

Table with columns: NO., DATE, REVISION / REMARKS, GENERAL REVISION, J.L., J.L., J.L.

LS ELEC. E-2

SHEET NUMBER 0 OF 0

SEAL

- A. Panel Builder
1. The panel builder shall be experienced in the construction of lift station control panels...

- B. Panel Components
1. The panel components are specified on the drawings with the exception of items described in these specifications...

- C. Enclosure
1. The panel with size 1, or 2 starters shall be minimum 36 inch wide x 60 inch high x 12 inch deep...

- a. Constructed of 304 stainless steel 14 gauge. Enclosure shall have powder coated white stainless steel body and door...

- f. A removable min. 1/8 inch thick lexan cover shall be provided on the incoming line terminals.

- g. The outer door is to have nine inch by eleven inch (9" x 11") stainless steel or aluminum pocket for lock box...

- h. Arms and latches shall hold both outer door and inner door in an open position, these must be sufficiently rigid and secure to hold doors open...

- i. Sliding locking bar to allow only main or emergency breaker to be closed. Bar shall be aluminum with stainless steel hardware.

- j. No penetration through the panel will be allowed except for conduits on bottom, and for generator receptacle and transformer conduit...

- 2. The enclosure shall be the product of a UL approved manufacturer and shall be a modified NEMA-3R enclosure.

- D. Wiring
1. All wiring shall be copper THWN or approved equal, AWG 14 minimum. Color code wires as follows: Ground - Green, Grounded Neutral - White, 120 Volt Power - Black, Control - Red, 240 Volt Control - Blue

Different control wiring colors are acceptable if clearly identified. Power wiring shall be kept separate from control wiring, and shall be identified by phase. The high leg shall be the center terminal on the main breaker.

- 2. All wires shall be numbered with machine made plastic wrap around labels at both ends.

- 3. All external connection and internal connections, where shown on the drawings, shall be brought to the numbered terminals. All PLC inputs and outputs shall be brought to the terminal blocks even if not used.

- 4. Wiring shall be enclosed in conduit or equivalent wireways and wiring between the doors and the panel shall be enclosed in a spiral wrap or approved equal with sufficient slack to allow full opening of the door.

- 5. Wiring shall be secured with screw-on tabs, tabs with adhesives shall not be used.

- 6. All wiring shall be front accessible.

- 7. All electrical wiring must meet or exceed National Electric Code and Local Code Standards.

- 8. Any place that electrical wire passes through a metal cover or shield, insulating grommet is required to protect the wire.

- E. Component Mounting
1. All components shall be securely mounted with stainless steel hardware. Self tapping screws are not acceptable.

- 2. All relay bases shall be front mounted with screw terminals, no soldered connections shall be used. All base terminals shall be numbered to correspond to relay numbers. Where plug-in components are not firmly secured in bases, hold down clamps shall be provided.

- F. Identification
1. All components shall be identified in accordance with the schematic diagram, using permanent name tags on the panel of laminated micarta or approved equal.

- 2. All operator's controls shall be provided with laminated micarta name tags attached with stainless steel screws, with minimum lettering height of 1/8 inch.

- 3. Provide a laminated schematic drawing attached to the inside of the outer door - minimum size 11 inches by 17 inches (11" x 17").

- 4. Attach a separate stick-on label showing the following details: PUMP MOTOR, Brand, Catalog number, Impeller number and size, Design head, G.P.M., Serial numbers

- 5. Pump ID tags shall be provided by the PBCWUD and installed by the Contractor. Request via PBCWUD pump shop prior to pump installation.

- G. Junction Box
1. The "RAIN TIGHT" junction box shall be NEMA-4X, 316 stainless steel, Hoffman or approved equal with padlock fitting, continuous hinge clamped cover construction.

- 2. Provide gas sealing hubs, conduit, terminals, and wire as shown on the drawings. Provide four (4) extra wires for future control.

- 3. Pour seals into gas sealing hubs between panel and junction box with compound approved by seal manufacturer.

- 4. Provide plated copper ground lug and wire to the panel ground.

- H. Drawings
1. Panel builder shall provide the following drawings: a. Schematic drawing showing all components...

- b. Bill of material listing all parts as follows, in tabular form: 1) Drawing Reference, 2) Description, 3) Manufacturer, 4) Catalog Number, 5) Type, 6) Notes

- c. Layout drawing showing the front with the operators panel and with the panel open. Layout drawings shall also show the outside dimensions of the panels and dimensioned mounting supports.

- d. Plastic encased drawing inside the panel as previously noted herein.

- 2. Drawings shall be clear and readable and a minimum of 11 inches by 17 inches (11" x 17"). "Fuzzy" reductions will be rejected.

- I. Loose Components
1. Ship the following for mounting by the site electrician: a. Alarm Light - Item 22, b. Outside Floodlight - Item 12, c. 120 Volt Transformer - Item 7, d. Junction Box - Item 33, e. Alarm Horn - Item 23, f. Outlet 120V - Item 39

- J. Soft Starters (SSRVS - Item 41)
1. Soft Starters shall be provided in the control panel for the lift stations which have 20HP motors and larger. Soft Starters shall be solid state reduced voltage starter type with integral bypass, fan and display.

- 2. Soft starters line voltage shall be rated from 240V to 480V, 3Ø. Control supply voltage, control logic inputs and fan supply voltage for soft starters shall be 120V. Soft Starters shall be rated to operate at higher ambient temperature. Oversize soft starter rating minimum one size higher than motor HP.

- 3. All soft starter settings shall be set and adjusted properly for functional operation of lift station. Set ramp up time to "5 sec", ramp down time to "OFF", overload protection to "On", over current time delay to "5 sec", under and over voltage time delay to "10 sec", the line voltage, and motor full load amp per motor nameplate, etc. Disable all the protection features including phase loss, phase reverse, under, unbalance and ground current. Only overload protection shall be enable.

BILL OF MATERIALS (CONTROL PANEL)

Table with columns: ITEM, NAME, DESCRIPTION, MANUFACTURER, TYPE. Lists various electrical components like Main Breaker, Generator Breaker, Level Transmitter, etc.

NOTES ON 240V PANELS:

A. This is the minimum size pump station panel for under 15 hp at 240 volts, 3Ø. For larger than 15 hp items 1, 2, 6, and 8 change. Minimum service size 100 AMP.

B. Short circuit amps rating of circuit breaker and panel shall equal or exceed system S.C. amps. Contractor shall confirm this value with the power company and order the panel accordingly.

C. For two (2) motors 15 h.p. and up, size components per the following table for 240 volt 3 phase services. Soft Starters shall be provided for motors 20 h.p. and up.

Table with columns: MOTOR HP, MOTOR AMPS, SERVICE MINIMUM, MAIN BREAKER, MOTOR CIRCUIT BREAKER, MOTOR STARTER, SERVICE WIRES AND CONDUIT (BETWEEN C.P. AND J-BOX), MOTOR WIRES AND CONDUIT (BETWEEN C.P. AND J-BOX)

NOTES ON 480 VOLT PANELS:

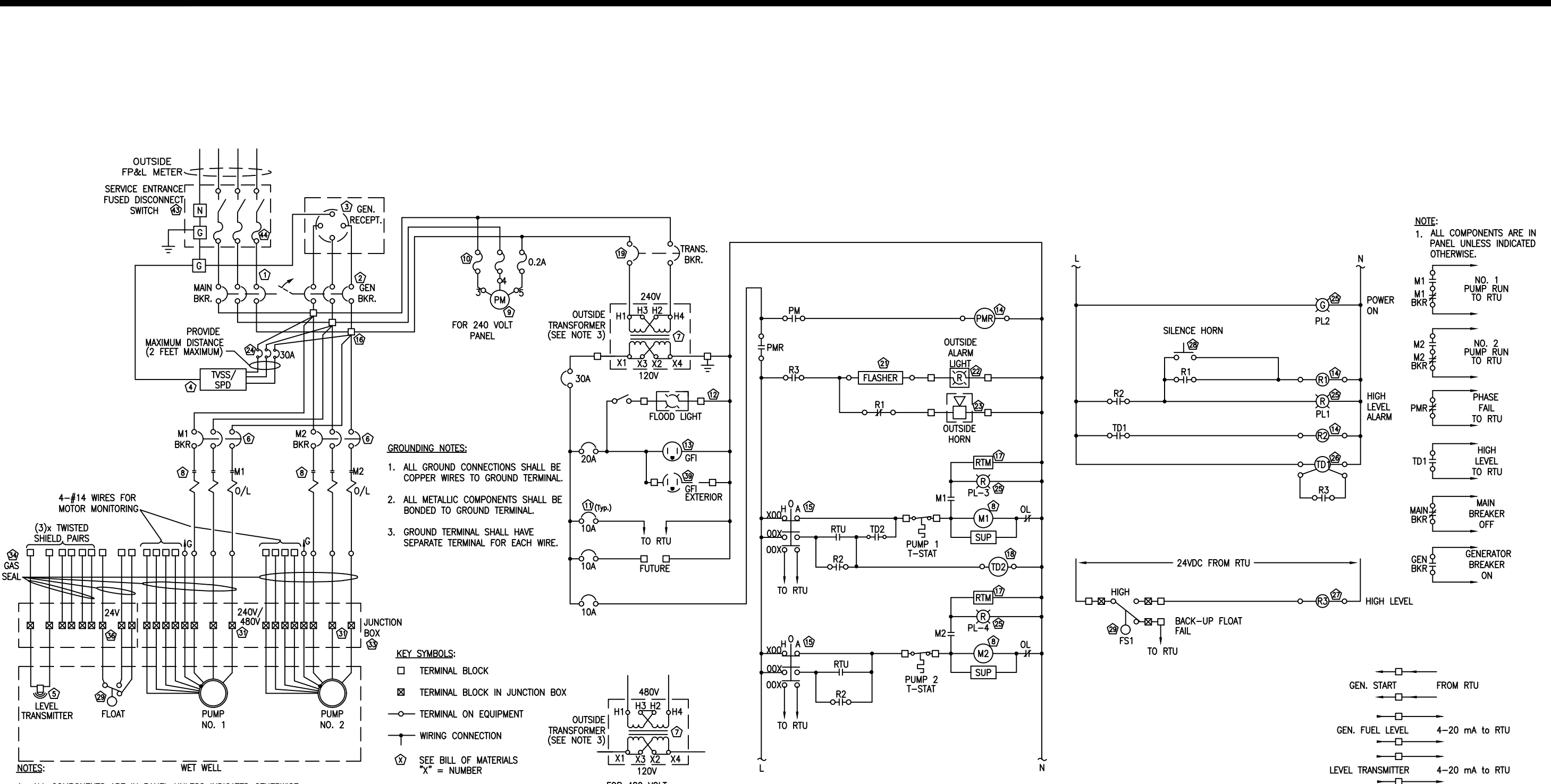
A. The following components shall change: 3 Generator Receptacle, 4 wire 200 amp, 4 TVSS/SPD, 277/480v, 3 phase, 4 wire, 8 Phase Monitor, 200 Amp, 15 Transformer Breaker, 2Ø-15 Amps, 25k AC (Min.)

B. The 480 volt short circuit rating of panel shall equal or exceed system S.C. amps. Contractor shall confirm this value with the power company and order the panel accordingly.

S.C. amp rating of the panel shall be as follows: For 100 amp service 18,000 amps, For 200 to 250 amp service 42,000 amps

Table with columns: MOTOR HP, MOTOR AMPS, SERVICE MINIMUM, MAIN BREAKER, MOTOR CIRCUIT BREAKER, MOTOR STARTER, SERVICE WIRES AND CONDUIT (BETWEEN C.P. AND J-BOX), MOTOR WIRES AND CONDUIT (BETWEEN C.P. AND J-BOX)

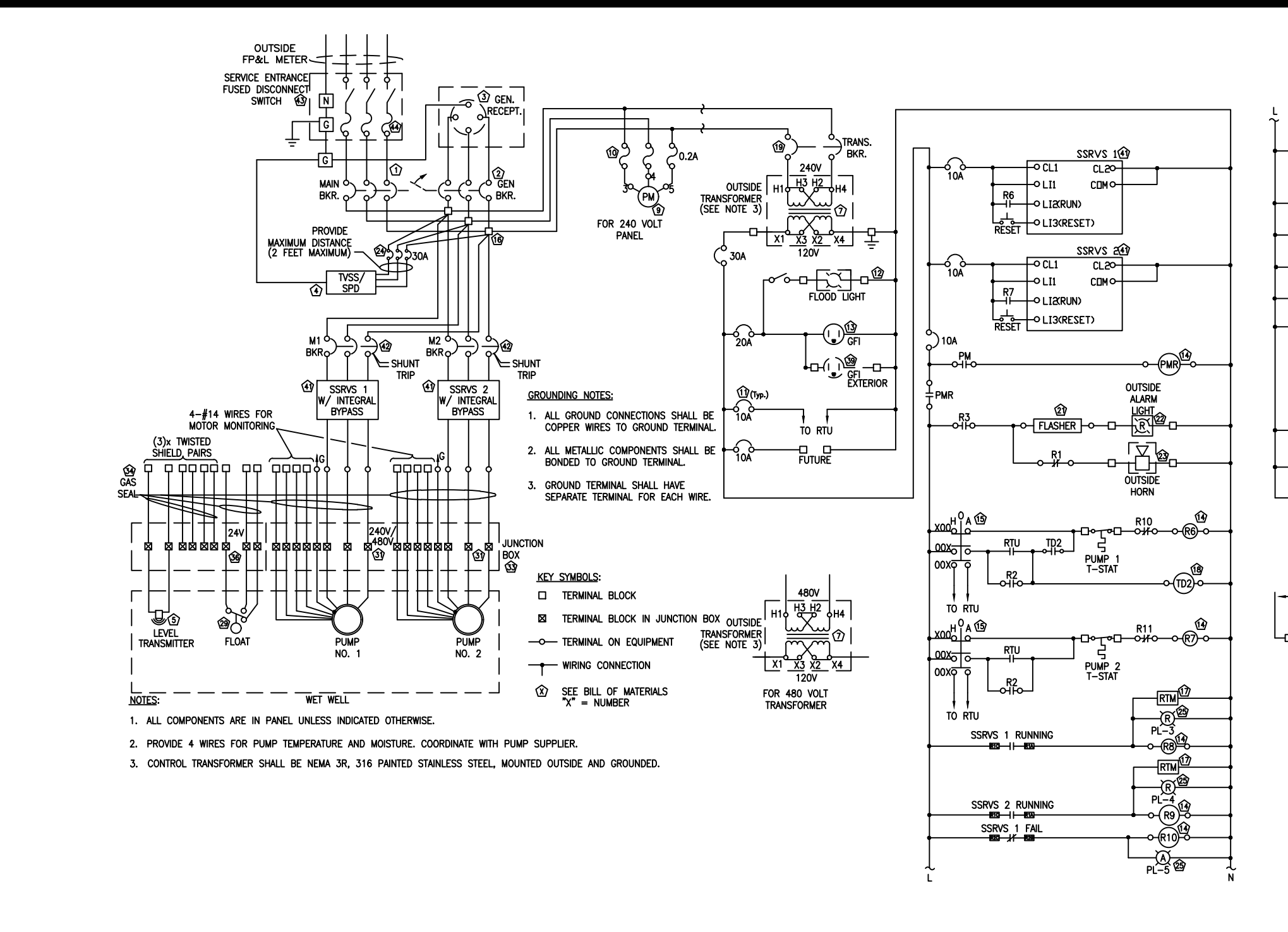
ELECTRICAL PANEL SPECIFICATIONS



- 1. ALL COMPONENTS ARE IN PANEL UNLESS INDICATED OTHERWISE.
2. PROVIDE 4 WIRES FOR PUMP TEMPERATURE AND MOISTURE. COORDINATE WITH PUMP SUPPLIER.
3. CONTROL TRANSFORMER SHALL BE NEMA 3R, 316 PAINTED STAINLESS STEEL, MOUNTED OUTSIDE AND GROUNDED.

LIFT STATION ELECTRICAL SCHEMATIC

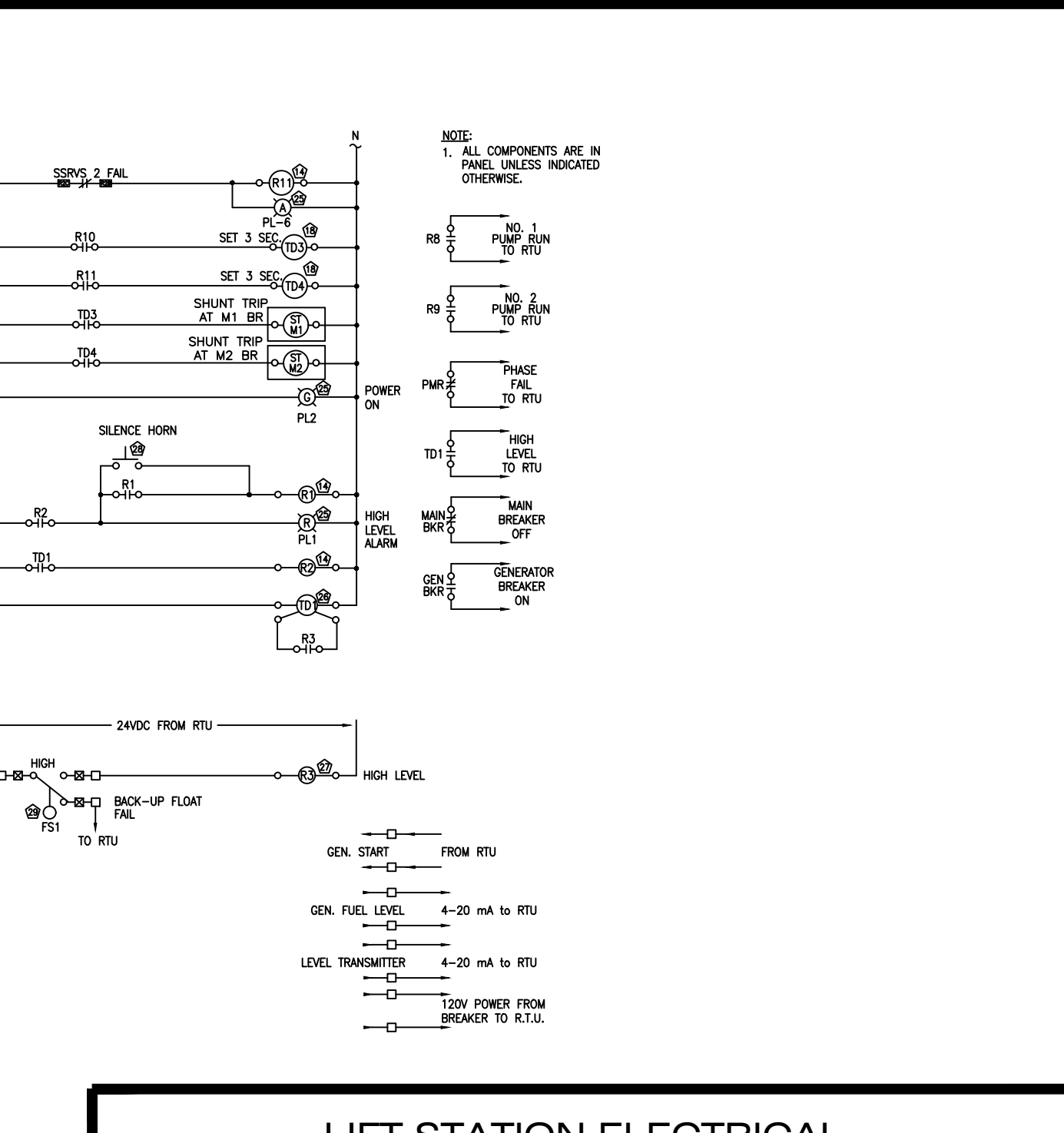
LIFT STATION CONTROL PANEL BILL OF MATERIALS



- 1. ALL COMPONENTS ARE IN PANEL UNLESS INDICATED OTHERWISE.
2. PROVIDE 4 WIRES FOR PUMP TEMPERATURE AND MOISTURE. COORDINATE WITH PUMP SUPPLIER.
3. CONTROL TRANSFORMER SHALL BE NEMA 3R, 316 PAINTED STAINLESS STEEL, MOUNTED OUTSIDE AND GROUNDED.

LIFT STATION ELECTRICAL SCHEMATIC WITH SOFT STARTERS

LIFT STATION CONTROL PANEL 240V & 480V PANEL NOTES



LIFT STATION ELECTRICAL STANDARD DETAILS 2 OF 3

CONSULTANT: IT'S THE LAW! CALL 48 HOURS BEFORE YOU DIG 1-800-432-4770 SUNSHINE STATE ONE CALL OF FLORIDA, INC. UTILITIES NOTIFICATION CENTER

DESIGNED BY: WUD
DRAWN BY: M. BUCKNER
CHECKED BY: J. LAMMERT
APPROVED BY: WUD

Palm Beach County Water Utilities Department P.O. Box 16097 West Palm Beach, FL 33416-6097