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DIVISION 33 - UTILITIES

SECTION 33 09 52

FUEL PUMP CONTROL AND ANNUNCIATION SYSTEM (NON-HYDRANT)

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FUEL PUMP CONTROL AND ANNUNCIATION SYSTEM (NON-HYDRANT)
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C37.90	(2005; R 2011) Standard for Relays and Relay Systems Associated With Electric Power Apparatus
IEEE C62.41	(1991; R 1995) Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits

INTERNATIONAL SOCIETY OF AUTOMATION (ISA)

ISA 18.1	(1979; R2004) Annunciator Sequences and Specifications

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA 250	(2020) Enclosures for Electrical Equipment (1000 Volts Maximum)
NEMA IA 2	(2005) Programmable Controllers - Parts 1 thru 8
NEMA ICS 1	(2022) Standard for Industrial Control and Systems: General Requirements
NEMA ICS 2	(2000; R 2020) Industrial Control and Systems Controllers, Contactors, and Overload Relays Rated 600 V
NEMA ICS 4	(2015) Application Guideline for Terminal Blocks
NEMA ICS 6	(1993; R 2016) Industrial Control and Systems: Enclosures

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2023; ERTA 7 2023; TIA 23-15) National Electrical Code

U.S. FEDERAL COMMUNICATIONS COMMISSION (FCC)

FCC Part 15	Radio Frequency Devices (47 CFR 15)

UL SOLUTIONS (UL)

UL 508	(2018; Reprint Jul 2021) UL Standard for Safety Industrial Control Equipment
UL 1012	(2010; Reprint Apr 2016; Rev Mar 2021) UL Standard for Safety Power Units Other than Class 2
UL 1449	(2021; Reprint Dec 2022) UL Standard for Safety Surge Protective Devices

1.2 ADMINISTRATIVE REQUIREMENTS

a. Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM applies to this section, with the additions and modifications specified herein.

b. Programmable Logic Controllers (PLCs) receive information from motor operated valved, position indicated ball valves, automatic tank gauging/independent level alarm probes and sensors, and other devices to control the fueling system.

c. The control system must be furnished by a single supplier. See Section 33 57 55 FUEL SYSTEM COMPONENTS (NON-HYDRANT) for other required components of the control system. The control system supplier must be responsible for providing a fully functional control system, in accordance with the drawings and specifications, including the field devices. Installation must be in accordance with NFPA 70.

d. Submit six copies of Operation and Maintenance Manuals, within 7 calendar days following the completion of factory tests. Installation, Operation, and Maintenance manuals for all system components supplied must be furnished following the completion of shop tests and must include:

(1) Pump Control Panels and Fiber Converter Panels including interior and exterior system components layout. Complete guide outlining step-by-step procedures for system startup and operation.

(2) All documents previously submitted and approved with all comments and field changes annotated. Complete description of the sequence of operation including that described in PART 3 and any subsystems not controlled by the PLC (e.g. alarm annunciator safety/circuit).

(3) Complete listing of all programming of the PLCs, and laptop computer.

(4) Complete relay ladder logic diagrams, PLC input/output diagrams and control power distribution diagrams for the complete control system.

(5) Complete troubleshooting guide, which lists possible operational problems and corrective action to be taken, including all as-built conditions.

e. Submit documents demonstrating the accuracy and completeness of the list of material and components, that items proposed comply fully with contract requirements, and are otherwise suitable for the application

indicated. Documents must consist of all data or drawings published by the manufacturer of individual items listed including manufacturer's descriptive and technical literature, performance data, catalog cuts, and installation instructions. Submit additional material if the listed items are not adequate to identify intent or conformance to technical requirements. Provide typed and electronic copies of these lists for approval. Any delays associated with resubmittals of incomplete or ambiguous initial submittals will be the Contractor's responsibility.

f. Documents must be bound in a suitable binder adequately marked or identified on the spine and front cover. A table of contents page must be included and marked with pertinent contract information and contents of the manual. Tabs must be provided to separate different types of documents, such as catalog ordering information, drawings, instructions, and spare parts data. Index sheets must be provided for each section of the manual when warranted by the quantity of documents included under separate tabs or dividers.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Shop Drawing; G, DO

SD-03 Product Data

Tools and Spare Parts

Laptop Computer; G, DO

Programmable Logical Controller (PLC) Hardware and Software; G, DO

Control Wiring Data Lists; G, DO

Human Machine Interface (HMI) Touchscreen; G, DO

Fiber Converter Panels (FCP) and Components; G, DO

Pump Control Panels (PCP) and Components; G, DO

Graphics Display Screen; G, DO

SD-06 Test Reports

Certified Pump Control Panels (PCP) Shop Test Reports; G, DO

Record of Test

SD-07 Certificates

Experience and Qualifications; G, DO

Testing Plan; G, DO

Training Plan for Instructing Personnel; G, DO

SD-10 Operation and Maintenance Data

Operation and Maintenance Manuals; G, DO

1.3.1 Submittal Coordination and Sequencing Requirements

See references to this Specifications Section and/or specific submittal items in Section 01 33 00, as well as requirements herein and as referenced in other parts of this contract, for coordination and sequencing of submittals and the associated work to be performed.

1.4 TOOLS AND SPARE PARTS

Provide the following:

a. Any special tools necessary for operation and maintenance of the system components providing supplier name, current cost, catalog order number, and a recommended list of spare parts to be stocked.

b. One spare set of fuses of each type and size.

c. Recommended manufacturer list of spare parts, including part number, current unit price, and source of supply.

d. One spare power supply module.

e. One spare I/O module for discrete devices.

f. Two PLC RAM back-up batteries.

1.5 EXPERIENCE AND QUALIFICATIONS

Submit the following data for approval:

a. Certification stating that the manufacturer has manufactured, installed, and successfully completed at least five PLC-based systems for automatic cycling of pumps based upon varying dispensing demands ranging from 0 to 2400 GPM utilizing multiple pumps.

b. Certification that the control systems have successfully operated over the last 2-years and are currently in service.

c. Project names, locations, and system description of these installations. Include user point-of-contact and current telephone numbers.

1.6 WARRANTY

The Pump Control and Annunciation System including devices, hardware and software must be warranted for a period of one year from the date of acceptance of the system by the Government. This warranty service must include parts and labor service for system components supplied under this specification. Upon notification by the Government of system or component failure, respond at the site with necessary parts within 48-hours of notification.

PART 2 PRODUCTS

2.1 MATERIALS AND SYSTEM COMPONENTS

2.1.1 Pump Control Panels (PCP) and Components

NEMA ICS 1, NEMA ICS 6, NEMA 250, and UL 508. The PCP enclosure must be a freestanding NEMA Type 12, smooth, gasketed enclosure constructed of 12 gauge steel. All seams must be continuously welded and there must be no drilled holes or knockout prior to delivery to the job site. The pump control panel dimensions must be a maximum of 90-inches high, maximum 36-incheswide, and a maximum of 24-inches deep and must have removable lifting eyes. The interior surfaces of the panel must be properly cleaned, primed, and spray painted with white high-gloss enamel. Exterior surfaces must have standard factory finish. Access for the PCP must be front only and must consist of hinged doors having 3-point latching mechanisms. The doors must open approximately 120 degrees. Rack mounting angles, swing-out panels and other component mounting hardware must be installed such that servicing of one component must not require removal or disconnection of other components. No clearance will be required between the back of the panel and the room walls. Terminal facilities must be arranged for entrance of external conductors from the top or bottom of the enclosure.

2.1.2 Fiber Converter Panels (FCP) and Components

NEMA ICS 1, NEMA ICS 6, NEMA 250, and UL 508. The FCP enclosure must be a rack mounted NEMA Type 4X, [*Am-00002] heated and insulated for cold weather, [**Am-00002] stainless steel 316L, smooth, gasketed enclosure constructed of 14 gauge steel. All seams must be continuously welded and there must be no drilled holes or knockout prior to delivery to the job site. [*Am-00002] <text deleted> [**Am-00002] Exterior surfaces must have standard factory brushed finish. Access for the FCP must be front only and must consist of hinged doors having 3-point latching mechanisms. The doors must open approximately 120 degrees. Rack mounting angles, swing-out panels and other component mounting hardware must be installed such that servicing of one component must not require removal or disconnection of other components. Terminal facilities must be arranged for entrance of external conductors from the top or bottom of the enclosure. [*Am-00002] FCP enclosure heater must be thermostatically controlled and fan driven. Heater must be powered from FCP power distribution. Heating calculations must be performed to provide consistent heating of the enclosure. [**Am-00002]

[*Am-00003] FCP must be fitted with EFSO system pushbuttons, strobe, and vibrating horn as shown. For pushbuttons details see paragraph 2.1.8. Strobe must be 120VAC, immune to shock and vibration, 65 fpm mode field-selectable via dipswitch, operating temperature -31 degrees F to 212 degrees F. For vibrating horn details see paragraph 2.1.16. FCP I/O racks (remote I/O racks) must be able to receive discrete inputs through its programming, it must perform data handling operations and communicate with external devices and PCP I/O racks. FCP I/O racks must be a modular, field expandable design allowing the system to be tailored to the process control application. The capability must exist to allow for expansion to the system by the addition of hardware and user software. At a minimum the FCP must include mounting backplanes and I/O modules. For details see paragraph 2.2. [**Am-00003]

2.1.3 Ventilation System

Provide one supply fans, single phase, 115 volt. Each fan must supply a minimum of 100 CFM. The supply and exhaust grill must contain a filter that is easily removed from the exterior of the enclosure. Also provide two thermostats with an adjustable set point range of 70 degrees F to 140 degrees F. Locate the thermostats near the top in the interior of the PCP.

2.1.4 Ground Bar

The control panel must have a tin-plated copper equipment ground bar. The bar must have a minimum of twenty grounding screws.

2.1.5 Human Machine Interface (HMI) Touchscreen Terminals

Provide HMI touchscreens in locations as provided on the drawings. Touchscreen terminal must be industrial grade. The touchscreen terminal must be a minimum of 15-inches SGA TFT LED LCD. Provide the latest Intel Atom process operating at aminimum of 1.91 GHz quad core processor with a minimum of 4 GB DDR3L SDRAM and 64G SSD. Touchscreen terminal operating temperature should range from -4 degrees F to 140 degrees F. The cooling system must be fanless. The touchscreen terminal must be a minimum of 36 million touches at a single point. The touchscreen terminal type must be 5 wire analog resistive. Input and Output connections must include one RS-232, one RS-232/422/485, one USB 3.0, three USB 2.0 and any other connection type to make a complete operational system.

2.1.6 Standard Indicator Lights

NEMA ICS 1, NEMA ICS 2, and UL 508. Lights must be heavy duty, NEMA 13, 1-inch mounting hole, round indicating lights operating at 120 volts ac/dc or 24 volts ac/dc. Long life bulbs must be used. Indicator lights must have a legend plate with words as shown on drawings. Lens color as indicated on the drawings. Lights must be "push to test (lamp)" type. LED type lamps of comparable size and color may be substituted for standard indicator lights.

2.1.7 Selector Switches

NEMA ICS 1, NEMA ICS 2, and UL 508. Non-illuminated lever operated selector switches must be heavy duty, NEMA 13, round, and utilize a 7/8-inches mounting hole. They must have the number of positions as indicated on the drawings. Switches must be rated 600 volt, 10 amperes continuous. Legend plates must be provided with each switch with words as indicated on the drawings.

2.1.8 Pushbuttons

NEMA ICS 1, NEMA ICS 2, and UL 508. Non-illuminated pushbuttons must be heavy duty, NEMA 13, round, utilize a 7/8-inch mounting hole, and have the number and type of contacts as indicated on the drawings or elsewhere in the specifications. The emergency stop switch must be a red mushroom head, 1.5inch diameter, momentary contact type. Pushbuttons must be rated 600 volt, 10 amperes continuous. Legend plates must be provided with each switch with words as indicated on the drawings.

2.1.9 Relays

IEEE C37.90, NEMA ICS 2, UL 508.

2.1.10 Nameplates

Nameplates must be made of laminated plastic with black outer layers and a white core. Edges must be chamfered. Nameplates must be fastened with black-finished round-head drive screws or approved nonadhesive metal fasteners.

2.1.11 Transient Voltage Surge Suppression Devices

IEEE C62.41 for Category "B" transients, UL 1449.

2.1.12 Terminal Blocks

NEMA ICS 4. Terminal blocks for conductors exiting the PCP must be two-way type with double terminals, one for internal wiring connections and the other for external wiring connections. Terminal blocks must be made of bakelite or other suitable insulating material with full deep barriers between each pair of terminals. A terminal identification strip must form part of the terminal block and each terminal must be identified by a number in accordance with the numbering scheme on the approved wiring diagrams.

2.1.13 Circuit Breakers

UL 508. Individual, appropriately sized, terminal block mounted, circuit breakers must be provided for all 120 volt PCP mounted system components and for the 120 volt terminal boards shown on the drawings.

2.1.14 Uninterruptible Power Supplies

UL 1012. Input voltage must be 120 volts (nominal), 1 phase, 60 Hertz. Output voltage regulation must be plus/minus 5.0 percent for the following conditions:

a. 20 to 100 percent load on output.

b. Input voltage variation of minus 15 to 10 percent.

c. Constant load power factor between 80 and 100 percent.

Response time must be 1.5 cycles or less. Battery capacity must be such as to provide an orderly shut down of operating programs or as a minimum 10 minutes.

2.1.15 Miscellaneous Power Supplies

UL 1012. Certain field devices may require power other than 120 VAC (i.e. 24 VDC). The power supplies must be convection cooled, have fully isolated independent outputs, have constant voltage, have short circuit and overvoltage protection, and have automatic current limiting.

2.1.16 Alarm Horns

UL 508. The alarm horns must consist of vibrating horns and resonating horns as shown on the drawings. One vibrating horn is to be mounted on each Fiber Converter Panel, and two vibrating and two resonating horns must be mounted outside of Building 451 as shown on the drawings. The exterior horns must each produce 100 db at 10 feet and must be provided in

a weather proof housing. The PCP and FCP horns must produce 70 db at 10 feet.

2.1.17 Laptop Computer

2.1.17.1 Hardware

The following are the minimum hardware requirements for the laptop computer:

a. Latest Core i9 CPU operating at 5.4 GHz or faster

b. 16 GB RAM

c. 1 TB hard drive SSD

e. 16-inch 1920 x 1200 LED - Backlit Display

f. Keyboard

g. Pointing device (e.g. mouse, track ball)

h. 120VAC and Battery power supply

i All cables and connectors for interfacing with PLCs

j. One HDMI Port

k. Three USB 3.2 communications ports

l. Provide a carrying case for the Laptop Computer

2.1.17.2 Software

The following is the minimum software to be loaded on the laptop. The software must be the most current versions and compatible with each other to make a complete and usable system. All software needs to be fully site licensed (provide with software key) and come with all devices to allow a full restore or reload of software in the event of a hard drive crash.

a. Operating system (e.g. the latest commercially available MS Operating system)

b. Software for programming the PLCs

2.2 PROGRAMMABLE LOGICAL CONTROLLER (PLC) HARDWARE AND SOFTWARE

2.2.1 General

a. NEMA IA 2. PLC must be able to receive discrete and analog inputs and through its programming it must control discrete and analog output functions, perform data handling operations and communicate with external devices and remote I/O racks. PLC must be a modular, field expandable design allowing the system to be tailored to the process control application. The capability must exist to allow for expansion to the system by the addition of hardware and user software. At a minimum the PLC must include mounting backplanes, power supply

modules, CPU module, communication modules, and I/O modules.

b. Design and test PLC provided for use in the high electrical noise environment of an industrial plant. PLC module must comply with the FCC Part 15 Part A for radio noise emissions. The programmable controller processor must be able to withstand conducted susceptibility tests as outlined in NEMA ICS 2, IEEE C37.90.

c. PLC must function properly at temperatures between 32 and 122 degrees F, at 5 to 95 percent relative humidity non-condensing and have storage temperatures between minus 40 and 140 degrees F at 5 to 95 percent relative humidity non-condensing.

d. PLC must have manufacturer's standard system status indicators (e.g. power supply status, system fault, run mode status, back-up battery status).

2.2.2 Central Processing Unit Module

The CPU must be a modular self-contained unit that will provide time of day, scanning, application (ladder rung logic) program execution, storage of the application program, storage of numerical values related to the application process and logic, I/O bus traffic control, peripheral and external device communications and self-diagnostics.

2.2.3 Power Supply Module

a. The power supply module must be plugged into the backplane not separately mounted. The power supply must be wired to utilize 120 VAC, 60 Hz power, the system must function properly within the range of minus 10 to plus 15 percent of nominal voltage. The power supply must provide an output to the backplane at a wattage and voltage necessary to support the attached modules. A single main power supply module must have the capability of supplying power to the CPU module and local communication and I/O modules. Auxiliary power supplies must provide power to remote racks.

b. Each power supply must have an integral on/off disconnect switch to the module. If the manufacturers standard power supply does not have an on/off disconnect switch a miniature toggle type switch must be installed near the PLC and clearly labeled as to its function.

c. The power supply must monitor the incoming AC line voltage for proper levels and have provisions for both over current and over voltage protection. If the voltage level is detected as being out of range the system must have adequate time to complete a safe and orderly shutdown.

2.2.4 Program Storage/Memory Requirements

a. The PLC must have the manufacturers standard nonvolatile executive memory for the operating system. The PLC must also have EEPROM (Electrically Erasable Programmable Read Only Memory) for storage of the user program and battery backup RAM for application memory. The EEPROM must be loaded by use of the laptop computer.

b. Submit a calculation of the required amount of EEPROM and RAM (random access memory) needed for this application plus an extra 50 percent.

c. The number of times a normally open (N.O.) or normally closed (N.C.)

contact of an internal output can be programmed must be limited only by the memory capacity to store these instructions.

2.2.5 Input/Output (I/O) Modules

a. Provide all required I/O modules (analog input, analog output, discrete input, discrete output, and isolated discrete output) to manipulate the types of inputs and outputs as shown on the drawings and to comply with the sequence of operations. Also provide a minimum of 20 percent (round up for calculation) spare input and output points of each type provided, but not less than 2 of each type.

b. I/O modules must be a self-contained unit housed within an enclosure to facilitate easy replacement. All user wiring to I/O modules must be through a heavy-duty terminal strip. Pressure-type screw terminals must be used to provide fast, secure wire connections. The terminal block must be removable so it is possible to replace any input or output module without disturbing field wiring.

c. During normal operation, a malfunction in any remote input/output channel must affect the operation of only that channel and not the operation of the CPU or any other channel.

d. Isolation must be used between all internal logic and external power circuits. This isolation must meet the minimum specification of 1500 VRMS. Provide optically isolated I/O components which are compatible with field devices.

e. Each I/O module must contain visual indicators to display ON/OFF status of individual input or output points.

f. Discrete output modules must be provided with self-contained fuses for overload and short circuit protection of the module.

g. All input/output modules must be color coded and titled with a distinctive label.

2.2.6 Interfacing

The PLC must have communication ports and communication modules using the manufacturers standard communication architecture for connections of the FCPs, other PCP, and Laptop Computer.

2.2.7 Program Requirements

a. The programming format must be ladder diagram type as defined by NEMA IA 2.

b. There must be a means to indicate contact or output status of the contact or output on the LCD screen (of the laptop computer). Each element's status must be shown independently, regardless of circuit configuration.

c. The program must be full featured in its editing capabilities (e.g. change a contact from normally open to normally closed, add instructions, change addresses).

2.2.8 Diagnostics

The CPU must continuously perform self-diagnostic routines that will provide information on the configuration and status of the CPU, memory, communications and I/O. The diagnostic routines must be regularly performed during normal system operation. A portion of the scan time of the controller should be dedicated to perform these housekeeping functions. In addition, a more extensive diagnostic routine should be performed at power up and during normal system shutdown. The CPU must log I/O and system faults in fault tables, which must be accessible for display. When a fault affects I/O or communication modules the CPU must shut down only the hardware affected and continue operation by utilizing healthy system components. All faults must be annunciated on the alarm annunciator.

PART 3 EXECUTION

3.1 PUMP CONTROL PANELS (PCP) AND COMPONENTS

3.1.1 General

a. Where two or more system components performing the same function are required, they must be exact duplicates produced by the same manufacturer. All display instruments of each type must represent the same outward appearance, having the same physical size and shape, and the same size and style of numbers, characters, pointers, and lamp lenses.

b. The PCP must include all required resident software programs and hardware to provide the specified sequence of operation. All software optical discs, including programming manuals, must be turned over to the Government at the completion of start-up so modification can be done in the field with no outside assistance.

c. It is intended that process controlling devices except field devices, and motor controllers be attached to or mounted within each PCP enclosure and all interconnecting wiring installed prior to shipment to the job site. This is to allow shop testing of the system and to decrease field labor requirements.

d. The PCP must be shipped fully assembled in one piece after the completion of the shop tests and all defects corrected.

3.1.2 Wiring

Wiring methods and practices must be in conformance with NEMA ICS 1, NEMA ICS 2, NEMA ICS 4, and NEMA ICS 6 recommendations as applicable. All wiring to instruments and control devices must be made with stranded wire, and wiring must be permanently labeled with conductor/wire numbers within one-inch of termination points. Labels must be tubular heat-shrinkable wire markers that remain legible after exposure to industrial fluids and abrasion. Position markers so that wire numbers can be read without disturbing or disconnecting wiring. Use of individual character-markers placed side-by-side is not acceptable. Numbers must match approved shop drawings. All wiring must be neatly laced from point of entry into enclosures to termination points with nylon lacing cord or plastic lacing ties. Lacing within wiring channels is not required. Where the PCP contains intrinsically safe wiring, barriers or other devices, the panel must be arranged so that all intrinsically safe wiring is separated from

non-intrinsically safe wiring by approved methods. Wiring channels containing intrinsically safe wiring must be blue and be labeled as "Intrinsically Safe Wiring Only" on the cover. All conduit penetrations into the PCP containing intrinsically safe wiring must be separated from non-intrinsically safe conduit penetrations by a minimum of 2-inches. Provide typed Control Wiring Data Lists within each terminal cabinet and the PCP. The data lists must include: conductor identification number, wire gauge, wire insulation type, "FROM" terminal identification, "TO" terminal identification, and remarks. The preliminary lists generated by the Contractor will be submitted for approval to the Contracting Officer and will be updated to As-Built conditions by the Contractor. The As-Built data lists must be placed in a document holder within each enclosure.

3.1.3 Certified Pump Control Panels (PCP) Shop Test Reports

The manufacturer must shop test each PCP and laptop computer. The procedure must include simulation of field components and must provide for fully testing each pump control functions, fiber converter functions, and (HMIs) as a unit before delivery to the project site. The test must, reveal system defects, including, but not limited to, functional deficiencies, operating program deficiencies, algorithm errors, timing problems, wiring errors, loose connections, short circuits, failed components and misapplication of components. The test must be performed prior to shipment to the site and problems detected must be corrected. The final testing and correction sequence must be repeated until no problems are revealed and then two additional successful tests must be performed. Submit certified test report within 15-days after completion of the test. The report must include a statement that the Pump Control Panel performs as specified. Notify the Contracting Officer and the Service Headquarters 30-days prior to the final shop testing date. The Contracting Officer may require a Government witness at the final test before the PCP is shipped to the site.

3.1.4 Ventilation System

Thermostat T-1, must control fan F-1 and thermostat T-2 must control fan F-2. T-1 and T-2 must be set at 80 degrees F to maintain interior air temperature to 20 degrees F above ambient. Thermostat T-2 , set at 100 degrees F, must provide a non-critical PCP HIGH TEMPERATURE alarm to the alarm annunciator.

3.1.5 Grounding

The PCP ground bar must be connected to the building counterpoise via a #10 AWG conductor. Within the enclosure all I/O racks, processor racks, and power supplies must be grounded to meet the manufacturer's specifications.

3.1.6 Indicator Lights, Switches, and Pushbuttons

Indicator lights, switches, and pushbuttons must be mounted as shown on the drawings and must be arranged to allow easy vision and operation of each device. Each device must have a nameplate or legend plate as indicated on the drawings. Nameplate wordings must be as indicated on the drawings.

3.1.7 Surge Protective Devices

Surge protective devices (SPD) must be installed in the PCP to minimize

effects of nearby lightning strikes, switching on and off of motors and other inductive loads. SPD must be provided for each control circuit ladder. Each ladder may contain any combination of the following devices: PLCs, power supplies (e.g., 24 volt), fans, relays, lights, switches. SPD must also be provided for PLC I/O originating outside of the building.

3.1.8 Terminal Blocks

As a minimum, any FCP or PCP device that connects to a field device (devices not located in the FCP or PCP) must be connected to a terminal block. A connection diagram similar to the drawings must be provided to the field Contractor for field connections to the FCP or PCP.

3.1.9 Circuit Breakers

As a minimum, any 120 volt FCP or PCP device i.e. (fans, lights, power receptacles, converter panels, 24 VDC power supplies, PLC CPUs, PLC I/O racks) must be provided with an individual circuit breaker. Additionally 120 volt terminal boards connecting to field devices (devices not located in the FCP or PCP) must be protected by a 120 volt circuit breaker.

3.1.10 Uninterruptible Power supplies

The PCP must contain two uninterruptible power supplies (UPS) (each connected to a dedicated circuit). As shown on the drawings one UPS must supply the PLC System , and the second UPS must supply the miscellaneous device power. The UPSs output capacity must be sufficient to drive all the system components connected plus 25 percent. The UPSs must be mounted on shelves near the bottom of the PCP but not rest on the floor of the PCP.

3.1.11 Power Supplies

Provide and install all 120 VAC and 24 VDC power supply. Interconnecting wiring between UPSs and PLC power supplies must be completely installed prior to shipment to the job site.

3.1.12 Alarm Annunciator and Horns

Signals must be initiated by PCP outputs as required. The control system must energize alarm horns, both an integral panel mounted vibrating horn and remote horns, and flash the appropriate HMI indicator. The minimum number of windows (on Human Machine Interface (HMI) Touch Screen) must correspond to the number of alarm points, plus 15 percent spare. The drawings indicate HMI annunciator screen layout and the alarms to be annunciated.

3.1.12.1 Non-critical Alarms

Non-critical alarm windows must be white with black lettering and must sound the panel mounted vibrating horns and the exterior mounted vibrating horns.

3.1.12.2 Critical Alarms

Critical alarm windows must be red with white lettering and must sound the panel mounted vibrating horns and the exterior mounted resonating horns. Critical alarms must also cancel all automatic pump starts in the PLC.

3.1.12.3 Alarm Sequence

Alarm sequence for each alarm must be as follows (ISA 18.1 sequence 'A').

a. For a normal condition, visual indicator and horns will be off.

b. For an alarm condition, visual indicator will flash, and horns will sound (this condition will be locked in).

c. Upon acknowledgment of the alarm condition, visual indicator will be steady on and the horns will be off.

d. If, after acknowledgment of an alarm condition, another alarm condition is established, the new alarm will cause the appropriate window to flash and the horn to sound.

e. When condition returns to normal after acknowledgment, the visual indicator and the horn will be off.

3.1.13 Human Machine Interface (HMI) Touch Screen

The Human Machine Interface (HMI) Touch Screen must be flush mounted in a wall mounted panel. The Human Machine Interface (HMI) Touch Screen must download system parameters from the PLCs for display. The Human Machine Interface (HMI) Touch Screen must also upload new set point values that the operator has changed using the Human Machine Interface (HMI) Touch Screen, after a password has been entered.

3.1.13.1 Screen Number 1

This must be a general opening screen. As a minimum it must display the name and location of the installation (e.g. Buckley Space Force Base, CO), name of the project (e.g., Power Independence, Mission Control Station) and screen navigation information.

3.1.13.2 Screen Number 2

Screen number two must list the systems parameters monitored by the PCP and their current value. The values must be continuously updated, a 2 second delay maximum between updates will be acceptable.

Parameter	Value
Bulk Receipt Tank	BT-001/BT-002/BT-003/BT-004
Bulk Issue Tank	BT-001/BT-002/BT-003/BT-004
Operating Receipt Tank	OT-N/OT-S
Operating Issue Tank	OT-N/OT-S
OP-1	On/Off xxxxx.xx HOURS
IP-F1	On/Off xxxxx.xx HOURS

IP-F2	On/Off xxxxx.xx HOURS
IP-F3	On/Off xxxxx.xx HOURS
IP-F4	On/Off xxxxx.xx HOURS
IP-O1	On/Off xxxxx.xx HOURS
IP-O2	On/Off xxxxx.xx HOURS
IP-O3	On/Off xxxxx.xx HOURS
IP-O4	On/Off xxxxx.xx HOURS
R10	Open/Closed
R11	Open/Closed
R12	Open/Closed
R13	Open/Closed
R14	Open/Closed
R15	Open/Closed
R16	Open/Closed
R17	Open/Closed
R18	Open/Closed
R19	Open/Closed
R20	Open/Closed
R21	Open/Closed
R27	Open/Closed
R28	Open/Closed
R29	Open/Closed
R30	Open/Closed
R31	Open/Closed
R32	Open/Closed
R33	Open/Closed
R34	Open/Closed
R35	Open/Closed

I01	Open/Closed
I02	Open/Closed
I03	Open/Closed
I04	Open/Closed
I05	Open/Closed
I06	Open/Closed
I07	Open/Closed
I08	Open/Closed
I09	Open/Closed
I10	Open/Closed
I11	Open/Closed
I12	Open/Closed
I13	Open/Closed
I14	Open/Closed
I15	Open/Closed
I16	Open/Closed
I17	Open/Closed
I18	Open/Closed
I19	Open/Closed
I20 (MOV)	Open/Closed
I21 (MOV)	Open/Closed
I22 (MOV)	Open/Closed
I23 (MOV)	Open/Closed
I24	Open/Closed
I25	Open/Closed
I26	Open/Closed
I27	Open/Closed
BV1	Open/Closed

BV2	Open/Closed
BV3	Open/Closed
BV4	Open/Closed
BV5 (MOV)	Open/Closed
BV6 (MOV)	Open/Closed
BV7	Open/Closed
BV8	Open/Closed
BV9 (MOV)	Open/Closed
BV10 (MOV)	Open/Closed
BV11	Open/Closed
BV12	Open/Closed
BV13 (MOV)	Open/Closed
BV14 (MOV)	Open/Closed
BV15	Open/Closed
BV17 (MOV)	Open/Closed
BV18 (MOV)	Open/Closed
BV19	Open/Closed
BV20	Open/Closed
Only one of the words separated by a slash (/) must be displayed. The xxxxx.x HOURS is the fuel pumps elapsed run time and the value must not be lost when the lead PLC is switched. The pump and valve status words must be color coded to match the colors used on the graphic display screen. Manual ball valves and Motor Operated Valves (MOV)s must have different symbols.	

3.1.13.3 Screen Number 3

The following table must be displayed graphically. The table lists the set points that can be adjusted using the operator interface. A password must

be entered before the "current value" can be adjusted. The value entered can only be a number within the "set point range". The "default value" is the value held in the program that is loaded into EEPROM memory (This screen may require more than one display screen).

SET POINT DESCRIPTION	SET POINT RANGE	DEFAULT VALUE	CURRENT VALUE
Bulk Tank No. 1 High-High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 1 High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 1 Pump Stop Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 1 Pump Start Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 1 Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 1 Low-Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 2 High-High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 2 High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 2 Pump Stop Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 2 Pump Start Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 2 Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 2 Low-Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 3 High-High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 3 High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 3 Pump Stop Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 3 Pump Start Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 3 Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 3 Low-Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 4 High-High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 4 High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 4 Pump Stop Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 4 Pump Start Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Bulk Tank No. 4 Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"

SET POINT DESCRIPTION	SET POINT RANGE	DEFAULT VALUE	CURRENT VALUE
Bulk Tank No. 4 Low-Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Operating Tank No. 1 High-High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Operating Tank No. 1 High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Operating Tank No. 1 Pump Start Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Operating Tank No. 1 Pump Stop Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Operating Tank No. 1 Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Operating Tank No. 1 Low-Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Operating Tank No. 2 High-High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Operating Tank No. 2 High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Operating Tank No. 2 Pump Start Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Operating Tank No. 2 Pump Stop Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Operating Tank No. 2 Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Operating Tank No. 2 Low-Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 1 High-High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 1 High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 1 Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 1 Low-Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 2 High-High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 2 High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 2 Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 2 Low-Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 3 High-High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 3 High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 3 Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 3 Low-Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 4 High-High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"

SET POINT DESCRIPTION	SET POINT RANGE	DEFAULT VALUE	CURRENT VALUE
Day Tank No. 4 High Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 4 Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"
Day Tank No. 4 Low-Low Level	xx'-xx" to xx'-xx"	xx'-xx"	xx'-xx"

3.1.13.4 Screen Number 4

This screen must be a duplicate of the Graphic Display Drawing showing a schematic of the process flow. This screen must be referred to as the graphical display. Many operating parameters must be displayed here as required in later paragraphs of this specification.

3.1.13.5 Screen Number 5

This screen must be the Alarm Annunciator and it must be superimposed over the current active screen on the Human Machine Interface (HMI) Touch Screen when an alarm is activated.

3.1.13.6 Screen Number 5

This screen must be a screen designed solely for assisting the testing team during initial start up to watch all of the significant parameters of the systems operation simultaneously on one screen. This screen must include the system parameters i.e. (pump selection, tank selection, valve position, etc.) from screen 2, the set points from screen 3, and timers for all of the actions that will take place following a delay function.

3.1.13.7 Screen Number 7

This screen must be an alarm history screen. This screen must be referred to as the Alarm History Display. This screen must be capable of storing and displaying all alarms that have occurred in the system for at least a period of 30-days.

3.1.13.8 Screen Number 8

This screen must be a screen designed to show EFSO system status. This screen must show the status of all 13 EFSO pushbuttons. Refer to EFSO system control diagram.3.1.14 Laptop Computer

The Laptop computer must be used to create, edit, and load the ladder logic program into the PLCs and the operator interface graphics control program into the Human Machine Interface (HMI) Touch Screen. The Laptop must also be used to monitor the PLCs memory and ladder logic program. The computer must be stored in a lockable cabinet located within the Pump

Control Panel.

3.2 PROGRAMMABLE LOGICAL CONTROLLER (PLC) HARDWARE AND SOFTWARE

3.2.1 General

The basic operation of the PLC system is (Reference "Control System Block Diagram" on the drawings):

a. The CPU and its associated I/O rack (I/O-1) sends system outputs to appropriate devices and receive input signals from field devices (PITs-1, DPTs-1, DPTs-3, flow switches, valve limit switches).

3.2.2 Programs

a. Provide two copies of all working programs (i.e. PLC logic, HMI Touchscreen Terminal) on read only optical discs as well as a printed program listing.

b. Provide rung comments (documentation) in the ladder logic program. Each device, on the ladder, must be identified as to the type of device, i.e. limit switch XX, flow indicator XX, motor starter XX. Rung comments must be provided for input and output rungs. The programmer must also provide a comment describing the function of each rung or group of rungs that accomplish a specific function.

3.3 GRAPHICS DISPLAY SCREEN

3.3.1 General

The graphic display screen shall be capable of being displayed on the Human Machine Interface (HMI) Touch Screen.

3.3.2 Display Presentation

The Graphic Display shall depict the process fuel flow schematically as indicated on the drawings. Red, green, and amber symbols shall be integrated with the process schematic to provide current equipment status graphically. The symbols shall be located immediately adjacent to related equipment symbol.

3.3.3 Process Schematic

The process schematic graphic representation shall utilize conventional symbols when possible. Symbols and flow lines shall be sized and spaced so as to provide a clear representation of the system process. The Graphic Display shall be suitable for supervised field modification when future items are added. Minor changes may be incorporated to allow proper line width and spacing. Component arrangement, piping routing, and location of valves shall match the flow diagram. The Graphic Display layout shall be approved by the Government.

3.4 INSTALLATION

Installation must conform to the manufacturer's drawings, written recommendations and directions.

3.4.1 Shop Drawing

The shop drawing must be clear and readable and preferably drawn using a computer aided drafting package. At the conclusion of the project the diagram drawings must be redrafted to include all as-built conditions. These updated drawings must be included in the O&M Manuals and appropriate section of the drawings placed in a data pocket located in each of the enclosures. The shop drawing at a minimum must show:

a. Overall dimensions, front, side and interior elevation views of the PCP showing size, location and labeling of each device.

b. Overall dimensions, front elevation of the GDP showing graphical layout and size, location and labeling of each device.

c. Power ladder diagram indicating power connections between SDP, power conditioners, PLCs, power supplies and field and panel devices. Any terminal block connection numbers used must be indicated.

d. Control ladder diagram indicating control connections between field and devices and PLC I/O modules. Terminal block connection numbers and PLC terminal numbers must be indicated.

e. Communication connections between PLCs and I/O racks. Communication channel numbers must be indicated.

f. Bill of materials.

g. Written control sequence covering all inputs, outputs, and control scheme.

3.4.2 System Start-Up and Testing

a. At PCP start-up and testing provide personnel, onsite, to provide technical assistance, program fine tuning, and to start-up and test the system. Start-up and testing must be coordinated with the overall fueling system start-up test specified in Section 33 08 55 FUEL DISTRIBUTION SYSTEM START-UP (NON-HYDRANT). Prior to this test, all connections must have been made between the PCP, Human Machine Interface (HMI) Touch Screen, and all field devices. In addition, wiring must have been checked for continuity and short circuits. Adjust set point values, timing values, and program logic as required to provide a functional hydrant fuel control system. Once the system has been fine tuned and passed the system test, the new system default values, must be loaded into the PLC EEPROM and Human Machine Interface (HMI) Touch Screen adjusted to indicate the new values.

b. A step-by-step Testing Plan of the PCP must be submitted. The test must be designed to show that every device (lights, switches, display screens, alarms) on the PCP and HMI Touchscreen TerminalHuman Machine Interface (HMI) Touch Screen is in working order and that the PLC program controls the system per specifications. The test must be performed in conjunction with Section 33 08 55 FUEL DISTRIBUTION SYSTEM START-UP (NON-HYDRANT). The plan must include a place for the Contractor and government representative to initial each step of the plan after satisfactory completion and acceptance of each step. The complete initialed Record of Test must be certified by the Contractor and then submitted.

3.4.3 Training Plan for Instructing Personnel

a. Upon completion of the system start-up a competent technician regularly employed by the PCP manufacturer must hold a training class for the instruction of Government personnel in the operation and maintenance of the system. Provide both classroom type theory instruction and hands-on instruction using operating system components provided. The period of instruction must be a minimum of three 8-hour working days. The training must be designed to accommodate 8 operators, 4 maintenance personnel, and 2 programmers. The Contracting Officer must receive written notice a minimum of 14-days prior to the date of the scheduled classes.

b. Furnish a written lesson plan and training schedule for Government approval at least 60-days prior to instructing operating, maintenance and programming personnel. Concurrently submit above to the Service Headquarters or officially designated alternate for their input into the review process. Approval of lesson plan will be based on both Government and Service Headquarters' concurrence. This plan must be tailored to suit the requirements of the Government. The training must be divided into three separate classes. Each class must be tailored to a specific group of personnel. The groups are: 1) Operators, those that will use the control system on a day-to-day basis; 2) Maintenance personnel, those that will perform routine and non-routine maintenance and trouble shooting of the control system; 3) Programmers, those that will make changes to and trouble shoot the PLC and Human Machine Interface (HMI) Touch Screen programs. The training program must provide:

(1) a detailed overview of the control system including the complete step-by-step procedures for start-up, operation and shut-down of the control system.

(2) a general overview of programmable logic controllers.

(3) the maintenance of system components installed.

(4) the programming of the PLC and Human Machine Interface (HMI) Touch Screen.

(5) troubleshooting of the system.

c. Complete approved Operation and Maintenance manuals for this specification and 26 20 00 INTERIOR DISTRIBUTION SYSTEM must be used for instructing operating personnel. Training must include both classroom and hands-on field instruction. The class must be recorded in DVD format.

d. Provide training courses in DVD format covering system overview, operation, maintenance, trouble shooting, and programming. These DVDs must be produced onsite by the Contractor using the supplied Pump Control Panel as the teaching aid, or commercially produced DVDs by the PLC manufacturer or third party who specializes in training on PLC systems. Along with the DVDs, provide workbooks, which follow along with the DVDs.

3.5 PLC CONTROL SYSTEM SEQUENCE OF OPERATION

The following describes general functions of the fueling system components.

3.5.1 Abbreviations

a. SYS: components of System including UPS, power supply, CPU, I/O, and system input and outputs.

b. CPU: SYS PLC CPU.

c. I/O: SYS PLC input/output modules.

d. PCP: Pump Control Panel.

e. HMI: Human Machine Interface.

f. UPS: Uninterruptible Power Supply.

3.5.2 Bulk Tanks

3.5.2.1 Level Control

Each bulk tank has an Automatic Tank Gauging (ATG) system. The ATG system provides fuel level, volume, temperature and water contents. From the ATG, level control can be generated based on predetermined fuel levels. The ATG must be used to generate low-low, low, high and high-high levels to the PLC system.

3.5.2.1.1 Low-Low Level

When the low-low level is activated, the associated tank's graphic display low-low level symbol must change to red in color. If the selected tank's level drops below the low-low level, the alarm annunciator's low-low level alarm sequence activates, issue pump and MOVs associated with the tank must be disabled. If all tanks are at low-low level, no issue pumps or MOVs in automatic mode must be enabled.

3.5.2.1.2 Low Level

When the low level is activated, the associated tank's graphic display low level symbol must change to red in color and the alarm annunciator's non-critical low level alarm sequence activates.

3.5.2.1.3 High Level

When the high level float is activated the associated tank's graphic display high level light must light up and the alarm annunciator's non-critical high level alarm sequence activates.

3.5.2.1.4 High-High Level

When the high-high level float is activated the associated tank's graphic display high-high level light must light up, the alarm annunciator's critical high-high level alarm sequence activates, the pump control panel must de-energize the solenoid on the tank's high level shutoff valve to force it closed.

3.5.3 Operating Tanks

3.5.3.1 Level Control (ATG)

Each operating tank has an Automatic Tank Gauging (ATG) [*Am-00003] <text deleted> [**Am-00003] system. The ATG system provides fuel level, volume, temperature and water contents. From the ATG, level control can be generated based on predetermined fuel levels. The ATG must be used to generate low-low, low, high and high-high levels to the PLC system. [*Am-00003] <text deleted> [**Am-00003]

3.5.3.1.1 Low-Low Level

When the low-low level float is activated the associated tank's graphic display low-low level symbol must change to red in color. If the selected tank's level drops below the low-low sensor the alarm annunciator's low-low level alarm sequence activates, issue pump(s) running in automatic mode must be disabled.

3.5.3.1.2 Low Level

When the low level float is activated the associated tank's graphic display low level light must light up and the alarm annunciator's non-critical low level alarm sequence activates.

3.5.3.1.3 High Level

When the high level float is activated the associated tank's graphic display high level light must light up and the alarm annunciator's non-critical high level alarm sequence activates.

3.5.3.1.4 High-High Level

When the high-high level float is activated the associated tank's graphic display high-high level light must light up, the alarm annunciator's critical high-high level alarm sequence activates.

3.5.3.2 Level Control (ILA)

Each operating tank has electronic level switches to monitor low-low, low, high, and high-high fuel levels.

3.5.3.2.1 Low-Low Level

When the low-low level elevation is attained the associated tank's GDP low-low level light must light up. If the selected tank's level drops below the low-low sensor the alarm annunciator's low-low level alarm sequence activates, issue pumps running in automatic mode must be disabled. If all tanks are at low-low level, no issue pumps in automatic mode must be enabled.

3.5.3.2.2 Low Level

When the low level elevation is attained the associated tank's GDP low level light must light up and the alarm annunciator's non-critical low level alarm sequence activates. The low level switch shall start the selected bulk tank issue pump.

3.5.3.2.3 High Level

When the high level elevation is attained the associated tank's GDP high level light must light up and the alarm annunciator's non-critical high level alarm sequence activates. The high level switch shall shut off the selected bulk tank issue pump.

3.5.3.2.4 High-High Level

When the high-high level elevation is attained, the associated tank's GDP high-high level light must light up and the alarm annunciator's critical high-high level alarm sequence activates. The High-high level switch closes the associated operating tank MOV.

3.5.4 Day Tanks

3.5.4.1 Level Control (ATG)

Each day tank has four level float switches to measure [*Am-00003] <text deleted> [**Am-00003] low, high and high-high levels.

[*Am-00003] <text deleted> [**Am-00003]

3.5.4.1.1 Low Level

When the low level float is activated the associated tank's graphic display low level light must light up and the alarm annunciator's non-critical low level alarm sequence activates.

3.5.4.1.2 High Level

When the high level float is activated the associated tank's graphic display high level light must light up and the alarm annunciator's non-critical high level alarm sequence activates.

3.5.4.1.3 High-High Level

When the high-high level float is activated the associated tank's graphic display high-high level light must light up, the alarm annunciator's critical high-high level alarm sequence activates.

3.5.4.2 Level Control [*Am-00003] <text deleted> [**Am-00003]

Each day tank has electrinic level switches to monitor [*Am-00003] <text deleted> [**Am-00003] low, high, and high-high fuel levels.

[*Am-00003] <text deleted>[**Am-00003]

3.5.4.2.1 Low Level

When the low level elevation is attained the associated tank's GDP low level light must light up and the alarm annunciator's non-critical low level alarm sequence activates. The selected operating tank lead pump shall start.

3.5.4.2.2 High Level

When the high level elevation is attained the associated tank's GDP high level light must light up and the alarm annunciator's non-critical high

level alarm sequence activates. The operating tank lead pump shall stop.

3.5.4.2.3 High-High Level

When the high-high level elevation is attained, the associated tank's GDP high-high level light must light up and the alarm annunciator's critical high-high level alarm sequence activates.

3.5.5 Fueling Pumps (FP)

The lead pump selection must select the pump starting sequence. Each pump's motor controller has a status relay to indicate the on/off status of the pump. When status relay is open the associated pump's graphic display off light must activate and screen number 2 must indicate on. When the status relay is closed the associated pump's graphic display on light must activate and screen number 2 must indicate off. The status relay state must also be used to start and stop the pumps elapsed run time timer and must be displayed on screen number 2.

3.5.6 Flow Switch, Fueling Pump

On the discharge side of each pump is a flow switch to indicate positive flow (fail safe feature). If the PLC has given a signal to start a pump and the flow switch has not closed before the set point timer expires or if the flow switch opens after the pump has been running then the pump must be in a failure state and it must be disabled (taken out of the starting sequence), the non-critical alarm sequence must also be activated, and the next pump in the start sequence started. After the PLC has stopped all of the pumps, any failed pump must be added back into the start sequence.

3.5.7 Safety Circuit

3.5.7.1 [*Am-00003] Safety Circuit By-Pass

The safety circuit must have a by-pass mode in the event of safety circuit failure. A safety circuit mode switch must be connected as indicated on the EFSO Control Diagram with a normal mode and by-pass mode. When by-pass mode is selected the emergency stop circuit relays (ER1 and ER1A) must be energized and remain energized. The EFSO BY-PASS annunciation (white non-critical) must be displayed as shown on the Pump Control Panel Elevation and remain until the mode selector switch is selected to normal mode. [**Am-00003]

3.5.7.2 Emergency Stop Status

The emergency stop circuit status relay (ER1) N.O. contact must be connected as indicated on the Terminal Block Connection drawing. When the circuit is activated the critical alarm sequence is activated and any calls to start fueling pumps must be canceled and no additional pump start signals must be sent until the circuit has been reset. The fueling pumps will actually be stopped by an emergency stop circuit status relay (ER1) N.O. contact in the fuel pump motor control circuit.

3.5.7.3 Circuit Power Status

When the safety circuit power status relay is closed the PCP emergency circuit power on light must light up.

3.5.8 Pump Control Panel

3.5.8.1 CPU Faults

The PCP mounted CPU on light is connected to SYS. The associated CPU light must light when no system faults are detected. When a fault is detected by the CPU the faulted CPU's on light must be turned off and the alarm annunciator's non-critical alarm sequence must be activated.

3.5.8.2 Mode Select

The HMI touch screen shows what mode of fueling is active: issue, or off. The screen number 2 status must indicate the active mode.

A selection on the The HMI touch screen selects what mode of fueling is active: issue, transfer or off. The screen number 2 status must indicate the active mode.

A selection on the The HMI touch screen selects what mode of fueling is active: issue, transfer, tightness Test or off. The screen number 2 status must indicate the active mode.

3.5.8.3 Lead Pump Select (Operating Tanks)

A selection on the The HMI touch screen selects which pump must be the lead pump. The selection must fix the starting sequence for all pumps. If the lead pump fails to start or fails during operation, that pump will be disabled and the lag pump in the sequence started. The screen number 2 status display must indicate the lead pump.

3.5.8.4 PCP Temperature Alarm

The alarm thermostat when activated must activate the alarm annunciator's non-critical alarm sequence.

3.6 OPERATING PROGRAM REQUIREMENTS

The control system's logic program must be stored on a EEPROM chip. Default values of operator adjustable parameters must be permanently stored on the chip with the capability of resetting the values in RAM to the values within the range specified below. The default values can be changed through the use of the personal computer (after the correct password has been entered). After loss of power and battery failure the adjustable settings must revert back to the default values located on the chip. The default values shown here must be reset to the values determined during the system start up and test.

3.7 AUTOMATIC MODE - TRANSFER CONDITION

a. The issue bulk tank pump shall start when the operating tank [*Am-00003] ATG [**Am-00003] low level switch is closed. The issue bulk tank pump shall stop when the operating tank [*Am-00003] ATG [**Am-00003] high level switch is closed. If the issue bulk tank ATG low-low level alarm is activated, the bulk tank issue pump shall not start.

b. The operating tank lead issue pump shall start when a day tank [*Am-00003] ATG [**Am-00003] low level switch is closed. The operating tank lead pump shall stop when the day tank ILA high level switch is

closed. MOVs BV06, BV10, BV14, and BV18 on the primary issue fuel line shall be commanded open. MOVs BV05, BV09, BV13, and BV17 on the secondary issue fuel line shall be commanded closed. If the day tank ATG low-low level [*Am-00003] switch [**Am-00003] is activated the associated generator shall not start.

c. Any failure of an operational tank lead pump shall automatically start the operational tank lag pump. MOVs BV05, BV09, BV13, and BV17 on the secondary issue fuel line shall be commanded open. MOVs BV06, BV10, BV14, and BV18 on the primary issue fuel line shall be commanded closed.

d. Any MOV position error such as an MOV on the primary issue fuel line fails to open, the operating tank lead pump shall automatically stop and the operating tank lag pump shall automatically start. Starting of the operating tank lag pump commands MOVs BV05, BV09, BV13, and BV17 on the secondary issue fuel line to open. MOVs BV06, BV10, BV14, and BV18 on the primary issue fuel line shall be commanded closed isolating the failure on the primary fuel line.

3.8 OFF MODE

a. Automatic starting of fueling pumps must be disabled. All other functions (graphic display, HMI touchscreen terminal, EFSO system) must be active to allow manual control of the fueling pumps using the Hand-Off-Auto or Hand-Auto switch.

b. The second, fueling pumps maybe started or stopped manually as needed by the operator.

3.9 MANUAL OPERATION OF FUELING PUMPS

a. If the PLC system is still active see paragraph OFF MODE.

b. If the PLC system has no power or the CPUs have faulted (CPU light on PCP off) the pumping system will be in a completely manual mode. Other valves may need to be opened or closed manually by the operators for the system to work properly.

-- End of Section --

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DIESEL EXHAUST FLUID SYSTEMS PIPING (SERVICE STATION)

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SECTION 33 52 10

DIESEL EXHAUST FLUID SYSTEMS PIPING (SERVICE STATION)
11/18, CHG 1: 11/20

PART 1 GENERAL

1.1 SUMMARY

This section defines the requirements for pipe, piping components, and valves as related to small diesel exhaust fluid distribution systems (non-aviation type). Provide the entire diesel exhaust fluid distribution system as a complete and fully operational system. Size, select, construct, and install system components to operate together as a complete system. Substitutions of functions specified herein will not be acceptable. Coordinate the work of the system manufacturer's service personnel during construction, testing, calibration, and acceptance of the system. Design system components and piping specified herein to handle a working pressure of 275 psig at 100 deg F. System components specified herein must be compatible with the diesel exhaust fluid to be handled. Components must be suitable for inside, sheltered location, and to function normally in ambient temperatures between 40 degrees F and 100 degrees F.

1.1.1 Related Sections

1.1.1.1 Welding

Welding activities for pipe and piping components must be in accordance with Section 33 52 23.15 POL SERVICE PIPING WELDING.

1.1.1.2 Earthwork

Excavate and backfill piping as specified in Section 31 00 00 EARTHWORK.

1.1.1.3 Cathodic Protection

Provide buried metallic components including pipe, anchors, and conduit with a cathodic protection system as specified in Section 26 42 13 GALVANIC (SACRIFICIAL) ANODE CATHODIC PROTECTION (GACP) SYSTEM. Cathodic protection for metal components that attach to a tank must be coordinated and compatible with the tank corrosion control system.

1.1.1.4 Concrete Manholes

Construct manhole of concrete in accordance with Section 03 30 00 CAST-IN-PLACE CONCRETE.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN PETROLEUM INSTITUTE (API)

API RP 540 (1999; R 2004) Electrical Installations in

	Petroleum Processing Plants
API RP 1110	(2013; R 2018) Recommended Practice for the Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids, or Carbon Dioxide
API RP 2003	(2015; 8th Ed) Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents
API STD 600	(2015) Steel Gate Valves-Flanged and Butt-welding Ends, Bolted Bonnets
API STD 608	(2012) Metal Ball Valves - Flanged, Threaded, And Welding End
API Spec 5L	(2018; 46th Ed; ERTA 2018) Line Pipe
API Spec 6D	(June 2018, 4th Ed; Errata 1 July 2018; Errata 2 August 2018) Specification for Pipeline and Piping Valves
API Spec 17J	(2016; Errata 2 2017; ADD 1 2017) Specification for Unbonded Flexible Pipe
API Std 607	(2016) Fire Test for Quarter-turn Valves and Valves Equipped with Non-metallic Seats

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B16.5	(2020) Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard
ASME B16.9	(2018) Factory-Made Wrought Buttwelding Fittings
ASME B16.11	(2022) Forged Fittings, Socket-Welding and Threaded
ASME B31.3	(2022; Errata 2023) Process Piping
ASME B40.200	(2008; R 2013) Thermometers, Direct Reading and Remote Reading
ASME BPVC SEC VIII D1	(2019) BPVC Section VIII-Rules for Construction of Pressure Vessels Division 1

AMERICAN WELDING SOCIETY (AWS)

AWS BRH	(2007; 5th Ed) Brazing Handbook

ASTM INTERNATIONAL (ASTM)

ASTM A36/A36M	(2019) Standard Specification for Carbon Structural Steel
ASTM A53/A53M	(2022) Standard Specification for Pipe,

	Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A182/A182M	(2023) Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service
ASTM A193/A193M	(2023) Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service and Other Special Purpose Applications
ASTM A194/A194M	(2023) Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both
ASTM A269/A269M	(2022) Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service
ASTM A307	(2021) Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
ASTM A312/A312M	(2022a) Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
ASTM A358/A358M	(2019) Standard Specification for Electric-Fusion-Welded Austenitic Chromium-Nickel Stainless Steel Pipe for High-Temperature Service and General Applications
ASTM A403/A403M	(2022b) Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings
ASTM A563	(2021; E 2022a) Standard Specification for Carbon and Alloy Steel Nuts
ASTM A733	(2016; R 2022) Standard Specification for Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples
ASTM B687	(1999; R 2023) Standard Specification for Brass, Copper, and Chromium-Plated Pipe Nipples
ASTM D3308	(2012; R 2017) Standard Specification for PTFE Resin Skived Tape
ASTM F844	(2019) Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 142	(2007; Errata 2014) Recommended Practice for Grounding of Industrial and Commercial Power Systems - IEEE Green Book
IEEE 1100	(2005) Emerald Book IEEE Recommended Practice for Powering and Grounding Electronic Equipment

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-58	(2018) Pipe Hangers and Supports - Materials, Design and Manufacture, Selection, Application, and Installation

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 30	(2024) Flammable and Combustible Liquids Code
NFPA 30A	(2024; ERTA 1 2023) Code for Motor Fuel Dispensing Facilities and Repair Garages
NFPA 70	(2023; ERTA 7 2023; TIA 23-15) National Electrical Code
NFPA 77	(2024) Recommended Practice on Static Electricity
NFPA 110	(2022) Standard for Emergency and Standby Power Systems
NFPA 407	(2022; TIA 21-1) Standard for Aircraft Fuel Servicing
NFPA 780	(2023) Standard for the Installation of Lightning Protection Systems

SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC PA 1	(2016) Shop, Field, and Maintenance Coating of Metals

SOCIETY OF AUTOMOTIVE ENGINEERS INTERNATIONAL (SAE)

SAE J514	(2012) Hydraulic Tube Fittings

U.S. DEPARTMENT OF DEFENSE (DOD)

MIL-PRF-13789	(1999; Rev E; Notice 1 2008; Notice 2 1016; Notice 3 2021) Strainers, Sediment: Pipeline, Basket Type

1.3 SUBMITTALS

Include in submittals the information required by the "CFCI Equipment Electrical Data" submittal in Section 26 20 00 INTERIOR DISTRIBUTION

SYSTEM and as described in Section 01 33 00 Subpart "Contractor-Furnished Items Requiring Electrical Interface".

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Grounding and Bonding

Pipe Supports

SD-03 Product Data

Stainless Steel Pipe; G, RO

[*Am-0003]High Density Polyethylene (HDPE) Pipe; G, RO[**Am-0003]

Steel Reinforced Flexible Pipe; G, RO

Joint Compound; G, RO

Strainer; G, DO

Thermometers; G, DO

Pressure Gauge; G, DO

Ball Valves; G, DO

Swing Type Check Valves; G, RO

Tank Overfill Prevention Valve (Pumped Fuel Receipt); G, DO

Diaphragm Pump; G, DO

Pump Control Panel; G, DO

SD-06 Test Reports

Preliminary Pneumatic Test

Final Pneumatic Test

Hydrostatic Test

Exterior Containment Piping Tests

SD-07 Certificates

Contractor Qualifications; G, RO

Licensed Personnel

Pipeline Inventory; G, RO

Demonstrations

SD-08 Manufacturer's Instructions

SD-10 Operation and Maintenance Data

Strainer; G, RO

Thermometers; G, RO

Ball Valves; G, RO

Swing Type Check Valves; G, RO

Tank Overfill Prevention Valve (Pumped Fuel Receipt); G, RO

Diaphragm Pump; G, RO

Pump Control Panel; G, RO

1.3.1 Submittal Coordination and Sequencing Requirements

See references to this Specifications Section and/or specific submittal items in Section 01 33 00, as well as requirements herein and as referenced in other parts of this contract, for coordination and sequencing of submittals and the associated work to be performed.

1.4 QUALITY ASSURANCE

1.4.1 Contractor Qualifications

Each installation Contractor must have successfully completed at least 3 projects of the same scope and the same size, or larger, within the last 6-years; demonstrate specific installation experience in regard to the specific system installation to be performed; have taken, if applicable, manufacturer's training courses on the installation of piping; and meet the licensing requirements in the state. Experience must include the erection of piping systems in compliance with the requirements of ASME B31.3, NFPA 30, NFPA 30A, NFPA 110NFPA 110, and NPFPA 400. Submit a letter listing prior projects, the date of construction, a point of contact for each prior project, the scope of work of each prior project, and a detailed list of work performed providing in the letter evidence of prior manufacturer's training and state licensing.

1.4.2 Regulatory Requirements

1.4.2.1 Licensed Personnel

Pipe installers must be licensed/certified when the state, city or locality requires licensed installers.

1.4.3 Design Data

1.4.3.1 Pipeline Inventory

Diesel exhaust fluid system volume must be calculated using as constructed pipe lengths, internal diameters, fittings, and components. Totals must be provided for all items containing diesel exhaust fluid with the exception of tanks which is covered by other specifications. A certified pipeline inventory with sizes, lengths, quantity, and volumes must be

provided for the systems in this project.

1.5 DELIVERY, STORAGE, AND HANDLING

Handle, store, and protect system components and materials to prevent damage before and during installation in accordance with the manufacturer's recommendations, and as approved by the Contracting Officer. Replace damaged or defective items.

1.6 PROJECT/SITE CONDITIONS

Diesel exhaust fluid required for the testing, flushing and cleaning efforts, as specified in this section, will be provided and delivered by the Contracting Officer. Diesel exhaust fluid used in the system will remain the property of the Government. Diesel exhaust fluid shortages not attributable to normal handling losses must be reimbursed to the Government.

PART 2 PRODUCTS

2.1 ELECTRICAL WORK

2.1.1 General

Motors, manual or automatic motor control system components except where installed in motor control centers, and protective or signal devices required for the operation specified herein must be provided under this section in accordance with Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM. Any wiring required for the operation specified herein, but not shown on the electrical plans, must be provided under this section in accordance with Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM, Section 33 71 02 UNDERGROUND ELECTRICAL DISTRIBUTION.

2.1.2 Grounding and Bonding

Ground and bond in accordance with NFPA 70, NFPA 77, NFPA 407, NFPA 780, API RP 540, API RP 2003, IEEE 142, and IEEE 1100. Provide jumpers to overcome the insulating effects of gaskets, paints, or nonmetallic components.

2.2 MATERIALS AND SYSTEM COMPONENTS

Internal parts and components of system components, piping, piping components, and valves that could be exposed to diesel exhaust fluid during system operation must [*Am-0003]<text deleted>[**Am-0003] be constructed of stainless-steel metal or high-density polyethylene. Do not install cast iron bodied valves in piping systems that could be exposed to diesel exhaust fluid during system operation.

2.2.1 Standard Products

Provide materials and system components that are standard products of a manufacturer regularly engaged in the manufacturing of such products; that are of a similar material, design and workmanship; and that have been in satisfactory commercial or industrial use for a minimum 2-years prior to bid opening. The 2-year period must include applications of the system components and materials under similar circumstances and of similar size. Materials and system components must have been for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures

during the 2-year period.

2.2.2 Nameplates

Attach nameplates to all specified system components, thermometers, gauges, and valves defined herein. List on each nameplate the manufacturer's name, address, contract number,acceptance date, component type or style, model or serial number, catalog number, capacity or size, and the system that is controlled. Construct plates of stainless steel. Install nameplates in prominent locations with nonferrous screws, nonferrous bolts, or permanent adhesive. Minimum size of nameplates must be 1 by 2.5 inches. Lettering must be the normal block style with a minimum 0.25 inch height. Accurately align all lettering on nameplates. Key the nameplates to a chart and schedule for each system. Frame charts and schedule under glass, and locate where directed near each system. Furnish two copies of each chart and schedule. Each nameplate description must identify its function.

2.3 Threaded END CONNECTIONS

2.3.1 Threads

Provide threaded end connections on system components, fittings, piping, piping components, adapters, couplers,and valves that conform to ASME B16.11, Class 2000.

2.3.1.1 Stainless Steel

Stainless steel threads must conform to ASTM A182/A182M, Grade F304, forged type.

2.4 PIPE

Pipe must meet the material, fabrication and operating requirements of ASME B31.3, except as modified herein.

2.4.1 Stainless Steel Pipe

[*Am-0003]For all DEF tank supply lines, [**Am-0003]Provide stainless steel pipe that complies with one of the following:

a. Pipe must conform to ASTM A312/A312M, Type TP304L, seamless only. Pipe smaller than 8 inches must be Schedule 40S. Pipe 8 inches or larger must be Schedule 10S.

b. Pipe must conform to ASTM A358/A358M, Grade 304L, Class 1 or 3, longitudinally welded. Radiographically inspect 100 percent of factory longitudinal welds in accordance with ASME BPVC SEC VIII D1. Minimum pipe wall thickness must be 0.25 inch for pipe 12 inches and smaller; 0.312 inch for pipe larger than 12 inches.

2.4.1.1 Fittings 2-1/2-inch and Larger

Provide buttwelded type fittings that complies with one of the following:

a. Stainless steel conforming to ASTM A403/A403M, Class WP-S, Grade WP 304L, seamless only and ASME B16.9 of the same thickness as the adjoining pipe.

b. Stainless steel conforming to ASTM A403/A403M, Class WP-XX, Grade WP 304L, of wall thickness as indicated. Do not fabricate starting material by the fusion welding process without addition of filler metal. Forming will not be allowed using fusion welding process without addition of filler metal. Radiographically inspect all factory longitudinal welds in accordance with ASME BPVC SEC VIII D1.

2.4.1.2 Fittings 2-inch and Smaller

[*Am-0003]Threaded [**Am-0003] type fittings, unless indicated otherwise, must conform to ASME B16.11. Fitting materials must be stainless steel that conforms to ASTM A182/A182M, Type F304L.

2.4.1.3 Control Tubing

Piping must be seamless, fully annealed stainless steel tubing conforming to ASTM A269/A269M, Grade TP316, with a hardness number not exceeding 80 HRB. For 1/2-inch tubing, provide a minimum 0.049 inch tubing wall thickness.

2.4.1.4 Control Tubing Fittings

Fittings must be the flareless, Type 316 stainless steel type conforming to SAE J514.

2.4.2 [*Am-0003]High Density Polyethylene (HDPE) Pipe[**Am-0003]

[*Am-0003]For all DEF tank vent lines, provide High Density Polyethylene (HDPE) pipe that complies with ASTM F714. HDPE fittings must conform to ASTM D3261.[**Am-0003]

2.4.3 Steel Reinforced Flexible Pipe

Steel Reinforced High Density Polyethylene (HDPE) flexible piping must be manufactured in accordance with API Spec 17J and consist of an inner layer of HDPE material, a steel reinforcing layer and an outer HDPE protective layer.

2.4.3.1 Steel Reinforced Flexible Pipe Fittings

End connections and mid-line connections for steel reinforced high density polyethylene (HDPE) flexible pipe must be of stainless steel swaged onto the pipe ends.

End connections must terminate in flanged end or weld ends as indicated. Mid-line connections must terminate in flanged fittings if they are in a pit or double swage type if they are not.

2.5 PIPING COMPONENTS

Provide piping components that meet the material, fabrication and operating requirements of ASME B31.3, except as modified herein. Pressure design class for piping components must be Class 150 as defined in ASME B16.5.

2.5.1 Welded Nipples

Nipples must conform to ASTM A733 or ASTM B687 and be constructed of the same material as the connecting pipe.

2.5.2 Steel Couplings

Couplings must conform to API Spec 5L, seamless, extra heavy, wrought steel with recessed ends.

2.5.3 Threaded Unions

Unions must conform to ASME B16.11, Class 2000. Unions materials must conform to ASTM A312/A312M, Grade 304 or 316. Dielectric unions must conform to dimensional, strength, and pressure requirements of ASME B16.11, Class 2000.

2.5.4 Joint Compound

Joint compounds must be resistant to water, urea, and be suitable for use with Diesel Exhaust Fluid (DEF) without causing contamination or degradation of the fluid.

2.5.5 Strainer

Strainer must be single, basket type, arranged in a simplex configuration as indicated in compliance with MIL-PRF-13789, except as specified otherwise. Strainer end connections must be designed in accordance with ASME B16.5. Strainer body material must be the same as the material specified for manual valves. Strainers must have removable baskets of 100 mesh wire screen with larger wire mesh reinforcement; wire must be stainless steel, Type 316. Pressure drop for clean strainer must not exceed 3 psig at maximum design flow rate. The ratio of net effective strainer area to the area of the connecting pipe must be not less than three to one. Each strainer must be provided with a suitable drain at the bottom, equipped with a ball valve. The strainer must be equipped with a direct-reading, piston type differential pressure gauge that measures the differential pressure across the basket as per Section 33 57 55 FUEL SYSTEM COMPONENTS (NON-HYDRANT).

2.5.6 Thermometers

Analog, dial-type bimetallic actuated type that conforms to ASME B40.200. Thermometer must have a 5 inch diameter dial, a hermetically sealed stainless steel case, a stainless steel stem, a safety glass face, a fixed threaded connection, and a scale range as indicated. Thermometer accuracy must be within one percent of the scale range.

2.5.7 Pressure Gauge

See Section 33 57 55 FUEL SYSTEM COMPONENTS (NON-HYDRANT).

2.5.8 Pipe Supports

Supports must be the adjustable type conforming to MSS SP-58, except as modified herein. Provide hot-dipped galvanized finish on rods, nuts, bolts, washers, hangers, and supports. Provide miscellaneous metal that conforms to ASTM A36/A36M, standard mill finished structural steel shapes, hot-dipped galvanized.

2.5.8.1 Pipe Protection Shields

Shields must conform to MSS SP-58, Type 40, except material must be Type

316 stainless steel. Provide shields at each slide type pipe hanger and support.

2.5.8.2 Low Friction Supports

Supports must have self-lubricating anti-friction bearing elements composed of 100 percent virgin tetrafluoroethylene polymer and reinforcing aggregates, prebonded to appropriate backing steel members. The coefficient of static friction between bearing elements must be 0.06 from initial installation for both vertical and horizontal loads and deformation must not exceed 0.002 inch under allowable static loads. Bonds between material and steel must be heat cured, high temperature epoxy. Design pipe hangers and support elements for the loads applied. Provide anti-friction material with a minimum of 0.09 inch thick. Provide hot-dipped galvanized steel supports. Provide supports that are factory designed and manufactured.

2.6 MANUAL VALVES

All portions of a valve coming in contact with Diesel Exhaust Fluid (DEF) must be of noncorrosive material. Valves in stainless steel pipe lines must be Type 304 or Type 316. Stem and trim must be stainless steel for all valves. Manually operated valves 6 inches and larger must be worm-gear operated and valves smaller than 6 inches must be lever operated or handwheel operated. Valves smaller than 2 inches must have lever-type handles. Handles installed more than 6 feet above finished floor must have chain operators. Valve indicators installed higher than 5 feet must have a position indicator visible from ground level.

2.6.1 Ball Valves

Ball valves must be fire tested and qualified in accordance with the requirements of API Std 607 and API STD 608. Seal material for the fire test must be graphite, seal material for the project must be as indicated below. Ball valves must be nonlubricated valves that operate from fully open to fully closed with 90 degree rotation of the ball. Valves 2 inches and larger must conform to applicable construction and dimension requirements of API Spec 6D, ANSI Class 150 and must [*Am-0003]be threaded type[**Am-0003]. Valves smaller than 2 inches must be ANSI class 150 [*Am-0003]threaded type [**Am-0003]valves[*Am-0003]<text deleted>[**Am-0003], unless noted otherwise. The balls in valves 10 inches and larger full port and 12 inch and larger regular port and larger must have trunnion type support bearings. Except as otherwise specified or indicated, reduced port or full port valves may be provided at the Contractor's option. Balls must be solid, not hollow cavity.

2.6.1.1 Materials

Ball must be stainless steel. Ball valves must have polytetrafluoroethylene (PTFM) or fluoroelastomer (FKM), commonly referred to as Viton seats, body seals and stem seals.

2.6.1.2 Electric Valve Actuator

Electric valve actuator must be as indicated for electric valve actuator.

2.6.2 Swing Type Check Valves

Swing check valves must conform to API STD 600, regular type, ANSI Class

150 with [*Am-0003]threaded type[**Am-0003] connections. Discs and seating rings must be renewable without removing the valve from the line. The disc must be guided and controlled to contact the entire seating surface.

2.6.3 Tank Overfill Prevention Valve (Pumped Fuel Receipt)

Valve must be the two-stage, float-activated, shutoff type that is an integral part of the drop tube used for pressurized fill systems. The valve must completely stop the flow of fuel into the tank, when the liquid level rises above 96.5 percent of tank capacity. Valve must be constructed of the same material as the fill tube.

2.7 PUMPS

2.7.1 Diaphragm Pump

Pumps used for Diesel Exhaust Fluid (DEF) must be driven by a motor suitable for use in environments where DEF is handled, ensuring compliance with relevant safety standards. Pump assemblies must be statically and dynamically balanced for all flow rates from no flow to 120 percent of design flow. Additionally, pump motors must be non-overloading throughout their entire pump curve.

2.7.2 Pump Control Panel

Panel must include on and off indication lights for each pump. Panel must contain an adjustable control logic for pump operation in accordance with the indicated operation. Panel must also have a manual override switch for each pump to allow for the activation or deactivation of each pump. See Section 33 09 52 FUEL PUMP CONTROL AND ANNUNCIATION SYSTEM (NON-HYDRANT).

2.8 ACCESSORIES

2.8.1 Concrete Anchor Bolts

Concrete anchors must conform to ASTM A307, Grade C, hot-dipped galvanized.

2.8.2 Bolts and Studs

Carbon steel bolts and studs must conform to ASTM A307, Grade B, hot-dipped galvanized. Stainless steel bolts and studs must conform to ASTM A193/A193M, Class 2, Grade 8.

2.8.3 Nuts

Carbon steel nuts must conform to ASTM A563, Grade A, hex style, hot-dipped galvanized. Stainless steel nuts must conform to ASTM A194/A194M, Grade 8.

2.8.4 Washers

Provide flat circular washers under each bolt head and each nut. Washer materials must be the same as the connecting bolt and nut. Carbon steel washers must conform to ASTM F844, hot-dipped galvanized. Stainless steel washers must conform to ASTM A194/A194M, Grade 8.

2.8.5 Polytetrafluoroethylene (PTFE) Tape

Tape must conform to ASTM D3308.

2.8.6 Pipe Sleeves

Provided sleeves constructed of hot-dipped galvanized steel, ductile iron, or cast-iron pipe, conforming to ASTM A53/A53M, Standard weight.

2.9 FINISHES

Ship, store, and handle coating materials as well as apply and cure coatings in accordance with SSPC PA 1.

PART 3 EXECUTION

3.1 INSTALLATION

Installation, workmanship, fabrication, assembly, erection, examination, inspection, and testing must be in accordance with ASME B31.3 ,NFPA 30, NFPA110, and NPFPA 400, except as modified herein. Safety rules as specified in NFPA 30, NFPA 110, and NFPA 400 must be strictly observed. Never direct bury threaded connections, socket welded connections, unions, flanges, valves, air vents, or drains. Install all work so that parts requiring periodic inspection, operation, maintenance, and repair are readily accessible.

3.1.1 Pumps

Properly level, align, and secure pumps in place in accordance with manufacturer's instructions. Support, anchor, and guide so that no strains are imposed on a pump by weight or thermal movement of piping. Provide floor-mounted pumps with mechanical vibration isolators or a vibration isolation foundation.

3.1.2 Piping

3.1.2.1 General

Thoroughly clean pipe of all scale and foreign matter before the piping is assembled. Cut pipe accurately to measurements established at the jobsite, and worked into place without springing or forcing. Cut pipe square and have burrs removed by reaming. Install pipe to permit free expansion and contraction without causing damage to the building structure, pipe, joints, or hangers. Cutting or other weakening of the building structure to facilitate piping installation will not be permitted without written approval.

a. Use reducing fittings for changes in pipe sizes. Install system components and piping into space allotted and allow adequate acceptable clearances for installation, replacement, entry, servicing, and maintenance. Provide electric isolation fittings between dissimilar metals. Install piping straight and true to bear evenly on supports. Piping must be free of traps, must not be embedded in concrete pavement, and must drain as indicated. Make changes in direction with fittings, except that bending of pipe 4 inches and smaller will be permitted, provided a pipe bender is used and wide sweep bends are formed. Mitering or notching pipe or other similar construction to form elbows or tees will not be permitted.

b. The centerline radius of bends must not be less than 6 diameters of the pipe. Bent pipe showing kinks, wrinkles, flattening, or other malformations will not be accepted. When work is not in progress, securely close open ends of pipe and fittings with an expandable pipe plug so that water, earth, or other substances cannot enter the pipe or fittings. For belowground piping, the full length of each pipe must rest solidly on the underlying pipe bed.

3.1.2.2 Double-Wall Flexible Non-Metallic Piping

Install double-wall flexible non-metallic piping in accordance with manufacturer's instructions.

3.1.2.3 Stainless-steel Reinforced Flexible Pipe

Connections between stainless-steel pipe and stainless-steel reinforced flexible pipe and between separate lengths of stainless-steel reinforced flexible pipe must not be made aboveground but must be made either inside a pit or vault, or direct bury them. Where practicable, end-line and mid-line connections must be located inside pit type enclosures of an appropriate size. Where it is not practicable to locate mid-line connections inside pit type enclosures, mid-line connections may be wrapped with a suitable waterproof protective substance and direct buried underground. The location of direct buried mid-line connections must be indicated on the final drawings and provided with a pipeline marker.

3.1.2.4 Threaded End Connections

Provide threaded end connections only on piping 2 inches in nominal size or smaller and only where indicated on the drawings. Provide threaded connections with PTFE tape or equivalent thread-joint compound applied to the male threads only. Not more than three threads must show after the joint is tighten.

3.1.2.5 Brazed Connections

Provide brazing in accordance with AWS BRH, except as modified herein. During brazing, fill pipe and fittings with a pressure regulated inert gas, such as nitrogen, to prevent the formation of scale. Before brazing copper joints, clean both the outside of the tube and the inside of the fitting with a wire fitting brush until the entire joint surface is bright and clean. Do not use brazing flux. Remove surplus brazing material at all joints. Support piping prior to brazing and do not be spring or force piping.

3.1.3 Bolted Connections

For each bolted connection of stainless steel components (e.g., pipes, piping components, valves, and system components) use stainless steel bolts or studs, nuts, and washers. For each bolted connection of carbon steel components, use carbon steel bolts or studs, nuts, and washers. Bolts to project no more than three full threads and no less than two full threads beyond the nuts with the bolts tightened to the required torque. Prior to installing nuts, apply a compatible anti-seize compound to the male threads.

3.1.4 Flanges and Unions

Except where threaded end connections or unions are indicated, provide flanged joints in each line immediately preceding the connection to a system component or material requiring maintenance such as pumps, general valves, control valves, strainers, and other similar items and as indicated. Assemble flanged joints square and tight with matched flanges, gaskets, and bolts. For flanges, provide washers under each bolt head and nut. Torque wrenches must be used to tighten all flange bolts to the torque recommended by the gasket manufacturer. Tightening pattern must be as recommended by the gasket manufacturer. Use anti-seize compound on threads for stainless steel bolts.

3.1.5 Valves

Install isolation plug or ball valves on each side of each system component, at the midpoint of looped mains, and at any other points indicated or required for draining, isolating, or sectionalizing purpose. Install valves with stems vertically up unless otherwise indicated. Provide individual supports and anchors for each valve.

3.1.6 Pipe Sleeves

Provide a pipe sleeve around any pipe that penetrates a wall, floor, or crosses under a roadway. Do not install sleeves in structural members except where indicated or approved. Install pipe sleeves in masonry structures at the time of the masonry construction. Sleeves must be of such size as to provide a minimum of 1/2 inch all-around clearance between bare pipe and the sleeve. Align sleeve and piping such that the pipe is accurately centered within the sleeve by a nonconductive centering element. Securely anchor the sleeve to prevent dislocation. Closure of the space between the pipe and the pipe sleeve must be by means of a mechanically adjustable segmented elastomeric seal. The seal must be installed so as to be flush. For wall or floor penetrations, extend each sleeve through its respective wall or floor and cut flush with each surface. For roadway crossings, pipe sleeves must be continuous for the entire crossing as well as extend a minimum of 6 inches beyond both sides of the crossing. Seal around sleeves that penetrate through valve or fuel related pits with a Buna-N casing seal. Seal around sleeves that penetrate through non-fire-rated walls and floors in accordance with Section 07 92 00 JOINT SEALANTS. Seal around sleeves that penetrate through fire-rated walls and floors as specified in Section 07 84 00 FIRESTOPPING.

3.1.7 Framed Instructions

Framed instructions must include system components layout, wiring and control diagrams, piping, valves, control sequences, and typed condensed operation instructions. The condensed operation instructions must include preventative maintenance procedures, methods of checking the system for normal and safe operation, and procedures for safely starting and stopping the system. Frame under glass or laminated plastic the framed instructions and post where directed by the Contracting Officer. Post the framed instructions before the system performance tests.

3.2 PIPE SUPPORTS

Install supports with a maximum spacing as defined in Table 1 below, except where indicated otherwise. In addition to meeting the requirements

of Table 1, provide additional supports where concentrated piping loads exist (e.g., valves).

Table 1. Maximum Support Spacing

Nominal Pipe Size (Inches)	One and Under	1.5	2	3	4	6	8	10	12
Maximum Support Spacing (ft)	7	9	10	12	14	17	19	22	23

3.2.1 Seismic Requirements

Support and brace piping and attach valves to resist seismic loads as specified under Section 13 48 73 SEISMIC CONTROL FOR MISCELLANEOUS EQUIPMENT as shown on the drawings. Structural steel required for reinforcement to properly support piping, headers, and system components but not shown must be provided under this section. Material used for support must be as specified under Section 05 12 00 STRUCTURAL STEEL.

3.2.2 Structural Attachments

Provide attachments to building structure concrete and masonry by cast-in concrete inserts, built-in anchors, or masonry anchor devices. Apply inserts and anchors with a safety factor not less than 5. Do not attach supports to metal decking. Construct masonry anchors for overhead applications of ferrous materials only. Structural steel brackets required to support piping, headers, and system components, but not shown, must be provided under this section. Material used for support must be as specified under Section 05 12 00 STRUCTURAL STEEL.

3.3 FIELD QUALITY CONTROLS

3.3.1 System Commissioning

System commissioning must conform to Section 33 08 55 FUEL DISTRIBUTION SYSTEM START-UP (NON-HYDRANT).

3.3.2 Tests

Furnish labor, materials, equipment, electricity, repairs, and retesting necessary for any of the tests required herein. Perform piping test in accordance with the applicable requirements of ASME B31.3 except as modified herein. To facilitate the tests, various sections of the piping system may be isolated and tested separately. Where piping sections terminate at flanged valve points, close the line by means of blind flanges in lieu of relying on the valve. Provide tapped flanges to allow a direct connection between the piping and the air compressor or pressurizing pump. Use tapped flanges for gauge connections. Taps in the permanent line will not be permitted. Gauges will be subject to testing

and approval. Provide provisions to prevent displacement of the piping during testing. Keep personnel clear of the piping during pneumatic testing. Only authorized personnel must be permitted in the area during pneumatic and hydrostatic testing. Isolate system components such as pumps, tanks and meters from the piping system during the testing. Do not exceed the pressure rating of any component in the piping system during the testing. Following satisfactory completion of each test, relieve the test pressure and seal the pipe immediately. Piping to be installed underground must not receive field applied exterior coatings at the joints or be covered by backfill until the piping has passed the final pneumatic tests described herein.

3.3.2.1 Preliminary Pneumatic Test

Apply a 25 psig pneumatic test to product piping. Maintain the pressure while soapsuds or equivalent materials are applied to the exterior of the piping. While applying the soapsuds, visually inspect the entire run of piping, including the bottom surfaces, for leaks (bubble formations). If leaks are discovered, repair the leaks accordingly and retest.

3.3.2.2 Final Pneumatic Test

Following the preliminary pneumatic test, apply a 50 psig pneumatic test to all product piping and hold for a period not less than 2-hours. During the test period, there must be no drop in pressure in the pipe greater than that allowed for thermal expansion and contraction. Disconnect the pressure source during the final test period. If leaks are discovered, repair the leaks accordingly and retest.

3.3.2.3 Hydrostatic Test

Testing must comply with the requirements in ASME B31.3, except as modified herein. Hydrostatically test product piping with the fuel to be handled to the lesser of 1-1/2 times operating pressure or 275 psig in accordance with API RP 1110. Maintain the pressure within the piping for 4-hours with no leakage or reduction in gauge pressure. If leaks are discovered, repair the leaks accordingly and retest.

3.3.2.4 Exterior Containment Piping Tests

Apply a minimum pneumatic pressure of 5 psig to the exterior containment piping. Maintain the pressure for at least 1-hour while soapsuds or equivalent materials are applied to the exterior of the piping. While applying the soapsuds, visually inspect the entire run of piping, including the bottom surfaces, for leaks (bubble formations). Repair leaks discovered in accordance with manufacturer's instructions and retest. Perform testing in compliance with the manufacturer's published installation instructions.

3.4 SYSTEM PERFORMANCE TESTS

Conform tests to Section 33 08 55 FUEL DISTRIBUTION SYSTEM START-UP (NON-HYDRANT).

3.5 DEMONSTRATIONS

Conduct a training session for designated Government personnel in the operation and maintenance procedures related to the system components and specified herein. Include pertinent safety operational procedures in the

session as well as physical demonstrations of the routine maintenance operations. Furnish instructors who are familiar with the installation/system components/systems, both operational and practical theories, and associated routine maintenance procedures. The training session must consist of a total of 3 hours of normal working time and must start after the system is functionally completed, but prior to final system acceptance. Submit a letter, at least 14 working days prior to the proposed training date, scheduling a proposed date for conducting the onsite training.

-- End of Section --

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[*Am-00003] DOUBLE-WALL [**Am-00003]COALESCING OIL-WATER SEPARATORS

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[*Am-00003] DOUBLE-WALL [**Am-00003]COALESCING OIL-WATER SEPARATORS
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

[*Am-00003]AMERICAN PETROLEUM INSTITUTE (API)

API 421	Monographs on Refinery Environmental Control - Management of Water Discharges; Design and Operation of Oil/Water Separators.[**Am-00003]

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B16.5	(2020) Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA 10084	(2017) Standard Methods for the Examination of Water and Wastewater

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2020; Errata 1 2021) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A36/A36M	(2019) Standard Specification for Carbon Structural Steel
ASTM C990	(2009; R 2019) Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
ASTM E165/E165M	(2023) Standard Practice for Liquid Penetrant Examination for General Industry

SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC SP 10/NACE No. 2	(2015) Near-White Blast Cleaning

U.S. AIR FORCE (USAF)

DAFMAN 32-1067	(2024) Water and Fuel Systems

U.S. DEPARTMENT OF DEFENSE (DOD)

MIL-DTL-24441 (2009; Rev D; Notice 1 2021) Paint, Epoxy-Polyamide, General Specification for

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 600/4-79/020 (1983) Methods for Chemical Analysis of Water and Wastes

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NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 30 Flammable and Combustible Liquids Code

UL SOLUTIONS (UL)

UL 58 (2018) UL Standard for Safety Steel Underground Tanks for Flammable and Combustible Liquids [**Am-00003]

1.2 SYSTEM DESCRIPTION

1.2.1 Applications

The separator shall remove free oil and suspended solids from oil-in-water mixtures of freshwater originating from generator maintenance operations. The influent oil-in-water mixture will flow by gravity to the unit which will not be located in an area with a corrosive atmosphere.

1.2.2 Influent Characteristics

Provide oil-water separator designed for a maximum flow of 27 gallons per minute. Operating temperatures of the influent oil-in-water mixture will range from 40 to 100 degrees F and ambient air temperatures will range from 40 to 100 degrees F. The specific gravity of the oil at operating oil-water temperatures will range from 0.82 to 0.88. The specific gravity of the freshwater at operating temperatures will be approximately 1.0.

1.2.3 Performance Requirements

The petroleum hydrocarbon concentration in the effluent from the oil-water separator shall not exceed the following limitations:

Contaminants	Maximum
Petroleum hydrocarbon, 30-day average	5 mg/L
Petroleum hydrocarbon, daily maximum	10 mg/L

To achieve this goal , it will be necessary to remove all free oil droplets equal to or greater than 20 microns.
[**Am-00003]

1.2.4 Design Criteria

The Oil/Water Separator (OWS) design must meet specific industry standards and construction mandates:

Performance Criteria
Governing Standards: Design shall be in strict accordance with Stokes Law and API 421.

Plate Design: The manufacturer must determine the required total effective surface area for both the parallel-corrugated plate coalescer and the polypropylene impingement coalescer, based on the specified flow, temperature, and oil gravity conditions.

Construction Criteria
Regulatory Compliance: The separator must comply with NFPA 30 Flammable and Combustible Liquids Code.

Physical Construction: The tank capacities, dimensions, and construction must adhere to UL 58 Standard for Safety.

Double-Wall Mandate:

It must use UL Type I Double-Wall construction, featuring 360-degree steel secondary containment where the inner steel tank is completely contained within the outer steel tank, enclosing 100% of the volume.

The space between the walls must be monitored by an approved electronic leak detection device.

See Section 33 56 10 FACTORY-FABRICATED FUEL STORAGE TANKS for additional requirements.

Prohibited Construction: Construction using a thin-walled primary tank with an external fiberglass jacket is not permitted.[**Am-00003]

1.3 SUBMITTALS

Government approval is required for submittals with a "G" classification. Submittals not having a "G" classification are for Contractor Quality Control approval. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Separator; G, DO

Submit shop drawings for separator including principal dimensions, location of fittings and unit foundation. Include data to verify center of gravity with the unit empty and filled with water.

SD-05 Design Data

Separator; G, DO

Submit analysis, signed by a registered professional engineer, which indicates that at the calculated overflow rate, the separator will be provided with the required square feet of projected plate separation area to achieve the specified performance under laminar flow (i.e. Reynolds number of less than

500) conditions. Calculations shall take into account the rate of flow, potential surge flow, influent concentrations, particle characteristics, fluid temperature, fluid specific gravities, and pH.

SD-06 Test Reports

Shop hydrostatic test; G, RO

Submit results of hydrostatic and dynamic testing.

Inspection

Field hydrostatic test

Preoperational test

In-service test

SD-07 Certificates

Separator corrosion protection; G, DO

Submit written verification on the fabricator's letterhead that surface preparation and coating application were performed in accordance with the manufacturer's printed recommendations for the coating system.

SD-08 Manufacturer's Instructions

Separator system; G, RO

SD-10 Operation and Maintenance Data

Separator system, Data Package 3; G, RO

Submit in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery and Storage

Inspect materials delivered to site for damage; unload and store with minimum handling. Store materials on-site in enclosures or under protective coverings. Protect materials not suitable for outdoor storage to prevent damage during periods of inclement weather, such as subfreezing temperatures, precipitation, and high winds. Store materials susceptible to deterioration by direct sunlight under cover and avoid damage due to high temperatures. Do not store materials directly on ground. If special precautions are required, prominently and legibly stencil instructions for such precautions on outside of equipment or its crating.

1.4.2 Handling

Handle separator in such a manner as to ensure delivery to final location in sound, undamaged condition. Take special care not to damage interior and exterior surfaces of separator, coalescing plates, and associated supports and pipe coatings or linings. Make satisfactory repairs to

damaged materials at no cost to Government. Carry and do not drag materials.

PART 2 PRODUCTS

2.1 MATERIALS

Use 3/16 inch minimum thick carbon steel conforming to ASTM A36/A36M or material having equivalent structural properties and corrosion resistance for separator, hoppers, stationary and adjustable weirs, nozzles, flow distributor and energy dissipator device, bolts, seals, stiffeners, washers, and nuts. Weld in accordance with AWS D1.1/D1.1M to provide watertight separator that will not warp or deform under load. Use welders qualified in accordance with AWS Standard Qualification Procedure. Grind welds smooth and remove weld spatter. Fabricate free of kinks and sharp bends in a manner not to reduce the strength of steel to a value less than that intended by the design. Size and shape of bends shall be uniform. Clean and finish carbon steel surfaces as described in paragraph entitled "Separator Corrosion Protection."

Underground storage tanks will be managed in accordance with DAFMAN 32-1067 and documented in the Buckley SFB Spill Prevention Control and Countermeasure (SPCC) plan. Notify the Buckley SFB Tank Program Manager, Matthew Cohen (matthew.cohen.4@spaceforce.mil) when the tanks arrive at Buckley SFB.

2.1.1 Separator Corrosion Protection

2.1.1.1 Steel Separator

After shop conducted hydrostatic tests have been successfully completed, provide a MIL-DTL-24441 coating system to the interior and exterior surfaces of the separator. Prior to shop painting, abrasive blast clean the surfaces in accordance with SSPC SP 10/NACE No. 2 to a surface profile of 1 to 2 1/2 mils. Apply primer conforming to MIL-DTL-24441/1, Formula 150 applied to a minimum dry film thickness of 3 to 4 mils. Apply intermediate coat conforming to MIL-DTL-24441/2, Formula 151 applied to a minimum dry film thickness of 3 to 4 mils. Apply topcoat conforming to MIL-DTL-24441/3, Formula 152 applied to a minimum dry film thickness of 3 to 4 mils. Total dry film thickness shall not be less than 9 mils. Repair and replace areas of the coating system which are found to be damaged or defective upon delivery of equipment to the site or found to be defective due to work of the applicator. An interior polytetrafluoroethylene liner with a minimum thickness of 1/8 inch may be provided in lieu of paint coating the interior separator surfaces.

2.1.1.2 Other Than Steel Separator

After shop conducted hydrostatic tests and have been successfully completed, provide a coating system which will protect the separator from the oil-in-water mixture, and in situ soil conditions specified herein.

2.1.1.3 Cathodic Protection

For below ground metal separators, provide cathodic protection with test stations as specified in Section 26 42 13 GALVANIC (SACRIFICIAL) ANODE CATHODIC PROTECTION (GACP) SYSTEM in addition to the protective coating.

2.1.2 External Surfaces

External surfaces and appurtenances shall be resistant to corrosion from the in situ soil, backfill material, and groundwater .

2.1.3 Internal Surfaces

Parallel plate material and orientation shall enhance oil coalescence and solids removal, and be corrosion and chemically resistant to the oil-in-water mixture as specified in paragraph entitled "SYSTEM DESCRIPTION."

2.1.4 Hardware

Bolts, stiffeners, washers, nuts, screws, pins, oil level sensors, and fittings as required shall be corrosion resistant. Provide materials that are inherently corrosion resistant and not merely treated with a corrosion-resistant coating, such as provided by the galvanizing process.

2.1.5 Accessibility

As a minimum provide access hatches over the following areas: parallel plates, oil storage compartments, Influent sampling area, effluent sampling area, oil skimmer, and weirs. Parts subject to wear or requiring adjustment, inspection, cleaning or repair shall be accessible and capable of convenient removal when required.

2.2 SEPARATION CHAMBER

Provide below ground separator to withstand hydraulic and soil loadings under static and dynamic conditions while empty and during operating conditions. Provide adequate support for additional loadings from separator appurtenances including weirs, hoppers, internal supports, parallel plate oil coalescers, equipment transportation, and rapid lowering and braking of load during handling operations. Bolt separator to weld-fabricated, structural steel skid base, or mount on manufacturer's standard base.

2.2.1 Lifting Mechanism

Fit separator with lifting lugs for handling and installation. Each lug shall carry the total dry weight of the separator and attendant appurtenances. Prominently display lifting instructions on anodized aluminum plate located on outside of separator.

2.2.2 Flanges

Use only flat face flanges and drill 150 pound ANSI Standard bolt circle and remove burrs. Use flanged piping connections that conform to ASME B16.5, welding neck type.

2.2.3 Weirs

Attach stationary weirs and adjustable weir supports to separator side walls to provide a watertight seal between adjoining compartments and trough to prevent hydraulic short-circuiting. Use carbon steel for weir plates and baffles. Provide sharp crested weirs of size and section specified by manufacture. Provide slotted holes in weir plates and baffles or supports to permit horizontal and vertical adjustment of weir

or baffle. Use nondeteriorating sealant or gaskets for mounting weir plates. Fill voids between separator wall and weir plate with sealant to make watertight.

2.2.4 Low Point Drains

Provide means at low points for dewatering separator.

2.2.5 Identification Plates

Provide anodized aluminum identification and instruction plates and stamp necessary data. Securely affix plates, in prominent location, to separator with nonferrous screws or bolts of not less than 1/8 inch in diameter.

2.2.6 Instruction Plates

Instruction plates shall describe special or required procedures to operate and service equipment, and shall include warnings of hazardous procedures and notice of safety and health requirements. Plates shall be durable and legible throughout equipment life.

2.2.7 Warning Sign

On entrances to the separator (and entrances to the vault) place a permanent sign which states the following: "DO NOT ENTER separator (OR VAULT) OR PERFORM HOT WORK ON OR IN separator UNTIL THE ATMOSPHERE HAS BEEN TESTED AND CERTIFIED GAS FREE AND SAFE."

2.3 OIL SEPARATION COMPARTMENT

2.3.1 General

The separator will provide a minimum detention time within the oil separation compartment of 45 minutes at design flow. Detention time will recomputed by calculating the volume of the separation zone within the separator and dividing this volume by the design flow rate. For computing detention time, total volume shall be reduced by 20 percent for the space occupied by settled solids (sediment) and accumulated oil at the surface.

Provide an oil separation compartment sensor measuring the depth of liquid in the compartment. The oil separation compartment sensor shall report back to the operator control room.

2.3.2 Parallel Plates

Provide parallel plates at an angle from 40 to 60 degrees with respect to longitudinal axis of the plate corrugations and space not less than 3/4 inch apart for removal of free oil and settleable solids. Configuration used shall not promote solids buildup on plates which would increase velocities to point of discharging an effluent of unacceptable quality. Maintain laminar flow at maximum design flow rate throughout plate packs including entrance and exit so as to prevent re-entrainment of oil(s) with water. Flow through plate packs shall be in a downflow mode parallel to plate corrugations or cross-flow perpendicular to plate corrugations, so that the oil collects and coalesces at high point of corrugations and rises to top of pack without clogging from oil or settleable solids.

2.3.3 Supports

Brace and support individual plates or plate packs to withstand loads associated with transportation and operation of units, including inplace cleaning. Equip each plate pack with lifting lugs or other attachments for handling and installation. Each lug shall carry total weight of plate pack . Provide adequate structural supports to facilitate inplace cleaning of plate pack.

2.3.4 Baffles

Provide oil retention baffle and stationary underflow baffle. Position underflow baffle to prevent resuspension of solids that have accumulated in secondary solids hopper.

2.4 WASTE OIL STORAGE COMPARTMENT

Provide a waste oil storage compartment with a capacity of not less than 1,000 gallons. Provide a waste oil compartment sensor measuring the depth of oil in the compartment. The compartment must be accessible via a manway to remove contents via a pump truck. Coordinate compartment invert elevations with the waste oil drain piping.

The oil storage compartment sensor shall report back to the operator control room. The sensor shall be set to alarm when the waste oil storage compartment is 80% full.

2.5 OUTLET COMPARTMENT

Provide outlet compartment of at least 200 gallons, a sampling port, and nozzles.

2.6 INDEPENDENT LEVEL ALARM SYSTEM

Provide a system that will monitor programmable liquid level setpoints of quantity and elevation as a percentage of tank capacity for both the oil/water separator compartment and the waste oil storage compartment. The system shall delineate between each individual setpoint. The system shall produce an audible and visible alarm in the event of monitoring an alarm condition. Mechanically-actuated float assemblies shall be field adjustable. The system shall be totally independent of the tank gauging system.

2.7 ACCESSORIES

Provide bolts, stiffeners, washers, nuts, screws, pins, gaskets, and fittings as required for adjustable weirs, and parallel plate packs .

2.8 FABRICATION

Provide shop fabricated, skid mounted oil-water separator, or other shop fabricated unit approved by the Contracting Officer, which is comprised of a separator containing an inlet compartment, parallel plate oil coalescing compartment, and outlet compartment.

2.8.1 Shop Hydrostatic Test

Prior to applying coatings, perform hydrostatic test at atmospheric pressure by filling separator with water in the shop for a minimum of 4

hours. Testing shall be conducted after all seams have been cleaned and all welds have been inspected in accordance with ASTM E165/E165M. Acceptance criteria, for the hydrostatic test, is no leakage after 4 hours using a thorough visual inspection for the leaks.

2.8.2 Reduction of Solids

Inlet compartment shall reduce settleable solids to nonclogging level for parallel plates and provide a uniform oily wastewater hydraulic loading across inlet face of oil coalescing compartment, under laminar flow conditions. Equip compartment with an inlet nozzle with wastewater sampling port, nonclogging flow distributor and energy dissipator device, primary solids outlet nozzle, oil retention weir, and primary oil outlet nozzles. The oil-water separator shall be preceded by a solid water basin which includes a removable solids or trash basket. Equip the solid water basin with a hoist for servicing the trash basket. Size the basket to retain all solids larger than 3 inches in any dimensions. The solid waste basin shall have a minimum storage volume of 250 gallons.

2.8.3 Oil Coalescing Compartment

Equip oil coalescing compartment with easily removable and reinstallable, parallel, corrugated plates arranged to optimize separation of free oil from liquid carrier. Use parallel plates that are easily removable without dismantling packs and without confined space entry. Provide adjustable surface oil overflow weir with trough, oil outlet nozzle and stationary underflow baffle, oil retention baffle positioned to prevent discharge of free oil that has been separated from the carrier liquid in inlet and oil coalescing compartments. Provide access to each plate pack from top. Each bundle shall be equipped with handles or lifting rings. Plate designs that permit cleaning of plate packs in place are not acceptable.

2.8.4 Wastewater Sampling Port

Equip inlet and outlet compartments, adjustable overflow effluent weir, effluent trough, and wastewater outlet nozzle with wastewater sampling ports permitting easy access for obtaining isokinetic influent and effluent samples.

2.8.5 Connections

Connect the separator at the inlet and outlet pipe invert elevations indicated. Follow equipment manufacturer's recommendation for setting and adjusting top of weir elevations throughout unit.

2.8.6 Storage

Provide oil and suspended solids collection, storage, and transfer systems as an integral part of proposed oil-water separator system. As a minimum, the separator oil storage compartment shall have a capacity of not less than 1,000 gallons. Provide an access port to the separator oil storage compartment which allows removal of the waste oil using a vacuum-equipped truck.

PART 3 EXECUTION

3.1 INSPECTION

Inspect each component of separator for compliance with requirements specified in PART 2 PRODUCTS. Redesign or modification of equipment to comply with specified requirements, or necessary redesign or modification following failure to meet specified requirements, shall receive particular attention for adequacy and suitability. This element of inspection shall encompass visual examinations and dimensional measurements. Noncompliance with specified requirements, or presence of one or more defects preventing or lessening maximum efficiency of separator operation, shall constitute cause for rejection.

3.2 INSTALLATION

Lift separator as required without parallel plate packs in place onto level foundation using lifting mechanism provided. Level separator and bolt to supports to prevent hydrostatic uplift and ensure unit stability. Use a lifting bar through lugs to insert plate packs into separator and place on supports. Caulk around packs and pack supports with sealing compound conforming to ASTM C990 to prevent hydraulic short-circuiting. Avoid abrupt contact between the packs and the separator walls and pack supports to avoid damage. Separator system installation shall be conducted in accordance with manufacturer's recommendations.

3.3 FIELD QUALITY CONTROL

3.3.1 Field Hydrostatic Test

After separator has been leveled and secured to foundation and parallel plate packs are in place, level effluent overflow weir at elevation specified by manufacturer and hydrostatically test unit at atmospheric or operational pressure (for no leakage) for an additional 8 hours by filling with water. Perform the hydrostatic test prior to backfilling below ground or partially below ground installations.

3.3.2 Preoperational Test

The manufacturer's service representative shall inspect, operate, and test unit before in-service testing by the Contractor.

3.3.2.1 Tests

Tests shall include but not be limited to the following:

a. Soundness (without cracked or otherwise damaged parts).

b. Completeness in all details, as specified.

c. Correctness of setting, alignment, and relative arrangement of each component.

d. Verification of proper operation for all system components.

3.3.2.2 Preoperational Investigation and Test Report

Submit manufacturer's service representative's preoperational test report. Document inspections, operations, adjustments, and tests

performed and indicate whether they were acceptable or not. For unacceptable items, describe corrective action taken or recommended. Include detailed descriptions of points inspected, tests and adjustments made, quantitative results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance. Include the manufacturer's certificate that equipment conforms to specified requirements and is ready for permanent operation and that nothing in installation will render manufacturer's warranty null and void.

3.3.3 In-Service Test

After hydrostatic test and preoperational test have been successfully completed and unit has been properly connected to influent and effluent piping, allow influent oil-in-water mixture previously described in paragraph entitled "SYSTEM DESCRIPTION" to flow into separator filled with water. Adjust and level surface oil overflow weirs to optimize oil skimming and minimize water overflow to oil recovery. Optimize operation of unit within 5 working days. Operate unit for a minimum of ten separator volume changes prior to testing for removal of contaminants and document testing results.

3.3.3.1 Analytical Methods

Test and sample preservation methods for test contaminants shall be in accordance with the latest revisions of AWWA 10084, APHA Standard Methods for the Examination of Water and Wastewater, EPA 600/4-79/020, EPA Methods for Chemical Analysis of Water and Wastes, or those substitute methods approved by the governing regulatory agencies having jurisdiction.

3.3.3.2 Test for Contaminants

Verify the separator efficiency by testing influent and effluent for contaminants described in paragraph entitled "Performance Requirements." If effluent quality is found to be unacceptable, then verify influent to effluent performance in particle size removal at the site. Tests shall be performed by an independent certified testing laboratory.

3.3.3.3 Sampling Procedures

Within an 8 hour period and at regular intervals collect a minimum of 10 influent and effluent samples from sampling ports provided as part of the separator. Purge each sampling port to remove built-up solids or other material prior to collecting sample. Collect wastewater samples isokinetically in clean glass containers with polytetrafluoroethylene lined caps. Collect duplicate wastewater samples in separate glass containers. Do not attempt to split sample. Use containers for other contaminants as recommended in references listed in paragraph entitled "Analytical Methods."

3.3.3.4 Acceptance Criteria

90 percent of the effluent samples taken shall not exceed the specified daily maximum limit for petroleum hydrocarbon contaminants. The remaining samples shall not exceed 10 mg/L for petroleum hydrocarbon contaminants. If the separator does not meet requirements of this specification, due to poor workmanship and wrong fabrication dimensions, the unit may be rejected. If the unit is not operating at design efficiency 5 days after

installation, Government may reject system. In the event Government rejects unit, Contractor shall remove separator or defective components and replace with acceptable unit or components and test as specified above.

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BUCO00102A-103.PDF	A-103	ROOF PLAN
BUCO00102A-104.PDF	A-104	FIRST FLOOR REFLECTED CEILING PLAN
BUCO00102A-105.PDF	A-105	MEZZANINE REFLECTED CEILING PLAN
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BUCO00102A-400.PDF	A-400	ENLARGED PLANS
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BUCO00102A-510.PDF	A-510	ROOF DETAILS
BUCO00102A-511.PDF	A-511	ROOF DETAILS
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BUCO00102A-602.PDF	A-602	DOOR DETAILS
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BUCO00102A-701.PDF	A-701	PRECAST PANEL ELEVATIONS
BUCO00102A-702.PDF	A-702	PRECAST PANEL ELEVATIONS

INTERIORS

FILE NAME	SHEET ID NO.	DESCRIPTION
BUCO00102IG101.PDF	IG101	SIGNAGE TYPICALS

FIRE PROTECTION

FILE NAME	SHEET ID NO.	DESCRIPTION
BUCO00102FA001.PDF	FA001	FIRE ALARM GENERAL NOTES AND SUPPLEMENTAL LEGEND
BUCO00102FA101.PDF	FA101	FIRE ALARM INITIATION AND CONTROL PLAN
BUCO00102FA102.PDF	FA102	FIRE ALARM INITIATION AND CONTROL PLAN MEZZANINE
BUCO00102FA201.PDF	FA201	FIRE ALARM NOTIFICATION PLAN
BUCO00102FA202.PDF	FA202	FIRE ALARM NOTIFICATION PLAN MEZZANINE
BUCO00102FA401.PDF	FA401	ENLARGED FIRE ROOM PLAN
BUCO00102FA501.PDF	FA501	FIRE ALARM DETAILS
BUCO00102FA600.PDF	FA600	FIRE ALARM RISER DIAGRAM
BUCO00102FA601.PDF	FA601	FIRE ALARM MATRIX
BUCO00102FA602.PDF	FA602	RSCP FIRE ALARM MATRIX
BUCO00102F-101.PDF	F-101	COMPOSITE LIFE SAFETY AND BUILDING CODE PLAN
BUCO00102F-102.PDF	F-102	COMPOSITE MEZZANINIE LIFE SAFETY AND BUILDING CODE PLAN
BUCO00102F-103.PDF	F-103	CODE PLAN NARRATIVE
BUCO00102FX101.PDF	FX101	COMPOSITE FIRE SUPPRESSION PLAN
BUCO00102FX102.PDF	FX102	COMPOSITE MEZZANINE FIRE SUPPRESSION PLAN

INDEX LEGEND

1. SHEET INDENTIFICATION NUMBERS:

M - 2 0 1

- DISCIPLINE DESIGNATOR w/ Level 2 Designator *(see A/E/C CADD STANDARD RELEASE 6.0 for Level 2 Designator)*
- SHEET TYPE DESIGNATOR
- SHEET SEQUENCE NUMBER

2. DISCIPLINE DESIGNATORS:

G	GENERAL
H	HAZARDOUS MATERIALS
V	SURVERY / MAPPING
B	GEOTECHNICAL
C	CIVIL
L	LANDSCAPE
S	STRUCTURAL
A	ARCHITECTURAL
I	INTERIORS
Q	EQUIPMENT
F	FIRE PROTECTION
P	PLUMBING
D	PROCESS
M	MECHANICAL
E	ELECTRICAL
T	TELECOMMUNICATIONS
R	RESOURCE

3. SHEET TYPE DESIGNATORS:

0	GENERAL
1	PLANS
2	ELEVATIONS
3	SECTIONS
4	LARGE-SCALE VIEWS
5	DETAILS
6	SCHEDULES & DIAGRAMS
7	USER DEFINED
8	USER DEFINED
9	3D REPRESENTATIONS

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MARK	DESCRIPTION	DATE
2	AM #0003 - GENERAL REVISIONS	09/29/2025
1	AM #0002 - GENERAL REVISIONS	09/19/2025

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US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

DESIGNED BY: J. KAITANY
DRAWN BY: J. KAITANY
CHECKED BY: C. GORUP
SUBMITTED BY: B. GORUP
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9126F25RA043
CONTRACT NO.:
FILE NAME: BUCO00102_DM_A1.rvt

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BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION
BUCO00102
INDEX

SHEET ID
G-002

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A1 SOF CONSTRUCTION FREE ZONE

TRUE NORTH

0 80' 160'

NOTES
1. SEE CS511 AND CS512 FOR CHAINLINK FENCE AND GATE DETAILS.
2. CONTRACTOR MAY PROVIDE THEIR OWN GUARD SHACK FOR ACCESS CONTROL OF THE FREE ZONE, AND SHOULD POWER BE REQUIRED, IT MAY BE SOURCED FROM EXISTING TRANSFORMER (150 KVA 208/120V SECONDARY).
3. CONTRACTOR RESPONSIBLE FOR REMOVING FREE ZONE FENCING AT CONCLUSION OF CONSTRUCTION.

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MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

DESIGNED BY: N. BURNS
DRAWN BY: N. BURNS
CHECKED BY: T. OWENS
SUBMITTED BY: T. OWENS
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:
FILE NUMBER:
FILENAME: BUCO0102CS100-104.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

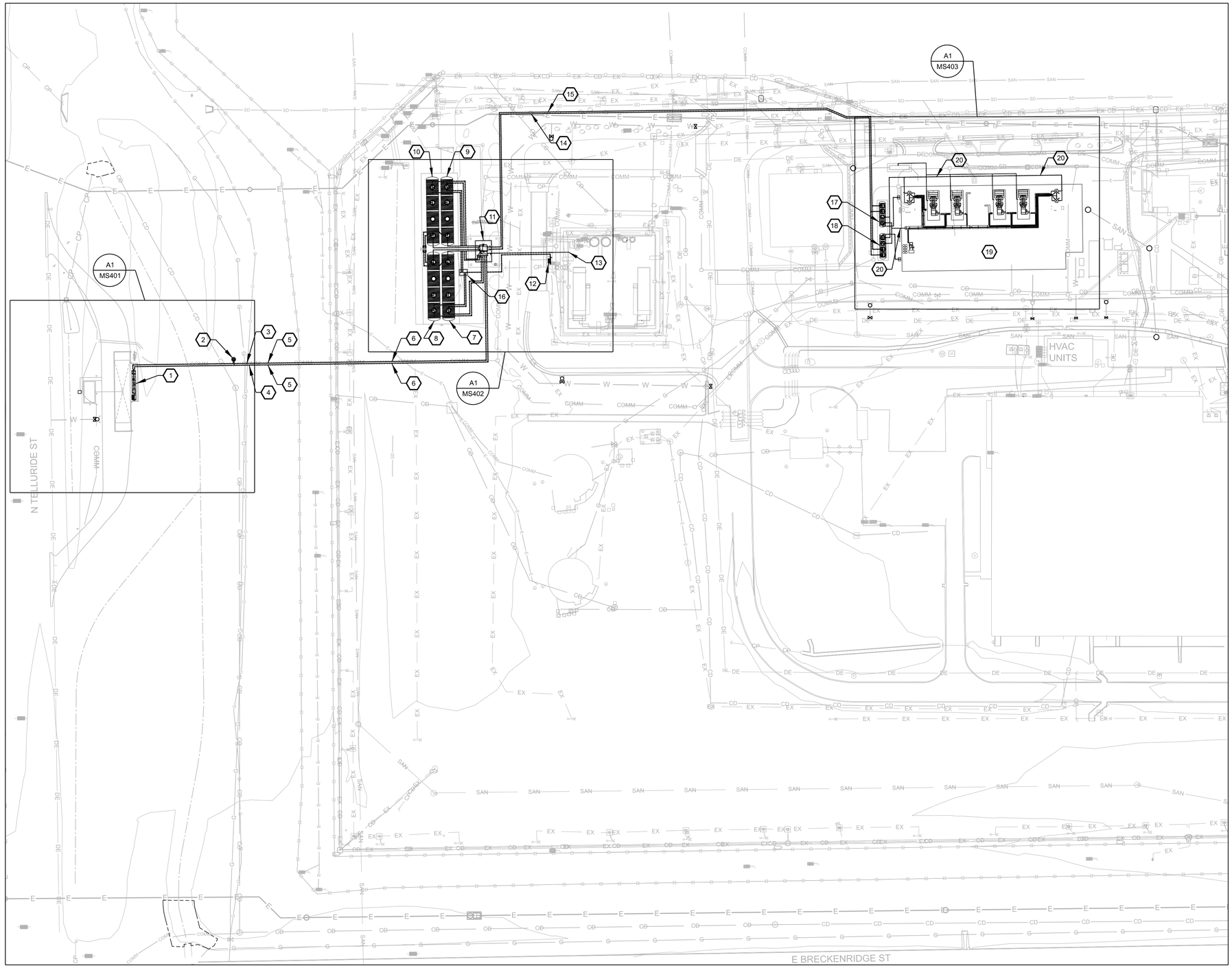
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CONSTRUCTION FREE ZONE

SHEET ID
G-006

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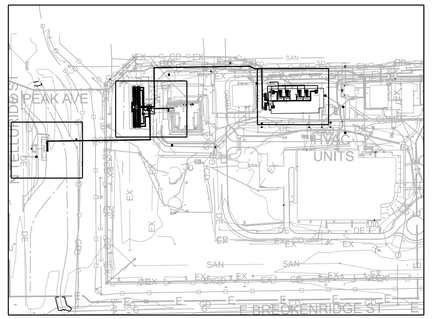
GENERAL SHEET NOTES

1. ALL UNDERGROUND PIPING SHALL BE DOUBLE WALL PIPING. THE CONTAINMENT PIPE SHALL BE FIBERGLASS REINFORCED PIPING. THE CARRIER PIPING SHALL BE BUTT WELDED STAINLESS STEEL PIPING. LEAK DETECTION SHALL BE PROVIDED IN THE INTERSTITIAL SPACE AT LOW POINTS.
2. ALL VALVES UPSTREAM OF PUMPS MUST BE FULL PORT.
3. ALL NUTS, BOLTS AND WASHERS SHALL BE STAINLESS STEEL.
4. FIELD VERIFY DIMENSIONS AND ELEVATIONS OF EXISTING CONDITIONS PRIOR TO FABRICATION.
5. MINIMUM WELD CLEARANCES ARE 3" BETWEEN ADJACENT GIRTH WELDS AND 2" BETWEEN PIPE GIRTH WELDS AND ADJACENT BRANCH FITTINGS.

SHEET KEYNOTES

1. 300 GPM DIESEL FUEL PUMPED TRUCK OFFLOAD
2. LOW POINT DRAIN PIT
3. 4" DOUBLE WALL RECEIPT LINE NO.1 - FROM TRUCK OFFLOAD
4. 4" DOUBLE WALL RECEIPT LINE NO.2 - FROM TRUCK OFFLOAD
5. STARTING LIMITS OF JACK AND BORE. THE METHOD OF JACK AND BORE SHALL BE USED FOR FUEL PIPING UNDERNEATH SECURITY FENCING. THE METHOD OF JACK AND BORE SHALL BE STARTED A MINIMUM OF 30 FEET FROM SECURITY FENCE.
6. ENDING LIMITS OF JACK AND BORE. THE METHOD OF JACK AND BORE SHALL BE USED FOR FUEL PIPING UNDERNEATH SECURITY FENCING. THE METHOD OF JACK AND BORE SHALL BE ENDED A MINIMUM OF 30 FEET FROM SECURITY FENCE.
7. 50,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND BULK STORAGE TANK - BT-001
8. 50,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND BULK STORAGE TANK - BT-002
9. 50,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND BULK STORAGE TANK - BT-003
10. 50,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND BULK STORAGE TANK - BT-004
11. DIESEL FUEL FILTRATION FACILITY
12. DIESEL FUEL GRAVITY TRUCK OFFLOAD
13. CROSS CONNECTION TO/FROM EXISTING FUELING FACILITY
14. 3" DOUBLE WALL TRANSFER LINE NO.1 - TO OPERATIONAL STORAGE TANKS
15. 3" DOUBLE WALL TRANSFER LINE NO.2 - TO OPERATIONAL STORAGE TANKS
16. GRAVITY TRUCK OFFLOAD ISOLATION VAULT
17. 5,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND OPERATIONAL STORAGE TANK - OT-001
18. 5,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND OPERATIONAL STORAGE TANK - OT-002
19. GENERATOR BUILDING
20. 2" DOUBLE WALL ISSUE LINE TO DAY TANKS WITHIN GENERATOR BUILDING

KEY PLAN



A1 MECHANICAL FUELING SYSTEM SITE PLAN
SCALE: 1" = 50'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE
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DESIGNED BY:	M. PETERSON
DRAWN BY:	M. PETERSON
CHECKED BY:	D. SCHEUFFELE
SUBMITTED BY:	D. SCHEUFFELE
SIZE:	ANSI D
ISSUE DATE:	05/01/2025
SOLICITATION NO.:	W9128F25RA043
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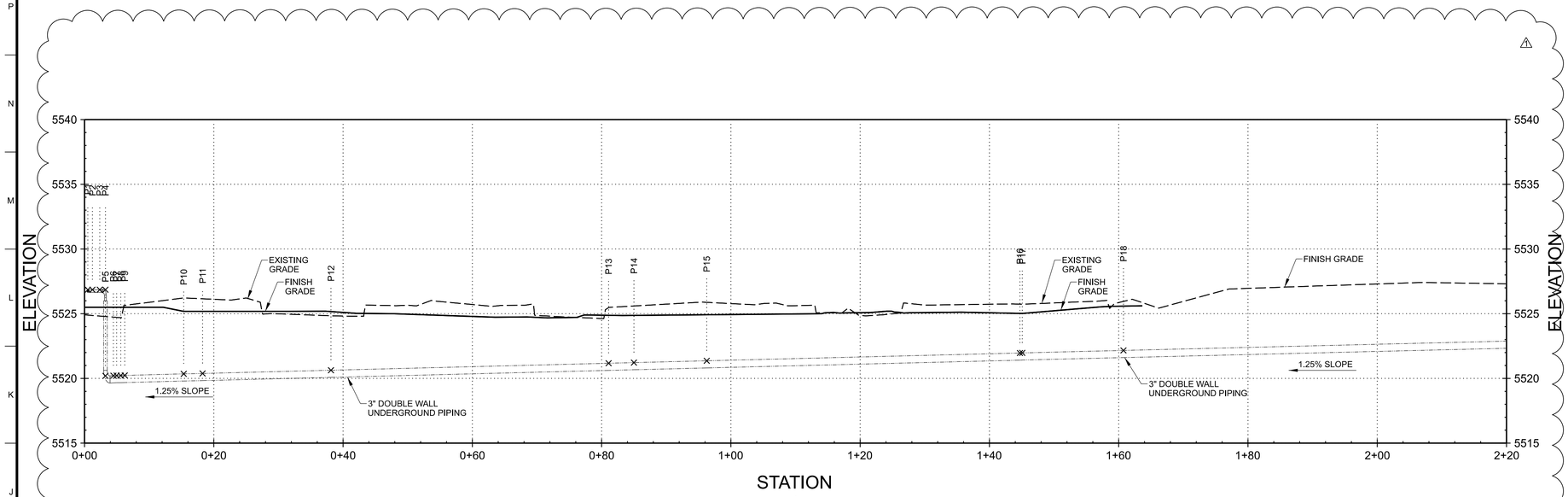
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OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

MECHANICAL FUELING SYSTEM SITE PLAN

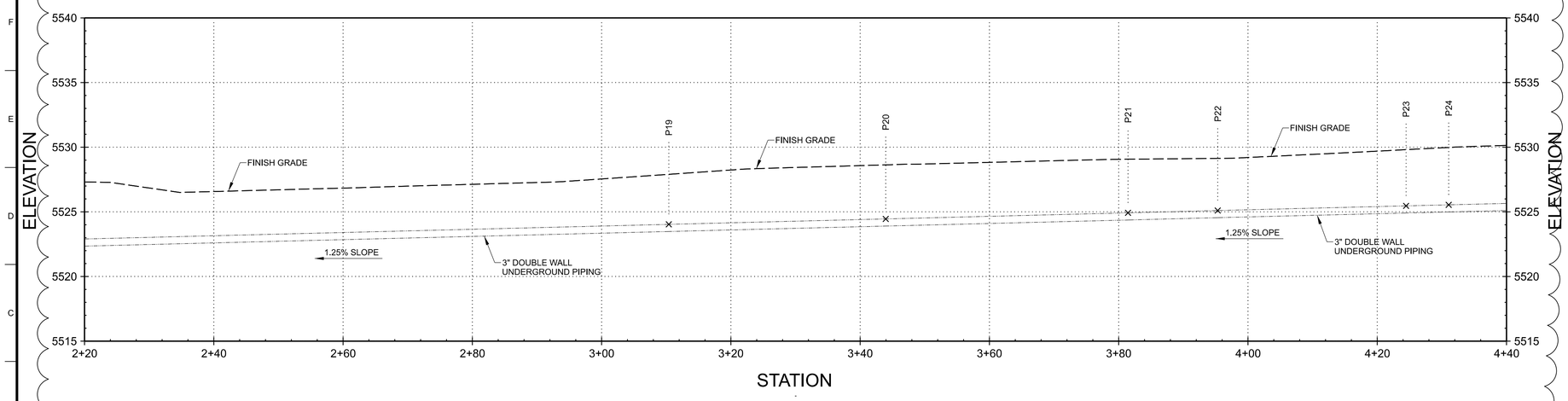
SHEET ID
MS101

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J1 TRANSFER LINE NO.1 PIPING PROFILE

HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 5'



A1 TRANSFER LINE NO.1 PIPING PROFILE

HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 5'

DESCRIPTION	COGO POINT	BASELINE STATION	ELEVATION - TOP (FT)	ELEVATION - BOP (FT)	NORTHING	EASTING
TEE AT FILTER SHELTER	P1	0.500	5526.849	5526.651	1686380.008	3202564.189
DBB PLUG VALVE	P2	1.220	5526.849	5526.651	1686380.018	3202564.908
PIPE SUPPORT	P3	2.350	5526.849	5526.651	1686380.033	3202566.043
ELBOW - AG	P4	3.230	5526.849	5526.651	1686380.045	3202566.918
ELBOW - BG	P5	3.230	5520.194	5519.819	1686380.045	3202566.918
INSIDE EDGE OF CONTAINMENT PAD	P6	4.460	5520.210	5519.835	1686380.062	3202568.152
OUTSIDE EDGE OF CONTAINMENT PAD	P7	4.960	5520.216	5519.841	1686380.069	3202568.652
COMM	P8	5.600	5520.224	5519.849	1686380.078	3202569.293
ELECTRICAL	P9	6.220	5520.232	5519.857	1686380.087	3202569.905
ELBOW - BG	P10	15.340	5520.346	5519.971	1686380.212	3202579.029
COMM	P11	18.260	5520.382	5520.007	1686383.132	3202578.989
ELECTRICAL	P12	38.120	5520.630	5520.255	1686402.993	3202578.715
COMM	P13	81.080	5521.167	5520.792	1686445.940	3202578.124
ELECTRICAL	P14	84.990	5521.216	5520.841	1686449.855	3202578.070
ELECTRICAL	P15	96.260	5521.357	5520.982	1686461.124	3202577.915
ELECTRICAL	P16	144.730	5521.963	5521.588	1686509.584	3202577.247
ELBOW - BG	P17	145.080	5521.967	5521.592	1686509.935	3202577.242
CWS	P18	160.740	5522.163	5521.788	1686510.151	3202592.902
COMM	P19	310.390	5524.034	5523.659	1686512.212	3202742.537
AW	P20	343.960	5524.453	5524.078	1686512.675	3202776.103
COMM	P21	381.430	5524.922	5524.547	1686513.191	3202813.575
SANITARY	P22	395.310	5525.095	5524.720	1686513.382	3202827.456
ELECTRICAL	P23	424.460	5525.460	5525.085	1686513.783	3202856.599
ELECTRICAL	P24	431.050	5525.542	5525.167	1686513.874	3202863.191
45 BEND	P25	458.380	5525.884	5525.509	1686514.251	3202890.516
ELECTRICAL	P26	462.550	5525.936	5525.561	1686512.608	3202894.348
45 BEND	P27	478.930	5526.141	5525.766	1686506.153	3202909.399
SANITARY	P28	482.180	5526.181	5525.806	1686506.198	3202912.655
ELBOW - BG	P29	501.150	5526.418	5526.043	1686506.453	3202931.610
ELECTRICAL	P30	504.590	5526.461	5526.086	1686503.004	3202931.658
EDGE OF ROAD	P31	509.080	5526.517	5526.142	1686498.524	3202931.719
GAS	P32	512.670	5526.562	5526.187	1686494.934	3202931.769
ELECTRICAL	P33	522.400	5526.684	5526.309	1686485.203	3202931.903
EDGE OF ROAD	P34	523.280	5526.695	5526.320	1686484.319	3202931.915
ELECTRICAL	P35	528.790	5526.764	5526.389	1686478.808	3202931.991
ELECTRICAL	P36	529.800	5526.776	5526.401	1686477.804	3202932.005
AW	P37	537.720	5526.875	5526.500	1686469.879	3202932.114
SANITARY	P38	549.430	5527.022	5526.647	1686458.174	3202932.275
COMM	P39	572.850	5527.315	5526.940	1686434.755	3202932.598
TEE CONNECTION TO OT-001	P40	591.380	5527.546	5527.171	1686416.232	3202932.853
ELBOW - BG	P41	633.170	5528.069	5527.694	1686374.442	3202933.429
OT-002 RECEIPT SUMP	P42	642.150	5528.181	5527.806	1686374.565	3202942.407

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MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

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DRAWN BY: M. PETERSON
CHECKED BY: D. SCHEUFFELE
SUBMITTED BY: D. SCHEUFFELE
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:
FILE NUMBER:
FILE NAME: BUCO00102MS401.dwg

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OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

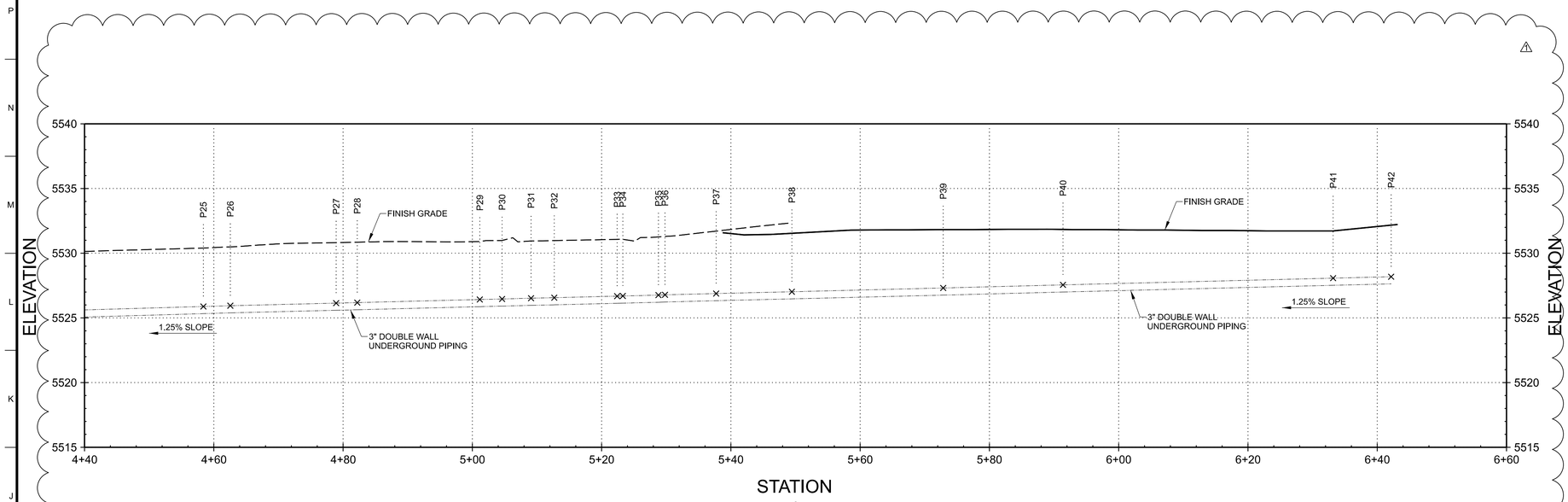
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FUELS PIPING PROFILES
SHEET 10 OF 16

SHEET ID
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J1 TRANSFER LINE NO.1 PIPING PROFILE

HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 5'

0 10' 20'
0 5' 10'

DESCRIPTION	COGO POINT	BASELINE STATION	ELEVATION - TOP (FT)	ELEVATION - BOP (FT)	NORTHING	EASTING
TEE AT FILTER SHELTER	P1	0.500	5526.849	5526.651	1686380.008	3202564.189
DBB PLUG VALVE	P2	1.220	5526.849	5526.651	1686380.018	3202564.908
PIPE SUPPORT	P3	2.350	5526.849	5526.651	1686380.033	3202566.043
ELBOW - AG	P4	3.230	5526.849	5526.651	1686380.045	3202566.918
ELBOW - BG	P5	3.230	5520.194	5519.819	1686380.045	3202566.918
INSIDE EDGE OF CONTAINMENT PAD	P6	4.460	5520.210	5519.835	1686380.062	3202568.152
OUTSIDE EDGE OF CONTAINMENT PAD	P7	4.960	5520.216	5519.841	1686380.069	3202568.652
COMM	P8	5.600	5520.224	5519.849	1686380.078	3202569.293
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COMM	P11	18.260	5520.382	5520.007	1686383.132	3202578.989
ELECTRICAL	P12	38.120	5520.630	5520.255	1686402.993	3202578.715
COMM	P13	81.080	5521.167	5520.792	1686445.940	3202578.124
ELECTRICAL	P14	84.990	5521.216	5520.841	1686449.855	3202578.070
ELECTRICAL	P15	96.260	5521.357	5520.982	1686461.124	3202577.915
ELECTRICAL	P16	144.730	5521.963	5521.588	1686509.584	3202577.247
ELBOW - BG	P17	145.080	5521.967	5521.592	1686509.935	3202577.242
CWS	P18	160.740	5522.163	5521.788	1686510.151	3202592.902
COMM	P19	310.390	5524.034	5523.659	1686512.212	3202742.537
AW	P20	343.960	5524.453	5524.078	1686512.675	3202776.103
COMM	P21	381.430	5524.922	5524.547	1686513.191	3202813.575
SANITARY	P22	395.310	5525.095	5524.720	1686513.382	3202827.456
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45 BEND	P25	458.380	5525.884	5525.509	1686514.251	3202890.516
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45 BEND	P27	478.930	5526.141	5525.766	1686506.153	3202909.399
SANITARY	P28	482.180	5526.181	5525.806	1686506.198	3202912.655
ELBOW - BG	P29	501.150	5526.418	5526.043	1686506.453	3202931.610
ELECTRICAL	P30	504.590	5526.461	5526.086	1686503.004	3202931.658
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ELBOW - BG	P41	633.170	5528.069	5527.694	1686374.442	3202933.429
OT-002 RECEIPT SUMP	P42	642.150	5528.181	5527.806	1686374.565	3202942.407

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE
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U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

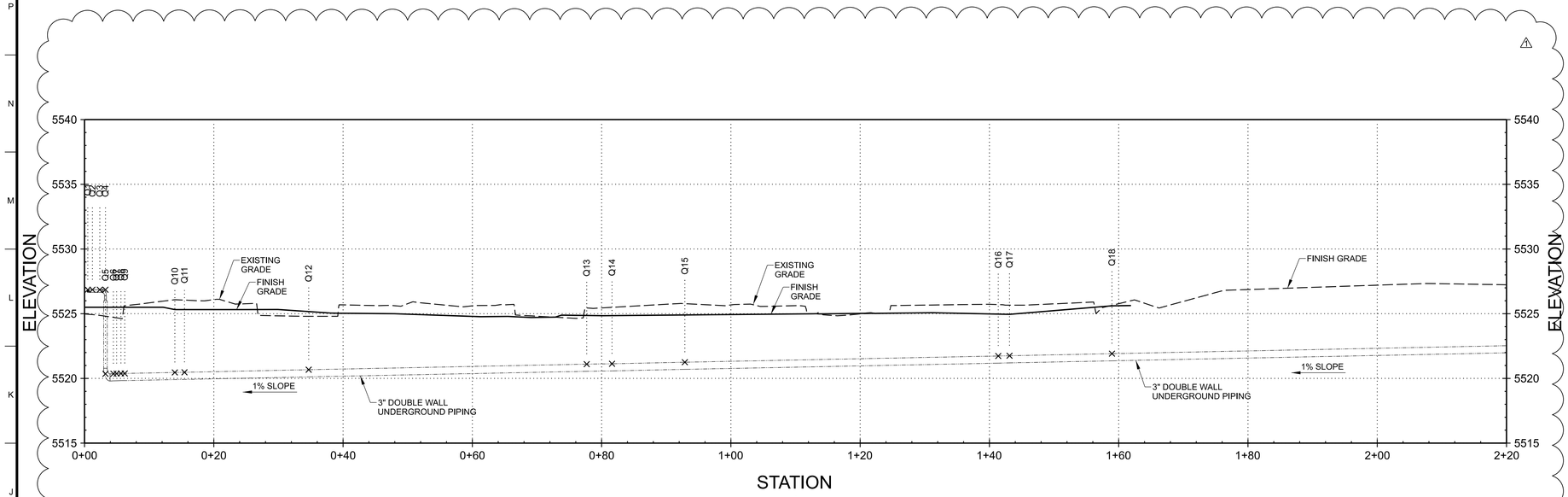
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POWER INDEPENDENCE, MISSION CONTROL STATION

FUELS PIPING PROFILES
SHEET 11 OF 16

SHEET ID
MS211

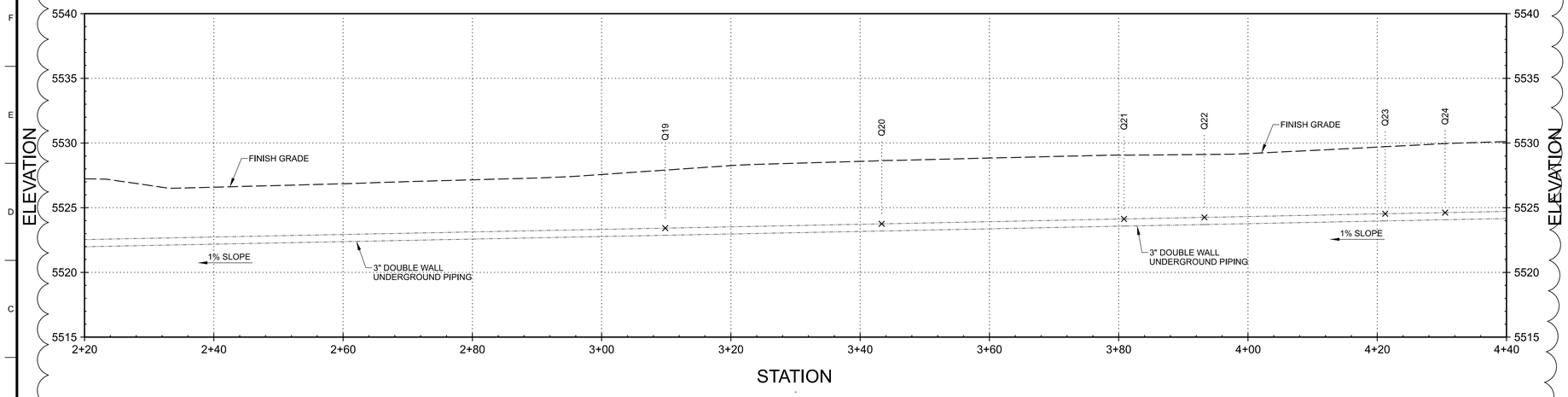
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J1 TRANSFER LINE NO.2 PIPING PROFILE

HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 5'



A1 TRANSFER LINE NO.2 PIPING PROFILE

HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 5'

DESCRIPTION	COGO POINT	BASELINE STATION	ELEVATION - TOP (FT)	ELEVATION - BOP (FT)	NORTHING	EASTING
TEE AT FILTER SHELTER	Q1	0.500	5526.849	5526.651	1686382.039	3202564.161
DBB PLUG VALVE	Q2	1.220	5526.849	5526.651	1686382.049	3202564.880
PIPE SUPPORT	Q3	2.350	5526.849	5526.651	1686382.064	3202566.015
ELBOW - AG	Q4	3.230	5526.849	5526.651	1686382.076	3202566.890
ELBOW - BG	Q5	3.230	5520.351	5519.976	1686382.076	3202566.890
INSIDE EDGE OF CONTAINMENT PAD	Q6	4.460	5520.364	5519.989	1686382.093	3202568.124
OUTSIDE EDGE OF CONTAINMENT PAD	Q7	4.960	5520.369	5519.994	1686382.100	3202568.624
COMM	Q8	5.630	5520.375	5520.000	1686382.110	3202569.292
ELECTRICAL	Q9	6.220	5520.381	5520.006	1686382.118	3202569.882
ELBOW - BG	Q10	13.970	5520.459	5520.084	1686382.224	3202577.626
COMM	Q11	15.470	5520.474	5520.099	1686383.724	3202577.606
ELECTRICAL	Q12	34.670	5520.666	5520.291	1686402.930	3202577.341
COMM	Q13	77.680	5521.096	5520.721	1686445.936	3202576.749
ELECTRICAL	Q14	81.600	5521.135	5520.760	1686449.855	3202576.695
ELECTRICAL	Q15	92.870	5521.248	5520.873	1686461.118	3202576.540
ELECTRICAL	Q16	141.360	5521.733	5521.358	1686509.609	3202575.872
ELBOW - BG	Q17	143.110	5521.750	5521.375	1686511.354	3202575.848
CWS	Q18	158.950	5521.908	5521.533	1686511.572	3202591.688
COMM	Q19	309.850	5523.417	5523.042	1686513.650	3202742.573
AW	Q20	343.330	5523.752	5523.377	1686514.111	3202776.047
COMM	Q21	380.820	5524.127	5523.752	1686514.628	3202813.540
SANITARY	Q22	393.250	5524.251	5523.876	1686514.799	3202825.968
ELECTRICAL	Q23	421.230	5524.531	5524.156	1686515.184	3202853.941
ELECTRICAL	Q24	430.500	5524.624	5524.249	1686515.312	3202863.208
45 BEND	Q25	457.940	5524.898	5524.523	1686515.690	3202890.648
ELECTRICAL	Q26	462.490	5524.944	5524.569	1686513.898	3202894.828
45 BEND	Q27	478.640	5525.105	5524.730	1686507.532	3202909.672
SANITARY	Q28	481.520	5525.134	5524.759	1686507.572	3202912.550
ELBOW - BG	Q29	501.940	5525.338	5524.963	1686507.847	3202932.966
ELECTRICAL	Q30	506.810	5525.387	5525.012	1686502.979	3202933.033
EDGE OF ROAD	Q31	511.230	5525.431	5525.056	1686498.559	3202933.094
GAS	Q32	514.810	5525.467	5525.092	1686494.974	3202933.143
ELECTRICAL	Q33	524.550	5525.564	5525.189	1686485.235	3202933.278
EDGE OF ROAD	Q34	525.430	5525.573	5525.198	1686484.362	3202933.290
ELECTRICAL	Q35	530.950	5525.628	5525.253	1686478.840	3202933.366
ELECTRICAL	Q36	531.940	5525.638	5525.263	1686477.848	3202933.379
AW	Q37	539.830	5525.717	5525.342	1686469.964	3202933.488
SANITARY	Q38	551.600	5525.835	5525.460	1686458.193	3202933.650
COMM	Q39	574.130	5526.060	5525.685	1686435.667	3202933.960
TEE CONNECTION TO OT-001	Q40	588.050	5526.199	5525.824	1686421.750	3202934.152
TRANSFER LINE NO.1 PIPING	Q41	593.550	5526.254	5525.879	1686416.251	3202934.228
ELBOW - BG	Q42	629.840	5527.434	5527.059	1686379.960	3202934.728
OT-002 RECEIPT SUMP	Q43	637.440	5527.681	5527.306	1686380.065	3202942.331

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

DESIGNED BY: M. PETERSON
DRAWN BY: M. PETERSON
CHECKED BY: D. SCHEUFFELE
SUBMITTED BY: D. SCHEUFFELE
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:
FILE NUMBER:
FILE NAME: BUCO00102MS401.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

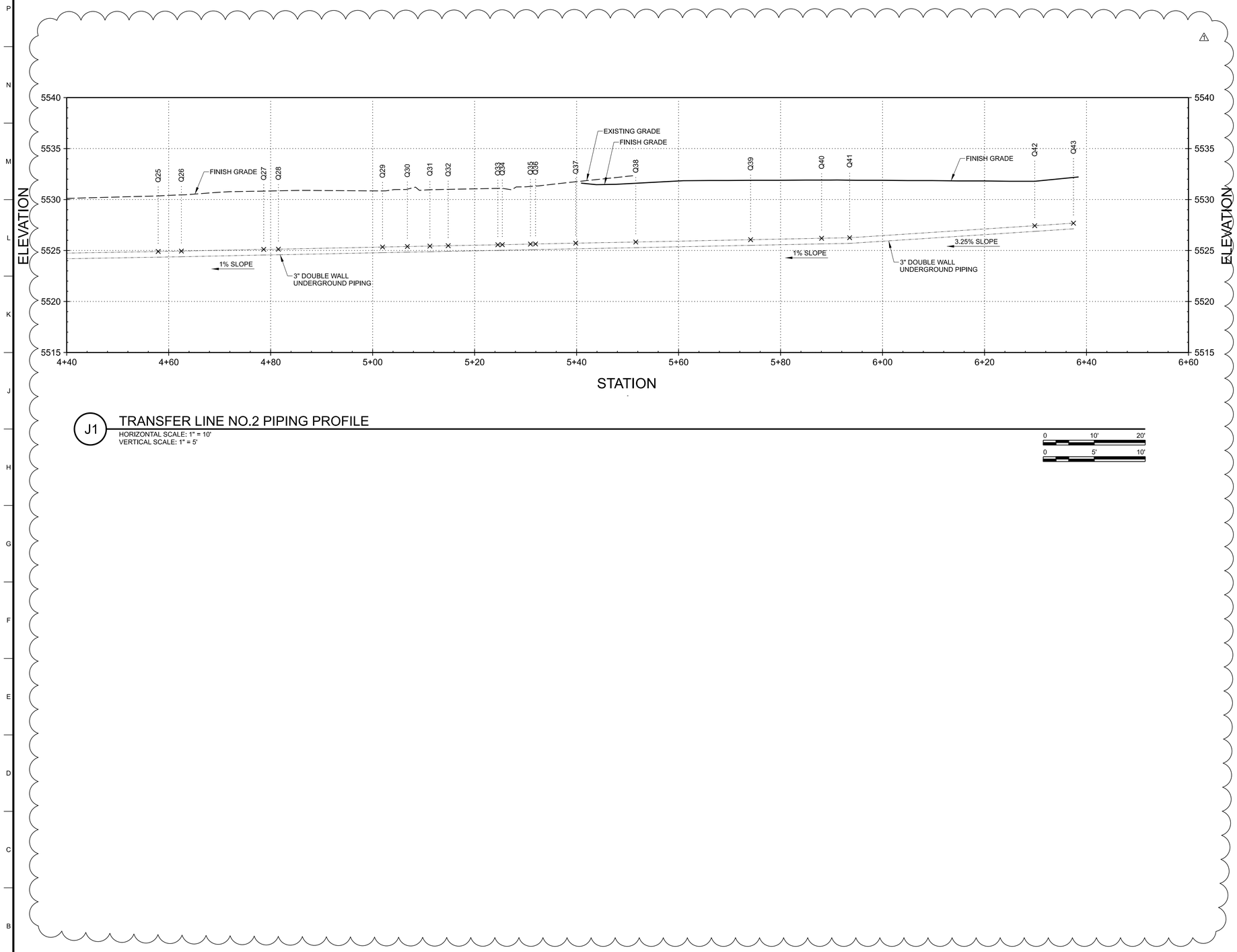
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

FUELS PIPING PROFILES
SHEET 12 OF 16

SHEET ID
MS212

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J1 TRANSFER LINE NO.2 PIPING PROFILE

HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 5'

0 10' 20'
0 5' 10'

DESCRIPTION	COGO POINT	BASELINE STATION	ELEVATION - TOP (FT)	ELEVATION - BOP (FT)	NORTHING	EASTING
TEE AT FILTER SHELTER	Q1	0.500	5526.849	5526.651	1686382.039	3202564.161
DBB PLUG VALVE	Q2	1.220	5526.849	5526.651	1686382.049	3202564.880
PIPE SUPPORT	Q3	2.350	5526.849	5526.651	1686382.064	3202566.015
ELBOW - AG	Q4	3.230	5526.849	5526.651	1686382.076	3202566.890
ELBOW - BG	Q5	3.230	5520.351	5519.976	1686382.076	3202566.890
INSIDE EDGE OF CONTAINMENT PAD	Q6	4.460	5520.364	5519.989	1686382.093	3202568.124
OUTSIDE EDGE OF CONTAINMENT PAD	Q7	4.960	5520.369	5519.994	1686382.100	3202568.624
COMM	Q8	5.630	5520.375	5520.000	1686382.110	3202569.292
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ELBOW - BG	Q10	13.970	5520.459	5520.084	1686382.224	3202577.626
COMM	Q11	15.470	5520.474	5520.099	1686383.724	3202577.606
ELECTRICAL	Q12	34.670	5520.666	5520.291	1686402.930	3202577.341
COMM	Q13	77.680	5521.096	5520.721	1686445.936	3202576.749
ELECTRICAL	Q14	81.600	5521.135	5520.760	1686449.855	3202576.695
ELECTRICAL	Q15	92.870	5521.248	5520.873	1686461.118	3202576.540
ELECTRICAL	Q16	141.360	5521.733	5521.358	1686509.609	3202575.872
ELBOW - BG	Q17	143.110	5521.750	5521.375	1686511.354	3202575.848
CWS	Q18	158.950	5521.908	5521.533	1686511.572	3202591.688
COMM	Q19	309.850	5523.417	5523.042	1686513.650	3202742.573
AW	Q20	343.330	5523.752	5523.377	1686514.111	3202776.047
COMM	Q21	380.820	5524.127	5523.752	1686514.628	3202813.540
SANITARY	Q22	393.250	5524.251	5523.876	1686514.799	3202825.968
ELECTRICAL	Q23	421.230	5524.531	5524.156	1686515.184	3202853.941
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TRANSFER LINE NO.1 PIPING	Q41	593.550	5526.254	5525.879	1686416.251	3202934.228
ELBOW - BG	Q42	629.840	5527.434	5527.059	1686379.960	3202934.728
OT-002 RECEIPT SUMP	Q43	637.440	5527.681	5527.306	1686380.065	3202942.331

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

DESIGNED BY: M. PETERSON
DRAWN BY: M. PETERSON
CHECKED BY: D. SCHEUFFELE
SUBMITTED BY: D. SCHEUFFELE
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:
FILE NUMBER:
FILE NAME: BUCO00102MS401.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

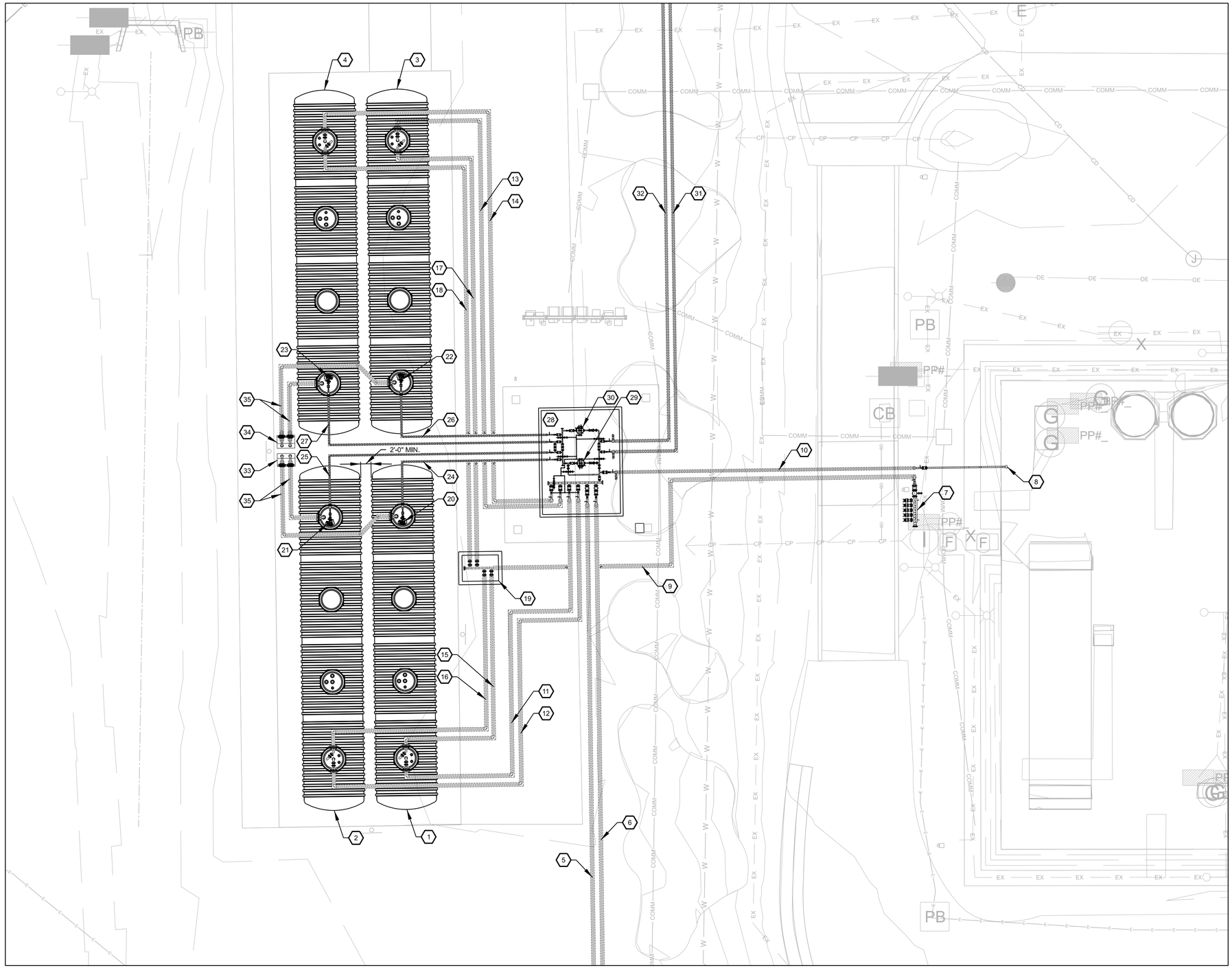
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

FUELS PIPING PROFILES
SHEET 13 OF 16

SHEET ID
MS213

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A1 BULK STORAGE ENLARGED SITE PLAN
SCALE: 1" = 10'

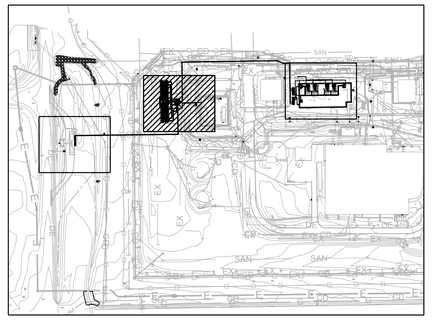
GENERAL SHEET NOTES

1. ALL UNDERGROUND PIPING SHALL BE DOUBLE WALL PIPING. THE CONTAINMENT PIPE SHALL BE FIBERGLASS REINFORCED PIPING. THE CARRIER PIPING SHALL BE BUTT WELDED STAINLESS STEEL PIPING. LEAK DETECTION SHALL BE PROVIDED IN THE INTERSTITIAL SPACE AT LOW POINTS.
2. ALL VALVES UPSTREAM OF PUMPS MUST BE FULL PORT.
3. ALL NUTS, BOLTS AND WASHERS SHALL BE STAINLESS STEEL.
4. FIELD VERIFY DIMENSIONS AND ELEVATIONS OF EXISTING CONDITIONS PRIOR TO FABRICATION.
5. MINIMUM WELD CLEARANCES ARE 3" BETWEEN ADJACENT GIRTH WELDS AND 2" BETWEEN PIPE GIRTH WELDS AND ADJACENT BRANCH FITTINGS.

SHEET KEYNOTES

1. 50,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND BULK STORAGE TANK - BT-001
2. 50,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND BULK STORAGE TANK - BT-002
3. 50,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND BULK STORAGE TANK - BT-003
4. 50,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND BULK STORAGE TANK - BT-004
5. 4" DOUBLE WALL RECEIPT LINE NO.1 - FROM TRUCK OFFLOAD
6. 4" DOUBLE WALL RECEIPT LINE NO.2 - FROM TRUCK OFFLOAD
7. DIESEL FUEL GRAVITY TRUCK OFFLOAD
8. CROSS CONNECTION TO EXISTING FUELING FACILITY
9. 4" DOUBLE WALL RECEIPT LINE - FROM GRAVITY TRUCK OFFLOAD
10. 3" DOUBLE WALL TRANSFER LINE - TO/FROM EXISTING FUELING SYSTEM
11. 4" DOUBLE WALL RECEIPT LINE - TO TANK NO.1 FROM PUMPED TRUCK OFFLOAD
12. 4" DOUBLE WALL RECEIPT LINE - TO TANK NO.2 FROM PUMPED TRUCK OFFLOAD
13. 4" DOUBLE WALL RECEIPT LINE - TO TANK NO.3 FROM PUMPED TRUCK OFFLOAD
14. 4" DOUBLE WALL RECEIPT LINE - TO TANK NO.4 FROM PUMPED TRUCK OFFLOAD
15. 4" DOUBLE WALL RECEIPT LINE - TO TANK NO.1 FROM GRAVITY TRUCK OFFLOAD
16. 4" DOUBLE WALL RECEIPT LINE - TO TANK NO.2 FROM GRAVITY TRUCK OFFLOAD
17. 4" DOUBLE WALL RECEIPT LINE - TO TANK NO.3 FROM GRAVITY TRUCK OFFLOAD
18. 4" DOUBLE WALL RECEIPT LINE - TO TANK NO.4 FROM GRAVITY TRUCK OFFLOAD
19. GRAVITY TRUCK OFFLOAD ISOLATION VAULT
20. 100 GPM BULK ISSUE PUMP NO.1 - (IP-F1)
21. 100 GPM BULK ISSUE PUMP NO.2 - (IP-F2)
22. 100 GPM BULK ISSUE PUMP NO.3 - (IP-F3)
23. 100 GPM BULK ISSUE PUMP NO.4 - (IP-F4)
24. 2" DOUBLE WALL ISSUE LINE - FROM IP-F1 TO FILTRATION FACILITY
25. 2" DOUBLE WALL ISSUE LINE - FROM IP-F2 TO FILTRATION FACILITY
26. 2" DOUBLE WALL ISSUE LINE - FROM IP-F3 TO FILTRATION FACILITY
27. 2" DOUBLE WALL ISSUE LINE - FROM IP-F4 TO FILTRATION FACILITY
28. DIESEL FUEL FILTRATION FACILITY
29. 100 GPM ISSUE FILTER SEPARATOR NO.1
30. 100 GPM ISSUE FILTER SEPARATOR NO.2
31. 3" DOUBLE WALL TRANSFER LINE NO.1 - TO OPERATIONAL STORAGE TANKS
32. 3" DOUBLE WALL TRANSFER LINE NO.2 - TO OPERATIONAL STORAGE TANKS
33. TRANSITION SUMP FOR BT-001 AND BT-002 VENT PIPING
34. TRANSITION SUMP FOR BT-003 AND BT-004 VENT PIPING
35. 4" DOUBLE WALL VENT PIPING

KEY PLAN



US Army Corps of Engineers®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

DESIGNED BY:	M. PETERSON
DRAWN BY:	M. PETERSON
CHECKED BY:	D. SCHEUFFELE
SUBMITTED BY:	D. SCHEUFFELE
SCHEDULE:	
SIZE:	ANSI D
ISSUE DATE:	05/01/2025
SOLICITATION NO.:	W9128F25RA043
CONTRACT NO.:	
FILE NUMBER:	
FILE NAME:	BUCO00102MS402.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

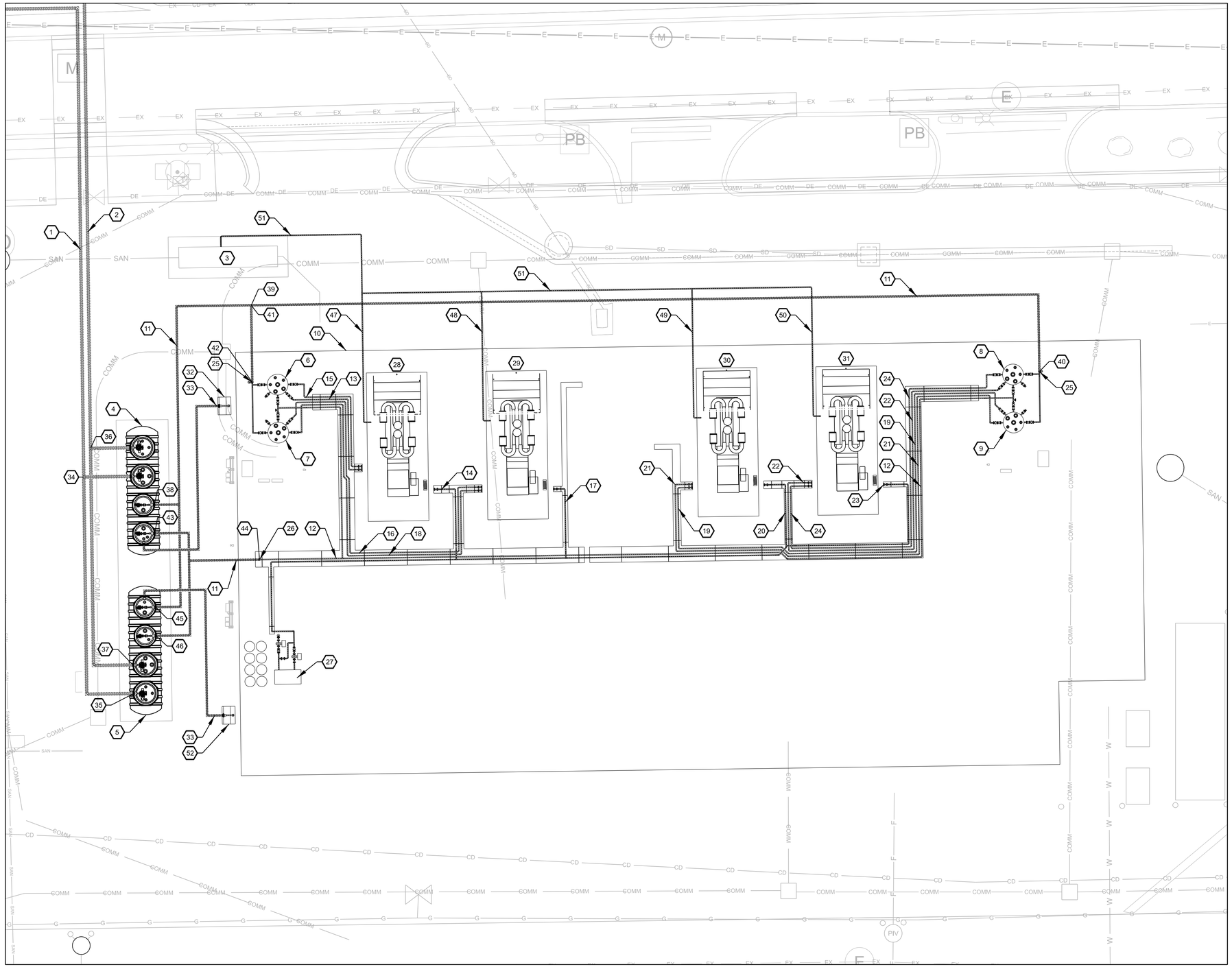
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

BULK STORAGE
ENLARGED SITE PLAN

SHEET ID
MS402

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PLAN NORTH

0 10' 20'

A1 GENERATOR BUILDING ENLARGED SITE PLAN

SCALE: 1" = 10'

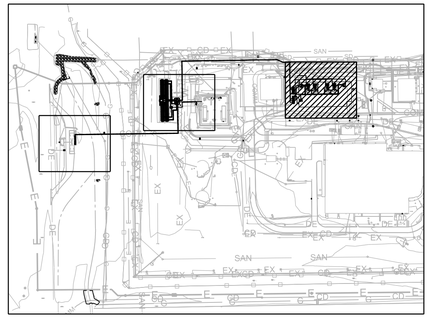
GENERAL SHEET NOTES

1. ALL UNDERGROUND PIPING SHALL BE DOUBLE WALL PIPING. THE CONTAINMENT PIPE SHALL BE FIBERGLASS REINFORCED PIPING. THE CARRIER PIPING SHALL BE BUTT WELDED STAINLESS STEEL PIPING. LEAK DETECTION SHALL BE PROVIDED IN THE INTERSTITIAL SPACE AT LOW POINTS.
2. ALL VALVES UPSTREAM OF PUMPS MUST BE FULL PORT.
3. ALL NUTS, BOLTS AND WASHERS SHALL BE STAINLESS STEEL.
4. FIELD VERIFY DIMENSIONS AND ELEVATIONS OF EXISTING CONDITIONS PRIOR TO FABRICATION.
5. MINIMUM WELD CLEARANCES ARE 3" BETWEEN ADJACENT GIRTH WELDS AND 2" BETWEEN PIPE GIRTH WELDS AND ADJACENT BRANCH FITTINGS.

SHEET KEYNOTES

1. 3" DOUBLE WALL TRANSFER LINE NO.1 - FROM BULK STORAGE TANKS
2. 3" DOUBLE WALL TRANSFER LINE NO.2 - FROM BULK STORAGE TANKS
3. OIL WATER SEPARATOR
4. 5,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND OPERATIONAL STORAGE TANK - OT-001
5. 5,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND OPERATIONAL STORAGE TANK - OT-002
6. 660 GAL SINGLE WALL VERTICAL STORAGE TANK - DT-001
7. 660 GAL SINGLE WALL VERTICAL STORAGE TANK - DT-002
8. 660 GAL SINGLE WALL VERTICAL STORAGE TANK - DT-003
9. 660 GAL SINGLE WALL VERTICAL STORAGE TANK - DT-004
10. GENERATOR BUILDING
11. 2" DOUBLE WALL ISSUE LINE - FROM OPERATIONAL STORAGE
12. 2" STAINLESS STEEL ISSUE LINE - FROM OPERATIONAL STORAGE
13. 2" STAINLESS STEEL ISSUE LINE TO GB1
14. 2" STAINLESS STEEL LUBE OIL ISSUE LINE TO GB1
15. 2" STAINLESS STEEL RETURN LINE FROM GB1
16. 2" STAINLESS STEEL ISSUE LINE TO GB2
17. 2" STAINLESS STEEL LUBE OIL ISSUE LINE TO GB2
18. 2" STAINLESS STEEL RETURN LINE FROM GB2
19. 2" STAINLESS STEEL ISSUE LINE TO GA1
20. 2" STAINLESS STEEL LUBE OIL ISSUE LINE TO GA1
21. 2" STAINLESS STEEL RETURN LINE FROM GA1
22. 2" STAINLESS STEEL ISSUE LINE TO GA2
23. 2" STAINLESS STEEL LUBE OIL ISSUE LINE TO GA2
24. 2" STAINLESS STEEL RETURN LINE FROM GA2
25. ABOVEGROUND / UNDERGROUND TRANSITION THROUGH FLOOR SLAB
26. ABOVEGROUND / UNDERGROUND TRANSITION THROUGH TRENCH FLOOR SLAB
27. 500 GAL SINGLE WALL HORIZONTAL STORAGE TANK - LUBE OIL
28. GB1
29. GB2
30. GA1
31. GA2
32. TRANSITION SUMP FOR OT-001 VENT PIPING
33. 2" DOUBLE WALL VENT PIPING
34. COGO POINT - P40 - STA.: 5+91.38 - SEE SHEETS MS210 AND MS211 FOR FULL PROFILE
35. COGO POINT - P42 - STA.: 6+42.15 - SEE SHEETS MS210 AND MS211 FOR FULL PROFILE
36. COGO POINT - Q40 - STA.: 5+88.05 - SEE SHEETS MS212 AND MS213 FOR FULL PROFILE
37. COGO POINT - Q43 - STA.: 6+37.44 - SEE SHEETS MS212 AND MS213 FOR FULL PROFILE
38. COGO POINT - R1 - STA.: 0+01.00 - SEE SHEET MS214 FOR FULL PROFILE
39. COGO POINT - R6 - STA.: 0+58.33 - SEE SHEET MS214 FOR FULL PROFILE
40. COGO POINT - R18 - STA.: 2+24.61 - SEE SHEET MS214 FOR FULL PROFILE
41. COGO POINT - S1 - STA.: 0+01.00 - SEE SHEET MS215 FOR FULL PROFILE
42. COGO POINT - S5 - STA.: 0+15.83 - SEE SHEET MS215 FOR FULL PROFILE
43. COGO POINT - T1 - STA.: 0+01.11 - SEE SHEET MS215 FOR FULL PROFILE
44. COGO POINT - T8 - STA.: 0+26.41 - SEE SHEET MS215 FOR FULL PROFILE
45. COGO POINT - U1 - STA.: 0+00.78 - SEE SHEET MS215 FOR FULL PROFILE
46. COGO POINT - V1 - STA.: 0+01.00 - SEE SHEET MS215 FOR FULL PROFILE
47. 2" DOUBLE WALL PIPING - GB1 LUBE OIL DRAIN PIPING
48. 2" DOUBLE WALL PIPING - GB2 LUBE OIL DRAIN PIPING
49. 2" DOUBLE WALL PIPING - GA1 LUBE OIL DRAIN PIPING
50. 2" DOUBLE WALL PIPING - GA2 LUBE OIL DRAIN PIPING
51. 2" DOUBLE WALL PIPING - LUBE OIL DRAIN PIPING HEADER TO OIL WATER SEPARATOR
52. TRANSITION SUMP FOR OT-002 VENT PIPING

KEY PLAN



US Army Corps of Engineers®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

DESIGNED BY: M. PETERSON
DRAWN BY: M. PETERSON
CHECKED BY: D. SCHEUFFELE
SUBMITTED BY: SCHEUFFELE
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
FILE NAME: BUCO00102MS403.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

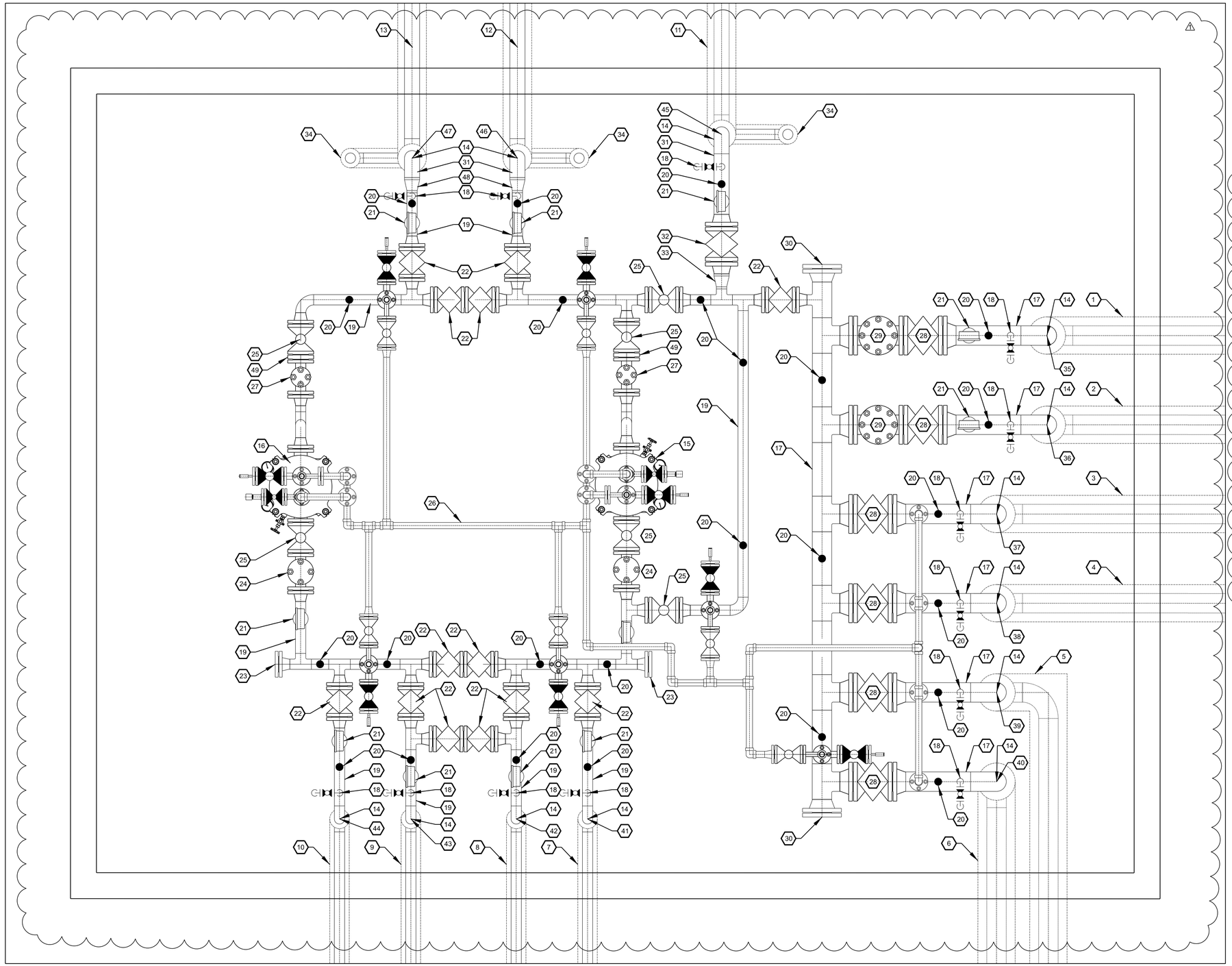
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

GENERATOR BUILDING
ENLARGED SITE PLAN

SHEET ID
MS403

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GENERAL SHEET NOTES

1. ALL UNDERGROUND PIPING SHALL BE DOUBLE WALL PIPING. THE CONTAINMENT PIPE SHALL BE FIBERGLASS REINFORCED PIPING. THE CARRIER PIPING SHALL BE BUTT WELDED STAINLESS STEEL PIPING. LEAK DETECTION SHALL BE PROVIDED IN THE INTERSTITIAL SPACE AT LOW POINTS.
2. ALL VALVES UPSTREAM OF PUMPS MUST BE FULL PORT.
3. ALL NUTS, BOLTS AND WASHERS SHALL BE STAINLESS STEEL.
4. FIELD VERIFY DIMENSIONS AND ELEVATIONS OF EXISTING CONDITIONS PRIOR TO FABRICATION.
5. MINIMUM WELD CLEARANCES ARE 3" BETWEEN ADJACENT GIRTH WELDS AND 2" BETWEEN PIPE GIRTH WELDS AND ADJACENT BRANCH FITTINGS.

SHEET KEYNOTES

1. 4" DOUBLE WALL RECEIPT LINE NO.2 - FROM TRUCK OFFLOAD
2. 4" DOUBLE WALL RECEIPT LINE NO.1 - FROM TRUCK OFFLOAD
3. 4" DOUBLE WALL RECEIPT LINE - TO BT-002 FROM PUMPED TRUCK OFFLOAD
4. 4" DOUBLE WALL RECEIPT LINE - TO BT-001 FROM PUMPED TRUCK OFFLOAD
5. 4" DOUBLE WALL RECEIPT LINE - TO BT-003 FROM PUMPED TRUCK OFFLOAD
6. 4" DOUBLE WALL RECEIPT LINE - TO BT-004 FROM PUMPED TRUCK OFFLOAD
7. 2" DOUBLE WALL ISSUE LINE - FROM BT-001
8. 2" DOUBLE WALL ISSUE LINE - FROM BT-002
9. 2" DOUBLE WALL ISSUE LINE - FROM BT-004
10. 2" DOUBLE WALL ISSUE LINE - FROM BT-003
11. 3" DOUBLE WALL TRANSFER LINE - TO/FROM EXISTING FUELING SYSTEM
12. 3" DOUBLE WALL TRANSFER LINE NO.1 - TO OPERATIONAL STORAGE TANKS
13. 3" DOUBLE WALL TRANSFER LINE NO.2 - TO OPERATIONAL STORAGE TANKS
14. ABOVEGROUND / UNDERGROUND TRANSITION
15. 100GPM ISSUE FILTER SEPARATOR NO.1
16. 100GPM ISSUE FILTER SEPARATOR NO.2
17. 4" STAINLESS STEEL ABOVEGROUND RECEIPT PIPING
18. HIGH POINT VENT (TYP.)
19. 2" STAINLESS STEEL ABOVEGROUND PIPING
20. PS-2 PIPE SUPPORT (TYP.)
21. PRESSURE GAUGE
22. 2" FLANGED DOUBLE BLOCK AND BLEED PLUG VALVE
23. 2" STAINLESS STEEL BLIND FLANGE
24. 2" FLANGED BASKET STRAINER
25. 2" FLANGED BALL VALVE
26. 1" STAINLESS STEEL PIPING (PRESSURE RELIEF PIPING)
27. 2" FLANGED CHECK VALVE
28. 4" FLANGED DOUBLE BLOCK AND BLEED PLUG VALVE
29. 4" FLANGED CHECK VALVE
30. 4" STAINLESS STEEL BLIND FLANGE
31. 3" STAINLESS STEEL ABOVEGROUND PIPING
32. 3" FLANGED DOUBLE BLOCK AND BLEED PLUG VALVE
33. 3"x2" STAINLESS STEEL REDUCER (FLAT SIDE DOWN)
34. LOW POINT DRAIN AND INTERSTITIAL LEAK DETECTION PROBE LOCATION
35. COGO POINT - B33 - STA.: 4+41.64 - SEE SHEET MS202 FOR FULL PROFILE
36. COGO POINT - A34 - STA.: 4+41.61 - SEE SHEET MS201 FOR FULL PROFILE
37. COGO POINT - E4 - STA.: 0+03.86 - SEE SHEET MS204 FOR FULL PROFILE
38. COGO POINT - D4 - STA.: 0+03.86 - SEE SHEET MS204 FOR FULL PROFILE
39. COGO POINT - F4 - STA.: 0+03.86 - SEE SHEET MS205 FOR FULL PROFILE
40. COGO POINT - G4 - STA.: 0+03.86 - SEE SHEET MS205 FOR FULL PROFILE
41. COGO POINT - L10 - STA.: 0+37.01 - SEE SHEET MS208 FOR FULL PROFILE
42. COGO POINT - M10 - STA.: 0+52.35 - SEE SHEET MS208 FOR FULL PROFILE
43. COGO POINT - O10 - STA.: 0+52.34 - SEE SHEET MS209 FOR FULL PROFILE
44. COGO POINT - N10 - STA.: 0+37.01 - SEE SHEET MS209 FOR FULL PROFILE
45. COGO POINT - W25 - STA.: 0+75.73 - SEE SHEET MS203 FOR FULL PROFILE
46. COGO POINT - P4 - STA.: 0+03.23 - SEE SHEETS MS210 AND MS211 FOR FULL PROFILE
47. COGO POINT - Q4 - STA.: 0+03.23 - SEE SHEETS MS212 AND MS213 FOR FULL PROFILE
48. 2"x3" STAINLESS STEEL INCREASER FITTING
49. 100GPM FLOW RESTRICTING ORIFICE PLATE

A1 FILTER SHELTER ENLARGED SITE PLAN
SCALE: 1" = 1'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

DESIGNED BY: M. PETERSON
DRAWN BY: M. PETERSON
CHECKED BY: D. SCHEUFFELE
SUBMITTED BY: D. SCHEUFFELE
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:
FILE NUMBER:
FILE NAME: BUCO00102MS403.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

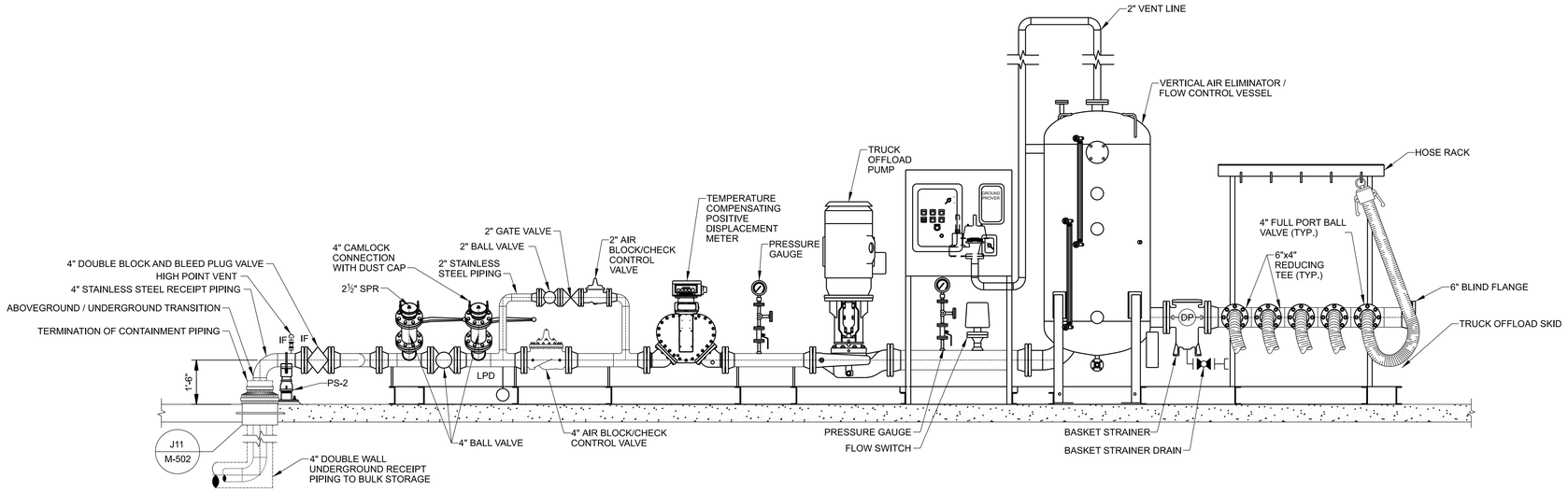
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

FILTER SHELTER
ENLARGED SITE PLAN

SHEET ID
MS404

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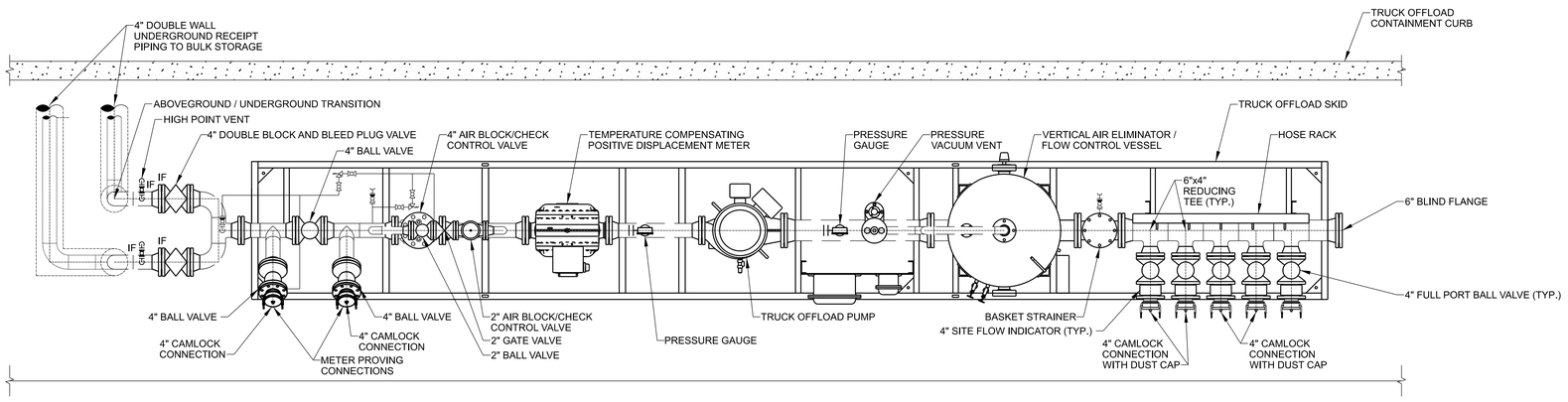
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H1 TRUCK OFFLOAD PROFILE VIEW

SCALE: NO SCALE

AIR BLOCK / CHECK VALVE				
CONDITION	4" VALVE ACTION	2" VALVE ACTION	SOLENOID 'A'	SOLENOID 'B'
LOW LEVEL SENSOR IN FUEL	CLOSED	DE-ENERGIZED OPEN 75 GPM	DE- ENERGIZED	DE- ENERGIZED
MIDDLE LEVEL SENSOR IN FUEL	HALF OPEN 150 GPM	ENERGIZED CLOSED	DE- ENERGIZED	ENERGIZED
HIGH LEVEL SENSOR IN FUEL	MOST OPEN 300 GPM	ENERGIZED CLOSED	ENERGIZED	ENERGIZED



A1 TRUCK OFFLOAD PLAN VIEW

SCALE: NO SCALE

GENERAL SHEET NOTES

1. SEE M-001 FOR GENERAL NOTES, LEGEND, AND ABBREVIATION.
2. PUMP SUCTION PG RANGE SHALL BE -30 TO 60 IN Hg/PSIG. PUMP DISCHARGE PG RANGE SHALL BE 0-300 PSIG
3. OFFLOAD HOSE SHALL MAINTAIN FLEXIBILITY IN FREEZING CONDITIONS
4. SEE SHEET M-601 FOR SCHEDULES.
5. SEE SHEETS M-505, M-506 AND M-507 FOR DOUBLE WALL PIPING INFORMATION AND DETAILS
6. SEE SHEET M-502 FOR FUEL PIPE CONCRETE PENETRATION DETAIL
7. ALL ABOVEGROUND PIPING SHALL BE STAINLESS STEEL.
8. ALL UNDERGROUND PIPING SHALL FOLLOW DETAIL B1 ON SHEET M-505.

SEQUENCE OF OPERATION

THE TRUCK OFFLOAD SYSTEM SKID IS SETUP TO OFFLOAD ONE TRUCK WITH ONE OFFLOAD PUMP. OFFLOAD PUMP (OP-1) IS LOCATED AT TRUCK OFFLOAD NO.1. A START BUTTON IS LOCATED AT THE OFFLOAD STATION.

TO INITIATE A TRUCK OFFLOAD, AN OPERATOR CONNECTS AN OFFLOAD HOSE TO EACH TRUCK COMPARTMENT CONNECTION,OPENS EACH ASSOCIATED COUPLER AND BALL VALVE. FUEL WILL FLOW TO THE AIR ELIMINATOR TANK. WHEN THE LOWER LEVEL SENSOR IS COVERED BY FUEL AND THE START BUTTON IS PUSHED, THE PUMP WILL BE ALLOWED TO START.

AS LONG AS THE LOWER LEVEL SENSOR IS COVERED WITH FUEL, THE PUMP WILL CONTINUE TO RUN. IF FUEL LEVEL DROPS BELOW THE LOWER LEVEL SENSOR, THE CONTROL SYSTEM WILL STOP THE PUMP.

WHILE THE PUMP IS RUNNING, IF ONLY THE LOWER LEVEL SENSOR IS COVERED WITH FUEL THE 2" AIR BLOCK/CHECK VALVE IN THE DISCHARGE LINE WILL BE OPEN TO CONTROL THE FLOW AT 75 GPM. THE 4" AIR BLOCK/CHECK VALVE WILL REMAIN CLOSED.

IF THE FUEL LEVEL IN THE AIR ELIMINATOR TANK RISES AND THE MIDDLE LEVEL SENSOR IS COVERED BY FUEL, SOLENOID "B" WILL BE ENERGIZED ON THE 4" AIR BLOCK/CHECK VALVE, AND THE 4" VALVE WILL OPEN TO CONTROL THE FLOW AT 150 GPM, THE 2" AIR BLOCK/CHECK VALVE WILL BE ENERGIZED TO CLOSE.

IF THE FUEL LEVEL IN THE AIR ELIMINATOR TANK DROPS BELOW THE MIDDLE LEVEL SENSOR, SOLENOID "B" WILL BE DE-ENERGIZED ON THE 4" AIR BLOCK/CHECK VALVE, AND THE VALVE WILL CLOSE, AND THE 2" AIR BLOCK/CHECK VALVE WILL OPEN TO CONTROL THE FLOW AT 75 GPM AS LONG AS THE LOWER LEVEL SENSOR IS COVERED BY FUEL.

IF THE FUEL LEVEL IN THE AIR ELIMINATOR TANK RISES AND THE UPPER LEVEL SENSOR IS COVERED BY FUEL, SOLENOID "A" WILL BE ENERGIZED ON THE 4" AIR BLOCK/CHECK VALVE, AND THE VALVE WILL THEN MODULATE TO CONTROL THE FLOW AT 300 GPM. THE 2" AIR BLOCK/CHECK VALVE WILL REMAIN CLOSED.

IF THE FUEL LEVEL IN THE AIR ELIMINATOR TANK DROPS BELOW THE UPPER LEVEL SENSOR, SOLENOID "A" WILL BE DE-ENERGIZED ON THE 4" AIR BLOCK / CHECK VALVE, AND THE VALVE WILL THEN MODULATE TO CONTROL THE FLOW AT 150 GPM AS LONG AS THE LOWER AND THE MIDDLE LEVEL SENSORS ARE COVERED BY FUEL.

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1	AM #0003 - GENERAL REVISIONS	09/29/2025

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CONTRACT NO.:
FILE NUMBER:

DESIGNED BY: M. PETERSON
DRAWN BY: M. PETERSON
CHECKED BY: D. SCHEUFFELE
SUBMITTED BY: D. SCHEUFFELE
SIZE: ANSI D
FILENAME: BUCO00102MS502.dwg

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OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

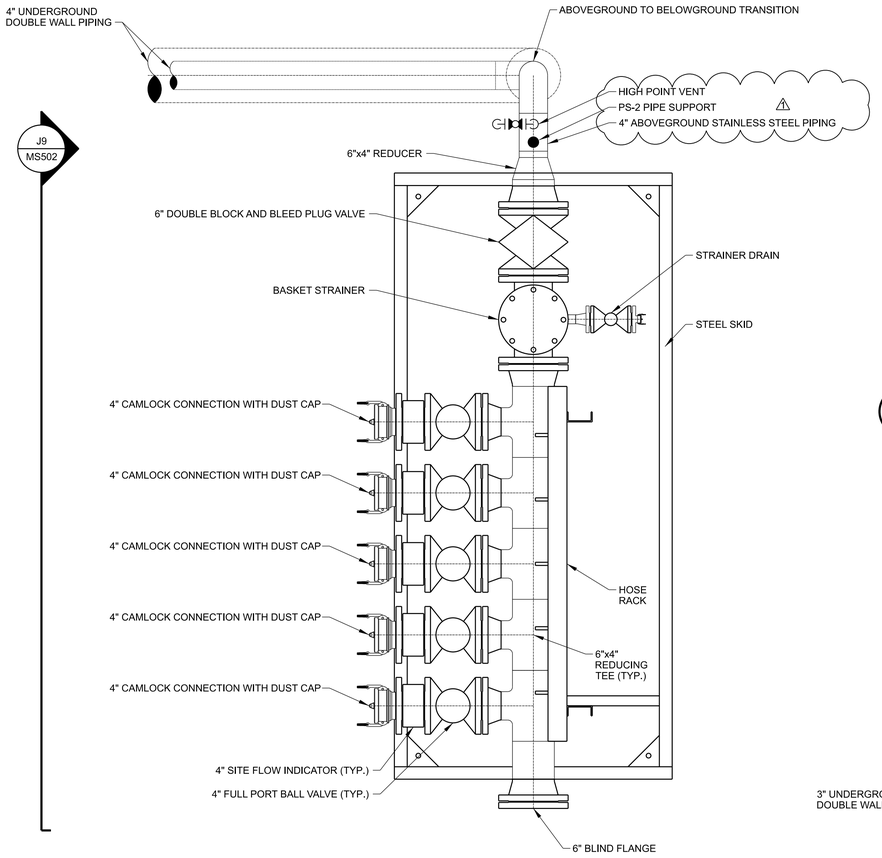
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

TRUCK OFFLOAD DETAILS

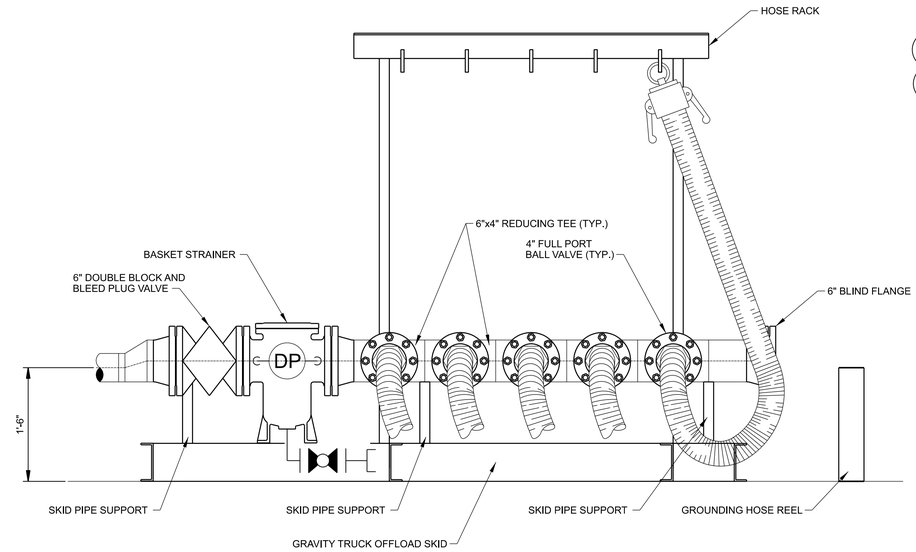
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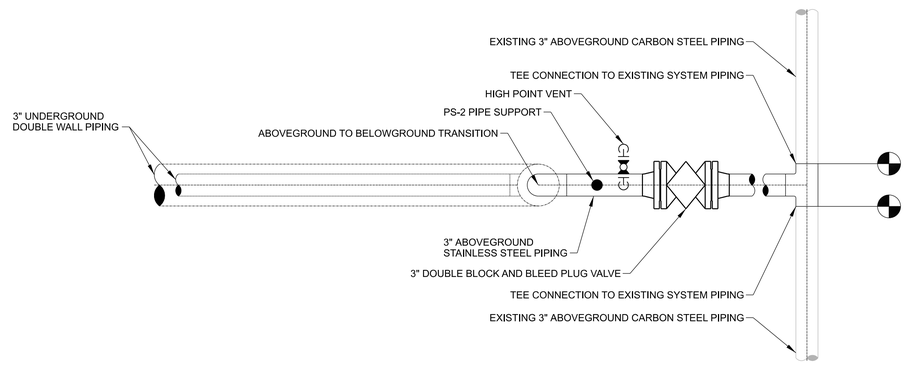
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A1 GRAVITY TRUCK OFFLOAD SKID
SCALE: NO SCALE



J9 GRAVITY TRUCK OFFLOAD SKID SECTION
SCALE: NO SCALE



A9 FUEL PIPING CONNECTION TO EXISTING SYSTEM
SCALE: NO SCALE

GENERAL SHEET NOTES

1. SEE M-001 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS
2. ALL PIPING SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED
3. SEE SHEETS M-505, M-506 AND M-507 FOR DOUBLE WALL PIPING INFORMATION AND DETAILS
4. SEE SHEET M-502 FOR FUEL PIPE CONCRETE PENETRATION DETAIL
5. ALL ABOVEGROUND PIPING SHALL BE STAINLESS STEEL.
6. ALL UNDERGROUND PIPING SHALL FOLLOW DETAIL B1 ON SHEET M-505. ⚠

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DRAWN BY:	M. PETERSON
CHECKED BY:	D. SCHEUFFELE
SUBMITTED BY:	D. SCHEUFFELE
SIZE:	ANSI D
FILE NAME:	BUCO00102MS502.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

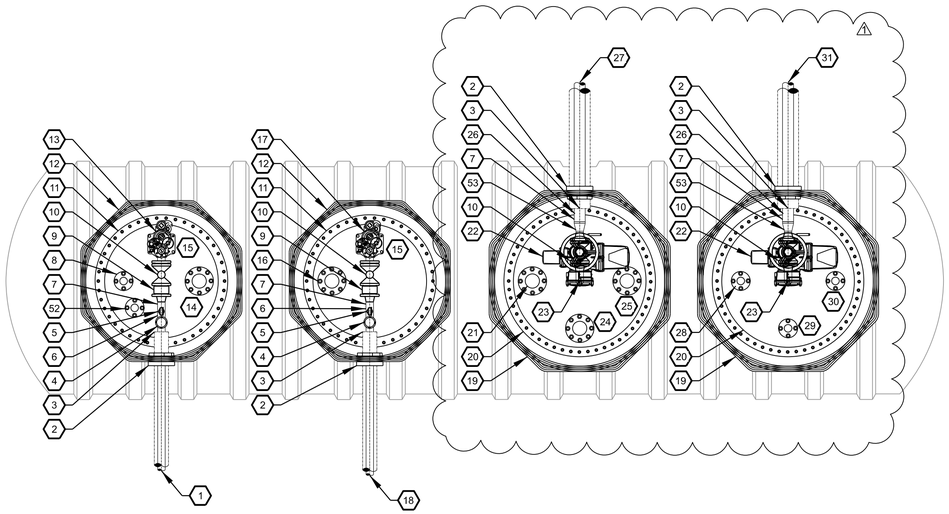
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

MECHANICAL FUELING SITE DETAILS

SHEET ID
MS502

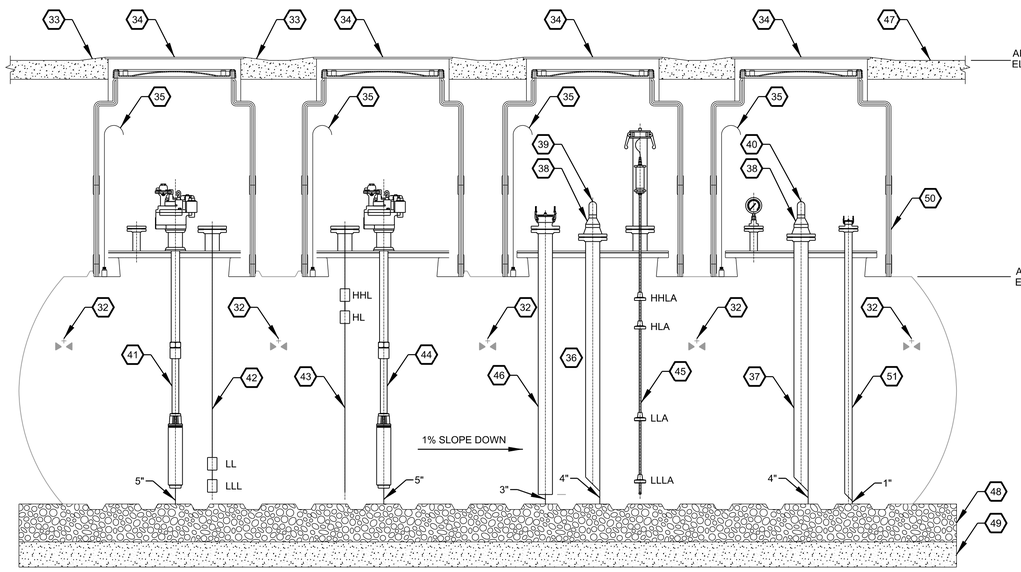
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H1 5,000 GALLON DOUBLE WALL UNDERGROUND FIBERGLASS STORAGE TANK FOR DIESEL (OT-001) - PLAN VIEW

SCALE: NO SCALE



A1 5,000 GALLON DOUBLE WALL UNDERGROUND FIBERGLASS STORAGE TANK FOR DIESEL (OT-001) - PROFILE VIEW

SCALE: NO SCALE

GENERAL SHEET NOTES

1. SEE M-001 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. PUMP SUCTION PG RANGE SHALL BE -30 TO 60 IN Hg/PSIG. PUMP DISCHARGE PG RANGE SHALL BE 0-300 PSIG.
3. SEE SHEET M-601 FOR TANK SCHEDULES
4. ALL PIPING SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED
5. SEE SHEET M-509 FOR TANK LEVEL ALARM DETAIL
6. EACH TANK WILL BE SLOPED DOWN TO THE WATER DRAW-OFF END AND THE TANK NOZZLES SHALL REMAIN PLUMB WITH ONE ANOTHER DESPITE TANK SLOPE
7. PROVIDE STRIKER PLATES BENEATH EACH TANK NOZZLE
8. ALL BOLTS, NUTS AND WASHERS SHALL BE STAINLESS STEEL
9. SEE SHEETS M-505, M-506 AND M-507 FOR DOUBLE WALL PIPING INFORMATION AND DETAILS

(XX) SHEET KEYNOTES

1. 2" DOUBLE WALL UNDERGROUND ISSUE PIPING TO DAY TANKS (VIA TRENCH)
2. TANK MANWAY SUMP BOOT SEAL
3. TERMINATION OF DOUBLE WALL PIPING
4. FLOW SWITCH
5. PRESSURE GAUGE
6. 2" STAINLESS STEEL UNDERGROUND ISSUE PIPING
7. LOW POINT DRAIN
8. 2" FLANGED TANK NOZZLE - PRIMARY VENT
9. 2" WAFER CHECK VALVE
10. 2" FLANGED BALL VALVE
11. 42" TANK MANWAY OPENING
12. 48" DOUBLE WALL FIBERGLASS TANK CONTAINMENT SUMP
13. 30GPM ISSUE PUMP (IP-O2)
14. 4" FLANGED TANK NOZZLE - LOW AND LOW-LOW LEVEL SWITCHES
15. 4" NPT TANK NOZZLE
16. 4" FLANGED TANK NOZZLE - HIGH AND HIGH-HIGH LEVEL SWITCHES
17. 30GPM ISSUE PUMP (IP-O1)
18. 2" DOUBLE WALL UNDERGROUND ISSUE PIPING TO DAY TANKS
19. 54" DOUBLE WALL FIBERGLASS TANK CONTAINMENT SUMP
20. 48" TANK MANWAY OPENING
21. 4" FLANGED TANK NOZZLE - TANK GAUGING
22. MOTORIZED VALVE ACTUATOR
23. 4" FLANGED TANK NOZZLE
24. 4" FLANGED TANK NOZZLE - SPARE
25. 4" FLANGED TANK NOZZLE - ATG
26. 2" STAINLESS STEEL UNDERGROUND RECEIPT PIPING
27. 3" DOUBLE WALL UNDERGROUND RECEIPT PIPING FROM BULK TANKS (ISSUE LINE NO.1)
28. 2" FLANGED TANK NOZZLE - CLOCK GAUGE
29. 2" FLANGED TANK NOZZLE - INTERSTITIAL MONITORING PORT
30. 2" FLANGED TANK NOZZLE - WATER DRAW-OFF
31. 3" DOUBLE WALL UNDERGROUND RECEIPT PIPING FROM BULK TANKS (ISSUE LINE NO.2)
32. TANK STRAPS SPACED PER MANUFACTURERS RECOMMENDATION
33. 1" -1½" SLOPE AROUND ALL TANK OPENINGS (TYP.)
34. 42" RAIN TIGHT STEEL MANWAY COVER
35. TANK SUMP LEAK DETECTION PROBE
36. 4" STAINLESS STEEL FILL LINE FROM RECEIPT LINE NO.1
37. 4" STAINLESS STEEL FILL LINE FROM RECEIPT LINE NO.2
38. 2"x4" INCREASER FITTING
39. 2" STAINLESS STEEL RECEIPT PIPING FROM RECEIPT LINE NO.1
40. 2" STAINLESS STEEL RECEIPT PIPING FROM RECEIPT LINE NO.2
41. 30GPM SUBMERSIBLE ISSUE PUMP (IP-O2) TO DAY TANKS
42. LOW AND LOW-LOW LEVEL SWITCHES
43. HIGH AND HIGH-HIGH LEVEL SWITCHES
44. 30GPM SUBMERSIBLE ISSUE PUMP (IP-O1)
46. 4" GAUGING PORT WITH DROP TUBE
47. 6" REINFORCED CONCRETE
48. 12" OF BEDDING MATERIAL BETWEEN TANK BOTTOM AND DEADMAN SLAB. BEDDING MATERIAL SHALL FOLLOW TANK MANUFACTURER RECOMMENDATION.
49. TANK DEADMAN SLAB
50. ALL TANK SUMPS SHALL HAVE A POLYGON SUMP BODY
51. 2" STAINLESS STEEL WATER DRAW-OFF PIPING
52. 2" FLANGED TANK NOZZLE WITH MALE CAMLOCK AND DUST CAP
53. 3"x2" STAINLESS STEEL REDUCER - FLAT SIDE UP

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U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

DESIGNED BY: M. PETERSON
DRAWN BY: M. PETERSON
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SUBMITTED BY: D. SCHEUFFELE
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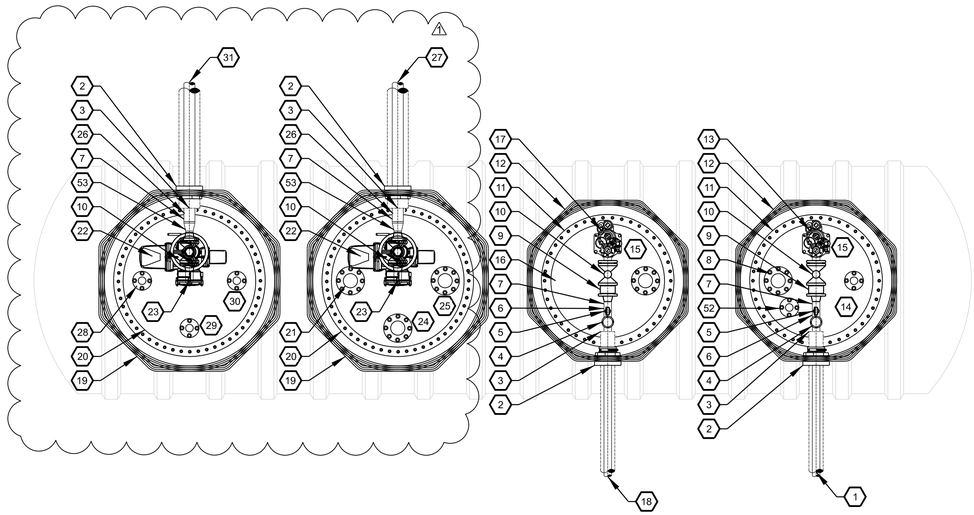
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

OT-001 DETAILS

SHEET ID
MS507

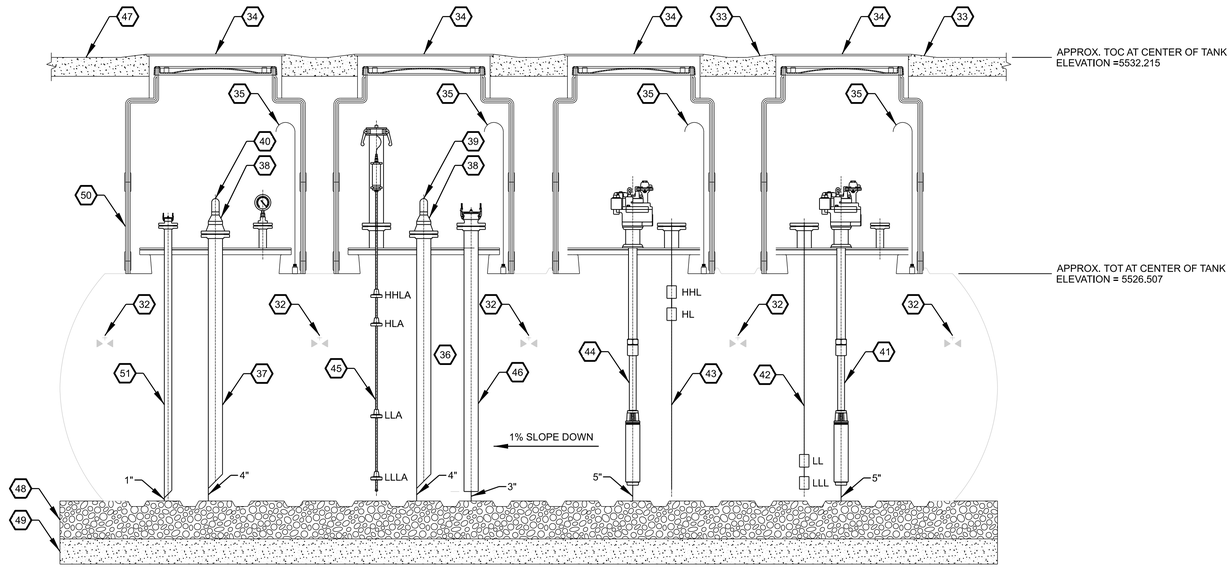
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H1 5,000 GALLON DOUBLE WALL UNDERGROUND FIBERGLASS STORAGE TANK FOR DIESEL (OT-002) - PLAN VIEW

SCALE: NO SCALE



A1 5,000 GALLON DOUBLE WALL UNDERGROUND FIBERGLASS STORAGE TANK FOR DIESEL (OT-002) - PROFILE VIEW

SCALE: NO SCALE

GENERAL SHEET NOTES

1. SEE M-001 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. PUMP SUCTION PG RANGE SHALL BE -30 TO 60 IN Hg/PSIG. PUMP DISCHARGE PG RANGE SHALL BE 0-300 PSIG.
3. SEE SHEET M-601 FOR TANK SCHEDULES
4. ALL PIPING SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED
5. SEE SHEET M-509 FOR TANK LEVEL ALARM DETAIL
6. EACH TANK WILL BE SLOPED DOWN TO THE WATER DRAW-OFF END AND THE TANK NOZZLES SHALL REMAIN PLUMB WITH ONE ANOTHER DESPITE TANK SLOPE
7. PROVIDE STRIKER PLATES BENEATH EACH TANK NOZZLE
8. ALL BOLTS, NUTS AND WASHERS SHALL BE STAINLESS STEEL
9. SEE SHEETS M-505, M-506 AND M-507 FOR DOUBLE WALL PIPING INFORMATION AND DETAILS

(XX) SHEET KEYNOTES

1. 2" DOUBLE WALL UNDERGROUND ISSUE PIPING TO DAY TANKS
2. TANK MANWAY SUMP BOOT SEAL
3. TERMINATION OF DOUBLE WALL PIPING
4. FLOW SWITCH
5. PRESSURE GAUGE
6. 2" STAINLESS STEEL UNDERGROUND ISSUE PIPING
7. LOW POINT DRAIN
8. 2" FLANGED TANK NOZZLE - PRIMARY VENT
9. 2" WAFER CHECK VALVE
10. 2" FLANGED BALL VALVE
11. 42" TANK MANWAY OPENING
12. 48" DOUBLE WALL FIBERGLASS TANK CONTAINMENT SUMP
13. 30GPM ISSUE PUMP (IP-O3)
14. 4" FLANGED TANK NOZZLE - LOW AND LOW-LOW LEVEL SWITCHES
15. 4" NPT TANK NOZZLE
16. 4" FLANGED TANK NOZZLE - HIGH AND HIGH-HIGH LEVEL SWITCHES
17. 30GPM ISSUE PUMP (IP-O4)
18. 2" DOUBLE WALL UNDERGROUND ISSUE PIPING TO DAY TANKS (VIA TRENCH)
19. 54" DOUBLE WALL FIBERGLASS TANK CONTAINMENT SUMP
20. 48" TANK MANWAY OPENING
21. 4" FLANGED TANK NOZZLE - TANK GAUGING
22. MOTORIZED VALVE ACTUATOR
23. 4" FLANGED TANK NOZZLE
24. 4" FLANGED TANK NOZZLE - SPARE
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27. 3" DOUBLE WALL UNDERGROUND RECEIPT PIPING FROM BULK TANKS (ISSUE LINE NO.2)
28. 2" FLANGED TANK NOZZLE - CLOCK GAUGE
29. 2" FLANGED TANK NOZZLE - INTERSTITIAL MONITORING PORT
30. 2" FLANGED TANK NOZZLE - WATER DRAW-OFF
31. 3" DOUBLE WALL UNDERGROUND RECEIPT PIPING FROM BULK TANKS (ISSUE LINE NO.1)
32. TANK STRAPS SPACED PER MANUFACTURERS RECOMMENDATION
33. 1" -1½" SLOPE AROUND ALL TANK OPENINGS (TYP.)
34. 42" RAIN TIGHT STEEL MANWAY COVER
35. TANK SUMP LEAK DETECTION PROBE
36. 4" STAINLESS STEEL FILL LINE FROM RECEIPT LINE NO.2
37. 4" STAINLESS STEEL FILL LINE FROM RECEIPT LINE NO.1
38. 2"x4" INCREASER FITTING
39. 2" STAINLESS STEEL RECEIPT PIPING FROM RECEIPT LINE NO.2
40. 2" STAINLESS STEEL RECEIPT PIPING FROM RECEIPT LINE NO.1
41. 30GPM SUBMERSIBLE ISSUE PUMP (IP-O3) TO DAY TANKS
42. LOW AND LOW-LOW LEVEL SWITCHES
43. HIGH AND HIGH-HIGH LEVEL SWITCHES
44. 30GPM SUBMERSIBLE ISSUE PUMP (IP-O4) TO DAY TANKS
45. AUTOMATIC TANK GAUGE
46. 4" GAUGING PORT WITH DROP TUBE
47. 6" REINFORCED CONCRETE
48. 12" OF BEDDING MATERIAL BETWEEN TANK BOTTOM AND DEADMAN SLAB. BEDDING MATERIAL SHALL FOLLOW TANK MANUFACTURER RECOMMENDATION.
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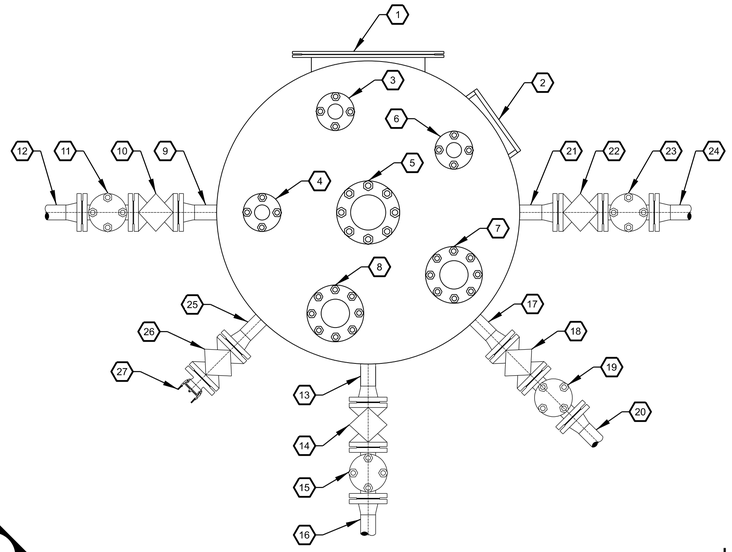
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

OT-002 DETAILS

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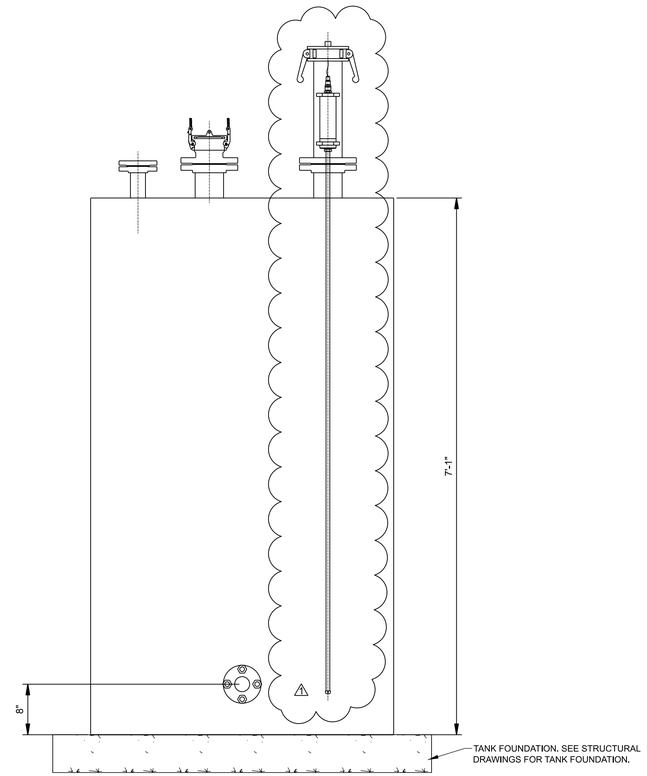
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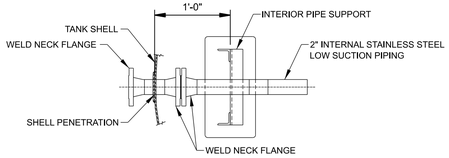


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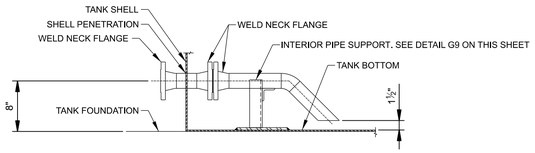
J1 660 GALLON DAY TANK (DT-001) - PLAN VIEW
SCALE: NO SCALE



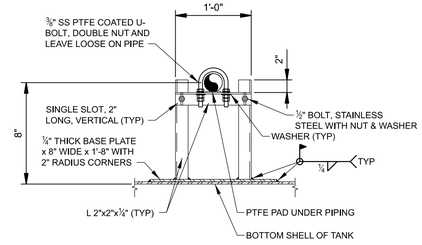
A1 660 GALLON DAY TANK (DT-001) - PROFILE VIEW
SCALE: NO SCALE



M9 LOW SUCTION TANK NOZZLE - PLAN VIEW
SCALE: NO SCALE



K9 LOW SUCTION TANK NOZZLE - PROFILE VIEW
SCALE: NO SCALE



G9 INTERIOR PIPE SUPPORT
SCALE: NO SCALE

GENERAL SHEET NOTES

1. SEE M-001 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. SEE SHEET M-601 FOR TANK SCHEDULES.
3. ALL PIPING SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED
4. SEE SHEET M-507 FOR TANK LEVEL ALARM DETAIL.
5. PROVIDE STRIKER PLATES BENEATH EACH TANK NOZZLE.
6. INTERNAL LOW SUCTION PIPING NOT SHOWN IN DAY TANK PLAN VIEW BUT IS SHOWN IN DETAILS M9, K9 AND G9 OF THIS SHEET.
7. ALL TANK NOZZLES ON THE EXTERIOR OF THE TANK SHALL BE 8" FROM BOTTOM OF TANK SHEEL OR TOP OF TANK FOUNDATION TO CENTERLINE OF NOZZLE. ALL EXTERIOR TANK NOZZLES SHALL BE 4" FROM EXTERIOR OF TANK SHEEL TO EDGE OF WELD NECK FLANGE.
8. TANK MANWAY SHALL BE 3'-6" FROM BOTTOM OF TANK SHELL TO MIDDLE OF MANWAY OPENING.
9. ALL TANK NOZZLES ON TOP OF TANK SHALL BE A MINIMUM OF 3" FROM EXTERIOR OF TANK SHELL TO EDGE OF WELD NECK FLANGE.
10. NOT ALL TANK NOZZLES ARE SHOWN IN DAY TANK PROFILE VIEW FOR CLARITY.

⟨XX⟩ SHEET KEYNOTES

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2. EXTERNAL LADDER WITH CAGE. DESIGNED BY THE TANK MANUFACTURER.
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21. 2" FLANGED TANK NOZZLE - GENERATOR RETURN LINE
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23. 2" FLANGED CHECK VALVE
24. 2" STAINLESS STEEL GENERATOR RETURN PIPING
25. 2" FLANGED TANK NOZZLE - LOW SUCTION
26. 2" FLANGED DOUBLE BLOCK AND BLEED PLUG VALVE
27. 2" STAINLESS STEEL CAMLOCK WITH DUST CAP
28. SEE THIS SHEET FOR LOW SUCTION PIPING DETAILS

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1	AM #0003 - GENERAL REVISIONS	09/29/2025

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DESIGNED BY: M. PETERSON
DRAWN BY: M. PETERSON
CHECKED BY: D. SCHEUFFELE
SUBMITTED BY: D. SCHEUFFELE
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:
FILE NUMBER:
FILE NAME: BUCO00102MS502.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

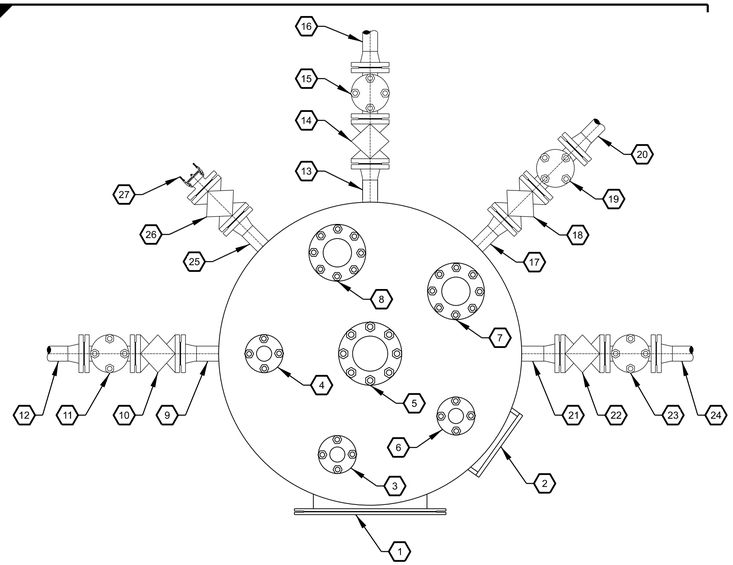
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

DT-001 DETAILS

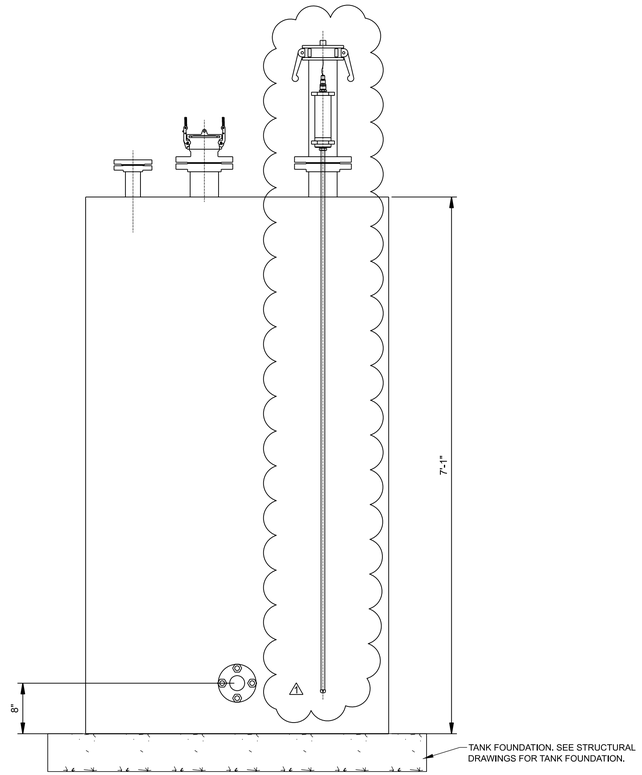
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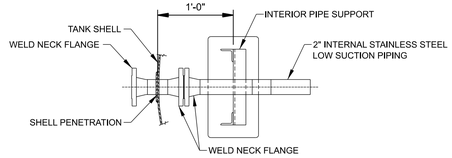
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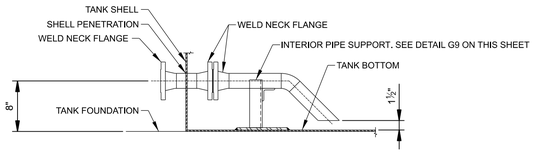
J1 660 GALLON DAY TANK (DT-002) - PLAN VIEW
SCALE: NO SCALE



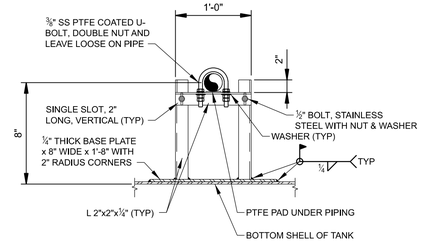
A1 660 GALLON DAY TANK (DT-002) - PROFILE VIEW
SCALE: NO SCALE



M9 LOW SUCTION TANK NOZZLE - PLAN VIEW
SCALE: NO SCALE



K9 LOW SUCTION TANK NOZZLE - PROFILE VIEW
SCALE: NO SCALE



G9 INTERIOR PIPE SUPPORT
SCALE: NO SCALE

GENERAL SHEET NOTES

1. SEE M-001 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. SEE SHEET M-601 FOR TANK SCHEDULES.
3. ALL PIPING SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED
4. SEE SHEET M-507 FOR TANK LEVEL ALARM DETAIL.
5. PROVIDE STRIKER PLATES BENEATH EACH TANK NOZZLE.
6. INTERNAL LOW SUCTION PIPING NOT SHOWN IN DAY TANK PLAN VIEW BUT IS SHOWN IN DETAILS M9, K9 AND G9 OF THIS SHEET.
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28. SEE THIS SHEET FOR LOW SUCTION PIPING DETAILS

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1	AM #0003 - GENERAL REVISIONS	09/29/2025

DESIGNED BY: M. PETERSON
DRAWN BY: M. PETERSON
CHECKED BY: D. SCHEUFFELE
SUBMITTED BY: D. SCHEUFFELE
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:
FILE NUMBER:
FILE NAME: BUCO00102MS502.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

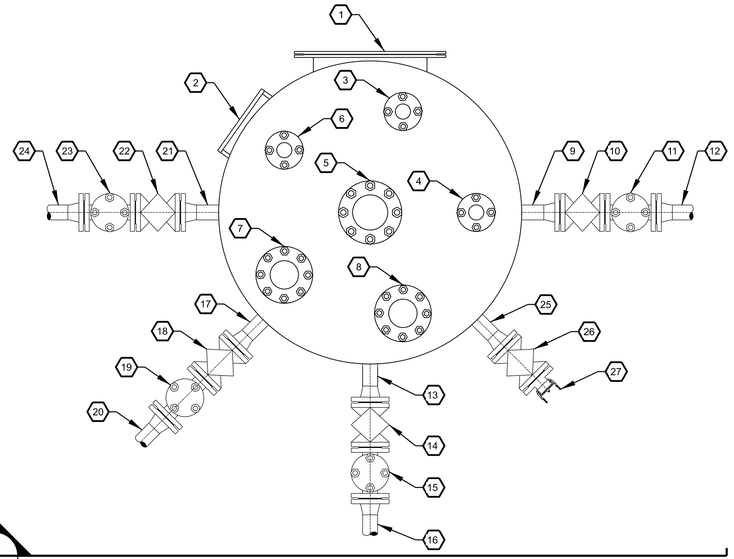
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DT-002 DETAILS

SHEET ID
MS510

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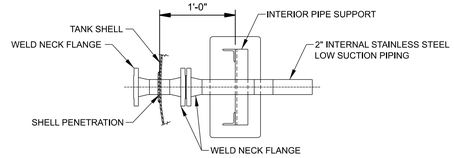
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MS511

J1 660 GALLON DAY TANK (DT-003) - PLAN VIEW

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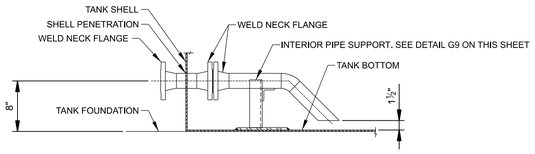
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SCALE: NO SCALE



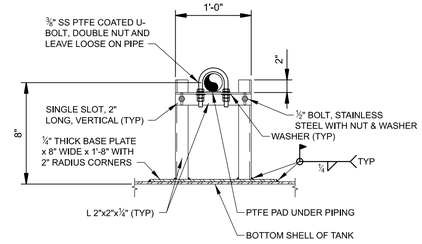
M9 LOW SUCTION TANK NOZZLE - PLAN VIEW

SCALE: NO SCALE



K9 LOW SUCTION TANK NOZZLE - PROFILE VIEW

SCALE: NO SCALE



G9 INTERIOR PIPE SUPPORT

SCALE: NO SCALE

GENERAL SHEET NOTES

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SUBMITTED BY: D. SCHEUFFELE
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FILE NAME: BUCO00102MS502.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

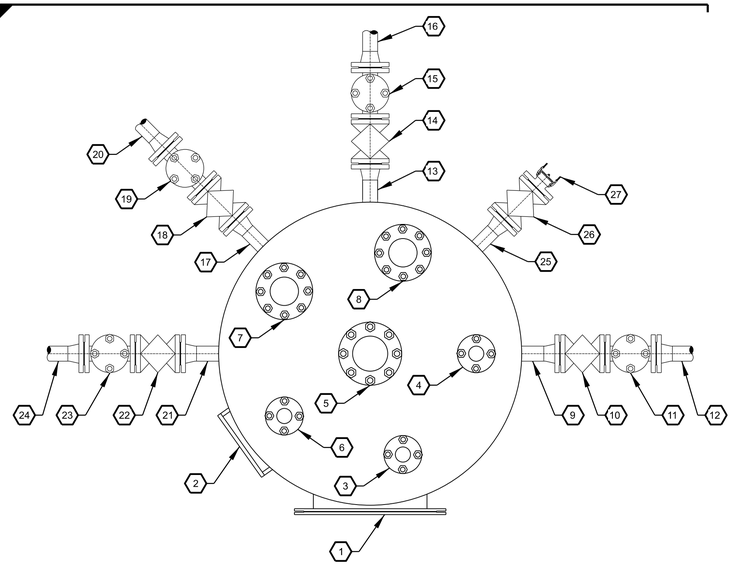
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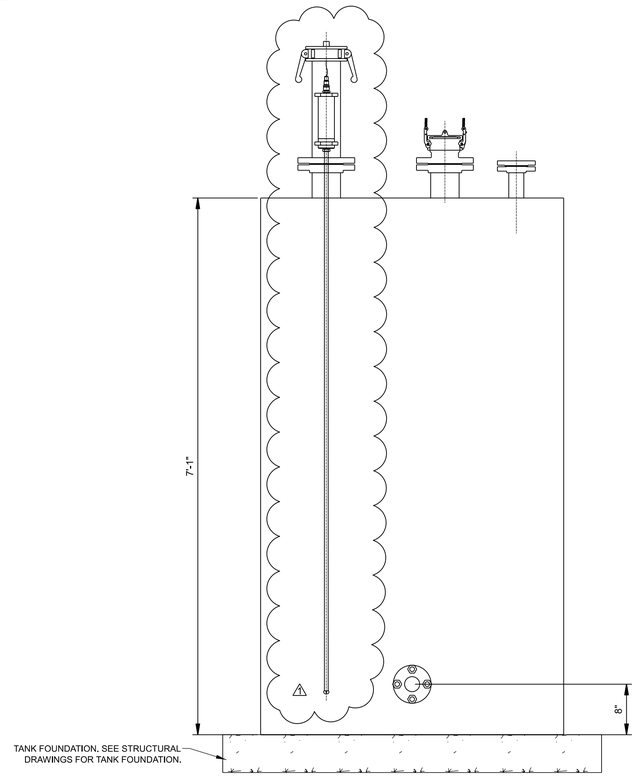
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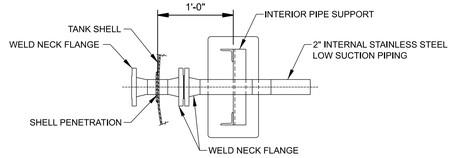
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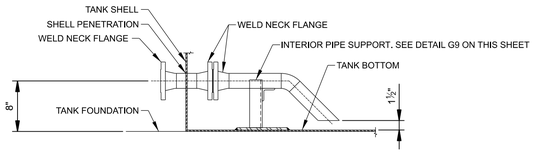
J1 660 GALLON DAY TANK (DT-004) - PLAN VIEW
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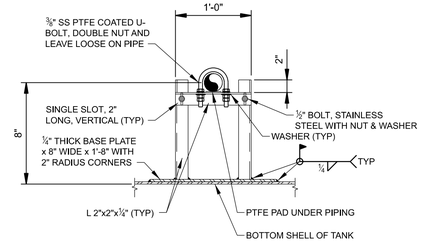
A1 660 GALLON DAY TANK (DT-004) - PROFILE VIEW
SCALE: NO SCALE



M9 LOW SUCTION TANK NOZZLE - PLAN VIEW
SCALE: NO SCALE



K9 LOW SUCTION TANK NOZZLE - PROFILE VIEW
SCALE: NO SCALE



G9 INTERIOR PIPE SUPPORT
SCALE: NO SCALE

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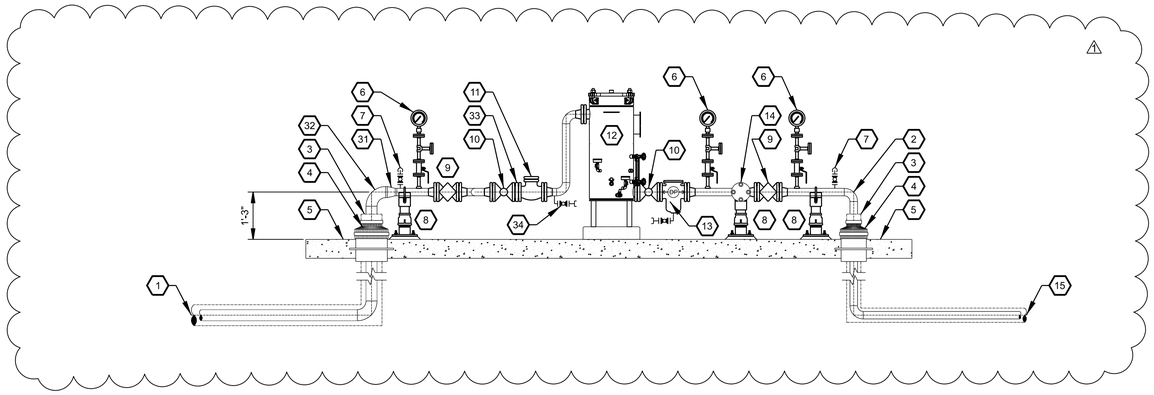
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

DT-004 DETAILS

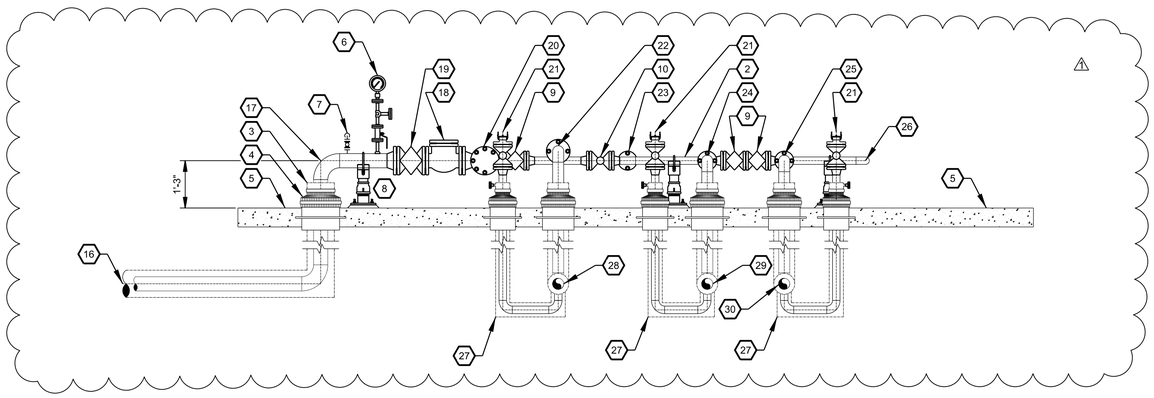
SHEET ID
MS512

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H1 FILTER SHELTER - PROFILE VIEW
SCALE: NO SCALE



A1 FILTER SHELTER - PROFILE VIEW
SCALE: NO SCALE

GENERAL SHEET NOTES

1. SEE M-001 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. ALL PIPING SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED.
3. 6" CURBING NOT SHOW IN PROFILE VIEWS
4. PRESSURE RELIEF PIPING NOT SHOWN IN PROFILE VIEWS

(XX) SHEET KEYNOTES

1. 3" DOUBLE WALL UNDERGROUND ISSUE PIPING FROM BULK STORAGE TANKS TO OPERATIONAL STORAGE TANKS
2. 2" STAINLESS STEEL PIPING
3. TERMINATION OF DOUBLE WALL PIPING
4. ABOVEGROUND / UNDERGROUND TRANSITION
5. 6" REINFORCED CONCRETE - FILTER SHELTER CONTAINMENT PAD
6. PRESSURE GAUGE
7. HIGH POINT VENT
8. PS-2 PIPE SUPPORT
9. 2" FLANGED DOUBLE BLOCK AND BLEED PLUG VALVE
10. 2" FLANGED BALL VALVE
11. 2" FLANGED CHECK VALVE
12. 100 GPM ISSUE FILTER SEPARATOR NO.2
13. 2" FLANGED BASKET STRAINER
14. 2" STAINLESS STEEL ISSUE HEADER
15. 2" DOUBLE WALL UNDERGROUND ISSUE PIPING FROM BT-003
16. 4" DOUBLE WALL RECEIPT LINE NO.2 - FROM TRUCK OFFLOAD
17. 4" STAINLESS STEEL PIPING
18. 4" FLANGED CHECK VALVE
19. 4" FLANGED DOUBLE BLOCK AND BLEED PLUG VALVE
20. 4" STAINLESS STEEL RECEIPT HEADER
21. LOW POINT DRAIN (SEE DETAIL B9 ON SHEET M-506)
22. 3" STAINLESS STEEL TRANSFER LINE - TO/FROM EXISTING FUEL SYSTEM
23. 2" STAINLESS STEEL ISSUE LINE FROM FILTER SEPARATOR NO.1
24. 3" STAINLESS STEEL TRANSFER LINE NO.1 - TO OPERATIONAL STORAGE TANKS
25. 3" STAINLESS STEEL TRANSFER LINE NO.2 - TO OPERATIONAL STORAGE TANKS
26. 2" STAINLESS STEEL ISSUE LINE FROM FILTER SEPARATOR NO.2
27. 2" DOUBLE WALL LOW POINT DRAIN PIPING
28. 3" DOUBLE WALL TRANSFER LINE - TO/FROM EXISTING FUEL SYSTEM
29. 3" DOUBLE WALL TRANSFER LINE NO.1 - TO OPERATIONAL STORAGE TANKS
30. 3" DOUBLE WALL TRANSFER LINE NO.2 - TO OPERATIONAL STORAGE TANKS
31. 2"x3" STAINLESS STEEL INCREASER
32. 3" STAINLESS STEEL PIPING
33. 100GPM FLOW RESTRICTING ORIFICE PLATE
34. LOW POINT DRAIN

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MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

DESIGNED BY:	M. PETERSON
DRAWN BY:	M. PETERSON
CHECKED BY:	D. SCHEUFFELE
SUBMITTED BY:	D. SCHEUFFELE
SIZE:	ANSI D
ISSUE DATE:	05/01/2025
SOLICITATION NO.:	W9128F25RA043
CONTRACT NO.:	
FILE NUMBER:	
FILE NAME:	BUCO00102MS502.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

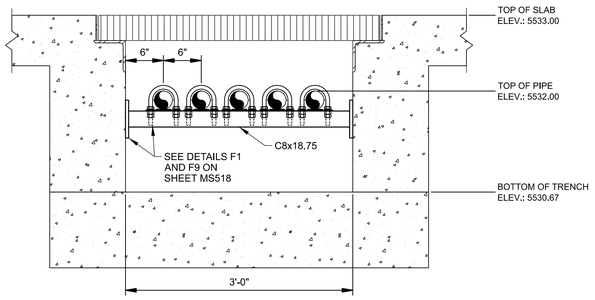
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

FILTER SHELTER PROFILE VIEWS
SHEET 1 OF 2

SHEET ID
MS514

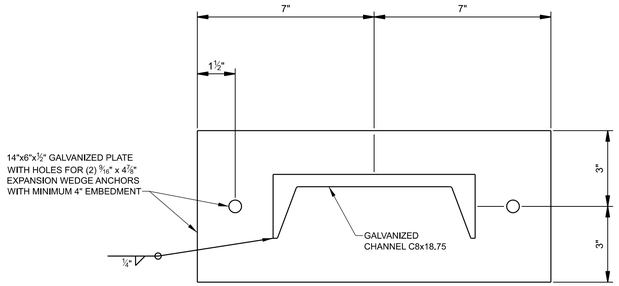
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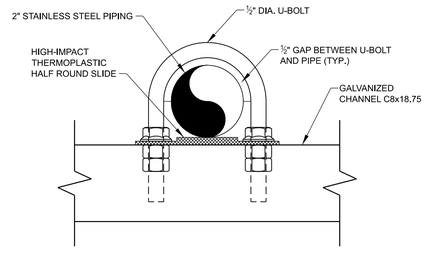
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K1 FUEL TRENCH PIPE SUPPORT DETAIL

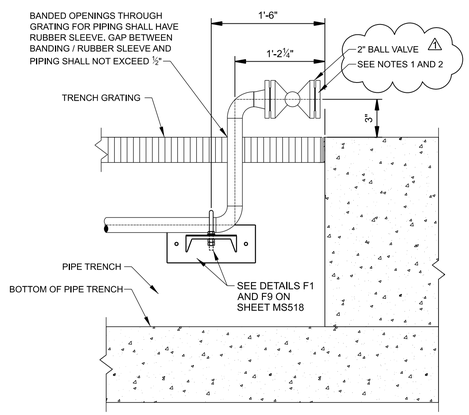
SCALE: NO SCALE





F1 TRENCH PIPE SUPPORT CHANNEL CONNECTION DETAIL

SCALE: NO SCALE



A1 END OF TRENCH PIPE SUPPORT DETAIL

SCALE: NO SCALE

NOTES:
1. MANUFACTURER RECOMMENDED FLEXIBLE HOSE SHALL CONNECT THE GENERATOR ISSUE FUEL PORT TO THE DOWNSTREAM FLANGED SIDE OF BALL VALVE THAT IS ASSOCIATED WITH ITS CORRESPONDING DAY TANKS ISSUE PIPING WHERE THE BLIND FLANGE CURRENTLY RESIDES.
2. MANUFACTURER RECOMMENDED FLEXIBLE HOSE SHALL CONNECT THE GENERATOR RETURN FUEL PORT TO THE DOWNSTREAM FLANGED SIDE OF BALL VALVE THAT IS ASSOCIATED WITH ITS CORRESPONDING DAY TANKS RETURN PIPING WHERE THE BLIND FLANGE CURRENTLY RESIDES.

F9 FUEL TRENCH PIPE SUPPORT CONNECTION DETAIL

SCALE: NO SCALE

NOTES:
1. PROVIDE U-BOLT WITH SEAMLESS NON-METALLIC LOW FRICTION COATING.
2. PROVIDE DOUBLE NUT ON BOTTOM OF U-BOLT.

GENERAL SHEET NOTES

1. SEE M-001 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS
2. ALL PIPING SHALL BE STAINLESS STEEL UNLESS OTHERWISE NOTED
3. SEE SHEET S-109 FOR PIPE TRENCH LAYOUT AND DETAILS
4. SEE SHEET S-519 FOR TRENCH AND GRATING DETAILS

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DESIGNED BY: M. PETERSON
DRAWN BY: M. PETERSON
CHECKED BY: D. SCHEUFFELE
SUBMITTED BY: D. SCHEUFFELE
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:
FILE NUMBER:
FILE NAME: BUCO00102MS501.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
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GENERATOR BUILDING
TRENCH DETAILS
SHEET 2 OF 2

SHEET ID
MS518

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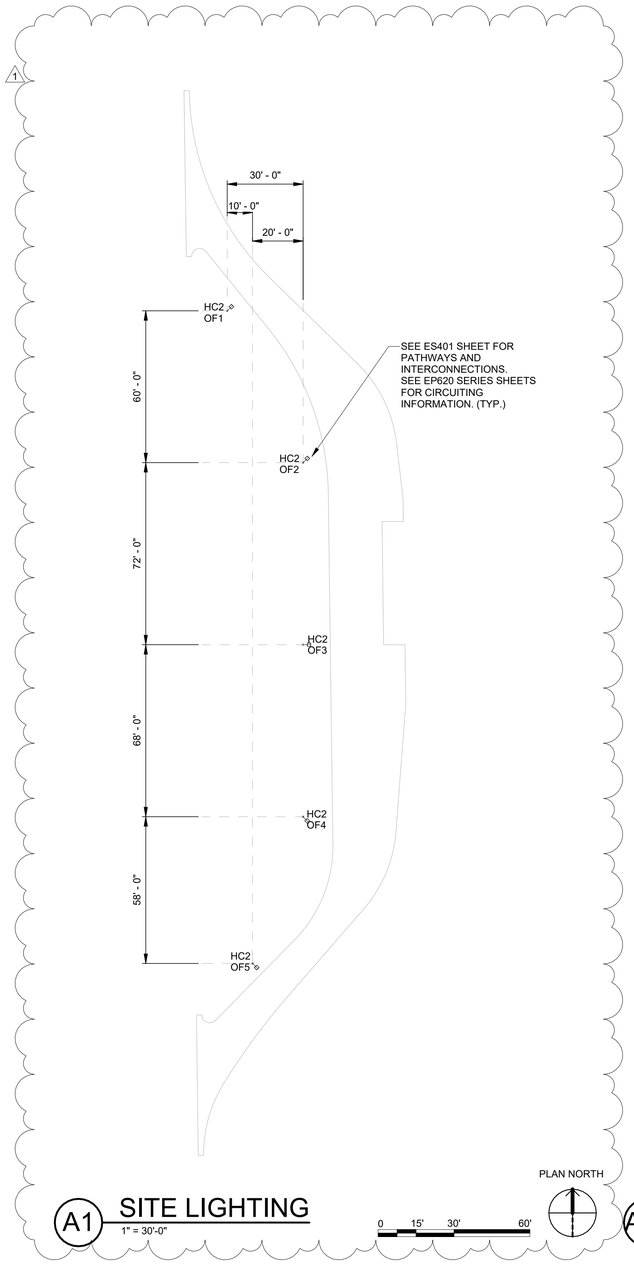
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LUMINAIRE SCHEDULE - SITE

LUMINAIRE SYMBOL	QUANTITY NORM	QUANTITY EMER	FIO LLF	TYPE	WATTS	QTY	CCT	MIN. CRI	MAXIMUM POWER	MINIMUM FLUX	VOLTS	MOUNTING	DESCRIPTION	REMARKS
HC2	5	0	0.7	LED	80 W	1	4000 K	70	80 W	9000 lm	277 V	Pole	Pole Mount Luminaire	TYPE III DISTRIBUTION. B4U0G2 MAX BUG RATING.

GENERAL LIGHTING NOTES:
1. QUANTITY PROVIDED FOR INFORMATION ONLY. CONFIRM LUMINAIRE COUNTS ON THE EL SERIES SHEETS.
2. LAMP/FIXTURE LUMEN OUTPUT, DRIVER INPUT WATTAGE, AND DRIVER FACTOR NOT INDICATED ON THIS SCHEDULE MUST COMPLY WITH SPECIFICATION SECTION 26 51 00: INTERIOR LIGHTING.
3. ALL FIXTURES, LAMPS, AND DRIVERS MUST BE RATED FOR STARTING AT ZERO DEGREES FAHRENHEIT UNLESS OTHERWISE NOTED.
4. ALL DRIVERS INCLUDING EMERGENCY DRIVERS MUST BE INTEGRAL TO THE FIXTURE AND SHALL BE FACTORY INSTALLED UNLESS OTHERWISE NOTED.
5. ALL FIXTURES SHALL BE FACTORY PREWIRED WITH HIGH TEMPERATURE WIRE, AND MUST BE COMPLETELY ASSEMBLED AND TESTED PRIOR TO SHIPMENT.
6. FIXTURES MUST BE COMPATIBLE WITH THE CEILING TYPE IN WHICH THEY ARE INSTALLED. RECESSED FIXTURES INSTALLED IN PLASTER CEILINGS MUST INCLUDE PLASTER FRAMES.
7. INDUSTRIAL AND STRIP FIXTURES MOUNTED IN ATTIC SPACES, MECHANICAL/ELECTRICAL ROOMS AND SIMILAR UTILITY EQUIPMENT SPACES MUST BE CHAIN MOUNTED UNLESS OTHERWISE INDICATED AND SHALL BE LOCATED IN CONSULTATION WITH THE CONTRACTING OFFICER'S REPRESENTATIVE TO AVOID INTERFERENCE WITH OR BY OTHER EQUIPMENT.
8. ALL REFERENCES TO SPACING AND MOUNTING HEIGHTS ARE MEASURED FROM THE FIXTURE CENTERLINE UNLESS OTHERWISE NOTED.
9. ALL EMERGENCY AND EXIT FIXTURES MUST BE SELF-TESTING, SELF-DIAGNOSTIC TYPE.
10. DRIVERS LISTED IN LIGHTING FIXTURE SCHEDULES ARE BASED ON 0-10V CONTROL. SHOULD AN ALTERNATIVE CONTROL SYSTEM BE PROVIDED, CONTRACTOR SHALL PROVIDE BALLASTS AND DRIVERS COMPATIBLE WITH THE ALTERNATIVE CONTROL SYSTEM AT NO ADDITIONAL COST TO THE GOVERNMENT.

LEGEND
FIXTURE SYMBOL: THE BASE MARK/TAG SHOWN ON THE PLANS.
FIO LLF: THE LIGHT LOSS FACTOR USED FOR PHOTOMETRIC CALCULATION PURPOSES (FOR INFORMATION ONLY).
LIGHT SOURCE-TYPE: LIGHT SOURCE TECHNOLOGY.
LIGHT SOURCE-WATTS: THE WATTAGE FOR A SINGLE LAMP. WHERE LED IS INDICATED AND THE "LAMPS-QTY" IS 1, THIS VALUE INDICATES THE INPUT POWER FOR THE FIXTURE AS A WHOLE.
LIGHT SOURCE-QTY: THE QUANTITY OF LAMPS IN A SINGLE FIXTURE.
LIGHT SOURCE-CCT: THE NOMINAL CORRELATED COLOR TEMPERATURE OF THE LIGHT SOURCE. SEE SECTIONS 26 51 00 AND 26 56 00 FOR THE "NOMINAL" TOLERANCE.
LIGHT SOURCE-CRI: THE MINIMUM COLOR RENDERING INDEX VALUE OF THE LIGHT SOURCE.
PERFORM. CONSTRAINTS-MAX. POWER: MAXIMUM INPUT POWER FOR A FIXTURE OF A GIVEN SYMBOL.
PERFORM. CONSTRAINTS-MIN. FLUX: MINIMUM INITIAL OUTPUT FLUX FOR A FIXTURE OF A GIVEN SYMBOL.
MIN. EM BATT. INITIAL FLUX: MINIMUM INITIAL OUTPUT FLUX FOR THE DISTRIBUTED EMERGENCY BATTERY OPERATION (SUCH AS EMERGENCY BALLAST OR DRIVER) FOR A FIXTURE OF A GIVEN SYMBOL.
VOLTS: INPUT VOLTAGE FOR A FIXTURE OF A GIVEN SYMBOL.
MOUNTING: MOUNTING TECHNIQUE FOR A FIXTURE OF A GIVEN SYMBOL, UNLESS OTHERWISE NOTED.
MAX. DEPTH: MAXIMUM PERMISSIBLE FIXTURE DEPTH FROM BOTTOM OF FIXTURE TO TOP OF FIXTURE AS INSTALLED.
DESCRIPTION: GENERIC TYPE OF HOUSING, CHARACTERISTICS, AND/OR LIGHT DISTRIBUTION FOR A FIXTURE OF A GIVEN SYMBOL.
REMARKS: ADDITIONAL CHARACTERISTICS CONVEYING FIXTURE REQUIREMENTS FOR A FIXTURE OF A GIVEN SYMBOL.



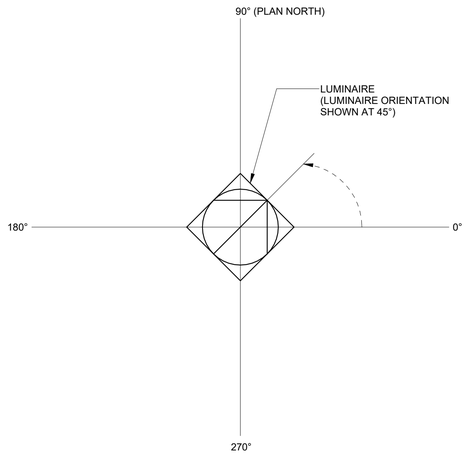
A1 SITE LIGHTING
1" = 30'-0"

EXTERIOR LUMINAIRE AIMING SCHEDULE

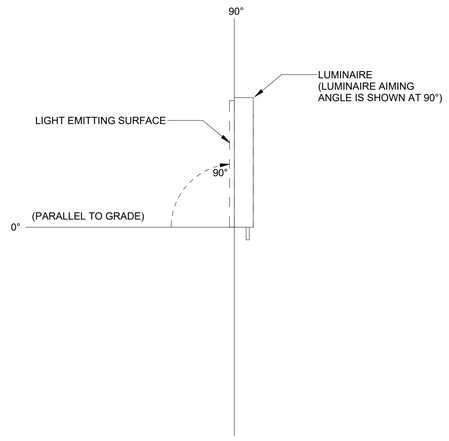
LUMINAIRE SYMBOL	LUMINAIRE IDENTIFICATION	LIGHT POLE IDENTIFICATION	LIGHT POLE HEIGHT	ORIENTATION (DEGREES)	TILT (DEGREES)
HC2	OF1	OF1	18'-0"	45	0
HC2	OF2	OF2	18'-0"	45	0
HC2	OF3	OF3	18'-0"	0	0
HC2	OF4	OF4	18'-0"	315	0
HC2	OF5	OF5	18'-0"	315	0

LEGEND
LUMINAIRE SYMBOL: THE BASE MARK/TAG SHOWN ON THE PLANS. SEE LUMINAIRE SCHEDULE - SITE.
LUMINAIRE IDENTIFICATION: THE UNIQUE IDENTIFIER FOR THE LUMINAIRE INSTANCE ON PLANS.
LIGHT POLE IDENTIFICATION: THE UNIQUE IDENTIFIER FOR THE LIGHT POLE INSTANCE ON PLANS.
LIGHT POLE HEIGHT: THE SPECIFIC POLE HEIGHT AND MOUNTING HEIGHT FOR THE LUMINAIRE OF A LIGHT POLE.
ORIENTATION (DEGREES): DEGREES ROTATED COUNTERCLOCKWISE FROM PLAN EAST.
TILT (DEGREES): ANGLE IN RELATION TO GROUND.

EXTERIOR LIGHTING CONTROLS
1. AUTO ON AT DUSK VIA PHOTOSENSOR.
2. AUTO OFF AT DAWN VIA PHOTOSENSOR.
3. HAND AND OFF FUNCTIONS OF HOA SWITCH TO OVERRIDE AUTO FUNCTIONS. HAND SHALL ENERGIZE LUMINARIES TO 100% OUTPUT.



A11 LUMINAIRE AIMING HORIZONTAL ORIENTATION
SCALE: NTS



A16 LUMINAIRE AIMING VERTICAL TILT
SCALE: NTS

FOR SUPPLEMENTAL LEGEND, GENERAL NOTES, AND KEYNOTES, SEE SHEET EL001.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

File Path: C:\Users\jfeddesen\Documents\BUCO00102_DM_ME_jfeddesen.rvt

DESIGNED BY: E.MCNAMARA
DRAWN BY: E.MCNAMARA
CHECKED BY: B.ADKINS
SUBMITTED BY: J.HROSKA
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:
FILE NAME: BUCO00102_DM_ME.rvt
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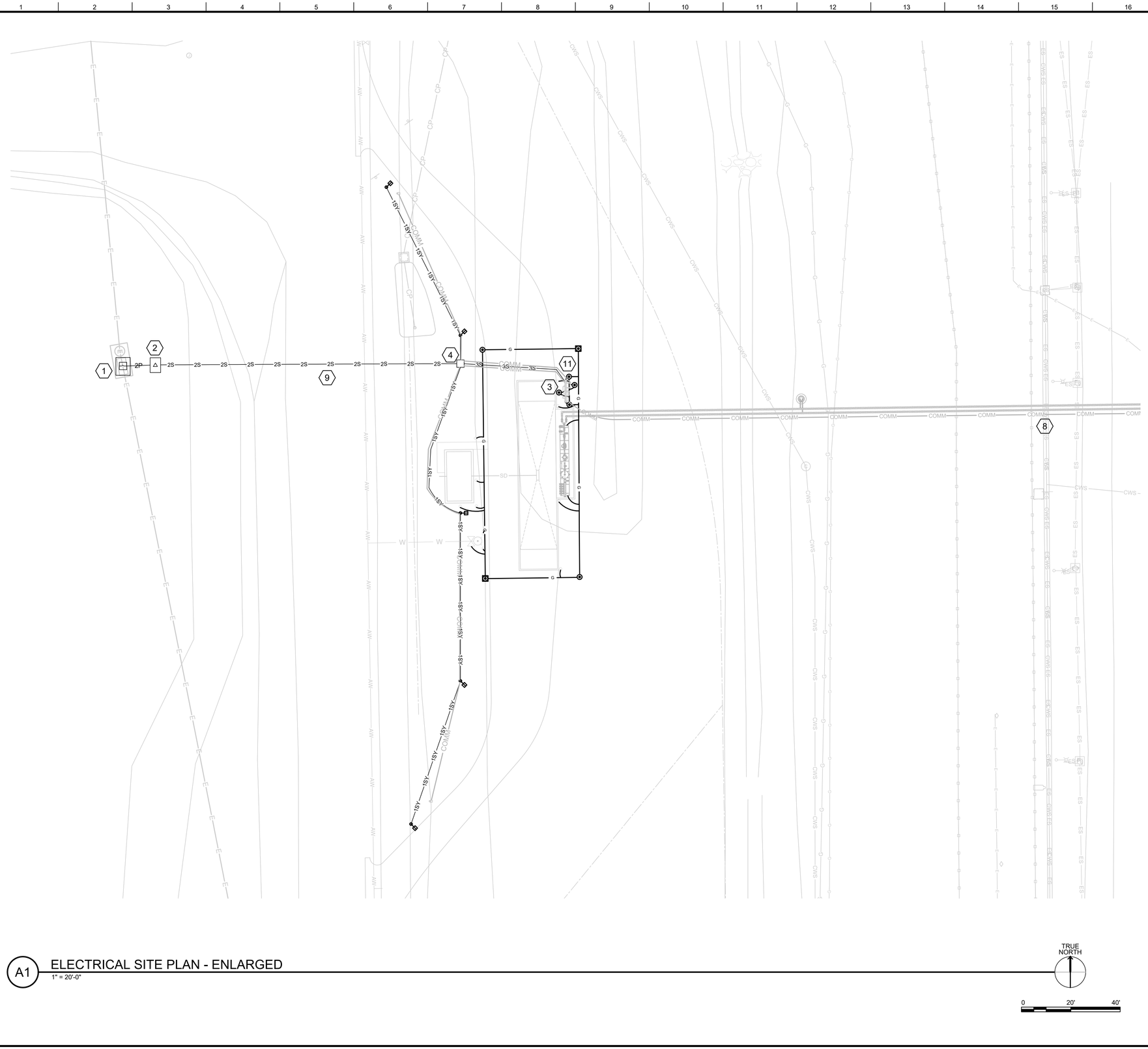
US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE.
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
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SITE LIGHTING OFFLOAD

SHEET ID
ES111

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A1 ELECTRICAL SITE PLAN - ENLARGED

1" = 20'-0"

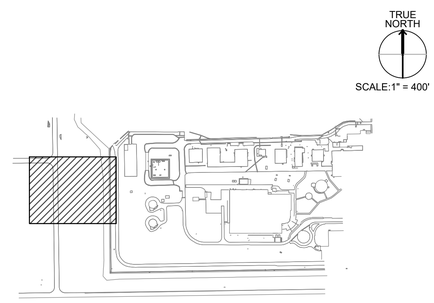
GENERAL NOTES

1. GENERAL NOTES AND LEGEND ON SHEET ES001 APPLY ON THIS SHEET.
2. GENERAL NOTES AND LEGEND ON SHEET EG001 APPLY ON THIS SHEET.

KEY NOTES

1. PROVIDE 15 KV SWITCH WITH TWO SOURCE SWITCHES AND TWO FUSED FEEDER SWITCHES ON TOP OF EXISTING MANHOLE. SEE ES500 DETAIL B1 AND ES501 DETAIL A15.
2. REFER TO TRANSFORMER SOURCE SWITCHES AND TWO FUSED FEEDER SWITCHES ON TOP OF EXISTING MANHOLE. SEE ES500 PAD DETAIL A6 ON SHEET ES501. SEE EP604S FOR ONE-LINE AND EP600 FOR TRANSFORMER SCHEDULES.
3. REFER TO ELEVATION DETAILS ON SHEET EF502.
4. REFER TO DETAILS ON SHEET ES504.
5. PROVIDE REPLACEMENT FEEDERS TO SUPPORT THE 'WEST TRUCKS' TEMPORARY POWER ACTIVITY. BYPASS JUNCTION BOX ON WALL OF B442 AND TIE INTO EXISTING POWER LINES UNDERGROUND IN MANHOLE WEST OF B442. NO CONNECTION DOWNTIME TO OCCUR. COORDINATE WITH BASE. 400A 600V DISCONNECT. 4" SCHEDULE 80 PVC CONDUIT CONCRETE ENCASED. (3) 500 KCMIL AND (1) #2 GROUND.
6. SEE ES404, ES405, ES406, AND ES407 FOR PHASING PLANS.
7. MAINTAIN AREA LIGHTING CONNECTION UNTIL REROUTED. SECURITY LIGHTS REQUIRE CONTINUOUS OPERATION. TEMPORARY LIGHTING SATISFYING AFI 31-101 §8.4.8 TO BE INSTALLED IN THE EVENT OF OPERATION IMPACT. COORDINATE WITH BASE AUTHORITY.
8. MANDATORY HORIZONTAL BORING PATHWAY FOR COMMUNICATION LINES AND FUEL LINES WITH BORING PITS TO BE OFFSET FROM FENCE LINE AT MINIMUM 30FT BOTH INSIDE AND OUTSIDE FENCE LINE. SEE SPECIFICATION 33 05 23.
9. HORIZONTAL BORING TO OCCUR FOR POWER CONDUCTORS FOR PATH UNDER ROAD. SEE SPECIFICATION 33 05 23.
10. SEE EF SERIES SHEETS FOR DETAILS. SEE EP600 SERIES SHEETS FOR ONE-LINE AND PANEL SCHEDULES.
11. SEE EG602 FOR GROUNDING REQUIREMENTS.

KEY PLAN



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DESIGNED BY: E.MCNAMARA
DRAWN BY: E. MCNAMARA
CHECKED BY: B. ADKINS
QA/QC PERFORMED BY: S. LINDGREN
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:
FILE NUMBER:
FILENAME: BUCO00102-ES001-999.dwg

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OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

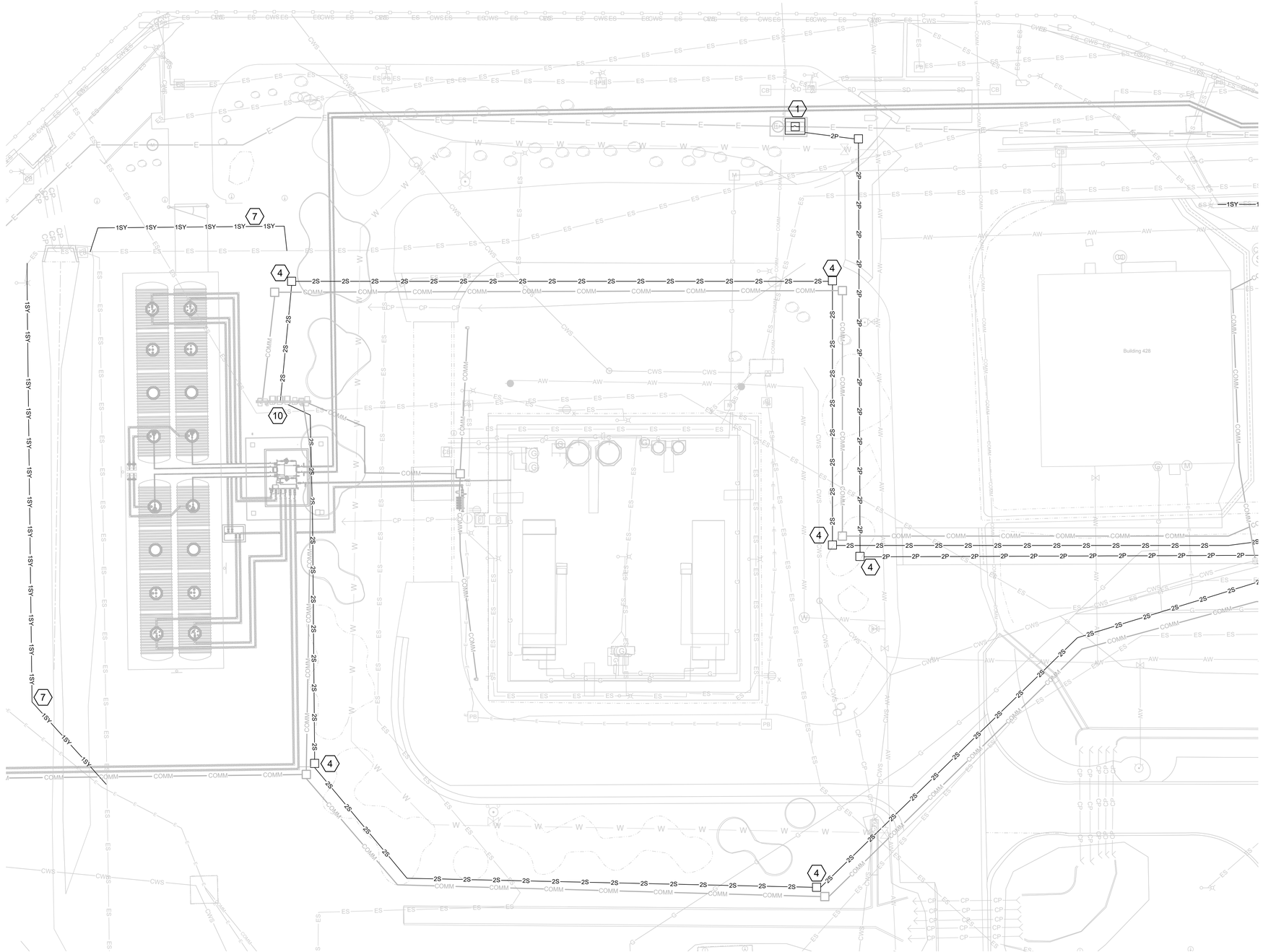
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POWER INDEPENDENCE, MISSION CONTROL STATION

ELECTRICAL SITE PLAN - ENLARGED

SHEET ID
ES401

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A1 ELECTRICAL SITE PLAN - ENLARGED
1" = 20'-0"

TRUE NORTH

0 20' 40'

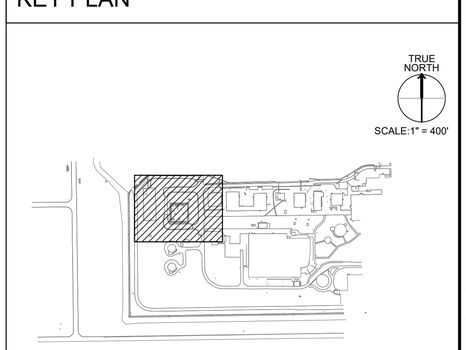
GENERAL NOTES

1. GENERAL NOTES AND LEGEND ON SHEET ES001 APPLY ON THIS SHEET.

KEY NOTES

1. PROVIDE 15 KV SWITCH WITH TWO SOURCE SWITCHES AND TWO FUSED FEEDER SWITCHES ON TOP OF EXISTING MANHOLE. SEE ES500 DETAIL B1 AND ES501 DETAIL A15.
2. REFER TO TRANSFORMER SOURCE SWITCHES AND TWO FUSED FEEDER SWITCHES ON TOP OF EXISTING MANHOLE. SEE ES500 PAD DETAIL A6 ON SHEET ES501. SEE EP604S FOR ONE-LINE AND EP600 FOR TRANSFORMER SCHEDULES.
3. REFER TO ELEVATION DETAILS ON SHEET EF502.
4. REFER TO DETAILS ON SHEET ES504.
5. PROVIDE REPLACEMENT FEEDERS TO SUPPORT THE 'WEST TRUCKS' TEMPORARY POWER ACTIVITY. BYPASS JUNCTION BOX ON WALL OF B442 AND TIE INTO EXISTING POWER LINES UNDERGROUND IN MANHOLE WEST OF B442. NO CONNECTION DOWNTIME TO OCCUR. COORDINATE WITH BASE. 400A 600V DISCONNECT. 4" SCHEDULE 80 PVC CONDUIT CONCRETE ENCASED. (3) 500 KCMIL AND (1) #2 GROUND.
6. SEE ES404, ES405, ES406, AND ES407 FOR PHASING PLANS.
7. MAINTAIN AREA LIGHTING CONNECTION UNTIL REROUTED. SECURITY LIGHTS REQUIRE CONTINUOUS OPERATION. TEMPORARY LIGHTING SATISFYING AFI 31-101 §8.4.8 TO BE INSTALLED IN THE EVENT OF OPERATION IMPACT. COORDINATE WITH BASE AUTHORITY.
8. MANDATORY HORIZONTAL BORING PATHWAY FOR COMMUNICATION LINES AND FUEL LINES WITH BORING PITS TO BE OFFSET FROM FENCE LINE AT MINIMUM 30FT BOTH INSIDE AND OUTSIDE FENCE LINE.
SEE SPECIFICATION 33 05 23.
9. HORIZONTAL BORING TO OCCUR FOR POWER CONDUCTORS FOR PATH UNDER ROAD. SEE SPECIFICATION 33 05 23.
10. SEE EF SERIES SHEETS FOR DETAILS. SEE EP600 SERIES SHEETS FOR ONE-LINE AND PANEL SCHEDULES.
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KEY PLAN



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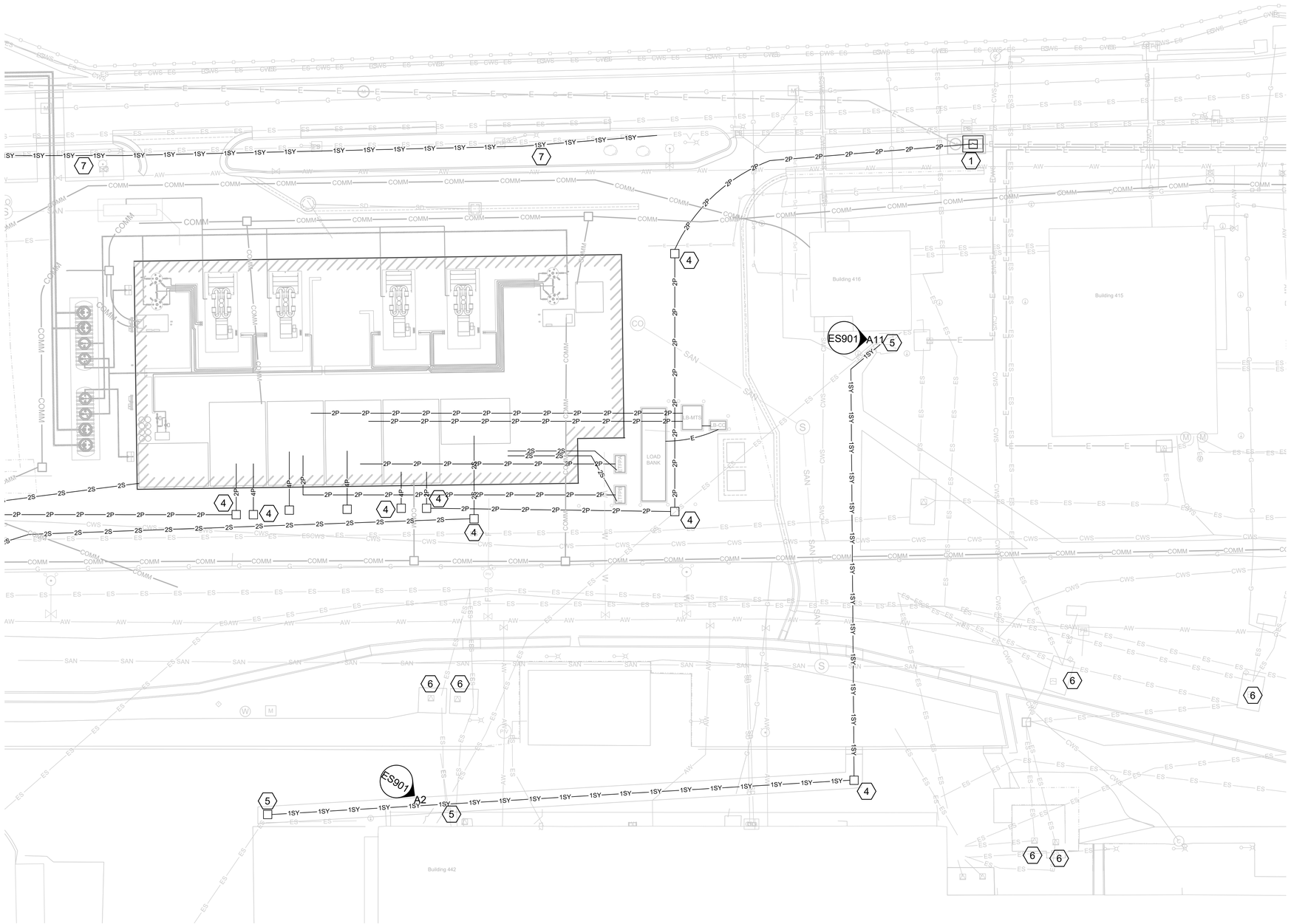
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POWER INDEPENDENCE - MISSION CONTROL STATION

ELECTRICAL SITE PLAN - ENLARGED

SHEET ID
ES402

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A1 ELECTRICAL SITE PLAN - ENLARGED

1" = 20'-0"

TRUE NORTH

0 20' 40'

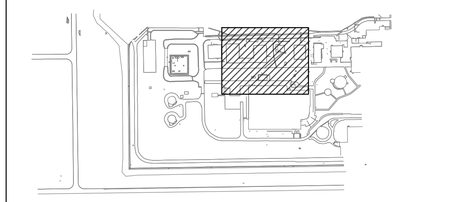
GENERAL NOTES

1. GENERAL NOTES AND LEGEND ON SHEET ES001 APPLY ON THIS SHEET.
2. POWER CONNECTION TO BUILDING 442 TO HAVE NO DOWNTIME. FOR PHASING PLANS, SEE SHEETS ES404, ES405, AND ES406.

KEY NOTES

1. PROVIDE 15 KV SWITCH WITH TWO SOURCE SWITCHES AND TWO FUSED FEEDER SWITCHES ON TOP OF EXISTING MANHOLE. SEE ES500 DETAIL B1 AND ES501 DETAIL A15.
2. REFER TO TRANSFORMER SOURCE SWITCHES AND TWO FUSED FEEDER SWITCHES ON TOP OF EXISTING MANHOLE. SEE ES500 PAD DETAIL A6 ON SHEET ES501. SEE EP604S FOR ONE-LINE AND EP600 FOR TRANSFORMER SCHEDULES.
3. REFER TO ELEVATION DETAILS ON SHEET EF502.
4. REFER TO DETAILS ON SHEET ES504.
5. PROVIDE REPLACEMENT FEEDERS TO SUPPORT THE 'WEST TRUCKS' TEMPORARY POWER ACTIVITY. BYPASS JUNCTION BOX ON WALL OF B442 AND TIE INTO EXISTING POWER LINES UNDERGROUND IN MANHOLE WEST OF B442. NO CONNECTION DOWNTIME TO OCCUR. COORDINATE WITH BASE. 400A 600V DISCONNECT. 4" SCHEDULE 80 PVC CONDUIT CONCRETE ENCASED. (3) 500 KCMIL AND (1) #2 GROUND.
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7. MAINTAIN AREA LIGHTING CONNECTION UNTIL REROUTED. SECURITY LIGHTS REQUIRE CONTINUOUS OPERATION. TEMPORARY LIGHTING SATISFYING AFI 31-101 §8.4.8 TO BE INSTALLED IN THE EVENT OF OPERATION IMPACT. COORDINATE WITH BASE AUTHORITY.
8. MANDATORY HORIZONTAL BORING PATHWAY FOR COMMUNICATION LINES AND FUEL LINES WITH BORING PITS TO BE OFFSET FROM FENCE LINE AT MINIMUM 30FT BOTH INSIDE AND OUTSIDE FENCE LINE. SEE SPECIFICATION 33 05 23.
9. HORIZONTAL BORING TO OCCUR FOR POWER CONDUCTORS FOR PATH UNDER ROAD. SEE SPECIFICATION 33 05 23.
10. SEE EF SERIES SHEETS FOR DETAILS. SEE EP600 SERIES SHEETS FOR ONE-LINE AND PANEL SCHEDULES.
11. SEE EG602 FOR GROUNDING REQUIREMENTS.

KEY PLAN



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MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	

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DESIGNED BY: E.MCNAMARA
DRAWN BY: E. MCNAMARA
CHECKED BY: B. ADKINS
QA/QC BY: S. LUNDGREN
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:
FILE NUMBER:
FILENAME: BUCO00102-ES901-999.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

ELECTRICAL SITE PLAN - ENLARGED

SHEET ID

ES403

ADVERTISEMENT



A1 TEMPORARY MV POWER LINE

TRUE NORTH

0 80' 160'

NOTES
1. TEMPORARY CONNECTION MV CONDUCTORS TO BE IN 5" PVC-80 CONDUIT WITH (3) 4/0 15kV 133% INSULATION ALUMINUM CONDUCTORS + #2 G CONDUCTORS.
2. DIRECT BURY (OPEN TRENCH) EXCEPT WHERE REQUIRED TO HORIZONTAL DRILL.
3. ESCORTS REQUIRED FOR ALL WORK PERFORMED ON SECURE SIDE OF FENCE, UNLESS WORK IS BEING PERFORMED IN AN ESTABLISHED FREE ZONE IDENTIFIED IN THIS CONTRACT'S DOCUMENTS
4. ALL CONDUITS TO BE BURIED MINIMUM 42" BELOW GRADE.

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DRAWN BY: E. MCNAMARA	SOLICITATION NO.: W9128F25RA043
CHECKED BY: S. LINDGREN	CONTRACT NO.:
SUBMITTED BY: S. LINDGREN	FILE NUMBER:
APPROVED BY: ANSI D	FILE NAME: BUCO0102CS100-104.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
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TEMPORARY MV POWER LINE

SHEET ID
ET100

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TELECOMMUNICATIONS SITE INSTALLATION LEGEND
APPLIES TO ALL TS100 AND TS400 SHEETS

——COMM—— TELECOMMUNICATIONS LINE

☐ HANDHOLE

TELECOMMUNICATIONS SITE INSTALLATION GENERAL NOTES:
APPLIES TO ALL TS100 AND TS400 SHEETS

1. CONTRACTOR TO COORDINATE ALL ELECTRICAL UTILITY CONNECTIONS WITH XCEL ENERGY.

2. CONTRACTOR TO CORE PRIOR TO ANY DIGGING AND HAVE ALL UTILITIES MARKED PRIOR TO ANY DIGGING BEING PERFORMED. IF CONTRACTOR SHOULD CUT ANY UTILITY IN THE PROCESS OF DIGGING, THEN THE CONTRACTOR WILL COVER ALL REQUIRED COSTS.

3. REFER TO SHEET TN601 FOR FURTHER DETAILS ON CONDUIT AND CONDUCTOR SIZES AND QUANTITIES. △1

4. FOR TELECOMMUNICATIONS SITE LINES REQUIRING HORIZONTAL DRILLING, REFERENCE ES502 FOR REQUIRED DETAILS.

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E.MCNAMARA	W9128F25RA043
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S.LUNDGREN	
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OMAHA, NE 68102

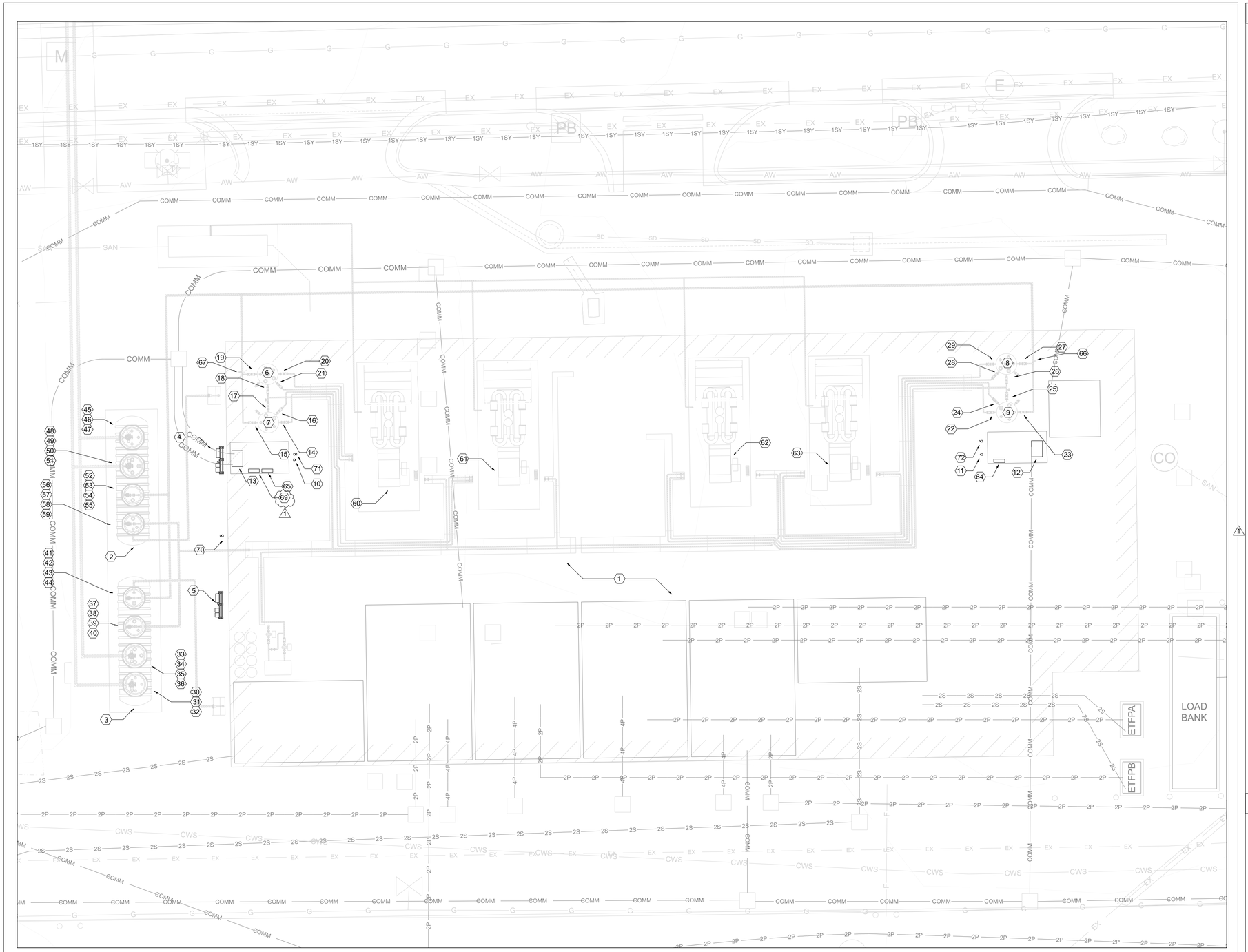
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POWER INDEPENDENCE: MISSION CONTROL STATION

TELECOMMUNICATIONS
NOTES AND SUPPLEMENTAL LEGEND

SHEET ID
TS001

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PLAN NORTH

0 10' 20'

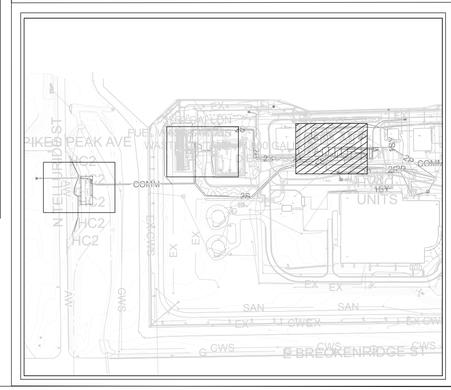
B1 GENERATOR BUILDING ENLARGED SITE PLAN

SCALE: 1" = 10'

SHEET KEYNOTES

01 - GENERATOR BUILDING 451
02 - OPERATING TANK 1 OT-N
03 - OPERATING TANK 2 OT-S
04 - OT-N ELECTRICAL EQUIPMENT RISER
05 - OT-S ELECTRICAL EQUIPMENT RISER
06 - DAY TANK 1 DT-B1
07 - DAY TANK 2 DT-B2
08 - DAY TANK 3 DT-A1
09 - DAY TANK 4 DT-A2
10 - EFSO-11 STATION
11 - EFSO-12 STATION
12 - PUMP CONTROL PANEL-A (PCP-A)
13 - PUMP CONTROL PANEL-B (PCP-B)
14 - VALVE BV11
15 - VALVE BV10
16 - VALVE BV12
17 - VALVE BV09
18 - VALVE BV05
19 - VALVE BV06
20 - VALVE BV08
21 - VALVE BV07
22 - VALVE BV15
23 - VALVE BV17
24 - VALVE BV16
25 - VALVE BV18
26 - VALVE BV14
27 - VALVE BV13
28 - VALVE BV19
29 - VALVE BV20
30 - VALVE I22
31 - TANK OT-N INTERSTITIAL LEAK DET SENSOR
32 - TANK OT-S SUMP-4 LEAK DET SENSOR
33 - VALVE I23
34 - TANK OT-S ATG PROBE
35 - TANK OT-S LEVEL SWITCH PROBE
36 - TANK OT-S SUMP-3 LEAK DET SENSOR
37 - PUMP IP-O4
38 - VALVE BV04
39 - FLOW SWITCH FS08
40 - TANK OT-S SUMP-2 LEAK DET SENSOR
41 - PUMP IP-O3
42 - VALVE BV03
43 - FLOW SWITCH FS07
44 - TANK OT-S SUMP-1 LEAK DET SENSOR
45 - VALVE I21
46 - TANK OT-N INTERSTITIAL LEAK DET SENSOR
47 - TANK OT-N SUMP-4 LEAK DET SENSOR
48 - VALVE I20
49 - TANK OT-N ATG PROBE
50 - TANK OT-N LEVEL SWITCH PROBE
51 - TANK OT-N SUMP-3 LEAK DET SENSOR
52 - PUMP IP-O1
53 - VALVE BV01
54 - FLOW SWITCH FS05
55 - TANK OT-N SUMP-2 LEAK DET SENSOR
56 - PUMP IP-O2
57 - VALVE BV02
58 - FLOW SWITCH FS06
59 - TANK OT-N SUMP-1 LEAK DET SENSOR
60 - GENERATOR GR1
61 - GENERATOR GB2
62 - GENERATOR GA1
63 - GENERATOR GA2
64 - ATG-FA
65 - ATG-FB
66 - ISSUE LINE LOW POINT DRAIN LEAK DET SENSOR-A
67 - ISSUE LINE LOW POINT DRAIN LEAK DET SENSOR-B
68 - REMOVED
69 - EFSO SYSTEM CONTROL PANEL
70 - RESONATING HORN-2
71 - RESONATING HORN-3
72 - RESONATING HORN-4

KEY PLAN



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MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

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DRAWN BY: C. RAISON	SOLICITATION NO.: W9128F25RA043
CHECKED BY: C. RAISON	CONTRACT NO.:
QA/QC BY: S. LINDGREN	FILE NUMBER:
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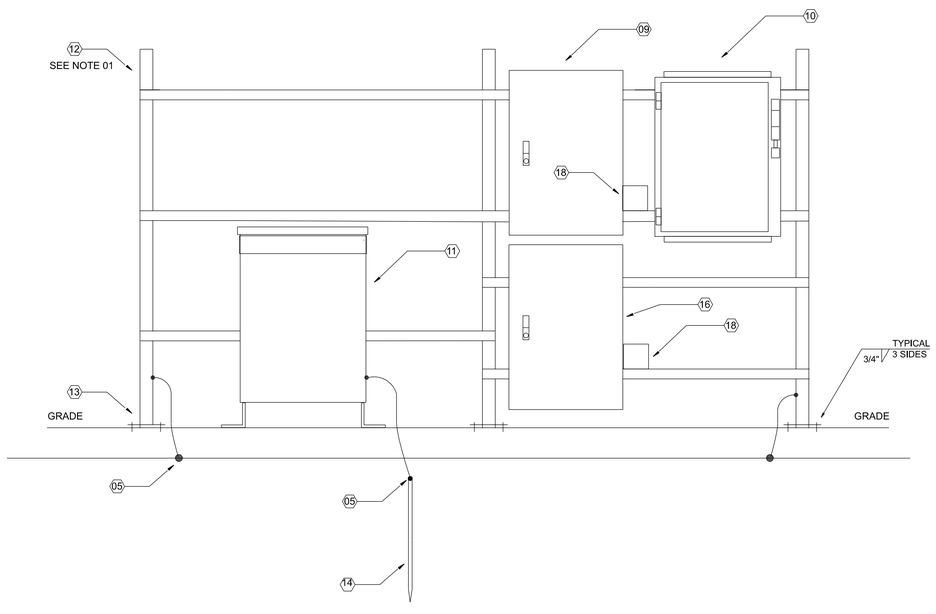
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE - MISSION CONTROL STATION

GENERATOR BUILDING ENLARGED SITE PLAN

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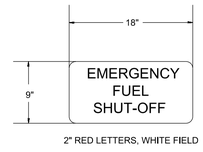
EF403

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H3 OFFLOAD EQUIPMENT RISER ELEVATION (FRONT)

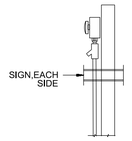
N.T.S.



2" RED LETTERS, WHITE FIELD

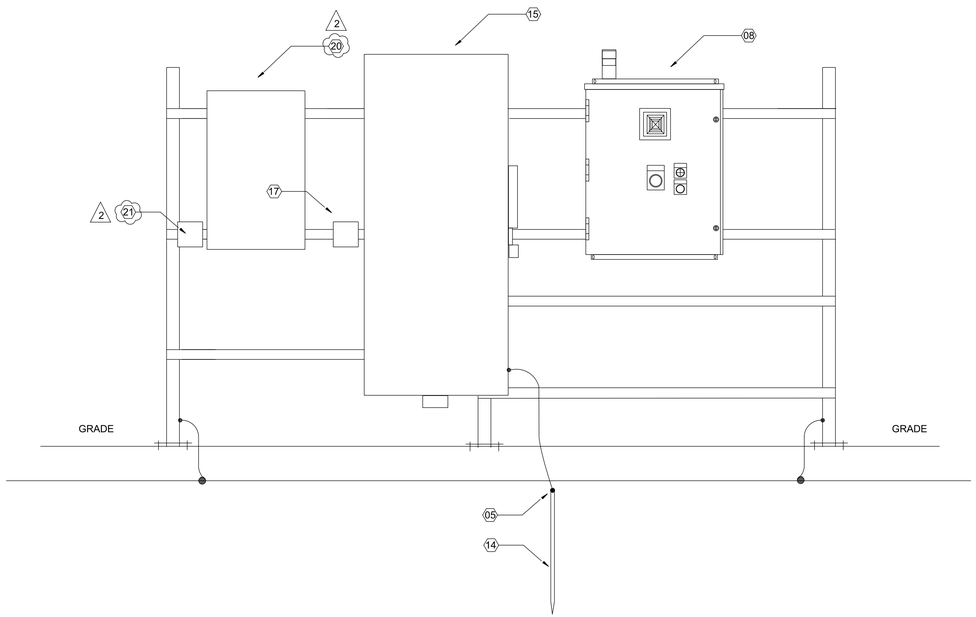
N12 EFSO SIGNAGE DETAIL

N.T.S.



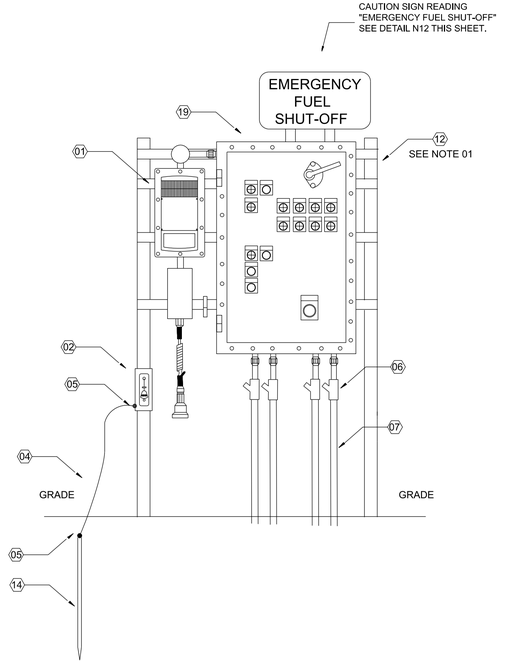
K12 EFSO STATION DETAIL

N.T.S.



B1 OFFLOAD EQUIPMENT RISER ELEVATION (REAR)

N.T.S.



B11 OFFLOAD CONTROL EQUIPMENT RISER DETAIL

N.T.S.

GENERAL SHEET NOTES

01 - CONTRACTOR TO SIZE RISER SUPPORT MEMBERS TO CARRY EQUIPMENT USED
02 - ALL EQUIPMENT RISERS SHALL HAVE (2) PATHS TO GROUND.
03 - EFSO STATION JUMBO MUSHROOM OPERATOR IS 1-NC MOMENTARY CONTACT, WITH "EMERGENCY STOP" LEGEND
04 - ALL CONDUITS ABOVE GRADE AND ALL ELBOWS BELOW GRADE SHALL BE GALVANIZED RIGID STEEL
05 - EQUIPMENT LAYOUT ON EQUIPMENT RISER IS CONCEPTUAL
06 - EQUIPMENT ENCLOSURES SHALL BE WEATHERPROOF (NEMA 4X MIN) INSULATED, AND HEATED. HEATER SHALL BE THERMOSTATICALLY CONTROLLED AND FAN DRIVEN. SEE UFGS 33 09 52 FOR DETAILS
07 - EQUIPMENT SHALL BE HEATED OR COOLED IN ACCORDANCE WITH MANUFACTURES SPECIFICATIONS
08 - EQUIPMENT RISER GROUNDING SHALL BE IN ACCORDANCE WITH NFPA 780
09 - SEE EP600 SHEET SERIES FOR EQUIPMENT DETAILS
10 - SEE SHEETS EF401 AND EG502 FOR DETAILS
11 - THE EMERGENCY EYEWASH UNIT IS SELF CONTAINED AND SELF-MONITORS TEMPERATURE TO PREVENT FREEZING. INSTALL PER MANUFACTURER'S SPECIFICATIONS

SHEET KEY NOTES

01 - GROUND PROVING UNIT
02 - MANUAL GROUND REEL, 30' LENGTH
03 - EXOTHERMIC WELD
04 - #1/0 COPPER GROUND CONDUCTOR
05 - EXOTHERMIC WELD
06 - CONDUIT SEALOFF FITTING (TYP.)
07 - 1" CONDUIT (TYP.)
08 - OFFLOAD FIBER CONVERTER PANEL
09 - OLB PANEL
10 - LIGHTING CONTRACTOR PANEL
11 - TRANSFORMER
12 - C4X7.5 CHANNEL, PRIME AND FINISH PAINT
13 - 4-1/2" CONCRETE ANCHORS AND 1/2"X5"X10" BASEPLATE W/ 1" (MIN.) NON-SHRINK GROUT, (TYP.) PRIME AND FINISH PAINT BASEPLATE
14 - 10'X3/4" COPPER CLAD STEEL GROUNDING ROD, COUNTERPOISE, OR GROUND RING AS APPLICABLE
15 - MANUAL TRANSFER SWITCH (MTS)
16 - OHB PANEL, NEMA (3R)
17 - WEATHERPROOF GFCI DUPLEX RECEPTACLE
18 - SURGE PROTECTION DEVICE (SPD)
19 - OFFLOAD CONTROL PANEL
20 - EMERGENCY EYEWASH UNIT
21 - WEATHERPROOF GFCI DUPLEX RECEPTACLE (DEDICATED TO EMERGENCY EYEWASH UNIT)

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MARK	DESCRIPTION	DATE
2	AM #0003 - GENERAL REVISIONS	09/29/2025
1	AM #0002 - GENERAL REVISIONS	09/19/2025

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DESIGNED BY:	ISSUE DATE:
C. RAISON	05/01/2025
DRAWN BY:	SOLICITATION NO.:
C. RAISON	W9128F25RA043
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SUBMITTED BY:	FILE NUMBER:
S. LINDGREN	
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OMAHA DISTRICT
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OMAHA, NE 68102

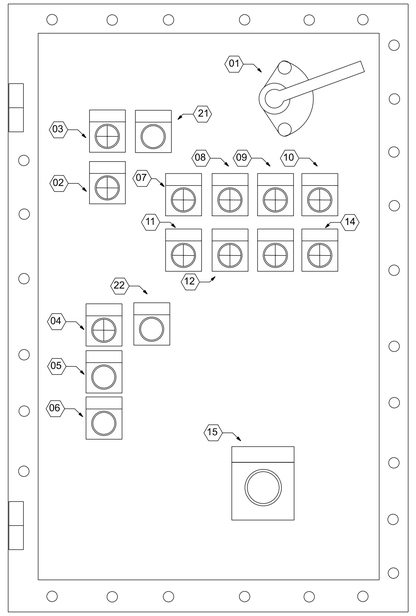
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE: MISSION CONTROL STATION

OFFLOAD ELECTRICAL DETAILS

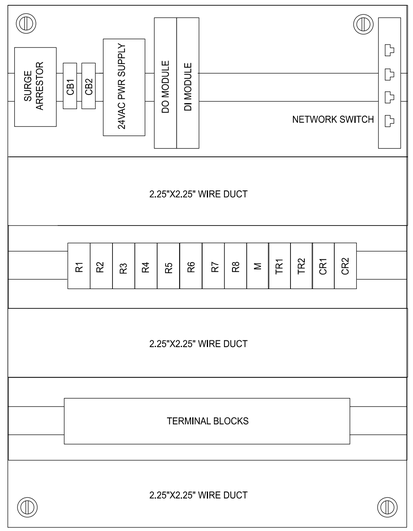
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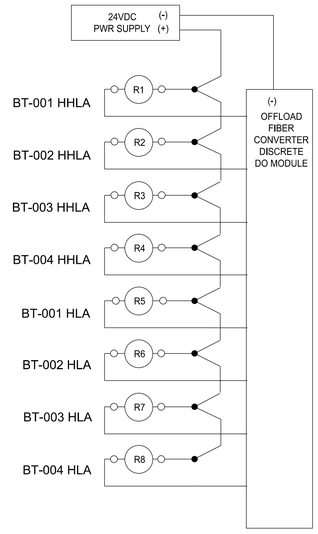
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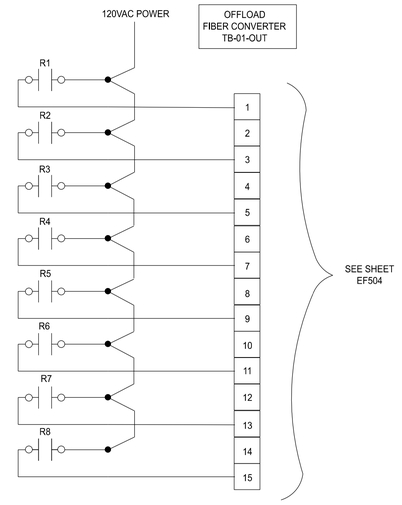


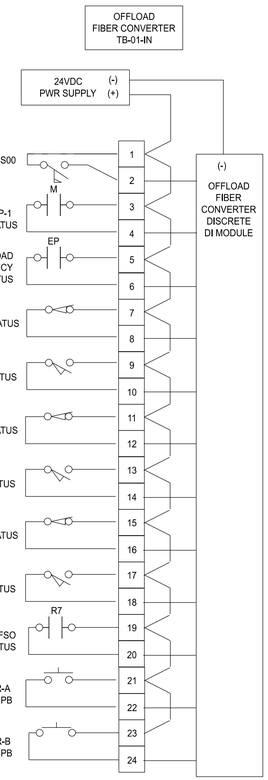
J1 OFFLOAD PUMP CONTROL PANEL ELEVATION
N.T.S.



J5 FIBER CONVERTER PANEL LAYOUT
N.T.S.





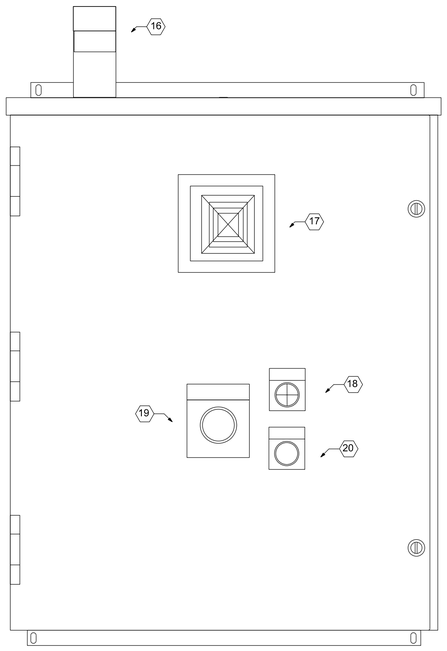


GENERAL SHEET NOTES

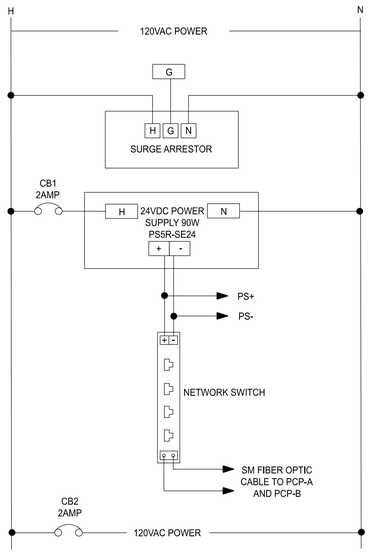
01 - DISCONNECT/STARTER ARE INCORPORATED IN THE PANEL.
02 - OFFLOAD CONTROL PANEL EQUIPMENT/COMPONENT LAYOUT IS CONCEPTUAL
03 - FIBER CONVERTER PANEL EQUIPMENT/COMPONENT LAYOUT IS CONCEPTUAL
04 - FIBER CONVERTER PANEL DIMENSIONS ARE CONCEPTUAL. CONTRACTOR SHALL SIZE THE PANEL TO ACCOMMODATE SYSTEM EQUIPMENT AND COMPONENTS
05 - OFFLOAD CONTROL PANEL DIMENSIONS ARE CONCEPTUAL. CONTRACTOR SHALL SIZE THE PANEL TO ACCOMMODATE SYSTEM EQUIPMENT AND COMPONENTS
06 - OFFLOAD CONTROL PANEL IS LOCATED ON AN EQUIPMENT RISER MOUNTED ON THE OFFLOAD SKID. FOR DETAILS SEE SHEET EF502, B11
07 - FIBER CONVERTER PANEL IS MOUNTED ON THE OFFLOAD EQUIPMENT RISER
1 08 - ALL PANELS/ENCLOSURES SHALL BE WEATHERPROOF (NEMA 4X MIN) INSULATED, AND HEATED. HEATER SHALL BE THERMOSTATICALLY CONTROLLED AND FAN DRIVEN. SEE UFGS 33-09-52 FOR DETAILS
09 - THE OFFLOAD SYSTEM IS CONSIDERED SACRIFICIAL. REDUNDANT I/O CIRCUITS ARE NOT REQUIRED
10 - EQUIPMENT SHALL BE HEATED OR COOLED PER MANUFACTURER'S RECOMMENDATIONS
2 11 - EFSO STSTEM COMPONENTS SHALL BE INCORPORATED INTO THE OFFLOAD FCP

SHEET KEY NOTES

01 - DISCONNECT SWITCH
02 - NAME PLATE "EMERGENCY CIRCUIT POWER ON" INDICATOR, WHITE INDICATOR LIGHT
03 - NAME PLATE "AE HIGH FLOW", RED INDICATOR LIGHT
04 - NAME PLATE "OP-1 STATUS", GREEN INDICATOR LIGHT
05 - NAME PLATE "OP-1 CALL", MOMENTARY PUSHBUTTON SWITCH
06 - NAME PLATE "OP-1 CANCEL", MOMENTARY PUSHBUTTON SWITCH
07 - NAME PLATE "BT-001 HHLA", RED INDICATOR LIGHT
08 - NAME PLATE "BT-002 HHLA", RED INDICATOR LIGHT
09 - NAME PLATE "BT-003 HHLA", RED INDICATOR LIGHT
10 - NAME PLATE "BT-004 HHLA", RED INDICATOR LIGHT
11 - NAME PLATE "BT-001 HLA", AMBER INDICATOR LIGHT
12 - NAME PLATE "BT-002 HLA", AMBER INDICATOR LIGHT
13 - NAME PLATE "BT-003 HLA", AMBER INDICATOR LIGHT
14 - NAME PLATE "BT-004 HLA", AMBER INDICATOR LIGHT
15 - NAME PLATE "EMERGENCY STOP","EFSO-1, 3" MUSHROOM MOMENTARY CONTACT PUSHBUTTON SWITCH. SEE GENERAL SHEET NOTE 01
16 - EFSO STROBE. SEE GENERAL SHEET NOTE 01
17 - VIBRATING HORN (70dB AT 10'). SEE GENERAL SHEET NOTE 01
18 - NAME PLATE "EFSO ACTIVATED", RED INDICATOR LIGHT. SEE GENERAL SHEET NOTE 01
19 - NAME PLATE "EMERGENCY STOP","EFSO-2, 3" MUSHROOM MOMENTARY CONTACT PUSHBUTTON SWITCH, SEE GENERAL SHEET NOTE 01
20 - NAME PLATE "ACKNOWLEDGE" MOMENTARY PUSHBUTTON SWITCH. SEE GENERAL SHEET NOTE 01
21 - NAME PLATE "TEST", MOMENTARY PUSHBUTTON SWITCH (AE HIGH FLOW)
22 - NAME PLATE "TEST", MOMENTARY PUSHBUTTON SWITCH (OP-1 STATUS)



A1 FIBER CONVERTER PANEL ELEVATION
N.T.S.



B5 FIBER CONVERTER POWER DISTRIBUTION DIAGRAM
N.T.S.

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MARK	DESCRIPTION	DATE
2	AM #0003 - GENERAL REVISIONS	09/29/2025
1	AM #0002 - GENERAL REVISIONS	08/19/2025

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DESIGNED BY:	C. RAISON
DRAWN BY:	C. RAISON
CHECKED BY:	R. WAGNER
SUBMITTED BY:	S. LINDGREN
SIZE:	ANSI D
ISSUE DATE:	05/01/2025
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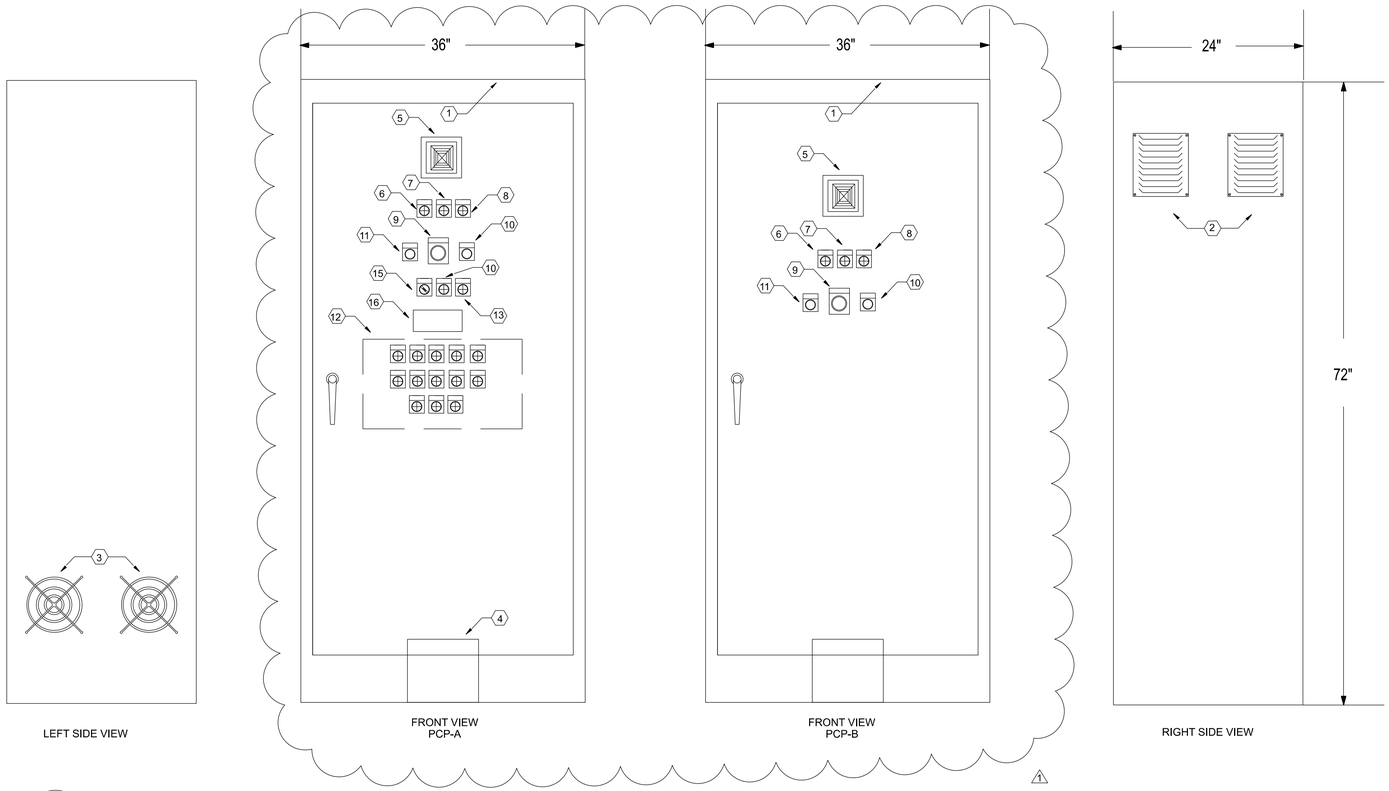
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OFFLOAD PUMP CONTROL PANEL AND FIBER CONVERTER PANEL DETAILS

SHEET ID
EF503

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H1 PUMP CONTROL PANEL (PCP) ELEVATION

N.T.S.

GENERAL NOTES

01 - FIRST LINE OF TEXT SHALL BE 1/4" HEIGHT AND THE SECOND AND/OR THIRD LINES SHALL BE 1/8" HEIGHT
02 - (WHITE) - WHITE WINDOW WITH BLACK LETTERS
03 - (RED) - RED WINDOW WITH BLACK LETTERS
04 - RED WINDOW ALARMS (CRITICAL) SHALL SOUND THE RESONATING HORNS AND VIBRATING HORNS
05 - CRITICAL ALARMS SHALL STOP ALL PUMPS RUNNING IN AUTOMATIC MODE.
06 - THE ANNUNCIATOR SHOWN IN DETAIL B2 THIS SHEET IS THE TYPICAL ANALOG VERSION. A PAGE ON THE HMI TOUCH SCREEN SHALL BE DEVELOPED FROM THIS EXAMPLE. REFER TO SPECIFICATION 33 09 52
07 - THESE TERMINAL BLOCK CONNECTIONS ARE INTENDED TO SHOW CONNECTIONS TO FIELD DEVICES ONLY. THE PUMP CONTROL PANEL MANUFACTURER MAY REQUIRE SEVERAL MORE TERMINAL BLOCKS FOR CONNECTIONS TO HMI TOUCH SCREEN, HORNS, ETC
08 - KEYED SELECTOR SWITCH IS SPRING LOADED TO RETURN TO THE LEFT POSITION. KEY CAN ONLY BE INSERTED AND REMOVED WHEN IN LEFT POSITION
09 - PANEL LAYOUT IS DIAGRAMIC. EXACT LAYOUT MUST BE SUBMITTED FOR APPROVAL

SHEET KEY NOTES

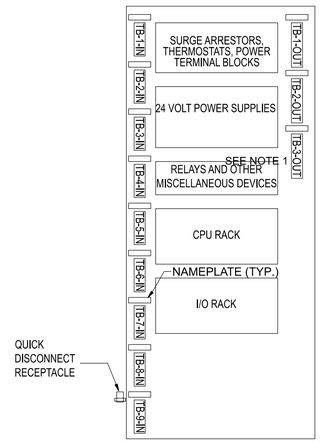
01 - FREE STANDING ENCLOSURE
02 - VENTS
03 - FANS
04 - UNITERRUPTIBLE POWER SUPPLY IN CABINET
05 - VIBRATING HORN
06 - WHITE INDICATOR LIGHT WITH LEGEND PLATE "PCP-A ON"
07 - WHITE INDICATOR LIGHT WITH LEGEND PLATE "PCP-B ON"
08 - WHITE INDICATOR LIGHT WITH LEGEND PLATE "EMERGENCY CKT POWER ON"
09 - RED JUMBO MUSHROOM MOMENTARY CONTACT PUSHBUTTON WITH LEGEND PLATE "EMERGENCY STOP"
10 - MOMENTARY CONTACT PUSHBUTTON WITH LEGEND PLATE "ACKNOWLEDGE"
11 - MOMENTARY CONTACT PUSHBUTTON WITH LEGEND PLATE "EFSO RESET"
12 - RED INDICATOR LIGHT WITH LEGEND PLATE "EFSO-1"
RED INDICATOR LIGHT WITH LEGEND PLATE "EFSO-2"
RED INDICATOR LIGHT WITH LEGEND PLATE "EFSO-3"
RED INDICATOR LIGHT WITH LEGEND PLATE "EFSO-4"
RED INDICATOR LIGHT WITH LEGEND PLATE "EFSO-5"
RED INDICATOR LIGHT WITH LEGEND PLATE "EFSO-6"
RED INDICATOR LIGHT WITH LEGEND PLATE "EFSO-7"
RED INDICATOR LIGHT WITH LEGEND PLATE "EFSO-8"
RED INDICATOR LIGHT WITH LEGEND PLATE "EFSO-9"
RED INDICATOR LIGHT WITH LEGEND PLATE "EFSO-10"
RED INDICATOR LIGHT WITH LEGEND PLATE "EFSO-11"
RED INDICATOR LIGHT WITH LEGEND PLATE "EFSO-12"
RED INDICATOR LIGHT WITH LEGEND PLATE "EFSO-13"
13 - WHITE INDICATOR LIGHT WITH LEGEND PLATE "BYPASSED"
14 - WHITE INDICATOR LIGHT WITH LEGEND PLATE "BY-PASS NORMAL"
15 - KEYED BY-PASS SELECTRO SWITCH
16 - BY-PASS TIMER

BT-001 HIGH-HIGH LEVEL (RED)	BT-002 HIGH-HIGH LEVEL (RED)	BT-003 HIGH-HIGH LEVEL (RED)	BT-004 HIGH-HIGH LEVEL (RED)	OT-N HIGH-HIGH LEVEL (RED)	OT-S HIGH-HIGH LEVEL (RED)
BT-001 HIGH LEVEL (WHITE)	BT-002 HIGH LEVEL (WHITE)	BT-003 HIGH LEVEL (WHITE)	BT-004 HIGH LEVEL (WHITE)	OT-N HIGH LEVEL (WHITE)	OT-S HIGH LEVEL (WHITE)
BT-001 LOW LEVEL (WHITE)	BT-002 LOW LEVEL (WHITE)	BT-003 LOW LEVEL (WHITE)	BT-004 LOW LEVEL (WHITE)	OT-N LOW LEVEL (WHITE)	OT-S LOW LEVEL (WHITE)
BT-001 LOW-LOW LEVEL (RED)	BT-002 LOW-LOW LEVEL (RED)	BT-003 LOW-LOW LEVEL (RED)	BT-004 LOW-LOW LEVEL (RED)	OT-N LOW-LOW LEVEL (RED)	OT-S LOW-LOW LEVEL (RED)
DT-B1 HIGH-HIGH LEVEL (RED)	DT-B2 HIGH-HIGH LEVEL (RED)	DT-A1 HIGH-HIGH LEVEL (RED)	DT-A2 HIGH-HIGH LEVEL (RED)	IP-F1 FAILURE (WHITE)	IP-F2 FAILURE (WHITE)
DT-B1 HIGH LEVEL (WHITE)	DT-B2 HIGH LEVEL (WHITE)	DT-A1 HIGH LEVEL (WHITE)	DT-A2 HIGH LEVEL (WHITE)	IP-F3 FAILURE (WHITE)	IP-F4 FAILURE (WHITE)
DT-B1 LOW LEVEL (WHITE)	DT-B2 LOW LEVEL (WHITE)	DT-A1 LOW LEVEL (WHITE)	DT-A2 LOW LEVEL (WHITE)	IP-O1 FAILURE (WHITE)	IP-O2 FAILURE (WHITE)
DT-B1 LOW LOW LEVEL (RED)	DT-B2 LOW LOW LEVEL (RED)	DT-A1 LOW LOW LEVEL (RED)	DT-A2 LOW LOW LEVEL (RED)	IP-O3 FAILURE (WHITE)	IP-O4 FAILURE (WHITE)
PCP-A EMERGENCY POWER CKT ON (WHITE)	PCP-A PLC FAILURE (WHITE)	PCP-A DATA FAILURE (WHITE)	PCP-A HIGH TEMPERATURE (WHITE)	EMERGENCY STOP (RED)	OP-1 FAILURE (WHITE)
PCP-B EMERGENCY POWER CKT ON (WHITE)	PCP-B PLC FAILURE (WHITE)	PCP-B DATA FAILURE (WHITE)	PCP-B HIGH TEMPERATURE (WHITE)	EMERGENCY EYEWASH HEAT FAIL (WHITE)	OWS HIGH LEVEL 1 (WHITE)
OFFLOAD EMERGENCY POWER CKT ON (WHITE)	LEAK DETECTED (WHITE)	EFSO SYSTEM BYPASS (WHITE)	SPARE (WHITE)	SPARE (WHITE)	OWS HIGH LEVEL 2 (WHITE)

SEE NOTE 2, 3 AND 6

B2 TYPICAL PUMP CONTROL ANNUNCIATOR

N.T.S.



B10 TYPICAL INTERIOR BACKPLANE MOUNTING DETAIL

N.T.S.

TB-X-1-IN
PUMP STATUS

D14 TYPICAL TERMINAL BLOCK NAMEPLATE

N.T.S.

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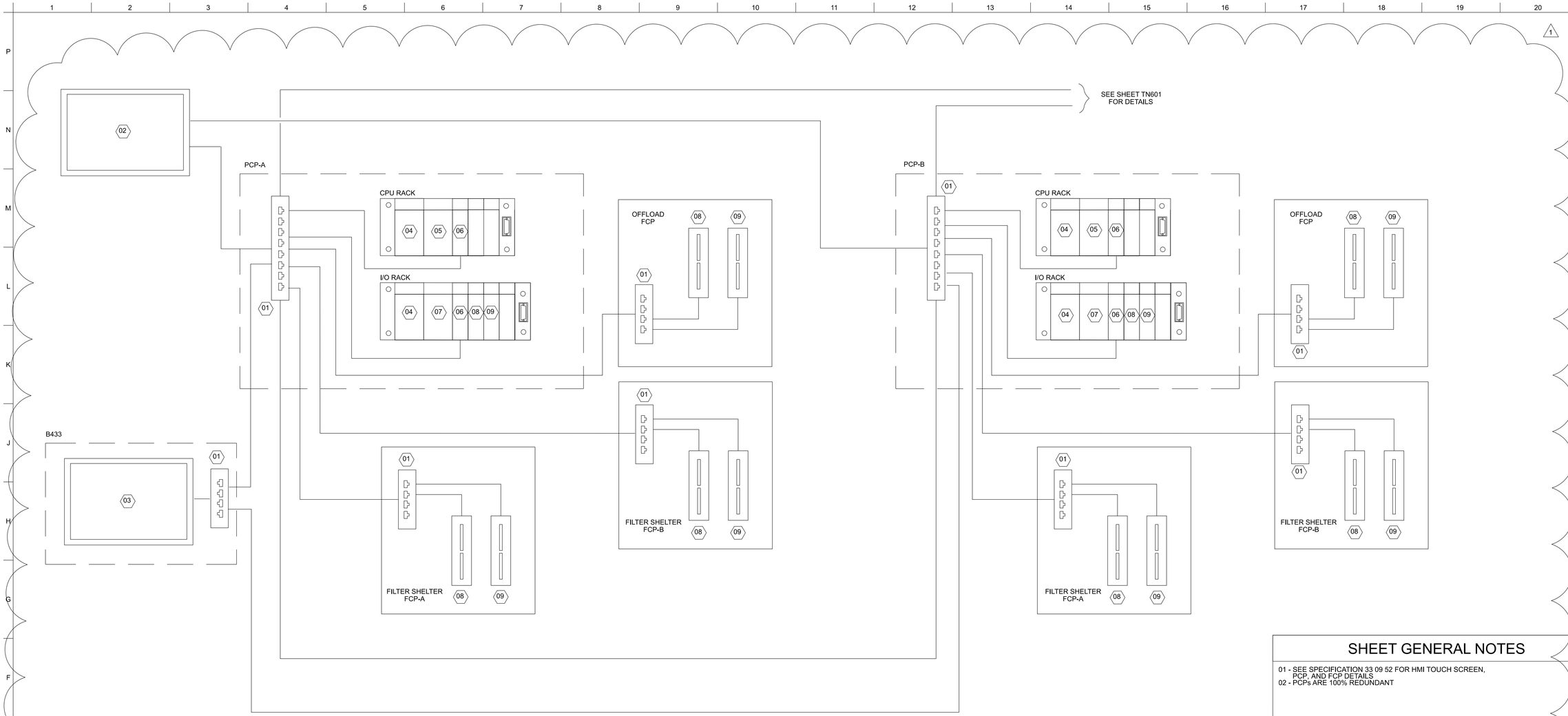
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PUMP CONTROL PANEL ELEVATION

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SHEET GENERAL NOTES

01 - SEE SPECIFICATION 33 09 52 FOR HMI TOUCH SCREEN, PCP, AND FCP DETAILS
02 - PCPs ARE 100% REDUNDANT

SHEET KEY NOTES

01 - NETWORK SWITCH
02 - HMI TOUCH SCREEN AT B451
03 - HMI TOUCH SCREEN AT B433
04 - POWER SUPPLY MODULE
05 - CPU MODULE
06 - COMMUNICATIONS MODULE
07 - NETWORK INTERFACE MODULE
08 - DISCRETE INPUT MODULE
09 - DISCRETE OUTPUT MODULE

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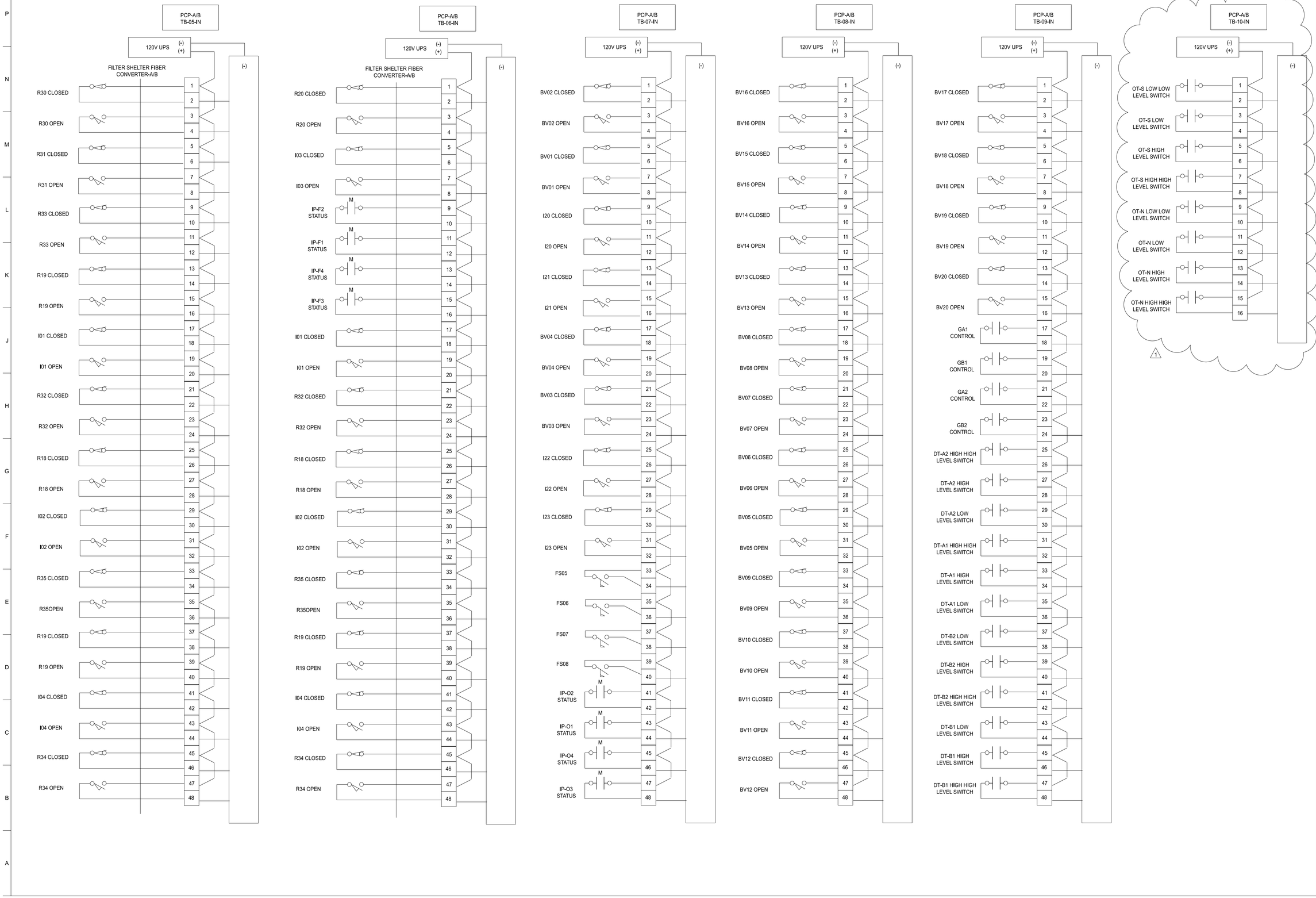
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CONTROL SYSTEM DIAGRAM

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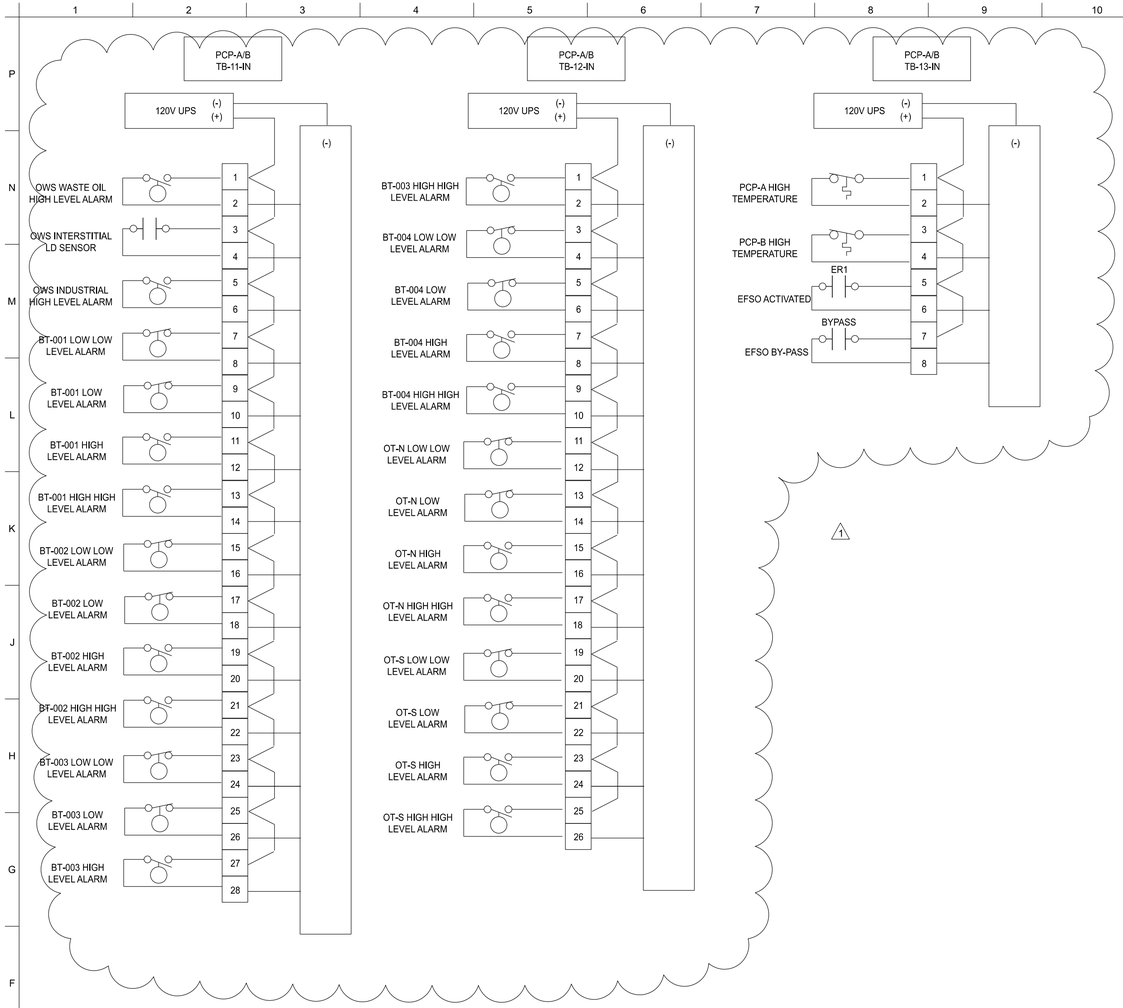
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TERMINAL BLOCK CONNECTIONS (FOR FIELD DEVICES) SHEET 2 OF 3

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(FOR FIELD DEVICES) SHEET 3 OF 3

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PCP-A/B TB-11-OUT

NOTE: THESE OUTPUTS ARE SENT TO BOTH HMI SCREENS

		PCP-A/B ISOLATED DISCRETE DO MODULE
I27 CLOSED	1	
	2	
I27 OPEN	3	
	4	
I25 CLOSED	5	
	6	
I25 OPEN	7	
	8	
I08 CLOSED	9	
	10	
I08 OPEN	11	
	12	
I07 CLOSED	13	
	14	
I07 OPEN	15	
	16	
I14 CLOSED	17	
	18	
I14 OPEN	19	
	20	
I09 CLOSED	21	
	22	
I09 OPEN	23	
	24	
I10 CLOSED	25	
	26	
I10 OPEN	27	
	28	
I11 CLOSED	29	
	30	
I11 OPEN	31	
	32	
I12 CLOSED	33	
	34	
I12 OPEN	35	
	36	
I28 CLOSED	37	
	38	
I28 OPEN	39	
	40	
I29 CLOSED	41	
	42	
I29 OPEN	43	
	44	
I18 CLOSED	45	
	46	
I18 OPEN	47	
	48	

PCP-A/B TB-12-OUT

NOTE: THESE OUTPUTS ARE SENT TO BOTH HMI SCREENS

		PCP-A/B ISOLATED DISCRETE DO MODULE
I13 CLOSED	1	
	2	
I13 OPEN	3	
	4	
I14 CLOSED	5	
	6	
I14 OPEN	7	
	8	
I19 CLOSED	9	
	10	
I19 OPEN	11	
	12	
BV16 CLOSED	13	
	14	
BV16 OPEN	15	
	16	
BV15 CLOSED	17	
	18	
BV15 OPEN	19	
	20	
MOV BV14 CLOSE CONTROL (SELECT)	21	
	22	
MOV BV14 OPEN CONTROL (SELECT)	23	
	24	
MOV BV14 CLOSE	25	
	26	
MOV BV14 OPEN	27	
	28	
MOV BV13 CLOSE CONTROL (SELECT)	29	
	30	
MOV BV13 OPEN CONTROL (SELECT)	31	
	32	
MOV BV13 CLOSE	33	
	34	
MOV BV13 OPEN	35	
	36	
BV08 CLOSED	37	
	38	
BV08 OPEN	39	
	40	
BV07 CLOSED	41	
	42	
BV07 OPEN	43	
	44	
MOV BV06 CLOSE CONTROL (SELECT)	45	
	46	
MOV BV06 OPEN CONTROL (SELECT)	47	
	48	

PCP-A/B TB-13-OUT

NOTE: THESE OUTPUTS ARE SENT TO BOTH HMI SCREENS

		PCP-A/B ISOLATED DISCRETE DO MODULE
MOV BV06 CLOSE	1	
	2	
MOV BV06 OPEN	3	
	4	
MOV BV05 CLOSE CONTROL (SELECT)	5	
	6	
MOV BV05 OPEN CONTROL (SELECT)	7	
	8	
MOV BV05 CLOSE	9	
	10	
MOV BV05 OPEN	11	
	12	
MOV BV09 CLOSE CONTROL (SELECT)	13	
	14	
MOV BV09 OPEN CONTROL (SELECT)	15	
	16	
MOV BV09 CLOSE	17	
	18	
MOV BV09 OPEN	19	
	20	
MOV BV10 CLOSE CONTROL (SELECT)	21	
	22	
MOV BV10 OPEN CONTROL (SELECT)	23	
	24	
MOV BV10 CLOSE	25	
	26	
MOV BV10 OPEN	27	
	28	
BV11 CLOSED	29	
	30	
BV11 OPEN	31	
	32	
BV12 CLOSED	33	
	34	
BV12 OPEN	35	
	36	
MOV BV17 CLOSE CONTROL (SELECT)	37	
	38	
MOV BV17 OPEN CONTROL (SELECT)	39	
	40	
MOV BV17 CLOSE	41	
	42	
MOV BV17 OPEN	43	
	44	
MOV BV18 CLOSE CONTROL (SELECT)	45	
	46	
MOV BV18 OPEN CONTROL (SELECT)	47	
	48	

PCP-A/B TB-14-OUT

NOTE: THESE OUTPUTS ARE SENT TO BOTH HMI SCREENS

		PCP-A/B ISOLATED DISCRETE DO MODULE
MOV BV18 CLOSE	1	
	2	
MOV BV18 OPEN	3	
	4	
BV19 CLOSED	5	
	6	
BV19 OPEN	7	
	8	
BV20 CLOSED	9	
	10	
BV20 OPEN	11	
	12	
EFSO-1 ACTIVATED	13	
	14	
EFSO-2 ACTIVATED	15	
	16	
EFSO-3 ACTIVATED	17	
	18	
EFSO-4 ACTIVATED	19	
	20	
EFSO-5 ACTIVATED	21	
	22	
EFSO-6 ACTIVATED	23	
	24	
EFSO-7 ACTIVATED	25	
	26	
EFSO-8 ACTIVATED	27	
	28	
EFSO-9 ACTIVATED	29	
	30	
EFSO-10 ACTIVATED	31	
	32	
EFSO-11 ACTIVATED	33	
	34	
EFSO-12 ACTIVATED	35	
	36	
EFSO-13 ACTIVATED	37	
	38	
EFSO BY-PASS (NON-CRITICAL)	39	
	40	
	41	
	42	
	43	
	44	
	45	
	46	
	47	

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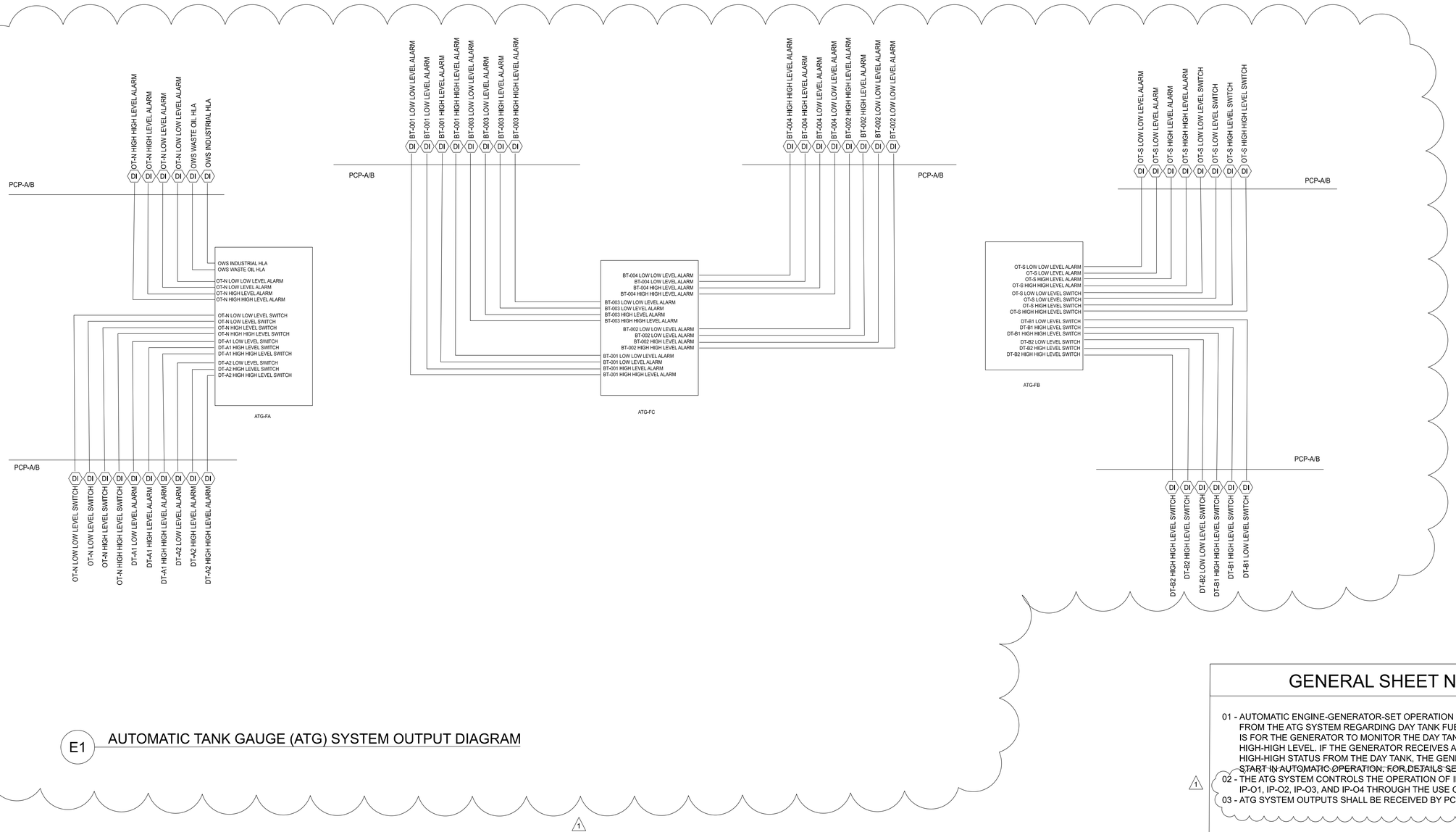
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TERMINAL BLOCK DIAGRAMS
SHEET 3 OF 3

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E1 AUTOMATIC TANK GAUGE (ATG) SYSTEM OUTPUT DIAGRAM

GENERAL SHEET NOTES

01 - AUTOMATIC ENGINE-GENERATOR-SET OPERATION SHALL RECEIVE DATA FROM THE ATG SYSTEM REGARDING DAY TANK FUEL LEVELS. THE INTENT IS FOR THE GENERATOR TO MONITOR THE DAY TANK LOW-LOW AND HIGH-HIGH LEVEL. IF THE GENERATOR RECEIVES A LOW-LOW ALARM OR HIGH-HIGH STATUS FROM THE DAY TANK, THE GENERATOR SHOULD NOT START IN AUTOMATIC OPERATION. FOR DETAILS SEE SHEET EP501.
02 - THE ATG SYSTEM CONTROLS THE OPERATION OF IP-F1, IP-F2, IP-F3, IP-F4, IP-O1, IP-O2, IP-O3, AND IP-O4 THROUGH THE USE OF OUTPUT RELAYS.
03 - ATG SYSTEM OUTPUTS SHALL BE RECEIVED BY PCP-A AND PCP-B.

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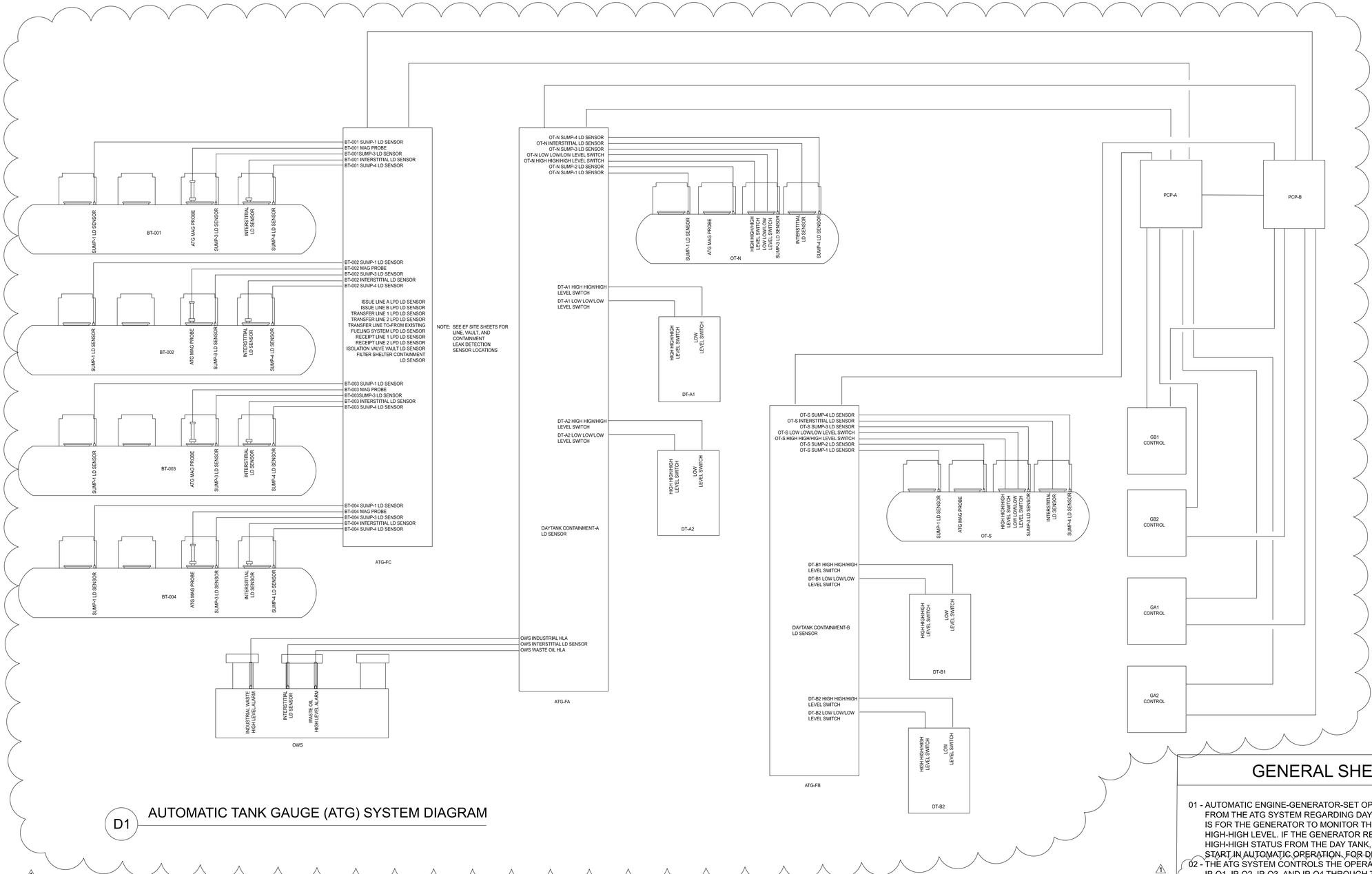
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1 ATG SYSTEM OUTPUT DIAGRAM

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D1 AUTOMATIC TANK GAUGE (ATG) SYSTEM DIAGRAM

GENERAL SHEET NOTES

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02 - THE ATG SYSTEM CONTROLS THE OPERATION OF IP-F1, IP-F2, IP-F3, IP-F4, IP-O1, IP-O2, IP-O3, AND IP-O4 THROUGH THE USE OF OUTPUT RELAYS.

03 - ATG-FA AND ATG-FB CONSOLES ARE LOCATED IN THEIR ASSOCIATED PUMP CONTROL ROOMS. ATG-FC CONSOLE IS LOCATED AT THE FILTER SHELTER EQUIPMENT RISER.

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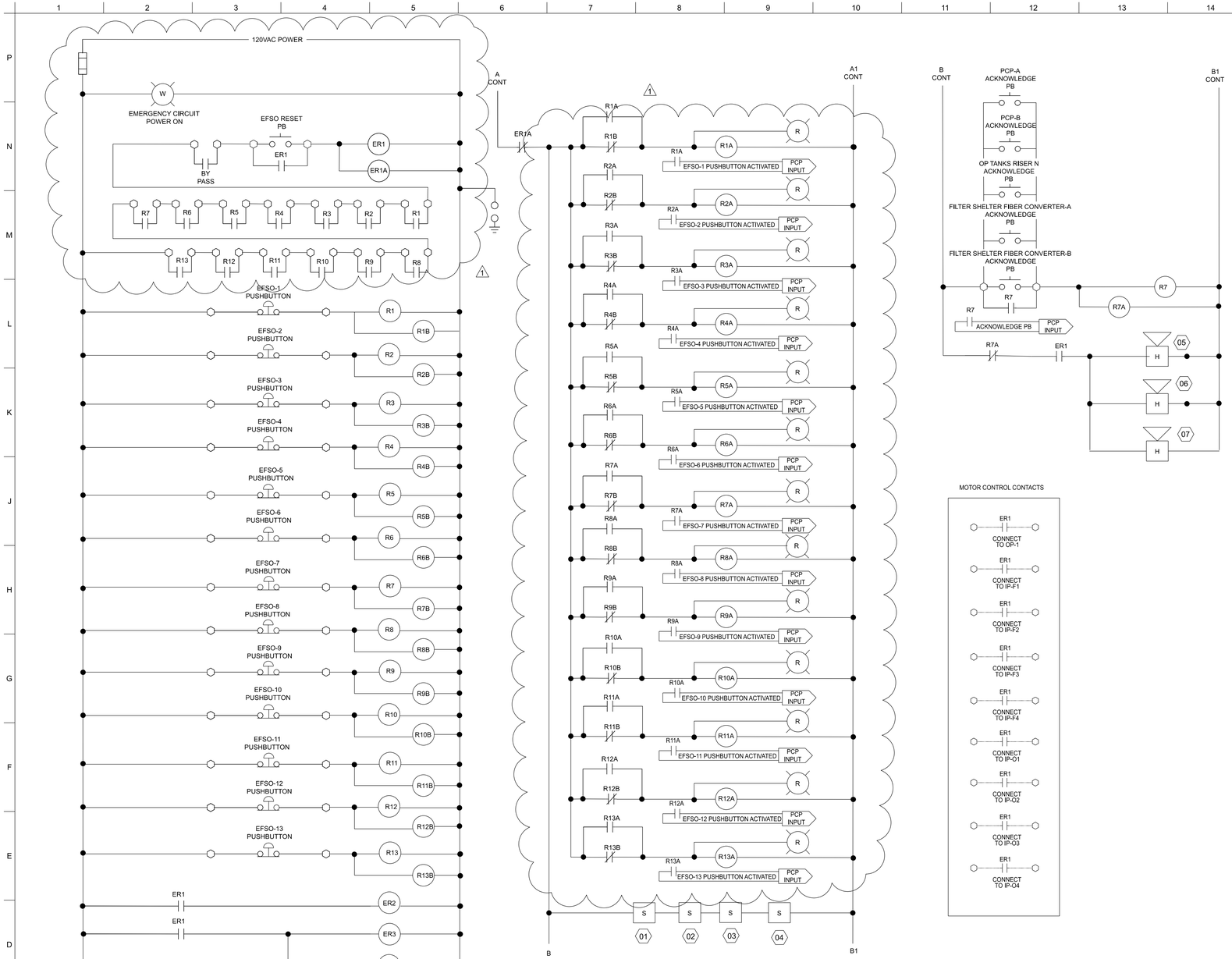
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ATG SYSTEM DIAGRAM

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B1 EFSO CONTROL SYSTEM DIAGRAM

GENERAL SHEET NOTES

01 - OFFLOAD EFSO SYSTEM AND EFSO SYSTEM SHALL NOT BE INTEGRATED. OFFLOAD EFSO SYSTEM SHALL SEND AN EFSO STATUS SIGNAL TO THE PCP.
02 - ACKNOWLEDGE PB SHALL CANCEL HORNS AND STROBES SHALL CONTINUE TO FLASH UNTIL EFSO SYSTEM IS MANUALLY RESET
03 - EFSO SYSTEM COMPONENTS SHALL BE INTEGRATED INTO PCP-A UNLESS INDICATED OTHERWISE. EFSO SYSTEM SHALL HAVE A DEDICATED 120V BRANCH CIRCUIT
04 - DIGITAL RELAY TIMER WITH DIGITAL DISPLAY PERFORMS THE FUNCTION OF A BYPASS COUNTDOWN TIMER. THE DIGITAL DISPLAY SHALL SHOW THE SETPOINT VALUE (SV) OF 0 SECONDS AND THE PRESENT VALUE (PV) READING IN HOURS, MINUTES AND SECONDS (COUNTDOWN TO START AT 24 HOURS AND SHALL COUNTDOWN IN 1 SECOND INCREMENTS). THE DIGITAL RELAY TIMER SHALL HAVE A "RESET" BUTTON LOCATED ON THE FRONT OF THE UNIT, NEXT TO THE DISPLAY (ACCESSIBLE ON FRONT OF PANEL), THAT WHEN PRESSED WILL RESET THE COUNTDOWN TIMER TO 24 HOURS. THIS "RESET" WILL REMOVE THE BYPASS FOR THAT AREA. THE DIGITAL RELAY TIMER SHALL BE CAPABLE OF LOCKING THE KEYPAD WHILE STILL ALLOWING THE "RESET" BUTTON REMAIN FUNCTIONAL. DIGITAL RELAY TIMER IS BASED ON:
MANUFACTURER: AUTOMATION DIRECT MODEL: CTT-1C-A120
TIMER SETTING: SIGNAL OFF DELAY "SOFFD", TIMING DOWN.
KEYPAD LOCK SETTING: "LOCK 2" ("RESET" FUNCTIONAL)
05 - OUTPUT CONTACT SHALL CLOSE WHILE COUNTDOWN TIMER IS COUNTING DOWN OR WHILE DURING THE COUNTDOWN TIMER, PAUSE IS PRESSED. OUTPUT CONTACT SHALL OPEN WHEN COUNTDOWN TIMER IS AT 24 HOURS (PRIOR TO COUNTING DOWN), WHEN COUNTDOWN TIMER REACHES 0 SECONDS (END OF COUNTDOWN), WHEN RESET IS PRESSED. ON LOSS OF POWER TO THE DIGITAL RELAY TIMER, THE OUTPUT CONTACTS SHALL OPEN.

SHEET KEY NOTES

01 - STROBE LOCATED OUTSIDE PUMP CONTROL ROOM A
02 - STROBE LOCATED OUTSIDE PUMP CONTROL ROOM B
03 - STROBE LOCATED AT OT-N EQUIPMENT RISER
04 - STORBE LOCATED AT FILTER SHELTER EQUIPMENT RISER
05 - RESONATING HORN LOCATED ON WEST SIDE OF B451 NEAR OT-N EQUIPMENT RISER
06 - RESONATING HORN LOCATED PUMP CONTROL ROOM A
06 - RESONATING HORN LOCATED PUMP CONTROL ROOM B

LEGEND

K KEYED INTERLOCK

- KEYED SWITCH INTERCONNECTION (WHEN PLACED IN BY-PASS, THIS CONNECTION IS ALSO MADE)

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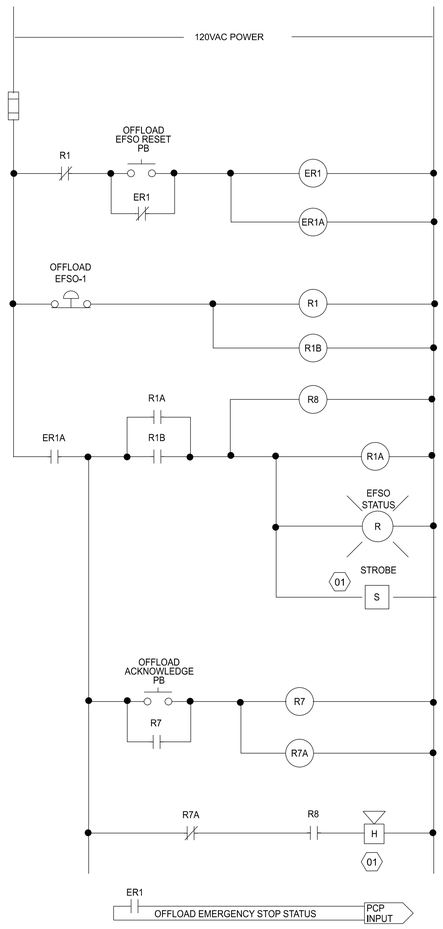
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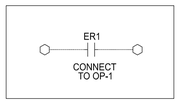
EFSO SYSTEM CONTROL DIAGRAM

SHEET ID
EF529

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MOTOR CONTROL CONTACTS



EMERGENCY/SAFTEY CIRCUIT DIAGRAM

EFSO SYSTEM SHALL BE FAIL SAFE.
NORMAL OPERATING CONDITION
IS ENERGIZED.

E2 OFFLOAD EFSO SYSTEM CONTROL DIAGRAM

GENERAL SHEET NOTES

01 - OFFLOAD EFSO SYSTEM AND EFSO SYSTEM SHALL NOT BE INTEGRATED. OFFLOAD EFSO SYSTEM SHALL SEND AN EFSO STATUS SIGNAL TO THE PCP.
02 - ACKNOWLEDGE PB SHALL CANCEL HORN AND STROBE SHALL CONTINUE TO FLASH UNTIL EFSO SYSTEM IS MANUALLY RESET
1 03 - EFSO SYSTEM COMPONENTS SHALL BE INCORPORATED INTO THE OFFLOAD FCP

SHEET KEY NOTES

01 - VIBRATING HORN HORN AND STROBE ARE LOCATED ON THE OFFLOAD FIBER CONVERTER PANEL

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DESIGNED BY: M. MERWALD	ISSUE DATE: 05/01/2025
DRAWN BY: M. MERWALD	SOLICITATION NO.: W9128F25RA043
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OFFLOAD EFSO SYSTEM CONTROL DIAGRAM

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GENERATOR EXHAUST SCR AFTERTREATMENT SYSTEM (TYP OF ALL GENSETS) SEE SPECIFICATION FOR MORE INFORMATION

24" DIAMETER STEEL EXHAUST STACK (TYP)

EXPANSION JOINT (TYP)

10' x 14' EXHAUST LOUVER DUCTED TO RADIATOR (TYP)

VENTILATED WALL THIMBLE (TYP)

SLOPE EXHAUST PIPE DOWN AT 1/8" PER FOOT TOWARDS BUILDING EXIT (TYP ALL EXHAUST PIPES)

ROUTE LINES ABOVE ROOM 111 LID AND THEN OUT

DAY TANKS B
124

DAY TANKS A
111

EXHAUST TREATMENT
116

6" MINERAL WOOL INSULATION (TYP)

EXPANSION JOINT (TYP)

PROVIDE INSULATION SHIELD AND PIPE SADDLE ON STRUCTURAL SUPPORT (TYP)

PUMP CONTROL B
123

PUMP CONTROL A
110

GENERATOR B
117

GENERATOR A
106

ELEC
104

TELECOM
103

CIRC
101A

UNISEX RR
102

READINESS
101

VEST.
100

TOOL STORAGE
107

MECHANICAL
105

6" DIA. EXHAUST DUCT TO HOODED WALL OUTLET. PROVIDE INSECT SCREEN

SPLIT SYSTEM CABINET UNIT CONCEALED IN PLENUM SPACE

4" DIA. INTAKE DUCT TO HOODED WALL OUTLET. PROVIDE INSECT SCREEN PROVIDE DAMPER IN DUCT AND BALANCE TO 30 CFM

WALL MOUNTED HYDROGEN GAS DETECTOR. MOUNT APPROX. 10' A.F.F. PROVIDE INPUT TO DDC WITH ALARM AT 1% CONCENTRATION

WALL MOUNTED HYDROGEN GAS DETECTOR. MOUNT APPROX. 10' A.F.F. PROVIDE INPUT TO DDC WITH ALARM AT 1% CONCENTRATION

NEW OIL STORAGE
122

FORKLIFT CHARGING
121

SWITCHGEAR UB
119

SWITCHGEAR GB
118

SWITCHGEAR GA
115

SWITCHGEAR UA
114

SPLIT SYSTEM CONSOLE UNIT. MOUNT 8'-0" AFF (TYP)

DISTRO A
112

DDC PANEL A

DISTRO B
120

DDC PANEL B

WORKSHOP
108

FIRE PUMP
113

36"x16" INTAKE DUCT WITH MOTORIZED DAMPER.

REFRIGERANT SUCTION AND LIQUID LINES SIZED PER MANUFACTURER (TYP)

36"x16" INTAKE DUCT WITH MOTORIZED DAMPER.

PROVIDE 18"x18" MOTORIZED DAMPER CONNECTED TO LOUVER. DAMPER TO OPEN WITH DIESEL FIRE PUMP OPERATION. DAMPER TO FAIL OPEN.

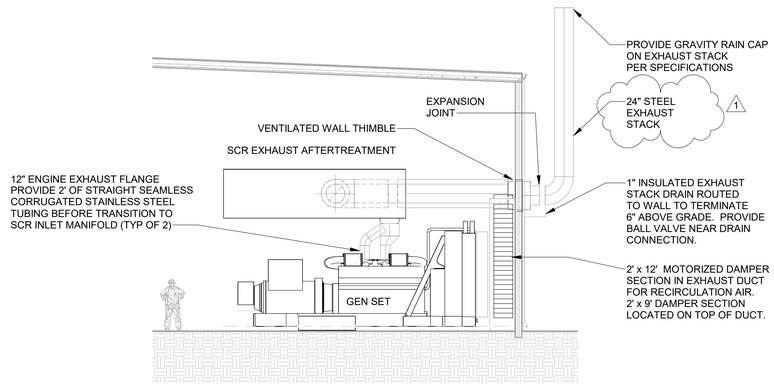
ELECTRIC UNIT HEATER PROVIDE WALL MOUNT SUPPORT AND MOUNT 8'-0" ABOVE FLOOR (TYP)

18"x18" EXHAUST DUCT WITH MOTORIZED DAMPER

SPLIT SYSTEM HEAT PUMP UNIT. WALL MOUNT 3'-4" ABOVE GRADE AND ENSURE ALL AIR FLOW CLEARANCES ARE MAINTAINED.

18"x18" EXHAUST DUCT WITH MOTORIZED DAMPER

F2 FIRST FLOOR HVAC
1/8" = 1'-0"



A2 GENERATOR EXHAUST SECTION
1/8" = 1'-0"

KEY PLAN

B451

PLAN NORTH

0 4' 8' 16'

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1	AM #0003 - GENERAL REVISIONS	09/29/2025

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ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9126P25RA043
CONTRACT NO.:

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SUBMITTED BY: C. FOSMER
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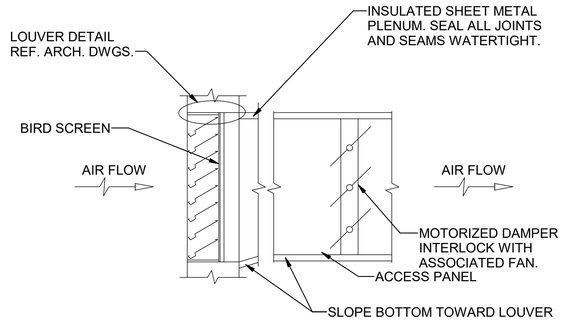
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FIRST FLOOR HVAC PLAN

SHEET ID

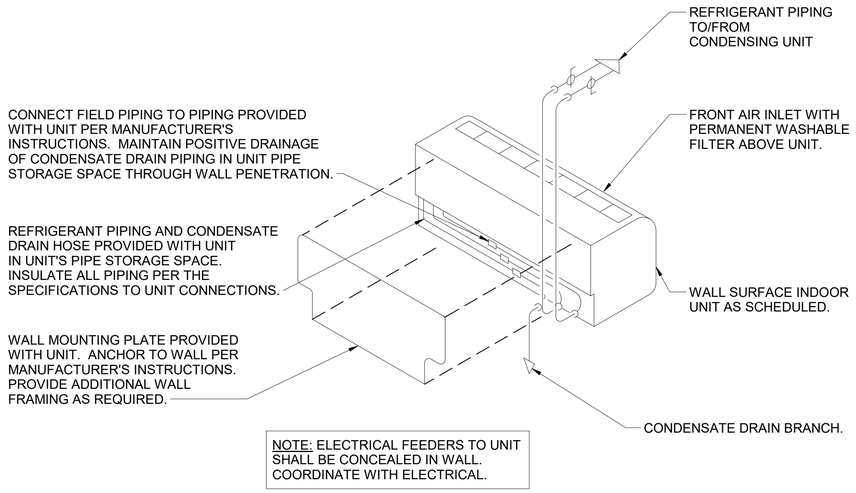
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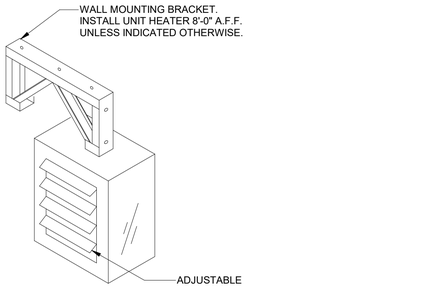
K2 OUTSIDE AIR INTAKE DETAIL

1/8" = 1'-0"



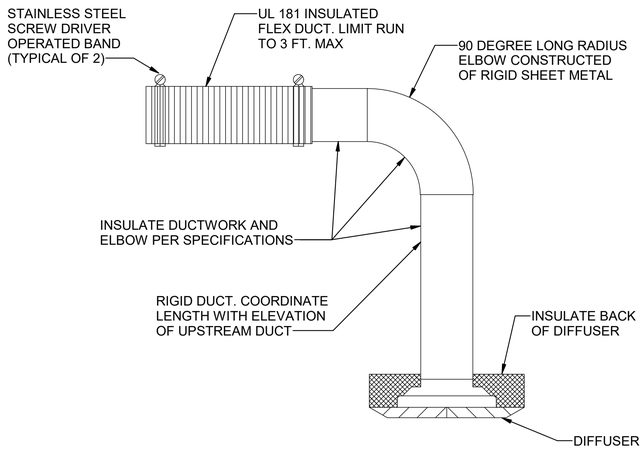
K9 SPLIT SYSTEM INDOOR UNIT DETAIL

1/2" = 1'-0"



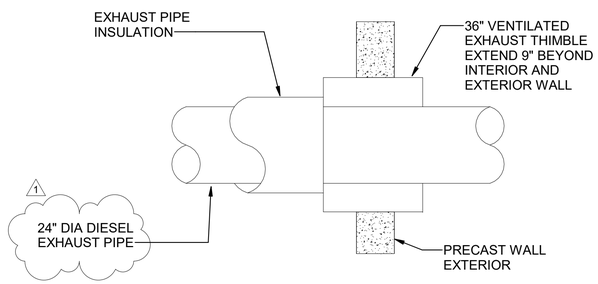
B2 ELECTRIC UNIT HEATER DETAIL

1/8" = 1'-0"



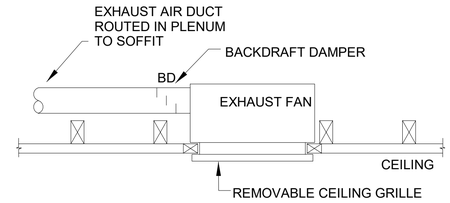
B8 DIFFUSER CONNECTION DETAIL

1/8" = 1'-0"



E15 EXHAUST THIMBLE DETAIL

3" = 1'-0"



B16 CEILING EXHAUST FAN DETAIL

1" = 1'-0"

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ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
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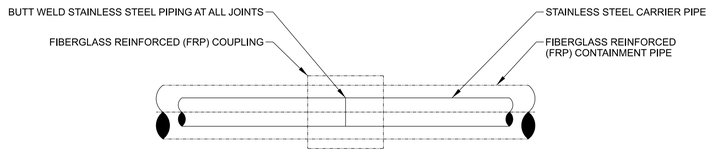
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HVAC DETAILS

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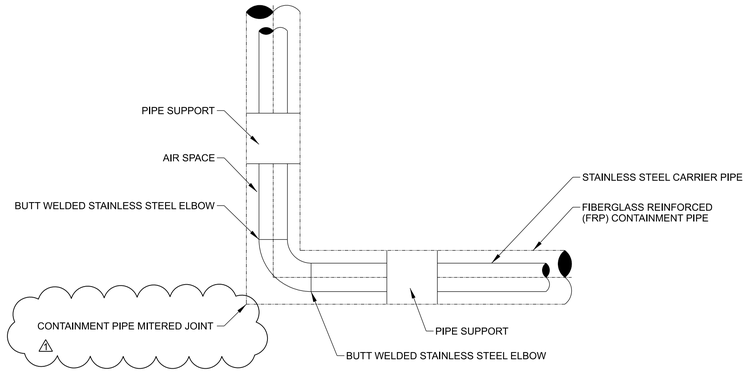
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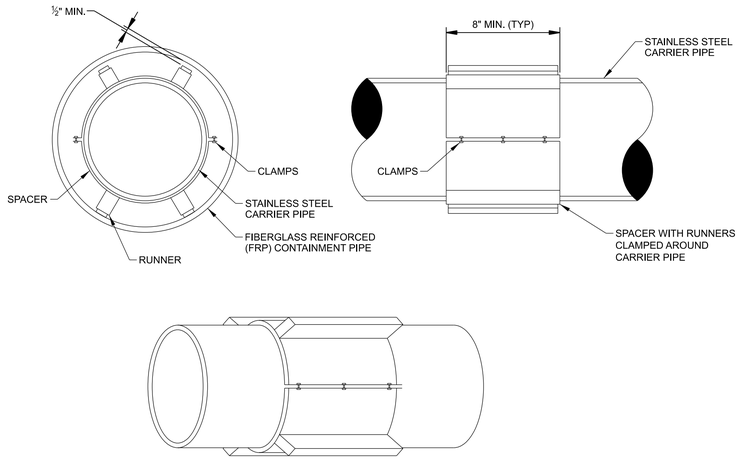
J1 DOUBLE WALL PIPING BELOW GRADE FIELD JOINT

SCALE: NOT TO SCALE



J9 DOUBLE WALL PIPING BELOW GRADE ELBOW

SCALE: NOT TO SCALE

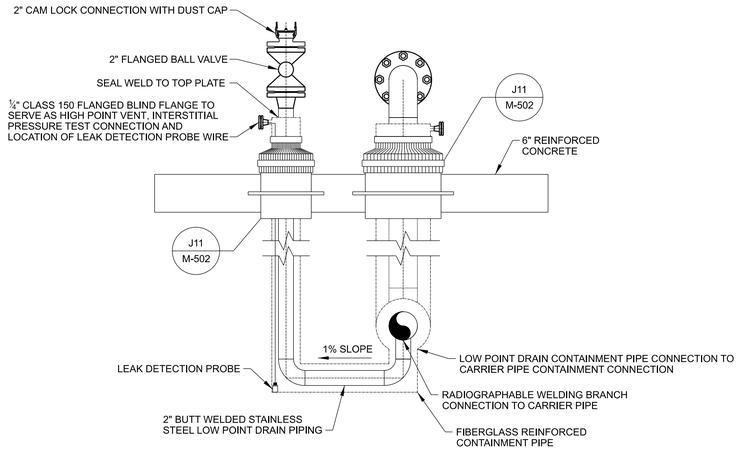


B1 DOUBLE WALL PIPE SUPPORT / SPACER

SCALE: NOT TO SCALE

NOTES:

1. THIS DETAIL IS FOR DOUBLE WALL PIPING WITH STAINLESS STEEL CARRIER PIPE AND FIBERGLASS REINFORCED CONTAINMENT PIPE ONLY.
2. SUPPORT SPACERS SHALL BE INSTALLED AROUND THE CARRIER PIPE TO BE SUPPORTED WITHIN THE CONTAINMENT PIPE. SUPPORT SPACERS SHALL BE OF EPOXY COATED STAINLESS STEEL CONSTRUCTION WITH FUEL RESISTANT LINER. SPACERS SHALL BE BANDED AND SECURELY BOLTED AROUND THE CARRIER PIPE. THE SUPPORT SPACERS SHALL BE OF SUFFICIENT LENGTH AND WIDTH TO ALLOW FREE MOVEMENT OF THE CARRIER PIPE WITHIN THE CONTAINMENT PIPE WITH SUFFICIENT CLEARANCES ON THE SIDES AND TOP AND BETWEEN THE CARRIER PIPE SUPPORT SPACERS AND THE INSIDE OF THE CONTAINMENT PIPE. THE SUPPORT SPACERS SHALL BE INSTALLED APPROXIMATELY EVERY 8 TO 10 FEET OR AS RECOMMENDED BY THE MANUFACTURER FOR THE CARRIER PIPE SIZE.
3. PURGE PIPING INTERSTITIAL SPACE BETWEEN CARRIER PIPE AND CONTAINMENT PIPE WITH AIR, HAVING A DEW POINT OF 40 DEGREES FAHRENHEIT OR NITROGEN PRIOR TO SEALING INTERSTITIAL SPACE.
4. CARRIER PIPE TO BE COATED TO TWICE SPECIFIC THICKNESS 6" TO BOTH SIDES OF CASING SEAL.
5. CONTRACTOR SHALL PROVIDE GOVERNMENT WITH A SUBMITTAL FOR LOCATIONS OF SPACERS WITHIN THE DOUBLE WALL PIPING.



B9 LOW POINT DRAIN / LEAK DETECTION DETAIL

SCALE: NOT TO SCALE

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CHECKED BY: D. SCHEUFFELE	CONTRACT NO.:
SUBMITTED BY: D. SCHEUFFELE	FILE NUMBER:
SIZE: ANSI D	FILE NAME: BUCO00102M-505.dwg

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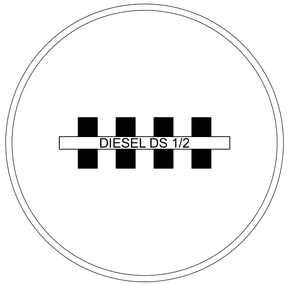
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MECHANICAL FUELING DETAILS
SHEET 6 OF 9

SHEET ID
M-506

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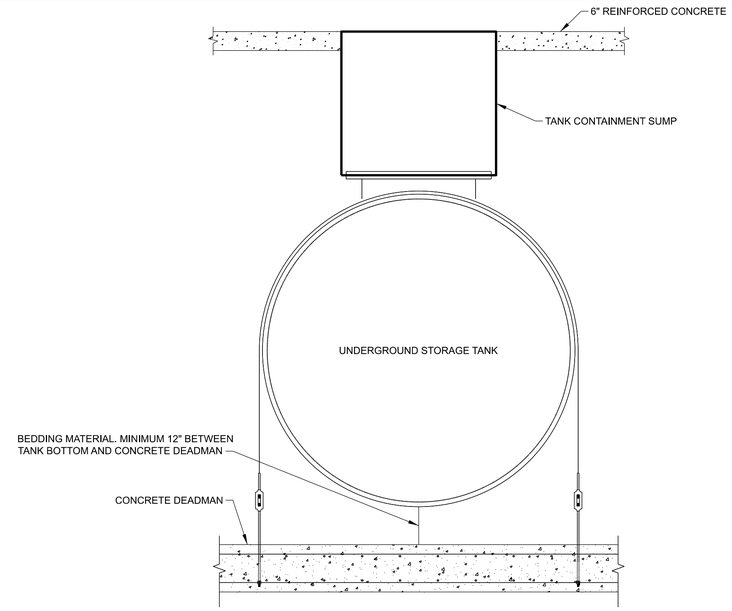
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J1 TANK SUMP LABELING

SCALE: NOT TO SCALE

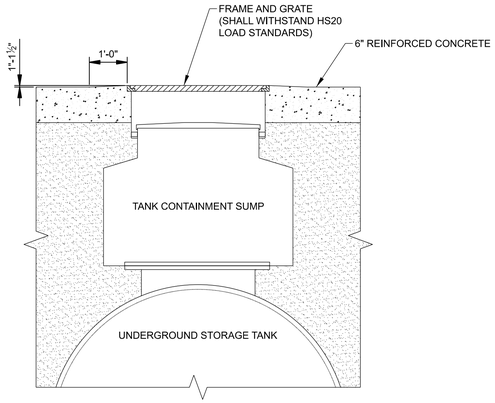
NOTES:
1. CONTRACTOR TO INSTALL PRODUCT GROUP IDENTIFICATIONS ON BULK TANK MANWAYS AND OPERATING TANK MANWAYS PER MIL-STD-161H.



J9 TANK STRAP INSTALLATION DETAIL

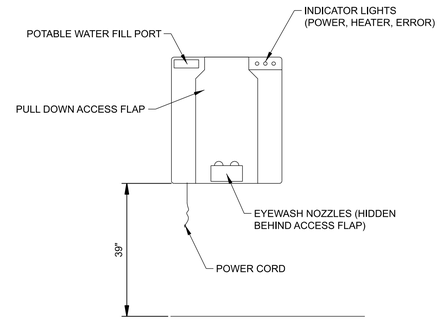
SCALE: NOT TO SCALE

NOTES:
1. HOLD-DOWN STRAPS, TURN BUCKLES AND ANCHOR RODS SHALL BE NON-CORROSIVE OR COATED FOR CORROSION PROTECTION.
2. SEE SHEET SS100 FOR TANK DEADMAN INFORMATION.



B1 TANK SUMP INSTALLATION

SCALE: NOT TO SCALE



B9 SELF-CONTAINED EMERGENCY EYEWASH

SCALE: NOT TO SCALE

NOTES:
1. MUST BE CERTIFIED TO ANSI Z358.1
2. SIZE MUST BE SIZED TO MEET A MINIMUM 0.4 GPM OVER A 15 MINUTE PERIOD
3. UNIT MUST INCLUDE A 120VAC HEATER TO MAINTAIN TEMPERATURE AT A MINIMUM 68 DEG-F
4. INCLUDE TWO BOTTLES OF MANUFACTURER'S WATER ADDITIVES PER UNIT. ONE WILL BE USED DURING THE START-UP, AND THE OTHER WILL BE PROVIDED TO THE INSTALLATION.
5. INCLUDE THE MANUFACTURER'S STANDARD CLEANING BRUSH WITH EACH UNIT.
6. EACH UNIT MUST HAVE A MOUNTING BRACKET.
7. MOUNT ONE UNIT ON FILTER SHELTER COLUMN WITH ACCESS TO POWER RECEPTACLE.
8. MOUNT ONE UNIT ON PUMPED OFFLOAD RACK OR PUMPED OFFLOAD CANOPY WITH ACCESS TO POWER RECEPTACLE. ⚠1

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MECHANICAL FUELING DETAILS
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SHEET ID
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PUMP SCHEDULE

DESIGNATION	TYPE OF PUMP	LOCATION	FLUID	SPECIFIC GRAVITY	FLOW RATE (GPM)	FEET OF FLUID /DIFFERENTIAL PRESSURE	NOTES
OP-1	IN-LINE VERTICAL	TRUCK OFFLOAD	DIESEL	0.81	300	50	SEE EP610 SERIES EQUIPMENT CONNECTION SCHEDULES FOR ELECTRICAL INFORMATION
IP-F1	SUBMERSIBLE TURBINE	BT-001	DIESEL	0.81	100	100	SEE EP610 SERIES EQUIPMENT CONNECTION SCHEDULES FOR ELECTRICAL INFORMATION
IP-F2	SUBMERSIBLE TURBINE	BT-002	DIESEL	0.81	100	100	SEE EP610 SERIES EQUIPMENT CONNECTION SCHEDULES FOR ELECTRICAL INFORMATION
IP-F3	SUBMERSIBLE TURBINE	BT-003	DIESEL	0.81	100	100	SEE EP610 SERIES EQUIPMENT CONNECTION SCHEDULES FOR ELECTRICAL INFORMATION
IP-F4	SUBMERSIBLE TURBINE	BT-004	DIESEL	0.81	100	100	SEE EP610 SERIES EQUIPMENT CONNECTION SCHEDULES FOR ELECTRICAL INFORMATION
IP-O1	SUBMERSIBLE TURBINE	OT-001	DIESEL	0.81	30	50	SEE EP610 SERIES EQUIPMENT CONNECTION SCHEDULES FOR ELECTRICAL INFORMATION
IP-O2	SUBMERSIBLE TURBINE	OT-001	DIESEL	0.81	30	50	SEE EP610 SERIES EQUIPMENT CONNECTION SCHEDULES FOR ELECTRICAL INFORMATION
IP-O3	SUBMERSIBLE TURBINE	OT-002	DIESEL	0.81	30	50	SEE EP610 SERIES EQUIPMENT CONNECTION SCHEDULES FOR ELECTRICAL INFORMATION
IP-O4	SUBMERSIBLE TURBINE	OT-002	DIESEL	0.81	30	50	SEE EP610 SERIES EQUIPMENT CONNECTION SCHEDULES FOR ELECTRICAL INFORMATION

FILTER SEPARATOR SCHEDULE

DESIGNATION	TYPE OF FILTER	LOCATION	FLUID	FLOW RATE (GPM)	ASME LABELED WORKING PRESSURE	CONNECTIONS INLET / OUTLET	NOTES
FSI-1	VERTICAL	FILTER SHELTER	DIESEL	100	275 PSI	2", ANSI B16.5, CLASS 150	
FSI-2	VERTICAL	FILTER SHELTER	DIESEL	100	275 PSI	2", ANSI B16.5, CLASS 150	

TANK SCHEDULE

DESIGNATION	NOMINAL CAPACITY (GAL)	TANK DIAMETER(S)	TANK LENGTH(S)	FLUID	DESIGN STANDARD	DESIGN PRESSURE	DESIGN TEMPERATURE
BT-001	50,000	INNER: 11'-6" OUTER: 12'-2½"	66'-3"	DIESEL	UL 1316	ATMOSPHERIC	AMBIENT
BT-002	50,000	INNER: 11'-6" OUTER: 12'-2½"	66'-3"	DIESEL	UL 1316	ATMOSPHERIC	AMBIENT
BT-003	50,000	INNER: 11'-6" OUTER: 12'-2½"	66'-3"	DIESEL	UL 1316	ATMOSPHERIC	AMBIENT
BT-004	50,000	INNER: 11'-6" OUTER: 12'-2½"	66'-3"	DIESEL	UL 1316	ATMOSPHERIC	AMBIENT
OT-001	5,000	INNER: 6'-0" OUTER: 6'-3½"	24'-9"	DIESEL	UL 1316	ATMOSPHERIC	AMBIENT
OT-002	5,000	INNER: 6'-0" OUTER: 6'-3½"	24'-9"	DIESEL	UL 1316	ATMOSPHERIC	AMBIENT
DT-001	660	4'-0"	7'-1"	DIESEL	UL142	ATMOSPHERIC	AMBIENT
DT-002	660	4'-0"	7'-1"	DIESEL	UL142	ATMOSPHERIC	AMBIENT
DT-003	660	4'-0"	7'-1"	DIESEL	UL142	ATMOSPHERIC	AMBIENT
DT-004	660	4'-0"	7'-1"	DIESEL	UL 142	ATMOSPHERIC	AMBIENT

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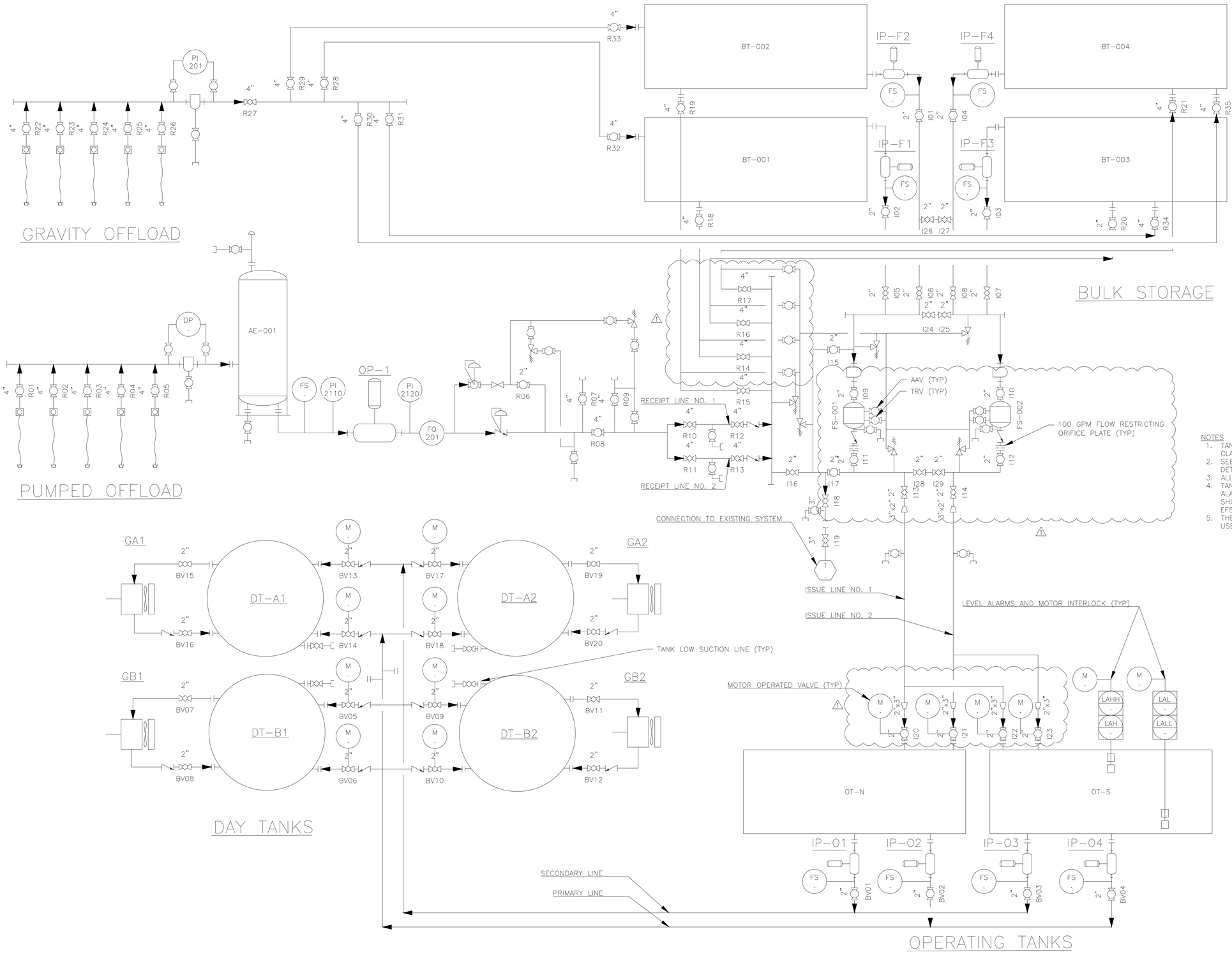
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MECHANICAL FUELING SCHEDULES

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NOTES
1. TANK SUMPS NOT SHOWN FOR CLARITY
2. SEE MS401–MS404 FOR LEAK DETECTORS
3. ALL ACCESSORIES NOT SHOWN
4. TANK ATGS WITH INTEGRAL ALARMS AND INTERLOCKS SHOWN ON MS503–MS509, EF518–EF521, AND EF524
5. THERMAL FLOW SWITCHES USED TO SAVE SPACE

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SUBMITTED BY:	M. PETERSON
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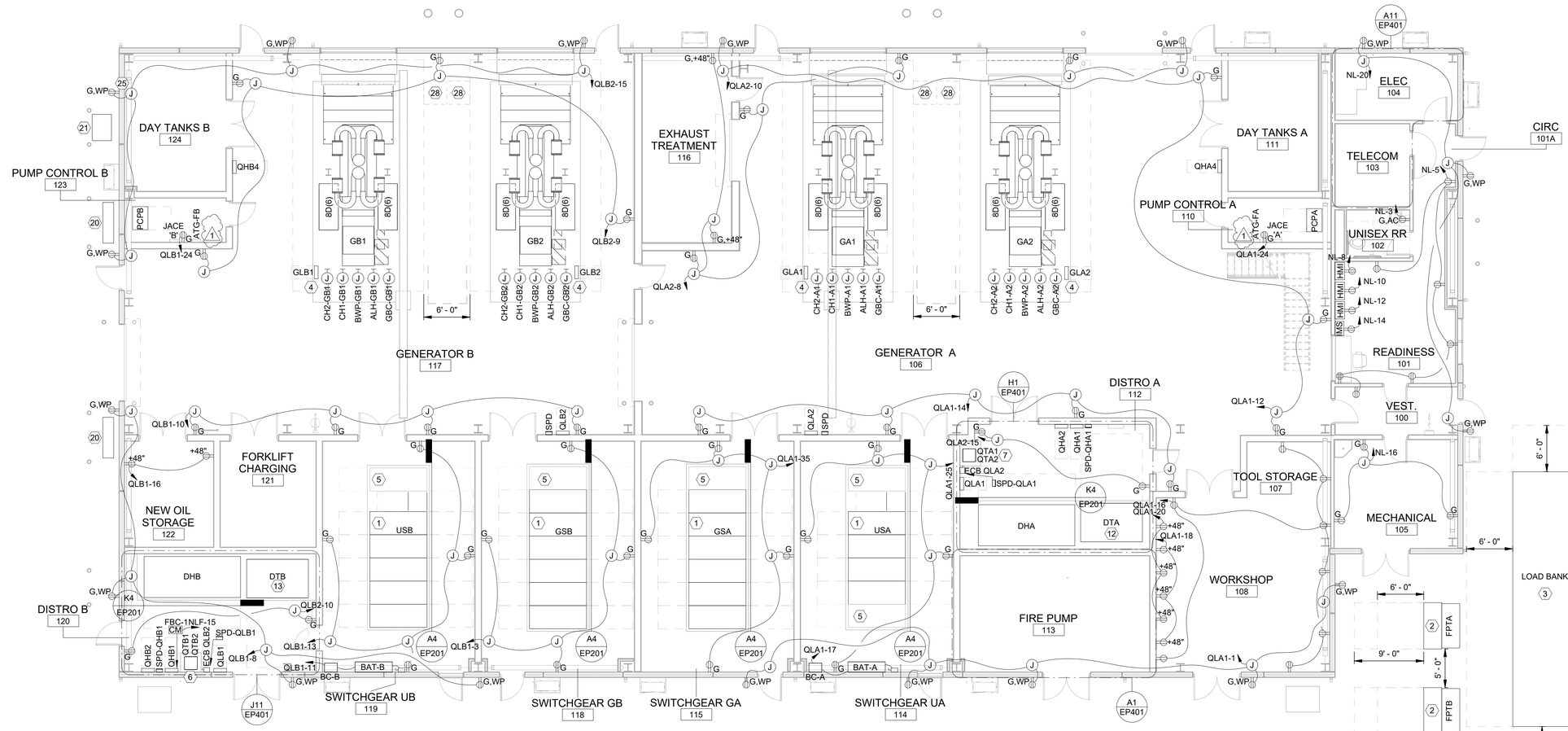
U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE: MISSION CONTROL STATION

MECHANICAL FUELS P&ID

SHEET ID
M-603

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A1 POWER PLAN

1/8" = 1'-0"

FOR SUPPLEMENTAL LEGEND, GENERAL NOTES, AND KEYNOTES, SEE SHEET EP001.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

File Path: C:\Users\gfeddesen\Documents\BUCO00102_DM_ME_gfeddesen.rvt

Plot Date: 9/29/2025 11:50:48 AM

DESIGNED BY: E.MCNAMARA	ISSUE DATE: 05/01/2025
DRAWN BY: E.MCNAMARA	SOLICITATION NO.: W9128F25RA043
CHECKED BY: B.ADKINS	CONTRACT NO.:
SUBMITTED BY: J.MOSTER	FILE NAME: BUCO00102_DM_ME.rvt
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US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
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OMAHA, NE 68102

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

POWER PLAN

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EP101

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EQUIPMENT ELECTRICAL CONNECTION SCHEDULES KEY

EQUIPMENT ELECTRICAL CONNECTION SCHEDULE - < CONTRACTOR-FURNISHED, CONTRACTOR-INSTALLED: CONTRACTOR-PROVIDED EQUIPMENT, CONTRACTOR IS RESPONSIBLE FOR PROVIDING ELECTRICAL SUPPORT REQUIRED BY THE EQUIPMENT WITH FEATURES IDENTIFIED IN SCHEDULE >
< GOVERNMENT-FURNISHED, GOVERNMENT-INSTALLED; EQUIPMENT PROVIDED BY OTHERS, CONTRACTOR IS RESPONSIBLE FOR THE SUPPORT INDICATED IN SCHEDULE >

E.Q. I.D. TAG	DESCRIPTION	LOCATION	VOLTS	PH	HP	FLA	MCA	PKG UNIT	NEMA ENCL.	DISCONNECT TYPE	DISCONNECT SIZE	DISCONNECT FUSE	STARTER TYPE	STARTER SIZE	PNL-CKT	COORDINATING DOCUMENTS SPECIFICATION(S)	COORDINATING DOCUMENTS SHEET(S)	REMARKS

- E.Q. I.D. TAG: EQUIPMENT IDENTIFICATION TAG ("MARK") SHOWN ON PLANS.
- DESCRIPTION: EQUIPMENT (OR SUBPART OF EQUIPMENT) SERVED
- LOCATION: EQUIPMENT LOCATION
- VOLTS: CIRCUIT NOMINAL SUPPLY VOLTAGE
- PH: CIRCUIT PHASE QUANTITY
- HP: EQUIPMENT HORSEPOWER SIZE (AS APPLICABLE)
- FLA: EQUIPMENT ESTIMATED FULL-LOAD AMPACITY
- MCA: EQUIPMENT ESTIMATED MINIMUM CIRCUIT AMPACITY
- PKG UNIT: PACKAGED UNIT. "YES" INDICATES EQUIPMENT IS ASSUMED TO CONTAIN AN INTEGRAL STARTER. SHOULD EQUIPMENT BE PROVIDED WITHOUT AN INTEGRAL STARTER, A SEPARATE STARTER (COMBINATION STARTER/DISCONNECT) SHALL BE PROVIDED AND SIZED APPROPRIATELY FOR EQUIPMENT AT NO ADDITIONAL COST TO THE GOVERNMENT.
- NEMA ENCL.: NEMA ICS 6 ENCLOSURE RATING (IP RATING IF "IP##" IS SHOWN) FOR DISCONNECTING MEANS, STARTER, VFD, ETC. RACEWAYS AND THE EQUIPMENT ITSELF TO BE RATED FOR THE ENVIRONMENT IN WHICH SAID FEATURES ARE INSTALLED. FOR CIRCUIT BREAKERS AND ENCLOSED CIRCUIT BREAKERS ("--" IN THIS FIELD), SEE THE RESPECTIVE SCHEDULE IDENTIFYING THE ENCLOSURE RATING. FOR RECEPTACLE DISCONNECTING MEANS, SEE PLANS AND APPLIED NOTES FOR RECEPTACLE AND RECEPTACLE PROTECTION AND ENCLOSURE REQUIREMENTS.
- REMARKS: EQUIPMENT-SPECIFIC NOTATIONS. WHERE "NOTE ..." IS INDICATED, SEE SHEET EP610 "EQUIPMENT CONNECTIONS - SCHEDULE NOTES (REMARKS)".
- COORDINATING DOCUMENTS: "COORDINATING DOCUMENTS" ARE LISTED TO INDICATE WHERE MOST REQUIREMENTS FOR A GIVEN PIECE OF EQUIPMENT ARE FOUND FOR GENERAL ORIENTATION PURPOSES. THESE REFERENCES ARE NOT NECESSARILY ALL-INCLUSIVE (FOR EXAMPLE, GENERAL AND KEYED NOTES APPLICABLE TO SPECIFIC CONDITIONS OR APPLICATIONS MAY BE FOUND ELSEWHERE IN THE DOCUMENTS). CONTRACTOR IS RESPONSIBLE FOR MEETING ALL CONTRACT REQUIREMENTS, WHICH ARE NOT NECESSARILY ENCOMPASSED IN THIS SCHEDULE OR ITS REFERENCES.
- PNL-CKT: ASSIGNED PANELBOARD, DISTRIBUTION PANEL, SWITCHBOARD, OR OTHER EQUIPMENT SUPPLY CIRCUIT SOURCE AND THE POLE ASSIGNMENT(S) ON THE CIRCUIT SOURCE EQUIPMENT.
- STARTER TYPE: EXTERNAL STARTER TYPE AND SIZE RATING BASED ON THE BASIS OF DESIGN EQUIPMENT. SIZE TO BE ADJUSTED FOR ACTUAL EQUIPMENT REQUIREMENTS.
- DISCONNECT FUSE: WHERE "F" IS INDICATED IN THE "DISCONNECT - FUSE" COLUMN, PROVIDE FUSE SIZED PER MANUFACTURER RECOMMENDATIONS.
- DISCONNECT SIZE: RATING FOR IMMEDIATELY-UPSTREAM DISCONNECTING MEANS. WHERE OMITTED, RATING IS COVERED ELSEWHERE.
- DISCONNECT TYPE: INTENDED DISCONNECTING MEANS. DISCONNECT TYPES AS FOLLOWS:
  - SPST SINGLE POLE, SINGLE THROW NEMA KS 1 DISCONNECT.
  - DPST DOUBLE POLE, SINGLE THROW NEMA KS 1 DISCONNECT.
  - DPDT DOUBLE POLE, DOUBLE THROW NEMA KS 1 DISCONNECT.
  - 1 $M MOTOR-RATED SWITCH WITH THERMAL OVERLOAD OR A MOTOR CIRCUIT PROTECTOR. (ADDITIONALLY SEE GENERAL NOTE 8.)
  - $M(2P) SAME AS "$M" ENTRY EXCEPT IN A DOUBLE POLE, SINGLE THROW CONFIGURATION. (ADDITIONALLY SEE GENERAL NOTES 7 AND 8.)
  - $ GENERAL USE SWITCH HAVING AN AMPERE RATING NOT LESS THAN TWICE THE FULL-LOAD RATING OF THE MOTOR (NFPA 70 §430.109(C)(1)).
  - $(2P) SAME AS "$" ENTRY EXCEPT IN A DOUBLE POLE, SINGLE THROW CONFIGURATION. (ADDITIONALLY SEE GENERAL NOTE 7.)
  - CB CIRCUIT BREAKER DISCONNECTING MEANS ONLY. PROVIDE LOCKABLE CIRCUIT BREAKER WHEN LOCATED REMOTELY DUE TO SAFETY ISSUES.
  - ECB ENCLOSED CIRCUIT BREAKER DISCONNECTING MEANS ONLY. PROVIDE LOCKABLE CIRCUIT BREAKER.
  - REC RECEPTACLE / CORD-AND-PLUG CONFIGURATION.
  - DFPC DIESEL FIRE PUMP CONTROLLER
  - JPCP JOCKEY PUMP CONTROL PANEL.
  - FPC FIRE PUMP CONTROLLER
  - FPCS FIRE PUMP CONTROLLER / TRANSFER SWITCH
  - CLF CURRENT-LIMITING FUSE IN DISCONNECT LOCKABLE IN THE CLOSED POSITION.

EQUIPMENT CONNECTIONS - SCHEDULE NOTES (REMARKS)

	(APPLICABLE TO EP610 SERIES SHEETS)
1	THE ELECTRICAL SUPPLY TO THE DISCONNECT SHALL BE UNCHANGED UNLESS A LARGER SUPPLY IS REQUIRED BY THE MANUFACTURER. THE DISCONNECT FUSE RATING AND DOWNSTREAM ELECTRICAL SUPPORT FOR THE CRANE SHALL BE SIZED IN ACCORDANCE NFPA 70-2017 ARTICLE 610 FOR CONTINUOUS DUTY. CONDUCTORS SHALL TAKE INTO ACCOUNT THE AMBIENT TEMPERATURE AND OTHER CODE-REQUIRED AMPACITY CORRECTION FACTORS ASSIGNED TO THE SPACE IN WHICH THE CIRCUIT IS ROUTED. ADDITIONALLY, THE DOWNSTREAM CIRCUIT AND SUBSEQUENT RUNWAY ELECTRIFICATION SYSTEM SHALL HAVE A VOLTAGE DROP OF NO GREATER THAN 2 PERCENT TO THE CRANE-MOUNTED PANEL WHEN LOCATED AT THE COMBINED FARTHEST END OF THE RUNWAY AND BRIDGE.
2	SEE EF500 SERIES SHEETS FOR FUEL ELECTRICAL EQUIPMENT RACK FOR CONTROLLER/DISCONNECT.
3	PROVIDE LOCKABLE DISCONNECTING MEANS.
4	PROVIDE VFD(s) INTEGRAL TO EQUIPMENT.
5	DAMPER/LOUVER TO FAIL OPEN.
6	BASIS OF DESIGN INDOOR UNIT IS SHOWN WITH A 2-POLE SWITCH AND POWERED BY OUTDOOR UNIT. PROVIDE INDOOR UNIT WITH SWITCH ONLY AS REQUIRED BY MANUFACTURER'S INSTRUCTIONS. IF PERMITTED OR REQUIRED BY THE SPLIT SYSTEM MANUFACTURER, PROVIDE SWITCH AT THE OUTDOOR UNIT ONLY, AND AT THE INDOOR UNIT LOCATION, PROVIDE A PLACARD INDICATING THE LOCATION OF THE SWITCH CONTROLLING POWER TO BOTH UNITS. IF SWITCH IS NOT PROVIDED AT INDOOR UNIT, PROVIDE PLACARD AT INDOOR UNIT INDICATING LOCATION OF THE DISCONNECTING MEANS.
7	PROVIDE CIRCUIT WITH DEDICATED SPD IN ENCLOSURE SEPARATE FROM PANEL AND PRIOR TO EXITING BUILDING.
8	BASIS OF DESIGN PROVIDES ONE POINT OF POWER FOR MULTIPLE DAMPERS AS PART OF THE SAME ASSEMBLY.
9	PROVIDE LABEL WITH LOCATION OF THE DISCONNECTING MEANS PER NFPA 70 §430.102(A) EXCEPTION 3.
10	PROVIDE DISCONNECT WITH FUSE PER EQUIPMENT MANUFACTURER INSTRUCTIONS.
11	EQUIPMENT SHALL BE SUPPORTED SUCH THAT ALL ELECTRICAL COMPONENTS ARE OUTSIDE THE HAZARDOUS CONDITION IDENTIFIED ON E-100 SERIES SHEETS.
12	PROVIDE INTEGRAL DISCONNECT TOGGLE SWITCH AT DEVICE.
13	FAULT CURRENT AT THIS LOCATION IS ANTICIPATED TO EXCEED THE WITHSTAND VALUE OF A STANDARD DISCONNECT SWITCH (10,000A). WHERE A FUSIBLE DISCONNECT IS INDICATED, PROVIDE CLASS RK5 (FLSR OR FLNR, AS APPLICABLE) FUSES.
14	PANEL CONTAINING CIRCUIT BREAKER FOR EQUIPMENT IS LOCATED WITHIN SIGHT OF THE EQUIPMENT AND IS INTENDED TO BE USED AS THE DISCONNECTING MEANS.
15	DISCONNECTING MEANS IS A LOCKABLE CIRCUIT BREAKER IN ACCORDANCE WITH NFPA 70 §422.31.
16	DISCONNECTING MEANS IS A LOCKABLE CIRCUIT BREAKER IN ACCORDANCE WITH NFPA 70 §427.55(A).
17	DISCONNECTING MEANS IS A LOCKABLE CIRCUIT BREAKER IN ACCORDANCE WITH NFPA 70 §430.102(B)(2) EXCEPTION 1 DUE TO THE IMPRACTICALITY OF PROVIDING LOCAL DISCONNECTING MEANS AT THE SUBMERSIBLE PUMP.
18	DISCONNECTING MEANS IS A LOCKABLE CIRCUIT BREAKER IN ACCORDANCE WITH NFPA 70 §430.102(B)(2) EXCEPTION 2 AS AN INDUSTRIAL INSTALLATION WITH MEASURES IN PLACE SUCH THAT ONLY QUALIFIED PERSONS SERVICE THE EQUIPMENT.
19	BATTERY SHALL BE PROVIDED WITH A DISCONNECT LOCKABLE IN THE 'ON' POSITION ON THE DOWNSTREAM SIDE OF THE BATTERY PER NFPA 70 §480.7(A).

EQUIPMENT CONNECTIONS - GENERAL SCHEDULE NOTES

	(APPLICABLE TO EP610 SERIES SHEETS)
1	WHERE EQUIPMENT IS PROVIDED WITH A DISCONNECTING MEANS INTEGRAL TO EQUIPMENT, THE SEPARATE DISCONNECTING MEANS MAY BE OMITTED WHERE PERMITTED BY NFPA 70 FOR THE SPECIFIC APPLICATION, EXCEPT WHERE LOCKING-TYPE DISCONNECTS ARE SPECIFIED (INCLUDING DISCONNECT SWITCHES AND CIRCUIT BREAKERS).
2	COORDINATE FINAL ELECTRICAL CONNECTIONS, CONDUCTORS, RACEWAYS, CIRCUIT BREAKER FRAME AND TRIP RATINGS, FUSE RATINGS, STARTER SIZES AND TYPES, DISCONNECTING DEVICES AND SIZES, AND VFD SIZES (AS APPLICABLE) WITH ACTUAL EQUIPMENT PROVIDED (INCLUDING ADJUSTMENT FOR UFC 3-501-01 MAXIMUM PERMISSIBLE BRANCH CIRCUIT VOLTAGE DROP). THIS SCHEDULE HAS BEEN COORDINATED FOR EQUIPMENT LISTED IN THE PLANS AND SPECIFICATIONS INCLUDED IN THIS CONTRACT USING THE AVAILABLE PRODUCT LITERATURE AT THE TIME OF DESIGN. THE CONTRACTOR IS RESPONSIBLE FOR ADJUSTING ELECTRICAL CONNECTIONS, CONDUCTORS, RACEWAY, CIRCUIT BREAKER FRAME AND TRIP, AND DISCONNECTING DEVICES AND SIZES FOR FINAL EQUIPMENT APPROVED AND INSTALLED, INCLUDING ADJUSTMENTS FOR MORE ACCURATE/REFINED MANUFACTURER ELECTRICAL PROPERTIES. THE MAXIMUM OVERCURRENT PROTECTIVE DEVICE RATING, MAXIMUM FUSE RATING, OR SIMILAR LANGUAGE USED TO DENOTE A PROTECTION VALUE SHALL BE CONSIDERED THE MANUFACTURER RECOMMENDED RATING AND USED TO MAKE THE ADJUSTMENTS IDENTIFIED HEREIN. CIRCUIT BREAKER AND SUPPLY CIRCUIT CONDUCTOR INFORMATION FOR EQUIPMENT IS LOCATED ON THE PANEL SCHEDULES. CONDUCTORS AND CONDUIT ARE SIZED AS A SINGLE CIRCUIT AND ACCOUNTING FOR VOLTAGE DROP, ANTICIPATED MAXIMUM AMBIENT TEMPTERATURE, AND NUMBER OF CURRENT CARRYING CONDUCTORS. CONTRACTOR IS RESPONSIBLE FOR DERATING SHOULD MULTIPLE CIRCUITS BE ROUTED IN THE SAME CONDUIT OR IF ROUTING PATH TRAVELS INTO AN AREA ANTICIPATED TO EXCEED THE VALUES INDICATED IN THE PANEL SCHEDULE ENTRY ASSOCIATED WITH THIS EQUIPMENT.
3	ENCLOSURE (THIS SCHEDULE AND E-100 SHEET SERIES) AND FAULT DUTY RATINGS (EP600 SERIES ONE-LINE AND PANEL SCHEDULES, IN CONJUNCTION WITH SECTION 26 05 73) LISTED ARE MINIMUM RATINGS. WHERE A CONFLICT EXISTS BETWEEN THIS SCHEDULE AND THE E-100 SHEET SERIES, THE ENCLOSURE RATING RESULTING IN A HIGHER EQUIVALENT IP VALUE OR NEMA RATING SHALL BE USED. FAULT CURRENT RATINGS SHALL BE ADJUSTED IN ACCORDANCE WITH THE SECTION 26 05 73 COORDINATION STUDY. ADDITIONALLY, NON-FUSIBLE LOCAL DISCONNECTNG MEANS ARE INDICATED WHERE ANTICIPATED FAULT CURRENT IS LESS THAN 10,000A. PROVIDE FUSIBLE DISCONNECT WITH CLASS RK5 (FLSR OR FLNR, AS APPLICABLE) OR PROPERLY RATED ENCLOSED CIRCUIT BREAKER WHERE POWER STUDY REVEALS AVAILABLE FAULT CURRENT OF 10,000A OR GREATER, OR AS REQUIRED BY THE EQUIPMENT MANUFACTURER.
4	LOAD INFORMATION LISTED IN THIS SCHEDULE IS FOR COORDINATION PURPOSES WITH THE DESIGN OF OTHER DISCIPLINES. WHERE CONFLICTS EXIST BETWEEN THIS SCHEDULE AND OTHER REQUIREMENTS, NOTIFY THE COR IMMEDIATELY.
5	WHERE THE CIRCUIT BREAKER IS USED AS THE DISCONNECTING MEANS, THE PANEL NAME, CIRCUIT NUMBER, AND ROOM CONTAINING THE PANEL SHALL BE INCLUDED ON A LABEL ON OR AT THE EQUIPMENT, ALONG WITH THE EQUIPMENT IDENTIFIER.
6	RECEPTACLE CONNECTIONS SHOWN WHERE DESIGN RESEARCH INDICATED PRODUCT AVAILABILITY SUPPORTED SUCH CONNECTION AND DISCONNECTING MEANS. WHERE CONTRACTOR SELECTS EQUIPMENT REQUIRING (OR PERMITTING AND ELECTING TO PROVIDE) HARDWIRED CONNECTION, REMOVE "RECEPTACLE: " FROM PANEL SCHEDULE/DIRECTORY IF RECEPTACLE IS NOT INSTALLED AND PROVIDE THE APPROPRIATE DISCONNECTING MEANS COMPLYING WITH NFPA 70.
7	FOUR-WAY SWITCHES ARE DOUBLE-POLE, DOUBLE-THROW AND MAY NOT BE USED FOR DOUBLE-POLE, SINGLE-THROW APPLICATIONS.
1 8	DUE TO THE DESIGN-PHASE UNKNOWNS REGARDING THE EXISTENCE OF THERMAL OVERLOAD DEVICES FOR A GIVEN MOTOR, THE PLANS SHOW MOTOR-RATED SWITCHES WITH THERMAL OVERLOAD DEVICES. THERMAL OVERLOADS ON THE SWITCH MAY BE OMITTED AND A GENERAL-USE SWITCH COMPLYING WITH NFPA 70 §430.109(C) MAY BE PROVIDED IF THERMAL OVERLOAD DEVICES ASSOCIATED WITH THE MOTOR IN QUESTION ARE PROVIDED ELSEWHERE IN THE CIRCUIT IN ACCORDANCE WITH NFPA 70 §430.32.
2 9	BASIS OF DESIGN ASSUMES CONSERVATIVE AMOUNTS OF ATGS FOR PURPOSES OF SUPPLY PANEL POLE QUANTITY ACCOUNTING. SEE MECHANICAL PLANS FOR OPPORTUNITIES TO COMBINE EQUIPMENT. PROVIDE SPARE CIRCUIT BREAKER(S) IN PLACE OF EXCESS CIRCUITS ACCOUNTED FOR IN THE BASIS OF DESIGN.

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MARK	DESCRIPTION	DATE
2	AM #0003 - GENERAL REVISIONS	09/29/2025
1	AM #0002 - GENERAL REVISIONS	09/19/2025

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ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:

DESIGNED BY: E.MCNAMARA
DRAWN BY: E.MCNAMARA
CHECKED BY: B.ADKINS
SUBMITTED BY: S.MOSCRIP
FILE NAME: BUCO00102_DM_ME.rvt
SIZE: ANSI D

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE.
OMAHA, NE 68102

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BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

EQUIPMENT ELECTRICAL CONNECTION NOTES

SHEET ID

EP610

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EQUIPMENT ELECTRICAL CONNECTION SCHEDULE

E.Q. I.D. TAG	DESCRIPTION	LOCATION	VOLTS	PH	HP	FLA	MCA	PKG UNIT	NEMA ENCL.	DISCONNECT TYPE	DISCONNECT SIZE	DISCONNECT FUSE	STARTER TYPE	STARTER SIZE	PNL-CKT	COORDINATING DOCUMENTS SPECIFICATION(S)	COORDINATING DOCUMENTS SHEET(S)	REMARKS
AC-A1	AIR COMPRESSOR	106 GEN RM A	208 V	1	--	9.5 A	11.9 A	Yes	--	CB	--	--	--	--	GLA1-8,10	26 32 15	MP607	SEE NOTE 18.
AC-A2	AIR COMPRESSOR	106 GEN RM A	208 V	1	--	9.5 A	11.9 A	Yes	--	CB	--	--	--	--	GLA2-7,9	26 32 15	MP607	SEE NOTE 18.
AC-B1	AIR COMPRESSOR	117 GEN RM B	208 V	1	--	9.5 A	11.9 A	Yes	--	CB	--	--	--	--	GLB1-8,10	26 32 15	MP607	SEE NOTE 18.
AC-B2	AIR COMPRESSOR	117 GEN RM B	208 V	1	--	9.5 A	11.9 A	Yes	--	CB	--	--	--	--	GLB2-7,9	26 32 15	MP607	SEE NOTE 18.
AC-F	AIR COMPRESSOR	113 FIRE PUMP	208 V	3	10	32.2 A	40.3 A	Yes	--	CB	--	--	--	--	NLF-2,4,6	21 13 18	FX101	SEE NOTE 14.
ATG-A1	AUTOMATIC TANK GAUGE PANEL	106 GEN RM A	120 V	1	--	2.0 A	2.5 A	Yes	--	CB	--	--	--	--	GLA1-4	33 56 10	MP607	SEE NOTE 9. 2
ATG-A2	AUTOMATIC TANK GAUGE PANEL	106 GEN RM A	120 V	1	--	2.0 A	2.5 A	Yes	--	CB	--	--	--	--	GLA2-3	33 56 10	MP607	SEE NOTE 9.
ATG-B1	AUTOMATIC TANK GAUGE PANEL	117 GEN RM B	120 V	1	--	2.0 A	2.5 A	Yes	--	CB	--	--	--	--	GLB1-4	33 56 10	MP607	SEE NOTE 9.
ATG-B2	AUTOMATIC TANK GAUGE PANEL	117 GEN RM B	120 V	1	--	2.0 A	2.5 A	Yes	--	CB	--	--	--	--	GLB2-3	33 56 10	MP607	SEE NOTE 9.
ATG-D1	AUTOMATIC TANK GAUGE PANEL	106 GEN RM A	120 V	1	--	2.0 A	2.5 A	Yes	--	CB	--	--	--	--	QLA2-4	33 56 10	MP607	SEE NOTE 9.
ATG-D2	AUTOMATIC TANK GAUGE PANEL	106 GEN RM A	120 V	1	--	2.0 A	2.5 A	Yes	--	CB	--	--	--	--	QLA2-6	33 56 10	MP607	SEE NOTE 9.
ATG-FA	AUTOMATIC TANK GAUGE PANEL	110 PUMP CTRL A	120 V	1	--	2.0 A	2.5 A	Yes	--	CB	--	--	--	--	QLA1-26	33 56 10	EF528	--
ATG-FB	AUTOMATIC TANK GAUGE PANEL	123 PUMP CTRL B	120 V	1	--	2.0 A	2.5 A	Yes	--	CB	--	--	--	--	QLB1-22	33 56 10	EF528	--
BC-A	SWITCHGEAR BATTERY CHARGER	114 SWITCHGEAR UA	120 V	1	--	23.0 A	28.8 A	Yes	--	CB	--	--	--	--	QLA1-17	26 13 13	--	SEE NOTE 19.
BC-B	SWITCHGEAR BATTERY CHARGER	119 SWITCHGEAR UB	120 V	1	--	23.0 A	28.8 A	Yes	--	CB	--	--	--	--	QLB1-11	26 13 13	--	SEE NOTE 19.
BV05	BALL VALVE	124 DAY TANKS B	480 V	3	1	2.1 A	2.6 A	Yes	--	CB	--	--	--	--	QHB4-2,4,6	33 52 40	--	SEE NOTE 9.
BV06	BALL VALVE	124 DAY TANKS B	480 V	3	1	2.1 A	2.6 A	Yes	--	CB	--	--	--	--	QHB4-8,10,12	33 52 40	--	SEE NOTE 9.
BV09	BALL VALVE	124 DAY TANKS B	480 V	3	1	2.1 A	2.6 A	Yes	--	CB	--	--	--	--	QHB4-14,16,18	33 52 40	--	SEE NOTE 9.
BV10	BALL VALVE	124 DAY TANKS B	480 V	3	1	2.1 A	2.6 A	Yes	--	CB	--	--	--	--	QHB4-20,22,24	33 52 40	--	SEE NOTE 9.
BV13	BALL VALVE	111 DAY TANKS A	480 V	3	1	2.1 A	2.6 A	Yes	--	CB	--	--	--	--	QHA4-1,3,5	33 52 40	--	SEE NOTE 9.
BV14	BALL VALVE	111 DAY TANKS A	480 V	3	1	2.1 A	2.6 A	Yes	--	CB	--	--	--	--	QHA4-7,9,11	33 52 40	--	SEE NOTE 9.
BV17	BALL VALVE	111 DAY TANKS A	480 V	3	1	2.1 A	2.6 A	Yes	--	CB	--	--	--	--	QHA4-13,15,17	33 52 40	--	SEE NOTE 9.
BV18	BALL VALVE	111 DAY TANKS A	480 V	3	1	2.1 A	2.6 A	Yes	--	CB	--	--	--	--	QHA4-19,21,23	33 52 40	--	SEE NOTE 9.
BV-001	ACTUATED BALL VALVE	106 GEN RM A	120 V	1	--	0.3 A	0.3 A	Yes	--	CB	--	--	--	--	QLA2-13	33 52 10	MP607	SEE NOTE 14.
BV-103	ACTUATED BALL VALVE	116 EXHAUST TREATMENT	120 V	1	--	0.3 A	0.3 A	Yes	--	CB	--	--	--	--	QLA2-12	33 52 10	MP607	SEE NOTE 15.
BV-111	ACTUATED BALL VALVE	117 GEN RM B	120 V	1	--	0.3 A	0.3 A	Yes	--	CB	--	--	--	--	QLB2-6	33 52 10	MP607	SEE NOTE 14.
BV-121	ACTUATED BALL VALVE	117 GEN RM B	120 V	1	--	0.3 A	0.3 A	Yes	--	CB	--	--	--	--	QLB2-6	33 52 10	MP607	SEE NOTE 14.
BV-203	ACTUATED BALL VALVE	116 EXHAUST TREATMENT	120 V	1	--	0.3 A	0.3 A	Yes	--	CB	--	--	--	--	QLA2-12	33 52 10	MP607	SEE NOTE 15.
BV-211	ACTUATED BALL VALVE	106 GEN RM A	120 V	1	--	0.3 A	0.3 A	Yes	--	CB	--	--	--	--	QLA2-13	33 52 10	MP607	SEE NOTE 14.
BV-221	ACTUATED BALL VALVE	106 GEN RM A	120 V	1	--	0.3 A	0.3 A	Yes	--	CB	--	--	--	--	QLA2-13	33 52 10	MP607	SEE NOTE 14.
CLI	CENTRAL LIGHTING INVERTER	104 ELEC	480 V	3	--	27.0 A	33.8 A	Yes	--	CB	--	--	--	--	NH-4,6,8	26 51 00	--	SEE NOTE 14. CENTRAL LIGHTING INVERTER TO PROVIDE SUFFICIENT POWER TO SUPPLY ALL EMERGENCY LUMINAIRES SERVING BUILDING.
CRANE-A	10T CRANE	106 GEN RM A	480 V	3	20	30.0 A	37.5 A	Yes	4	SPST	60A	--	--	--	QHA1-37,39,41	41 22 13.14	--	SEE NOTES 1, 3.
CRANE-B	10T CRANE	117 GEN RM B	480 V	3	20	30.0 A	37.5 A	Yes	4	SPST	60A	--	--	--	QHB1-27,29,31	41 22 13.14	--	SEE NOTES 1, 3.
D-EF114(E)	LOUVER MOTOR-OPERATED EXHAUST DAMPER	114 SWITCHGEAR UA	120 V	1	--	1.0 A	1.3 A	Yes	7	1 $M	--	--	--	--	QLA1-23	23 09 13	--	SEE NOTE 5.
D-EF114(I)	LOUVER MOTOR-OPERATED INTAKE DAMPER	114 SWITCHGEAR UA	120 V	1	--	1.0 A	1.3 A	Yes	1	$M	--	--	--	--	QLA1-23	23 09 13	--	SEE NOTE 5.
D-EF119(E)	LOUVER MOTOR-OPERATED EXHAUST DAMPER	119 SWITCHGEAR UB	120 V	1	--	1.0 A	1.3 A	Yes	7	$M	--	--	--	--	QLB1-9	23 09 13	--	SEE NOTE 5.
D-EF119(I)	LOUVER MOTOR-OPERATED INTAKE DAMPER	119 SWITCHGEAR UB	120 V	1	--	1.0 A	1.3 A	Yes	1	$M	--	--	--	--	QLB1-9	23 09 13	--	SEE NOTE 5.
D-EF121(E)	LOUVER MOTOR-OPERATED EXHAUST DAMPER	122 NEW OIL STORAGE	120 V	1	--	1.0 A	1.3 A	Yes	7	$M	--	--	--	--	QLB1-14	23 09 13	--	SEE NOTE 5.
D-F(E)	LOUVER MOTOR-OPERATED EXHAUST DAMPER	113 FIRE PUMP	120 V	1	--	1.0 A	1.3 A	Yes	3R	$M	--	--	--	--	NLF-28	23 09 13	--	SEE NOTE 5.
D-GA1(E)	DAMPERS FOR GENERATOR EXHAUST (APPROX. 4)	106 GEN RM A	120 V	1	--	3.0 A	3.8 A	Yes	1	$M	--	--	--	--	GLA1-6	23 09 13	--	SEE NOTE 8.
D-GA2(E)	DAMPERS FOR GENERATOR EXHAUST (APPROX. 4)	106 GEN RM A	120 V	1	--	3.0 A	3.8 A	Yes	1	$M	--	--	--	--	GLA2-5	23 09 13	--	SEE NOTE 8.
D-GB1(E)	DAMPERS FOR GENERATOR EXHAUST (APPROX. 4)	117 GEN RM B	120 V	1	--	3.0 A	3.8 A	Yes	1	$M	--	--	--	--	GLB1-6	23 09 13	--	SEE NOTE 8.
D-GB2(E)	DAMPERS FOR GENERATOR EXHAUST (APPROX. 4)	117 GEN RM B	120 V	1	--	3.0 A	3.8 A	Yes	1	$M	--	--	--	--	GLB2-5	23 09 13	--	SEE NOTE 8.
DDC PANEL A	DIRECT DIGITAL CONTROL PANEL	105 MECHANICAL	120 V	1	--	3.0 A	3.8 A	Yes	--	CB	--	--	--	--	QLA1-13	23 09 00	--	--
DDC PANEL B	DIRECT DIGITAL CONTROL PANEL	105 MECHANICAL	120 V	1	--	3.0 A	3.8 A	Yes	--	CB	--	--	--	--	QLB1-19	23 09 00	--	--
DFP-1	DIESEL FIRE PUMP	113 FIRE PUMP	120 V	1	25	0.0 A	0.0 A	Yes	4	DFPC	--	--	--	--	NLF-26	21 30 00	FX101	--
DFP-EH	DIESEL FIRE PUMP ENGINE HEATER	113 FIRE PUMP	120 V	1	--	8.3 A	10.4 A	Yes	--	CB	--	--	--	--	NLF-24	21 30 00	--	SEE NOTE 14.
EEWS-1A	EMERGENCY EYE WASH STATION	106 GEN RM A	120 V	1	--	5.5 A	6.9 A	Yes	--	CB	--	--	--	--	QLA2-2	22 00 00	P-601	SEE NOTE 14.
EEWS-1B	EMERGENCY EYE WASH STATION	117 GEN RM B	120 V	1	--	5.5 A	6.9 A	Yes	--	CB	--	--	--	--	QLB2-8	22 00 00	P-601	SEE NOTE 14.
EF-102	EXHAUST FAN	102 UNISEX RR	120 V	1	--	0.3 A	0.3 A	Yes	1	1 $M	--	--	--	--	NL-1	23 30 00	MH601	--
EF-111	EXHAUST FAN (SPARK RESISTANT)	111 DAY TANKS A	120 V	1	--	1.5 A	1.9 A	Yes	7	$M	--	--	--	--	QLA1-30	23 30 00	MH601	--
EF-114	EXHAUST FAN (SPARK RESISTANT)	114 SWITCHGEAR UA	208 V	1	1/2	5.4 A	6.8 A	Yes	7	$M(2P)	--	--	--	--	QLA1-19,21	23 30 00	MH601	--
EF-119	EXHAUST FAN (SPARK RESISTANT)	119 SWITCHGEAR UB	208 V	1	1/2	5.4 A	6.8 A	Yes	7	$M(2P)	--	--	--	--	QLB1-5,7	23 30 00	MH601	--
EF-121	EXHAUST FAN (SPARK RESISTANT)	121 FORKLIFT CHARGING	120 V	1	1/40	0.2 A	0.2 A	Yes	7	1 $M	--	--	--	--	QLB1-12	23 30 00	MH601	--
EF-122	EXHAUST FAN	122 NEW OIL STORAGE	120 V	1	1/40	0.2 A	0.2 A	Yes	1	$M	--	--	--	--	QLB1-18	23 30 00	MH601	--

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2	AM #0003 - GENERAL REVISIONS	09/29/2025
1	AM #0002 - GENERAL REVISIONS	09/19/2025

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DESIGNED BY: E.MCNAMARA
DRAWN BY: E.MCNAMARA
CHECKED BY: B.ADKINS
SUBMITTED BY: S.MOORCROFT
SIZE: ANSI D
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:
FILE NAME: BUCO00102_DM_ME.rvt

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US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE.
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

EQUIPMENT ELECTRICAL CONNECTION

SHEET ID

EP611

ADVERTISEMENT

EQUIPMENT ELECTRICAL CONNECTION SCHEDULE

E.Q. I.D. TAG	DESCRIPTION	LOCATION	VOLTS	PH	HP	FLA	MCA	PKG UNIT	NEMA ENCL.	DISCONNECT TYPE	DISCONNECT SIZE	DISCONNECT FUSE	STARTER TYPE	STARTER SIZE	PNL-CKT	COORDINATING DOCUMENTS SPECIFICATION(S)	COORDINATING DOCUMENTS SHEET(S)	REMARKS
EF-124	EXHAUST FAN (SPARK RESISTANT)	124 DAY TANKS B	120 V	1	--	1.5 A	1.9 A	Yes	7	1 $M	--	--	--	--	QLB1-28	23 30 00	MH601	--
EFP-1	ELECTRIC FIRE PUMP	113 FIRE PUMP	480 V	3	25	34.0 A	42.5 A	Yes	4	FPCS	--	--	--	--	FPCS-1	21 30 00	FX101	--
EV-1	WALL-MOUNTED ELECTRICAL VEHICLE SUPPLY EQUIPMENT	EXTERIOR EAST	208 V	3	--	20.1 A	25.1 A	Yes	--	CB	--	--	--	--	NL-17,19,21	11 11 37	--	--
FBC-1	FORKLIFT BATTERY CHARGER	121 FORKLIFT CHARGING	480 V	3	--	20.5 A	27.1 A	Yes	--	ECB	--	--	--	--	QHB1-1,3,5	--	--	SEE NOTE 13. THIS ENTRY IS FOR INFRASTRUCTURE (BREAKER, CONDUCTORS, RACEWAY, SEALOFFS, DISCONNECT) FROM SUPPLY PANEL THROUGH AND INCLUDING DISCONNECT LOCAL TO PROPOSED EQUIPMENT LOCATION ONLY. FORKLIFT CHARGING EQUIPMENT FOR THIS ENTRY IS NOT IN SCOPE.
HMI-A1	SCR CONTROLLER: HMI-A1, BP-A1, DB-A1	106 GEN RM A	120 V	1	--	5.0 A	6.3 A	Yes	--	CB	--	--	--	--	GLA1-2	26 32 15	MP607	SEE NOTE 18.
HMI-A2	SCR CONTROLLER: HMI-A2, BP-A2, DB-A2	106 GEN RM A	120 V	1	--	5.0 A	6.3 A	Yes	--	CB	--	--	--	--	GLA2-1	26 32 15	MP607	SEE NOTE 18.
HMI-B1	SCR CONTROLLER: HMI-B1, BP-B1, DB-B1	117 GEN RM B	120 V	1	--	5.0 A	6.3 A	Yes	--	CB	--	--	--	--	GLB1-2	26 32 15	MP607	SEE NOTE 18.
HMI-B2	SCR CONTROLLER: HMI-B2, BP-B2, DB-B2	117 GEN RM B	120 V	1	--	5.0 A	6.3 A	Yes	--	CB	--	--	--	--	GLB2-1	26 32 15	MP607	SEE NOTE 18.
HS-114	HYDROGEN SENSOR PANEL	114 SWITCHGEAR UA	120 V	1	--	4.2 A	5.2 A	Yes	--	CB	--	--	--	--	NLF-11	28 31 70	--	--
HS-119	HYDROGEN SENSOR PANEL	119 SWITCHGEAR UB	120 V	1	--	4.2 A	5.2 A	Yes	--	CB	--	--	--	--	NLF-13	28 31 70	--	--
HS-121	HYDROGEN SENSOR PANEL	121 FORKLIFT CHARGING	120 V	1	--	4.2 A	5.2 A	Yes	--	CB	--	--	--	--	NLF-17	28 31 70	--	--
I20	BALL VALVE	EXTERIOR WEST OPERATING TANKS (NORTH)	480 V	3	1	4.6 A	5.8 A	Yes	--	CB	--	--	--	--	QHA3-1,3,5	33 57 55	--	SEE NOTE 14.
I21	BALL VALVE	EXTERIOR WEST OPERATING TANKS (NORTH)	480 V	3	1	4.6 A	5.8 A	Yes	--	CB	--	--	--	--	QHA3-2,4,6	33 57 55	--	SEE NOTE 14.
I22	BALL VALVE	EXTERIOR WEST OPERATING TANKS (SOUTH)	480 V	3	1	4.6 A	5.8 A	Yes	--	CB	--	--	--	--	QHB3-1,3,5	33 57 55	--	SEE NOTE 14.
I23	BALL VALVE	EXTERIOR WEST OPERATING TANKS (SOUTH)	480 V	3	1	4.6 A	5.8 A	Yes	--	CB	--	--	--	--	QHB3-2,4,6	33 57 55	--	SEE NOTE 14.
IP-O1	VERTICAL TURBINE ISSUE PUMP	EXTERIOR WEST OPERATING TANKS (NORTH)	208 V	1	3/4	7.6 A	9.5 A	No	3R	SPST	30A	--	FVNR	00	QLA2-30,32	33 57 55	M-601	SEE NOTE 2.
IP-O2	VERTICAL TURBINE ISSUE PUMP	EXTERIOR WEST OPERATING TANKS (NORTH)	208 V	1	3/4	7.6 A	9.5 A	No	3R	SPST	30A	--	FVNR	00	QLA2-34,36	33 57 55	M-601	SEE NOTE 2.
IP-O3	VERTICAL TURBINE ISSUE PUMP	EXTERIOR WEST OPERATING TANKS (SOUTH)	208 V	1	3/4	7.6 A	9.5 A	No	3R	SPST	30A	--	FVNR	00	QLB2-18,20	33 57 55	M-601	SEE NOTE 2.
IP-O4	VERTICAL TURBINE ISSUE PUMP	EXTERIOR WEST OPERATING TANKS (SOUTH)	208 V	1	3/4	7.6 A	9.5 A	No	3R	SPST	30A	--	FVNR	00	QLB2-22,24	33 57 55	M-601	SEE NOTE 2.
JACE 'A'	JAVA APPLICATION CONTROL ENGINE	110 PUMP CTRL A	120 V	1	--	3.0 A	3.8 A	Yes	--	CB	--	--	--	--	QLA1-22	23 09 23.02 25 10 10	--	--
JACE 'B'	JAVA APPLICATION CONTROL ENGINE	123 PUMP CTRL B	120 V	1	--	3.0 A	3.8 A	Yes	--	CB	--	--	--	--	QLB1-20	23 09 23.02 25 10 10	--	--
JP	JOCKEY PUMP	113 FIRE PUMP	208 V	3	1/2	2.4 A	3.0 A	Yes	4	JPC	--	--	--	--	NLF-8,10,12	21 30 00	FX101	--
LP-1	NEW OIL PUMP	122 NEW OIL STORAGE	480 V	3	1	2.1 A	2.6 A	No	--	ECB	--	--	FVNR	00	QHB2-26,28,30	33 57 55	--	SEE NOTE 13.
LP-2	NEW OIL PUMP	122 NEW OIL STORAGE	480 V	3	1	2.1 A	2.6 A	No	--	ECB	--	--	FVNR	00	QHB2-32,34,36	33 57 55	--	SEE NOTE 13.
NG-C	NITROGEN GENERATOR: COMPRESSOR CIRCUIT	113 FIRE PUMP	208 V	3	--	9.0 A	11.3 A	Yes	--	CB	--	--	--	--	NLF-14,16,18	21 13 18	FX101	SEE NOTE 14.
NG-G	NITROGEN GENERATOR: GENERATOR CIRCUIT	113 FIRE PUMP	120 V	1	--	2.0 A	2.5 A	Yes	--	CB	--	--	--	--	NLF-20	21 13 18	FX101	SEE NOTE 14.
OHD-E	OVERHEAD DOOR	117 GEN RM B	208 V	1	3/4	7.6 A	9.5 A	Yes	--	CB	--	--	--	--	QLB2-11,13	08 33 23	--	SEE NOTE 14.
OHD-N	OVERHEAD DOOR	106 GEN RM A	208 V	1	3/4	7.6 A	9.5 A	Yes	1	1 $M(2P)	30A	--	--	--	QLA2-9,11	08 33 23	--	--
OHD-W	OVERHEAD DOOR	117 GEN RM B	208 V	1	3/4	7.6 A	9.5 A	Yes	1	$M(2P)	30A	--	--	--	QLB2-2,4	08 33 23	--	--
P-001	DEF PUMP	116 EXHAUST TREATMENT	208 V	3	--	12.5 A	15.6 A	Yes	1	SPST	30A	--	--	--	QLA2-14,16,18	33 52 10	MP607	--
P-002	DEF PUMP	116 EXHAUST TREATMENT	120 V	1	1/2	12.0 A	15.0 A	Yes	1	$M	--	--	--	--	QLA2-20	33 52 10	MP607	--
P-003	DEF PUMP	116 EXHAUST TREATMENT	120 V	1	1/2	12.0 A	15.0 A	Yes	1	$M	--	--	--	--	QLA2-22	33 52 10	MP607	--
PCPA	FUEL PUMP CONTROL PANEL	110 PUMP CTRL A	120 V	1	--	25.0 A	31.3 A	Yes	--	CB	--	--	--	--	QLA2-17	33 09 52	EF512	--
PCPB	FUEL PUMP CONTROL PANEL	123 PUMP CTRL B	120 V	1	--	25.0 A	31.3 A	Yes	--	CB	--	--	--	--	QLB2-12	33 09 52	EF512	--
RCP-1	RECIRCULATING PUMP	105 MECHANICAL	120 V	1	--	0.8 A	1.1 A	Yes	1	$M	--	--	--	--	NL-18	22 00 00	P-601	--
SF-A1	GENERATOR SUPPLY FAN	201 MECHANICAL MEZ. GEN RM A	480 V	3	30	40.0 A	50.0 A	Yes	1	SPST	100A	--	VFD	--	QHA1-13,15,17	23 30 00	MH601	--
SF-A2	GENERATOR SUPPLY FAN	201 MECHANICAL MEZ. GEN RM A	480 V	3	30	40.0 A	50.0 A	Yes	1	SPST	100A	--	VFD	--	QHA1-19,21,23	23 30 00	MH601	--
SF-A3	GENERATOR SUPPLY FAN	201 MECHANICAL MEZ. GEN RM A	480 V	3	30	40.0 A	50.0 A	Yes	1	SPST	100A	--	VFD	--	QHA1-25,27,29	23 30 00	MH601	--
SF-A4	GENERATOR SUPPLY FAN	201 MECHANICAL MEZ. GEN RM A	480 V	3	30	40.0 A	50.0 A	Yes	1	SPST	100A	--	VFD	--	QHA1-31,33,35	23 30 00	MH601	--
SF-B1	GENERATOR SUPPLY FAN	202 MECHANICAL MEZ. GEN RM B	480 V	3	30	40.0 A	50.0 A	Yes	1	SPST	100A	--	VFD	--	QHB1-2,4,6	23 30 00	MH601	SEE NOTE 13.
SF-B2	GENERATOR SUPPLY FAN	202 MECHANICAL MEZ. GEN RM B	480 V	3	30	40.0 A	50.0 A	Yes	1	SPST	100A	--	VFD	--	QHB1-8,10,12	23 30 00	MH601	SEE NOTE 13.
SF-B3	GENERATOR SUPPLY FAN	202 MECHANICAL MEZ. GEN RM B	480 V	3	30	40.0 A	50.0 A	Yes	1	SPST	100A	--	VFD	--	QHB1-14,16,18	23 30 00	MH601	--
SF-B4	GENERATOR SUPPLY FAN	202 MECHANICAL MEZ. GEN RM B	480 V	3	30	40.0 A	50.0 A	Yes	1	SPST	100A	--	VFD	--	QHB1-20,22,24	23 30 00	MH601	--
SFD-A1	DAMPERS FOR GENERATOR SUPPLY FAN (APPROX. 4)	202 MECHANICAL MEZ. GEN RM B	120 V	1	--	4.0 A	5.0 A	Yes	1	1 $M	--	--	--	--	QLA2-1	23 09 13	--	--
SFD-A2	DAMPERS FOR GENERATOR SUPPLY FAN (APPROX. 4)	202 MECHANICAL MEZ. GEN RM B	120 V	1	--	4.0 A	5.0 A	Yes	1	$M	--	--	--	--	QLA2-3	23 09 13	--	--
SFD-A3	DAMPERS FOR GENERATOR SUPPLY FAN (APPROX. 4)	202 MECHANICAL MEZ. GEN RM B	120 V	1	--	4.0 A	5.0 A	Yes	1	$M	--	--	--	--	QLA2-5	23 09 13	--	--
SFD-A4	DAMPERS FOR GENERATOR SUPPLY FAN (APPROX. 4)	202 MECHANICAL MEZ. GEN RM B	120 V	1	--	4.0 A	5.0 A	Yes	1	$M	--	--	--	--	QLA2-7	23 09 13	--	--
SFD-B1	DAMPERS FOR GENERATOR SUPPLY FAN (APPROX. 4)	202 MECHANICAL MEZ. GEN RM B	120 V	1	--	4.0 A	5.0 A	Yes	1	$M	--	--	--	--	QLB2-1	23 09 13	--	--
SFD-B2	DAMPERS FOR GENERATOR SUPPLY FAN (APPROX. 4)	202 MECHANICAL MEZ. GEN RM B	120 V	1	--	4.0 A	5.0 A	Yes	1	$M	--	--	--	--	QLB2-3	23 09 13	--	--
SFD-B3	DAMPERS FOR GENERATOR SUPPLY FAN (APPROX. 4)	202 MECHANICAL MEZ. GEN RM B	120 V	1	--	4.0 A	5.0 A	Yes	1	$M	--	--	--	--	QLB2-5	23 09 13	--	--
SFD-B4	DAMPERS FOR GENERATOR SUPPLY FAN (APPROX. 4)	202 MECHANICAL MEZ. GEN RM B	120 V	1	--	4.0 A	5.0 A	Yes	1	$M	--	--	--	--	QLB2-7	23 09 13	--	--
SS-101	SPLIT-SYSTEM INDOOR UNIT	100A READINESS	208 V	1	--	0.7 A	1.0 A	Yes	1	$M(2P)	--	--	--	--	NL-13,15	23 81 00	MH601	NOTE 6.
SS-103	SPLIT-SYSTEM INDOOR UNIT	103 TELE/FA	208 V	1	--	0.7 A	1.0 A	Yes	1	$M(2P)	--	--	--	--	NLT-21,23	23 81 00	MH601	NOTE 6.
SS-104	SPLIT-SYSTEM INDOOR UNIT	104 ELEC	208 V	1	--	0.7 A	1.0 A	Yes	1	$M(2P)	--	--	--	--	NL-9,11	23 81 00	MH601	NOTE 6.
SS-110	SPLIT-SYSTEM INDOOR UNIT	110 PUMP CTRL A	208 V	1	--	0.7 A	1.0 A	Yes	1	$M(2P)	--	--	--	--	QLA2-19,21	23 81 00	MH601	NOTE 6.
SS-112	SPLIT-SYSTEM INDOOR UNIT	112 DISTRO A	208 V	1	--	6.0 A	7.5 A	Yes	1	$M(2P)	--	--	--	--	QLA1-3,5	23 81 00	MH601	--
SS-113	SPLIT-SYSTEM INDOOR UNIT	113 FIRE PUMP	208 V	1	--	0.7 A	1.0 A	Yes	3R	1 $M(2P)	--	--	--	--	NLF-30,32	23 81 00	MH601	NOTE 6.
SS-114	SPLIT-SYSTEM INDOOR UNIT	114 SWITCHGEAR UA	208 V	1	--	0.3 A	1.0 A	Yes	1	$M(2P)	--	--	--	--	QLA1-27,29	23 81 00	MH601	NOTE 6.
SS-115	SPLIT-SYSTEM INDOOR UNIT	115 SWITCHGEAR GA	208 V	1	--	0.3 A	1.0 A	Yes	1	$M(2P)	--	--	--	--	QLA1-31,33	23 81 00	MH601	NOTE 6.
SS-116	SPLIT-SYSTEM INDOOR UNIT	116 EXHAUST TREATMENT	208 V	1	--	0.7 A	1.0 A	Yes	1	$M(2P)	--	--	--	--	QLA2-26,28	23 81 00	MH601	NOTE 6.
SS-118	SPLIT-SYSTEM INDOOR UNIT	118 SWITCHGEAR GB	208 V	1	--	0.3 A	1.0 A	Yes	1	$M(2P)	--	--	--	--	QLB1-21,23	23 81 00	MH601	NOTE 6.
SS-119	SPLIT-SYSTEM INDOOR UNIT	119 SWITCHGEAR UB	208 V	1	--	0.3 A	1.0 A	Yes	1	$M(2P)	--	--	--	--	QLB1-25,27	23 81 00	MH601	NOTE 6.
SS-120	SPLIT-SYSTEM INDOOR UNIT	120 DISTRO B	208 V	1	--	6.0 A	7.5 A	Yes	1	$M(2P)	--	--	--	--	QLB1-15,17	23 81 00	MH601	--
SS-123	SPLIT-SYSTEM INDOOR UNIT	124 PUMP CTRL B	208 V	1	--	0.7 A	1.0 A	Yes	1	1 $M(2P)	--	--	--	--	QLB2-14,16	23 81 00	MH601	NOTE 6.
SSHP-101	SPLIT-SYSTEM OUTDOOR UNIT	EXTERIOR EAST	208 V	1	--	7.9 A	9.9 A	Yes	3R	SPST	30A	--	--	--	NL-13,15	23 81 00	MH601	--
SSHP-103	SPLIT-SYSTEM OUTDOOR UNIT	EXTERIOR NORTH	208 V	1	--	11.0 A	13.8 A	Yes	3R	SPST	30A	--	--	--	NLT-21,23	23 81 00	MH601	--
SSHP-104	SPLIT-SYSTEM OUTDOOR UNIT	EXTERIOR NORTH	208 V	1	--	11.0 A	13.8 A	Yes	3R	SPST	30A	--	--	--	NL-9,11	23 81 00	MH601	--
SSHP-110	SPLIT-SYSTEM OUTDOOR UNIT	EXTERIOR NORTH	208 V	1	--	11.0 A	13.8 A	Yes	3R	SPST	30A	--	--	--	QLA2-19,21	23 81 00	MH601	--
SSHP-112	SPLIT-SYSTEM OUTDOOR UNIT	EXTERIOR SOUTH	208 V	3	--	23.1 A	28.9 A	Yes	3R	SPST	30A	--	--	--	QLA1-7,9,11	23 81 00	MH601	--
SSHP-113	SPLIT-SYSTEM OUTDOOR UNIT	EXTERIOR SOUTH	208 V	1	--	11.0 A	13.8 A	Yes	3R	SPST	30A	--	--	--	NLF-30,32	23 81 00	MH601	--
SSHP-114	SPLIT-SYSTEM OUTDOOR UNIT	EXTERIOR SOUTH	208 V	1	--	11.0 A	13.8 A	Yes	3R	SPST	30A	--	--	--	QLA1-27,29	23 81 00	MH601	--
SSHP-115	SPLIT-SYSTEM OUTDOOR UNIT	EXTERIOR SOUTH	208 V	1	--	11.0 A	13.8 A	Yes	3R	SPST	30A	--	--	--	QLA1-31,33	23 81 00	MH601	--
SSHP-116	SPLIT-SYSTEM OUTDOOR UNIT	EXTERIOR NORTH	208 V	1	--	11.0 A	13.8 A	Yes	3R	SPST	30A	--	--	--	QLA2-26,28	23 81 00	MH601	--
SSHP-118	SPLIT-SYSTEM OUTDOOR UNIT	EXTERIOR SOUTH	208 V	1	--	11.0 A	13.8 A	Yes	3R	SPST	30A	--	--	--	QLB1-21,23	23 81 00	MH601	--
SSHP-119	SPLIT-SYSTEM OUTDOOR UNIT	EXTERIOR SOUTH	208 V	1	--	11.0 A	13.8 A	Yes	3R	SPST	30A	--	--	--	QLB1-25,27	23 81 00	MH601	--
SSHP-120	SPLIT-SYSTEM OUTDOOR UNIT	EXTERIOR SOUTH	208 V	3	--	23.1 A	28.9 A	Yes	3R	SPST	30A	--	--	--	QLB1-29,31,33	23 81 00	MH601	--
SSHP-123	SPLIT-SYSTEM OUTDOOR UNIT	EXTERIOR NORTH	208 V	1	--	11.0 A	13.8 A	Yes	3R	SPST	30A	--	--	--	QLB2-14,16	23 81 00	MH601	--
UH-100	UNIT HEATER	100 VEST.	277 V	1	--	7.2 A	9.0 A	Yes	1	$M	--	--	--	--	NH-2	23 82 46.00 40	MH601	--
UH-104	UNIT HEATER	104 ELEC	480 V	3	--	4.0 A	5.0 A	Yes	1	SPST	30A	--	--	--	NH-10,12,14	23 82 46.00 40	MH601	--
UH-105	UNIT HEATER	105 MECHANICAL	480 V	3	--	4.0 A	5.0 A	Yes	1	SPST	30A	--	--	--	NH-22,24,26	23 82 46.00 40	MH601	--
UH-106NE	UNIT HEATER	106 GEN RM A	480 V	3	--	12.1 A	15.1 A	Yes	1	SPST	30A	--	--	--	QHA4-2,4,6	23 82 46.00 40	MH601	--
UH-106SE	UNIT HEATER	106 GEN RM A	480 V	3	--	12.1 A	15.1 A	Yes	1	SPST	30A	--	--	--	QHA4-14,16,18	23 82 46.00 40	MH601	--
UH-106SW	UNIT HEATER	106 GEN RM A	480 V	3	--	12.1 A	15.1 A	Yes	1	SPST	30A	--	--	--	QHA4-8,10,12	23 82 46.00 40	MH601	--
UH-108E	UNIT HEATER	108 WORKSHOP	480 V	3	--	4.0 A	5.0 A	Yes	1	SPST	30A	--	--	--	QHA2-14,16,18	23 82 46.00 40	MH601	--
UH-108W	UNIT HEATER	108 WORKSHOP	480 V	3	--	4.0 A	5.0 A	Yes	1	SPST	30A	--	--	--	QHA2-8,10,12	23 82 46.00 40	MH601	--
UH-111	UNIT HEATER	111 DAY TANKS A	480 V	3	--	4.3 A	5.4 A	Yes	7	SPST	30A	--	--	--	QHA4-20,22,24	23 82 46.00 40	MH601	--
UH-113	UNIT HEATER	113 FIRE PUMP	480 V	3	--	4.0 A	5.0 A	Yes	3R	SPST	30A	--	--	--	QHA2-2,4,6	23 82 46.00 40	MH601	--
UH-114	UNIT HEATER	114 SWITCHGEAR UA	480 V	3	--	4.0 A	5.0 A	Yes	1	SPST	30A	--	--	--	QHA2-25,27,29	23 82 46.00 40	MH601	--
UH-115	UNIT HEATER	115 SWITCHGEAR GA	480 V	3	--	4.0 A	5.0 A	Yes	1	SPST	30A	--	--	--	QHA2-19,21,23	23 82 46.00 40	MH601	--
UH-116	UNIT HEATER	116 EXHAUST TREATMENT	480 V	3	--	4.0 A	5.0 A	Yes	1	SPST	30A	--	--	--	QHA4-26,28,30	23 82 46.00 40	MH601	--
UH-117NE	UNIT HEATER	117 GEN RM B	480 V	3	--	12.1 A	15.1 A	Yes	1	SPST	30A	--	--	--	QHB4-1,3,5	23 82 46.00 40	MH601	--
UH-117SE	UNIT HEATER	117 GEN RM B	480 V	3	--	12.1 A	15.1 A	Yes	1	SPST	30A	--	--	--	QHB4-13,15,17	23 82 46.00 40	MH601	--
UH-117SW	UNIT HEATER	117 GEN RM B	480 V	3	--	12.1 A	15.1 A	Yes	1	SPST	30A	--	--	--	QHB4-7,9,11	23 82 46.00 40	MH601	--
UH-118	UNIT HEATER	118 SWITCHGEAR GB	480 V	3	--	4.0 A	5.0 A	Yes	1	SPST	30A	--	--	--	QHB2-13,15,17	23 82 46.00 40	MH601	--
UH-119	UNIT HEATER	119 SWITCHGEAR UB	480 V	3	--	4.0 A	5.0 A	Yes	1	SPST	30A	--	--	--	QHB2-7,9,11	23 82 46.00 40	MH601	--
UH-120	UNIT HEATER	120 DISTRO B	480 V	3	--	4.0 A	5.0 A	Yes	--	CB	--	--	--	--	QHB2-14,16,18	23 82 46.00 40	MH601	SEE NOTE 14.
UH-122	UNIT HEATER	122 NEW OIL STORAGE	480 V	3	--	4.0 A	5.0 A	Yes	1	SPST	30A	--	--	--	QHB2-20,22,24	23 82 46.00 40	MH601	--
UH-123	UNIT HEATER	124 PUMP CTRL B	480 V	3	--	4.0 A	5.0 A	Yes	1	SPST	30A	--	--	--	QHB4-25,27,29	23 82 46.00 40	MH601	--
UH-124	UNIT HEATER	124 DAY TANKS B	480 V	3	--	4.3 A	5.4 A	Yes	7	SPST	30A	--	--	--	QHB4-19,21,23	23 82 46.00 40	MH601	--
WE-1	HEATED WATERPROOF EXCLOSURE	EXTERIOR NORTH	120 V	1	--	10.0 A	12.5 A	Yes	1	SPST	30A	--	--	--	QLA2-24	--	MP607	PROVIDE WEATHER-RESISTANT GFCI DOUBLE DUPLEX RECEPTACLE IN ENCLOSURE.
WH-1	STORAGE WATER HEATER	105 MECHANICAL	480 V	3	--	15.0 A	18.8 A	Yes	1	SPST	30A	--	--	--	NH-16,18,20	22 00 00	P-601	--

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE
2	AM #0003 - GENERAL REVISIONS	09/29/2025
1	AM #0002 - GENERAL REVISIONS	09/19/2025

File Path: C:\Users\gfeddesen\Documents\BUCO00102_DM_ME_gfeddesen.rvt

ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:

DESIGNED BY: E.MCNAMARA
DRAWN BY: E.MCNAMARA
CHECKED BY: B.ADKINS
SUBMITTED BY: LINDSTROM
SIZE: ANSI D
FILE NAME: BUCO00102_DM_ME.rvt

Date: 9/29/2025 11:50:48 AM
Plot Date: 9/29/2025 11:50:48 AM

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE.
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

EQUIPMENT ELECTRICAL CONNECTION

SHEET ID
EP612

ADVERTISEMENT

EQUIPMENT ELECTRICAL CONNECTION SCHEDULE SITE

E.Q. I.D. TAG	DESCRIPTION	LOCATION	VOLTS	PH	HP	FLA	MCA	PKG UNIT	NEMA ENCL.	DISCONNECT TYPE	DISCONNECT SIZE	DISCONNECT FUSE	STARTER TYPE	STARTER SIZE	PNL-CKT	COORDINATING DOCUMENTS SPECIFICATION(S)	COORDINATING DOCUMENTS SHEET(S)	REMARKS
EW-O	WATER HEATING ELECTRIC BLANKET	SITE OFFLOAD	120 V	1	--	2.0 A	2.5 A	Yes	3R	REC	--	--	--	--	OL-5	33 57 55	M-509	--
GVU	GROUND VERIFICATION UNIT	SITE OFFLOAD	120 V	1	--	0.3 A	0.3 A	Yes	--	CB	--	--	--	--	OL-1	33 57 55	--	SEE NOTE 14.
OP-1	IN-LINE VERTICAL PUMP	SITE OFFLOAD	480 V	3	6	9.0 A	11.3 A	No	3R	SPST	30A	--	FVNR	1	OH-1,3,5	33 57 55	M-601	SEE NOTE 2.

1

FOR KEY, GENERAL NOTES, AND KEYNOTES, SEE SHEET EP610.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

File Path: C:\Users\gfeddesen\Documents\BUCO00102_DM_ME_gfeddesen.rvt

ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:

DESIGNED BY: E.MCNAMARA
DRAWN BY: E.MCNAMARA
CHECKED BY: B.ADKINS
SUBMITTED BY:
LIC. NO.:
SIZE: FILE NAME: BUCO00102_DM_ME.rvt
ANSI D

Date: 9/26/2025 7:03:00 AM

Plot Date:

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE.
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE: MISSION CONTROL STATION

EQUIPMENT ELECTRICAL CONNECTION SITE OFFLOAD

SHEET ID

EP613

ADVERTISEMENT

Branch Panel: QHA1

Location: DISTRO A 112
Supply From: 112 SWITCHBOARD DHA
Mounting: Surface
Sections: 1

Enclosure: NEMA 1
Fault Duty (Minimum): 35kA
Minimum Front Clearance: 4' - 0"
Main Meter: No

Volts: 480/277 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MLO
Frame Rating: 400 A

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A	PHASE B	PHASE C	P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
2-#12, #12 G, 3/4"C	75	2	Yes	0	No	Std	No	--	1	112 LIGHTING	L...	20 A	1	171 VA	3796 VA		1	20 A	L...	106 LIGHTING NORTH	2	V	No	Std	No	3	Yes	2	90	2-#8, #8 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	Yes	0	No	Std	No	--	3	113 LIGHTING	L...	20 A	1			148 VA	1917 VA		1	20 A	L...	106 LIGHTING SOUTH	4	V	No	Std	No	3	Yes	2	90	2-#10, #10 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	Yes	0	No	Std	No	--	5	114 LIGHTING	L...	20 A	1					322 VA	88 VA	1	20 A	L...	107 LIGHTING	6	--	No	Std	No	3	Yes	2	75	2-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	Yes	0	No	Std	No	--	7	115 LIGHTING	L...	20 A	1	332 VA	540 VA					1	20 A	L...	108 LIGHTING	8	--	No	Std	No	2	Yes	2	75	2-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	Yes	3	No	Std	No	--	9	116 LIGHTING	L...	20 A	1			215 VA	65 VA			1	20 A	L...	110 LIGHTING	10	--	No	Std	No	3	Yes	2	75	2-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	Yes	3	No	Std	No	--	11	201 LIGHTING	L...	20 A	1					1557 VA	148 VA	1	20 A	L...	111 LIGHTING	12	--	No	Std	No	3	Yes	2	75	2-#12, #12 G, 3/4"C
3-#6, #8 G, 1"C	75	3	Yes	3	No	Std	No	B	13	201 SF-A1 GENERATOR SUPPLY FAN	LM...	90 A	3	11100 VA	0 VA		1	20 A	--	SPARE	14	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	15	--	--	--	--			11100 VA	0 VA			1	20 A	--	SPARE	16	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	17	--	--	--	--					11100 VA	0 VA	1	20 A	--	SPARE	18	--	--	--	--	--	--	--	--
3-#6, #8 G, 1"C	75	3	Yes	3	No	Std	No	B	19	201 SF-A2 GENERATOR SUPPLY FAN	M...	90 A	3	11100 VA	0 VA					1	20 A	--	SPARE	20	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	21	--	--	--	--			11100 VA	0 VA			1	20 A	--	SPARE	22	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	23	--	--	--	--					11100 VA	0 VA	1	20 A	--	SPARE	24	--	--	--	--	--	--	--	--
3-#6, #8 G, 1"C	75	3	Yes	3	No	Std	No	B	25	201 SF-A3 GENERATOR SUPPLY FAN	M...	90 A	3	11100 VA	0 VA					1	20 A	--	SPARE	26	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	27	--	--	--	--			11100 VA	0 VA			1	20 A	--	SPARE	28	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	29	--	--	--	--					11100 VA	0 VA	1	20 A	--	SPARE	30	--	--	--	--	--	--	--	--
3-#6, #8 G, 1"C	75	3	Yes	3	No	Std	No	B	31	201 SF-A4 GENERATOR SUPPLY FAN	M...	90 A	3	11100 VA	0 VA					1	20 A	--	SPARE	32	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	33	--	--	--	--			11100 VA	0 VA			1	20 A	--	SPARE	34	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	35	--	--	--	--					11100 VA	0 VA	1	20 A	--	SPARE	36	--	--	--	--	--	--	--	--
3-#4, #10 G, 1-1/4"C	75	3	Yes	3	Yes	Std	No	B,SU	37	106 CRANE-A	M...	60 A	3	8333 VA	--					1	--	--	SPACE ONLY	38	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	39	--	--	--	--			8333 VA	--			1	--	--	SPACE ONLY	40	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	41	--	--	--	--					8333 VA	--	1	--	--	SPACE ONLY	42	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	43	SPACE ONLY	--	--	1	--	--					1	--	--	SPACE ONLY	44	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	45	SPACE ONLY	--	--	1			--	--			1	--	--	SPACE ONLY	46	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	47	SPACE ONLY	--	--	1					--	--	1	--	--	SPACE ONLY	48	--	--	--	--	--	--	--	--
3-#2, #8 G, 1-1/4"C	75	3	No	0	Yes	Std	No	--	49	112 TRANSFORMER QTA1 (PANEL QLA1)	Sp...	90 A	3	9775 VA	5 VA					3	30 A	O...	112 PANEL QHA1 SPD	50	K	No	Std	No	0	No	3	75	4-#10, #10 G, 3/4"C
--	--	--	--	--	--	--	--	--	51	--	--	--	--			9548 VA	5 VA			--	--	--	--	52	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	53	--	--	--	--					10437 VA	5 VA	--	--	--	--	54	--	--	--	--	--	--	--	--
											Total Load:			67129 VA		64519 VA			65189 VA											
											Total Amps:			243 A		233 A			236 A											
											Phase Imbalance:			2.31%		-1.67%			-0.65%											

Load Classification		Connected Load	Demand Factor	Estimated Demand
C	Continuous	2760 VA	100.00%	2760 VA
H	HVAC	6006 VA	90.00%	5406 VA
L	Lighting	9299 VA	100.00%	9299 VA
LM	Largest Motor	41622 VA	120.00%	49947 VA
M	Motor	126443 VA	80.00%	101155 VA
O	Other	990 VA	80.00%	792 VA
R	Receptacle	8640 VA	100.00%	8640 VA
T	Transformer Losses	1513 VA	100.00%	1513 VA

Panel Totals
Total Connected Load: 196833 VA
Total Estimated Demand: 179073 VA
Total Connected Current: 237 A
Total Estimated Demand Current: 215 A

Notes:

Branch Panel: QHB1

Location: DISTRO B 120
Supply From: 120 SWITCHBOARD DHB
Mounting: Surface
Sections: 1

Enclosure: NEMA 1
Fault Duty (Minimum): 35kA
Minimum Front Clearance: 4' - 0"
Main Meter: No

Volts: 480/277 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MLO
Frame Rating: 400 A

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A	PHASE B	PHASE C	P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
3-#4, #10 G, 1-1/4"C	75	3	Yes	2	Yes	Std	No	D,S,SU	1	121 FBC-1 FORKLIFT BATTERY CHARGER (VIA ECB)	C...	60 A	3	5679 VA	11100 VA					3	90 A	LM...	202 SF-B1 GENERATOR SUPPLY FAN (VIA ECB)	2	B	No	Std	No	3	Yes	3	75	3-#6, #8 G, 1"C
--	--	--	--	--	--	--	--	--	3	--	--	--	--			5679 VA	11100 VA			--	--	--	--	4	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	5	--	--	--	--					5679 VA	11100 VA	--	--	--	--	6	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	7	121 SPACE FOR SHUNT TRIP DEVICE	--	--	1	--	11100 VA					3	90 A	M...	202 SF-B2 GENERATOR SUPPLY FAN (VIA ECB)	8	B	No	Std	No	3	Yes	3	75	3-#6, #8 G, 1"C
2-#12, #12 G, 3/4"C	90	2	Yes	3	No	Std	No	--	9	117 LIGHTING SOUTH	L...	20 A	1			1407 VA	11100 VA			--	--	--	--	10	--	--	--	--	--	--	--	--
2-#10, #10 G, 3/4"C	90	2	Yes	3	No	Std	No	V	11	117 LIGHTING NORTH	L...	20 A	1					2595 VA	11100 VA	--	--	--	--	12	--	--	--	--	--	--	--	--
	75	2	Yes	0	No	Std	No	--	13	118 LIGHTING	L...	20 A	1	332 VA	11100 VA					3	90 A	M...	202 SF-B3 GENERATOR SUPPLY FAN	14	B	No	Std	No	3	Yes	3	75	3-#6, #8 G, 1"C
2-#12, #12 G, 3/4"C	75	2	Yes	0	No	Std	No	--	15	119 LIGHTING	L...	20 A	1			332 VA	11100 VA			--	--	--	--	16	--	--	--	--	--	--	--	--
2-#12, #12 G, 3/4"C	75	2	Yes	0	No	Std	No	--	17	120 LIGHTING	L...	20 A	1					166 VA	11100 VA	--	--	--	--	18	--	--	--	--	--	--	--	--
2-#12, #12 G, 3/4"C	75	2	Yes	2	No	Std	No	--	19	121 LIGHTING	L...	20 A	1	99 VA	11100 VA					3	90 A	M...	202 SF-B4 GENERATOR SUPPLY FAN	20	B	No	Std	No	3	Yes	3	75	3-#6, #8 G, 1"C
2-#12, #12 G, 3/4"C	75	2	Yes	2	No	Std	No	--	21	122 LIGHTING	L...	20 A	1			107 VA	11100 VA			--	--	--	--	22	--	--	--	--	--	--	--	--
2-#12, #12 G, 3/4"C	75	2	Yes	3	No	Std	No	--	23	123 LIGHTING	L...	20 A	1					65 VA	11100 VA	--	--	--	--	24	--	--	--	--	--	--	--	--
2-#12, #12 G, 3/4"C	75	2	Yes	3	No	Std	No	--	25	124 LIGHTING	L...	20 A	1	148 VA	1235 VA					1	20 A	L...	202 LIGHTING	26	--	No	Std	No	3	Yes	2	75	2-#12, #12 G, 3/4"C
3-#4, #10 G, 1-1/4"C	75	3	Yes	3	Yes	Std	No	B,SU	27	117 CRANE-B	M...	60 A	3			8333 VA	0 VA			1	20 A	--	SPARE	28	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	29	--	--	--	--					8333 VA	0 VA	1	20 A	--	SPARE	30	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	31	--	--	--	--	8333 VA	0 VA					1	20 A	--	SPARE	32	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	33	SPARE	--	20 A	1			0 VA	0 VA			1	20 A	--	SPARE	34	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	35	SPARE	--	20 A	1					0 VA	0 VA	1	20 A	--	SPARE	36	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	37	SPARE	--	20 A	1	0 VA	0 VA					1	20 A	--	SPARE	38	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	39	SPARE	--	20 A	1			0 VA	0 VA			1	20 A	--	SPARE	40	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	41	SPARE	--	20 A	1					0 VA	0 VA	1	20 A	--	SPARE	42	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	43	SPACE ONLY	--	--	1	--	0 VA					3	20 A	--	SPARE	44	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	45	SPACE ONLY	--	--	1			--	0 VA			--	--	--	--	46	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	47	SPACE ONLY	--	--	1					--	0 VA	--	--	--	--	48	--	--	--	--	--	--	--	--
3-#2, #8 G, 1-1/4"C	75	3	No	0	Yes	Std	No	--	49	120 TRANSFORMER QTB1 (PANEL QLB1)	Sp...	90 A	3	8395 VA	5 VA					3	30 A	O...	120 PANEL QHB1 SPD	50	K	No	Std	No	0	No	3	75	4-#10, #10 G, 3/4"C
--	--	--	--	--	--	--	--	--	51	--	--	--	--			8747 VA	5 VA			--	--	--	--	52	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	53	--	--	--	--					8644 VA	5 VA	--	--	--	--	54	--	--	--	--	--	--	--	--
											Total Load:			68538 VA		68921 VA			69752 VA											
											Total Amps:			247 A		249 A			252 A											
											Phase Imbalance:			-0.77%		-0.22%			0.99%											

Load Classification		Connected Load	Demand Factor	Estimated Demand
C	Continuous	19796 VA	100.00%	19796 VA
H	HVAC	6006 VA	90.00%	5406 VA
L	Lighting	6486 VA	100.00%	6486 VA
LM	Largest Motor	41622 VA	120.00%	49947 VA
M	Motor	126609 VA	80.00%	101287 VA
O	Other	990 VA	80.00%	792 VA
R	Receptacle	4500 VA	100.00%	4500 VA
T	Transformer Losses	1513 VA	100.00%	1513 VA

Panel Totals
Total Connected Load: 207210 VA
Total Estimated Demand: 189415 VA
Total Connected Current: 249 A
Total Estimated Demand Current: 228 A

Notes:

1 LOAD CHANGES HAVE OCCURRED IN THIS AMENDMENT. MULTIPLE PANELS UPSTREAM IMPACTED

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

File Path: C:\Users\gfieldeen\Documents\BUCO00102_DM_ME_gfieldeen.rvt

ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
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DESIGNED BY: E.MCNAMARA
DRAWN BY: E.MCNAMARA
CHECKED BY: B.ADKINS
SUBMITTED BY:
APPROVED BY:
FILE NAME: BUCO00102_DM_ME.rvt
SIZE: ANSI D

Plot Date: 9/29/2025 11:50:51 AM

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE.
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

PANEL SCHEDULES

SHEET ID
EP621

ADVERTISEMENT

Branch Panel: QHA2

Location: DISTRO A 112
Supply From: 112 SWITCHBOARD DHA
Mounting: Surface
Sections: 1

Enclosure: NEMA 1
Fault Duty (Minimum): 35kA
Minimum Front Clearance: 4' - 0"
Main Meter: No

Volts: 480/277 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MLO
Frame Rating: 400 A

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A	PHASE B	PHASE C	P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
4-1/0, #6 G, 2"C	75	3	No	3	Yes	Std	No	V	1	106 PANEL QHA4	Sp...	100 A	3	14287 VA	1109 VA		3	15 A	C...	113 UH-113 UNIT HEATER	2	B	No	Std	No	0	No	3	75	3-#12, #12 G, 3/4"C
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3-1/0, #6 G, 2"C	75	3	No	0	Yes	Std	No	--	7	112 TRANSFORMER QTA2 (PANEL QLA2 VIA ECB)	Sp...	150 A	3	19870 VA	1109 VA		3	15 A	C...	108 UH-108W UNIT HEATER	8	B	No	Std	No	2	No	3	75	3-#12, #12 G, 3/4"C
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4-#2, #6 G, 1-1/2"C	75	3	No	2	Yes	Std	No	V	13	EXTERIOR WEST PANEL QHA3	Sp...	60 A	3	1109 VA	1109 VA		3	15 A	C...	108 UH-108E UNIT HEATER	14	B	No	Std	No	2	No	3	75	3-#12, #12 G, 3/4"C
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3-#12, #12 G, 3/4"C	75	3	No	0	No	Std	No	B	19	115 UH-115 UNIT HEATER	C...	15 A	3	1109 VA	0 VA		3	20 A	--	SPARE	20	--	--	--	--	--	--	--	--	--	--
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3-#12, #12 G, 3/4"C	75	3	No	0	No	Std	No	B	25	114 UH-114 UNIT HEATER	C...	15 A	3	1109 VA	0 VA		3	20 A	--	SPARE	26	--	--	--	--	--	--	--	--	--	--
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												Total Load:		39128 VA		39339 VA		40043 VA												
												Total Amps:		141 A		142 A		145 A												
												Phase Imbalance:		-0.95%		-0.42%		1.37%												

Load Classification		Connected Load	Demand Factor	Estimated Demand
C	Continuous	53707 VA	100.00%	53707 VA
H	HVAC	6842 VA	90.00%	6157 VA
LM	Largest Motor	10499 VA	110.72%	11624 VA
M	Motor	15812 VA	80.00%	12649 VA
O	Other	930 VA	80.00%	744 VA
P	Power	32982 VA	100.00%	32982 VA
R	Receptacle	1620 VA	100.00%	1620 VA
T	Transformer Losses	2394 VA	100.00%	2394 VA

Panel Totals

Total Connected Load: 118509 VA
Total Estimated Demand: 115714 VA
Total Connected Current: 143 A
Total Estimated Demand Current: 139 A

Notes:

Branch Panel: QHB2

Location: DISTRO B 120
Supply From: 120 SWITCHBOARD DHB
Mounting: Surface
Sections: 1

Enclosure: NEMA 1
Fault Duty (Minimum): 35kA
Minimum Front Clearance: 4' - 0"
Main Meter: No

Volts: 480/277 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MLO
Frame Rating: 400 A

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A	PHASE B	PHASE C	P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
3-1/0, #6 G, 2"C	75	3	No	0	Yes	Std	No	--	1	120 TRANSFORMER QTB2 (PANEL QLB2 VIA ECB)	Sp...	150 A	3	16700 VA	14287 VA		3	100 A	Sp...	117 PANEL QHB4	2	--	No	Std	Yes	3	No	3	75	4-#1, #8 G, 2"C
--	--	--	--	--	--	--	--	--	3	--	--	--	--			16759 VA	14287 VA		--	--	4	--	--	--	--	--	--	--	--	--	--
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3-#12, #12 G, 3/4"C	75	3	No	0	No	Std	No	B	7	119 UH-119 UNIT HEATER	C...	15 A	3	1109 VA	1109 VA		3	60 A	Sp...	EXTERIOR WEST PANEL QHB3	8	--	No	Std	Yes	2	No	3	75	4-#4, #10 G, 1-1/4"C
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3-#12, #12 G, 3/4"C	75	2	No	0	No	Std	No	B	13	118 UH-118 UNIT HEATER	C...	15 A	3	1109 VA	1109 VA		3	15 A	C...	120 UH-120 UNIT HEATER	14	B	No	Std	No	0	No	3	75	3-#12, #12 G, 3/4"C
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--	--	--	--	--	--	--	--	--	25	SPARE	--	20 A	3	0 VA	582 VA		3	15 A	M...	122 LP-1 NEW OIL PUMP (VIA ECB)	26	B	No	Std	No	3	No	3	75	3-#12, #12 G, 3/4"C
--	--	--	--	--	--	--	--	--	27	--	--	--	--		0 VA	582 VA		--	--	--	28	--	--	--	--	--	--	--	--	--
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--	--	--	--	--	--	--	--	--	35	SPACE ONLY	--	--	1				--	582 VA	--	--	36	--	--	--	--	--	--	--	--	--
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--	--	--	--	--	--	--	--	--	39	SPACE ONLY	--	--	1		--	--			--	--	40	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	41	SPACE ONLY	--	--	1			--	--	--	--	--	42	--	--	--	--	--	--	--	--	--
												Total Load:		36164 VA		36220 VA		37067 VA												
												Total Amps:		131 A		131 A		134 A												
												Phase Imbalance:		-0.88%		-0.72%		1.60%												

Load Classification		Connected Load	Demand Factor	Estimated Demand
C	Continuous	50382 VA	100.00%	50382 VA
H	HVAC	1920 VA	90.00%	1728 VA
LM	Largest Motor	8460 VA	106.80%	9035 VA
M	Motor	18323 VA	80.00%	14658 VA
O	Other	690 VA	80.00%	552 VA
P	Power	31302 VA	100.00%	31302 VA
R	Receptacle	1800 VA	100.00%	1800 VA
T	Transformer Losses	2394 VA	100.00%	2394 VA

Panel Totals

Total Connected Load: 109451 VA
Total Estimated Demand: 106169 VA
Total Connected Current: 132 A
Total Estimated Demand Current: 128 A

Notes:

1 LOAD CHANGES HAVE OCCURRED IN THIS AMENDMENT. MULTIPLE PANELS UPSTREAM IMPACTED

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

File Path: C:\Users\gfeddesen\Documents\BUCO00102_DM_ME_gfeddesen.rvt

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE.
OMAHA, NE 68102

DESIGNED BY: E.MCNAMARA
DRAWN BY: E.MCNAMARA
CHECKED BY: B.ADKINS
SUBMITTED BY:
J.HEDRICK
SIZE: ANSI D
FILE NAME: BUCO00102_DM_ME.rvt
ISSUE DATE: 09/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:

Date: 9/29/2025 11:50:56 AM
Plot Date: 9/29/2025 11:51:00 AM

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

PANEL SCHEDULES

SHEET ID
EP622

ADVERTISEMENT

Branch Panel: QLA1

Location: DISTRO A 112
Supply From: 112 XFMR QTA1
Mounting: Surface
Sections: 1

Enclosure: NEMA 1
Fault Duty (Minimum): 10kA
Minimum Front Clearance: 3' - 0"
Main Meter: No

Volts: 120/208 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MCB
Frame Rating: 225 A
MCB Ampacity Rating: 150 A

MCB Service Rating: Std
MCB Solid State: Yes
MCB Other Features: None

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A		PHASE B		PHASE C		P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
2-#8, #8 G, 3/4"C	75	2	No	3	No	Std	No	V	1	EXT. SOUTH (A) RECEPTACLES	R...	20 A	1	900 VA	5 VA					3	30 A	O...	112 PANEL QLA1 SPD	2	K	No	Std	No	0	No	3	75	4-#10, #10 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	Yes	0	No	Std	No	B	3	112 SS-112 SPLIT-SYSTEM INDOOR UNIT	H...	15 A	2			624 VA	5 VA			--	--	--	--	4	--	--	--	--	--	--	--	--	--
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3-#8, #10 G, 3/4"C	75	3	Yes	2	No	Std	No	B	7	EXT. SOUTH SSHP-112 SPLIT-SYSTEM OUTDOOR UNIT	LM...	35 A	3	2774 VA	1260 VA					1	20 A	R...	201 RECEPTACLES	8	V	No	Std	No	3	No	2	75	2-#10, #10 G, 3/4"C
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2-#12, #12 G, 3/4"C	75	2	Yes	0	No	Std	No	L	13	112 DDC PANEL 'A'	O...	20 A	1	360 VA	720 VA					1	20 A	R...	106 SOUTH RECEPTACLES	14	V	No	Std	No	3	No	2	75	2-#10, #10 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	No	0	No	Std	No	--	15	113 RECEPTACLES	R...	20 A	1			540 VA	1440 VA			1	20 A	R...	108 EAST RECEPTACLES	16	V	No	Std	No	3	No	2	75	2-#10, #10 G, 3/4"C
2-#10, #10 G, 3/4"C	75	2	Yes	0	No	Std	No	B,L	17	114 BC-A, BAT-A SWITCHGEAR BATTERIES AND CHARGER	C...	30 A	1					2760 VA	540 VA	1	20 A	R...	108 WEST-1 RECEPTACLES	18	--	No	Std	No	3	No	2	75	2-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	No	0	No	Std	No	B	19	114 EF-114 EXHAUST FAN	M...	15 A	2	562 VA	540 VA					1	20 A	R...	108 WEST-2 RECEPTACLES	20	--	No	Std	No	3	No	2	75	2-#12, #12 G, 3/4"C
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2-#12, #12 G, 3/4"C	75	2	No	0	No	Std	No	B	23	114 D-EF114(E/I) EXHAUST FAN DAMPERS	M...	15 A	1					240 VA	180 VA	1	20 A	R...	110 RECEPTACLE	24	V	No	Std	No	3	No	2	75	2-#10, #10 G, 3/4"C
2-#10, #10 G, 3/4"C	75	2	No	0	No	Std	No	V	25	114 RECEPTACLES	R...	20 A	1	720 VA	240 VA					1	20 A	O...	110 ATG-FA AUTOMATIC TANK GAUGE	26	B,L	No	Std	No	3	Yes	2	75	2-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	Yes	2	No	Std	No	B	27	EXT. SOUTH SSHP-114 / 114 SS-114 SPLIT SYSTEM	H...	15 A	2			1190 VA	0 VA			1	20 A	--	SPARE	28	--	--	--	--	--	--	--	--	--
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2-#12, #12 G, 3/4"C	75	2	Yes	2	No	Std	No	B	31	EXT. SOUTH SSHP-115 / 115 SS-115 SPLIT SYSTEM	H...	15 A	2	1190 VA	0 VA					1	20 A	--	SPARE	32	--	--	--	--	--	--	--	--	--
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2-#10, #10 G, 3/4"C	75	2	No	0	No	Std	No	V	35	115 RECEPTACLES	R...	20 A	1					720 VA	0 VA	1	20 A	--	SPARE	36	--	--	--	--	--	--	--	--	--
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												Total Load:		9270 VA		9044 VA		9933 VA															
												Total Amps:		78 A		75 A		83 A															
												Phase Imbalance:		-1.54%		-3.95%		5.49%															

Load Classification		Connected Load	Demand Factor	Estimated Demand
C	Continuous	2760 VA	100.00%	2760 VA
H	HVAC	6006 VA	90.00%	5406 VA
LM	Largest Motor	8322 VA	125.00%	10403 VA
M	Motor	1543 VA	80.00%	1235 VA
O	Other	975 VA	80.00%	780 VA
R	Receptacle	8640 VA	100.00%	8640 VA

Panel Totals
Total Connected Load: 28247 VA
Total Estimated Demand: 29223 VA
Total Connected Current: 78 A
Total Estimated Demand Current: 81 A

Notes:

Branch Panel: QLB1

Location: DISTRO B 120
Supply From: 120 XFMR QTB1
Mounting: Surface
Sections: 1

Enclosure: NEMA 1
Fault Duty (Minimum): 10kA
Minimum Front Clearance: 3' - 0"
Main Meter: No

Volts: 120/208 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MCB
Frame Rating: 225 A
MCB Ampacity Rating: 150 A

MCB Service Rating: Std
MCB Solid State: Yes
MCB Other Features: None

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A		PHASE B		PHASE C		P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
2-#10, #10 G, 3/4"C	75	2	No	3	No	Std	No	V	1	202 RECEPTACLES	R...	20 A	1	1080 VA	5 VA					3	20 A	O...	120 PANEL QLB1 SPD	2	K	No	Std	No	0	No	3	75	4-#12, #12 G, 3/4"C
2-#10, #10 G, 3/4"C	75	2	No	0	No	Std	No	V	3	118 RECEPTACLES	R...	20 A	1			720 VA	5 VA			--	--	--	--	4	--	--	--	--	--	--	--	--	--
2-#12, #12 G, 3/4"C	75	2	No	0	No	Std	No	B	5	119 EF-119 EXHAUST FAN	M...	15 A	2					562 VA	5 VA	--	--	--	--	6	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	7	--	--	--	--	562 VA	720 VA					1	20 A	R...	EXT. SOUTHWEST (B) RECEPTACLES	8	--	No	Std	No	3	No	2	75	2-#10, #10 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	No	0	No	Std	No	B	9	119 D-EF119(E/I) EXHAUST FAN DAMPERS	M...	15 A	1			240 VA	720 VA			1	20 A	R...	117 SOUTH RECEPTACLES	10	V	No	Std	No	3	No	2	75	2-#10, #10 G, 3/4"C
2-#10, #10 G, 3/4"C	75	2	Yes	0	No	Std	No	B,L	11	119 BC-B, BAT-B SWITCHGEAR BATTERIES AND CHARGER	C...	30 A	1					2760 VA	23 VA	1	15 A	M...	121 EF-121 EXHAUST FAN	12	B	No	Std	No	2	No	2	75	2-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	No	0	No	Std	No	--	13	119 RECEPTACLES	R...	20 A	1	720 VA	120 VA					1	15 A	M...	122 D-EF121(E) EXHAUST FAN DAMPER	14	B	No	Std	No	2	No	2	75	2-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	Yes	0	No	Std	No	B	15	120 SS-120 SPLIT-SYSTEM INDOOR UNIT	H...	15 A	2			624 VA	360 VA			1	20 A	R...	122 RECEPTACLES	16	--	No	Std	No	2	No	2	75	2-#12, #12 G, 3/4"C
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2-#12, #12 G, 3/4"C	75	2	Yes	0	No	Std	No	L	19	120 DDC PANEL 'B'	O...	20 A	1	360 VA	360 VA					1	20 A	O...	123 JACE PANEL 'B'	20	B,L	No	Std	No	3	Yes	2	75	2-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	Yes	2	No	Std	No	B	21	EXT. SOUTH SSHP-118 / 118 SS-118 SPLIT SYSTEM	H...	15 A	2			1190 VA	240 VA			1	20 A	O...	123 ATG-FB AUTOMATIC TANK GAUGE	22	L	No	Std	No	3	Yes	2	75	2-#12, #12 G, 3/4"C
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2-#12, #12 G, 3/4"C	75	2	Yes	2	No	Std	No	B	25	EXT. SOUTH SSHP-119 / 119 SS-119 SPLIT SYSTEM	H...	15 A	2	1190 VA	0 VA					1	20 A	--	SPARE	26		--	--	--	--	--	--	--	--
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3-#8, #10 G, 3/4"C	75	3	Yes	2	No	Std	No	B	29	EXT. SOUTH SSHP-120 SPLIT-SYSTEM OUTDOOR UNIT	LM...	35 A	3					2774 VA	0 VA	1	20 A	--	SPARE	30	--	--	--	--	--	--	--	--	--
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												Total Load:		7890 VA		8242 VA		8140 VA															
												Total Amps:		66 A		69 A		68 A															
												Phase Imbalance:		-2.48%		1.87%		0.61%															

Load Classification		Connected Load	Demand Factor	Estimated Demand
C	Continuous	2760 VA	100.00%	2760 VA
H	HVAC	6006 VA	90.00%	5406 VA
LM	Largest Motor	8322 VA	125.00%	10403 VA
M	Motor	1709 VA	80.00%	1367 VA
O	Other	975 VA	80.00%	780 VA
R	Receptacle	4500 VA	100.00%	4500 VA

Panel Totals
Total Connected Load: 24272 VA
Total Estimated Demand: 25215 VA
Total Connected Current: 67 A
Total Estimated Demand Current: 70 A

Notes:

1 LOAD CHANGES HAVE OCCURRED IN THIS AMENDMENT. MULTIPLE PANELS UPSTREAM IMPACTED

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

DESIGNED BY: E.MCNAMARA
DRAWN BY: E.MCNAMARA
CHECKED BY: B.ADKINS
SUBMITTED BY: J.MOORE
SIZE: ANSI D
FILE NAME: BUCO00102_DM_ME.rvt
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:
Plot Date: 9/29/2025 11:51:01 AM
File Path: C:\Users\gfieldsen\Documents\BUCO00102_DM_ME_gfieldsen.rvt

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE.
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

PANEL SCHEDULES

SHEET ID
EP625

ADVERTISEMENT

Branch Panel: QLA2

Location: GENERATOR A 106
Supply From: 112 ECB QLA2
Mounting: Surface
Sections: 1

Enclosure: NEMA 3R
Fault Duty (Minimum): 10kA
Minimum Front Clearance: 3' - 0"
Main Meter: No

Volts: 120/208 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MCB
Frame Rating: 400 A
MCB Ampacity Rating: 250 A

MCB Service Rating: Std
MCB Solid State: Yes
MCB Other Features: None

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A		PHASE B		PHASE C		P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
2-#12, #12 G, 3/4"C	75	2	No	3	No	Std	No	B	1	202 SFD-A1 GENERATOR SUPPLY FAN DAMPER	H...	20 A	1	480 VA	660 VA					1	20 A	O...	106 EEWS-1A EMERGENCY EYE WASH STATION	2	B	No	Std	No	3	No	2	75	2-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	No	3	No	Std	No	B	3	202 SFD-A2 GENERATOR SUPPLY FAN DAMPER	H...	20 A	1			480 VA	240 VA			1	20 A	P...	106 ATG-D1 AUTOMATIC TANK GAUGE	4	B,L	No	Std	No	3	No	2	75	2-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	No	3	No	Std	No	B	5	202 SFD-A3 GENERATOR SUPPLY FAN DAMPER	H...	20 A	1					480 VA	240 VA	1	20 A	P...	106 ATG-D2 AUTOMATIC TANK GAUGE	6	B,L	No	Std	No	3	No	2	75	2-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	No	3	No	Std	No	B	7	202 SFD-A4 GENERATOR SUPPLY FAN DAMPER	H...	20 A	1	480 VA	900 VA					1	20 A	R...	106 NORTHWEST / 116 RECEPTACLES	8	V	No	Std	No	3	No	2	75	2-#8, #8 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	No	3	No	Std	No	B	9	106 OVERHEAD DOOR NORTH	M...	15 A	2			1000 VA	360 VA			1	20 A	R...	EXT. NORTH (A) RECEPTACLES	10	V	No	Std	No	3	No	2	75	2-#8, #8 G, 3/4"C
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2-#12, #12 G, 3/4"C	75	2	No	3	No	Std	No	B	13	106 BV-001, BV-211, AND BV-221 ACTUATED BALL VALVES	M...	15 A	1	99 VA	1500 VA					3	30 A	LM...	116 P-001 PUMP	14	B	No	Std	No	3	Yes	3	75	3-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	No	0	No	Std	No	--	15	112 RECEPTACLES	R...	20 A	1			360 VA	1500 VA			--	--	--	--	16	--	--	--	--	--	--	--	--	--
2-#6, #6 G, 1"C	75	2	Yes	3	No	Std	No	B,L,V	17	110 PCPA PUMP CONTROLLER PANEL	P...	35 A	1					3000 VA	1500 VA	--	--	--	--	18	--	--	--	--	--	--	--	--	--
2-#12, #12 G, 3/4"C	75	2	Yes	3	No	Std	No	--	19	EXT. NORTH SSHP-110 / 110 SS-110 SPLIT-SYSTEM	H...	15 A	2	1230 VA	1440 VA					1	20 A	M...	116 P-002 PUMP	20	B	No	Std	No	3	No	2	75	2-#12, #12 G, 3/4"C
--	--	--	--	--	--	--	--	--	21	--	--	--	--			1230 VA	1440 VA			1	20 A	M...	116 P-003 PUMP	22	B	No	Std	No	3	No	2	75	2-#12, #12 G, 3/4"C
1 2-#12, #12 G, 3/4"C	75	2	No	0	No	Std	No	B	23	SITE EFSO EMERGENCY FUEL SHUT OFF	O...	20 A	1					240 VA	1200 VA	1	20 A	P...	EXT. NORTH WE-1 HEATED WATERPROOF EXCLOSURE	24	B	No	Std	No	3	No	2	75	2-#12, #12 G, 3/4"C
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--	--	--	--	--	--	--	--	--	35	SPARE	--	20 A	1					0 VA	790 VA	--	--	--	--	36	--	--	--	--	--	--	--	--	--
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4-#10, #10 G, 3/4"C	90	3	No	3	No	Std	No	K	43	106 PANEL QLA2 SPD	O...	30 A	3	5 VA	--					1	--	--	SPACE ONLY	44	--	--	--	--	--	--	--	--	--
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4-#2, #6 G, 1-1/2"C	75	3	No	3	Yes	Std	No	V	49	106 GENERATOR A2 PANEL GLA2	P...	70 A	3	5128 VA	5128 VA					3	70 A	P...	106 GENERATOR A1 PANEL GLA1	50	V	No	Std	Yes	3	No	3	75	4-#2, #6 G, 1-1/2"C
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											Total Load:			19072 VA		19291 VA		20022 VA														
											Total Amps:			159 A		161 A		167 A														
											Phase Imbalance:			-2.00%		-0.88%		2.88%														

Load Classification		Connected Load	Demand Factor	Estimated Demand	Panel Totals
H	HVAC	6842 VA	90.00%	6157 VA	
LM	Largest Motor	7100 VA	115.85%	8225 VA	**Total Connected Load:** 58385 VA
M	Motor	8927 VA	80.00%	7141 VA	**Total Estimated Demand:** 56857 VA
O	Other	915 VA	80.00%	732 VA	**Total Connected Current:** 162 A
P	Power	32982 VA	100.00%	32982 VA	**Total Estimated Demand Current:** 158 A
R	Receptacle	1620 VA	100.00%	1620 VA	

Notes:

Branch Panel: QLB2

Location: GENERATOR B 117
Supply From: 120 ECB QLB2
Mounting: Surface
Sections: 1

Enclosure: NEMA 1
Fault Duty (Minimum): 10kA
Minimum Front Clearance: 3' - 0"
Main Meter: No

Volts: 120/208 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MCB
Frame Rating: 400 A
MCB Ampacity Rating: 250 A

MCB Service Rating: Std
MCB Solid State: Yes
MCB Other Features: None

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A		PHASE B		PHASE C		P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
2-#12, #12 G, 3/4"C	75	2	No	3	No	Std	No	B	1	202 SFD-B1 GENERATOR SUPPLY FAN DAMPER	H...	20 A	1	480 VA	1000 VA					2	15 A	M...	117 OHD-W OVERHEAD DOOR WEST	2	B	No	Std	No	3	No	2	75	2-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	No	3	No	Std	No	B	3	202 SFD-B2 GENERATOR SUPPLY FAN DAMPER	H...	20 A	1			480 VA	1000 VA			--	--	--	--	4	--	--	--	--	--	--	--	--	--
2-#12, #12 G, 3/4"C	75	2	No	3	No	Std	No	B	5	202 SFD-B3 GENERATOR SUPPLY FAN DAMPER	H...	20 A	1					480 VA	66 VA	1	15 A	M...	117 BV-111 AND BV-121 ACTUATED BALL VALVES	6	B	No	Std	No	3	No	2	75	2-#12, #12 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	No	3	No	Std	No	B	7	202 SFD-B4 GENERATOR SUPPLY FAN DAMPER	H...	20 A	1	480 VA	660 VA					1	20 A	O...	117 EEWS-1B EMERGENCY EYE WASH STATION	8	B	No	Std	No	3	No	2	75	2-#12, #12 G, 3/4"C
2-#8, #8 G, 3/4"C	75	2	No	3	No	Std	No	V	9	117 NORTH RECEPTACLES	R...	20 A	1			720 VA	360 VA			1	20 A	R...	120 RECEPTACLES	10	V	No	Std	No	0	No	2	75	2-#10, #10 G, 3/4"C
2-#12, #12 G, 3/4"C	75	2	No	3	No	Std	No	B	11	117 OHD-E OVERHEAD DOOR EAST	M...	15 A	2					1000 VA	3000 VA	1	35 A	P...	123 PCPB PUMP CONTROLLER PANEL	12	B,L	No	Std	No	3	Yes	2	75	2-#8, #10 G, 3/4"C
--	--	--	--	--	--	--	--	--	13	--	--	--	--	1000 VA	1230 VA					2	15 A	LM...	EXT. WEST SSHP-123 / 123 SS-123 SPLIT-SYSTEM	14	B	No	Std	No	3	Yes	2	75	2-#12, #12 G, 3/4"C
2-#6, #6 G, 1"C	75	2	No	3	No	Std	No	V	15	EXT. NORTHWEST (B) RECEPTACLES	R...	20 A	1			720 VA	1230 VA			--	--	--	--	16	--	--	--	--	--	--	--	--	--
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--	--	--	--	--	--	--	--	--	45	SPACE ONLY	--	--	1			--	5 VA			--	--	--	--	46	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	47	SPACE ONLY	--	--	1					--	5 VA	--	--	--	--	48	--	--	--	--	--	--	--	--	--
4-#2, #6 G, 1-1/2"C	75	3	No	3	Yes	Std	No	V	49	117 GENERATOR B2 PANEL GLB2	P...	70 A	3	5128 VA	5128 VA					3	70 A	P...	117 GENERATOR B1 PANEL GLB1	50	V	No	Std	Yes	3	No	3	75	4-#2, #6 G, 1-1/2"C
--	--	--	--	--	--	--	--	--	51	--	--	--	--			5328 VA	5328 VA			--	--	--	--	52	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	53	--	--	--	--					5355 VA	5355 VA	--	--	--	--	54	--	--	--	--	--	--	--	--	--
											Total Load:			15902 VA		15961 VA		16842 VA														
											Total Amps:			133 A		133 A		140 A														
											Phase Imbalance:			-2.05%		-1.69%		3.74%														

Load Classification		Connected Load	Demand Factor	Estimated Demand	Panel Totals
H	HVAC	1920 VA	90.00%	1728 VA	
LM	Largest Motor	5061 VA	111.36%	5636 VA	**Total Connected Load:** 48705 VA
M	Motor	7948 VA	80.00%	6358 VA	**Total Estimated Demand:** 47363 VA
O	Other	675 VA	80.00%	540 VA	**Total Connected Current:** 135 A
P	Power	31302 VA	100.00%	31302 VA	**Total Estimated Demand Current:** 131 A
R	Receptacle	1800 VA	100.00%	1800 VA	

Notes:

1 LOAD CHANGES HAVE OCCURRED IN THIS AMENDMENT. MULTIPLE PANELS UPSTREAM IMPACTED

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:

DESIGNED BY: E.MCNAMARA
DRAWN BY: E.MCNAMARA
CHECKED BY: B.ADKINS
SUBMITTED BY: J.MOSCRIP
FILE NAME: BUCO00102_DM_ME.rvt
SIZE: ANSI D

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE.
OMAHA, NE 68102

Plot Date: 9/29/2025 11:51:13 AM
File Path: C:\Users\jfieldsen\Documents\BUCO00102_DM_ME_jfieldsen.rvt

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

PANEL SCHEDULES

SHEET ID

EP626

ADVERTISEMENT

Branch Panel: OH

Location: OFFLOAD
Supply From: OFFLOAD MTS-O
Mounting: Surface
Sections: 1

Enclosure: NEMA 3R
Fault Duty (Minimum): 14kA
Minimum Front Clearance: 4' - 0"
Main Meter: No

Volts: 480/277 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MCB
Frame Rating: 100 A
MCB Ampacity Rating: 45 A

MCB Service Rating: Std
MCB Solid State: No
MCB Other Features: None

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A		PHASE B		PHASE C		P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
3-#12, #12 G, 3/4"C	75	3	No	2	No	Std	No	B	1	OP-001 IN-LINE VERTICAL PUMP	LM...	20 A	3	2493 VA	297 VA					3	30 A	Sp...	TRANSFORMER OTL (PANEL OL)	2	--	No	Std	No	2	No	3	75	3-#10, #10 G, 1"C
--	--	--	--	--	--	--	--	--	3	--	--	--	--			2493 VA	447 VA			--	--	--	--	4	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	5	--	--	--	--					2493 VA	1267 VA	--	--	--	--	6	--	--	--	--	--	--	--	--	--
2-#12, #12 G, 3/4"C	75	2	Yes	2	No	Std	No	--	7	ROAD / AREA LIGHTING	L...	20 A	1	400 VA	--					1	--	--	SPACE ONLY	8	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	9	SPACE ONLY	--	--	1			--	--			1	--	--	SPACE ONLY	10	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	11	SPACE ONLY	--	--	1					--	--	1	--	--	SPACE ONLY	12	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	13	SPACE ONLY	--	--	1	--	5 VA					3	30 A	O...	PANEL OH SPD	14	K	No	Std	No	2	No	3	75	4-#10, #10 G, 3/4"C
--	--	--	--	--	--	--	--	--	15	SPACE ONLY	--	--	1			--	5 VA			--	--	--	--	16	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	17	SPACE ONLY	--	--	1					--	5 VA	--	--	--	--	18	--	--	--	--	--	--	--	--	--
												Total Load:		3195 VA		2945 VA		3765 VA															
												Total Amps:		12 A		11 A		14 A															
												Phase Imbalance:		-3.23%		-10.80%		14.03%															

Load Classification		Connected Load	Demand Factor	Estimated Demand
C	Continuous	1000 VA	100.00%	1000 VA
L	Lighting	400 VA	100.00%	400 VA
LM	Largest Motor	7479 VA	125.00%	9349 VA
O	Other	60 VA	80.00%	48 VA
R	Receptacle	180 VA	100.00%	180 VA
T	Transformer Losses	787 VA	100.00%	787 VA

Panel Totals

Total Connected Load: 9906 VA
Total Estimated Demand: 11764 VA
Total Connected Current: 12 A
Total Estimated Demand Current: 14 A

Notes: SEE ONE-LINE FOR CONSIDERATIONS FOR COLD TEMPERATURES.

1

Branch Panel: OL

Location: OFFLOAD
Supply From: OFFLOAD XFMR OTL
Mounting: Surface
Sections: 1

Enclosure: NEMA 3R
Fault Duty (Minimum): 10kA
Minimum Front Clearance: 3' - 0"
Main Meter: No

Volts: 120/208 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MCB
Frame Rating: 100 A
MCB Ampacity Rating: 60 A

MCB Service Rating: Std
MCB Solid State: No
MCB Other Features: None

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A		PHASE B		PHASE C		P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
2-#12, #12 G, 3/4"C	75	2	Yes	2	No	Std	No	B	1	GROUND VERIFICATION UNIT	O...	15 A	1	30 VA	--					1	--	--	SPACE ONLY	2	--	--	--	--	--	--	--	--	--
2-#12, #12 G, 3/4"C	75	2	No	2	No	Std	No	--	3	RACK RECEPTACLE	R...	20 A	1			180 VA	--			1	--	--	SPACE ONLY	4	--	--	--	--	--	--	--	--	--
2-#12, #12 G, 3/4"C	75	2	No	2	No	Std	No	B,VM	5	EW-O ELECTRIC WATER BLANKET	C...	20 A	1					1000 VA	--	1	--	--	SPACE ONLY	6	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	7	SPARE	--	20 A	1	0 VA	--					1	--	--	SPACE ONLY	8	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	9	SPACE ONLY	--	--	1			--	--			1	--	--	SPACE ONLY	10	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	11	SPACE ONLY	--	--	1					--	--	1	--	--	SPACE ONLY	12	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	13	SPACE ONLY	--	--	1	--	5 VA					3	30 A	O...	PANEL OL SPD	14	K	No	Std	No	2	No	3	75	4-#10, #10 G, 3/4"C
--	--	--	--	--	--	--	--	--	15	SPACE ONLY	--	--	1			--	5 VA			--	--	--	--	16	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	17	SPACE ONLY	--	--	1					--	5 VA	--	--	--	--	18	--	--	--	--	--	--	--	--	--
												Total Load:		35 VA		185 VA		1005 VA															
												Total Amps:		0 A		2 A		9 A															
												Phase Imbalance:		-91.43%		-54.69%		146.12%															

Load Classification		Connected Load	Demand Factor	Estimated Demand
C	Continuous	1000 VA	100.00%	1000 VA
O	Other	45 VA	80.00%	36 VA
R	Receptacle	180 VA	100.00%	180 VA

Panel Totals

Total Connected Load: 1225 VA
Total Estimated Demand: 1216 VA
Total Connected Current: 3 A
Total Estimated Demand Current: 3 A

Notes: SEE ONE-LINE FOR CONSIDERATIONS FOR COLD TEMPERATURES.

1

2

FOR KEY, GENERAL NOTES, AND KEYNOTES, SEE SHEET EP620.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE
2	AM #0003 - GENERAL REVISIONS	09/29/2025
1	AM #0002 - GENERAL REVISIONS	09/19/2025

File Path: C:\Users\jfieldsem\Documents\BUCO00102_DM_ME_jfieldsem.rvt

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE.
OMAHA, NE 68102

DESIGNED BY: E.MCNAMARA
DRAWN BY: E.MCNAMARA
CHECKED BY: B.ADKINS
SUBMITTED BY: J.HEDRICK
SIZE: ANSI D
FILE NAME: BUCO00102_DM_ME.rvt
ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:

Date: 9/26/2025 7:08:56 AM
Plot Date: 9/26/2025 7:08:56 AM

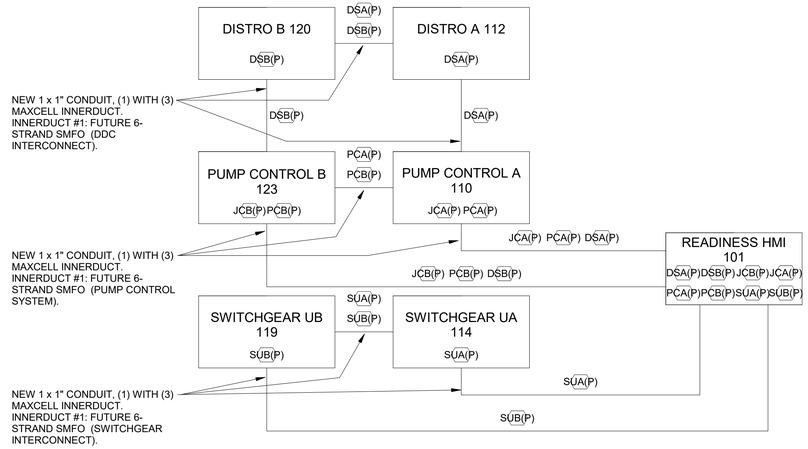
BUCKLEY SFB, COLORADO
POWER INDEPENDENCE: MISSION CONTROL STATION

PANEL SCHEDULES OFFLOAD

SHEET ID

EP631

ADVERTISEMENT



J2 TELECOMMUNICATIONS PREMISES DIAGRAM

SCALE: NTS

GENERAL NOTES:

1. COORDINATE WITH GENERATOR CONTROL DIAGRAM. EP501.

2. COORDINATE MANHOLE NAMING CONVENTION WITH BASE CE.

3. ALL PATHWAYS TO BE 4" CONDUIT. ALL CONDUITS SHALL BE PROVIDED A SPARE PATHWAY ALONGSIDE THE ORIGINAL.

4. EACH SPARE INNERDUCT AND SPARE CONDUIT SHALL BE PROVIDED WITH PULL ROPE.

5. CAP SPARE CONDUIT(S) WITH MECHANICAL PLUG.

6. ALL OSP FIBER SHALL BE HOMERUN (UNSPLICED) CABLES.

7. ALL COMMUNICATIONS CABLE MEDIA IDENTIFIED BY SYSTEM SHALL BE DEDICATED CABLES. COMMON PATHWAYS FOR DIFFERENT SYSTEMS MAY BE USED (EXCEPT __A AND __B FOR SAME SYSTEM TYPE SHALL NOT USE SAME PATHWAY).

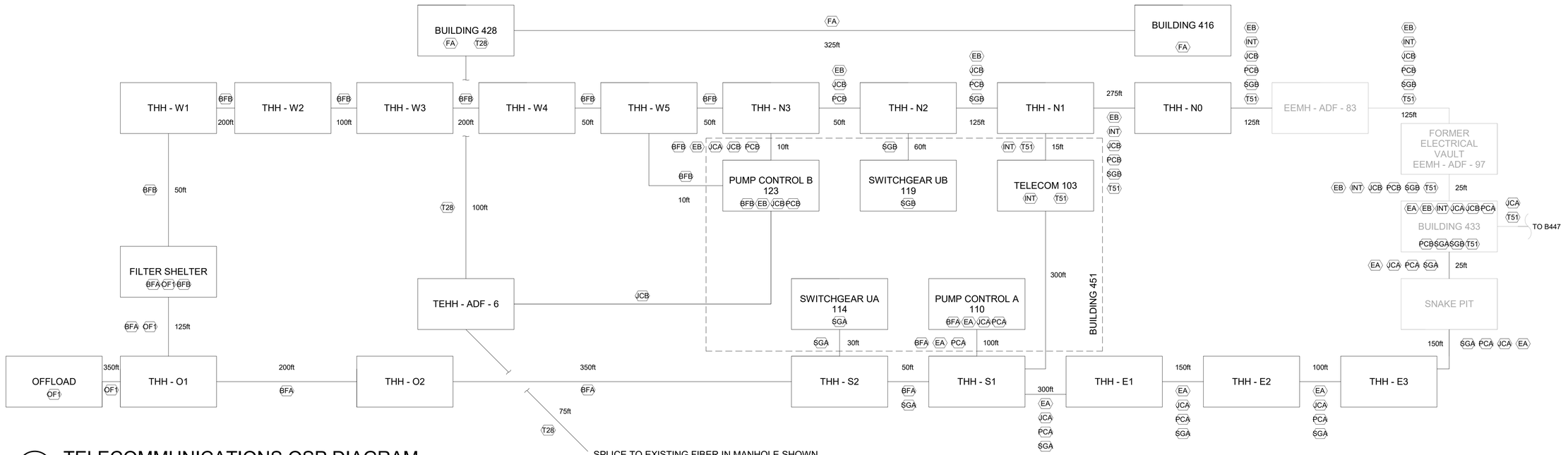
8. LENGTH(S) PROVIDED AS ESTIMATES FOR COURTESY ONLY. CONTRACTOR TO CONFIRM PATHWAY LENGTH(S) WITH PROPOSED INSTALLATION ROUTING.

9. ALL FIBER PENETRATING THE HEMP BARRIER INTO B433 SHALL BE UNSHIELDED FIBER.

#	KEYNOTES - TN601
BFA	SYSTEM: BULK FUELS SYSTEM A TO PUMP CONTROL A MEDIA: 6-STRAND SMFO SHEET SERIES: EF
BFB	SYSTEM: BULK FUELS SYSTEM B TO PUMP CONTROL B MEDIA: 6-STRAND SMFO SHEET SERIES: EF
DSA(P)	SYSTEM: DISTRO A TO READINESS HMI MEDIA: 6-STRAND SMFO SHEET SERIES: EP501
DSB(P)	SYSTEM: DISTRO B TO READINESS HMI MEDIA: 6-STRAND SMFO SHEET SERIES: EP501
EA	SYSTEM: EMCS A TO B433 HMI MEDIA: 6-STRAND SMFO SHEET SERIES: M-
EB	SYSTEM: EMCS B TO B433 HMI MEDIA: 6-STRAND SMFO SHEET SERIES: M-
FA	SYSTEM: FIRE ALARM CONNECTION FROM B416 TO B428 MEDIA: 12-STRAND SMFO SHEET SERIES: TS401
INT	SYSTEM: INTERCOMMUNICATIONS CONNECTION TO B433 MEDIA: 6-STRAND SMFO SHEET SERIES: EY001
JCA	SYSTEM: JACE CONTROLLER A TO B433 HMI MEDIA: 6-STRAND SMFO SHEET SERIES: MH701
JCA(P)	SYSTEM: JACE CONTROLLER A TO READINESS HMI MEDIA: 6-STRAND SMFO SHEET SERIES: MH701
JCB	SYSTEM: JACE CONTROLLER B TO B433 HMI MEDIA: 6-STRAND SMFO SHEET SERIES: MH701
JCB(P)	SYSTEM: JACE CONTROLLER B TO READINESS HMI MEDIA: 6-STRAND SMFO SHEET SERIES: MH701

#	KEYNOTES - TN601
OF1	SYSTEM: FUELS OFFLOAD TO FILTER SHELTER MEDIA: 6-STRAND SMFO SHEET SERIES: EF
PCA	SYSTEM: PUMP CONTROL A TO B433 HMI MEDIA: 12-STRAND SMFO SHEET SERIES: EF
PCA(P)	SYSTEM: INTERIOR PUMP CONTROL A MEDIA: 6-STRAND SMFO SHEET SERIES: EF
PCB	SYSTEM: PUMP CONTROL B TO B433 HMI MEDIA: 12-STRAND SMFO SHEET SERIES: EF
PCB(P)	SYSTEM: INTERIOR PUMP CONTROL B MEDIA: 6-STRAND SMFO SHEET SERIES: EF
SGA	SYSTEM: SWITCHGEAR UA TO B433 HMI MEDIA: 6-STRAND SMFO SHEET SERIES: EP501
SGB	SYSTEM: SWITCHGEAR UB TO B433 HMI MEDIA: 6-STRAND SMFO SHEET SERIES: EP501
SUA(P)	SYSTEM: SWITCHGEAR UA TO READINESS HMI MEDIA: 6-STRAND SMFO SHEET SERIES: EP501
SUB(P)	SYSTEM: SWITCHGEAR UB TO READINESS HMI MEDIA: 6-STRAND SMFO SHEET SERIES: EP501
T28	SYSTEM: B428 FIBER SOURCE FROM B447 MEDIA: 12-STRAND SMFO SHEET SERIES: TS
T51	SYSTEM: TELECOMMUNICATIONS ROOM FIBER SOURCE FROM B433 MEDIA: 6-STRAND SMFO SHEET SERIES: EF

1



A1 TELECOMMUNICATIONS OSP DIAGRAM

SCALE: NTS

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

File Path: C:\Users\jjfedstad\OneDrive - US Army Corps of Engineers\Documents\BUCC00102_DM_ME_jjfedstad.rvt

ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:

DESIGNED BY: S.BLASER
DRAWN BY: S.BLASER
CHECKED BY: J.FEDSTAD
SUBMITTED BY: S.LINDGREN
SIZE: ANSI D
FILE NAME: BUCC00102_DM_ME.rvt

Plot Date: 9/26/2025 10:01:03 AM

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE, MISSION CONTROL STATION

TELECOMMUNICATIONS OUTSIDE PLANT AND BACKBONE CONNECTION DIAGRAM

SHEET ID

TN601

ADVERTISEMENT

EQUIPMENT ELECTRICAL CONNECTION SCHEDULE PUMP SHELTER

E.Q. I.D. TAG	DESCRIPTION	LOCATION	VOLTS	PH	HP	FLA	MCA	PKG UNIT	NEMA ENCL.	DISCONNECT TYPE	DISCONNECT SIZE	DISCONNECT FUSE	STARTER TYPE	STARTER SIZE	PNL-CKT	COORDINATING DOCUMENTS SPECIFICATION(S)	COORDINATING DOCUMENTS SHEET(S)	REMARKS
EW-C	WATER HEATING ELECTRIC BLANKET	SITE FILTER SHELTER	120 V	1	--	2.0 A	2.5 A	Yes	3R	REC	--	--	--	--	PL-5	33 57 55	M-509	--
HT-HEAT TRACE	HEAT TRACE	SITE FILTER SHELTER	277 V	1	--	18.1 A	22.6 A	Yes	--	CB	--	--	--	--	PH-7	33 52 40	1 --	SEE NOTE 16. ESTIMATED 5W/FT OVER 325 FEET.
IP-F1	VERTICAL TURBINE ISSUE PUMP	SITE FILTER SHELTER	480 V	3	5	8.6 A	10.8 A	No	--	CB	--	--	FVNR	0	PHB-7,9,11	33 57 55	M-601	SEE NOTES 2, 17.
IP-F2	VERTICAL TURBINE ISSUE PUMP	SITE FILTER SHELTER	480 V	3	5	8.6 A	10.8 A	No	--	ECB	--	--	FVNR	0	ECB IP-F2-1,3,5	33 57 55	M-601	SEE NOTES 2, 17.
IP-F3	VERTICAL TURBINE ISSUE PUMP	SITE FILTER SHELTER	480 V	3	5	8.6 A	10.8 A	No	--	ECB	--	--	FVNR	0	ECB IP-F3-1,3,5	33 57 55	M-601	SEE NOTES 2, 17.
IP-F4	VERTICAL TURBINE ISSUE PUMP	SITE FILTER SHELTER	480 V	3	5	8.6 A	10.8 A	No	--	CB	--	--	FVNR	0	PHA-8,10,12	33 57 55	M-601	SEE NOTES 2, 17.
SHA	SUMP HEATER	SITE FILTER SHELTER	120 V	1	--	4.2 A	5.3 A	Yes	--	CB	--	--	--	--	PLA-5	33 52 43.28	M-503	SEE NOTE 14.
SHB	SUMP HEATER	SITE FILTER SHELTER	120 V	1	--	4.2 A	5.3 A	Yes	--	CB	--	--	--	--	PLB-3	33 52 43.28	M-503	SEE NOTE 14.
1 ATG-FC	AUTOMATIC TANK GAUGE PANEL	SITE FILTER SHELTER	120 V	1	--	2.0 A	2.5 A	Yes	--	CB	--	--	--	--	PL-1	33 56 10	EF528	--

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE
1	AM #0003 - GENERAL REVISIONS	09/29/2025

File Path: C:\Users\jfeldesm\Documents\BUCO00102_DM_ME_jfeldesm.rvt

ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:

DESIGNED BY: E.MCNAMARA
DRAWN BY: E.MCNAMARA
CHECKED BY: B.ADKINS
SUBMITTED BY:
LIKOFSKI
SIZE: FILE NAME: BUCO00102_DM_ME.rvt
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US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE.
OMAHA, NE 68102

Date: 9/29/2025 11:50:50 AM

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE: MISSION CONTROL STATION

EQUIPMENT ELECTRICAL CONNECTION SITE
FILTER SHELTER

SHEET ID

EP614S

Plot Date: 9/29/2025 11:50:50 AM

ADVERTISEMENT

Branch Panel: PHA

Location: FILTER SHELTER
Supply From: 112 SWITCHBOARD DHA
Mounting: Surface
Sections: 1

Enclosure: NEMA 3R
Fault Duty (Minimum): 14kA
Minimum Front Clearance: 4' - 0"
Main Meter: No

Volts: 480/277 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MCB
Frame Rating: 100 A
MCB Ampacity Rating: 100 A

MCB Service Rating: Std
MCB Solid State: Yes
MCB Other Features: See Notes "KI" and "SN"

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A		PHASE B		PHASE C		P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
4-#4, #8 G, 1-1/4"C	75	3	No	2	No	Std	No	--	1	TRANSFER SWITCH ATS-P (PANEL PH)	Sp...	60 A	3	5512 VA	5 VA					3	30 A	O...	PANEL PHA SPD	2	K	No	Std	No	2	No	3	75	4-#10, #10 G, 3/4"C
--	--	--	--	--	--	--	--	--	3	--	--	--	--			760 VA	5 VA			--	--	--	--	4	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	5	--	--	--	--					1272 VA	5 VA	--	--	--	--	6	--	--	--	--	--	--	--	--	--
4-#4, #8 G, 1-1/4"C	75	3	No	2	Yes	Std	No	--	7	TRANSFER SWITCH ATS IP-F2 (ECB IP-F2)	M...	60 A	3	2382 VA	2382 VA					3	20 A	LM...	IP-F4 VERTICAL TURBINE/CONTROLLER	8	B,L	No	Std	No	2	No	3	75	3-#12, #12 G, 3/4"C
--	--	--	--	--	--	--	--	--	9	--	--	--	--			2382 VA	2382 VA			--	--	--	--	10	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	11	--	--	--	--					2382 VA	2382 VA	--	--	--	--	12	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	13	SPARE	--	20 A	3	0 VA	2382 VA					3	60 A	M...	TRANSFER SWITCH ATS IP-F3 (ECB IP-F3)	14	--	No	Std	Yes	2	No	3	75	4-#4, #8 G, 1-1/4"C
--	--	--	--	--	--	--	--	--	15	--	--	--	--			0 VA	2382 VA			--	--	--	--	16	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	17	--	--	--	--					0 VA	2382 VA	--	--	--	--	18	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	19	SPARE	--	20 A	3	0 VA	267 VA					3	30 A	Sp...	TRANSFORMER PTA (PANEL PLA)	20	--	No	Std	Yes	2	No	3	75	3-#10, #10 G, 3/4"C
--	--	--	--	--	--	--	--	--	21	--	--	--	--			0 VA	1267 VA			--	--	--	--	22	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	23	--	--	--	--					0 VA	771 VA	--	--	--	--	24	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	25	SPARE	--	20 A	3	0 VA	--					1	--	--	SPACE ONLY	26	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	27	--	--	--	--			0 VA	--			1	--	--	SPACE ONLY	28	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	29	--	--	--	--					0 VA	--	1	--	--	SPACE ONLY	30	--	--	--	--	--	--	--	--	--
4-#1, #8 G, 2"C	75	3	No	2	Yes	Std	No	KI,SFN,V		TIE TO PANEL PHB	P...	100 A	3	4546 VA	--								SUBFEED POSITION FOR TIE TO PANEL PHB			--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--		--	--	--	--			4546 VA	--			--	--	--	--			--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--		--	--	--	--					4546 VA	--	--	--	--	--			--	--	--	--	--	--	--	--
											Total Load:			17477 VA		13718 VA		13741 VA														
											Total Amps:			63 A		50 A		50 A														
											Phase Imbalance:			16.68%		-8.41%		-8.26%														

Load Classification		Connected Load	Demand Factor	Estimated Demand	Panel Totals
C	Continuous	1504 VA	100.00%	1504 VA	
L	Lighting	316 VA	100.00%	316 VA	**Total Connected Load:** 44936 VA
LM	Largest Motor	7147 VA	125.00%	8933 VA	**Total Estimated Demand:** 42804 VA
M	Motor	19293 VA	80.00%	15435 VA	**Total Connected Current:** 54 A
O	Other	300 VA	80.00%	240 VA	**Total Estimated Demand Current:** 51 A
P	Power	14638 VA	100.00%	14638 VA	
R	Receptacle	180 VA	100.00%	180 VA	
T	Transformer Losses	1574 VA	100.00%	1574 VA	

Notes: SEE ONE-LINE FOR CONSIDERATIONS FOR COLD TEMPERATURES.

1

Branch Panel: PHB

Location: FILTER SHELTER
Supply From: 120 SWITCHBOARD DHB
Mounting: Surface
Sections: 1

Enclosure: NEMA 3R
Fault Duty (Minimum): 14kA
Minimum Front Clearance: 4' - 0"
Main Meter: No

Volts: 480/277 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MCB
Frame Rating: 100 A
MCB Ampacity Rating: 100 A

MCB Service Rating: Std
MCB Solid State: Yes
MCB Other Features: See Note "KI" and "SN"

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A		PHASE B		PHASE C		P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
4-#10, #10 G, 3/4"C	75	3	No	2	No	Std	No	K	1	PANEL PHB SPD	O...	30 A	3	5 VA	5512 VA					3	60 A	Sp...	TRANSFER SWITCH ATS-P (PANEL PH)	2	--	No	Std	No	2	No	3	75	4-#4, #8 G, 1-1/4"C
--	--	--	--	--	--	--	--	--	3	--	--	--	--			5 VA	760 VA			--	--	--	--	4	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	5	--	--	--	--					5 VA	1272 VA	--	--	--	--	6	--	--	--	--	--	--	--	--	--
3-#12, #12 G, 3/4"C	75	3	No	2	No	Std	No	B,L	7	IP-F1 VERTICAL TURBINE/CONTROLLER	LM...	20 A	3	2382 VA	2382 VA					3	60 A	M...	TRANSFER SWITCH ATS IP-F3 (ECB IP-F3)	8	--	No	Std	Yes	2	No	3	75	4-#4, #8 G, 1-1/4"C
--	--	--	--	--	--	--	--	--	9	--	--	--	--			2382 VA	2382 VA			--	--	--	--	10	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	11	--	--	--	--					2382 VA	2382 VA	--	--	--	--	12	--	--	--	--	--	--	--	--	--
4-#4, #8 G, 1-1/4"C	75	3	No	2	Yes	Std	No	--	13	TRANSFER SWITCH ATS IP-F2 (ECB IP-F2)	M...	60 A	3	2382 VA	0 VA					3	20 A	--	SPARE	14	--	No	Std	Yes	2	No	3	75	4-#4, #8 G, 1-1/4"C
--	--	--	--	--	--	--	--	--	15	--	--	--	--			2382 VA	0 VA			--	--	--	--	16	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	17	--	--	--	--					2382 VA	0 VA	--	--	--	--	18	--	--	--	--	--	--	--	--	--
3-#10, #10 G, 3/4"C	75	3	No	2	Yes	Std	No	--	19	TRANSFORMER PTB (PANEL PLB)	Sp...	30 A	3	267 VA	0 VA					3	20 A	--	SPARE	20	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	21	--	--	--	--			771 VA	0 VA			--	--	--	--	22	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	23	--	--	--	--					1267 VA	0 VA	--	--	--	--	24	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	25	SPACE ONLY	--	--	1	--	0 VA					3	20 A	--	SPARE	26	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	27	SPACE ONLY	--	--	1			--	0 VA			--	--	--	--	28	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	29	SPACE ONLY	--	--	1					--	0 VA	--	--	--	--	30	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--		SUBFEED POSITION FOR TIE TO PANEL PHB	--	--		--	4546 VA					3	100 A	P...	TIE TO PANEL PHA		KI,SN	No	Std	Yes	2	No	3	--	See Panel Schedule PHA for Tie Conductors
--	--	--	--	--	--	--	--	--		--	--	--	--			--	4546 VA			--	--	--	--			--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--		--	--	--						--	4546 VA	--	--	--	--			--	--	--	--	--	--	--	--
											Total Load:			17477 VA		13222 VA		14237 VA														
											Total Amps:			64 A		48 A		52 A														
											Phase Imbalance:			16.68%		-11.73%		-4.95%														

Load Classification		Connected Load	Demand Factor	Estimated Demand	Panel Totals
C	Continuous	1504 VA	100.00%	1504 VA	
L	Lighting	316 VA	100.00%	316 VA	**Total Connected Load:** 44936 VA
LM	Largest Motor	7147 VA	125.00%	8933 VA	**Total Estimated Demand:** 42804 VA
M	Motor	19293 VA	80.00%	15435 VA	**Total Connected Current:** 54 A
O	Other	300 VA	80.00%	240 VA	**Total Estimated Demand Current:** 51 A
P	Power	14638 VA	100.00%	14638 VA	
R	Receptacle	180 VA	100.00%	180 VA	
T	Transformer Losses	1574 VA	100.00%	1574 VA	

Notes: SEE ONE-LINE FOR CONSIDERATIONS FOR COLD TEMPERATURES.

1

2 LOAD CHANGES HAVE OCCURRED IN THIS AMENDMENT. MULTIPLE PANELS UPSTREAM IMPACTED

SEE SHEET EP620 FOR NOTES, KEY, AND LEGEND.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE
2	AM #0003 - GENERAL REVISIONS	09/29/2025
1	AM #0002 - GENERAL REVISIONS	09/19/2025

File Path: C:\Users\jfieldsen\Documents\BUCO00102_DM_ME_jfieldsen.rvt

ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:

DESIGNED BY: E.MCNAMARA
DRAWN BY: E.MCNAMARA
CHECKED BY: B.ADKINS
SUBMITTED BY:
QA/QC BY:
SIZE: ANSI D
FILE NAME: BUCO00102_DM_ME.rvt

Date: 9/29/2025 11:51:37 AM
Plot Date: 9/29/2025 11:51:37 AM

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE.
OMAHA, NE 68102

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE: MISSION CONTROL STATION

PANEL SCHEDULES FILTER SHELTER

SHEET ID

EP632S

ADVERTISEMENT

Branch Panel: PH

Location: FILTER SHELTER
Supply From: FILTER SHELTER ATS-P
Mounting: Surface
Sections: 1

Enclosure: NEMA 3R
Fault Duty (Minimum): 10kA
Minimum Front Clearance: 4' - 0"
Main Meter: No

Volts: 480/277 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MCB
Frame Rating: 100 A
MCB Ampacity Rating: 60 A

MCB Service Rating: Std
MCB Solid State: Yes
MCB Other Features: None

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A		PHASE B		PHASE C		P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
3-#10, #10 G, 3/4"C	75	3	No	2	Yes	Std	No	--	1	TRANSFORMER PT (PANEL PL)	Sp...	30 A	3	507 VA	--					1	--	--	SPACE ONLY	2	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	3	--	--	--	--			447 VA	--			1	--	--	SPACE ONLY	4	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	5	--	--	--	--					1267 VA	--	1	--	--	SPACE ONLY	6	--	--	--	--	--	--	--	--	--
2-#10, #10 G, 3/4"C	75	2	No	2	No	Std	No	B,L	7	HT-HEAT TRACE	M...	25 A	1	5000 VA	--					1	--	--	SPACE ONLY	8	--	--	--	--	--	--	--	--	--
2-#12, #12 G, 3/4"C	75	2	Yes	2	No	Std	No	--	9	CANOPY LIGHTING	L...	20 A	1			316 VA	--			1	--	--	SPACE ONLY	10	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	11	SPACE ONLY	--	--	1					--	--	1	--	--	SPACE ONLY	12	--	--	--	--	--	--	--	--	--
4-#10, #10 G, 3/4"C	75	3	No	2	No	Std	No	K	13	PANEL PH SPD	O...	30 A	3	5 VA	--					1	--	--	SPACE ONLY	14	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	15	--	--	--	--			5 VA	--			1	--	--	SPACE ONLY	16	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	17	--	--	--	--					5 VA	--	1	--	--	SPACE ONLY	18	--	--	--	--	--	--	--	--	--
										Total Load:				5512 VA		760 VA		1272 VA														
										Total Amps:				20 A		3 A		5 A														
										Phase Imbalance:				119.20%		-69.80%		-49.41%														

Load Classification		Connected Load	Demand Factor	Estimated Demand
C	Continuous	1000 VA	100.00%	1000 VA
L	Lighting	316 VA	100.00%	316 VA
M	Motor	5000 VA	80.00%	4000 VA
O	Other	270 VA	80.00%	216 VA
R	Receptacle	180 VA	100.00%	180 VA
T	Transformer Losses	787 VA	100.00%	787 VA

Panel Totals

Total Connected Load: 7538 VA
Total Estimated Demand: 6485 VA
Total Connected Current: 9 A
Total Estimated Demand Current: 8 A

Notes: SEE ONE-LINE FOR CONSIDERATIONS FOR COLD TEMPERATURES.

1

Branch Panel: PL

Location: FILTER SHELTER
Supply From: FILTER SHELTER XFMR PT
Mounting: Surface
Sections: 1

Enclosure: NEMA 3R
Fault Duty (Minimum): 10kA
Minimum Front Clearance: 3' - 0"
Main Meter: No

Volts: 120/208 Wye
Phases: 3
Wires: 4
Neutral Bus: 100%

Mains Type: MCB
Frame Rating: 100 A
MCB Ampacity Rating: 50 A

MCB Service Rating: Std
MCB Solid State: Yes
MCB Other Features: None

CIRCUIT	MCIT	CCC	NLL	ATZ	SSCB	CB SVC	METER	NOTES	NO	LOAD NAME	LT	CB	P	PHASE A		PHASE B		PHASE C		P	CB	LT	LOAD NAME	NO	NOTES	METER	CB SVC	SSCB	ATZ	NLL	CCC	MCIT	CIRCUIT
2 2-#12, #12 G, 3/4"C	75	2	No	2	No	Std	No	B	1	ATG-FC AUTOMATIC TANK GAUGE	O...	20 A	1	240 VA	--					1	--	--	SPACE ONLY	2	--	--	--	--	--	--	--	--	--
2-#12, #12 G, 3/4"C	75	2	No	2	No	Std	No	--	3	RACK RECEPTACLE	R...	20 A	1			180 VA	--			1	--	--	SPACE ONLY	4	--	--	--	--	--	--	--	--	--
2-#12, #12 G, 3/4"C	75	2	No	2	No	Std	No	B,VM	5	EW-C ELECTRIC WATER BLANKET	C...	20 A	1					1000 VA	--	1	--	--	SPACE ONLY	6	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	7	SPARE	--	20 A	1	0 VA	--					1	--	--	SPACE ONLY	8	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	9	SPARE	--	20 A	1			0 VA	--			1	--	--	SPACE ONLY	10	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	11	SPACE ONLY	--	--	1					--	--	1	--	--	SPACE ONLY	12	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	13	SPACE ONLY	--	--	1	--	5 VA					3	30 A	O...	PANEL PL SPD	14	K	No	Std	No	2	No	3	75	4-#10, #10 G, 3/4"C
--	--	--	--	--	--	--	--	--	15	SPACE ONLY	--	--	1			--	5 VA			--	--	--	--	16	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	17	SPACE ONLY	--	--	1					--	5 VA	--	--	--	--	18	--	--	--	--	--	--	--	--	--
										Total Load:				245 VA		185 VA		1005 VA														
										Total Amps:				2 A		2 A		8 A														
										Phase Imbalance:				-48.78%		-61.32%		110.10%														

Load Classification		Connected Load	Demand Factor	Estimated Demand
C	Continuous	1000 VA	100.00%	1000 VA
O	Other	255 VA	80.00%	204 VA
R	Receptacle	180 VA	100.00%	180 VA

Panel Totals

Total Connected Load: 1435 VA
Total Estimated Demand: 1384 VA
Total Connected Current: 4 A
Total Estimated Demand Current: 4 A

Notes: SEE ONE-LINE FOR CONSIDERATIONS FOR COLD TEMPERATURES.

1

2 LOAD CHANGES HAVE OCCURRED IN THIS AMENDMENT. MULTIPLE PANELS UPSTREAM IMPACTED

SEE SHEET EP620 FOR NOTES, KEY, AND LEGEND.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE
2	AM #0003 - GENERAL REVISIONS	09/29/2025
1	AM #0002 - GENERAL REVISIONS	09/19/2025

File Path: C:\Users\jfieldesen\Documents\BUCC00102_DM_ME_jfieldesen.rvt

ISSUE DATE: 05/01/2025
SOLICITATION NO.: W9128F25RA043
CONTRACT NO.:

DESIGNED BY: E.MCNAMARA
DRAWN BY: E.MCNAMARA
CHECKED BY: B.ADKINS
SUBMITTED BY: J.HEDRICK
SIZE: ANSI D
FILE NAME: BUCC00102_DM_ME.rvt
Date: 9/29/2025 11:51:39 AM
Plot Date: 9/29/2025

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
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OMAHA, NE 68102

BUCKLEY SFB, COLORADO
POWER INDEPENDENCE: MISSION CONTROL STATION

PANEL SCHEDULES FILTER SHELTER

SHEET ID

EP633S

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