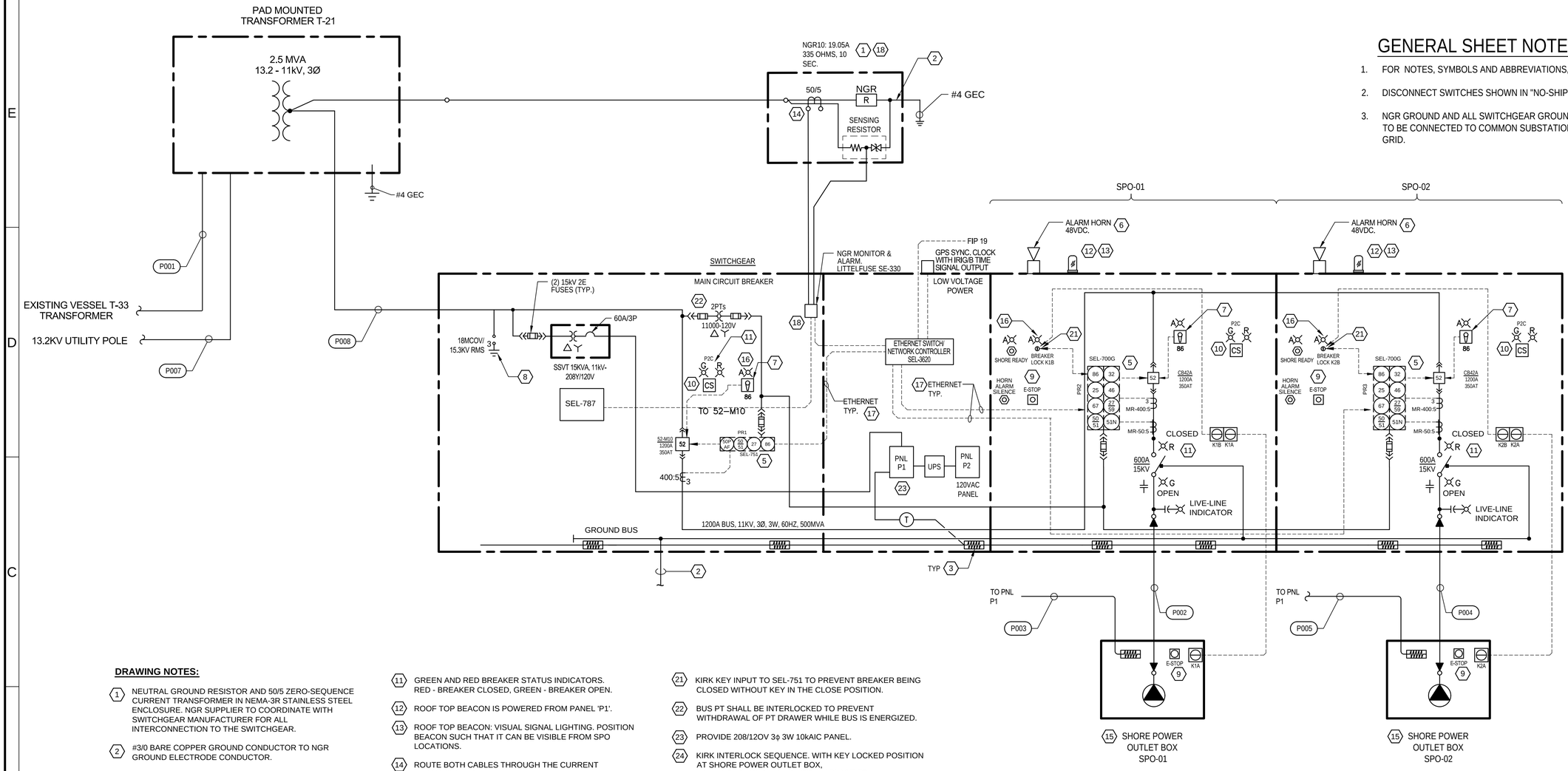


GENERAL SHEET NOTES:

1. FOR NOTES, SYMBOLS AND ABBREVIATIONS, SEE SHEET 2.
2. DISCONNECT SWITCHES SHOWN IN "NO-SHIP" POSITION.
3. NGR GROUND AND ALL SWITCHGEAR GROUND BUSSES ARE TO BE CONNECTED TO COMMON SUBSTATION GROUND GRID.

DRAWING NOTES:

1. NEUTRAL GROUND RESISTOR AND 50/5 ZERO-SEQUENCE CURRENT TRANSFORMER IN NEMA-3R STAINLESS STEEL ENCLOSURE. NGR SUPPLIER TO COORDINATE WITH SWITCHGEAR MANUFACTURER FOR ALL INTERCONNECTION TO THE SWITCHGEAR.
2. #3/0 BARE COPPER GROUND CONDUCTOR TO NGR GROUND ELECTRODE CONDUCTOR.
3. SPACE HEATER, WATTAGE & VOLTAGE AS SIZED BY SWITCHGEAR MANUFACTURER, INCLUDING THERMOSTAT.
4. SUBSTATION-TYPE TRANSFORMER, DRY-TYPE, AIR-COOLED, WITH PROVISIONS FOR FUTURE FORCED AIR COOLING, NEMA-3R STAINLESS STEEL ENCLOSURE.
5. SEL-751 RELAY. PROVIDE WITH THE IDENTIFIED FUNCTIONS. PROVIDE WITH 120VAC CONTROL POWER FROM PANEL P2
6. THE ALARM HORN IS POWERED FROM THE 48VDC PANEL.
7. 86 LOCK-OUT RELAY: SHALL HAVE MANUAL RESET.
8. SURGE ARRESTOR.
9. RED PUSH-ON/PULL-OFF EMERGENCY STOP BUTTON. PROVIDE WITH CLEAR PLASTIC LIFT UP COVER AND RED PHENOLIC NAMEPLATE WITH WHITE LETTERING "EMERGENCY STOP: TRIPS BREAKERS AND CLOSES EARTHING SWITCH". REFER TO TYPICAL BREAKER CLOSE SCHEMATIC AND PILOT WIRE SAFETY SCHEMATIC.
10. BREAKER CONTROL SWITCH CLOSE AND TRIP. PROVIDE ACRYLIC COVER OVER BREAKER CONTROL SWITCH TO PREVENT ACCIDENTAL SWITCHING OF THE HANDLE.
11. GREEN AND RED BREAKER STATUS INDICATORS. RED - BREAKER CLOSED, GREEN - BREAKER OPEN.
12. ROOF TOP BEACON IS POWERED FROM PANEL 'P1'.
13. ROOF TOP BEACON: VISUAL SIGNAL LIGHTING. POSITION BEACON SUCH THAT IT CAN BE VISIBLE FROM SPO LOCATIONS.
14. ROUTE BOTH CABLES THROUGH THE CURRENT TRANSFORMER.
15. OFCI SHORE-TO-SHIP POWER ENCLOSURE. SEE E-508A FOR DETAILS.
16. AMBER LED TO IDENTIFY IF DEVICE IS ACTIVE.
17. EACH RELAY SHALL BE INDIVIDUALLY WIRED BACK TO ETHERNET SWITCH/NETWORK CONTROLLER.
18. NGR MONITOR: PROVIDE DRY CONTACT OUTPUTS TO THE SEL-787 FOR THE FOLLOWING FUNCTIONS: OPEN, SHORTED, OVERHEATED, DISCONNECTED.
19. SHUNT TRIP DEVICE SHALL BE MONITORED AND CONTROLLED VIA SEL-787 TRANSFORMER PROTECTION RELAY AND ENERGIZED UPON ACTIVATION OF THE 50G/51G RELAY ELEMENTS. 51G PICKUP SHALL BE SET BETWEEN 8-10A ANDTIME DELAY SHALL BE SET NO HIGHER THAN 3 SECONDS AT 19A. 50G PICKUP SHALL BE SET TO APPROXIMATELY 23A. REFINE SETTINGS AS REQUIRED BY COORDINATION STUDY.
20. 25kV 600A 4/3W FUSED (WITH SHUNT TRIP) MOTOR-OPERATED LOAD INTERRUPTER SWITCH. PROVIDE WITH 27kV E RATED 50kV 175E CURRENT LIMITING FUSES. PROVIDE 4-SETS NORMALLY OPEN & NORMALLY CLOSED CONTACTS.
21. KIRK KEY INPUT TO SEL-751 TO PREVENT BREAKER BEING CLOSED WITHOUT KEY IN THE CLOSE POSITION.
22. BUS PT SHALL BE INTERLOCKED TO PREVENT WITHDRAWAL OF PT DRAWER WHILE BUS IS ENERGIZED.
23. PROVIDE 208/12OV 3ϕ 3W 10kAIC PANEL.
24. KIRK INTERLOCK SEQUENCE. WITH KEY LOCKED POSITION AT SHORE POWER OUTLET BOX,
    A. INSERT CABLE AND LOCK IN PLACE TO OPEN/RELEASE KEY K1A
    B. INSERT KEY K1A INTO EARTHING SWITCH TO PERMIT OPENING OF SWITCH. OPEN SWITCH TO RELEASE KEY K1B
    C. INSERT KEY K1B AND CLOSE AT BREAKER LOCK SWITCH TO PERMIT CLOSING OF SHORE POWER BREAKER. SHORE POWER BREAKER MAY ONLY BE CLOSED ONCE BREAKER LOCK SWITCH IS CLOSED AND ALL OTHER SAFETY REQUIREMENTS ARE MET, REFER TO PILOT WIRE SAFETY SCHEMATICS.

PROTECTION ELEMENTS

25 - SYNCHRO USED FOR VOLTAGE CHECK, DEAD BUS CONFIRMATION
46 - CURRENT UNBALANCE
67 - DIRECTIONAL OVERCURRENT
32 - DIRECTIONAL POWER
51N - NEUTRAL TIME-OVERCURRENT
27 - UNDERVOLTAGE
59 - OVERVOLTAGE
50 - NEGATIVE SEQUENCE OVERCURRENT
51 - AC INVERSE TIME OVERCURRENT
86 - LOCKOUT RELAY

B1 / E-601A — SINGLE LINE DIAGRAM
NTS

REVISION NAME-YYYY-MM-DD
FOR (SUBMITTAL NAME)
ISSUED: YYYY-MM-DD
NOT TO BE USED FOR CONSTRUCTION

CONNECTICUT Port Authority

Mark	Description	Date	Appr

STATE PIER BERTH ELECTRIFICATION
STATE PIER COMPLEX
NEW LONDON, CONNECTICUT

SINGLE LINE DIAGRAM

Rev. REVNO
Date: DATE
M&N Project No. 250604
Drawing code:
Drawing Scale: 1:1 (D SHEET)
Plot scale:
Designed by: DSGN
Drawn by: DRFT
Cad by: CHKR
Reviewed by: REVR
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL

moffatt & nichol
180 WELLS AVENUE, SUITE 302
NEWTON, MA 02459
617-299-7330

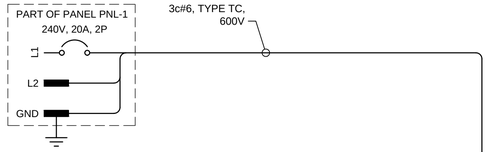
SEAL

Sheet Reference No.
E-601
INDEX: INDX OF ----

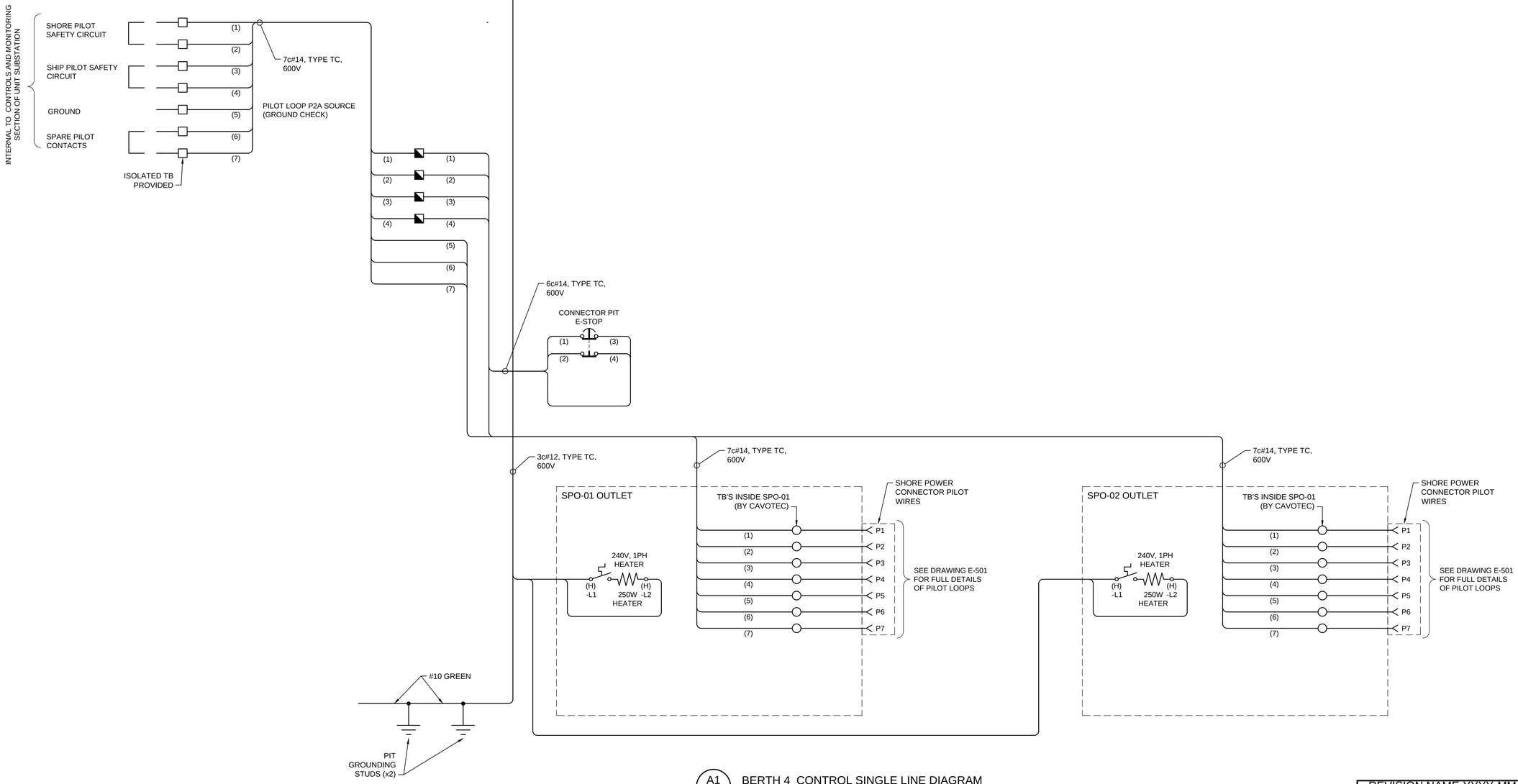
File: P:\BOS\Projects\250604 CT State Pier Berth Electrification\20 CADD_Active_ SheetSet\250604E-600 - Plotted: 4/10/2026 2:09 PM by: SHITTU, HABEEB - Saved: 4/10/2026 2:09 PM by: SHITTU, HABEEB

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

PANEL PNL-1



UNIT SUB-STATION



A1
E-602A

BERTH 4 CONTROL SINGLE LINE DIAGRAM

NTS

NOTES

1. TYPICAL DETAILS SHOWN FOR SHORE POWER CONNECTOR.

LEGEND

- ○ EQUIPMENT/COMPONENT TERMINAL
- □ SWITCHGEAR TERMINAL
- ⊠ CIRCUIT BREAKER TERMINAL
- ▨ PROTECTION/CONTROL/COMM. CABINET TERMINAL
- ◪ FIELD TERMINAL
- (1) CONTROL CABLE CONDUCTOR NUMBER

REVISION NAME-YYYY-MM-DD
FOR (SUBMITTAL NAME)
ISSUED: YYYY-MM-DD
NOT TO BE USED FOR CONSTRUCTION

CONNECTICUT Port Authority

Mark	Description	Date	Appr

STATE PIER BERTH 4 ELECTRIFICATION
STROBEL FLOAT DOCK
NEW LONDON, CONNECTICUT

CONTROL WIRING DIAGRAM

Designed by: DSGN
Drawn by: DRFT
Cad by: CHKR
Reviewed by: REVR
Submitted by: SUBMITTERS NAME MOFFATT & NICHOL
Date: DATE
M&N Project No. ---- 250604
Drawing cost: #####
Drawing Scale: Plot scale: 1:1 (D SHEET)
Rev. REVNO

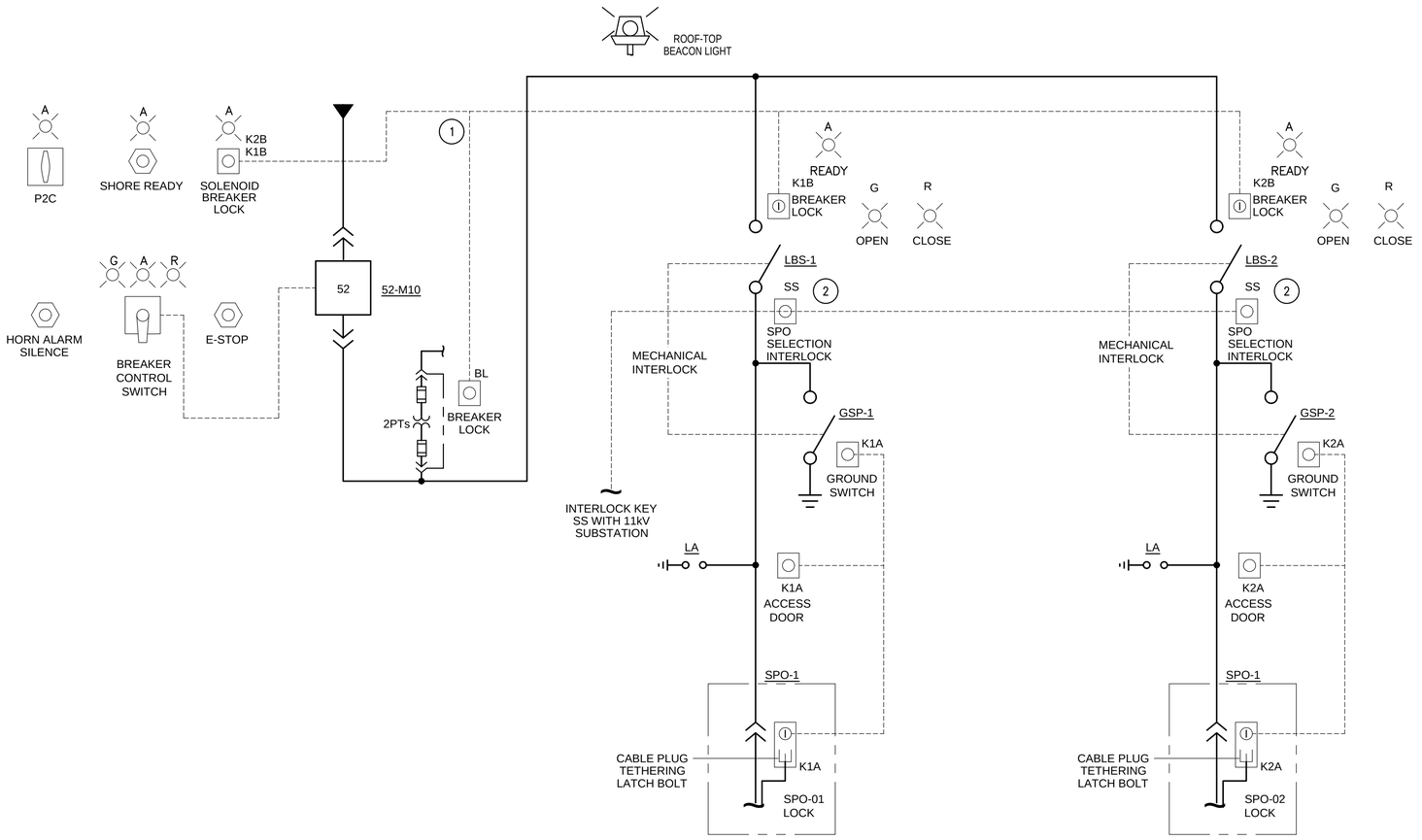
moffatt & nichol
180 WELLS AVENUE, SUITE 302
NEWTON, MA 02459
617-299-7330

SEAL

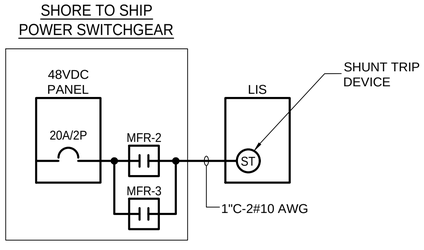
Sheet Reference No.
E-602
INDEX: INDX OF ----

File: P:\BOS\Projects\250604 CT State Pier Berth Electrification\20 CADD_Active_Sheet Set\250604E-602 - Plotted: 4/10/2026 2:09 PM by SHITTU, HABEEB - Saved: 1/21/2026 3:24 PM by HSHITTU

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



B1 E-603A — SEQUENCE OF OPERATION DIAGRAM INTERLOCK CONTROL RORO SHORE POWER 11kV
N.T.S.



A2 E-603A — SHUNT TRIP DIAGRAM
N.T.S.

LEGEND

- BEACON LIGHT
- KIRK INTERLOCK WITH KEY CAPTIVE IN IDLES STAGE OF SEQUENCE OPERATION
- KIRK INTERLOCK
- R — RED SIGNALING
- G — GREEN SIGNALING
- A — AMBER SIGNALING
- PUBLISBUTTON
- LOCK-OUT RELAY
- BREAKER CONTROL SWITCH

GENERAL SHEET NOTES

1. PROVIDE WARNING TAPE AT DUCT BANK CENTERLINES
2. THE BREAKER LOCK, LOCATED AT THE CONTROL PANEL SECTION, SHALL UTILIZE A SOLENOID KEY RELEASE UNIT WHICH WILL PREVENT THE KEY FROM BEING RELEASED WHILE THERE IS VOLTAGE ON ANY PHASE OF THE BUS. THIS FUNCTION SHALL BE WIRED IN A FAIL SAFE MANNER UTILIZING UNDERVOLTAGE OR OVERVOLTAGE RELAY(S).
3. THERE SHALL BE ONLY ONE SS INTERLOCK KEY FOR ALL SHORE POWER SWITCHGEARS.

KEYNOTE

1. THE BREAKER LOCK, LOCATED AT THE CONTROL PANEL SECTION, SHALL UTILIZE A SOLENOID KEY RELEASE UNIT WHICH WILL PREVENT THE KEY FROM BEING RELEASED WHILE THERE IS VOLTAGE ON ANY PHASE OF THE BUS. THIS FUNCTION SHALL BE WIRED IN A FAIL SAFE MANNER UTILIZING UNDERVOLTAGE OR OVERVOLTAGE RELAYS (S).
2. THERE SHALL BE ONLY ONE SS INTERLOCK KEY FOR ALL SHORE POWER SWITCHGEARS.

CONTROL SEQUENCE NOTES

A. NO SHIP AT BERTH:
1. SHORE POWER OUTLET (SPO) GROUND SWITCHES ARE LOCKED IN THE "GROUNDED" POSITION.
2. SPO POWER SWITCHES ARE LOCKED IN THE "OPEN" POSITION.
3. 11,000V CIRCUIT BREAKER (524110) IS OPEN.
4. SPO KEY IS HEW (KA1 AND K2A) CAPTIVE AT SPO RECEPTACLE.

B. SHIP AT BERTH:
1. VERIFY GROUND AND POWER SWITCH POSITIONS, AND LIVE LINE INDICATOR' IS NOT LIT.
2. VERIFY SAFE SHIP PLUG CONDITION.
3. INSERT SHIP PLUGS INTO SPO RECEPTACLE.
4. REMOVE CABLE INTERLOCK KEYS K1A FROM SPO, AND PROCEED TO SUBSTATION WITH THE FLASHING ROOFTOP BEACON.
5. AT THE SUBSTATION, GO TO THE SPO SWITCH WITH THE FLASHING AMBER LIGHTS (WILL BE FLASHING IF THE SHORE PILOT CIRCUIT IS COMPLETE), INSERT TRANSFER (K1A OR K2A) KEY INTO SPO GROUND SWITCH.
6. OPEN THE GROUND SWITCH.
7. INSERT THE SPO SELECTOR KEY (SS) INTO APPLICABLE SPO SWITCH.
8. VERIFY BOTH SWITCHGEAR "LIVE LINE INDICATORS" ARE NOT LIT AND CLOSE THE SWITCH. THE SPO AMBER LIGHT CHANGES FROM FLASHING TO "ON". REMOVE THE "BREAKER LOCK" KEY (K1B OR K2B).
9. INSERT THE 'BREAKER LOCK' KEY (K1B OR K2B) INTO THE 'BREAKER LOCK' ON SPO SWITCH (DENOTED BY THE FLASHING AMBER INDICATING LIGHT) AND TURN. KEY INTERLOCK SEQUENCE IS NOW COMPLETE AND THE AMBER LIGHT CHANGES FROM FLASHING TO "ON'.
10. WITH THE "SHIP READY CONFIRMED" AMBER INDICATION LIGHT NOW FLASHING -CONFIRM WITH SHIP'S CREW THAT VESSEL IS READY TO RECEIVE SHORE POWER. AFTER RECEIVING CONFIRMATION, PRESS "SHIP READY CONFIRMED" GREEN PUSHBUTTON. THE AMBER LIGHT CHANGES FROM FLASHING TO "ON'.
11. CHECK THE AMBER LIGHT AT THE LOCKOUT RELAY 86; IT WILL NOW BE FLASHING IF ALL PLC PERIAISSIVES ARE MET. RESET THE LOCKOUT RELAY Vi4 THE MANUAL HANDLE. THE LOCKOUT RELAY SHOULD REMAIN IN THE "RESET"POSITION AND THE AMBER LIGHT SHOULD CHANGE FROM FLASHING TO "ON".
12. PRIOR TO PROCEEDING, CHECK TO ENSURE THAT THE AMBER "PERMISSIVE TO CLOSE" LIGHT P2C IS FLASHING ABOVE THE BREAKER CONTROL SWITCH.
13. CLOSE 11,000V CIRCUIT BREAKER 52-MI0 BY BREAKER CONTROL SWITCH AT HMI SECTION. THE ROOFTOP BEACON CHANGES FROM FLASHING TO ON.
14. VERIFY "SPO ENERGIZED" LIVE LINE INDICATOR IS LIT AT APPLICABLE SPO SWITCH.
15. ADVISE SHIP PERSONNEL OF SHORE POWER "ON" CONDITION.

C. SHIP LEAVING BERTH:
1. ADVISE SHIP PERSONNEL OF IMPENDING POWER "OFF" CONDITION.
2. OPEN11,000V CIRCUIT BREAKER 524110 BY BREAKER CONTROL SWITCH AT HMI SECTION. AMBER LIGHTS ABOVE BREAKER CONTROL SWITCH, LOCKOUT RELAY. AND "SHIP READY" PUSHBUTTON SHOULD TURN OFF AND THE ROOFTOP BEACON AND AMBER LIGHTS ABOVE THE "BREAKER LOCK" SHOULD BEGIN TO FLASH.
3. VERIFY 'LIVE LINE INDICATORS" ARE NOT LIT (AT HMI SECTION AND SPO SWITCHES).
4. TURN AND REMOVE THE "BREAKER LOCK" KEY (BL) FROM THE BREAKER LOCK AT HMI SECTION. THE AMBER LIGHT ABOVE THE BREAKER LOCK SHOULD CHANGE FROM FLASHING TO "OFF".
5. PRIOR TO PROCEEDING, CHECK TO ENSURE THAT THE AMBER LIGHT AT THE SPO SWITCH SHOULD NOW BE FLASHING. INSERT THE "BREAKER LOCK" KEY INTO THE KEY INTERLOCK AT THE SPO SWITCH AND TURN. OPERATE THE SPO SWITCH FROM THE "CLOSED" POSITION TO THE "OPEN" POSITION. ROOFTOP BEACON TURNS OFF.
6. TURN AND REMOVE THE SELECTOR KEY (SS). THIS KEY SHALL BE STORED IN AN ACCESS-CONTROLLED STORAGE.
7. CLOSE GROUND SWITCH
8. TURN AND REMOVE THE CABLE INTERLOCK KEY (CI OR EI) FROM THE SPO GROUND SWITCH AND PROCEED TO THE SPO VAULT. THE AMBER LIGHT AT THE SPO SWITCH SHOULD BE 'OFF".
9. INSERT THE SPO TRANSFER KEY (C1 OR E1) INTO THE SPO VAULT KEY INTERLOCK BOX AND TURN. REMOVE THE IWO CABLE INTERLOCK KEYS, INSERT INTO THEIR RESPECTIVE INTERLOCKS ON THE RECEPTACLE HANDLES, AND TURN.
10. TURN AND REMOVE CABLE LATCH BOLT "FORK" KEYS FROM THE RECEPTACLE KEY INTERLOCKS.
11. REMOVE SHIP PLUGS.
12. ADVISE SHIP PERSONNEL THAT SHORE POWER DISCONNECTION OPERATION IS COMPLETE.

REVISION NAME-YYYY-MM-DD
FOR (SUBMITTAL NAME)
ISSUED: YYYY-MM-DD
NOT TO BE USED FOR CONSTRUCTION

CONNECTICUT Port Authority

Rev:	Date:	Description	Appr
REVNO	DATE		

STATE PIER BERTH ELECTRIFICATION
STATE PIER COMPLEX
NEW LONDON, CONNECTICUT

INTERLOCKING CONTROL SINGLE LINE DIAGRAM

Designed by: DSGN | Cad by: CHKR | Drawing code:
Drawn by: DRFT | Reviewed by: REVR
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL
M&N Project No. 250604
Drawing Scale: Plot scale: 1:1 (D SHEET)
Date: DATE

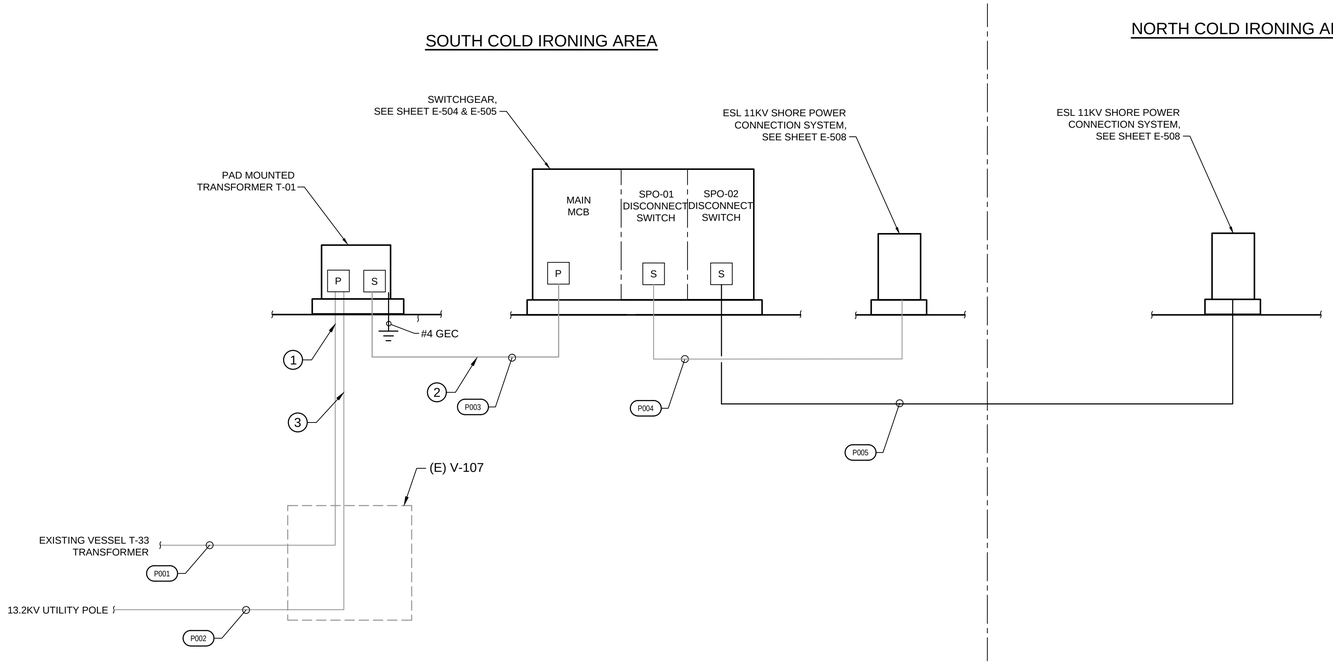
moffatt & nichol
180 WELLS AVENUE, SUITE 302
NEWTON, MA 02459
617-299-7330

SEAL

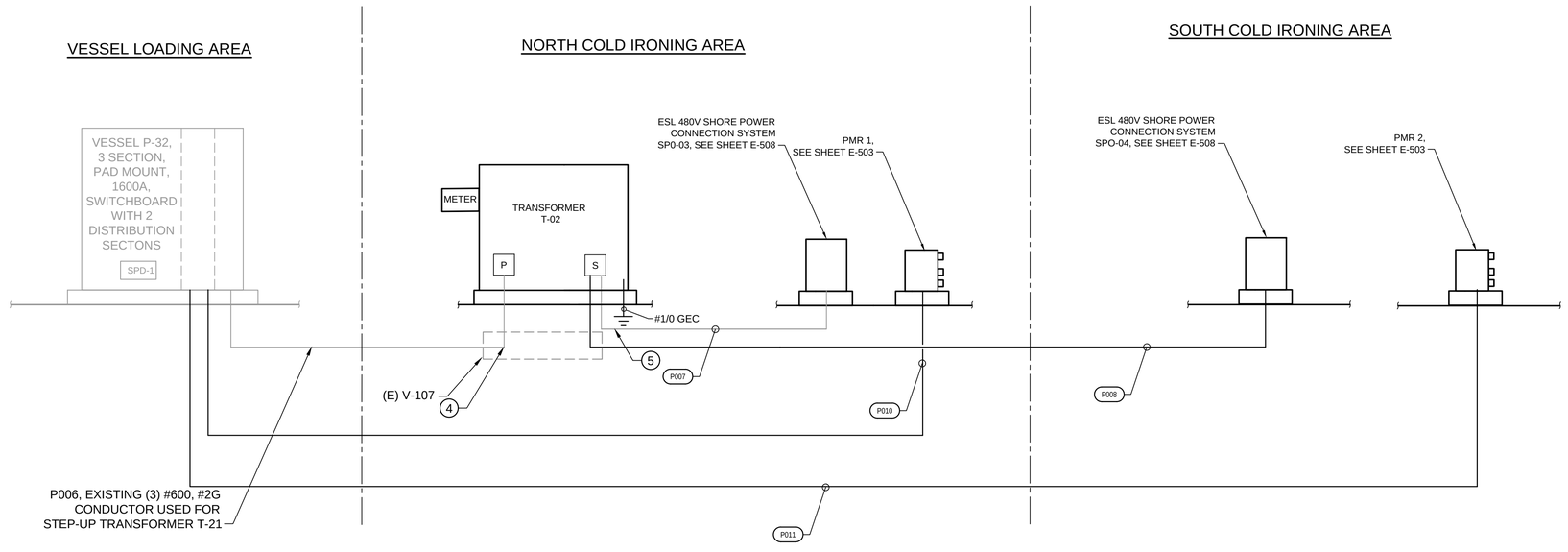
Sheet Reference No.
E-603
INDEX: INDX OF ----

File: P:\BOS\Projects\250604 CT State Pier Berth Electrification\20 CADD_Active_Sheet\Set\250604E-603 ; Plotted: 4/10/2026 2:09 PM by SHITTU, HABEEB ; Saved: 2/4/2026 4:13 PM by HSHITTU

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



C1 E-604 MEDIUM VOLTAGE SHORE POWER ONELINE
SCALE: NTS



A1 E-604 LOW VOLTAGE SHORE POWER ONELINE
SCALE: NTS

KEYNOTES:

1. PULL EXISTING (3) #2/0, #4G FROM DECOMMISSIONED COLD IRONING TRANSFORMER T-21 TO THE PRIMARY SIDE OF INSTALLED TRANSFORMER T-01 .
2. USE EXISTING (3) #1/0, #4G CONDUCTORS FROM DECOMMISSIONED TRANSFORMER T-21 TO DECOMMISSIONED COLD IRONING DISCONNECT D-21 T0 RUN THE CIRCUIT FROM TRANSFORMER T-01 TO SWITCHGEAR MAIN BREAKER.
3. PULL EXISTING (3) #2/0, #4G FROM DECOMMISSIONED COLD IRONING TRANSFORMER T-21 GOING BACK TO THE 13.2KV UTILITY POLE METER TO THE PRIMARY SIDE OF TRANSFORMER T-01.
4. PULL EXISTING (3) #600, #2G BACK FROM DECOMMISSIONED ISOLATION TRANSFORMER T-22 TO EXISTING VAULT V-107 AND ROUTE IT TO THE PRIMARY SIDE OF TRANSFORMER T-02.
5. USE REMAINING EXISTING (3) #600, #2G CONDUCTORS FROM KEYNOTE #3 T0 RUN THE SHORT LENGTH OF CONDUCTORS FROM TRANSFORMER T-02 TO SHORE POWER OUTLET (SPO-03).

REVISION NAME-YYYY-MM-DD
FOR (SUBMITTAL NAME)
ISSUED: YYYY-MM-DD
NOT TO BE USED FOR CONSTRUCTION

CONNECTICUT Port Authority

Mark	Description	Date	Appr

STATE PIER BERTH ELECTRIFICATION
STATE PIER COMPLEX
NEW LONDON, CONNECTICUT

ONE-LINE DIAGRAM

Rev.	REVNO
Date:	DATE
M&N Project No.	250604
Drawing code:	
Drawing Scale:	
Plot scale:	1:1 (0 SHEET)

Designed by: DSGN
Drwn by: DRFT
Ckd by: CHKR
Reviewed by: REVR
Submitted by: SUBMITTER'S NAME MOFFATT & NICHOL

moffatt & nichol
180 WELLS AVENUE, SUITE 302
NEWTON, MA 02459
617-299-7330

SEAL

Sheet
Reference No.
E-604
INDEX: INDX OF ----

File: P:\BOS\Projects\250604 CT State Pier Berth Electrification\20 CADD_Active_SheetSet\250604E-604 - Plotted: 4/10/2026 2:10 PM by SHITTU, HABEEB - Saved: 2/4/2026 2:53 PM by HSHITTU

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING