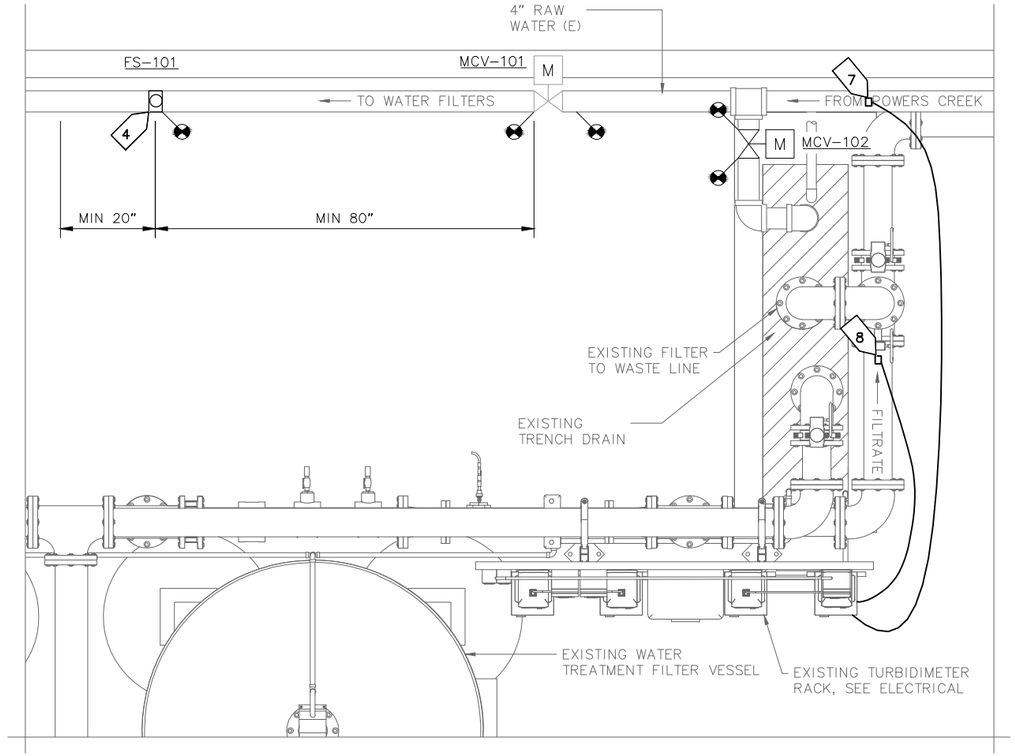
File: J:\JobsData\80901.02 Unalakleet WTP 2018 Upgrades\00 CADD\01 Working Set\06 Mechanical\M-100 Mechanical Site Plan.dwg PLOT DATE: 7/10/2020 8:23 AM




## 1 RAW WATER BYPASS DEMOLITION PLAN

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

0 1' 2' 3'




## 2 RAW WATER BYPASS REMODEL PLAN

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

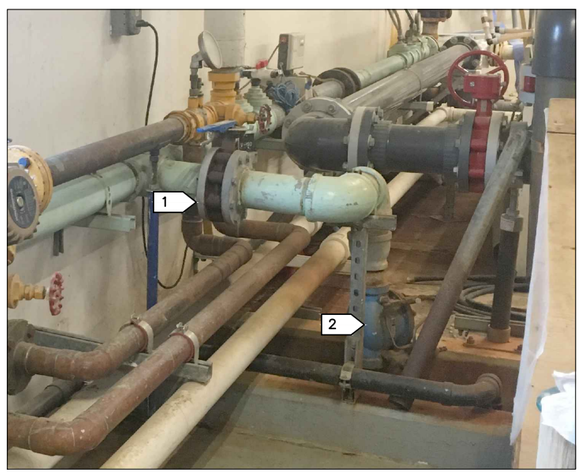
0 1' 2' 3'

GENERAL NOTES:

1. MECHANICAL DRAWINGS ARE GENERALLY DIAGRAMMATIC, CONTRACTOR TO FIELD LOCATE ALL DUCT, MECHANICAL EQUIPMENT, AND ASSOCIATED APPURTENANCES TO AVOID CONFLICTS OTHER EQUIPMENTS, PIPING, LIGHTING AND ELECTRICAL CLEARANCES.
2. IMPROVEMENTS SHOWN ON THIS SHEET SUPPORT AN AUTOMATIC RAW WATER BYPASS SYSTEM. SEE ELECTRICAL SYSTEM CONTROLS.

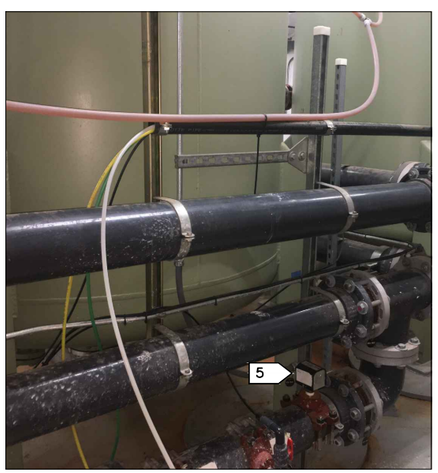
SHEET NOTES:

1. DEMOLISH BUTTERFLY VALVE. DEMOLISH ASSOCIATED PIPING ONLY TO THE EXTENT NECESSARY TO INSTALL NEW MOTORIZED VALVE.
2. DEMOLISH CLA-VAL PRESSURE RELIEF VALVE AND ALL ASSOCIATED APPURTENANCES. ENSURE THAT A MINIMUM 2 PIPE DIAMETER AIR GAP IS MAINTAINED BETWEEN THE END OF THE PIPE AND THE SUMP.
3. DEMOLISH 4" RAW WATER TO ACCOMMODATE THE INSTALLATION OF NEW INSTRUMENTATION AND VALVES. SEE 2/M-200.
4. FLOW SWITCH FS-101. SEE SHEET E-205 FOR WIRING.
5. REMOVE EXISTING FLOW SWITCH AND PLUG SADDLE.
6. DISCONNECT, ABANDON IN PLACE RAW WATER TURBIDIMETER TAP. PRESERVE TUBING FOR RE-CONNECTION.
7. PROVIDE NEW TAP AND TUBING FOR EXISTING RAW WATER TURBIDIMETER. SEE 4/M505.
8. PROVIDE NEW TAP AND TUBING FOR pH METER. SEE 2/M505.



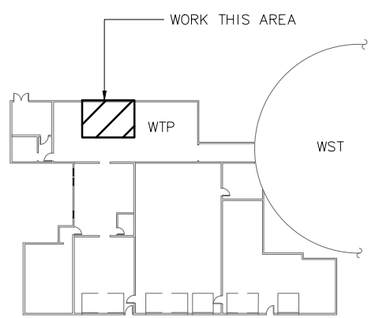

## 3 EXHIBIT PHOTO

NTS




## 4 EXHIBIT PHOTO

NTS




## – KEY PLAN

NTS

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE (907) 677-3520
FAX (907) 677-3522

STATE OF ALASKA
49TH
REGISTERED PROFESSIONAL ENGINEER
Ryan L. McKeon
ME-11388
7/6/2020

PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

UNALAKLEET WTP UPGRADES

RAW WATER BYPASS PLUMBING PLAN

PROJECT NO: 80901.02

STATUS: ISSUED FOR CONSTRUCTION

DATE: JULY 2020

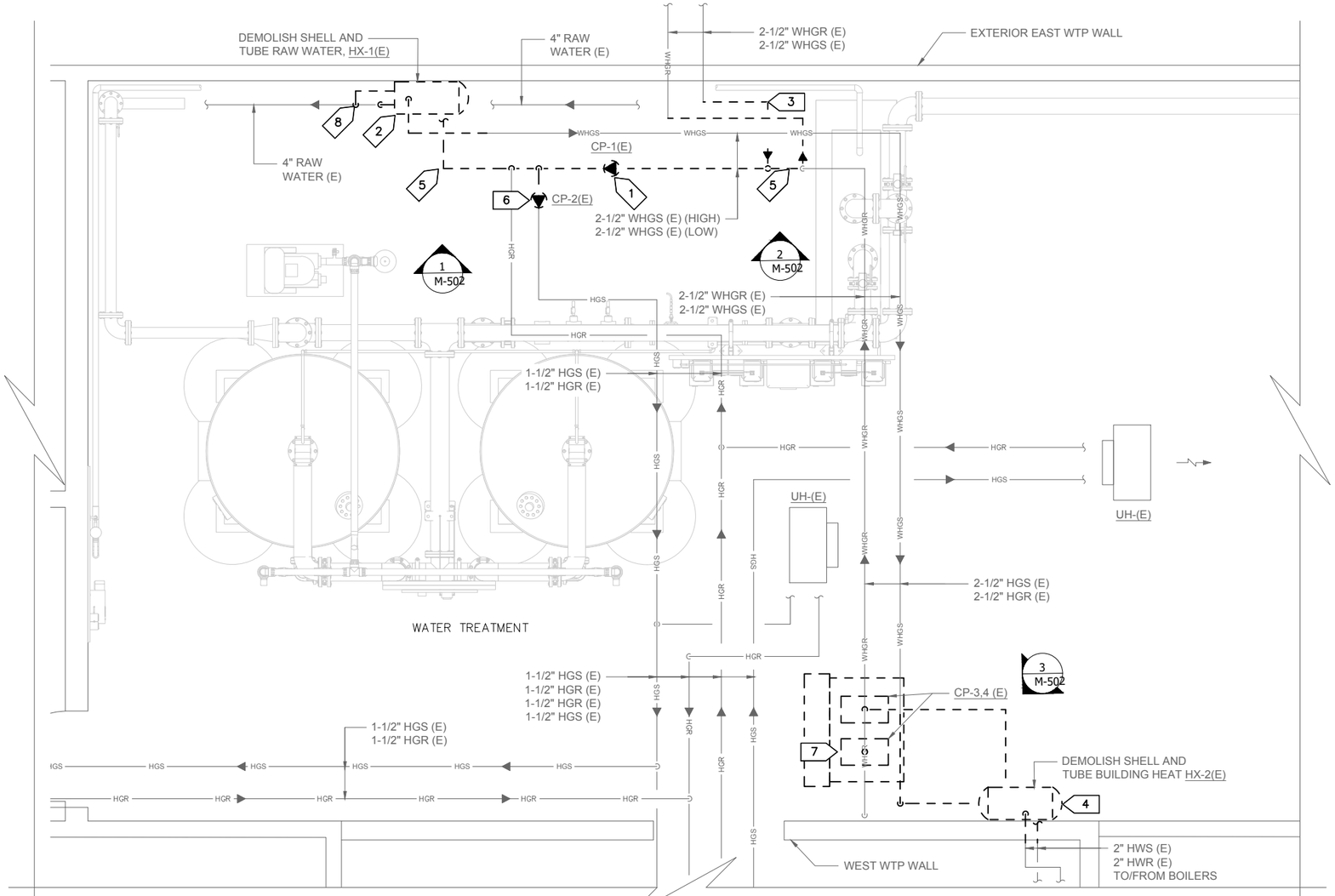
| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE HOR. 3/4" = 1'
VER. 3/4" = 1'
DESIGNED BY TLM
DRAWN BY EME
CHECKED BY KRH
APPROVED BY –

SHEET NO.

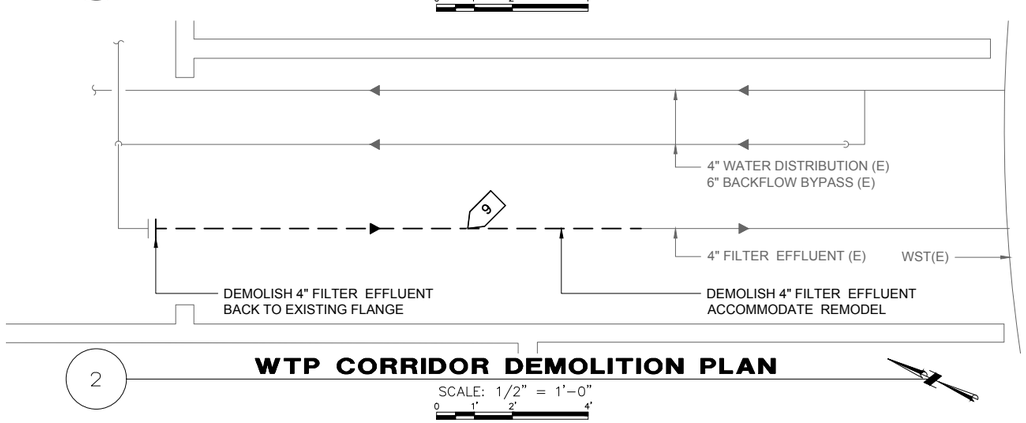
M-200

File: J:\JobsData\80901.02 Unalakleet WTP 2018 Upgrades\00 CADD\01 Working Set\06 Mechanical\WTP_Plumbing.dwg PLOT DATE: 7/10/2020 8:24 AM




## 1 HEAT RECOVERY DEMOLITION PLAN

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




## 2 WTP CORRIDOR DEMOLITION PLAN

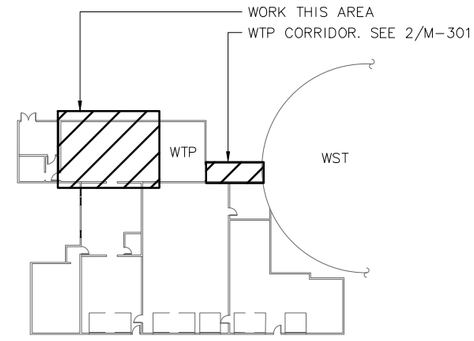
SCALE: 1/2" = 1'-0"

GENERAL NOTES:

1. MECHANICAL DRAWINGS ARE GENERALLY DIAGRAMMATIC, CONTRACTOR TO FIELD LOCATE ALL DUCT, MECHANICAL EQUIPMENT, AND ASSOCIATED APPURTENANCES TO AVOID CONFLICTS OTHER EQUIPMENTS, PIPING, LIGHTING AND ELECTRICAL CLEARANCES.
2. CONTRACTOR TO ISOLATE WTP SYSTEM AT UVEC USING EXISTING BYPASS AND PUMP OUT ALL ETHYLENE GLYCOL IN WTP LOOP. APPROXIMATE VOLUME: 180 GALLONS. ALL REUSED PIPING INSIDE OF WTP THAT CONTAINED ETHYLENE GLYCOL TO BE FLUSHED BEFORE BEGINNING NEW CONSTRUCTION.

SHEET NOTES:

1. DEMOLISH CIRCULATION PUMP AND ASSOCIATED PIPING UP TO DEMOLISHED HEAT EXCHANGER.
2. DEMOLISH HEAT EXCHANGER AND ASSOCIATED PIPING TO INSTALL NEW HEAT EXCHANGER, HX-B. SEE 1/M-500.
3. DEMOLISH 2-1/2" WHGS/WHGR ON UVEC SIDE TO INSTALL NEW HEAT EXCHANGER, HX-A. SEE 1/M-500.
4. DEMOLISH HEAT EXCHANGER AND ASSOCIATED PIPING TO INSTALL NEW HEAT EXCHANGER, HX-C. SEE 1/M-501.
5. PIPING IS RACKED TO WALL, SHOWN OFFSET FOR CLARITY.
6. DEMOLISH WTP HEAT LOOP PUMP AND 1-1/2" HGS TO GATE VALVE DOWNSTREAM OF PUMP. PUMP IS MOUNTED IN VERTICAL POSITION, SHOWN OFFSET HERE. DEMOLISH 1-1/2" HGR UP TO FIRST GATE VALVE. SEE 1/M-500.
7. DEMOLISH FLOOR MOUNTED CIRCULATION PUMPS, ASSOCIATED PIPING, AND CONTROLS.
8. DEMOLISH RAW WATER SUPPLY AND RETURN UP TO AND INCLUDING EXISTING GATE VALVE.
9. COORDINATE WITH ELECTRICAL. SEE DETAIL 1/E-505.




## – KEY PLAN

NTS

CRW ENGINEERING GROUP LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 563-4952
AECC-882-JA

STATE OF ALASKA — 49TH — REGISTERED PROFESSIONAL ENGINEER — Jay L. Mckeon — ME-11388 — 7/6/2020

PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

UNALAKLEET WTP UPGRADES
HEAT RECOVERY DEMOLITION PLAN

DATE: JULY 2020
STATUS: ISSUED FOR CONSTRUCTION

| REVISION | DESCRIPTION | DATE | REV | BY |
|---|---|---|---|---|
| | | | | |

SCALE: HOR. 1/2" = 1'
VER. 1/2" = 1'
DESIGNED BY TLM
DRAWN BY EWE
CHECKED BY KRH
APPROVED BY –

SHEET NO.
M-300

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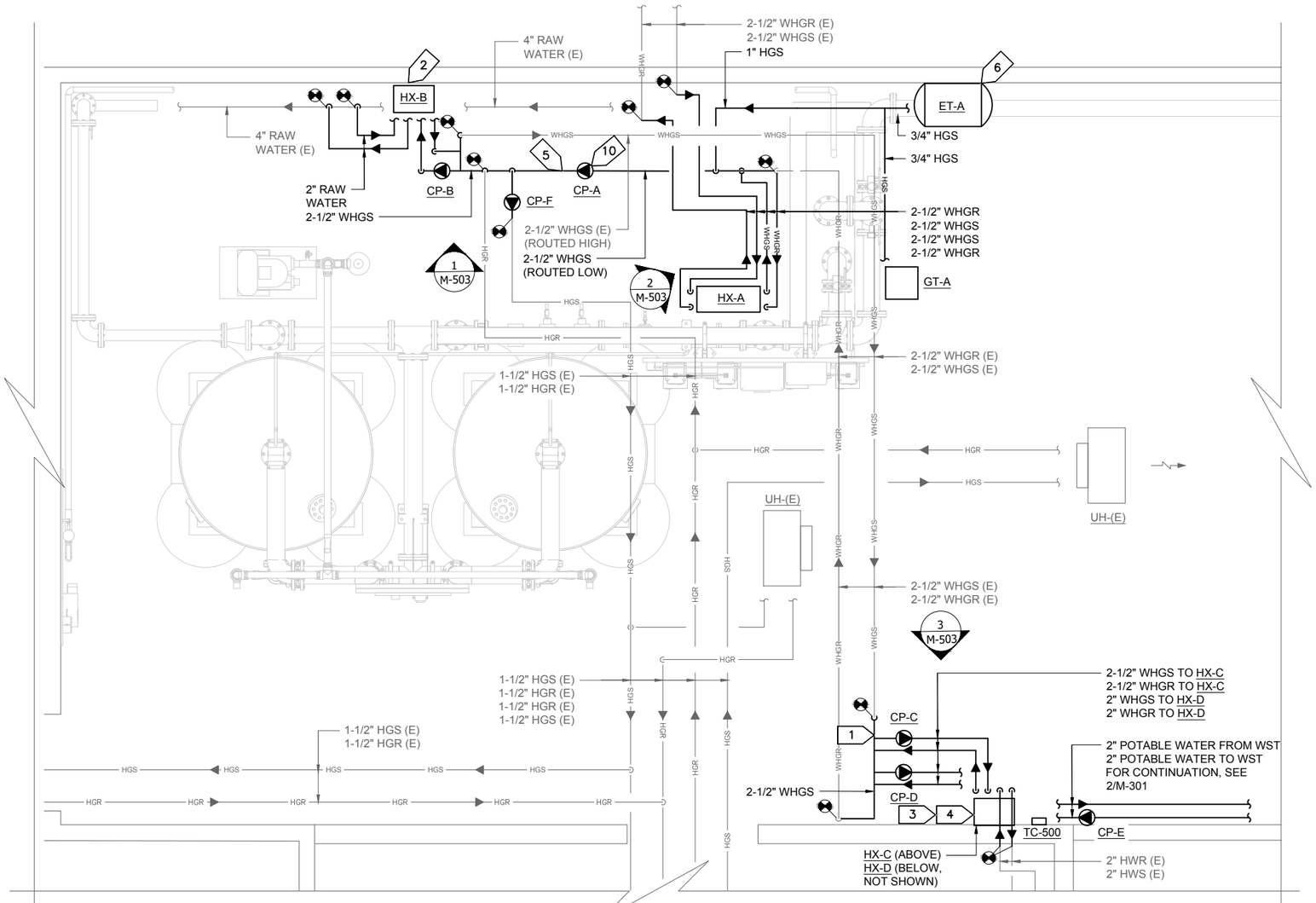
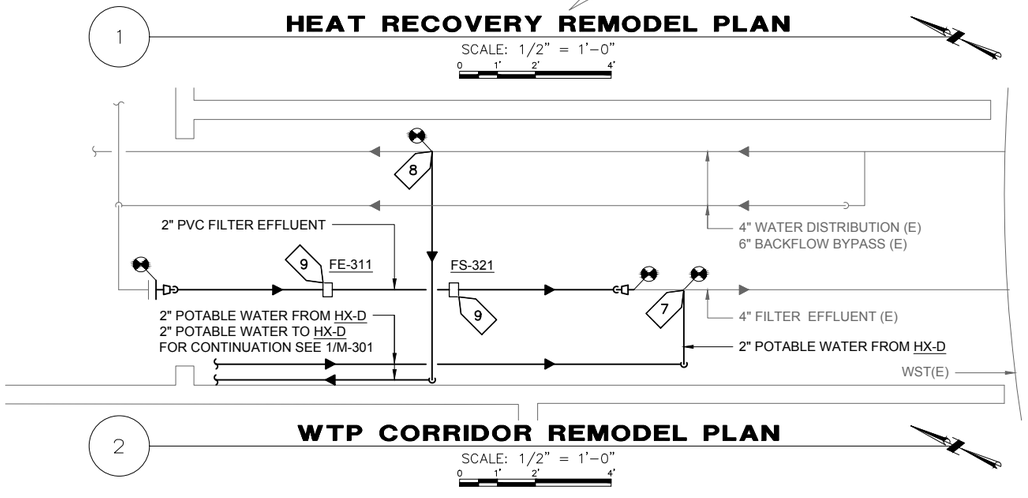



## 1 HEAT RECOVERY REMODEL PLAN

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




## 2 WTP CORRIDOR REMODEL PLAN

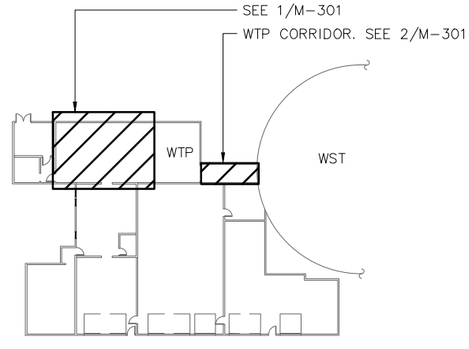
SCALE: 1/2" = 1'-0"

GENERAL NOTES:

1. MECHANICAL DRAWINGS ARE GENERALLY DIAGRAMMATIC, CONTRACTOR TO FIELD LOCATE ALL DUCT, MECHANICAL EQUIPMENT, AND ASSOCIATED APPURTENANCES TO AVOID CONFLICTS OTHER EQUIPMENTS, PIPING, LIGHTING AND ELECTRICAL CLEARANCES.
2. CONTRACTOR TO ENSURE THAT ALL REUSED PIPING THAT CONTAINED ETHYLENE GYLCOL IS CLEANED AND FLUSHED BEFORE BEGINNING NEW CONSTRUCTION.
3. ALL NEW POTABLE AND RAW WATER PIPING TO BE NUPI NIRON, EXCEPT FOR PVC AS INDICATED ON DRAWINGS. ALL NEW WASTE HEAT GLYCOL, HEATING GLYCOL, AND HEATING WATER PIPING TO BE COPPER.

SHEET NOTES:

1. PIPING IS SHOWN SCHEMATICALLY. PIPING TO HX-C AND HX-D TO CONNECT TO MAIN CIRCULATION LOOP IN VERTICAL PIPE. SEE SCHEMATIC, 2/M501.
2. NEW HEAT EXCHANGER, HX-B, WALL MOUNTED IN THE SAME LOCATION AS THE DEMOLISHED RAW WATER HEAT EXCHANGER. SEE 3/M505 FOR MOUNTING DETAIL.
3. NEW HEAT EXCHANGER HX-C, WALL MOUNTED IN THE SAME LOCATION AS THE DEMOLISHED BOILER LOOP HEAT EXCHANGER. SEE 3/M505 FOR MOUNTING DETAIL.
4. NEW HEAT EXCHANGER, HX-D, WALL MOUNTED BELOW HX-C, NOT SHOWN HERE. SEE 2/M501. SEE 3/M505 FOR MOUNTING DETAIL.
5. PIPING IS RACKED ON WALL, SHOWN OFFSET FOR CLARITY.
6. MOUNT NEW EXPANSION TANK ON WALL, FOR INSTALLATION DETAIL, SEE 1/M-504.
7. CONNECT HEATED WATER PIPING FROM HX-D INTO THE TO FILTER EFFLUENT PIPING IN WATER TREATMENT PLANT CORRIDOR. EXACT CONNECTION LOCATION TO BE FIELD LOCATED BY CONTRACTOR.
8. CONNECT UNHEATED WATER PIPING TO HX-D INTO EXISTING DISTRIBUTION PIPING IN THE WATER TREATMENT PLANT CORRIDOR. EXACT CONNECTION LOCATION TO BE FIELD LOCATED BY CONTRACTOR.
9. FOR INSTALLATION DETAIL, SEE 1/M-505.
10. COORDINATE HEAT RECOVERY PIPING WITH RAW WATER VALVE AND INSTRUMENTATION.




## – KEY PLAN

NTS

CRW ENGINEERING GROUP LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE (907) 562-2352
FAX (907) 562-4952

STATE OF ALASKA — 49TH — REGISTERED PROFESSIONAL ENGINEER
Loyl L. McKeon
ME-11388
7/6/2020

PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

UNALAKLEET WTP UPGRADES
HEAT RECOVERY REMODEL PLAN

PROJECT NO: 80901.02
DATE: JULY 2020
STATUS: ISSUED FOR CONSTRUCTION

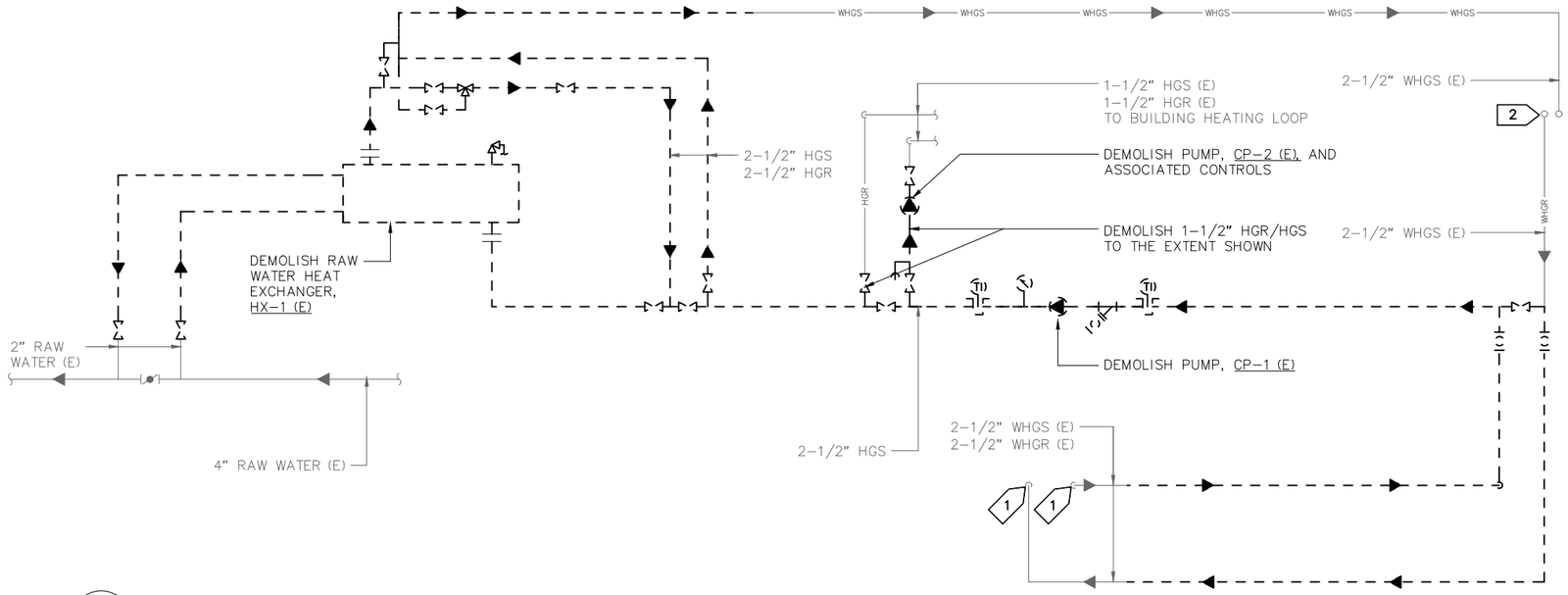
REVISION

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | | |

SCALE: HOR. 1/2" = 1' VER. 1/2" = 1'
DESIGNED BY TLM
DRAWN BY EME
CHECKED BY KRH
APPROVED BY –

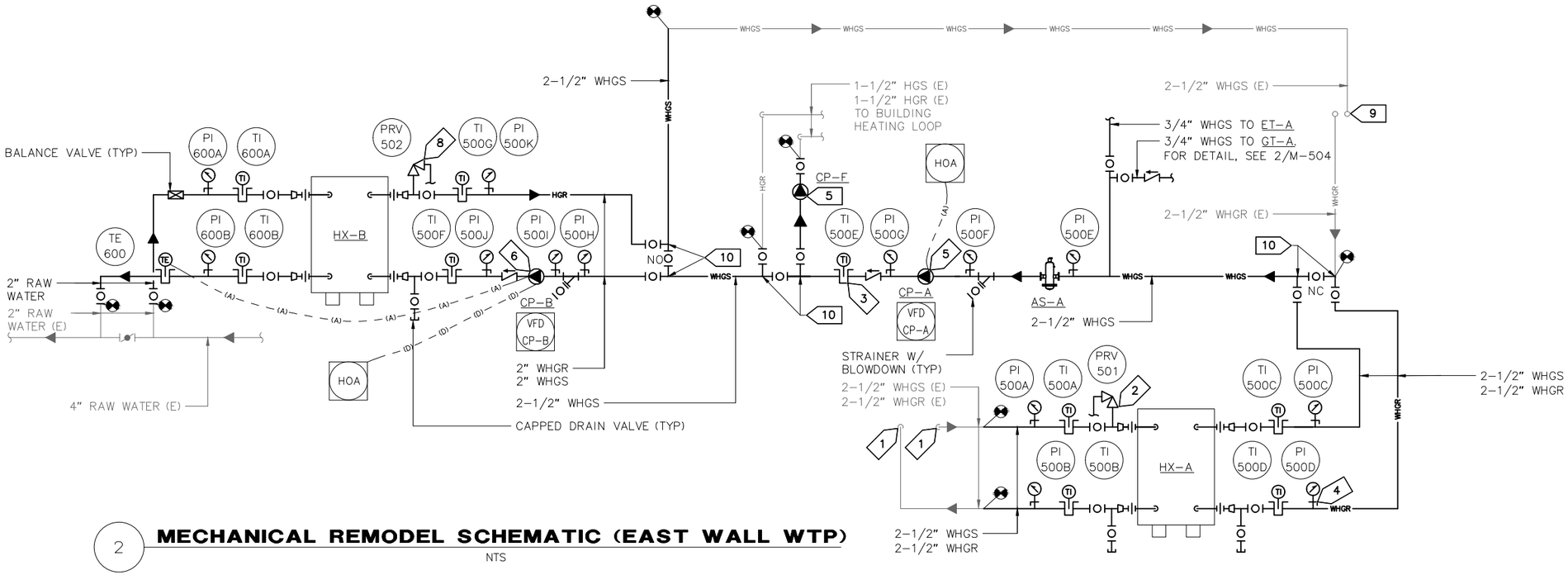
SHEET NO.
M-301

File: J:\Jobs\Data\80901.02 Unalakleet WTP 2018 Upgrades\00 CADD\01 Working Set\06 Mechanical\WTP_Mech.dwg PLOT DATE: 7/10/2020 8:24 AM




1 **MECHANICAL DEMOLITION SCHEMATIC (EAST WALL WTP**

NTS




2 **MECHANICAL REMODEL SCHEMATIC (EAST WALL WTP)**

NTS

SHEET NOTES:

1. EXTERIOR PENETRATION TO/FROM UVEC.
2. FOR CONTINUATION, SEE 1/M501.
3. INSTALL THERMOWELLS FOR THERMOMETERS AND SENSORS, TYPICAL.
4. PROVIDE ISOLATION VALVES FOR ALL PRESSURE INDICATORS AND AUTOMATIC AIR VENTS.
5. PUMP TO BE INSTALLED 36–60" ABOVE FINISHED FLOOR. MAINTAIN ALL MANUFACTURER SERVICE CLEARANCES. PUMP FACE TO HAVE MIN 36" CLEARANCE AND BE ACCESSIBLE FOR PROGRAMMING.
6. MAINTAIN ALL MANUFACTURER SERVICE CLEARANCES. PUMP TO HAVE MIN 36" CLEARANCE AND BE ACCESSIBLE FOR PROGRAMMING.
7. FOR EXPANSION TANK DETAIL, SEE 1/M504.
8. PRV DISCHARGE TO BE ROUTED TO WITHIN 6" OF FINISHED FLOOR.
9. FOR CONTINUATION, SEE 2/M501.
10. INSTALL CLOSE COUPLED TEES MAXIMUM 4 PIPE DIAMETERS APART.

SEQUENCE OF OPERATIONS:

CP–A IS OPERATED WITH A HOA SWITCH. WHEN HOA IS IN AUTO POSITION, CP–A TO RUN CONTINUOUSLY.

CP–B IS OPERATED WITH A HOA SWITCH. WHEN HOA IS IN AUTO POSITION, CP–B TO MODULATE FLOW TO MAINTAIN A RAW WATER TEMPERATURE OF 40 DEG F AS SENSED BY TE–600.

CRW ENGINEERING GROUP LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE (907) 563-3529
AECC-882-JA

STATE OF ALASKA
JOYCE L. MCKEON
49TH
REGISTERED PROFESSIONAL ENGINEER
Joyce L. McKeon
ME-11388
7/6/2020

PROJECT NO. – | CITY GRID – | WATER GRID – | SEWER GRID –

UNALAKLEET WTP UPGRADES
PIPING
SCHEMATICS I

DATE: JULY 2020

STATUS: ISSUED FOR CONSTRUCTION

PROJECT NO: 80901.02

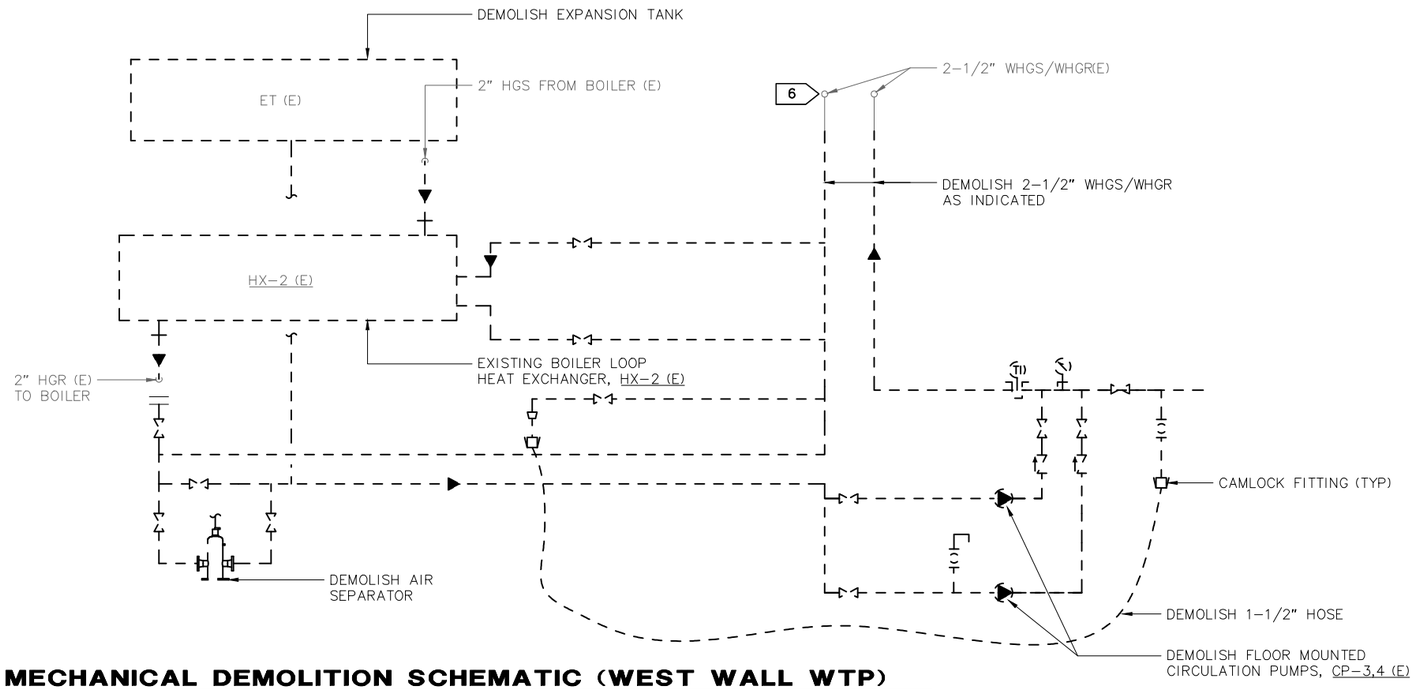
| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE HOR. N/A
VER. N/A
DESIGNED BY TLM
DRAWN BY EME
CHECKED BY KRH
APPROVED BY –

SHEET NO.

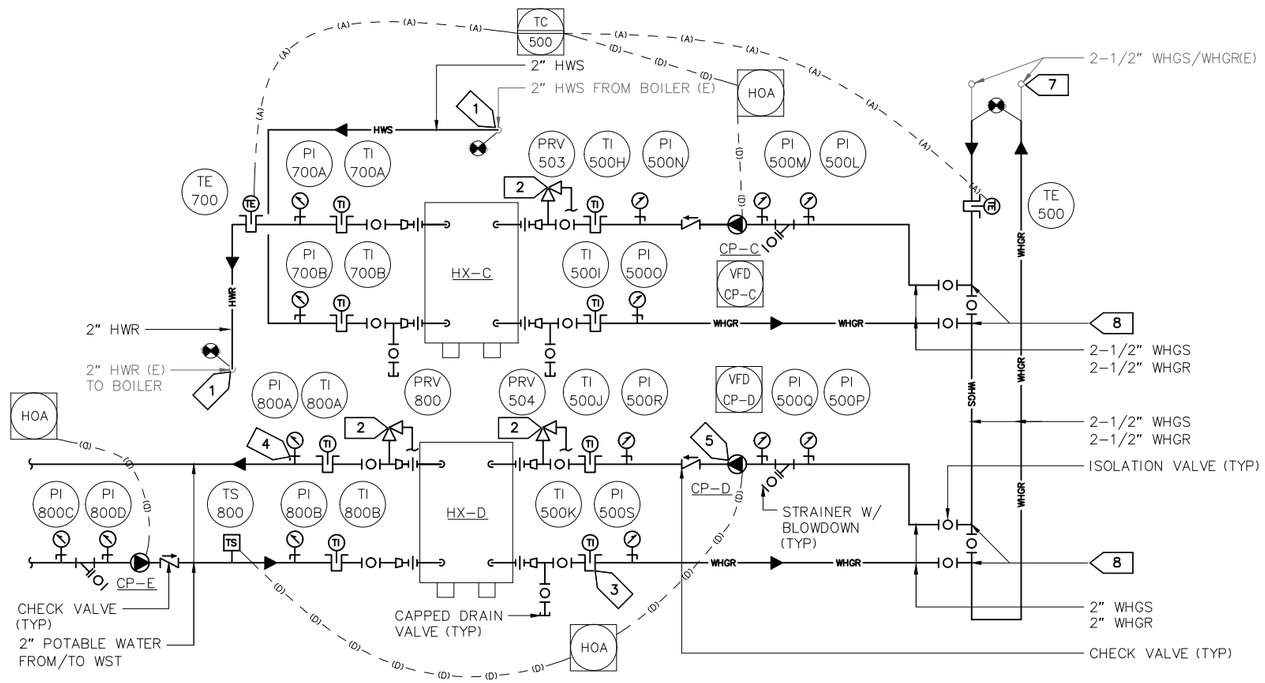
M-500

File: J:\JobsData\80901.02 Unalakleet WTP 2018 Upgrades\00 CADD\01 Working Set\06 Mechanical\Schematics.dwg PLOT DATE: 7/10/2020 8:24 AM




1 **MECHANICAL DEMOLITION SCHEMATIC (WEST WALL WTP)**

NTS




2 **MECHANICAL REMODEL SCHEMATIC (WEST WALL WTP)**

NTS

SEQUENCE OF OPERATIONS:

CP-C IS OPERATED WITH A HOA SWITCH. WHEN HOA IS IN AUTO POSITION, TEKMAR CONTROLLER, TC-500, TO ENABLE PUMP, CP-C, WHEN THE RECOVERED HEAT SUPPLY TEMPERATURE, TE-500, IS 5°F HIGHER THAN THE BUILDING HEAT RETURN TEMPERATURE, TE-700.

CP-D IS OPERATED WITH A HOA SWITCH. WHEN HOA IS IN AUTO POSITION, CP-D TO OPERATE ON CALL FROM HEAT FROM TS-800. TS-800 TO ENABLE PUMP WHEN TEMPERATURE IS BELOW 38 DEG F. CP-E TO RUN CONTINUOUSLY.

EXISTING HEATING SYSTEM INCLUDING BOILERS, PUMPS, AND CONTROLS WILL OPERATE UNCHANGED.

SHEET NOTES:

1. WALL PENETRATION TO/FROM BOILER ROOM.
2. PRV DISCHARGE TO BE ROUTED TO WITHIN 6" OF FINISHED FLOOR.
3. INSTALL THERMOWELLS FOR THERMOMETERS AND SENSORS, TYPICAL.
4. PROVIDE ISOLATION VALVES FOR ALL PRESSURE INDICATORS AND AUTOMATIC AIR VENTS.
5. PUMP TO BE INSTALLED 36-60" ABOVE FINISHED FLOOR. MAINTAIN ALL MANUFACTURER SERVICE CLEARANCES. PUMP FACE TO HAVE MIN 36" CLEARANCE AND BE ACCESSIBLE FOR PROGRAMMING.
6. FOR CONTINUATION, SEE 1/M-500.
7. FOR CONTINUATION, SEE 2/M-500.
8. INSTALL CLOSE COUPLED TEES MAXIMUM 4 PIPE DIAMETERS APART.

CRW ENGINEERING GROUP LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE (907) 563-3529
FAX (907) 563-4220

STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER
Jay L. Mckeon
ME-11388
7/6/2020

PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

UNALAKLEET WTP UPGRADES
PIPING SCHEMATICS II

DATE: JULY 2020

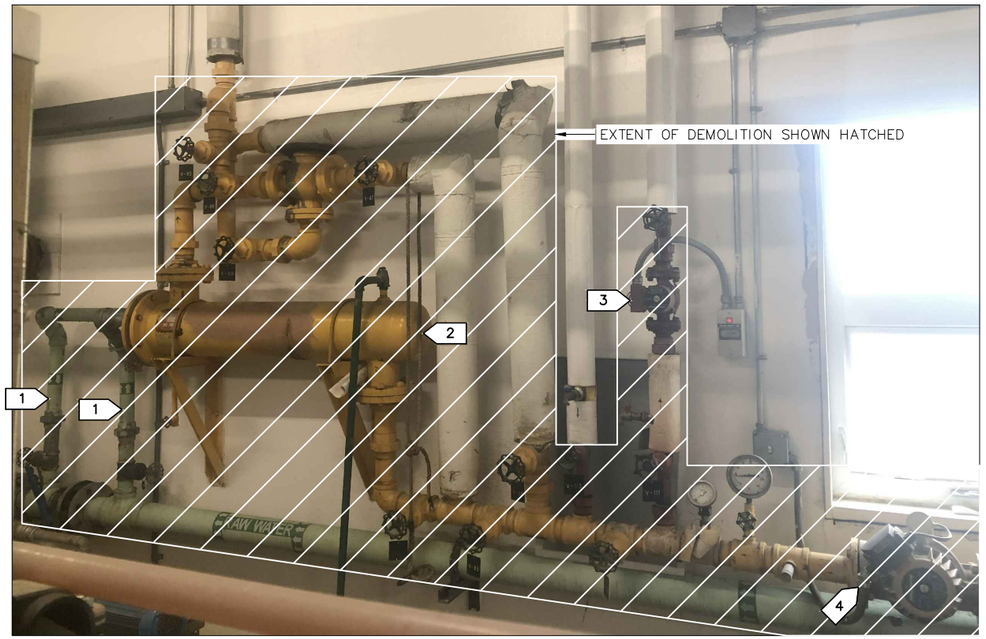
STATUS: ISSUED FOR CONSTRUCTION

PROJECT NO: 80901.02

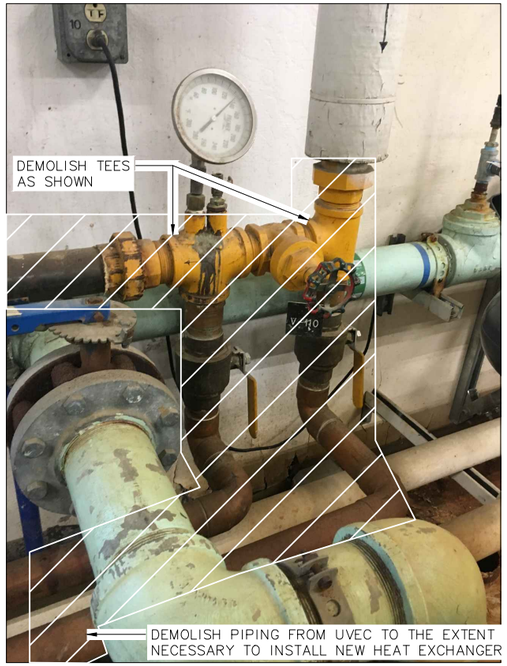
| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| REVISION | | | |

SCALE: HOR. N/A VER. N/A
DESIGNED BY TLM
DRAWN BY EME
CHECKED BY KRH
APPROVED BY –

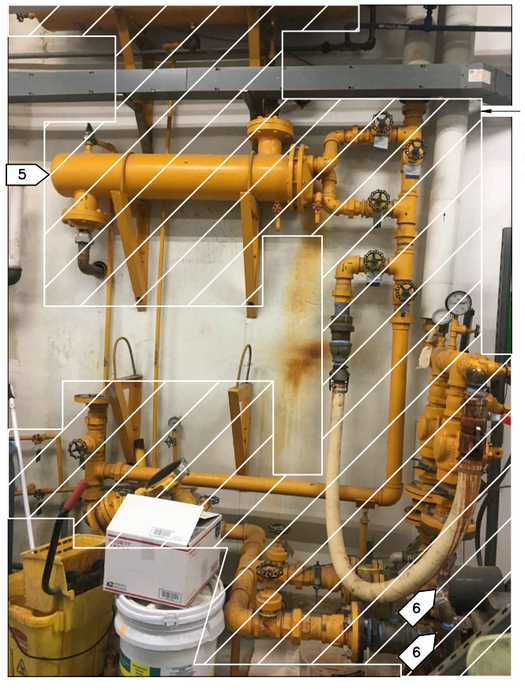
SHEET NO.
M-501




1 **EXHIBIT PHOTO #1**
NTS



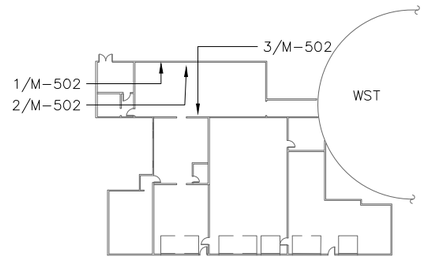

2 **EXHIBIT PHOTO #2**
NTS




3 **EXHIBIT PHOTO #3**
NTS

SHEET NOTES:

1. DEMOLISH RAW WATER PIPING UP TO AND INCLUDING EXISTING GATE VALVES. TYPICAL FOR SUPPLY AND RETURN.
2. DEMOLISH SHELL AND TUBE RAW WATER HEAT EXCHANGER, HX-1(E).
3. DEMOLISH EXISTING WTP HEATING CIRCULATION PUMP, CP-2(E).
4. DEMOLISH EXISTING WASTE HEAT CIRCULATION PUMP, CP-1(E).
5. DEMOLISH EXISTING BOILER SYSTEM HEAT EXCHANGER, HX-2(E).
6. DEMOLISH EXISTING FLOOR-MOUNTED PUMPS, CP-3,4(E).




– **KEY PLAN**
NTS

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 300
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PHONE (907) 562-3252
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STATE OF ALASKA
49TH
REGISTERED PROFESSIONAL ENGINEER
Jay L. Mckeon
ME-11388
7/9/2020

PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

UNALAKLEET WTP UPGRADES
DEMOLITION EXHIBIT PHOTOS

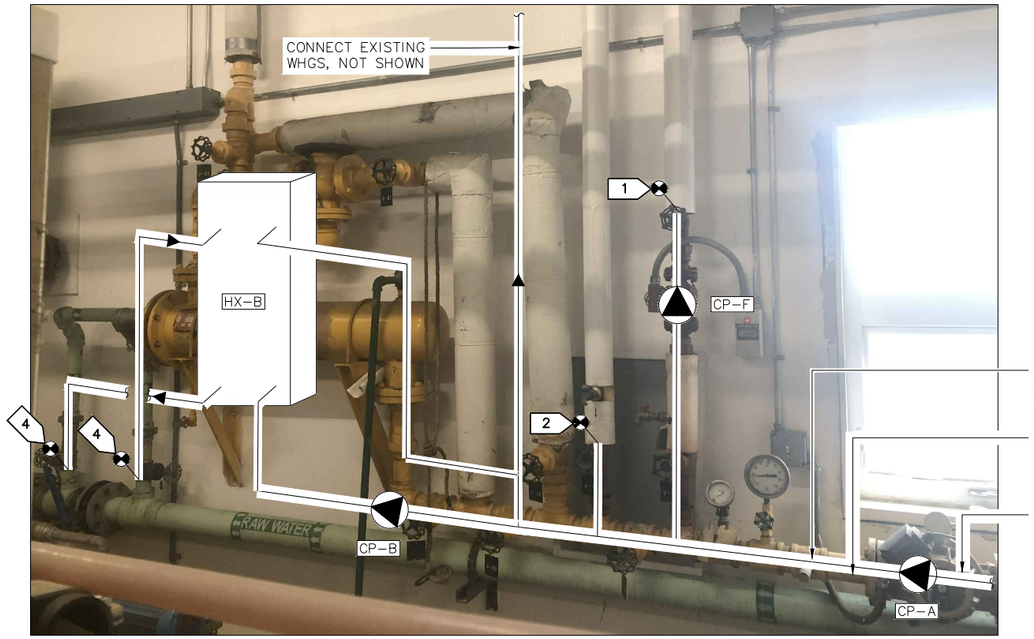
PROJECT NO: 80901.02
STATUS: ISSUED FOR CONSTRUCTION
DATE: JULY 2020

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

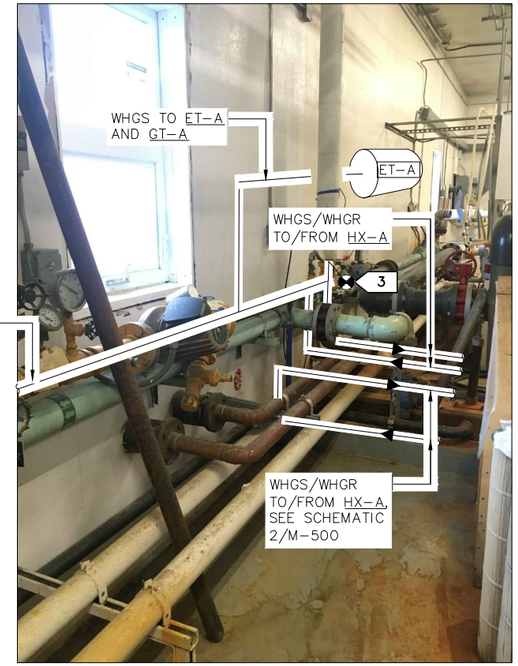
SCALE: HOR. N/A VER. N/A
DESIGNED BY TLM
DRAWN BY EME
CHECKED BY KRH
APPROVED BY –

SHEET NO.
**M-502**

File: J:\Jobs\Data\80901.02 Unalakleet WTP 2018 Upgrades\00 CADD\01 Working Set\06 Mechanical\M-502 Exhibit Photos.dwg PLOT DATE: 7/10/2020 8:24 AM




1 **EXHIBIT PHOTO #1**
NTS




2 **EXHIBIT PHOTO #2**
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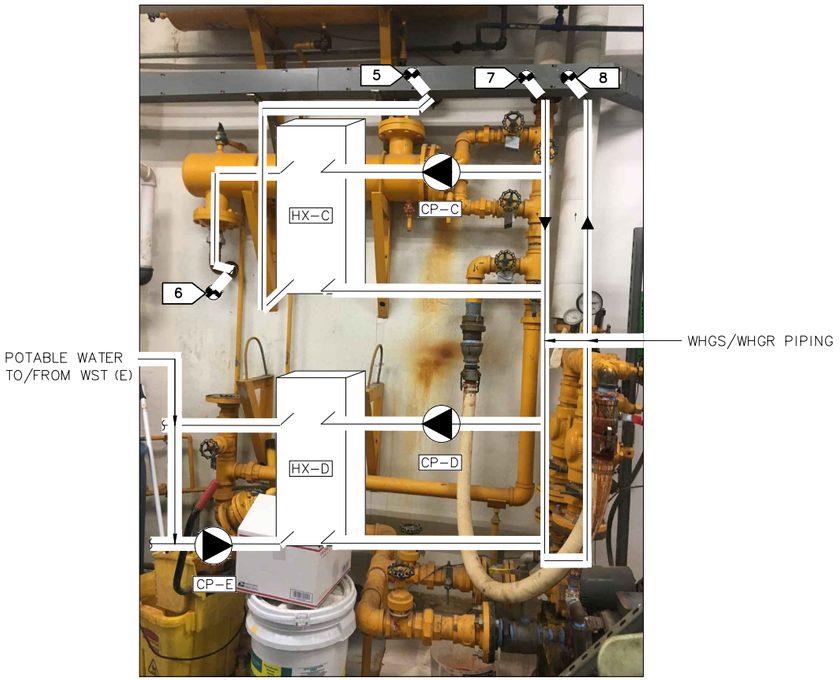
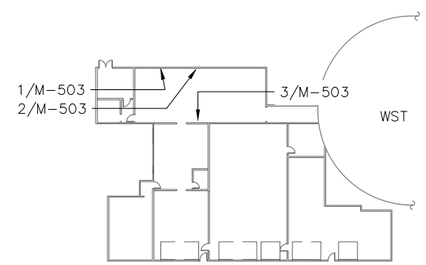



3 **EXHIBIT PHOTO #3**
NTS

SHEET NOTES:

1. CONNECT TO THE EXISTING WTP HEATING LOOP HGS PIPING.
2. CONNECT TO THE EXISTING WTP HEATING LOOP HGR PIPING.
3. CONNECT TO THE EXISTING WASTE HEAT LOOP WHGR PIPING.
4. CONNECT TO RAW WATER SUPPLY.
5. CONNECT TO EXISTING HWS FROM BOILER.
6. CONNECT TO EXISTING HWR TO BOILER.
7. CONNECT TO THE EXISTING WASTE HEAT LOOP WHGS PIPING.
8. CONNECT TO THE EXISTING WASTE HEAT LOOP WHGS PIPING.




– **KEY PLAN**
NTS

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STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER
Jay L. Mckeon
ME-11388
7/6/2020

PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

UNALAKLEET WTP UPGRADES
REMODEL EXHIBIT PHOTOS

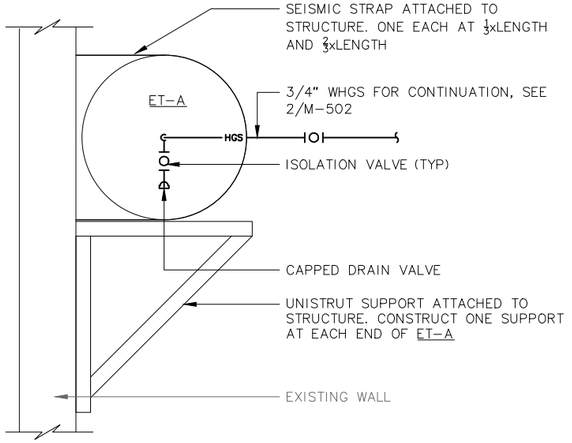
DATE: JULY 2020
STATUS: ISSUED FOR CONSTRUCTION
PROJECT NO: 80901.02

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

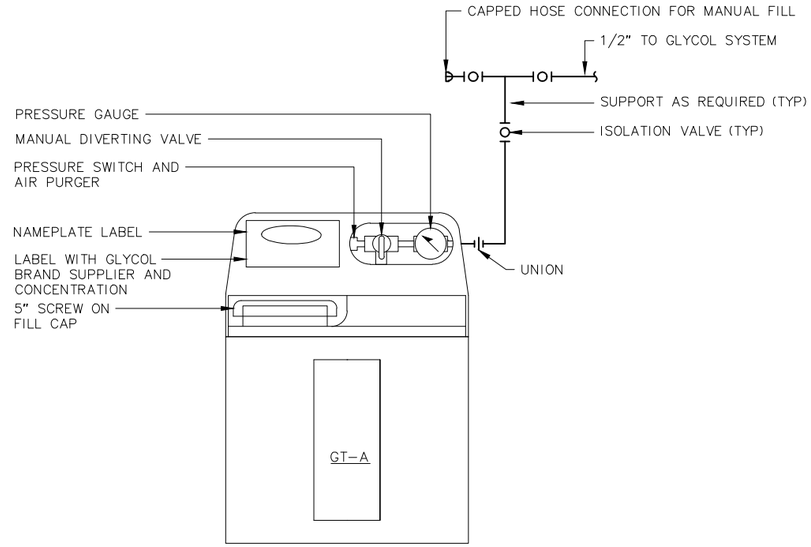
SCALE HOR. N/A VER. N/A
DESIGNED BY TLM
DRAWN BY EME
CHECKED BY KRM
APPROVED BY –

SHEET NO.
**M-503**

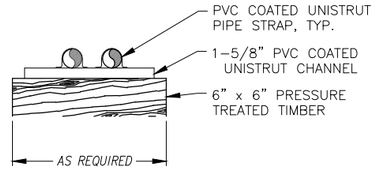
File: J:\JobsData\80901.02 Unalakleet WTP 2018 Upgrades\00 CADD\01 Working Set\06 Mechanical\M-502 Exhibit Photos.dwg PLOT DATE: 7/10/2020 8:24 AM



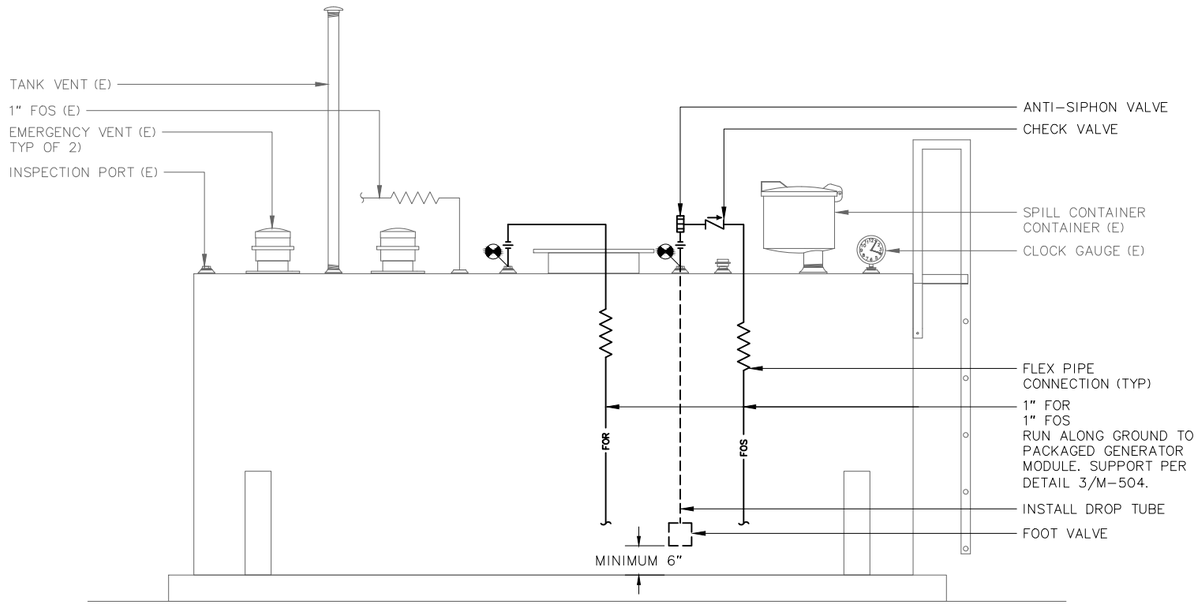

1 **EXPANSION TANK DETAIL**
NTS




2 **GLYCOL TANK DETAIL**
NTS



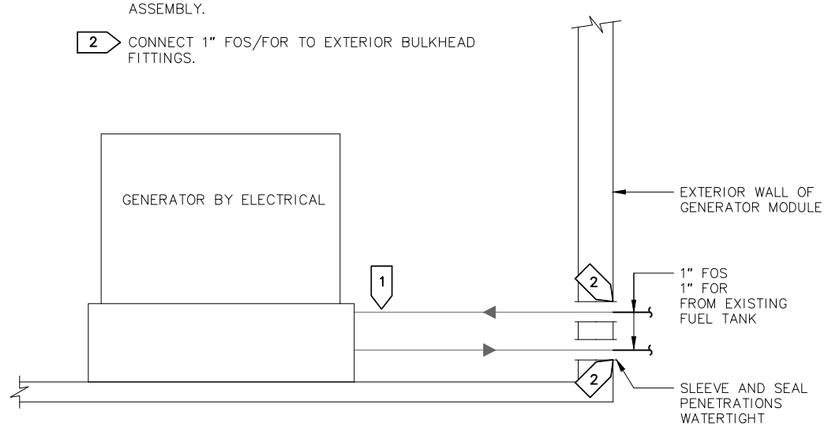

3 **FUEL PIPE SUPPORT DETAIL**
NTS




4 **FUEL TANK CONNECTION DETAIL**
NTS

SHEET NOTES:

1. ALL INTERIOR FUEL PIPING BY GENERATOR MODULE MANUFACTURER. COORDINATE WITH GENERATOR SPECIFICATION FOR ANY SPECIFIC CONNECTION REQUIREMENTS, INCLUDING, BUT NOT LIMITED TO SHUTOFF VALVES, FIRE SAFETY VALVES, AND FILTER ASSEMBLY.
2. CONNECT 1" FOS/FOR TO EXTERIOR BULKHEAD FITTINGS.




5 **GENERATOR CONNECTION DETAIL**
NTS

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STATE OF ALASKA — 49TH — REGISTERED PROFESSIONAL ENGINEER
Jay L. Mckeon
ME-11388
7/6/2020

PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

UNALAKLEET WTP UPGRADES
MECHANICAL
DETAILS

PROJECT NO: 80901.02

DATE: JULY 2020

STATUS: ISSUED FOR CONSTRUCTION

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE
HOR. N/A
VER. N/A
DESIGNED BY TLM
DRAWN BY EME
CHECKED BY KRH
APPROVED BY –

SHEET NO.
**M-504**

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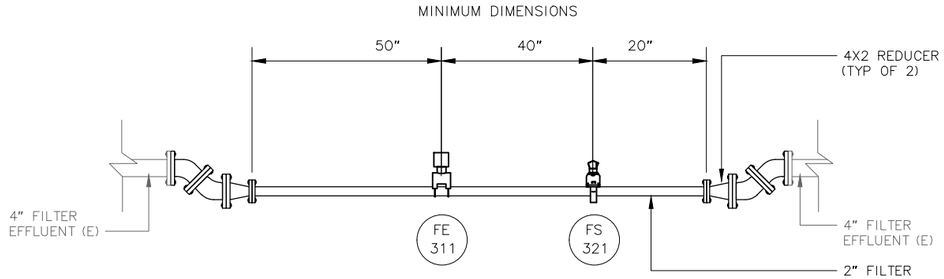
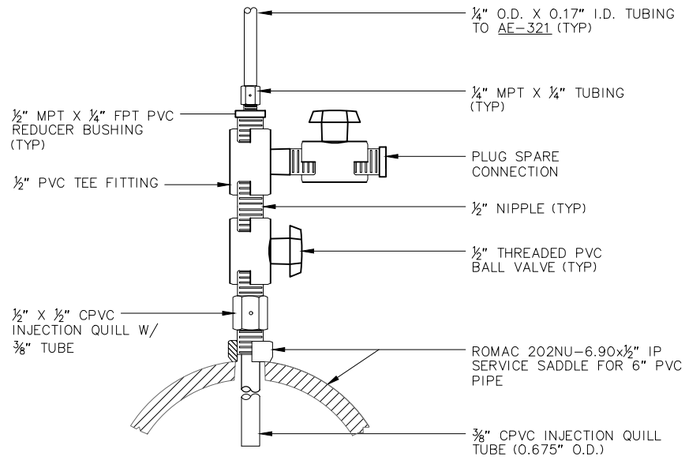



NOTE: INTENT OF MODIFICATION IS TO KEEP SENSORS SUBMERGED AT ALL TIMES AND TO INCREASE FLOW VELOCITY.

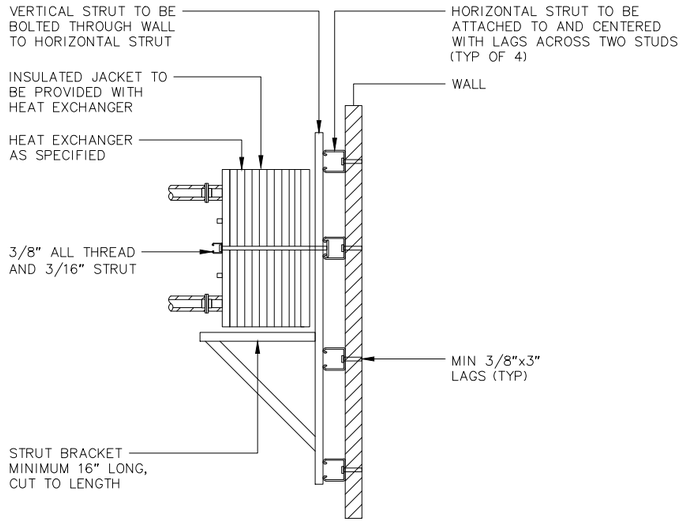
## 1 FILTRATE PIPE MODIFICATION DETAILS

NTS




## 2 pH SAMPLE QUILL

NTS

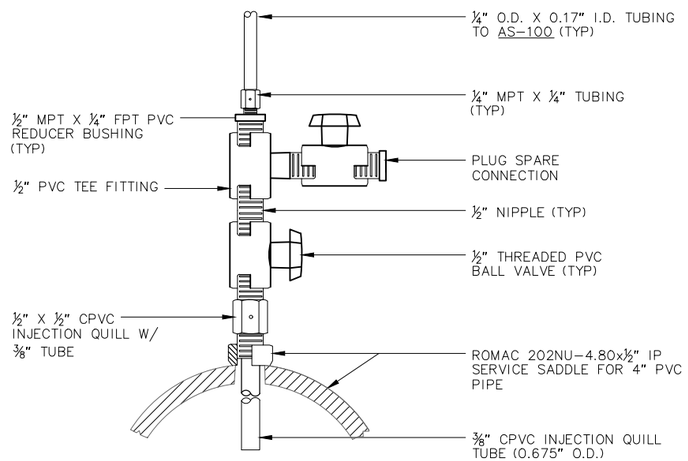



NOTES:

1. ALL STRUT TO BE A MINIMUM OF 13/16", 14 GAUGE STEEL.
2. ALL STRUT AND HARDWARE TO BE PROVIDED WITH ELECTRO-GALVANIZED OR PRE GALVANIZED FINISH FOR INDOOR APPLICATIONS.

## 3 HEAT EXCHANGER MOUNTING DETAIL

NTS




## 4 RAW WATER TURB. SAMPLE QUILL

NTS

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STATE OF ALASKA — 49TH — REGISTERED PROFESSIONAL ENGINEER — Troy L. McKeon — ME-11388 — 7/6/2020

PROJECT NO. – | CITY GRID – | WATER GRID – | SEWER GRID –

UNALAKLEET WTP UPGRADES
MECHANICAL DETAILS

PROJECT NO: 80901.02

DATE: JULY 2020

STATUS: ISSUED FOR CONSTRUCTION

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| REVISION | | | |

SCALE: HOR. N/A VER. N/A | DESIGNED BY: TLM | DRAWN BY: EME | CHECKED BY: KRH | APPROVED BY: –

SHEET NO.

M-505

## ELECTRICAL LEGEND

- EXPOSED CONDUIT
- CONDUIT/CABLE RUN UNDERGROUND
- X–Y,Z — HOMERUN TO PANEL "X", CIRCUITS NO. Y AND Z. CONDUIT RUNS NOT DEFINED ARE 1/2" C, 3#12.
- LIQUID–TIGHT FLEXIBLE CONDUIT
- CONDUIT RUN – CHANGE IN ELEVATION
- GROUND ROD
- GROUND
- PIGTAIL
- WEATHERHEAD
- (X) — SHEET NOTE "X"
- (XX) — CIRCUIT TAG
- UTILITY POLE WITH LUMINAIRE
- PANELBOARD
- VARIABLE FREQUENCY DRIVE
- UNIT MOUNT ENCLOSED CIRCUIT BREAKER
- MOTOR CONTROLLER
- MANUAL MOTOR STARTER
- COMBINATION MOTOR STARTER/DISCONNECT
- DISCONNECT SWITCH
- $_M — MOTOR STARTER SWITCH WITH THERMAL TRIP
- FUSED CUTOUT
- FUSED SWITCH
- MOTOR OVERLOAD
- (M) — KILOWATT–HOUR METER
- X/Y — MOLDED CASE CIRCUIT BREAKER, X = AMPERE RATING, Y = NO. OF POLES THERMAL/MAGNETIC UON
- (X) (F) — MOTOR – INTEGRAL (X=HP), FRACTIONAL (F)
- METER BASE
- (J) — JUNCTION BOX
- GFI — RECEPTACLE, 120V DUPLEX GFI = GROUND FAULT CIRCUIT INTERRUPTOR
- $ — SINGLE POLE SWITCH K = KEY SWITCH, WP = WEATHERPROOF
- LUMINAIRE, LINEAR SURFACE MOUNT EM = EMERGENCY TYPE
- TRANSFORMER
- AUTO TRANSFORMER

- CP — CONTROL PANEL
- PROCESS CONTROLLER
- INSTRUMENT DEVICE LOCATION (SEE TAG)
- HOA — HAND–OFF–AUTO SWITCH
- M — MOTORIZED ACTUATOR
- M — MOTORIZED VALVE
- LEVEL SWITCH
- AD — AUTOMATIC DIALER
- RA — REMOTE ANNUNCIATOR
- XX / XXXX — RELAY COIL
- PILOT LIGHT R=RED, B=BLUE, A=AMBER, G=GREEN
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- PANEL GROUND
- SWITCH
- PILOT LIGHT (PUSH TO TEST) A = AMBER, B = BLUE
- NORMALLY CLOSED
- NORMALLY OPEN
- FLOAT LEVEL SWITCH; CLOSE ON RISING LEVEL
- FLOAT LEVEL SWITCH; CLOSE ON RISING LEVEL
- X / X / X — 3 POSITION SELECTOR SWITCH
- X / X — 3 POSITION SELECTOR SWITCH

## ABBREVIATIONS

| | |
|---|---|
| ø | DIAMETER |
| A | AMPERE |
| AFF | ABOVE FINISH FLOOR |
| AFG | ABOVE FINISH GRADE |
| AIC | AMPERES INTERRUPTING CAPACITY |
| APT | APARTMENT |
| ATS | AUTOMATIC TRANSFER SWITCH |
| AUX | AUXILIARY |
| AWG | AMERICAN WIRE GAGE |
| BCU | BARE COPPER |
| BLDG | BUILDING |
| BLK | BLACK |
| C | CONDUCTOR, CONDUIT, OR CELSIUS |
| CP | CONTROL PANEL |
| CT | CURRENT TRANSFORMER |
| DIV | DIVISION |
| DWG | DRAWING |
| EGC | ELECTRODE GROUND CONDUCTOR |
| EMT | ELECTRICAL METALLIC TUBING |
| ENCL | ENCLOSURE |
| ENT | ELECTRICAL NON–METALLIC TUBING |
| EOL | END OF LINE RESISTOR |
| ESD | EMERGENCY SHUTDOWN |
| ETR | EXISTING TO REMAIN |
| EX,(E) | EXISTING |
| F | FAHRENHEIT |
| FT | FEET |
| FAP | FIRE ALARM PANEL |
| FCP | FUEL CONTROL PANEL |
| G | GROUND CONDUCTOR |
| GEN | GENERATOR |
| GFI | GROUND FAULT INTERRUPTER |
| H | HOT CONDUCTOR |
| HDG | HOT DIPPED GALVANIZED |
| HOA | HAND–OFF–AUTO |
| HP | HORSE POWER |
| IMC | INTERMEDIATE METAL CONDUIT |
| J–BOX | JUNCTION BOX |
| KA | KILO–AMPERES |
| KAIC | KILO–AMPERES INTERRUPTING CURRENT |
| KVA | KILO–VOLT–AMPERES |
| KW | KILO–WATTS |
| LBS | POUNDS |
| LFMC | LIQUID TIGHT FLEXIBLE METAL CONDUIT |
| LFNC | LIQUID TIGHT FLEXIBLE NON–METALLIC CONDUIT |
| L–N | LINE–TO–NEUTRAL |
| LS | LEVEL SWITCH |
| MCM | THOUSAND CIRCULAR MILLS |
| MCP | MOTOR CIRCUIT PROTECTOR |
| MCS | MOLDED CASE SWITCH |
| MCV | MOTORIZED CONTROL VALVE |
| MFR | MANUFACTURER |
| MG | MEGA–GALLONS |
| MIN | MINIMUM |
| MISC | MISCELLANEOUS |
| MLO | MAIN LUG ONLY |
| MOD | MODULE |
| MTS | MANUAL TRANSFER SWITCH |
| MX | MIXER |
| N | NEUTRAL CONDUCTOR |
| NEC | NATIONAL ELECTRICAL CODE |
| NEMA | NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION |
| NFS | NON FROST SUSCEPTIBLE |
| NIC | NOT IN CONTRACT |
| NMC | NON METALLIC CABLE |
| NTU | NEPHELOMETRIC UNIT |
| OH,O/H | OVERHEAD |
| P | POLE |
| PC | PROCESS CONTROLLER |
| PH,ϕ | PHASE |
| PRI | PRIMARY |
| RCP | RECEPTACLE |
| RMC | RIGID METAL CONDUIT, GALVANIZED |
| RTS | RATED TENSILE STRENGTH |
| SCCR | SHORT CIRCUIT CURRENT RATING |
| SCD | STREAMING CURRENT DETECTOR |
| SL | SWITCH LEG |
| TC | TRAY CABLE |
| TWSH | TWISTED/SHIELDED |
| TYP | TYPICAL |
| U/G | UNDERGROUND |
| UON | UNLESS OTHERWISE NOTED |
| UV | ULTRAVIOLET |
| UVEC | UNALAKLEET VALLEY ELECTRIC COOPERATIVE |
| V | VOLTS |
| VDC | DIRECT CURRENT VOLTAGE |
| VFD | VARIABLE FREQUENCY DRIVE |
| WP | WEATHERPROOF |
| WTP | WATER TREATMENT PLANT |
| XFMR | TRANSFORMER |

## SCOPE

PROJECT SCOPE INCLUDES ALL WORK SHOWN ON PLANS AND IN ACCORDANCE WITH SPECIFICATIONS AS REQUIRED, WITH MAJOR ELEMENTS OF WORK TO BE PROVIDED AS FOLLOWS:

- UTILITY SERVICE UPGRADE FROM 200A, 240/120V DELTA, TO 400A, 208Y/120V SERVICE.
- PREPARE GRAVEL PAD AND FOUNDATION FOR GENERATOR MODULE.
- ARCTIC–GRADE WALK–IN GENERATOR MODULE, TO INCLUDE A STANDBY–RATED DIESEL GENERATOR WITH SUB–BASE FUEL TANK AND RELATED ACCESSORIES, UNIT HEATER, LIGHTS, SERVICE EQUIPMENT, AUTOMATIC TRANSFER SWITCH, MAIN DISTRIBUTION PANEL, UTILITY PANEL, AND ELECTRICAL AS SHOWN.
- SURFACE AND OVERHEAD FEEDER FROM GENERATOR MODULE TO THE EXISTING LIFT STATION.
- OVERHEAD FEEDER FROM GENERATOR MODULE TO THE EXISTING UTILITY BUILDING HOUSING THE WATER TREATMENT PLANT, CITY SHOP & GARAGE, AND FIRE STATION.
- NEW SECONDARY DISTRIBUTION PANEL, TRANSFORMER, AND FEEDERS TO SUPPLY EXISTING PANELS IN THE UTILITY BUILDING.
- POWER AND CONTROLS FOR RAW WATER BYPASS SYSTEM THAT WILL DIVERT RAW WATER WHEN ACCEPTABLE NTU VALUES ARE EXCEEDED.
- POWER AND CONTROLS FOR THE RENOVATED HEAT RECOVERY SYSTEM.

## PROPOSED CONSTRUCTION SEQUENCE

CONTRACTOR SHALL PREPARE AND SUBMIT A PROJECT EXECUTION PLAN, WITH THE CONSTRUCTION SEQUENCED TO MINIMIZE POWER OUTAGES DURING CONSTRUCTION. THE FOLLOWING CONTRUCTION SEQUENCE IS PROVIDED AS A GUIDE FOR THE CONTRACTOR TO PREPARE A PLAN FOR THE INSTALLATION OF THE GENERATOR MODULE AND POWER DISTRIBUTION.

1. SCHEDULE UTILITY UPGRADES AND CUTOVER BY UVEC AS REQUIRED FOR PROPOSED CHANGE IN SERVICE CAPACITY AND VOLTAGE TO THE EXISTING UTILITY BUILDING.
2. INSTALL AND COMMISSION THE STANDBY GENERATOR MODULE, WITH NEW SERVICE EQUIPMENT READY FOR UTILITY CONNECTION.
3. INSTALL SURFACE AND OVERHEAD FEEDER FROM GENERATOR MODULE TO THE EXISTING LIFT STATION.
4. INSTALL OVERHEAD FEEDER TO THE UTILITY BUILDING, AND ROUTE CIRCUIT FROM ROOF CONNECTION THROUGH THE WATER TREATMENT PLANT TO PANEL "SDP". SIMILARLY, INSTALL OVERHEAD CONTROL CIRCUIT TO THE UTILITY BUILDING.
5. INSTALL GROUNDING ELECTRODES AND GROUNDING CONDUCTORS AT THE UTILITY BUILDING AND LIFT STATION.
6. DISCONNECT AND REMOVE FEEDER FROM PANEL A TO APARTMENT PANEL. APARTMENT PANEL WILL BE RECONNECTED BY OTHERS TO NEW 240/120V SERVICE (NIC).
7. INSTALL PANEL "SDP", 75KVA AUTO–TRANSFORMER, CIRCUIT BREAKER "CBA", AND NEW FEEDERS TO VICINITY OF PANELS A, B, F, G, M, AND S. TEST ALL CIRCUITS FOR INSULATION RESISTANCE, PROPER GROUNDING AND NEUTRAL ISOLATION. CONNECT AND ENERGIZE SDP FROM STANDBY GENERATOR POWER, THEN TEST ALL CIRCUITS FOR PROPER VOLTAGE AND PHASE ROTATION IN PREPARATION FOR CUTOVER TO NEW 208Y/120V SERVICE.
8. POWER OUTAGE: UVEC TO DISCONNECT EXISTING 240/120V DELTA SERVICE AND RECONFIGURE TRANSFORMERS FOR NEW 208Y/120V SERVICE. UVEC TO CONNECT NEW 208/120V SERVICE DROP TO GENERATOR MODULE SERVICE EQUIPMENT.
9. DISCONNECT PANEL A FROM EXISTING FEEDER; RECONNECT PANEL A TO NEW SDP FEEDER.
10. OPERATE WATER TREATMENT PLANT ON STANDBY GENERATOR AS REQUIRED UNTIL UVEC SERVICE CUTOVER IS COMPLETE. CHECK NEW SERVICE FOR CORRECT VOLTAGE AND ROTATION BEFORE CLOSING MAIN BREAKER "MCB".
11. DISCONNECT PANELS B, F, G, M, AND S FROM PANEL A FEEDERS, AND RECONNECT THESE PANELS TO NEW SDP FEEDERS. CHECK 2–POLE CIRCUITS FOR PROPER VOLTAGE.
12. DEMOLISH ABANDONED SERVICE EQUIPMENT, MANUAL TRANSFER SWITCHES, STANDBY GENERATOR, AND PANEL A FEEDER.
13. DEMOLISH ABANDONED FEEDERS FROM PANEL A TO PANELS B, F, G, M, AND S.

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STATE OF ALASKA — WILLIAM A. STRAIN — EE-9323 — REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. - | CITY GRID - | WATER GRID - | SEWER GRID -

UNALAKLEET WTP UPGRADES

LEGEND AND ABBREVIATIONS

DATE: JULY 2020

STATUS: ISSUED FOR CONSTRUCTION

PROJECT NO: 80901.02

| REVISION REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
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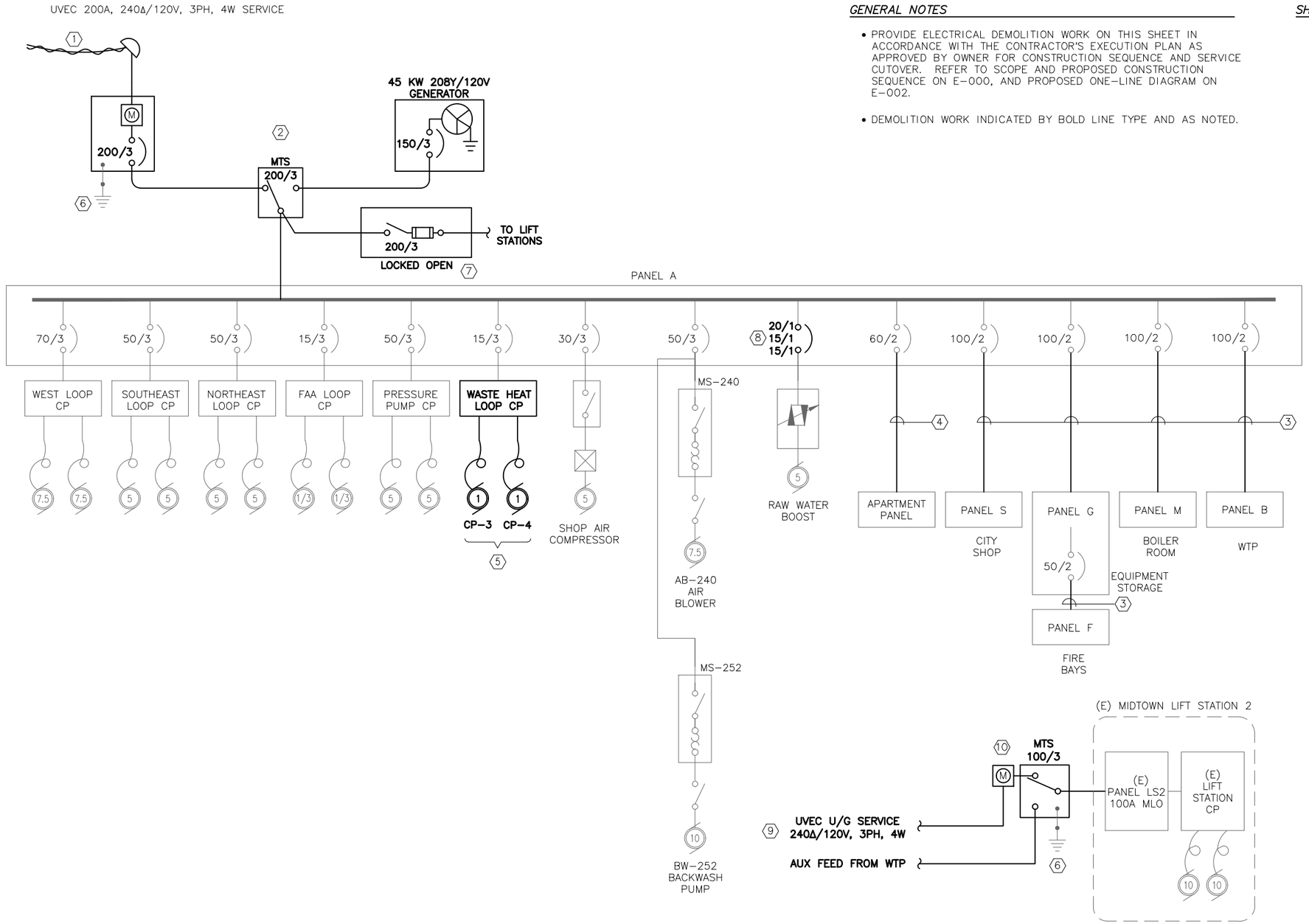
SCALE HOR. N/A VER. N/A | DESIGNED BY WAS | DRAWN BY JEH | CHECKED BY - | APPROVED BY -

SHEET NO.

E-000




## GENERAL NOTES

- PROVIDE ELECTRICAL DEMOLITION WORK ON THIS SHEET IN ACCORDANCE WITH THE CONTRACTOR'S EXECUTION PLAN AS APPROVED BY OWNER FOR CONSTRUCTION SEQUENCE AND SERVICE CUTOVER. REFER TO SCOPE AND PROPOSED CONSTRUCTION SEQUENCE ON E-000, AND PROPOSED ONE-LINE DIAGRAM ON E-002.
- DEMOLITION WORK INDICATED BY BOLD LINE TYPE AND AS NOTED.

## SHEET NOTES

1. COORDINATE WITH UVEC TO RETIRE 240V DELTA/120V OVERHEAD SERVICE TO WTP AND CUTOVER TO 208Y/120V SERVICE AT NEW GENERATOR MODULE.
2. AFTER CUTOVER TO NEW 208Y/120V SERVICE, REMOVE EXISTING SERVICE EQUIPMENT, MANUAL TRANSFER SWITCH, GENERATOR, AND RELATED INTERCONNECTS AND FEEDERS BACK TO PANEL A.
3. DEMOLISH EXISTING 240/120V FEEDER AND RECONNECT TO NEW 208/120V FEEDER WHEN THE FOLLOWING ARE COMPLETE:
   - NEW GENERATOR MODULE IS INSTALLED AND OPERATIONAL, AND
   - PANEL SDP IS INSTALLED, TESTED, AND READY TO ENERGIZE FROM NEW SERVICE, AND
   - NEW FEEDER FROM SDP IS EXTENDED FROM SDP TO VICINITY OF PANEL, AND
   - APARTMENT PANEL CUTOVER TO NEW 240/120V SERVICE (NIC, BY OTHERS), AND
   - UVEC SERVICE IS CUTOVER TO NEW 208/120V SYSTEM.
4. DEMOLISH EXISTING 240/120V FEEDER TO APARTMENT PANEL AFTER:
   - APARTMENT PANEL CUTOVER TO NEW 240/120V SERVICE (NIC, BY OTHERS).
5. REMOVE CIRC PUMP, CONTROL PANEL, AND RELATED CONDUIT AND WIRING BACK TO PANEL A. COORDINATE WITH MECHANICAL DEMOLITION.
6. PRESERVE EXISTING GROUND ELECTRODE(S) FOR RECONNECTION IN NEW WORK.
7. REMOVE FUSED SWITCH AND EXPOSED CONNECTIONS IN BOILER ROOM. SEE E-201 FOR ADDITIONAL INFORMATION.
8. REPLACE 1-POLE BREAKERS WITH 3-POLE BREAKER; SEE REWORKED PANEL A SCHEDULE ON E-302.
9. COORDINATE WITH UVEC TO RETIRE 240V DELTA/120V UNDERGROUND SERVICE TO LIFT STATION AND CUTOVER TO STANDBY FEEDER FROM NEW GENERATOR MODULE.
10. AFTER CUTOVER TO NEW STANDBY FEEDER, REMOVE METERBASE, MANUAL TRANSFER SWITCH, AND RELATED INTERCONNECTS. IDENTIFY SOURCE OF U/G AUX FEED FROM WTP AND VERIFY FEEDER IS ISOLATED AND UNUSABLE (FAULTED) BEFORE DEMOLITION. SEE E-101 FOR ADDITIONAL INFORMATION.

1 **EXISTING POWER ONE LINE - WTP & LIFT STATION**
NTS

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ANCHORAGE, ALASKA 99503
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STATE OF ALASKA — WILLIAM A. STRAIN — EE-6323 — REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. - | CITY GRID - | WATER GRID - | SEWER GRID -

UNALAKLEET WTP UPGRADES
EXISTING POWER ONE-LINE

PROJECT NO: 80901.02

DATE: JULY 2020

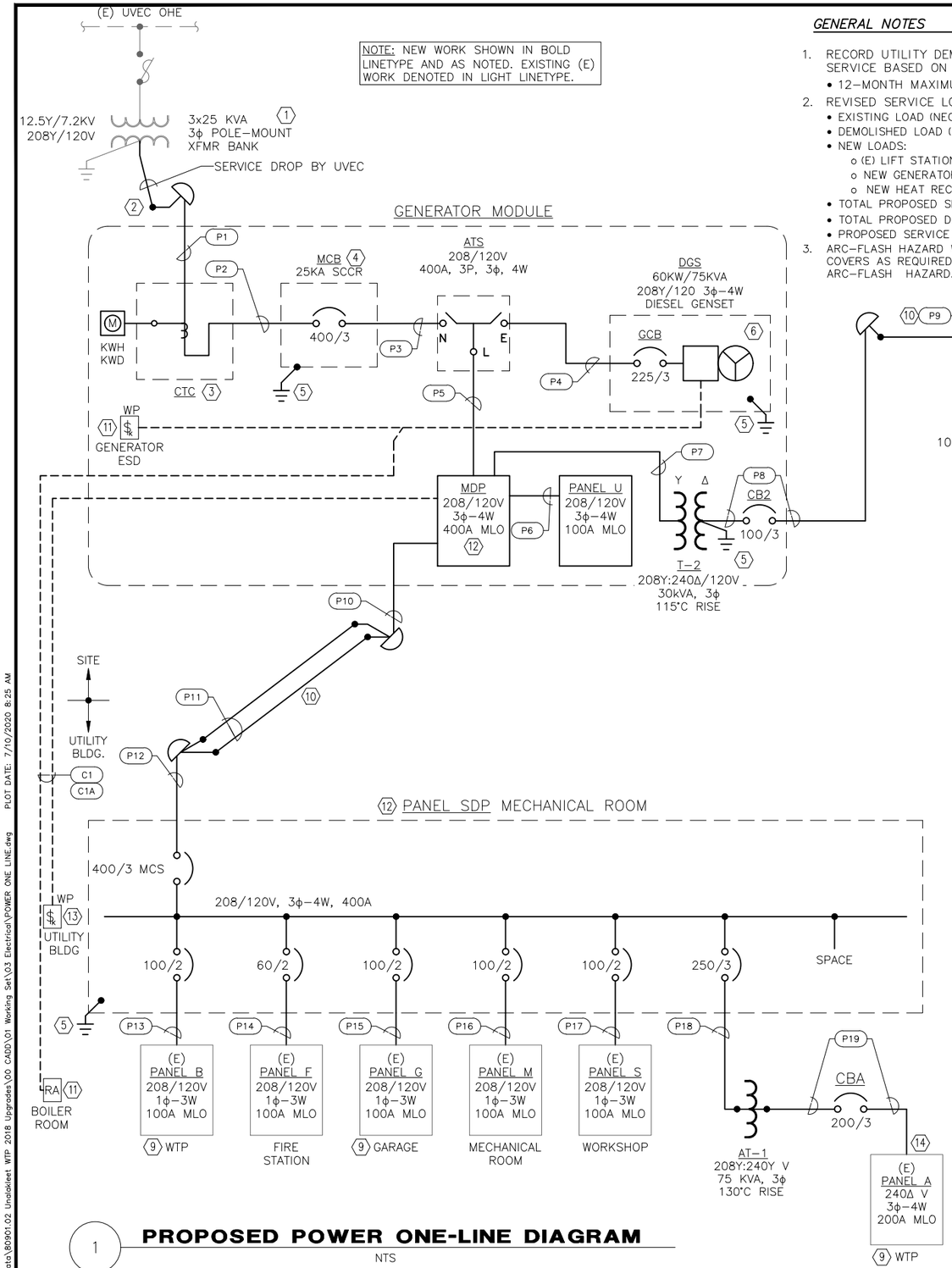
STATUS: ISSUED FOR CONSTRUCTION

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE HOR. N/A VER. N/A | DESIGNED BY WAS | DRAWN BY JEH | CHECKED BY - | APPROVED BY -

SHEET NO.
E-001

File: J:\JobsData\80901.02 Unalakleet WTP 2018 Upgrades\00 CADD\01 Working Set\03 Electrical\POWER ONE LINE.dwg PLOT DATE: 7/10/2020 8:25 AM




1 **PROPOSED POWER ONE-LINE DIAGRAM**

NTS

## GENERAL NOTES

1. RECORD UTILITY DEMAND FOR THE EXISTING 240V DELTA METERED SERVICE BASED ON 12-MONTH HISTORY FOR THE WTP IS AS FOLLOWS:
   - 12-MONTH MAXIMUM DEMAND = 29.8 KW / 0.85 PF = 35.1 KVA
2. REVISED SERVICE LOAD DEMAND CALCULATION:
   - EXISTING LOAD (NEC 220.87): 35.1 KVA X 125% = 43.8 KVA
   - DEMOLISHED LOAD (4 PUMPS): -3.5 KVA
   - NEW LOADS:
     - (E) LIFT STATION (2 @ 10HP + MISC) => 39.2 KVA
     - NEW GENERATOR MODULE (PANEL U) => 11.8 KVA
     - NEW HEAT RECOVERY SYSTEM => 2.1 KVA
   - TOTAL PROPOSED SERVICE LOAD: 93.4 KVA
   - TOTAL PROPOSED DEMAND AT 208/120V 3-PHASE: 259 A
   - PROPOSED SERVICE EQUIPMENT CAPACITY: 400 A
3. ARC-FLASH HAZARD WARNING: MARK DISTRIBUTION EQUIPMENT DEAD-FRONT COVERS AS REQUIRED BY NEC 110.16(A) WITH WARNING OF POTENTIAL ARC-FLASH HAZARD.

## SHEET NOTES

1. COORDINATE SERVICE CUTOVER WITH UTILITY TO SCHEDULE RECONNECT OF POLE TRANSFORMERS FROM 240V DELTA SERVICE TO 208/120V WYE SERVICE.
2. PROVIDE 18" CONDUCTOR TAILS FOR UTILITY CONNECTION, WITH NEUTRAL CLEARLY IDENTIFIED PER NEC 200.6.
3. PROVIDE SERVICE EQUIPMENT IN COMPLIANCE WITH UVEC STANDARDS, TO INCLUDE CT CABINET 36" X 36" X 11" MINIMUM SIZE WITH INSULATED NEUTRAL BUS, AND CT-RATED 13-JAW METER SOCKET WITH MANUAL TEST SWITCH PROVISION OR AUTOMATIC CIRCUIT RECLOSERS AS DIRECTED BY UVEC.
4. PROVIDE MAIN BREAKER IN TYPE 4X ENCLOSURE WITH LOCK OPEN AND LOCK CLOSED PROVISIONS. MARK EQUIPMENT WITH SIGNAGE IN COMPLIANCE WITH NEC 110.21(B), 110.24, AND 702.2 TO INDICATE THE FOLLOWING:
   - SERVICE DISCONNECT: WATER TREATMENT PLANT AND MIDTOWN LIFT STATION.
   - AVAILABLE FAULT CURRENT: 14,468 AMPS. DATE: JULY, 2019, BASED ON 3 X 25 KVA UTILITY SERVICE TRANSFORMERS.
   - NOTICE: THE WATER TREATMENT PLANT IS EQUIPPED WITH AN AUTOMATICALLY-STARTED STANDBY GENERATOR POWER SOURCE.
   - WARNING: SHOCK HAZARD EXISTS IF GROUNDING ELECTRODE CONDUCTOR OR BONDING JUMPER CONNECTION IN THIS EQUIPMENT IS REMOVED WHILE ALTERNATE SOURCE IS ENERGIZED.
5. SEE GROUNDING DIAGRAM AND DETAILS ON SHEET E-003.
6. GENERATOR NEUTRAL SHALL BE SOLIDLY CONNECTED THROUGH THE ATS TO THE GROUNDED SERVICE CONDUCTOR. ACCORDINGLY THE GENERATOR IS NOT A SEPARATELY DERIVED SYSTEM.
7. PROVIDE HEAVY-DUTY DISCONNECT SWITCH IN NEMA 4X ENCLOSURE WITH NEUTRAL AND GROUND BUS KITS AT LIFT STATION.
8. VERIFY NEW FEEDER IS CONNECTED TO MATCH EXISTING SERVICE PHASE ROTATION AND HIGH LEG IN C-PHASE POSITION. MARK HIGH LEG (139V L-N) AS REQUIRED BY NEC 110.15.
9. SEE PANEL SCHEDULE FOR REWORK REQUIRED AT EXISTING PANEL.
10. AERIAL CIRCUIT MESSENGER SHALL BE BONDED TO THE CABLE EGC AND TO THE RMC RISER MAST AT EACH WEATHERHEAD CONNECTION. SEE DETAIL 4/E-101.
11. SEE 2/E-003 RISER DIAGRAM FOR WTP AND GENERATOR SHUT-DOWNS, AND GENERATOR REMOTE ANNUNCIATOR INTERCONNECTS.
12. SEE PANEL SCHEDULE FOR COMPLETE CIRCUIT BREAKERS, SPARES, AND SPACE REQUIREMENTS.
13. PROVIDE KEYED SWITCH OR KEY-ACCESSIBLE SWITCH TO ACTUATE SHUNT-TRIP BREAKER AT THE SDP FEEDER BREAKER AT MDP. LOCATE SWITCH NEAR UTILITY BUILDING ENTRANCE AS SHOWN ON E-200.
14. ONLY EXISTING 240V 3-WIRE 3-PHASE LOADS SHALL REMAIN ON PANEL A; ALL LINE-TO-NEUTRAL LOADS SHALL BE REMOVED AND RECIRCUITED TO PANEL B.

### CIRCUIT SCHEDULE

| TAG | FROM | TO | SETS | CONDUIT * | CONDUCTOR** | EGC *** | NOTES |
|---|---|---|---|---|---|---|---|
| P1 | OH MAST | CTC | 1 | 3" | 4#500 | – | |
| P2 | CTC | MCB | 1 | 3" | 4#500 | #1/0 | |
| P3 | MCB | ATS | 1 | 3" | 4#500 | #2 | |
| P4 | DGS | ATS | 1 | 2-1/2" LFMC | 4#4/0 | #4 | [1] |
| P5 | ATS | MDP | 1 | 3" | 4#500 | #2 | |
| P6 | MDP | PANEL U | 1 | 1" | 4#6 | #10 | |
| P7 | MDP | T-2 PRI | 1 | 1-1/4" | 3#2 | #6 | 208V, 3PH-3W FEEDER |
| P8 | T-2/CB2 | POLE P2 | 1 | 1-1/2" | 4#1/0 | #4 | 240Δ/120V, 3PH-4W FEEDER |
| | OH MAST | PANEL LS2 | | | | | |
| P9 | POLE P2 | POLE P3 & OH MAST @ LIFT STATION | 1 | AERIAL SPAN MESSENGER 1/4" GUYWIRE | 4#1/0 + EGC XHHW-2, UL TYPE TC | #6 & GUYWIRE | 240Δ/120V, 3PH-4W FEEDER [2], [3], [4] GUYWIRE RTS = 3150 LB |
| P10 | MDP | OH MAST | 2 | 1-1/2" | 4#1/0 | #4 | FEED TO PANEL SDP |
| P11 | OH MAST AT GEN-MOD | OH MAST AT WTP BLDG | 2 | AERIAL SPAN MESSENGER 1/4" GUYWIRE | 4C #1/0 + EGC XHHW-2, UL TYPE TC | #6 & GUYWIRE | [2], [3], [4] GUYWIRE RTS = 3150 LB |
| P12 | OH MAST | SDP | 2 | 1-1/2" | 4#1/0 | #4 | |
| P13 | SDP | PANEL B | 1 | 1-1/4" | 3#2 | 1#8 | |
| P14 | SDP | PANEL F | 1 | 1" | 3#6 | 1#10 | |
| P15 | SDP | PANEL G | 1 | 1-1/4" | 3#2 | 1#8 | |
| P16 | SDP | PANEL M | 1 | 1-1/4" | 3#2 | 1#8 | |
| P17 | SDP | PANEL S | 1 | 1-1/4" | 3#2 | 1#8 | |
| P18 | SDP | AT-1 PRI | 1 | 2-1/2" | 4#250 | 1#4 | 208V, 3PH-4W FEEDER |
| P19 | AT-1 SEC | PANEL A | 1 | 2" | 3#3/0 | 1#6 | 240V, 3PH-3W FEEDER |
| C1 | GEN-MOD | OH MAST | 1 | 1" | 15C #14, 600V, XHHW-2, UL TYPE TC-ER | (#14) & GUYWIRE | [2], [4], [5] GUYWIRE RTS = 3150 LB |
| C1A | OH MAST AT GEN-MOD | OH MAST AT WTP BLDG | 1 | AERIAL SPAN MESSENGER 1/4" GUYWIRE | | | |
| C1 | OH MAST | WTP BLDG | 1 | 1" | | | |

NOTES:

- * CONDUIT SIZED BASED ON RMC. REFER TO SPECS FOR ALLOWABLE CONDUIT TYPES.
- ** CONDUCTORS ARE CU, 600V, TYPE XHHW-2 UNLESS NOTED OTHERWISE.
- *** PROVIDE INSULATED EGC UNLESS NOTED OTHERWISE.
- [1] LIMIT LFMC TO A 6' MAX DROP FOR GENERATOR CONNECTION.
- [2] PROVIDE APPROVED UV-RESISTANT METHOD OF CONTINUOUS LASHING OF CABLE TO MESSENGER WIRE.
- [3] TERMINATE TC CABLE AT EACH WEATHERHEAD WITH SUITABLE FITTING PER DETAIL.
- [4] MESSENGER SHALL BE BONDED TO RMC AND/OR EGC AT EACH WEATHERHEAD PER DETAIL.
- [5] USE ONE CABLE CONDUCTOR FOR THE EGC.

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PROJECT NO. - | CITY GRID - | WATER GRID - | SEWER GRID -

UNALAKLEET WTP UPGRADES

PROPOSED POWER ONE-LINE

PROJECT NO: 80901.02

STATUS: ISSUED FOR CONSTRUCTION

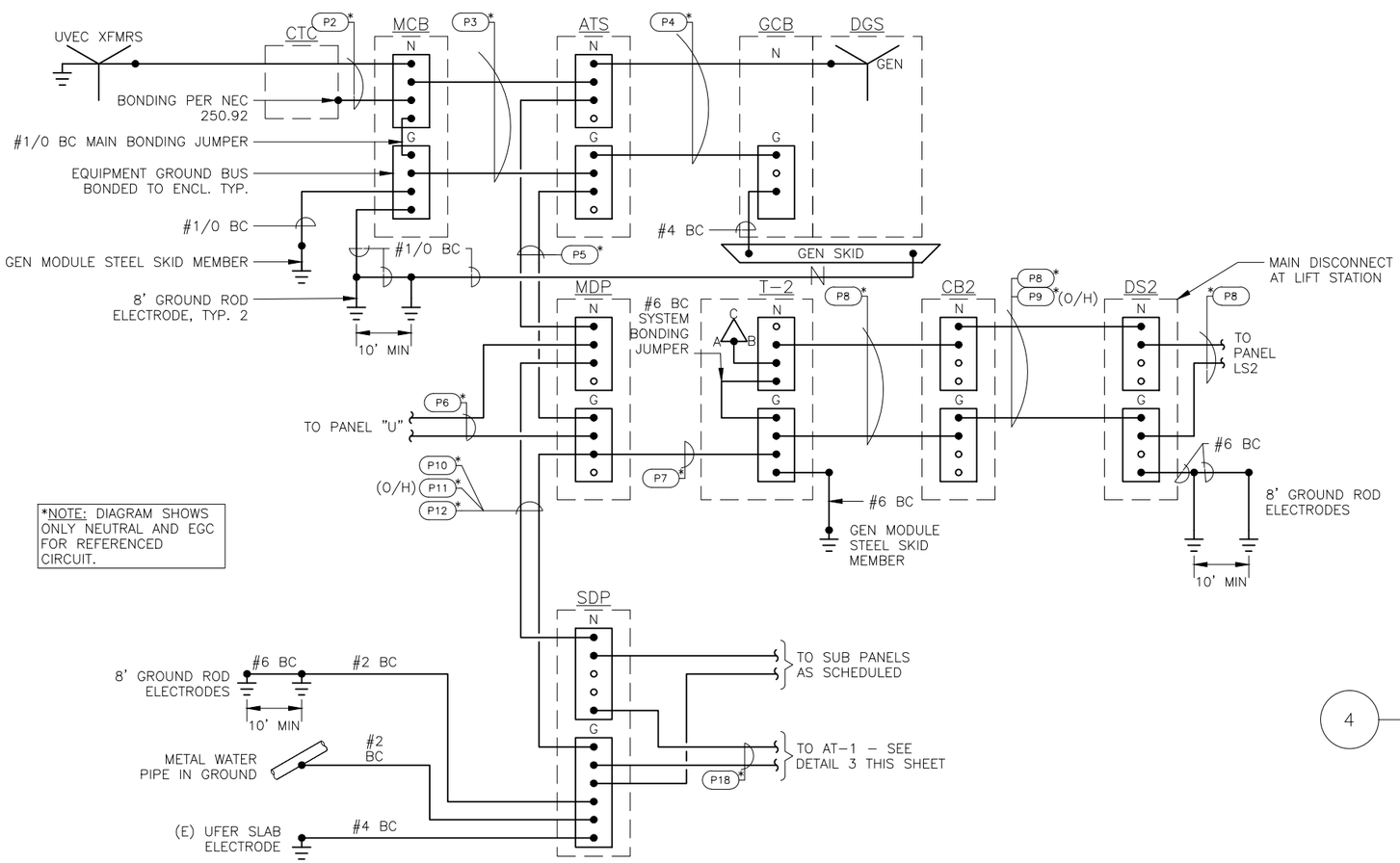
DATE: JULY 2020

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE: HOR. N/A VER. N/A | DESIGNED BY: WAS | DRAWN BY: JEH | CHECKED BY: - | APPROVED BY: -

SHEET NO.

**E-002**




*NOTE: DIAGRAM SHOWS ONLY NEUTRAL AND EGC FOR REFERENCED CIRCUIT.

## GROUNDING DIAGRAM

1

NTS

| PANEL x – FEED FROM ** | |
|---|---|
| VOLTAGE 208Y / 120V, 3P–4W | |
| PHASE A | BLACK |
| PHASE B | RED |
| PHASE C | BLUE |
| NEUTRAL | WHITE |
| GROUND | GREEN |

APPLIES TO (3) PANELS: x = MDP, SDP, U

** SEE POWER 1–LINE DIAGRAM

| PANEL LS2 – FEED FROM PANEL MDP | |
|---|---|
| VOLTAGE 240Δ / 120V, 3P–4W | |
| PHASE A | BLACK |
| PHASE B | RED |
| PHASE C | ORANGE * |
| NEUTRAL | WHITE |
| GROUND | GREEN |

* CAUTION: C–PHASE HAS 139V TO GROUND

| PANEL A – FEED FROM PANEL SDP | |
|---|---|
| VOLTAGE 240V, 3P–3W | |
| PHASE A | BLACK |
| PHASE B | RED |
| PHASE C | BLUE |
| GROUND | GREEN |

CAUTION: PHASE TO GROUND = 139V.
NEUTRAL NOT PROVIDED TO PANEL

| PANEL x – FEED FROM PANEL SDP | |
|---|---|
| VOLTAGE 208 / 120V, 2P–3W | |
| PHASE A | BLACK |
| PHASE B | RED |
| NEUTRAL | WHITE |
| GROUND | GREEN |

APPLIES TO (2) PANELS: x = F, G

| PANEL B – FEED FROM PANEL SDP | |
|---|---|
| VOLTAGE 208 / 120V, 2P–3W | |
| PHASE B | RED |
| PHASE C | BLUE |
| NEUTRAL | WHITE |
| GROUND | GREEN |

| PANEL x – FEED FROM PANEL SDP | |
|---|---|
| VOLTAGE 208 / 120V, 2P–3W | |
| PHASE A | BLACK |
| PHASE C | BLUE |
| NEUTRAL | WHITE |
| GROUND | GREEN |

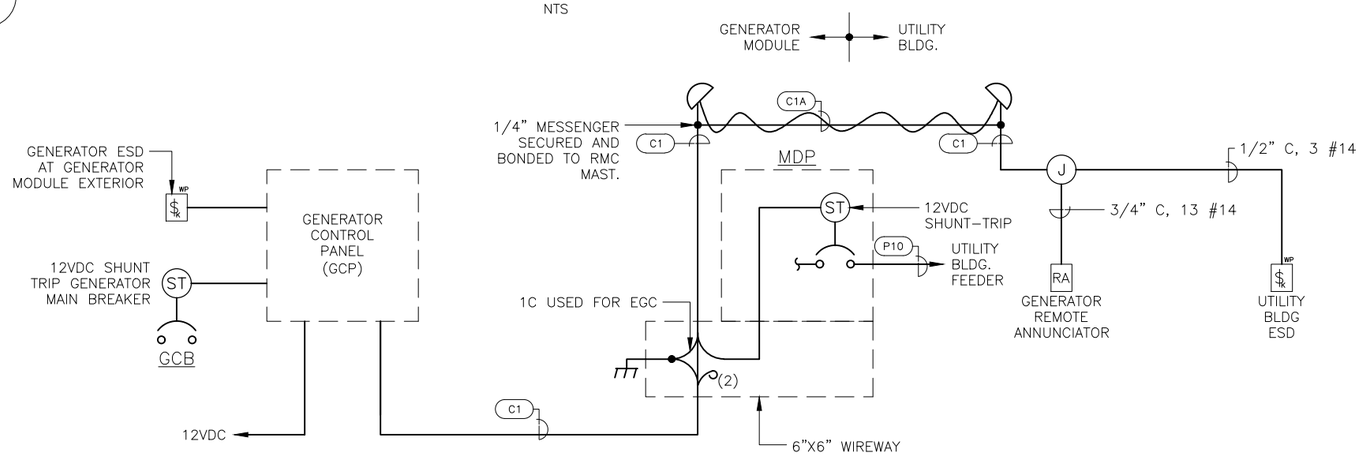
APPLIES TO (2) PANELS: x = M, S

NOTE:
PROVIDE PLACARD AS INDICATED AND APPLICABLE AT EACH PANELBOARD TO IDENTIFY THE WIRING SYSTEM AS–BUILT COLOR CODE (REF. NEC 310.110, 408.4), THE FEEDER SOURCE OF SUPPLY, AND PRECAUTIONS. PLACARDS SHALL BE ENGRAVED PHENOLIC, BLACK 1/4" HIGH LETTERS ON WHITE BACKGROUND AND MOUNTED ON PANEL FRONT COVER.

## PANEL VOLTAGE PLACARD DETAIL

4

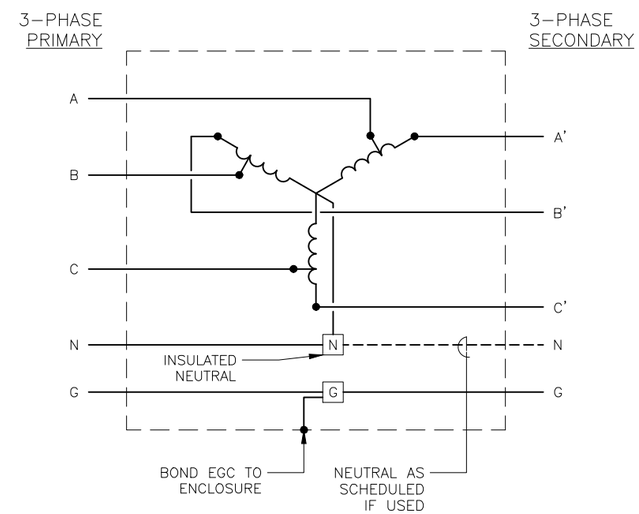
NTS




## RISER DIAGRAM - POWER SUPPLY ESD & GENERATOR ALARM

2

NTS




## AUTO-TRANSFORMER GROUNDING DETAIL

3

NTS

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PHONE (907) 563-3529
AECC-882-AK

PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

UNALAKLEET WTP UPGRADES

GROUNDING & RISER DIAGRAMS

PROJECT NO: 80901.02

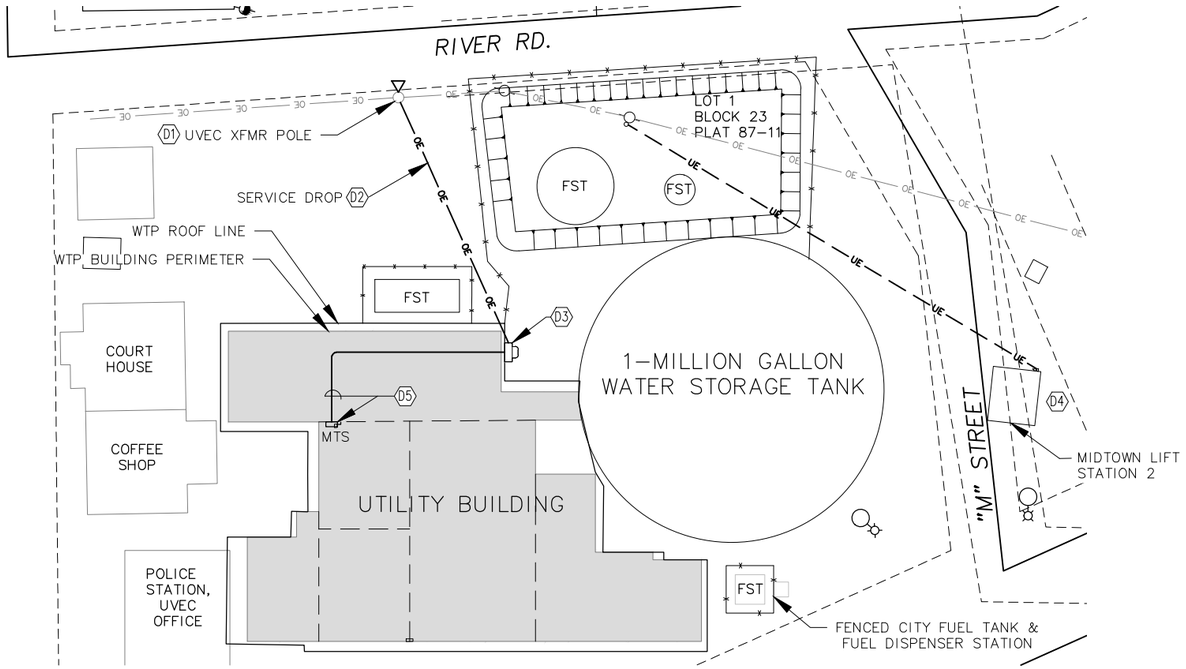
DATE: JULY 2020

STATUS: ISSUED FOR CONSTRUCTION

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE
HOR. N/A
VER. N/A
DESIGNED BY WAS
DRAWN BY JEH
CHECKED BY –
APPROVED BY –

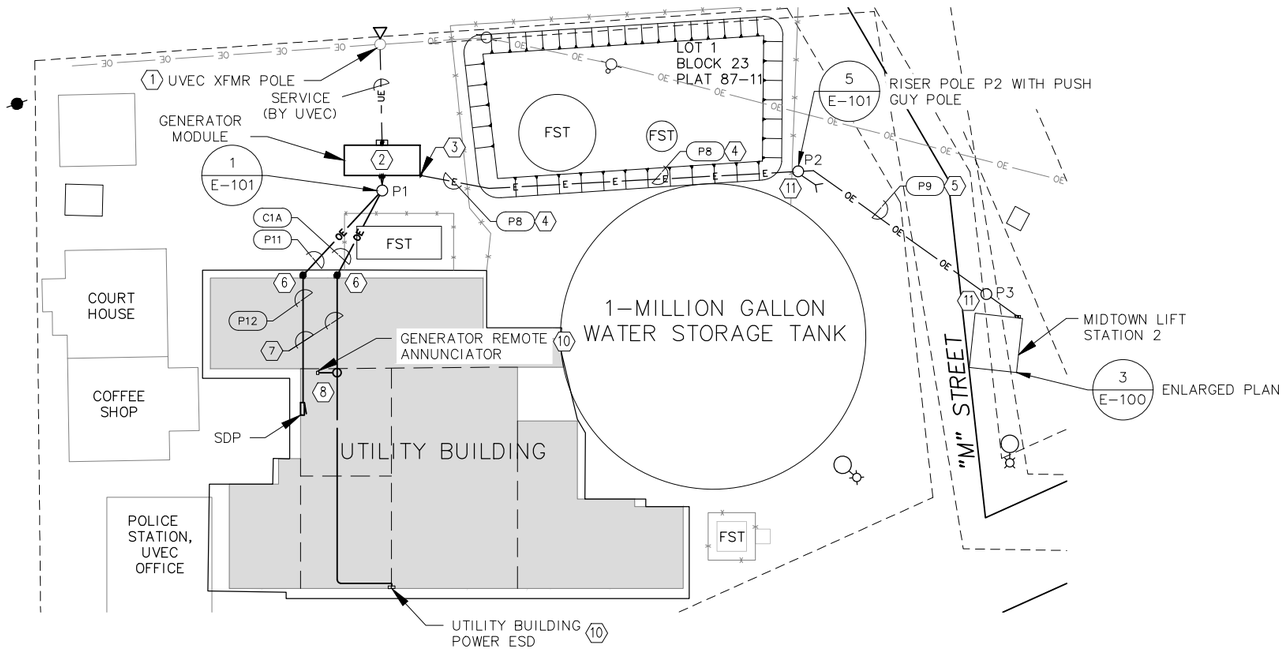
SHEET NO.
E-003




## 1 ELECTRICAL SITE DEMOLITION PLAN

1" = 20'

20' 0 20' 40'




## 2 PROPOSED ELECTRICAL SITE PLAN

1" = 20'

20' 0 20' 40'

### GENERAL NOTES

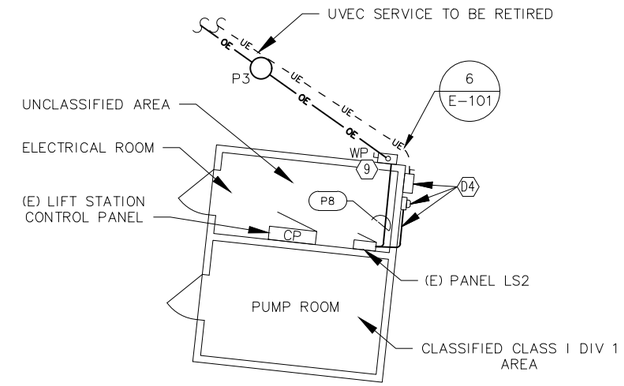
1. PROVIDE ELECTRICAL DEMOLITION WORK ON THIS SHEET IN ACCORDANCE WITH THE CONTRACTOR'S EXECUTION PLAN AS APPROVED BY OWNER FOR CONSTRUCTION SEQUENCE AND SERVICE CUTOVER. REFER TO SCOPE AND PROPOSED CONSTRUCTION SEQUENCE ON E-000, AND PROPOSED ONE-LINE DIAGRAM ON E-002.
2. AFTER SCHEDULED DEMOLITION ITEMS ARE REMOVED, PAINT UNDERLYING UNFINISHED OR DAMAGED SURFACES TO MATCH ADJACENT WORK FINISH, AND PATCH/SEAL ABANDONED PENETRATION VAPORTIGHT.
3. SEE CIRCUIT SCHEDULE ON SHEET E-002.

### DEMOLITION NOTES

(D1) 240/120V DELTA TRANSFORMER BANK TO BE RECONFIGURED BY UVEC FOR NEW SERVICE TO UTILITY BUILDING GENERATOR MODULE.
(D2) 200A SERVICE DROP TO UTILITY BUILDING WILL BE RETIRED BY UVEC.
(D3) RETIRE 200A SERVICE EQUIPMENT AFTER CUTOVER TO NEW 208Y/120V SERVICE.
(D4) 100A SERVICE LATERAL TO LIFT STATION 2 WILL BE RETIRED BY UVEC. DEMOLISH METER BASE, MTS, EXTERNAL ENCLOSURE, AND RELATED ACTIVE AND ABANDONED CONNECTIONS AT LIFT STATION AS REQUIRED DURING CUTOVER TO NEW 240/120V 3-PHASE STANDBY-BACKED FEEDER IN NEW WORK.
(D5) DEMOLISH 200A FEEDER AND MTS AFTER CUTOVER TO NEW 208Y/120V SERVICE.

### SHEET NOTES

(1) 208Y/120V TRANSFORMER BANK AND NEW OVERHEAD SERVICE DROP BY UVEC, TO CT-METERED SERVICE EQUIPMENT AT GENERATOR MODULE.
(2) SEE SHEET E-400 FOR GENERATOR MODULE PLAN AND DETAILS.
(3) REFER TO DETAIL 2/E-101 FOR FLEXIBLE CONDUIT RISER CONNECTION.
(4) REFER TO DETAIL 3/E-101 FOR CONDUIT SUPPORTS IN ABOVE GRADE FEEDER SEGMENT. ENSURE NEW WORK DOES NOT DAMAGE INTEGRITY OF EXISTING DIKED CONTAINMENT AREA LINER.
(5) SAG MESSENGER WITH TYPE TC CABLE AT 60F, WITH TENSION NOT TO EXCEED 25% OF MESSENGER RATED STRENGTH OR ~788 LBS, AND AS REQUIRED TO MAINTAIN 18 FT VERTICAL GROUND CLEARANCE OVER ROAD.
(6) PROVIDE RMC RISERS WITH WEATHERHEAD AT 36" MINIMUM ABOVE ROOF AND NOT LESS THAN 18" CONDUCTOR CLEARANCE ABOVE ROOF OVERHANG, AND AS REQUIRED TO MAINTAIN 18 FT VERTICAL GROUND CLEARANCE OVER DRIVEWAY SUBJECT TO TRUCK TRAFFIC.
(7) ROUTE FEEDER AND CONTROL CIRCUIT IN RMC INSIDE BUILDING AT MAXIMUM HEIGHT ABOVE WATER TREATMENT PLANT AND MECHANICAL ROOM.
(8) SEE E-201 AND E-202 FOR DEMOLITION AND NEW WORK IN BOILER ROOM TO PREPARE SPACE FOR SDP INSTALLATION.
(9) INSTALL NEW FEEDER DISCONNECT AND EXTEND CIRCUIT TO LIFT STATION PANEL LS2 PRIOR TO RETIREMENT OF EXISTING UVEC SERVICE, AS REQUIRED TO MINIMIZE LIFT STATION OUTAGE DURING CUTOVER.
(10) REFER TO DETAIL 2/E-003 RISER DIAGRAM FOR GENERATOR REMOTE ANNUNCIATOR AND UTILITY BUILDING ESD SWITCH.
(11) POLES P2 & P3: PROVIDE 30 FT CLASS 5 POLES SET TO 6 FT DEPTH WITH BELOW GRADE SECTION WRAPPED WITH TWO LAYERS 10-MIL POLYETHYLENE FILM. SECURE MESSENGER TO HDG DEADEND CLEVIS BRACKET(S) SECURED TO POLE WITH 5/8" THRU-BOLT. PROVIDE INSULATED STANDOFF BRACKET TO SECURE CONDUCTORS AROUND POLE AS REQUIRED AT POLE P3.




## 3 MIDTOWN LIFT STATION 2

1" = 5'

5' 0 5' 10'

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PROJECT NO. - | CITY GRID - | WATER GRID - | SEWER GRID -

UNALAKLEET WTP UPGRADES

ELECTRICAL SITE PLAN

DATE: JULY 2020

STATUS: ISSUED FOR CONSTRUCTION

PROJECT NO: 80901.02

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE HOR. GRAPHIC VER. N/A | DESIGNED BY WAS | DRAWN BY JEH | CHECKED BY - | APPROVED BY -

SHEET NO.

E-100

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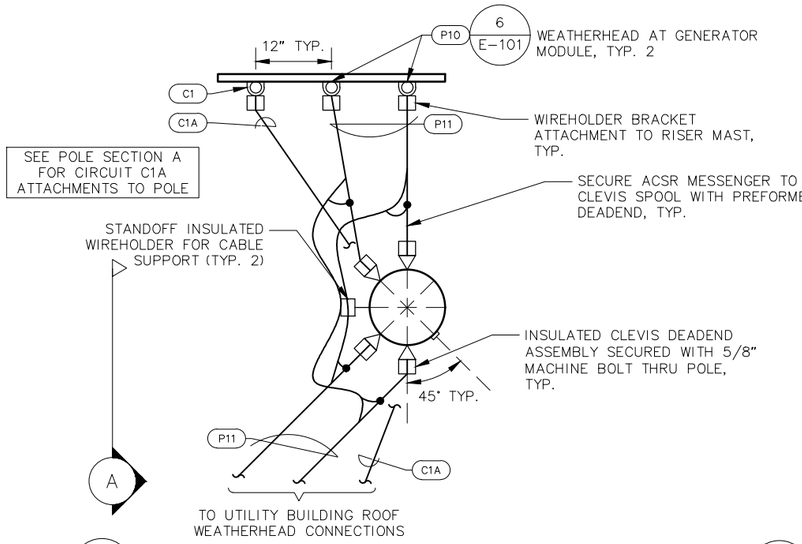
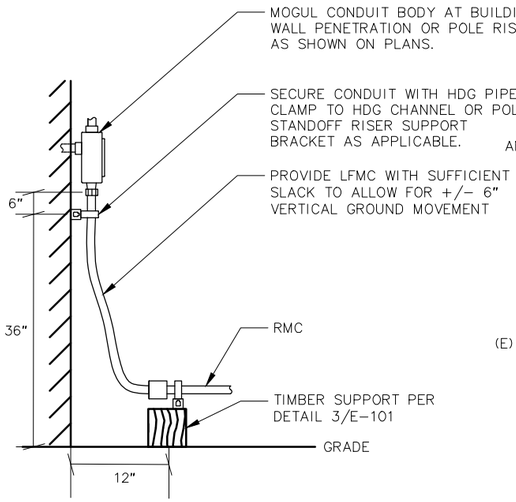
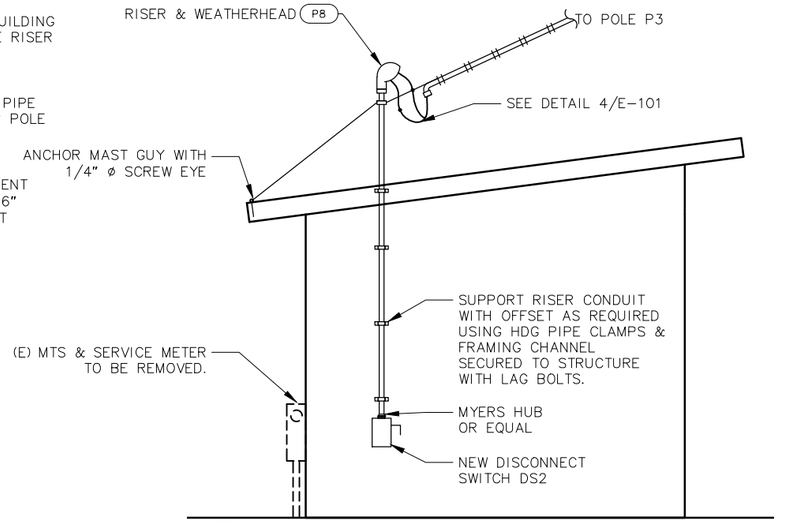


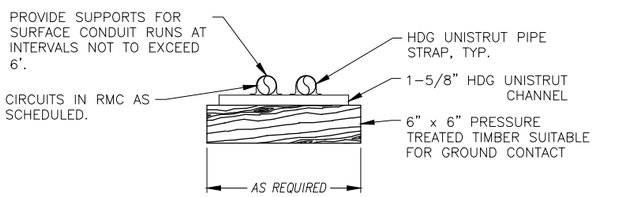

1 **POLE P1 PLAN DETAIL**
NTS



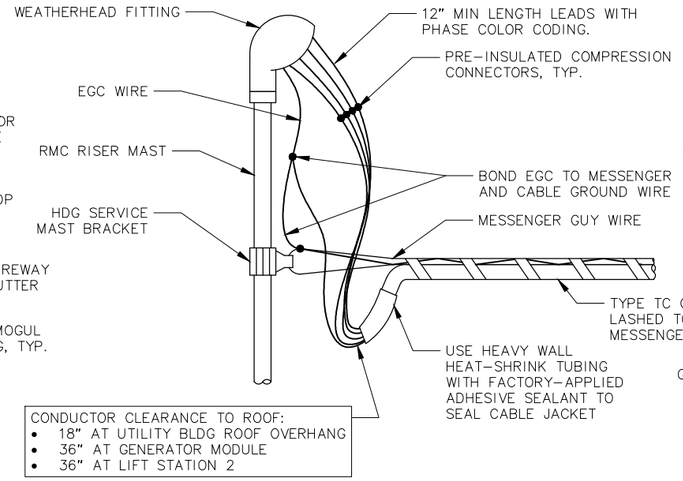

2 **FLEXIBLE CONDUIT RISER DETAIL**
NTS



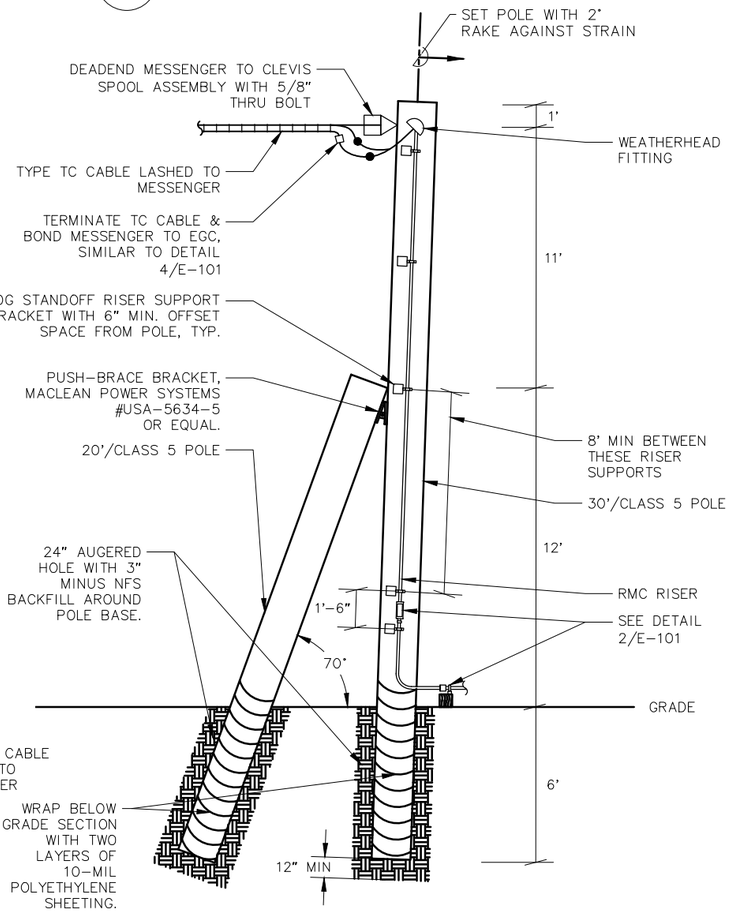

6 **LIFT STATION ELEVATION DETAIL**
NTS



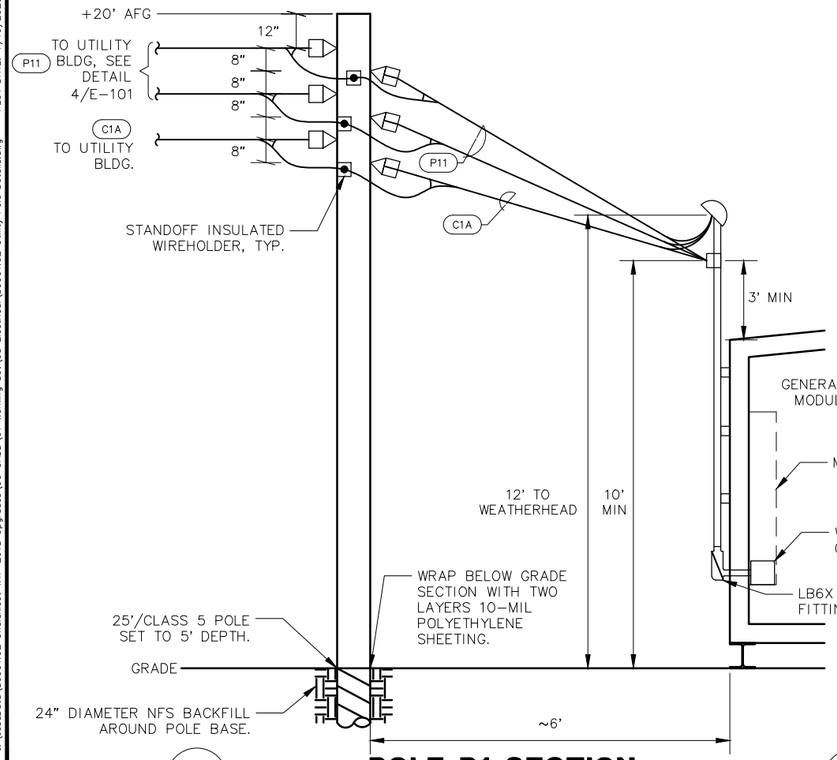

3 **CONDUIT SUPPORT DETAIL**
NTS




4 **WEATHERHEAD CONNECTION DETAIL**
NTS




5 **POLE P-2 DETAIL**
NTS




A **POLE P1 SECTION**
NTS

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STATE OF ALASKA — WILLIAM A. STRAIN — EE-9323 — REGISTERED ELECTRICAL ENGINEER

PROJECT NO. – | CITY GRID – | WATER GRID – | SEWER GRID –

UNALAKLEET WTP UPGRADES
ELECTRICAL DETAILS

DATE: JULY 2020

STATUS: ISSUED FOR CONSTRUCTION

PROJECT NO: 80901.02

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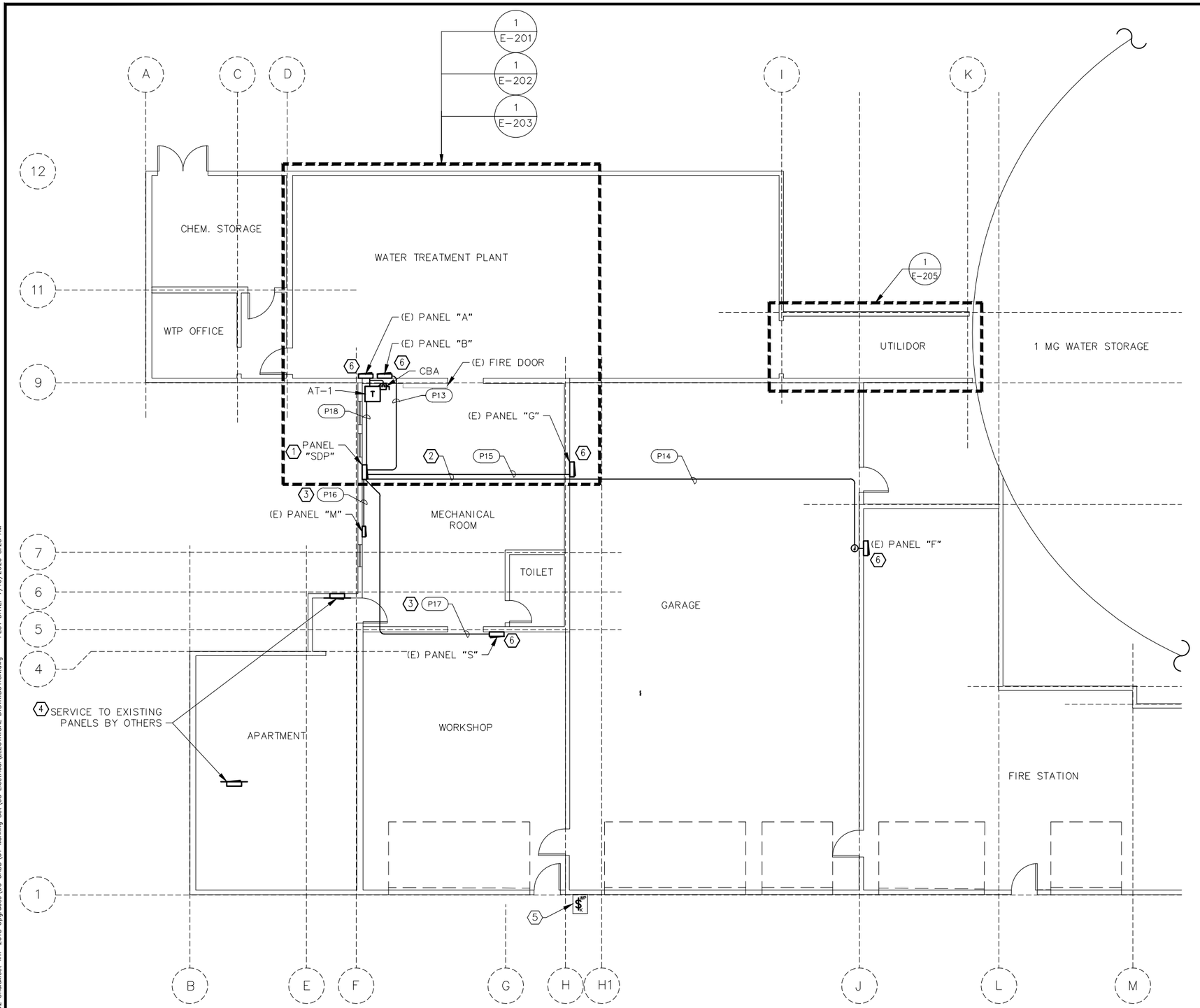
SCALE HOR. N/A VER. N/A | DESIGNED BY WAS | DRAWN BY JEH | CHECKED BY – | APPROVED BY –

SHEET NO.
E-101




1 **UTILITY BUILDING ELECTRICAL FLOOR PLAN**

1" = 6'

6' 0 6' 12'

## GENERAL NOTES

1. REFER TO SCOPE AND PROPOSED CONSTRUCTION SEQUENCE ON E-000, AND PROPOSED ONE-LINE DIAGRAM ON E-002.
2. SEE CIRCUIT SCHEDULE ON SHEET E-002.

## SHEET NOTES

1. REFER TO SHEET E-100 FOR DEMOLITION AND REPLACEMENT OF ELECTRIC SERVICE TO THE UTILITY BUILDING AND NEW FEEDER INSTALLATION TO DISTRIBUTION PANEL SDP. OFFSET NEW FEEDER RISERS OR MODIFY EXISTING 6" X 6" WIREWAY ABOVE PANEL SDP AS REQUIRED.
2. PROVIDE NEW FEEDERS FROM SDP TO EXISTING SUBPANELS F AND G, AND DEMOLISH EXISTING FEEDERS. ROUTE FEEDERS IN ATTIC SPACE ABOVE CEILING. EXISTING CONDUIT IN GOOD CONDITION AT FINAL DROP TO EXISTING PANEL MAY BE REUSED SUBJECT TO COMPLIANCE WITH SPECIFICATIONS AND SUITABLE SIZE.
3. PROVIDE NEW FEEDERS IN CONDUIT FROM SDP TO EXISTING SUBPANELS M AND S, AND REMOVE EXISTING FEEDERS IN 6" X 6" WIREWAY.
4. DISCONNECT AND REMOVE FEEDER FROM PANEL A TO SUBPANELS IN HOUSING UNIT. REFER TO E-000 SCOPE AND PROPOSED CONSTRUCTION SEQUENCE FOR WORK BY OTHERS.
5. PROVIDE KEY ACCESSIBLE SWITCH TO OPEN UTILITY BUILDING FEEDER MAIN BREAKER VIA 12VDC SHUNT TRIP CIRCUIT. MOUNT SWITCH IN W.P. ENCLOSURE WITH HINGED LOCKABLE DOOR OR PROVIDE W.P. KEY SWITCH. ATTACH WEATHER-RESISTANT ENGRAVED LABEL: "UTILITY BUILDING POWER – EMERGENCY SHUT-DOWN". SEE 2/E-003 CONTROL DIAGRAM AND 2/E-100 SITE PLAN.
6. SEAL FIRE RATED WALL PENETRATIONS WITH 2-HOUR RATED SEALS.

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AECC-882-JV

STATE OF ALASKA — WILLIAM A. STRAIN — EE-9323 — REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. – | CITY GRID – | WATER GRID – | SEWER GRID –

UNALAKLEET WTP UPGRADES

# UTILITY BUILDING ELECTRICAL FLOOR PLAN

PROJECT NO: 80901.02

DATE: JULY 2020

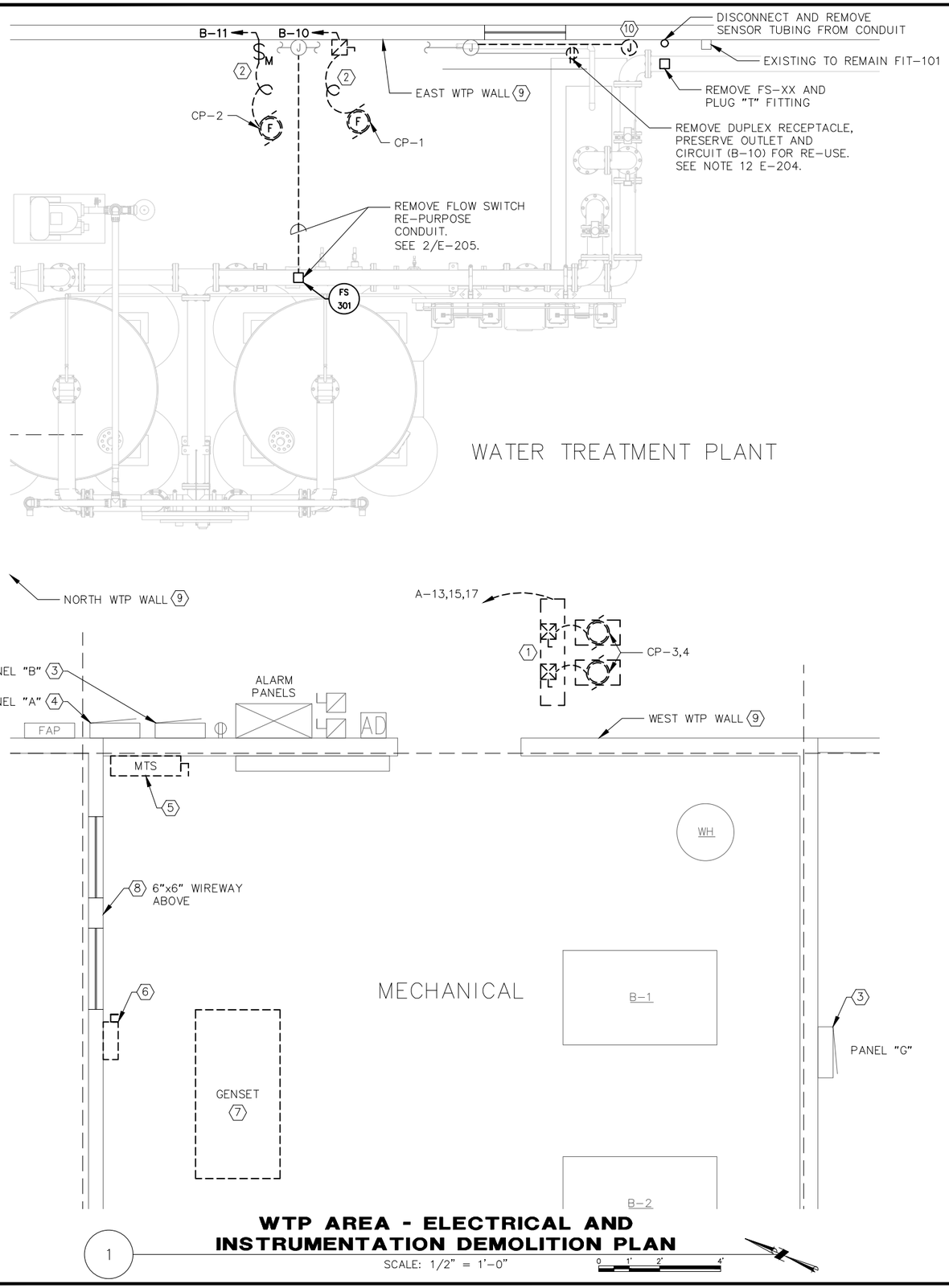
STATUS: ISSUED FOR CONSTRUCTION

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE HOR. GRAPHIC VER. N/A | DESIGNED BY WAS | DRAWN BY JEH | CHECKED BY – | APPROVED BY –

SHEET NO.

**E-200**




## WTP AREA - ELECTRICAL AND INSTRUMENTATION DEMOLITION PLAN

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

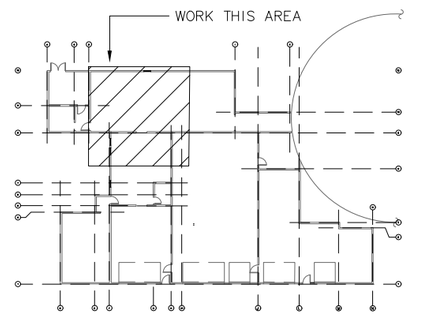
0 1' 2' 4'

### GENERAL NOTES

1. PROVIDE ELECTRICAL DEMOLITION WORK ON THIS SHEET IN ACCORDANCE WITH THE CONTRACTOR'S EXECUTION PLAN AS APPROVED BY OWNER FOR CONSTRUCTION SEQUENCE AND SERVICE CUTOVER. REFER TO SCOPE AND PROPOSED CONSTRUCTION SEQUENCE ON E-000, EXISTING ONE-LINE DIAGRAM ON E-001, AND PROPOSED ONE-LINE DIAGRAM ON E-002.
2. CIRCUITS IDENTIFIED FOR DEMOLITION IN THIS PROJECT AND PREVIOUSLY ABANDONED FEEDERS WITHIN THE BUILDING, WIREWAYS, AND ATTIC SPACE SHALL BE COMPLETELY REMOVED. FEEDERS TO UNKNOWN LOCATIONS OUTSIDE OF THE BUILDING THAT ARE DISCONNECTED AND ABANDONED SHALL BE REMOVED TO EDGE OF BUILDING, AND CUTOFF 12 INCHES BELOW GRADE. ABANDONED CONDUCTORS WITHIN THE BUILDING SHALL BE REMOVED IN THEIR ENTIRETY. CONCEALED CONDUIT RUNS IN ATTIC OR WALLS SHALL BE ABANDONED IN PLACE; OTHERWISE EXPOSED ABANDONED CONDUIT SHALL BE REMOVED. REPAIR SURFACES AND ABANDONED PENETRATIONS IN AN APPROVED MANNER AFTER DEMOLITION.

### SHEET NOTES

1. DISCONNECT AND REMOVE DUPLEX PUMP CONTROL PANEL, FRAMING STRUT RACK, AND CONNECTIONS TO FLOOR-MOUNT 3-PHASE PUMPS. REMOVE ASSOCIATED CONDUIT AND CIRCUIT CONDUCTORS IN WIREWAY BACK TO PANEL SOURCE.
2. DISCONNECT/REMOVE STARTER SWITCH AND CONDUCTORS FOR CIRCUITS B-10&11. PRESERVE CONDUITS FOR NEW PUMPS CP-A,B AND F. SEE E-202. UPDATE SCHEDULE WITH "SPARE"
3. REMOVE 240/120V SUBPANEL FEEDER BACK TO SOURCE PANEL A, WHEN SUBPANEL IS CUTOVER TO NEW 208/120V FEEDER.
4. REMOVE 240/120V 3-PHASE FEEDER FROM MTS IN MECHANICAL ROOM WHEN PANEL A IS CUTOVER TO NEW FEEDER FROM SDP.
5. DEMOLISH MTS AND CONNECTED FEEDERS WHEN BUILDING IS CUTOVER TO NEW 208/120V SERVICE. DEMOLITION SHALL INCLUDE THE ABANDONED CONDUIT AND FEEDER CONDUCTORS FROM ATTIC SPACE COILED AT CEILING ABOVE MTS. REFER TO GENERAL NOTE 2 ABOVE.
6. DEMOLISH ABANDONED FUSE SWITCH AND INCOMING FEEDER FROM MTS. REMOVE OUTGOING FEEDER TO LIFT STATIONS AND OTHER UNKNOWN LOADS TO EXTENT OF BUILDING. REFER TO GENERAL NOTE 2 ABOVE.
7. DISCONNECT AND REMOVE STANDBY GENERATOR SKID, WITH ALL APPURTENANCES INCLUDING WALL PENETRATION THIMBLE. PATCH AND REPAIR WALL TO MATCH EXISTING INTACT WALL SECTION.
8. AFTER CUTOVER TO NEW SERVICE, REMOVE ABANDONED FEEDERS TO APARTMENT, PANEL M AND PANEL S IN 6" X 6" WIREWAY ~7 FT AFF ON WALL. REFER TO GENERAL NOTE 2 ABOVE.
9. ABANDONED CIRCUIT CONDUCTORS THAT ORIGINATE IN PANEL A AND PANEL B SHALL BE REMOVED FROM THE 6" X 6" WIREWAY ON THE WTP WEST, NORTH, AND EAST WALLS.
10. DISCONNECT/REMOVE ABANDONED J-BOX AND CONDUCTORS.




– KEY PLAN
NTS

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PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

UNALAKLEET WTP UPGRADES
WTP AREA – ELECTRICAL AND INSTRUMENTATION DEMOLITION PLAN

DATE: JULY 2020

PROJECT NO: 80901.02

STATUS: ISSUED FOR CONSTRUCTION

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | | REVISION | |

SCALE: HOR. GRAPHIC VER. N/A
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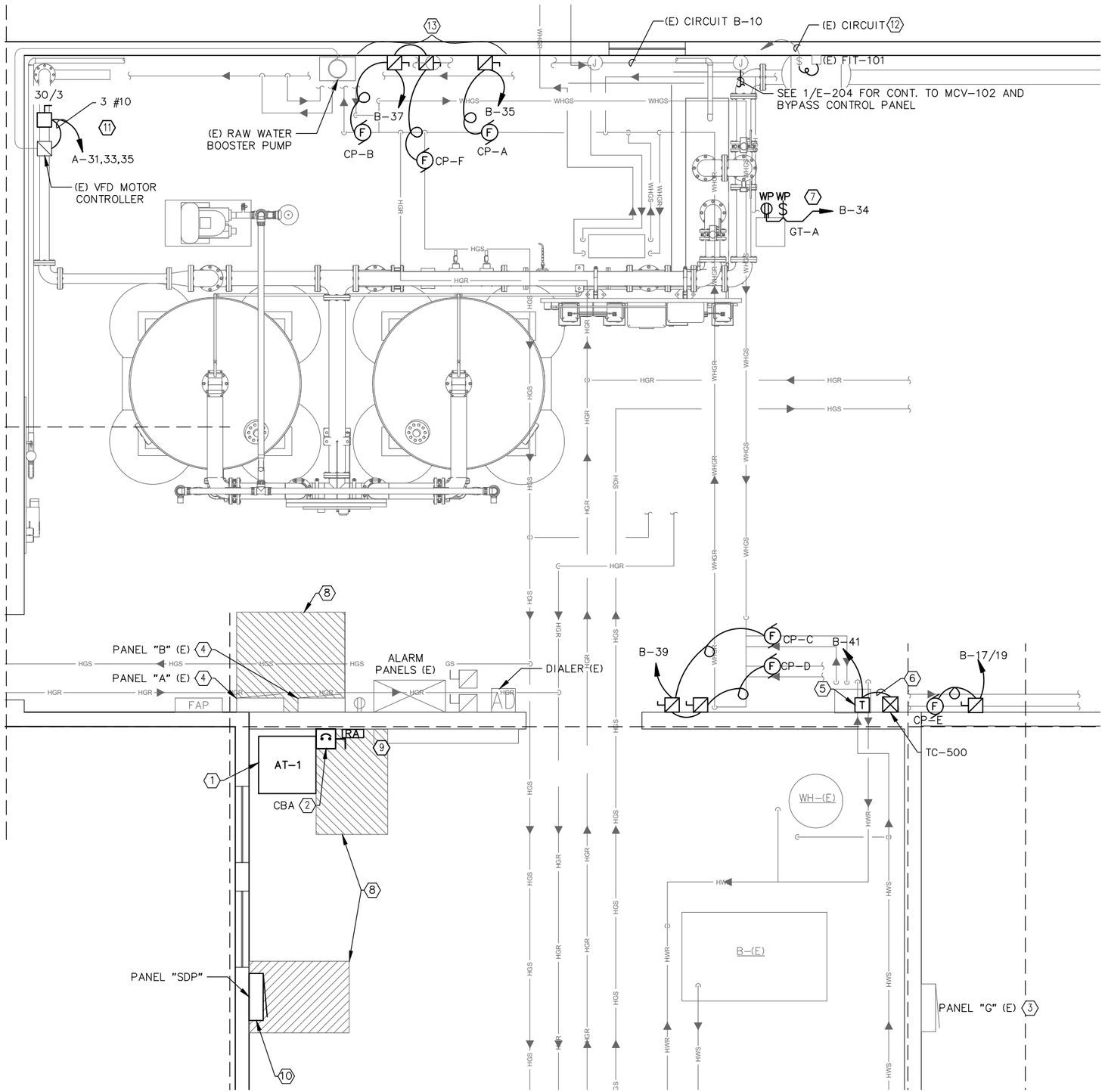
DRAWN BY JEH
CHECKED BY –
APPROVED BY –

SHEET NO.
E-201




1 **WTP AREA - ELECTRICAL PLAN**

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

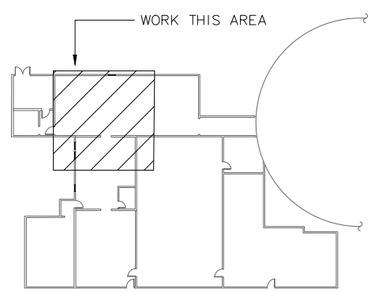
0 1' 2' 4'

## GENERAL NOTES

1. PROVIDE BRANCH CIRCUITS IN CONDUIT WITH FINAL LFMC CONNECTION NTE 36" TO MOTORS OR CONTROLS, CONDUIT TYPE PER SPECIFICATIONS. SIZE CIRCUITS IN ACCORDANCE WITH NEC UNLESS LARGER SIZE INDICATED. PROVIDE GREEN INSULATED EGC FOR ALL CIRCUITS.

## SHEET NOTES

1. FLOOR MOUNT AUTO-TRANSFORMER WITH VENTILATION AIR SPACE ON ALL SIDES AS REQUIRED BY MANUFACTURER.
2. LABEL ENCLOSED CIRCUIT BREAKER: "PANEL A FEEDER, 240V 3-PHASE, 3-WIRE."
3. RECONNECT EXISTING PANEL TO NEW FEEDER WHEN BUILDING IS CUTOVER TO NEW 208/120V SERVICE.
4. RECONNECT PANEL TO NEW FEEDER WHEN BUILDING IS CUTOVER TO NEW 208/120V SERVICE. RECONFIGURE, SPARE, OR ADD BRANCH CIRCUITS AS REQUIRED BY PANEL SCHEDULE PER DEMOLITION AND NEW WORK REQUIREMENTS.
5. PROVIDE ENCLOSED 120:24VAC 40VA TRANSFORMER WITH INTEGRAL CLASS 2 PROTECTION, MFR: RIB # TR40VA001 OR EQUAL, IN SUITABLE TYPE 1 ENCLOSURE.
6. 1/2" C, 3#12 (24VAC, G) CONNECTION TO CONTROLLER.
7. COORDINATE EXACT LOCATION OF OUTLET AND SWITCH AS REQUIRED FOR CONVENIENT PLUG CONNECTION TO GLYCOL TANK EQUIPMENT AND NOT CONFLICT WITH EXISTING INSTALLATION. PROVIDE HDG STRUT FLOOR STANCHION SUPPORT FOR 2-GANG OUTLET BOX AS REQUIRED
8. MARK FLOOR IN AN APPROVED MANNER TO IDENTIFY CLEAR WORK SPACE IN ACCORDANCE WITH NEC 110.26.
9. MOUNT REMOTE ANNUNCIATOR FOR GENERATOR IN CLEAR SPACE ON WALL AT +5' AFF IN MECHANICAL ROOM. COORDINATE EXACT LOCATION WITH OWNER. SEE CONTROL DIAGRAM 2/E-003.
10. MODIFY EXISTING 6"x6" WIREWAY AND/OR ROUTE NEW FEEDER CONDUIT RISERS AS REQUIRED TO OFFSET WIREWAY FROM CONDUITS ON WALL SPACE ABOVE PANEL SDP.
11. PROVIDE 30A/3P NEMA 4X DISCONNECT AT EXISTING VFD CONTROLLER. REMOVE EXISTING 3#12 CONDUCTORS IN EXISTING WIREWAY BACK TO PANEL A, AND REPLACE WITH NEW 30A BRANCH CIRCUIT CONDUCTORS.
12. IDENTIFY EXISTING BRANCH CIRCUIT AT PANEL B, WIRED TO EXISTING TOGGLE SWITCH AT ~5 FT AFF. PROVIDE APPROXIMATELY 4'x1/2" LFMC, (3)#12 AS REQUIRED TO EXTEND 120V POWER FROM SWITCH TO EXISTING FLOW TRANSMITTER.
13. USE EXISTING CONDUIT AND WIREWAY TO THE EXTENT POSSIBLE FOR CONDUCTORS SERVING NEW PUMPS.




– **KEY PLAN**

NTS

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PROJECT NO. 80901.02 | CITY GRID – | WATER GRID – | SEWER GRID –

UNALAKLEET WTP UPGRADES

WTP AREA – ELECTRICAL PLAN

PROJECT NO: 80901.02

STATUS: ISSUED FOR CONSTRUCTION

DATE: JULY 2020

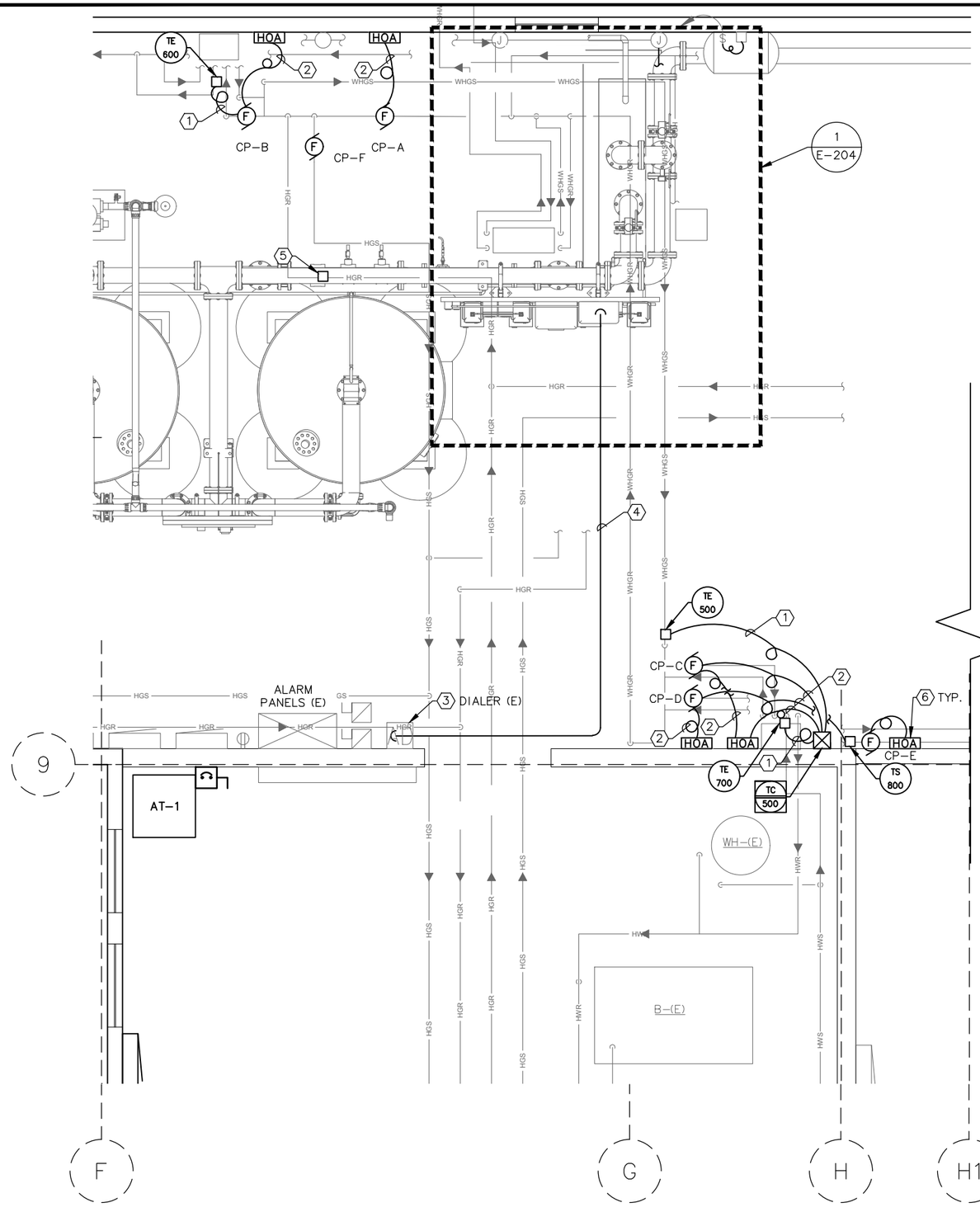
| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| 1 | | REVISION | |

SCALE: GRAPHIC VER. N/A | DESIGNED BY: WAS | DRAWN BY: | CHECKED BY: – | APPROVED BY: –

SHEET NO.

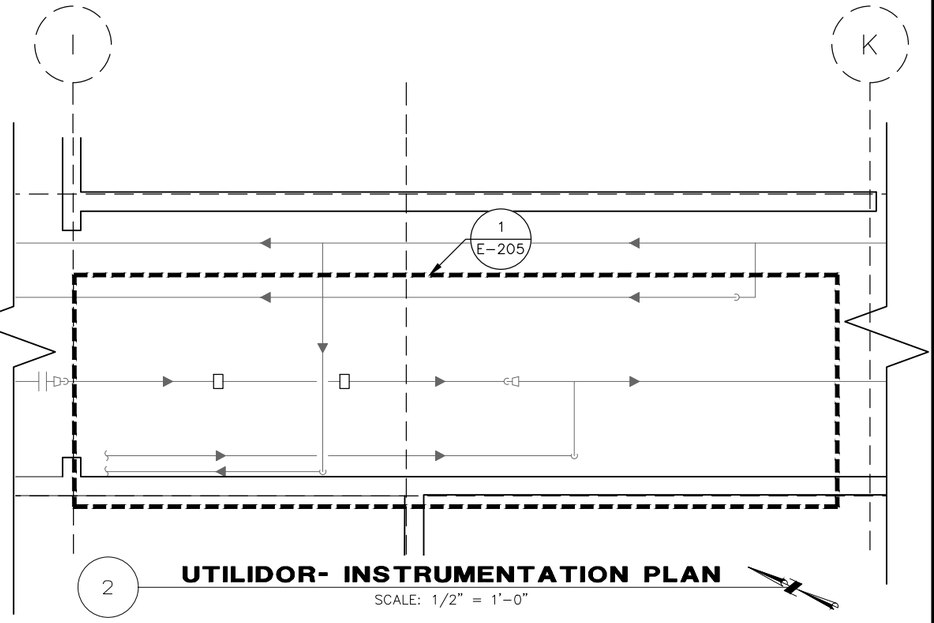
**E-202**

File: J:\Jobdata\80901.02 Unalakleet WTP 2018 Upgrades\00 CADD\01 Working Set\03 Electrical\80901.02 Electrical Heat Recovery.dwg PLOT DATE: 7/10/2020 8:26 AM

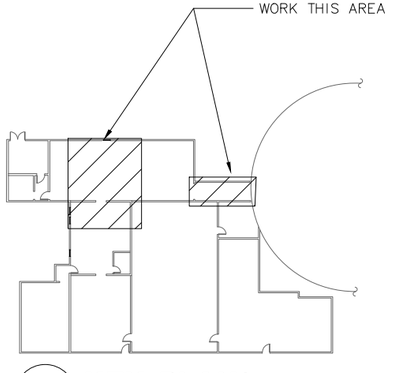



1 **INSTRUMENTATION PLAN**
SCALE: 1/2" = 1'-0"

0 1' 2' 4'




2 **UTILIDOR- INSTRUMENTATION PLAN**
SCALE: 1/2" = 1'-0"




– **KEY PLAN**
NTS

*SHEET NOTES*

1. 1/2"C, 3C#18TWSH.
2. 1/2"C, 3#12 (2SIG,G).
3. PROGRAM DIALER WITH FOLLOWING ALARMS:'
   - BACKWASH SUMP FLOOD
   - HIGH CFE NTU
   - BYPASS ENGAGED
   - FILTER 1 HIGH NTU
   - FILTER 2 HIGH NTU
4. SEE SHEET E-204 FOR CIRCUIT REQUIREMENTS.
5. DISCONNECT/REMOVE FS-301. REROUTE THIS CIRCUIT TO THE REPLACED/RELOCATED FS101 SHOWN ON E-205.
6. *HAND-OFF AUTO SWITCH IN NEMA 4X ENCLOSURE, ALLEN BRADLEY 800R-R3HA4RL OR APPROVED EQUAL. LABEL WITH PUMP NAME.*

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STATE OF ALASKA — 49TH — REGISTERED PROFESSIONAL ENGINEER — William H. McDonald — O-14318 — 7/6/2020

PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

UNALAKLEET WTP UPGRADES
WTP AREA – INSTRUMENTATION PLAN
PROJECT NO: 80901.02
DATE: JULY 2020
STATUS: ISSUED FOR CONSTRUCTION

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| REVISION | | | |

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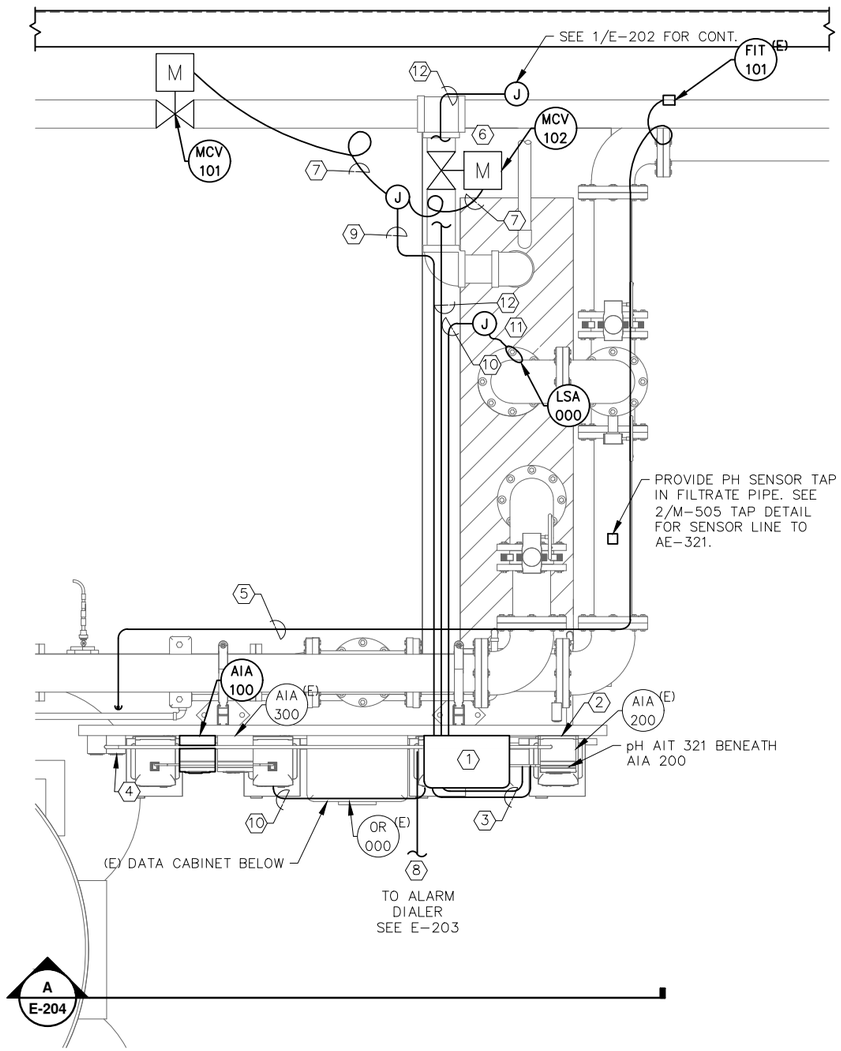
DRAWN BY JEH
CHECKED BY –
APPROVED BY –

SHEET NO.
**E-203**

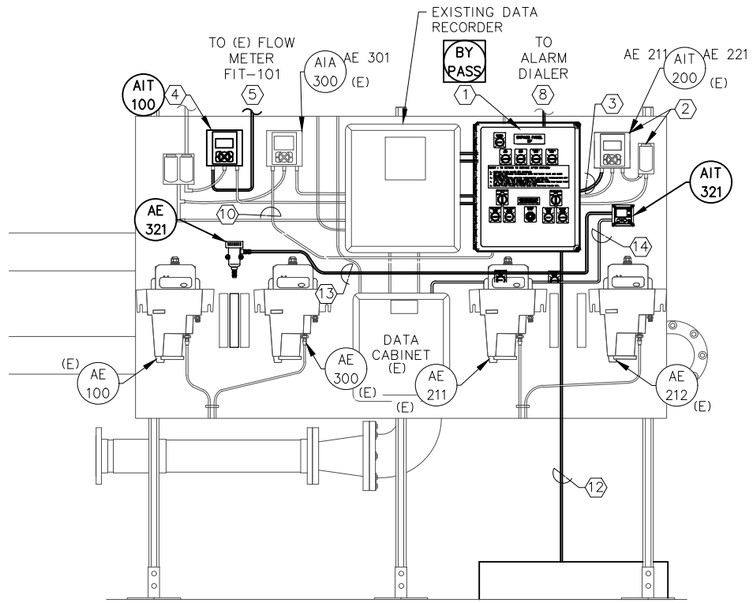
File: J:\Jobs\Data\80901.02 Unalakleet WTP 2018 Upgrades\00 CADD\01 Working Set\03 Electrical\80901.02 Electrical Heat Recovery.dwg PLOT DATE: 7/10/2020 8:26 AM




## BYPASS INSTRUMENTATION AND CONTROL PLAN

1

3' 0 3' 6'




## TURBIDIMETER RACK ELEVATION

A

1' 0 1' 2'

### SHEET NOTES

1. PROVIDE BYPASS CONTROL PANEL. SEE E-600 AND E-601. OFFSET PANEL FROM BACKBOARD TO PERMIT EXISTING CONDUITS TO RUN BEHIND.
2. DISCONNECT, RELOCATE, AND RECONNECT FILTER, TURBIDITY CONTROLLER TO MAKE ROOM FOR BYPASS PANEL.
3. 1/2"C, 4#14 (F1, F2 HIGH NTU) TO BYPASS.
4. DISCONNECT AND REMOVE RAW WATER TURBIDIMETER AND PROVIDE NEW HACH SC200 WITH ANALOG INPUT CARD. RECONNECT TO DATA RECORDER AND AC SUPPLY.
5. 1/2"C, (1) 1prTWSH. FLOW RATE FROM EXISTING FLOW METER.
6. PROVIDE MOTORIZED VALVE ACTUATORS.
7. 3/4"C, (8)#14.
8. 3/4"C, (12)#14.
9. 3/4"C, (16)#14.
10. 1/2"C, (2)#14 (ALARM)
11. NORMALLY CLOSED FLOAT SWITCH. SET TO ALARM 12" BELOW SUMP CURB.
12. EXTEND 120V CIRCUIT B-10 FROM RE-PURPOSED RECEPTACLE 1/2"C, (3)#12, USE LFMC ALONG TROUGH.
13. pH PROCESS POWER AND SIGNAL CABLE.
14. 1/2"C, 1PR #18 TWSH. RECONNECT NE-321 PH SENSOR TO AIT-321 TRANSMITTER.

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William H. McDonald
O-14318
7/6/2020

PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

PROJECT NO: –

UNALAKLEET WTP UPGRADES

INSTRUMENTATION AND CONTROL PLAN

STATUS: ISSUED FOR CONSTRUCTION

DATE: JULY 2020

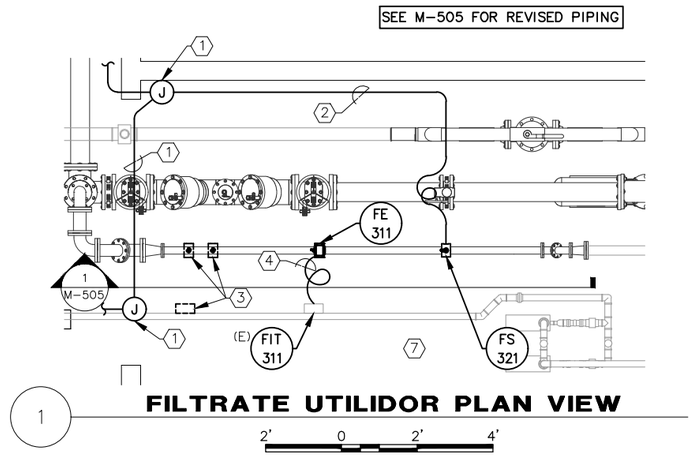
| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | | |

REVISION

SCALE: –
HOR: –
VER: –
DESIGNED BY WMM
DRAWN BY ARL
CHECKED BY –
APPROVED BY –

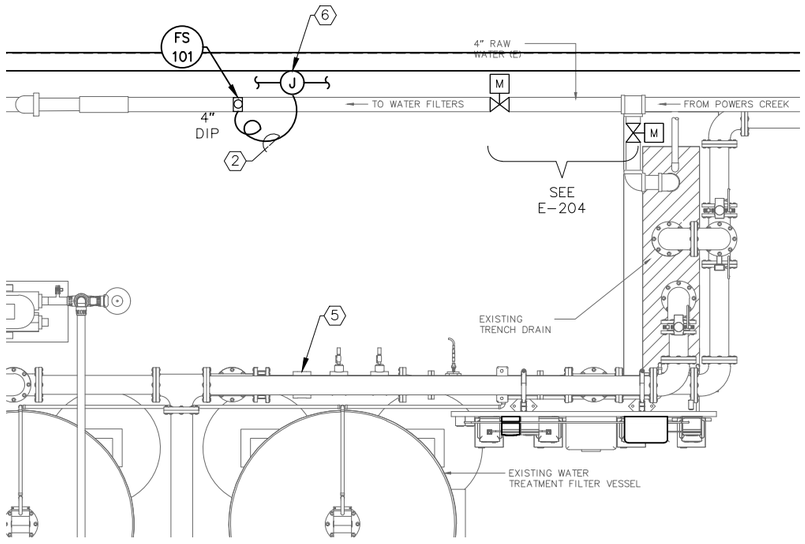
SHEET NO.

E-204




## 1 FILTRATE UTILIDOR PLAN VIEW

2' 0 2' 4'




## 2 RAW WATER FLOW SWITCH PLAN

2' 0 2' 4'




NOTE: FS-101 REPLACES FS-311
SEE NOTE 5 ON SHEET E-203

## 3 FLOW SWITCH 101 & 321 WIRING DIAGRAM

### SHEET NOTES

1. INTERCEPT AND EXTEND CIRCUIT B-33 TO POWER FS-321. 1/2"C, (3)#12.
2. 1/2"C, (5)#14 (H,N,G,2SL)
3. REMOVE EXISTING pH SENSOR, TRANSMITTER, AND RETURN TO OWNER. DEMOLISH EXISITNG FLOW SWITCH FS-311.
4. RUN EXISTING FLOW METER SENSOR CABLE FROM RELOCATED FE-311 TO EXISTING TRANSMITTER (FIT-311).
5. SEE NOTE 5 ON SHEET M-200. REMOVE FS-301 AND PLUG SADDLE. FLOW SWITCH IS NOT TO BE REUSED.
6. REROUTE EXISTING FLOW SWITCH CIRCUIT FROM EXISTING J-BOX AND EXTEND 120V POWER TO NEW FS101. SEE WIRING DIAGRAM DETAIL THIS SHEET. SEE NOTE 2 FOR NEW WIRING. EXISTING CIRCUITRY LOCATED APPROXIMATELY 8' ABOVE THIS LOCATION.
7. REMOVE FLOW SENSOR FROM (E) PIPING AND REINSTALL IN REPLACEMENT PIPE SECTION AS SHOWN.

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STATE OF ALASKA
49TH
REGISTERED PROFESSIONAL ENGINEER
CERTIFICATE NO. 14318
William H. McDonald
7/6/2020

PROJECT NO. –
CITY GRID –
WATER GRID –
SEWER GRID –

UNALAKLEET WTP UPGRADES

# PIPE INSTRUMENTATION PLAN AND DETAILS

PROJECT NO: B0901.02
DATE: JULY 2020
STATUS: ISSUED FOR CONSTRUCTION

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE HOR: GRAPHIC VER: N/A
DESIGNED BY WMM
DRAWN BY JEH
CHECKED BY –
APPROVED BY –

SHEET NO.
**E-205**

| LOCATION | NOTE: | PANEL | INTERRUPT RATING | INSTALLATION: |
|---|---|---|---|---|
| GENERATOR MODULE | | MDP | 18 KAIC | SURFACE MOUNT, TYPE 1 ENCL, TOP FEED |

| VOLTAGE | CONNECTION | TYPE | MAIN | AVAILABLE FAULT | SOURCE: |
|---|---|---|---|---|---|
| 208 / 120V | 3 φ — 4 W | MLO | 400A | CURRENT: 12.2 KA | 400A MAIN BREAKER THRU 400A ATS |

| CKT # | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CONNECTED KVA Aφ | Bφ | Cφ | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CKT # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | 32363 | F | 36.0 | — | — | | | | 3633 | F | 2 |
| 3 | 300/3 | PANEL SDP FEEDER — | | 37645 | F | — | 41.2 | — | 60/3 | PANEL U FEEDER — | | 3584 | F | 4 |
| 5 | ST | UTILITY BLDG | 1 | 35583 | F | — | — | 40.2 | | GENERATOR MODULE | | 4573 | F | 6 |
| 7 | | SPACE | | | | 13.8 | — | — | | | | 13848 | F | 8 |
| 9 | | SPACE | | | | — | 14.5 | — | 110/3 | LIFT STATION FEEDER | | 14483 | F | 10 |
| 11 | | SPACE | | | | — | — | 10.8 | | 30 KVA XFMR T-2 / PANEL LS2 | | 10774 | F | 12 |
| 13 | | SPACE | | | | 0.0 | — | — | | SPACE | | | | 14 |
| 15 | | SPACE | | | | — | 0.0 | — | | SPACE | | | | 16 |
| 17 | | SPACE | | | | — | — | 0.0 | | SPACE | | | | 18 |
| 19 | | SPACE | | | | 0.0 | — | — | | SPACE | | | | 20 |
| 21 | | SPACE | | | | — | 0.0 | — | | SPACE | | | | 22 |
| 23 | | SPACE | | | | — | — | 0.0 | | SPACE | | | | 24 |
| 25 | | SPACE | | | | 0.0 | — | — | | SPACE | | | | 26 |
| 27 | | SPACE | | | | — | 0.0 | — | | SPACE | | | | 28 |
| 29 | | SPACE | | | | — | — | 0.0 | | SPACE | | | | 30 |
| | | | TOTAL LOAD / PHASE: | | | 49.8 | 55.7 | 50.9 | KVA | | | | | |
| | | | DEMAND CURRENT / PHASE: | | | 382 | 427 | 390 | AMPS | | | | | |

**SUMMARY LOADS (KVA)**

| LOAD TYPE: | C | L | MM | M | N | R | X | | |
|---|---|---|---|---|---|---|---|---|---|
| CONNECTED: | 18.0 | 9.1 | 11.2 | 77.6 | 9.6 | 8.9 | 0.0 | | |
| DEMAND: | 22.5 | 11.4 | 13.9 | 77.6 | 9.6 | 8.9 | 0.0 | | |

| TOTALS | KVA | AMPS |
|---|---|---|
| CONNECTED: | 134.4 | 373 |
| DEMAND: | 143.9 | 400 |

NOTES [#]:

1. PROVIDE 12VDC SHUNT TRIP ACCESSORY FOR UTILITY BUILDING ESD.

| LOCATION | NOTE: | PANEL | INTERRUPT RATING | INSTALLATION: |
|---|---|---|---|---|
| MECHANICAL ROOM | | SDP | 18 KAIC | SURFACE MOUNT, TYPE 1 ENCL, TOP FEED |

| VOLTAGE | CONNECTION | TYPE | MAIN | AVAILABLE FAULT | SOURCE: |
|---|---|---|---|---|---|
| 208 / 120V | 3 φ — 4 W | MLO | 400A | CURRENT: 8.1 KA | MDP |

| CKT # | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CONNECTED KVA Aφ | Bφ | Cφ | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CKT # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | PANEL A — WTP | | 17873 | F | 17.9 | — | — | — | SPACE | | | | 2 |
| 3 | 250/3 | 240V 3PH, 3W LOADS | | 17873 | F | — | 27.3 | — | 100/2 | PANEL B — WTP | | 9471 | F | 4 |
| 5 | | VIA 75KVA AUTO-XFMR | | 17873 | F | — | — | 28.8 | | | | 10954 | F | 6 |
| 7 | 60/2 | PANEL F — FIRE STATION | | 1691 | F | 8.4 | — | — | 100/2 | PANEL G — CITY GARAGE | | 6690 | F | 8 |
| 9 | | | | 2484 | F | — | 7.8 | — | | | | 5360 | F | 10 |
| 11 | 100/2 | PANEL M — MECH ROOM | | 2494 | F | — | — | 4.4 | 100/2 | PANEL S — CITY SHOP | | 1939 | F | 12 |
| 13 | | | | 2621 | F | 4.0 | — | — | | | | 1376 | F | 14 |
| 15 | | SPACE | | | | — | 0.0 | — | | SPACE | | | | 16 |
| 17 | | SPACE | | | | — | — | 0.0 | | SPACE | | | | 18 |
| 19 | | SPACE | | | | 0.0 | — | — | | SPACE | | | | 20 |
| 21 | | SPACE | | | | — | 0.0 | — | | SPACE | | | | 22 |
| 23 | | SPACE | | | | — | — | 0.0 | | SPACE | | | | 24 |
| 25 | | SPACE | | | | 0.0 | — | — | | SPACE | | | | 26 |
| 27 | | SPACE | | | | — | 0.0 | — | | SPACE | | | | 28 |
| 29 | | SPACE | | | | — | — | 0.0 | | SPACE | | | | 30 |
| | | | TOTAL LOAD / PHASE: | | | 30.3 | 35.2 | 33.3 | KVA | | | | | |
| | | | DEMAND CURRENT / PHASE: | | | 238 | 277 | 262 | AMPS | | | | | |

**SUMMARY LOADS (KVA)**

| LOAD TYPE: | C | L | MM | M | N | R | X | | |
|---|---|---|---|---|---|---|---|---|---|
| CONNECTED: | 4.8 | 8.4 | 11.2 | 44.9 | 9.6 | 8.4 | 0.0 | | |
| DEMAND: | 6.0 | 10.5 | 13.9 | 44.9 | 9.6 | 8.4 | 0.0 | | |

| TOTALS | KVA | AMPS |
|---|---|---|
| CONNECTED: | 87.2 | 242 |
| DEMAND: | 93.3 | 259 |

NOTES [#]:

| LOCATION | NOTE: | PANEL | INTERRUPT RATING | INSTALLATION: |
|---|---|---|---|---|
| GENERATOR MODULE | | U | 22 KAIC | SURFACE MOUNT, TYPE 1 ENCL, TOP FEED |

| VOLTAGE | CONNECTION | TYPE | MAIN | AVAILABLE FAULT | SOURCE: |
|---|---|---|---|---|---|
| 208 / 120V | 3 φ — 4 W | MLO | 100A | CURRENT: 10.8 KA | MDP |

| CKT # | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CONNECTED KVA Aφ | Bφ | Cφ | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CKT # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 20/1 | RECEPTACLES | | 540 | R | 1.4 | — | — | 20/1 | FUEL CNTRL PANEL FCP, 1/3 HP | | 900 | MM | 2 |
| 3 | 20/1 | LIGHTING | | 100 | L | — | 0.4 | — | 20/1 | BATTERY CHARGER (BC) | | 300 | C | 4 |
| 5 | 20/2 | GENERATOR BLOCK HEATER | | 1200 | C | — | — | 1.2 | 20/1 | SPARE | | | | 6 |
| 7 | | | | 1200 | C | 1.5 | — | — | 20/1 | VENT CONTROL PANEL (VCP) | | 300 | C | 8 |
| 9 | 30/2 | UNIT HEATER | | 2500 | C | — | 2.5 | — | 20/1 | SPARE | | | | 10 |
| 11 | | | | 2500 | C | — | — | 2.5 | 20/1 | SPARE | | | | 12 |
| 13 | — | SPACE | | | | 0.0 | — | — | — | SPACE | | | | 14 |
| 15 | — | SPACE | | | | — | 0.0 | — | — | SPACE | | | | 16 |
| 17 | — | SPACE | | | | — | — | 0.0 | — | SPACE | | | | 18 |
| | | | TOTAL LOAD / PHASE: | | | 2.9 | 2.9 | 3.7 | KVA | | | | | |
| | | | DEMAND CURRENT / PHASE: | | | 30 | 30 | 38 | AMPS | | | | | |

**SUMMARY LOADS (KVA)**

| LOAD TYPE: | C | L | MM | M | N | R | X | | |
|---|---|---|---|---|---|---|---|---|---|
| CONNECTED: | 8.0 | 0.1 | 0.9 | 0.0 | 0.0 | 0.5 | 0.0 | | |
| DEMAND: | 10.0 | 0.1 | 1.1 | 0.0 | 0.0 | 0.5 | 0.0 | | |

| TOTALS | KVA | AMPS |
|---|---|---|
| CONNECTED: | 9.5 | 26 |
| DEMAND: | 11.8 | 33 |

NOTES [#]:

| LOCATION | NOTE: | PANEL | INTERRUPT RATING | INSTALLATION: |
|---|---|---|---|---|
| LIFT STATION NO. 2 | EXISTING/REWORK AS NOTED | LS2 | 10 KAIC | SURFACE MOUNT, TYPE 1 ENCL |

| VOLTAGE (SEE NOTE 1) | CONNECTION | TYPE | MAIN | AVAILABLE FAULT | SOURCE: |
|---|---|---|---|---|---|
| 240Δ/120V | 3 φ — 4 W | MLO | 100A | CURRENT: 2.4 KA | 100A FEEDER BREAKER/30KVA XFMR AT GENERATOR MODULE |

| CKT # | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CONNECTED KVA Aφ | Bφ | Cφ | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CKT # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 20/1 | LIGHTS | | 600 | L | 9.0 | — | — | | | | 8366 | M | 2 |
| 3 | 15/1 | FANS | | 900 | M | — | 9.3 | — | 70/3 | LIFT STATION CONTROL PANEL | | 8366 | M | 4 |
| 5 | — | SPACE | 1 | | | — | — | 8.4 | | 2 X 10HP, ONE @ 125% DF | | 8366 | M | 6 |
| 7 | 30/2 | 240V OUTLET / PUMP CP7 | | 2600 | M | 4.1 | — | — | 20/1 | ELECTRICAL ROOM HEATER | | 1500 | C | 8 |
| 9 | | | | 2600 | M | — | 4.4 | — | 20/2 | PUMP ROOM HEATER | | 1800 | C | 10 |
| 11 | — | SPACE | 1 | | | — | — | 1.8 | | | | 1800 | C | 12 |
| | | | TOTAL LOAD / PHASE: | | | 13.1 | 13.7 | 10.2 | KVA | | | | | |
| | | | DEMAND CURRENT / PHASE: | | | 100 | 105 | 78 | AMPS | | | | | |

**SUMMARY LOADS (KVA)**

| LOAD TYPE: | C | L | MM | M | N | R | X | | |
|---|---|---|---|---|---|---|---|---|---|
| CONNECTED: | 5.2 | 0.6 | 0.0 | 31.8 | 0.0 | 0.0 | 0.0 | | |
| DEMAND: | 6.5 | 0.8 | 0.0 | 31.8 | 0.0 | 0.0 | 0.0 | | |

| TOTALS | KVA | AMPS |
|---|---|---|
| CONNECTED: | 37.7 | 91 |
| DEMAND: | 39.1 | 94 |

NOTES [#]:

1. HIGH LEG LINE-TO-NEUTRAL VOLTAGE IS 139V. DO NOT USE C-PHASE FOR 1-PHASE LOADS.
2. REMOVE OR PAINT OVER SHARPEE MARKING ON PANEL COVER, AND INSTALL PHENOLIC TAG PER DETAIL 4 / E003.

CRW ENGINEERING GROUP LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE (907) 563-3529
AECC-882-AK

STATE OF ALASKA — REGISTERED PROFESSIONAL ENGINEER — WILLIAM A. STRAIN — EE-10223 — 4/30/21

PROJECT NO. —
CITY GRID —
WATER GRID —
SEWER GRID —

UNALAKLEET WTP UPGRADES
PANEL SCHEDULES (1 OF 3)

PROJECT NO: 80901.02
DATE: JULY 2020
STATUS: ISSUED FOR CONSTRUCTION

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE: N/A
HOR. N/A
VER. N/A
DESIGNED BY: WAS
DRAWN BY: JEH
CHECKED BY: —
APPROVED BY: —

SHEET NO.
E-301

File: J:\JobsData\80901.02 Unalakleet WTP 2018 Upgrades\00 CADD\01 Working Set\03 Electrical\80901.02 Panel Schedules.dwg PLOT DATE: 7/10/2020 8:27 AM

| LOCATION | NOTE: | PANEL | INTERRUPT RATING | INSTALLATION: |
|---|---|---|---|---|
| WATER TREATMENT AREA | EXISTING CONDITION | A | 10 KAIC | SURFACE MOUNT, TYPE 1 ENCL, TOP FEED |

| VOLTAGE | CONNECTION | TYPE | MAIN | AVAILABLE FAULT | SOURCE: |
|---|---|---|---|---|---|
| 240 / 139V | 3 φ — 4 W | MLO | 200A | CURRENT: | UVEC 240V DELTA 3PH–4W SERVICE |

| CKT # | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CONNECTED KVA Aφ | Bφ | Cφ | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CKT # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | 2900 | M | 4.9 | – | – | | | | 2020 | M | 2 |
| 3 | 70/3 | WEST LOOP PUMPS | | 2900 | M | – | 4.9 | – | 50/3 | SOUTHEAST LOOP PUMPS | | 2020 | M | 4 |
| 5 | | 7.5 HP | | 2900 | M | – | – | 4.9 | | 5 HP | | 2020 | M | 6 |
| 7 | | | | 2020 | M | 4.0 | – | – | | | | 2020 | M | 8 |
| 9 | 50/3 | NORTHEAST LOOP PUMPS | | 2020 | M | – | 4.0 | – | 50/3 | PRESSURE PUMP PANEL | | 2020 | M | 10 |
| 11 | | 5 HP | | 2020 | M | – | – | 4.0 | | 5 HP | | 2020 | M | 12 |
| 13 | | | | 557 | M | 4.3 | – | – | | BACKWASH PUMP, 10HP | | 3718 | MM | 14 |
| 15 | 15/3 | WASTE HEAT LOOP PUMPS | 3 | 557 | M | – | 4.3 | – | 50/3 | AIR BLOWER, 7.5 HP | | 3718 | MM | 16 |
| 17 | | 1 HP | | 557 | M | – | – | 4.3 | | NOTE: NON–COINCIDENT LOADS | | 3718 | MM | 18 |
| 19 | | | | 265 | M | 3.8 | – | – | 60/2 | APARTMENT PANEL | 2 | 3500 | F | 20 |
| 21 | 15/3 | FAA LOOP PUMPS | | 265 | M | – | 3.8 | – | | | | 3500 | F | 22 |
| 23 | | 1/3 HP | | 265 | M | – | – | 0.3 | – | SPACE | 4 | | | 24 |
| 25 | | | | 1200 | M | 3.2 | – | – | 100/2 | PANEL S | 1 | 2000 | F | 26 |
| 27 | 30/3 | SHOP AIR COMPRESSOR | | 1200 | M | – | 3.2 | – | | | | 2000 | F | 28 |
| 29 | | | | 1200 | M | – | – | 1.2 | – | SPACE | 4 | | | 30 |
| 31 | 20/1 | VFD | | 2240 | M | 3.6 | – | – | 100/2 | PANEL G | 1 | 1400 | F | 32 |
| 33 | 15/1 | RAW WATER BOOST PUMP | | 2240 | M | – | 3.6 | – | | | | 1400 | F | 34 |
| 35 | 15/1 | 5 HP | | 2240 | M | – | – | 2.2 | – | SPACE | 4 | | | 36 |
| 37 | 100/2 | PANEL B | 1 | 2500 | F | 6.0 | – | – | 100/2 | PANEL M | 1 | 3500 | F | 38 |
| 39 | | | | 2500 | F | – | 6.0 | – | | | | 3500 | F | 40 |
| 41 | – | SPACE | 4 | | | – | – | 0.0 | – | SPACE | 4 | | | 42 |
| | | | TOTAL LOAD / PHASE: | | | 29.8 | 29.8 | 16.9 | KVA | | | | | |
| | | | DEMAND CURRENT / PHASE: | | | 223 | 223 | 127 | AMPS | | | | | |

**SUMMARY LOADS (KVA)**

| LOAD TYPE: | C | L | MM | M | N | R | X | F | |
|---|---|---|---|---|---|---|---|---|---|
| CONNECTED: | 0.0 | 0.0 | 11.2 | 39.7 | 0.0 | 0.0 | 0.0 | 25.8 | |
| DEMAND: | 0.0 | 0.0 | 13.9 | 39.7 | 0.0 | 0.0 | 0.0 | 25.8 | |

| TOTALS | KVA | AMPS |
|---|---|---|
| CONNECTED: | 76.6 | 184 |
| DEMAND: | 79.4 | 191 |

NOTES [#]:

| | |
|---|---|
| 1 | DISCONNECT PANEL FEEDER AND SPARE THE BREAKER. SEE PLANS FOR RECONNECT OF EXISTING PANEL TO NEW 208/120V FEEDER. |
| 2 | DISCONNECT PANEL FEEDER AND SPARE THE BREAKER. PANEL WILL NOT BE RECONNECTED IN THIS CONTRACT. |
| 3 | DISCONNECT CIRCUIT IN DEMOLITION WORK AND SPARE THE BREAKER. |
| 4 | LINE–TO–GROUND VOLTAGE: 120V FOR PHASE A & B; 139V FOR PHASE C |
| | |

| LOCATION | NOTE: | PANEL | INTERRUPT RATING | INSTALLATION: |
|---|---|---|---|---|
| WATER TREATMENT AREA | EXISTING/REWORK AS NOTED | B | 10 KAIC | SURFACE MOUNT, TYPE 1 ENCL |

| VOLTAGE | CONNECTION | TYPE | MAIN | AVAILABLE FAULT | SOURCE: NOTE 1 |
|---|---|---|---|---|---|
| 208 / 120V | 2 φ — 3 W | MLO | 200A | CURRENT: 6.7 KA | PANEL SDP |

| CKT # | *TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CONNECTED KVA Aφ | Bφ | *TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CKT # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 20/1 | LIGHTS | | 1300 | L | 2.5 | – | 20/1 | LIGHTS | | 1200 | L | 2 |
| 3 | 20/1G | RECEPTACLES / FIT–311 | | 500 | C | – | 1.7 | 15/1 | LIGHTS | | 1200 | L | 4 |
| 5 | 20/1G | RECEPTACLES | | 500 | R | 1.0 | – | 20/1G | RECEPTACLES | | 500 | R | 6 |
| 7 | 20/1G | RECEPTACLES | | 500 | R | – | 1.0 | 20/1G | RECEPTACLES | | 500 | R | 8 |
| 9 | 20/1G | RECEPTACLES | | 500 | R | 1.0 | – | 20/1G | RECEPTACLES | 4 | 500 | R | 10 |
| 11 | 15/1 | CIRC PUMP BOOSTER | 4 | 600 | M | – | 1.0 | 20/1G | RECEPTACLES OFFICE | | 400 | R | 12 |
| 13 | 15/1 | UNIT HEATERS | | 500 | M | 0.7 | – | 15/1G | RECEPTACLES CHEM PUMP | | 200 | N | 14 |
| 15 | 15/1 | ADD HEAT PUMP | | 600 | M | – | 0.9 | 20/1G | RECEPTACLES STORAGE ROOM | | 300 | R | 16 |
| 17 | 20/2 | CIRC PUMP SCHOOL LOOP | | 400 | MM | 0.6 | – | 15/1 | FIRE ALARM | | 200 | C | 18 |
| 19 | | | | 400 | MM | – | 1.6 | 15/1 | LIGHTS STORAGE ROOM | | 1200 | L | 20 |
| 21 | 15/1 | SPARE | | | | 0.3 | – | 15/1 | AQUASTATS | | 300 | C | 22 |
| 23 | 20/1 | CEILING FAN | | 200 | M | – | 0.3 | 15/1 | SOLENOID | | 100 | C | 24 |
| 25 | 20/1 | TURBIDIMETERS / OR–OOO | | 100 | C | 0.4 | – | 15/1 | BUILDING ALARM | | 300 | C | 26 |
| 27 | 20/1 | MX–320 | | 500 | C | – | 0.7 | 20/1 | FP–110 / SV–111 / MX | | 200 | C | 28 |
| 29 | 15/1 | FS–102/301/311, SCD & ALL FP's | | 100 | C | 1.0 | – | 20/1 | MX–120 | | 900 | C | 30 |
| 31 | 15/1 | FILTER LIGHTS | | 100 | L | – | 1.0 | 20/1 | MX–310 | | 900 | C | 32 |
| 33 | 15/1 | AIT–321 | | 100 | C | 0.4 | – | 20/1 | GT–A | 2 | 300 | M | 34 |
| 35 | 20/1 | CP–A | 2 | 400 | M | – | 0.4 | – | SPACE | | | | 36 |
| 37 | 20/1 | CP–B, CP–F | 2 | 300 | M | 0.3 | – | – | SPACE | | | | 38 |
| 39 | 20/1 | CP–C, CP–D, CP–E | 2 | 1000 | M | – | 1.0 | – | SPACE | | | | 40 |
| 41 | 20/1 | TRANSFORMER TX | 2 | 100 | C | 0.1 | – | – | SPACE | | | | 42 |
| | | | TOTAL LOAD / PHASE: | | | 8.3 | 9.6 | KVA | | | | | |
| | | | DEMAND CURRENT / PHASE: | | | 79 | 91 | AMPS | | | | | |

**SUMMARY LOADS (KVA)**

| LOAD TYPE: | C | L | MM | M | N | R | X | |
|---|---|---|---|---|---|---|---|---|
| CONNECTED: | 4.3 | 5.0 | 0.8 | 3.9 | 0.2 | 3.7 | 0.0 | |
| DEMAND: | 5.4 | 6.3 | 1.0 | 3.9 | 0.2 | 3.7 | 0.0 | |

| TOTALS | KVA | AMPS |
|---|---|---|
| CONNECTED: | 17.9 | 75 |
| DEMAND: | 20.4 | 85 |

NOTES [#]: * G = GFCI CIRCUIT BREAKER

| | |
|---|---|
| 1 | CUTOVER EXISTING PANEL TO NEW 208/120V FEEDER. |
| 2 | ADD NEW CIRCUIT BREAKER TO EXISTING SPACE FOR NEW LOAD ADDITION. |
| 3 | REPLACE THREE (3) MISSING DEADFRONT COVER SCREWS. |
| 4 | IDENTIFY CIRCUIT AS SPARE AFTER EXISTING CIRC PUMPS AND WIRING REMOVED. |

| LOCATION | NOTE: | PANEL | INTERRUPT RATING | INSTALLATION: |
|---|---|---|---|---|
| WATER TREATMENT AREA | REWORKED PANEL | A | 10 KAIC | SURFACE MOUNT, TYPE 1 ENCL, TOP FEED |

| VOLTAGE | CONNECTION | TYPE | MAIN | AVAILABLE FAULT | SOURCE: NOTE 1 |
|---|---|---|---|---|---|
| 240 V | 3 φ — 3 W | MLO | 200A | CURRENT: 6.7 KA | PANEL SDP VIA STEP–UP AUTO–XFMR |

| CKT # | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CONNECTED KVA Aφ | Bφ | Cφ | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CKT # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | 2900 | M | 4.9 | – | – | | | | 2020 | M | 2 |
| 3 | 70/3 | WEST LOOP PUMPS | | 2900 | M | – | 4.9 | – | 50/3 | SOUTHEAST LOOP PUMPS | | 2020 | M | 4 |
| 5 | | 7.5 HP | | 2900 | M | – | – | 4.9 | | 5 HP | | 2020 | M | 6 |
| 7 | | | | 2020 | M | 4.0 | – | – | | | | 2020 | M | 8 |
| 9 | 50/3 | NORTHEAST LOOP PUMPS | | 2020 | M | – | 4.0 | – | 50/3 | PRESSURE PUMP PANEL | | 2020 | M | 10 |
| 11 | | 5 HP | | 2020 | M | – | – | 4.0 | | 5 HP | | 2020 | M | 12 |
| 13 | | | | | | 3.7 | – | – | | BACKWASH PUMP, 10HP | | 3718 | MM | 14 |
| 15 | 15/3 | SPARE | 2 | | | – | 3.7 | – | 50/3 | AIR BLOWER, 7.5 HP | | 3718 | MM | 16 |
| 17 | | | | | | – | – | 3.7 | | NOTE: NON–COINCIDENT LOADS | | 3718 | MM | 18 |
| 19 | | | | 265 | M | 0.3 | – | – | 60/2 | SPARE | 2 | | | 20 |
| 21 | 15/3 | FAA LOOP PUMPS | | 265 | M | – | 0.3 | – | | | | | | 22 |
| 23 | | 1/3 HP | | 265 | M | – | – | 0.3 | – | SPACE | 4 | | | 24 |
| 25 | | | | 1200 | M | 1.2 | – | – | 100/2 | SPARE | 2 | | | 26 |
| 27 | 30/3 | SHOP AIR COMPRESSOR | | 1200 | M | – | 1.2 | – | | | | | | 28 |
| 29 | | | | 1200 | M | – | – | 1.2 | – | SPACE | 4 | | | 30 |
| 31 | | VFD | 3 | 2800 | M | 2.8 | – | – | 100/2 | SPARE | 2 | | | 32 |
| 33 | 30/3 | RAW WATER BOOST PUMP | | 2800 | M | – | 2.8 | – | | | | | | 34 |
| 35 | | 5 HP | | 2800 | M | – | – | 2.8 | – | SPACE | 4 | | | 36 |
| 37 | 100/2 | SPARE | 2 | | | 0.0 | – | – | 100/2 | SPARE | 2 | | | 38 |
| 39 | | | | | | – | 0.0 | – | | | | | | 40 |
| 41 | – | SPACE | | | | – | – | 0.0 | – | SPACE | | | | 42 |
| | | | TOTAL LOAD / PHASE: | | | 16.9 | 16.9 | 16.9 | KVA | | | | | |
| | | | DEMAND CURRENT / PHASE: | | | 129 | 129 | 129 | AMPS | | | | | |

**SUMMARY LOADS (KVA)**

| LOAD TYPE: | C | L | MM | M | N | R | X | | |
|---|---|---|---|---|---|---|---|---|---|
| CONNECTED: | 0.0 | 0.0 | 11.2 | 39.7 | 0.0 | 0.0 | 0.0 | | |
| DEMAND: | 0.0 | 0.0 | 13.9 | 39.7 | 0.0 | 0.0 | 0.0 | | |

| TOTALS | KVA | AMPS |
|---|---|---|
| CONNECTED: | 50.8 | 122 |
| DEMAND: | 53.6 | 129 |

NOTES [#]:

| | |
|---|---|
| 1 | CUTOVER EXISTING PANEL TO NEW 240Y 3PH–3W FEEDER. NO LINE–NEUTRAL LOADS PERMITTED ON PANEL. |
| 2 | SPARE BREAKER AFTER REMOVING LOAD AS INDICATED ON PLANS. |
| 3 | REMOVE 1–POLE BREAKERS AND REPLACE WITH NEW 3–POLE BREAKER. |
| 4 | PROVIDE DEAD–FRONT INSERTS AS REQUIRED TO COVER OPEN POLE SPACES ON PANEL COVER. |
| 5 | REMOVE OR PAINT OVER SHARPEE MARKING ON PANEL COVER, AND INSTALL PHENOLIC TAG: 240V CIRCUITS ONLY; L–N VOLTAGE = 139V. |
| 6 | REPLACE FOUR (4) MISSING DEADFRONT COVER SCREWS. |

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STATE OF ALASKA — REGISTERED PROFESSIONAL ENGINEER — WILLIAM A. STRAIN — EE-9323

PROJECT NO. – | CITY GRID – | WATER GRID – | SEWER GRID –

PROJECT NO: 80901.02

UNALAKLEET WTP UPGRADES

# PANEL SCHEDULES (2 OF 3)

DATE: JULY 2020

STATUS: ISSUED FOR CONSTRUCTION

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE HOR. N/A VER. N/A | DESIGNED BY WAS | DRAWN BY JEH | CHECKED BY – | APPROVED BY –

SHEET NO.

**E-302**

| LOCATION | NOTE: | PANEL | INTERRUPT RATING | INSTALLATION: |
|---|---|---|---|---|
| FIRE STATION | EXISTING/REWORK AS NOTED | F | 10 KAIC | SURFACE MOUNT, TYPE 1 ENCL, TOP FEED |

| VOLTAGE | CONNECTION | TYPE | MAIN | AVAILABLE FAULT | SOURCE: |
|---|---|---|---|---|---|
| 208 / 120V | 2 φ — 3 W | MLO | 100A | CURRENT: 3.3 KA | NOTE 1 PANEL SDP |

| CKT # | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CONNECTED KVA Aφ | CONNECTED KVA Bφ | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CKT # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 20/1 | RECEPTACLE | | 360 | R | 0.7 | — | 20/1 | RECEPTACLE | | 360 | R | 2 |
| 3 | 20/1 | LIGHTS | | 600 | L | — | 1.0 | 20/1 | RECEPTACLE | | 360 | R | 4 |
| 5 | 20/1 | RECEPTACLE | | 360 | R | 0.9 | — | 30/2 | RED CONNEX | | 500 | N | 6 |
| 7 | 20/2 | BLK CORD | | 360 | N | — | 0.9 | | | | 500 | N | 8 |
| 9 | | | | | | 0.0 | — | — | SPACE | | | | 10 |
| 11 | 20/1 | HEATER FAN | | 500 | C | — | 0.5 | — | SPACE | | | | 12 |
| | | | TOTAL LOAD / PHASE: | | | 1.6 | 2.3 | KVA | | | | | |
| | | | DEMAND CURRENT / PHASE: | | | 14 | 21 | AMPS | | | | | |

**SUMMARY LOADS (KVA)**

| LOAD TYPE: | C | L | MM | M | N | R | X | |
|---|---|---|---|---|---|---|---|---|
| CONNECTED: | 0.5 | 0.6 | 0.0 | 0.0 | 1.4 | 1.4 | 0.0 | |
| DEMAND: | 0.6 | 0.8 | 0.0 | 0.0 | 1.4 | 1.4 | 0.0 | |

| TOTALS | KVA | AMPS |
|---|---|---|
| CONNECTED: | 3.9 | 16 |
| DEMAND: | 4.2 | 17 |

NOTES [#]:

| | |
|---|---|
| 1 | CUTOVER EXISTING PANEL TO NEW 208/120V FEEDER. |
| | |

| LOCATION | NOTE: | PANEL | INTERRUPT RATING | INSTALLATION: |
|---|---|---|---|---|
| MECHANICAL ROOM | EXISTING/REWORK AS NOTED | M | 10 KAIC | SURFACE MOUNT, TYPE 1 ENCL, TOP FEED |

| VOLTAGE | CONNECTION | TYPE | MAIN | AVAILABLE FAULT | SOURCE: |
|---|---|---|---|---|---|
| 208 / 120V | 2 φ — 3 W | MLO | 100A | CURRENT: 7.1 KA | NOTE 1 PANEL SDP |

| CKT # | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CONNECTED KVA Aφ | CONNECTED KVA Bφ | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CKT # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 20/1 | LIGHTS | | 500 | L | 1.0 | — | 20/1 | HOT WATER HEATER | | 500 | M | 2 |
| 3 | 15/1G* | BATHROOM LIGHTS | | 100 | L | — | 0.3 | 20/1G* | RECEPT | | 180 | R | 4 |
| 5 | 15/1G* | BATHROOM RECEPT | | 180 | R | 0.4 | — | 20/1G* | RECEPT BELOW PANEL | | 180 | R | 6 |
| 7 | 15/1 | BOILERS | | 1000 | M | — | 1.5 | 15/1 | UNKNOWN LOAD | | 500 | N | 8 |
| 9 | 15/1 | CIRC PUMP 1 | | 500 | MM | 1.0 | — | 15/1 | UNKNOWN LOAD | | 500 | N | 10 |
| 11 | 15/1 | APT ZONE VALVE | | 100 | N | — | 0.7 | 15/1 | CEILING FAN & UNIT HEATER | | 600 | M | 12 |
| | | | TOTAL LOAD / PHASE: | | | 2.4 | 2.5 | KVA | | | | | |
| | | | DEMAND CURRENT / PHASE: | | | 21 | 22 | AMPS | | | | | |

**SUMMARY LOADS (KVA)**

| LOAD TYPE: | C | L | MM | M | N | R | X | |
|---|---|---|---|---|---|---|---|---|
| CONNECTED: | 0.0 | 0.6 | 0.5 | 2.1 | 1.1 | 0.5 | 0.0 | |
| DEMAND: | 0.0 | 0.8 | 0.6 | 2.1 | 1.1 | 0.5 | 0.0 | |

| TOTALS | KVA | AMPS |
|---|---|---|
| CONNECTED: | 4.8 | 20 |
| DEMAND: | 5.1 | 21 |

NOTES [#]: * G = GFCI TYPE CIRCUIT BREAKER

| | |
|---|---|
| 1 | CUTOVER EXISTING PANEL TO NEW 208/120V FEEDER. |
| | |

| LOCATION | NOTE: | PANEL | INTERRUPT RATING | INSTALLATION: |
|---|---|---|---|---|
| CITY GARAGE | EXISTING/REWORK AS NOTED | G | 10 KAIC | SURFACE MOUNT, TYPE 1 ENCL, TOP FEED |

| VOLTAGE | CONNECTION | TYPE | MAIN | AVAILABLE FAULT | SOURCE: |
|---|---|---|---|---|---|
| 208 / 120V | 2 φ — 3 W | MLO | 100A | CURRENT: 6.1 KA | NOTE 1 PANEL SDP |

| CKT # | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CONNECTED KVA Aφ | CONNECTED KVA Bφ | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CKT # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 50/2 | WELDER OUTLET | | 4000 | N | 4.4 | — | 20/1 | RECEPTACLE | | 360 | R | 2 |
| 3 | | | | 4000 | N | — | 4.3 | 20/1 | STORAGE LIGHT & RECEPTACLE | | 300 | L | 4 |
| 5 | 20/1 | RECEPTACLE | | 360 | R | 0.7 | — | 20/1 | RECEPTACLE | | 360 | R | 6 |
| 7 | 20/1 | RECEPTACLE | | 360 | R | — | 0.9 | 20/1 | N. SHOP LIGHTS | | 500 | L | 8 |
| 9 | 20/1 | S. SHOP LIGHTS | | 500 | L | 0.9 | — | 20/1 | RECEPTACLE | | 360 | R | 10 |
| 11 | — | | | | | — | 0.0 | — | SPACE | | | | 12 |
| 13 | 20/1 | MIDDLE SHOP LIGHTS | | 500 | L | 0.5 | — | 50/2 | SPARE | 2 | | | 14 |
| 15 | — | SPACE | | | | — | 0.0 | | | | | | 16 |
| 17 | — | SPACE | | | | 0.0 | — | — | SPACE | | | | 18 |
| 19 | — | SPACE | | | | — | 0.0 | — | SPACE | | | | 20 |
| 21 | — | SPACE | | | | 0.0 | — | — | SPACE | | | | 22 |
| 23 | — | SPACE | | | | — | 0.0 | — | SPACE | | | | 24 |
| 25 | — | SPACE | | | | 0.0 | — | — | SPACE | | | | 26 |
| 27 | — | SPACE | | | | — | 0.0 | — | SPACE | | | | 28 |
| 29 | — | SPACE | | | | 0.0 | — | — | SPACE | | | | 30 |
| | | | TOTAL LOAD / PHASE: | | | 6.4 | 5.2 | KVA | | | | | |
| | | | DEMAND CURRENT / PHASE: | | | 56 | 45 | AMPS | | | | | |

**SUMMARY LOADS (KVA)**

| LOAD TYPE: | C | L | MM | M | N | R | X | |
|---|---|---|---|---|---|---|---|---|
| CONNECTED: | 0.0 | 1.8 | 0.0 | 0.0 | 8.0 | 1.8 | 0.0 | |
| DEMAND: | 0.0 | 2.3 | 0.0 | 0.0 | 8.0 | 1.8 | 0.0 | |

| TOTALS | KVA | AMPS |
|---|---|---|
| CONNECTED: | 11.6 | 48 |
| DEMAND: | 12.1 | 50 |

NOTES [#]: * G = GFCI TYPE CIRCUIT BREAKER

| | |
|---|---|
| 1 | CUTOVER EXISTING PANEL TO NEW 208/120V FEEDER. |
| 2 | SPARE BREAKER AFTER REMOVING EXISTING PANEL F SUBFEED. |
| 3 | REINSTALL DEADFRONT COVER ON PANEL, AND REPLACE MISSING SCREWS. |
| | |

| LOCATION | NOTE: | PANEL | INTERRUPT RATING | INSTALLATION: |
|---|---|---|---|---|
| CITY SHOP | EXISTING/REWORK AS NOTED | S | 10 KAIC | SURFACE MOUNT, TYPE 1 ENCL, TOP FEED |

| VOLTAGE | CONNECTION | TYPE | MAIN | AVAILABLE FAULT | SOURCE: |
|---|---|---|---|---|---|
| 208 / 120V | 2 φ — 3 W | MLO | 100A | CURRENT: 5.8 KA | NOTE 1 PANEL SDP |

| CKT # | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CONNECTED KVA Aφ | CONNECTED KVA Bφ | CONNECTED KVA Cφ | TRIP/ POLES | CIRCUIT DESCRIPTION | NOTE | VA | LOAD TYPE | CKT # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 20/1 | MAIN LIGHTS | | 500 | L | 1.0 | — | — | 15/1 | BENCH LIGHTS | | 500 | L | 2 |
| 3 | 20/1G* | RECEPTACLE | | 360 | R | — | 0.7 | — | 20/1G* | RECEPTACLE | | 360 | R | 4 |
| 5 | 20/1G* | RECEPTACLE | | 360 | R | 0.7 | — | — | 20/1G* | RECEPTACLE | | 360 | R | 6 |
| 7 | — | SPACE | | | | — | 0.5 | — | 15/1 | UNIT HEATER | | 500 | MM | 8 |
| 9 | — | SPACE | | | | 0.0 | — | — | — | SPACE | | | | 10 |
| 11 | — | SPACE | | | | — | 0.0 | — | — | SPACE | | | | 12 |
| 13 | — | SPACE | | | | 0.0 | — | — | — | SPACE | | | | 14 |
| 15 | — | SPACE | | | | — | 0.0 | — | — | SPACE | | | | 16 |
| | | | TOTAL LOAD / PHASE: | | | 1.7 | 1.2 | 0.0 | KVA | | | | | |
| | | | DEMAND CURRENT / PHASE: | | | 16 | 11 | 0 | AMPS | | | | | |

**SUMMARY LOADS (KVA)**

| LOAD TYPE: | C | L | MM | M | N | R | X | | |
|---|---|---|---|---|---|---|---|---|---|
| CONNECTED: | 0.0 | 1.0 | 0.5 | 0.0 | 0.0 | 1.4 | 0.0 | | |
| DEMAND: | 0.0 | 1.3 | 0.6 | 0.0 | 0.0 | 1.4 | 0.0 | | |

| TOTALS | KVA | AMPS |
|---|---|---|
| CONNECTED: | 2.9 | 12 |
| DEMAND: | 3.3 | 14 |

NOTES [#]: * G = GFCI TYPE CIRCUIT BREAKER

| | |
|---|---|
| 1 | CUTOVER EXISTING PANEL TO NEW 208/120V FEEDER. |
| | |


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ANCHORAGE, ALASKA 99503
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AECC-882-AK


STATE OF ALASKA — WILLIAM A. STRAIN — EE-9323 — REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. — | CITY GRID — | WATER GRID — | SEWER GRID —

UNALAKLEET WTP UPGRADES

# PANEL SCHEDULES (3 OF 3)

DATE: JULY 2020

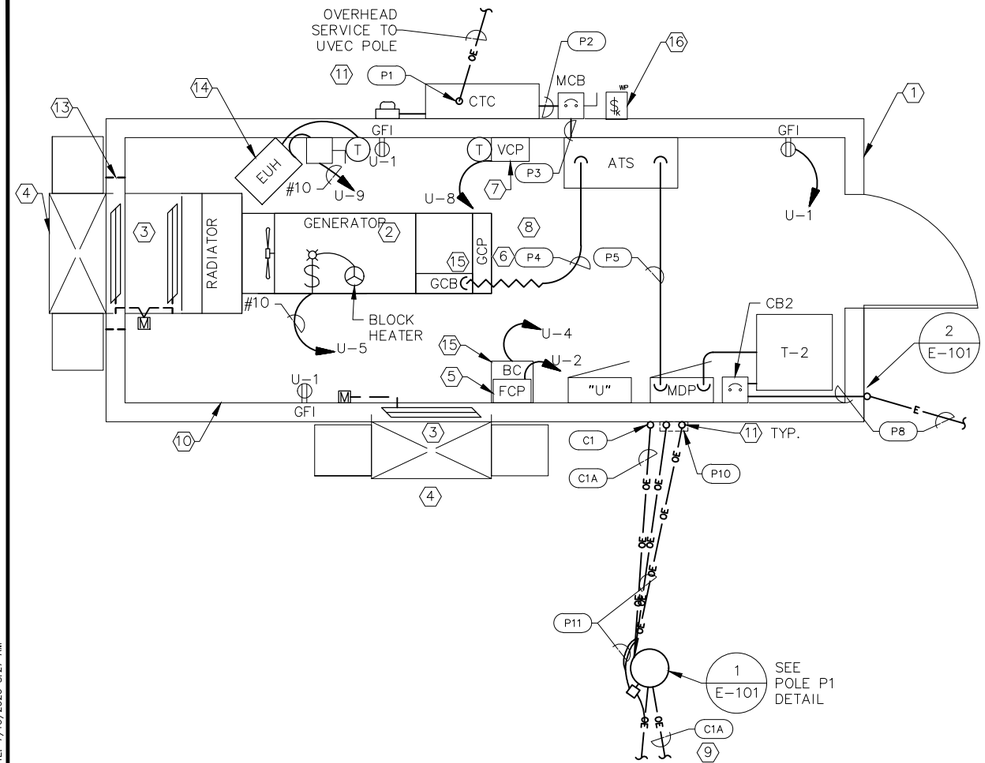
STATUS: ISSUED FOR CONSTRUCTION

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE: HOR. N/A VER. N/A | DESIGNED BY WAS | DRAWN BY JEH | CHECKED BY — | APPROVED BY —

SHEET NO.

**E-303**

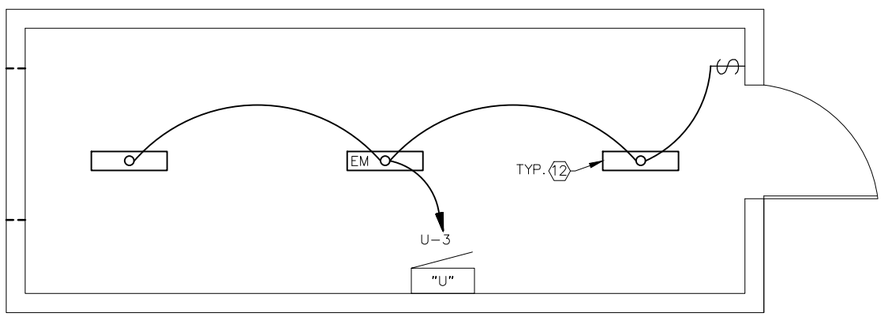



## GENERATOR MODULE POWER PLAN

1

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

2' 0 2' 4'




## GENERATOR MODULE LIGHTING PLAN

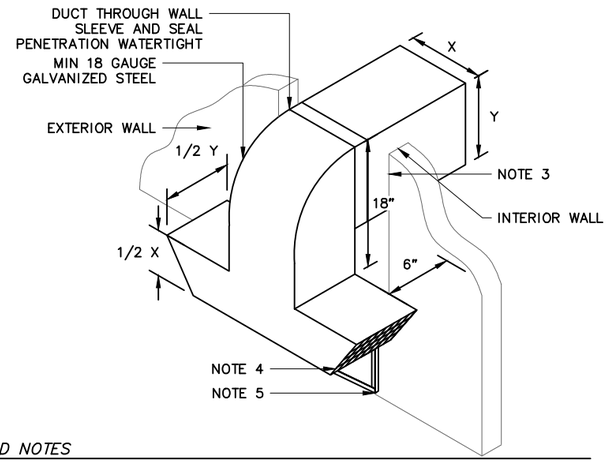
2

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

2' 0 2' 4'

## GENERAL NOTES

1. SEE CIRCUIT SCHEDULES ON SHEET E-002.
2. SEE PANEL SCHEDULES ON SHEET E-301.
3. GENERATOR MODULE HEATING AND VENTILATION CONTROL SEQUENCE:
   - WHEN GENERATOR IS OFF:
     - ELECTRIC UNIT HEATER (EUH) CYCLES TO MAINTAIN SPACE TEMPERATURE SETPOINT AT 50F (ADJUSTABLE). EUH AND ENGINE BLOCK HEATER ARE INTERLOCKED TO PREVENT HEATER OPERATION WHENEVER GENERATOR RUNS.
     - MAKEUP AND EXHAUST AIR DAMPERS ARE FULLY CLOSED; RETURN AIR DAMPER IS OPEN.
   - WHEN GENERATOR IS ON:
     - AT GENERATOR START, MAKEUP AIR DAMPER OPENS TO 10% MINIMUM POSITION (ADJUSTABLE) FOR COMBUSTION AIR. RADIATOR DISCHARGE AIR RETURNS TO ROOM THRU 100% OPEN RETURN AIR DAMPER.
     - AS ROOM TEMPERATURE RISES ABOVE SPACE TEMPERATURE SETPOINT, MAKEUP AIR AND EXHAUST AIR DAMPERS MODULATE OPEN, AND RETURN AIR DAMPER MODULATES CLOSED AS REQUIRED TO MAINTAIN 80F SETPOINT (ADJUSTABLE).
     - WHEN GENERATOR SHUTS DOWN, MAKEUP AIR AND EXHAUST DAMPERS RETURN TO NORMALLY CLOSED AND RETURN AIR DAMPER TO NORMALLY OPEN POSITIONS. DAMPER ACTUATORS EQUIPPED WITH SPRING RETURN.




## HOOD NOTES

1. FABRICATE WEATHER HOOD FROM MIN 18 GAUGE GALVANIZED STEEL PER SMACNA STANDARDS.

2. PROVIDE WEATHER HOODS FOR GENERATOR MODULE, SIZE, LOCATION, AND QUANTITY AS REQUIRED BY GENERATOR.

3. ATTACH HOOD TO WALL WITH 2X2X3/16 ANGLE (4 SIDES)

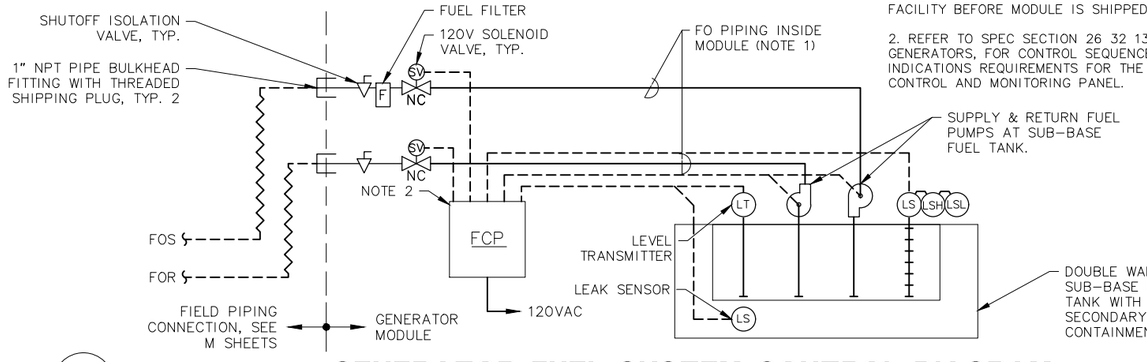
4. 1" BIRDSCREEN COVER. HINGED AT BOTTOM & SECURED AT TOP WITH MIN. OF 2 MEDIUM DUTY LATCHES, McMASTER-CARR #1863A16 OR EQUAL

5. TWO 2X2X3/16 ANGLE SUPPORT (TYP.) SECURE TO WALL AND HOOD, ONE ON EACH SIDE.

## SNOW HOOD DETAIL

3

NTS




## GENERATOR FUEL SYSTEM CONTROL DIAGRAM

4

NTS

## FUEL SYSTEM CONTROL NOTES

1. ALL FUEL PIPING AND APPURTENANCES IN GENERATOR MODULE SHALL BE INSTALLED AND TESTED IN AN APPROVED SHOP FABRICATION FACILITY BEFORE MODULE IS SHIPPED TO SITE.

2. REFER TO SPEC SECTION 26 32 13 – ENGINE GENERATORS, FOR CONTROL SEQUENCE AND INDICATIONS REQUIREMENTS FOR THE FUEL TANK CONTROL AND MONITORING PANEL.

## SHEET NOTES

1. GENERATOR MODULE: REFER TO SPEC SECTION 26 32 13 REQUIREMENTS FOR INSULATED ARCTIC ENCLOSURE, NOMINAL 20' X 8' X 9'H WITH PITCHED ROOF AND WELDED STEEL SKID BASE.
2. GENERATOR: REFER TO SPEC SECTION 26 32 13 REQUIREMENTS FOR DIESEL ENGINE GENERATOR WITH SUB-BASE FUEL TANK AND ACCESSORIES.
3. PROVIDE LOUVERED OPENINGS FOR MAKEUP AND EXHAUST AIR, SHEET METAL PLENUM DUCTWORK FOR EXHAUST/RETURN AIR AT RADIATOR DISCHARGE, AND INSULATED CONTROL DAMPERS WITH MOTORIZED ACTUATORS, SIZED AS REQUIRED BY GENERATOR.
4. PROVIDE WEATHER HOOD FOR EACH LOUVERED OPENING AS REQUIRED. SEE TYPICAL DETAIL THIS SHEET.
5. FUEL SYSTEM CONTROL PANEL (FCP): LOCATE FCP WITHIN 5 FEET OF, AND ON SAME SIDE OF GENERATOR SKID AS THE FUEL FILL OPENING AND FUEL TANK GAUGE.
6. ROUTE FEEDERS AT MAXIMUM HEIGHT. PROVIDE FLEXIBLE VIBRATION ISOLATED CONNECTION AT GENERATOR TERMINAL BOX.
7. VENTILATION CONTROL PANEL (VCP): REFER TO GENERATOR MODULE HEATING AND VENTILATION CONTROL SEQUENCE ON THIS SHEET.
8. COORDINATE ARRANGEMENT OF EQUIPMENT TO ENSURE THAT NEC WORKING CLEARANCE (3'-0" MINIMUM X 30"W) IS PROVIDED TO THE ATS, POWER DISTRIBUTION PANELS, CONTROL PANELS, GENERATOR CIRCUIT BREAKER (GCB), AND BATTERY CHARGER.
9. SEE SITE PLAN FOR OVERHEAD DISTRIBUTION TO FACILITIES.
10. RESERVE SPACE FOR FUEL OIL LINE ENTRANCE SHUTOFFS, SOLENOID VALVES, AND FILTER ASSEMBLY. SEE DETAIL THIS SHEET.
11. SECURE RMC RISER/ WEATHERHEAD MAST WITH CHANNEL-MOUNTED PIPE STRAPS AT MAXIMUM 2-FOOT INTERVALS. EXTEND MAST TO HEIGHT AS REQUIRED TO ENSURE 10' CLEARANCE FROM GRADE TO DRIP LOOP.
12. PROVIDE ENCLOSED AND GASKETED LED LUMINAIRES, FIBERGLASS HOUSING WITH IMPACT RESISTANT 80-MIL POLYCARBONATE LENS, 2000L, 4000K, MEDIUM DISTRIBUTION, 120V, WITH SELF-DIAGNOSTIC EMERGENCY BATTERY PACK OPTION FOR "EM" FIXTURES AS INDICATED ON PLAN. MFR: LITHONIA # DMW2-L24-2000LM-PCL-MD-120-40K-80CRI (-E10WCP FOR EM UNITS), OR EQUAL.
13. PROVIDE REMOVEABLE BOLTED WALL SECTION, NOMINALLY 4'W X 6'H SIZE AND AS REQUIRED TO ALLOW FOR FUTURE REMOVAL AND REPLACEMENT OF GENERATOR SKID WITH SUB-BASE FUEL TANK.
14. ELECTRIC UNIT HEATER (EUH): PROVIDE 5KW 208V ELECTRIC UNIT HEATER WITH INTERLOCK PER H&V CONTROL SEQUENCE.
15. BATTERY CHARGER (BC): WALL-MOUNT BELOW FUEL SYSTEM CONTROL PANEL.
16. PROVIDE GENERATOR ESD SHUNT-TRIP KEY-ACCESSIBLE SWITCH. MOUNT SWITCH IN W.P. ENCLOSURE WITH HINGED LOCKABLE DOOR OR PROVIDE W.P. KEY SWITCH. ATTACH WEATHER-RESISTANT ENGRAVED LABEL: "STANDBY GENERATOR EMERGENCY SHUT-DOWN". SEE 2/E-003 CONTROL DIAGRAM.

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PROJECT NO. – | CITY GRID – | WATER GRID – | SEWER GRID –

UNALAKLEET WTP UPGRADES

# GENERATOR MODULE

PROJECT NO: –

DATE: JULY 2020

STATUS: ISSUED FOR CONSTRUCTION

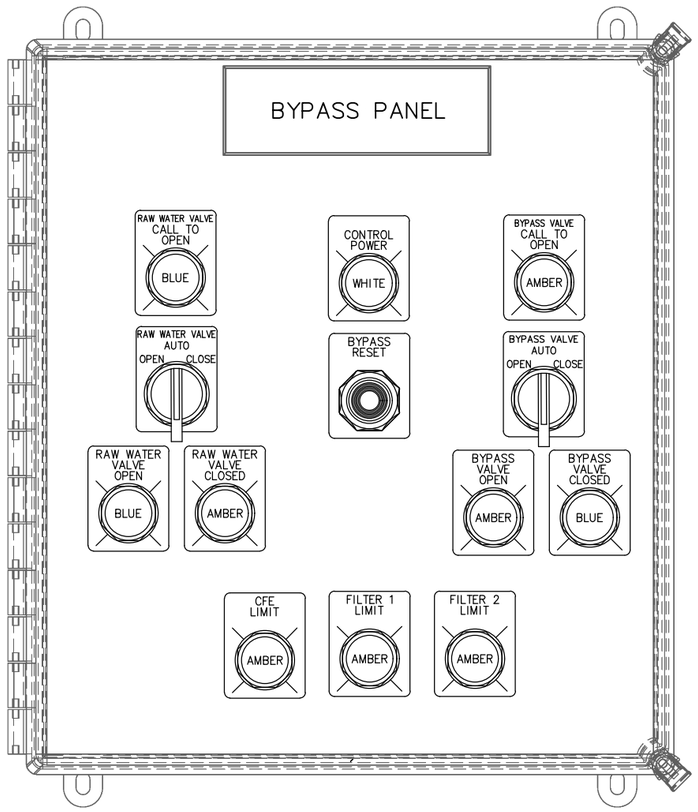
| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| REVISION | | | |

SCALE HOR. – VER. –
DESIGNED BY WAS
DRAWN BY JEH
CHECKED BY –
APPROVED BY –

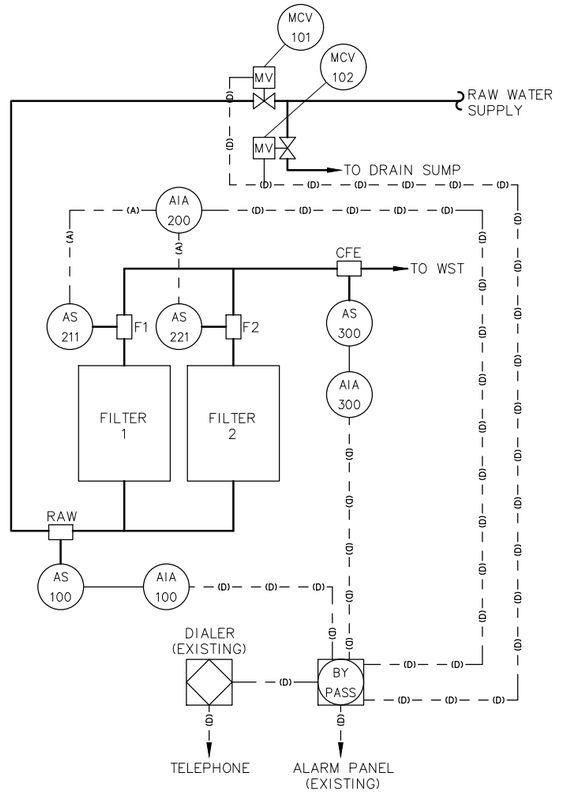
SHEET NO.

**E-400**

File: J:\Jobs\Data\60901.02 Unalakleet WTP 2018 Upgrades\00 CADD\01 Working Set\03 Electrical\60901.02 Generator Module.dwg PLOT DATE: 7/10/2020 8:27 AM




1 **BYPASS PANEL LAYOUT**
NTS




2 **BYPASS P&ID**
NTS

# RAW WATER BYPASS CONTROL FUNCTIONAL NARRATIVE

*The control panel will provide AUTO–FILTER–BYPASS operational modes.*

*Under normal operating conditions the motorized valves will be in AUTO mode with the RAW WATER valve (MCV–101) OPEN and the BYPASS valve (MCV–102) CLOSED.*

*The control panel will receive inputs from the (3) turbidimeter controllers: RAW WATER and COMBINED FILTER EFFLUENT (CFE) each have their own controller and FILTER 1 and FILTER 2 signals are combined in a third.*

*Upon receiving an actionable alarm signal, a panel light will illuminate indicating where the alarm came from, an alarm signal will be sent to the auto dialer system, and the motorized valves will be actuated as appropriate to re–direct the raw water to the drain sump.*

*Once the raw water bypass function is activated, the controls will require a manually initiated reset before allowing the valves to return to their normal positions. The operator will probably need to backwash the filters and run the system in filter to waste mode until turbidities return to acceptable limits before bringing the water system back on line and returning the turbidity alarm system to auto mode.*

*The drain sump level is equipped with a float switch set to send and alarm if the drain sump levels approach an overflow condition. Although this may result in potential flooding of the WTP, the alternative is to shut down the BYPASS and risk over–pressuring and possible rupturing the supply line or damaging the raw water submersible pumps that rely on water flow for cooling.*

*Process Alarms*
*As explained above, the existing system includes FOUR turbidimeter elements and three associated turbidimeter controllers to monitor raw water, individual filter effluent, and CFE turbidity. All of the turbidity controllers feature recording capabilities and provide an alarm relay for each channel that can be set to send an alarm signal at a desired set point.*

*A turbidity setpoint exceedance will activate the alarm and auto dialer functions, and power the motorized valves to the bypass configuration.*

*Reset is accomplished by manually by:*
1. *opening the RAW water valve and*
2. *closing the BYPASS valve,*
3. *perform backwash and filter to waste seqeunce as needed and*
4. *once turbidity levels as read on the turbidity meters drop to acceptable limits ( below setpoint)*
5. *press the BYPASS RESET button and all of the turbidity alarm lights should extinguish, then*
6. *put both RAW and BYPASS valve mode selector switches in AUTO to re–arm the controller.*

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STATE OF ALASKA — 49TH — ENGINEER — William M. McDonald — CI-14318 — 7/6/2020 — REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
CITY GRID
WATER GRID
SEWER GRID

UNALAKLEET WTP UPGRADES
CONTROL PANEL BP LAYOUT

PROJECT NO: 80901.02

DATE: JULY 2020

STATUS: ISSUED FOR CONSTRUCTION

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| REVISION | | | |

SCALE: HOR. N/A VER. N/A
DESIGNED BY
DRAWN BY
CHECKED BY
APPROVED BY

SHEET NO.
**E-600**

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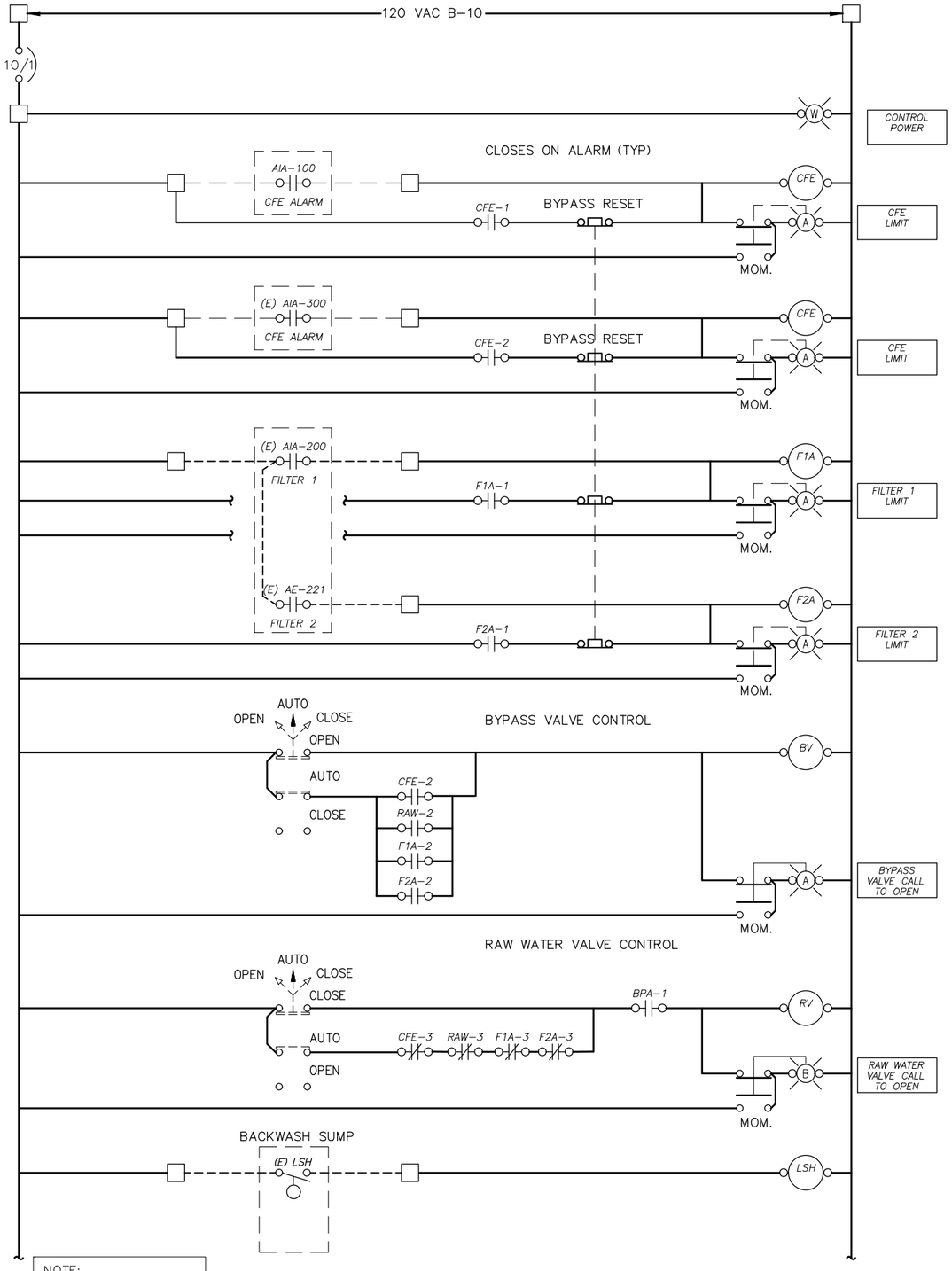


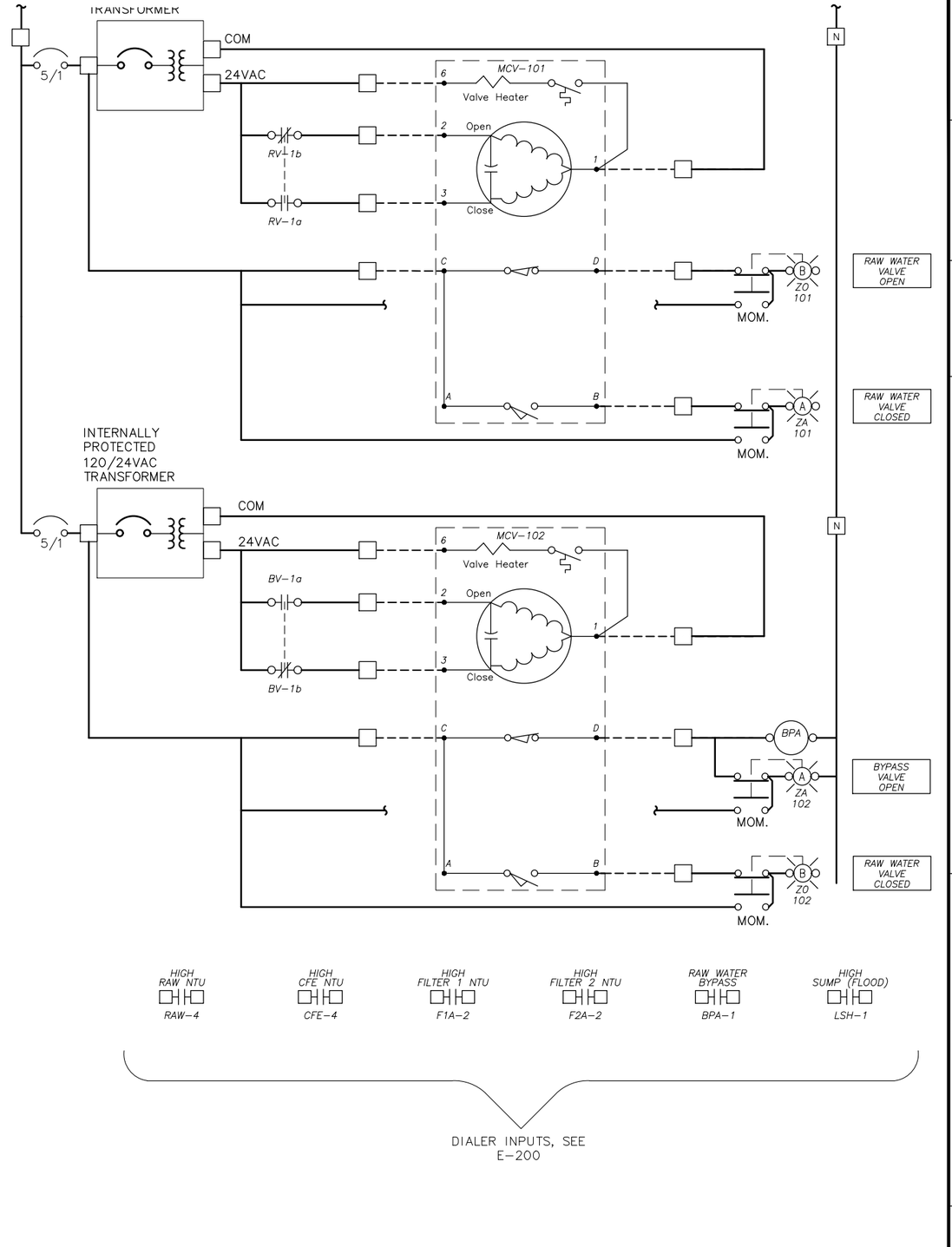


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STATE OF ALASKA
49TH
William M. McDonald
O-14318
7/6/2020
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
CITY GRID
WATER GRID
SEWER GRID

UNALAKLEET WTP UPGRADES
CONTROL PANEL BP LADDER

DATE: JULY 2020
STATUS: ISSUED FOR CONSTRUCTION
PROJECT NO: 80901.02

| REV | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | REVISION | |

SCALE: HOR. N/A VER. N/A
DESIGNED BY WMM
DRAWN BY ARL
CHECKED BY
APPROVED BY

SHEET NO.
E-601

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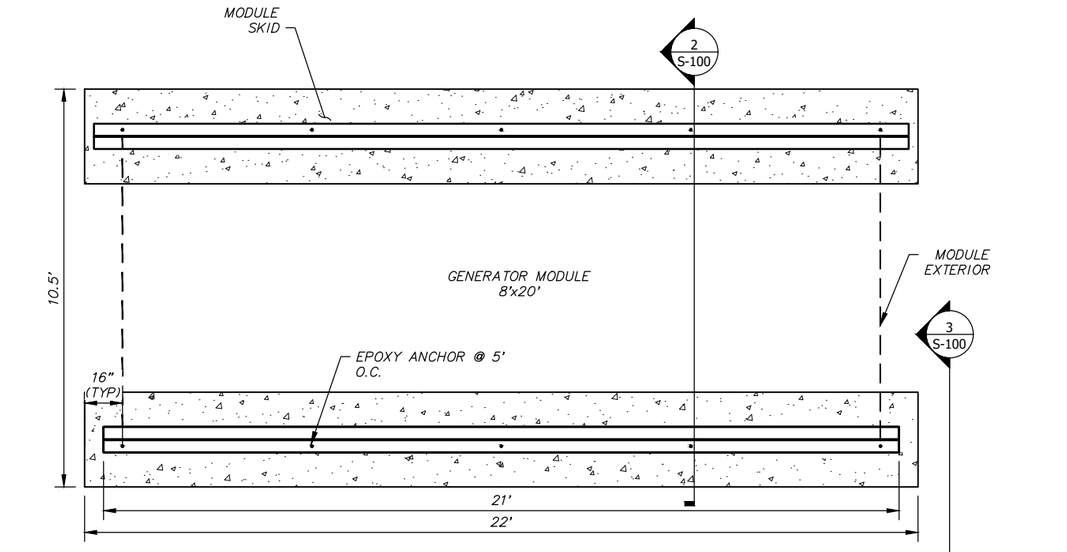
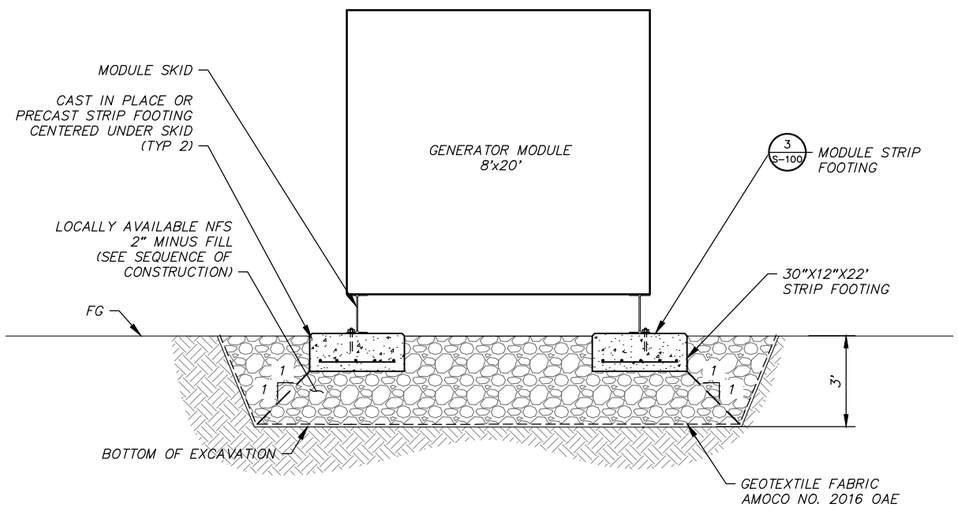


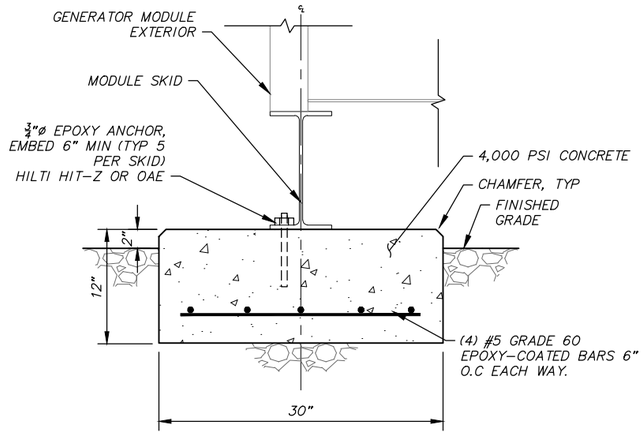

1 **PLAN - MODULE FOUNDATION LAYOUT**

NTS




2 **END VIEW - MODULE FOUNDATION**

NTS




3 **SECTION - FOUNDATION DETAIL**

SCALE: 1" = 1'-0"

**EARTHWORK NOTES:**

1.0 FABRICS:

A. WOVEN GEOTEXTILE: BLACK FUEL RESISTANT GEOTEXTILE FABRIC. INSTALL WITH 3' MINIMUM OVERLAP AT ALL JOINTS. AMOCO NO. 2016, OR APPROVED EQUAL.

2.0 EXCAVATION:

A. GRAVEL PAD FOUNDATION SEQUENCE OF CONSTRUCTION:

1. EXCAVATE TO THE LIMITS SHOWN AND PROOF COMPACT.
2. IF ORGANICS, SILTS, OR OTHER DELETERIOUS MATERIALS ARE ENCOUNTERED AT THE BASE OF EXCAVATION OVER-EXCAVATE A MINIMUM OF 2'.
3. PLACE WOVEN GEO-TEXTILE OVER ENTIRE EXCAVATION FOOTPRINT.
4. PLACE LOCALLY AVAILABLE 3" MINUS NFS MATERIAL IN NOMINAL 6" LIFTS AND COMPACT WITH A MINIMUM OF 5 PASSES USING APPROVED VIBRATORY COMPACTOR AT OPTIMUM MOISTURE CONTENT.

**STRUCTURAL DESIGN NOTES:**

1.0 DESIGN LOADS:

A. BUILDING CODE: 2012 INTERNATIONAL BUILDING CODE

B. FLOOR LIVE LOADS: (IBC TABLE 1607.1)
LIGHT STORAGE/MANUFACTURING 125 PSF OR 2000 POUND POINT LOAD
MAXIMUM GENERATOR UNIT WEIGHT 5,000 POUNDS

C. SNOW LOADS: (ASCE 7-10)
GROUND SNOW LOAD, Pg = 70 PSF
COEFFICIENT OF EXPOSURE, Ce = 1.0 , PARTIALLY EXPOSED
SNOW IMPORTANCE FACTOR, Is = 1.2 , CATEGORY IV
THERMAL COEFFICIENT, Ct = 1.2 , COLD, VENTILATED ROOF

D. WIND LOADS:
BASIC WIND SPEED = 163 MPH, 3 SECOND GUST
WIND IMPORTANCE FACTOR, Iw = 1.15 , CATEGORY IV
EXPOSURE CLASSIFICATION = EXPOSURE D

E. SEISMIC LOADING:
SEISMIC = $S_s$ = 0.376 $S_1$ = .148

SEISMIC IMPORTANCE FACTOR = 1.50 , CATEGORY IV

SITE CLASS "D"
BASIC SEISMIC FORCE RESISTANCE SYSTEM:
BUILDING - BEARING WALL WITH STEEL SHEAR PANELS
FOUNDATION - SPREAD CONCRETE FOOTINGS
SEISMIC RESPONSE COEFFICIENT, R = 7.0

**CAST IN PLACE CONCRETE NOTES:**

1.0 CONCRETE MATERIALS:

A. CEMENTITIOUS MATERIALS: USE THE SAME TYPE, BRAND, AND SOURCE, THROUGHOUT PROJECT.

1. PORTLAND CEMENT: ASTM C 150, TYPE IA, II, IIIA.

B. AGGREGATES: ALL AGGREGATES SHALL BE PROVIDED FROM AN APPROVED SOURCE:

1. NORMAL-WEIGHT AGGREGATES: ASTM C 33, GRADED, 1-INCH NOMINAL MAXIMUM COARSE-AGGREGATE SIZE.
2. FINE AGGREGATE: ASTM C 33, FREE OF MATERIALS WITH DELETERIOUS REACTIVITY TO ALKALI IN CEMENT.

C. WATER: ASTM C 94/C 94M AND POTABLE.

D. AIR-ENTRAINING ADMIXTURE: ASTM C 260.

E. CHEMICAL ADMIXTURES: PROVIDE ADMIXTURES CERTIFIED BYMANUFACTURER TO BE COMPATIBLE WITH OTHER ADMIXTURES AND THAT WILL NOT CONTRIBUTE WATER-SOLUBLE CHLORIDE IONS EXCEEDING THOSE PERMITTED IN HARDENED CONCRETE. DO NOT USE CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE.

1. WATER-REDUCING ADMIXTURE: ASTM C494/C 494M, TYPE A.

2.0 CONCRETE MIXTURES:

A. PREPARE DESIGN MIXTURES FOR EACH TYPE AND STRENGTH OF CONCRETE, PROPORTIONED ON THE BASIS OF LABORATORY TRIAL MIXTURE OR FIELD TEST DATA, OR BOTH, ACCORDING TO ACI 301.

B. PROPORTION NORMAL-WEIGHT CONCRETE MIXTURE AS FOLLOWS:

1. MINIMUM COMPRESSIVE STRENGTH: 4000 PSI AT 28 DAYS.
2. MAXIMUM WATER-CEMENTITIOUS MATERIALS RATIO: 0.45.
3. SLUMP LIMIT: 4 INCHES, PLUS OR MINUS 1 INCH.
4. AIR CONTENT: 4-7 PERCENT.

3.0 FIELD QUALITY CONTROL:

A. CONTRACTOR WILL ENGAGE A QUALIFIED INDEPENDENT TESTING AND INSPECTING AGENCY TO PERFORM FIELD TESTS AND INSPECTIONS AND PREPARE TEST REPORTS.

1. TESTING SERVICES: TESTS SHALL BE PERFORMED ACCORDING TO ACI 301 & THE DESIGN DRAWINGS.

4.0 REINFORCING STEEL:

A. MINIMUM COVER CAST AGAINST AND EXPOSED TO EARTH: 3"
B. LAP SPLICING: 44 BAR DIAMETERS AT SPLICES.

CRW ENGINEERING GROUP LLC
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PHONE (907) 677-3520
AECC-882-JV

STATE OF ALASKA
REGISTERED PROFESSIONAL ENGINEER
CR 10883
Karl R. Hulke
7/10/2020

PROJECT NO. - | CITY GRID - | WATER GRID - | SEWER GRID -

UNALAKLEET WTP UPGRADES -

GENERATOR MODULE FOUNDATION DETAILS

PROJECT NO: B0901.02

DATE: JULY 2020

STATUS: ISSUED FOR CONSTRUCTION

| REVISION | | | |
|---|---|---|---|
| REV | DATE | DESCRIPTION | BY |

SCALE HOR. - VER. -
DESIGNED BY NCP
DRAWN BY NCP
CHECKED BY KRH
APPROVED BY KRH

SHEET NO.

S-100