

BU-1/BU-3 BARGE HAUL SHIFTER – DEMOLITION SITE PLAN

1"=50'

SEQUENCE NOTES:

ALL WORK SHALL BE PERFORMED ON BARGE UNLOADER #3 (BU3) IN PHASE 1 OF THE WORK. DEMOLITION WORK ASSOCIATED WITH BARGE UNLOADER #1 (BU1) SHALL NOT BEGIN UNTIL BU3 HAS BEEN COMPLETED, COMMISSIONED AND FULLY OPERATIONAL.

DEMOLITION PLAN

- SEE DRAWING 4224E-E2 FOR BU-1 DEMOLITION REQUIREMENTS.
- SEE DRAWING 4224E-E3 FOR BU-3 DEMOLITION REQUIREMENTS.

ELECTRICAL NOTES:

1. ALL ELECTRICAL WORK SHALL BE INSTALLED AS REQUIRED BY THE NATIONAL ELECTRIC CODE (N.E.C.) AND ANY STATE, CITY AND/OR LOCAL CODE REQUIREMENTS. THE MORE STRINGENT CODE REQUIREMENT SHALL BE UTILIZED AND VERIFIED WITH THE LOCAL INSPECTION APPROVAL AGENCY. (DEFINITION "CODE" – STATE, CITY AND/OR LOCAL CODE REQUIREMENTS)
2. CONTRACTOR SHALL INSTALL ALL GROUNDING AS REQUIRED BY THE NATIONAL ELECTRIC CODE (N.E.C.) AND ANY STATE, CITY AND/OR LOCAL CODE REQUIREMENTS. THE MORE STRINGENT CODE REQUIREMENT SHALL BE UTILIZED AND VERIFIED WITH THE LOCAL INSPECTION APPROVAL AGENCY.
3. CONTRACTOR SHALL (PRIOR TO BID)
 - (a) VISIT THE JOB/CONSTRUCTION SITE AND FIELD VERIFY ALL EXISTING CONDITIONS
 - (b) TAKE ALL CONSIDERATIONS INTO ACCOUNT AT THE TIME OF BID. NO CONSIDERATIONS WILL BE GRANTED TO THE CONTRACTOR AFTER THE BID HAS BEEN ACCEPTED.
4. CONTRACTOR SHALL WORK THIS DEMOLITION DRAWING WITH THE RICHMOND ENGINEERING WORKS (REW) DEMOLITION AND INSTALLATION CONTRACT DRAWING PACKAGES. CONTRACTOR SHALL NOTIFY THE ENGINEERS OF ANY DISCREPANCY IN DEMOLITION/INSTALLATION DRAWING PACKAGES AND EQUIPMENT/DEVICE INSTALLED IN THE FIELD.

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REV.	DESCRIPTION	DATE	BY	CHK'D
A	ISSUED FOR BID	01/29/24	RCC	JJM

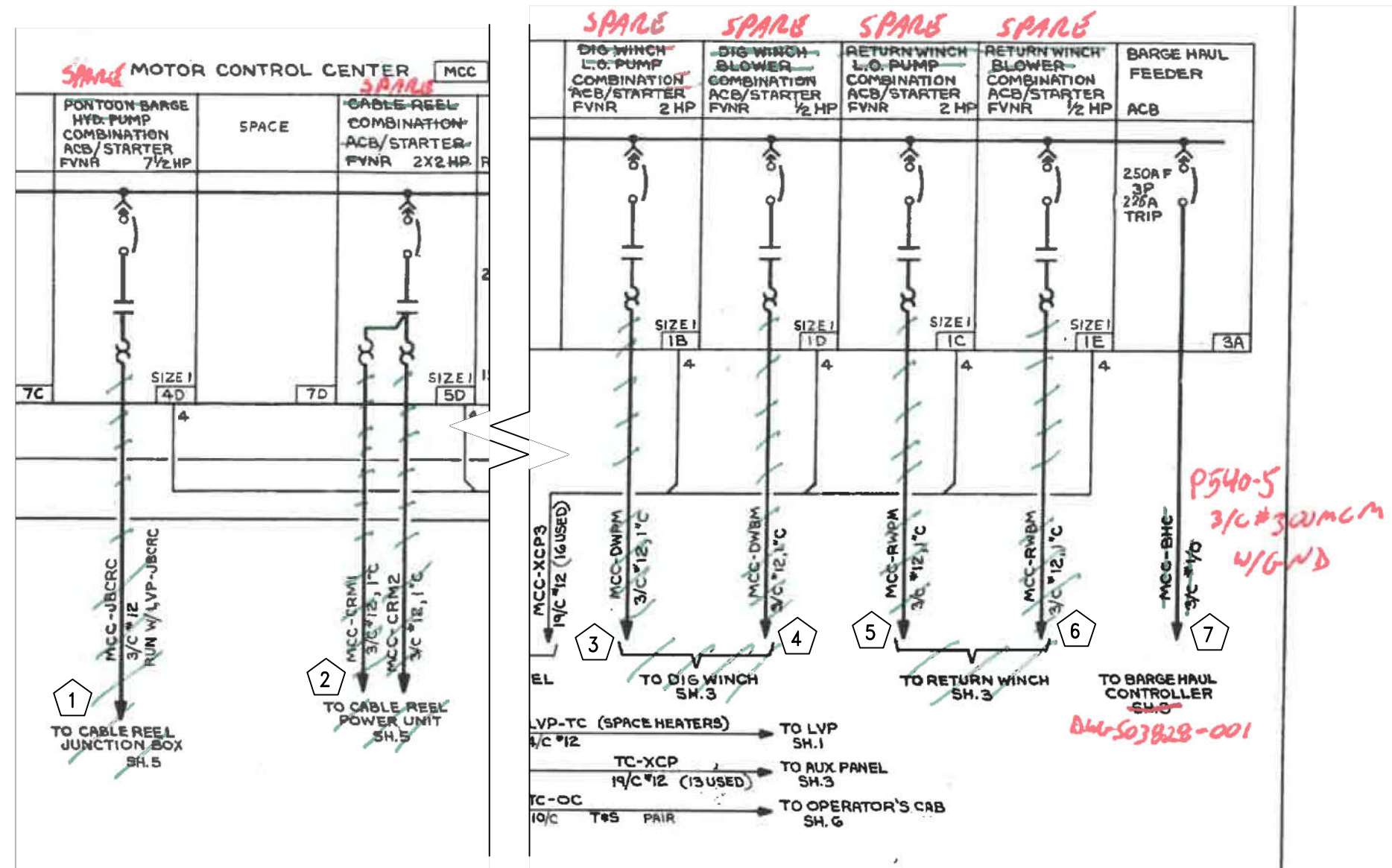
Cowles, Murphy, Glover & ASSOCIATES
A Full Service Engineering Firm

PERFORMANCE • RELIABILITY • EXPERIENCE

457 St. Michael St., Mobile, AL 36602
Alabama (251) 433-1611
11880 Cranston Dr. Ste 102, Arlington, TN 38002
Tennessee (901) 290-5444

PROJECT
**DUAL BARGE SHIFTER AND
BARGE HAUL MARINE CONSTRUCTION**
**McDUFFIE COAL TERMINAL
MOBILE, ALABAMA**

TITLE				
BU-1/BU-3 BARGE HAUL/SHIFTER DEMOLITION SITE PLAN				
SCALE	DRAWN BY	DATE	SHEET	22x34 REV.
AS NOTED	RCC	01/22/24	— OF —	A
JOB NO.	CHECKED BY	DATE	DRAWING NUMBER	
4224E	JJM	01/22/24	4224E-E1	



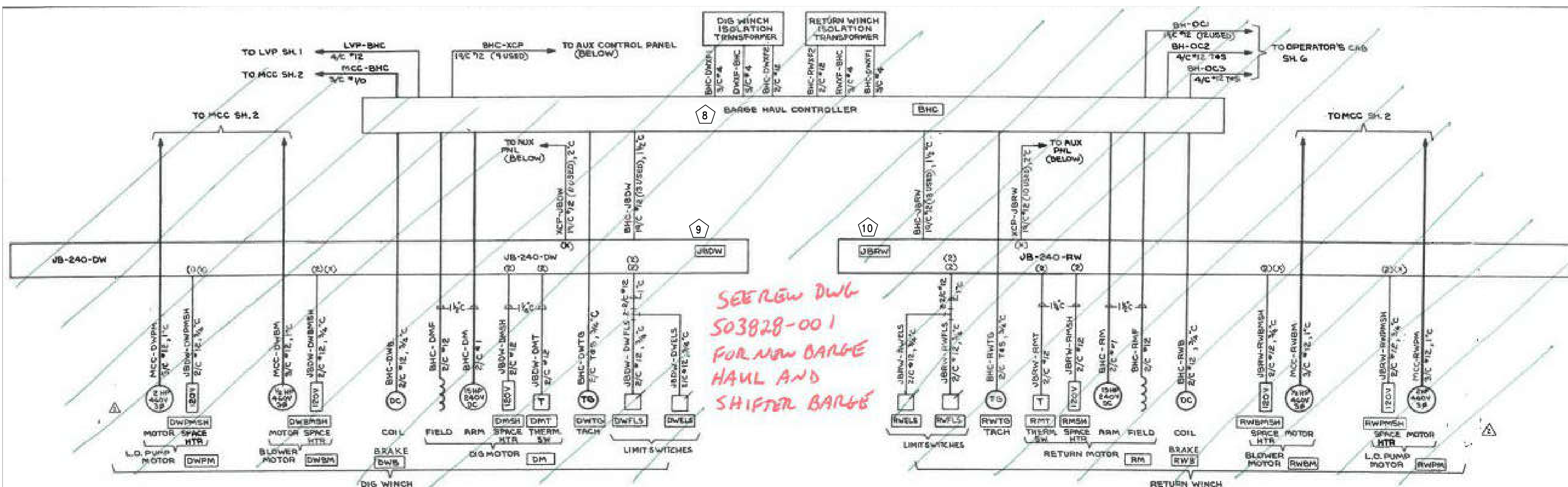
ENLARGED SECTION SHT.2 (DWG 348282)
SCALE: N.T.S.

DEMOLITION NOTES - SHT.2 (DWG 348282)

- 1 REMOVE EXISTING FEEDER, MCC-JBCRC, FROM MCC UNIT 4D TO BU-1 CABLE REEL JUNCTION BOX. REPLACE MCC NAME PLATE WITH 'SPARE' NAMEPLATE.
- 2 REMOVE EXISTING FEEDERS, MCC-CRM1 & MCC-CRM2, FROM MCC UNIT 5D TO CABLE REEL POWER UNIT. REPLACE MCC NAME PLATE WITH 'SPARE' NAMEPLATE.
- 3 REMOVE EXISTING FEEDERS, MCC-DWPM, FROM MCC UNIT 1B TO DIG WINCH. REPLACE MCC NAME PLATE WITH 'SPARE' NAMEPLATE.
- 4 REMOVE EXISTING FEEDERS, MCC-DWBM, FROM MCC UNIT 1D TO DIG WINCH. REPLACE MCC NAME PLATE WITH 'SPARE' NAMEPLATE.
- 5 REMOVE EXISTING FEEDERS, MCC-RWPM, FROM MCC UNIT 1C TO RETURN WINCH. REPLACE MCC NAME PLATE WITH 'SPARE' NAMEPLATE.
- 6 REMOVE EXISTING FEEDERS, MCC-RWBM, FROM MCC UNIT 1E TO RETURN WINCH. REPLACE MCC NAME PLATE WITH 'SPARE' NAMEPLATE.
- 7 REMOVE EXISTING FEEDERS, MCC-BHC, FROM MCC UNIT 3A TO BARGE HAUL CONTROLLER. MCC NAME PLATE TO REMAIN.

ELECTRICAL NOTES:

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4. CONTRACTOR SHALL WORK THIS DEMOLITION DRAWING WITH THE RICHMOND ENGINEERING WORKS (REW) DEMOLITION AND INSTALLATION CONTRACT DRAWING PACKAGES. CONTRACTOR SHALL NOTIFY THE ENGINEERS OF ANY DISCREPANCY IN DEMOLITION/INSTALLATION DRAWING PACKAGES AND EQUIPMENT/DEVICE INSTALLED IN THE FIELD.



DEMOLITION NOTES - SHT.3 (DWG 348283)

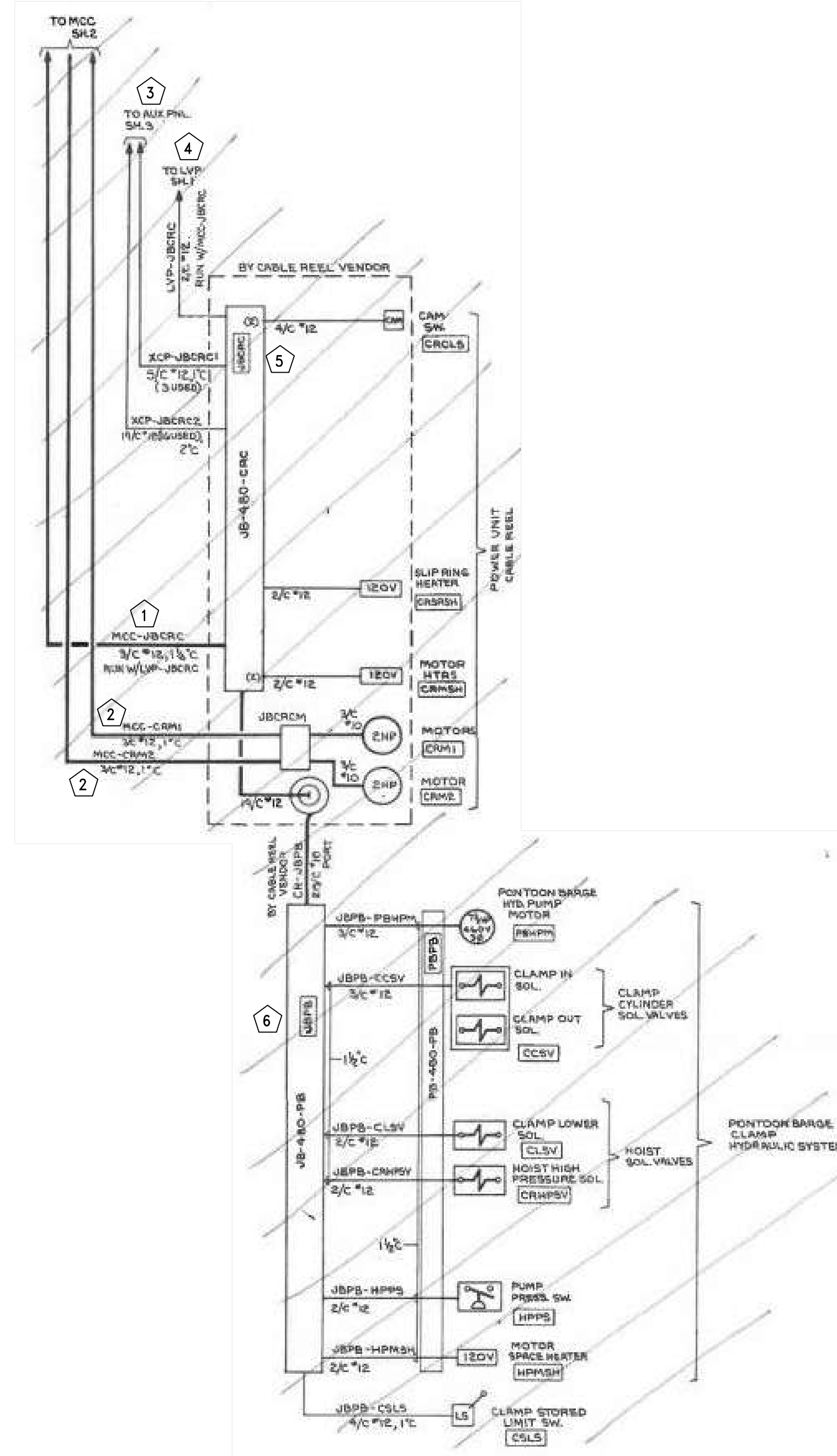
- 8 REMOVE EXISTING BARGE HAUL CONTROLLER, DIG/RETURN WINCH ISOLATION TRANSFORMERS AND ALL ASSOCIATED DEVICE, CONDUCTORS AND CONDUIT.
- 9 REMOVE EXISTING BARGE HAUL DIG WINCH JUNCTION BOX 'JBDW' AND ALL ASSOCIATED DEVICE, CONDUCTORS AND CONDUIT.
- 10 REMOVE EXISTING BARGE HAUL RETURN WINCH JUNCTION BOX 'JBRW' AND ALL ASSOCIATED DEVICE, CONDUCTORS AND CONDUIT.

ENLARGED SECTION SHT.3 (DWG 348283)

SCALE: N.T.S.

SEQUENCE NOTES:

ALL WORK SHALL BE PERFORMED ON BARGE UNLOADER #3 (BUS) IN PHASE I OF THE WORK. DEMOLITION WORK ASSOCIATED WITH BARGE UNLOADER #1 (BU1) SHALL NOT BEGIN UNTIL BU3 HAS BEEN COMPLETED, COMMISSIONED AND FULLY OPERATIONAL.



ENLARGED SECTION SHT.5 (DWG 348285)

SCALE: N.T.S.

DEMOLITION NOTES - SHT.5 (DWG 348285)

- 1 REMOVE EXISTING FEEDER, MCC-JBCRC, FROM MCC UNIT 4D TO BU-1 CABLE REEL JUNCTION BOX.
- 2 REMOVE EXISTING FEEDERS, MCC-CRM1 & MCC-CRM2, FROM MCC UNIT 5D TO CABLE REEL POWER UNIT.
- 3 REMOVE EXISTING CONTROL CONDUCTORS, XCP-JBCRC1 & XCP-JBCRC2, FROM AUXILIARY CONTROL PANEL 'XCP' TO JUNCTION BOX 'JBCPC'.
- 4 REMOVE EXISTING LOW VOLTAGE POWER 'LVP-JBCRC' FROM LOW VOLTAGE DISTRIBUTION PANELBOARD 'ACB' TO JUNCTION BOX 'JBCPC'.
- 5 REMOVE EXISTING JUNCTION BOX 'JBCPC' AND ALL ASSOCIATED DEVICES, CONDUCTORS AND CONDUIT.
- 6 REMOVE EXISTING JUNCTION BOX 'JBPB' AND ALL ASSOCIATED DEVICES, CONDUCTORS AND CONDUIT.

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A	ISSUED FOR BID	01/29/24	RCC	JJM

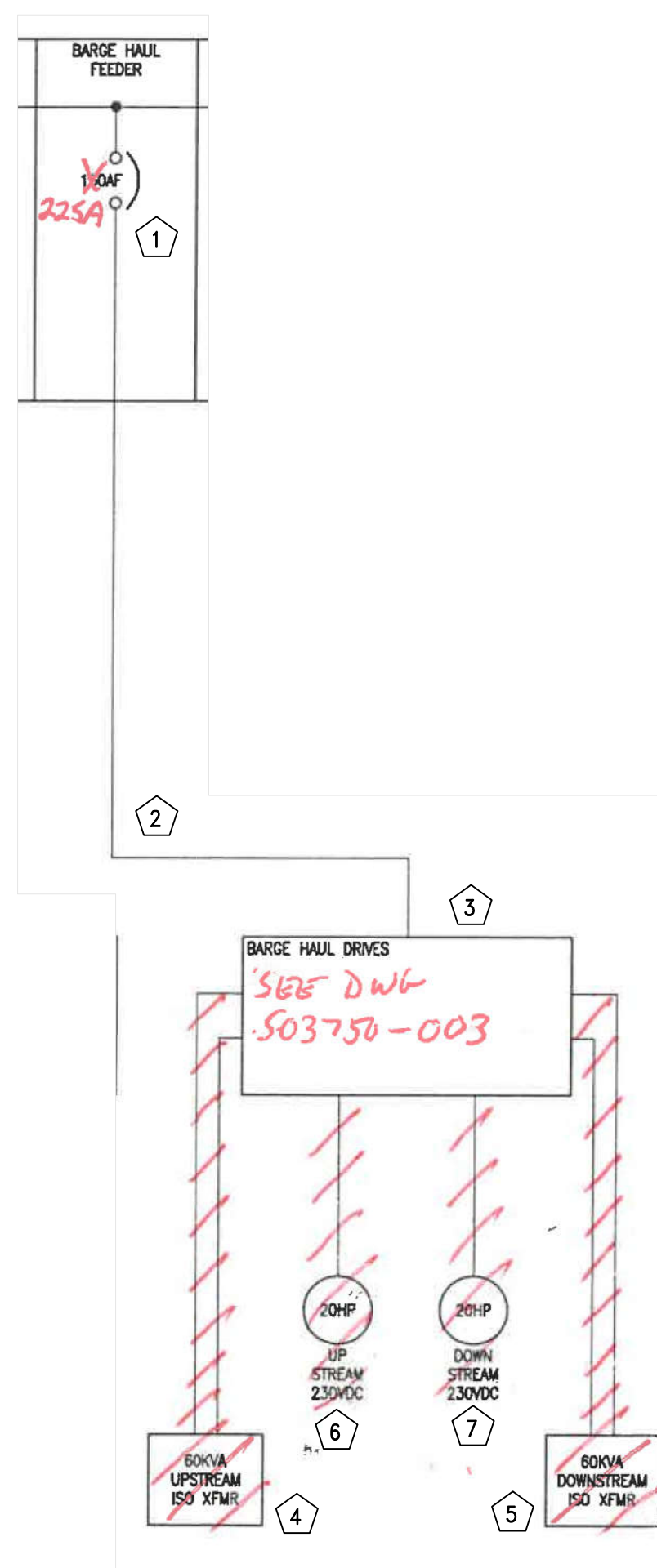
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PROJECT
**DUAL BARGE SHIFTER AND
BARGE HAUL MARINE CONSTRUCTION**
**McDUFFIE COAL TERMINAL
MOBILE, ALABAMA**

TITLE BU-1 BARGE HAUL/ SHIFTER DEMOLITION PLAN				
SCALE AS NOTED	DRAWN BY RCC	DATE 01/22/24	SHEET — OF —	22x34 REV. A
JOB NO. 4224E	CHECKED BY JJM	DATE 01/22/24	DRAWING NUMBER 4224E-E2	



ENLARGED SECTION DWG S03750-001

SCALE: N.T.S.

DEMOLITION NOTES - SHT.5 (DWG 348285)

- 1 REPLACE EXISTING 150A CIRCUIT BREAKER WITH NEW 225A CIRCUIT BREAKER.
- 2 REMOVE EXISTING FEEDER TO BARGE HAUL DRIVES.
- 3 REMOVE EXISTING BARGE HAUL DRIVES.
- 4 REMOVE EXISTING 60kVA UPSTREAM ISO XFMR AND ASSOCIATED CONDUCTOR, CONDUITS AND SUPPORTS.
- 5 REMOVE EXISTING 60kVA DOWNSTREAM ISO XFMR AND ASSOCIATED CONDUCTOR, CONDUITS AND SUPPORTS.
- 6 REMOVE EXISTING UPSTREAM 20HP DC MOTOR AND ASSOCIATED CONDUCTOR, CONDUITS AND SUPPORTS.
- 7 REMOVE EXISTING DOWNSTREAM 20HP DC MOTOR AND ASSOCIATED CONDUCTOR, CONDUITS AND SUPPORTS.

SEQUENCE NOTES:

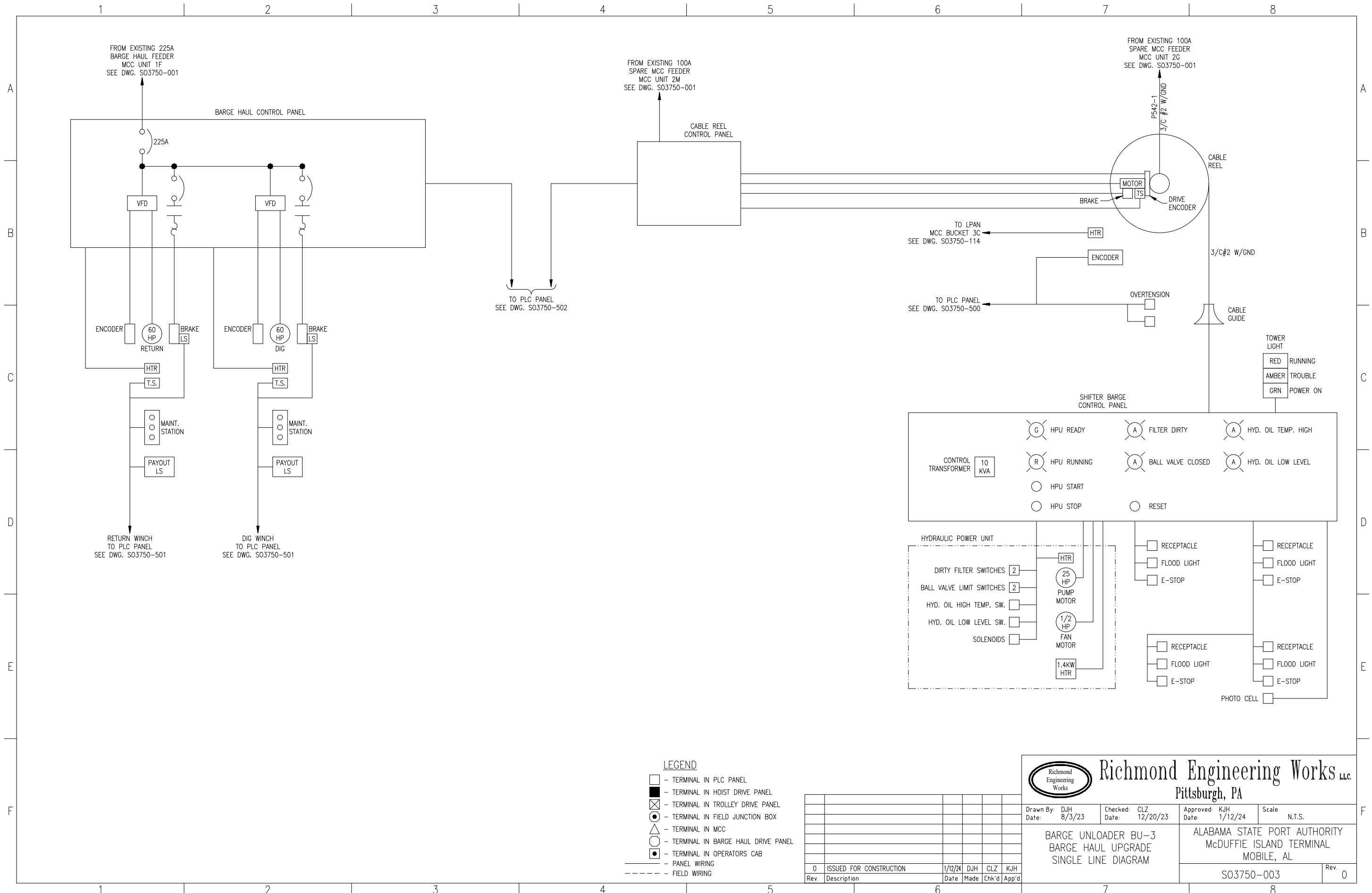
ALL WORK SHALL BE PERFORMED ON BARGE UNLOADER #3 (BU3) IN PHASE I OF THE WORK. DEMOLITION WORK ASSOCIATED WITH BARGE UNLOADER #1 (BU1) SHALL NOT BEGIN UNTIL BU3 HAS BEEN COMPLETED, COMMISSIONED AND FULLY OPERATIONAL.

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SCALE	AS NOTED	DRAWN BY	RCC	DATE	01/22/24	SHEET	22x34	REV.	A
JOB NO.	4224E	CHECKED BY	JJM	DATE	01/22/24	DRAWING NUMBER	4224E-E3		
REV.	DESCRIPTION	DATE	BY	CHK'D					
A	ISSUED FOR BID	01/29/24	RCC	JJM					

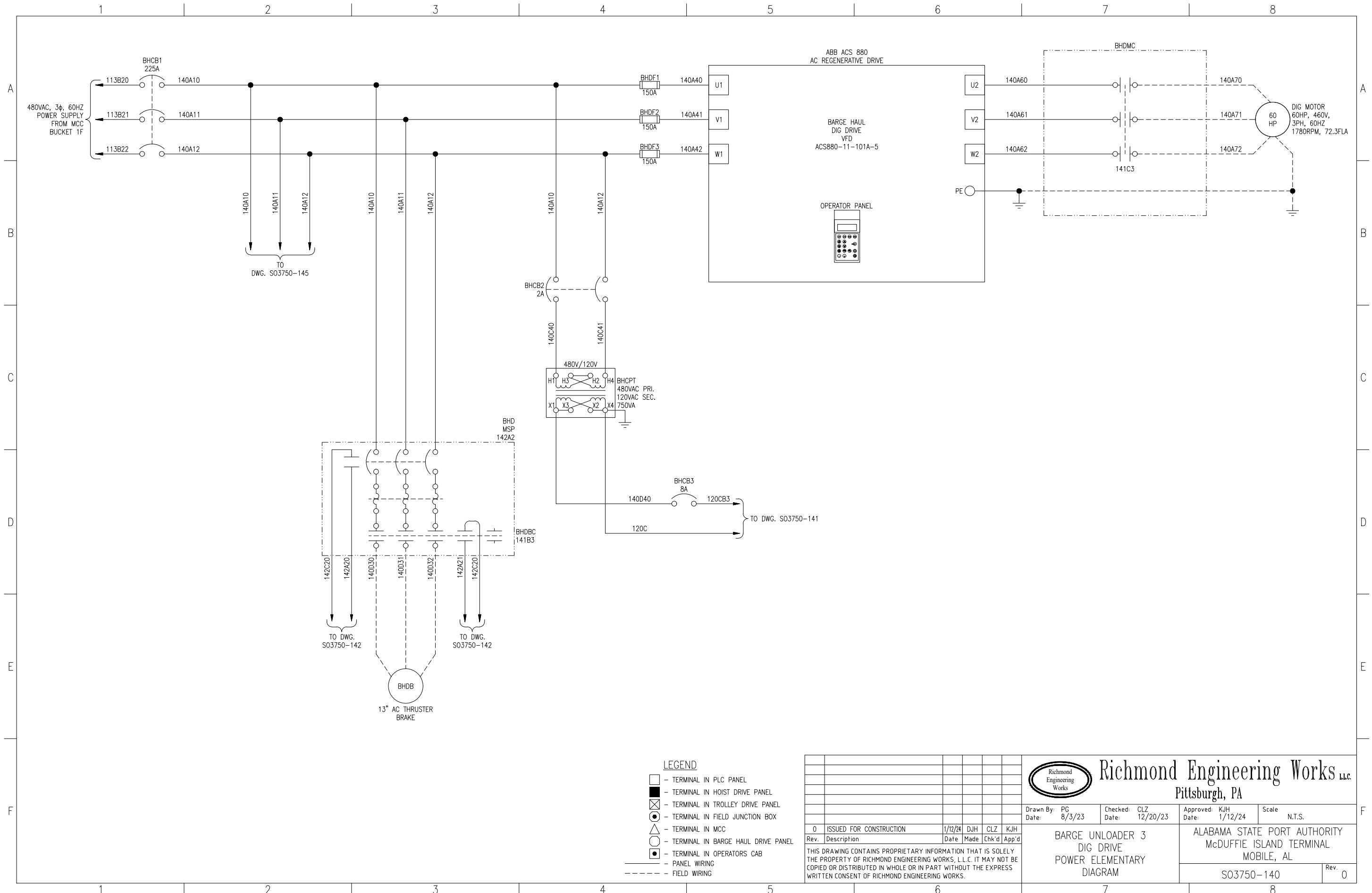


- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - ◐ - TERMINAL IN OPERATORS CAB
 - - - - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	DJH	CLZ	KJH

Richmond Engineering Works LLC.
 Pittsburgh, PA


Drawn By: DJH Date: 8/3/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
BARGE UNLOADER BU-3 BARGE HAUL UPGRADE SINGLE LINE DIAGRAM		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-003			Rev. 0



- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ▣ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - ⊙ - TERMINAL IN OPERATORS CAB
 - - - - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	DJH	CLZ	KJH

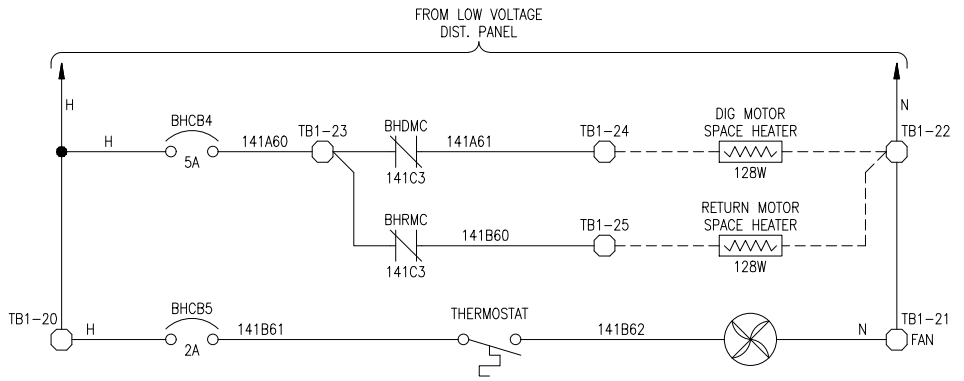
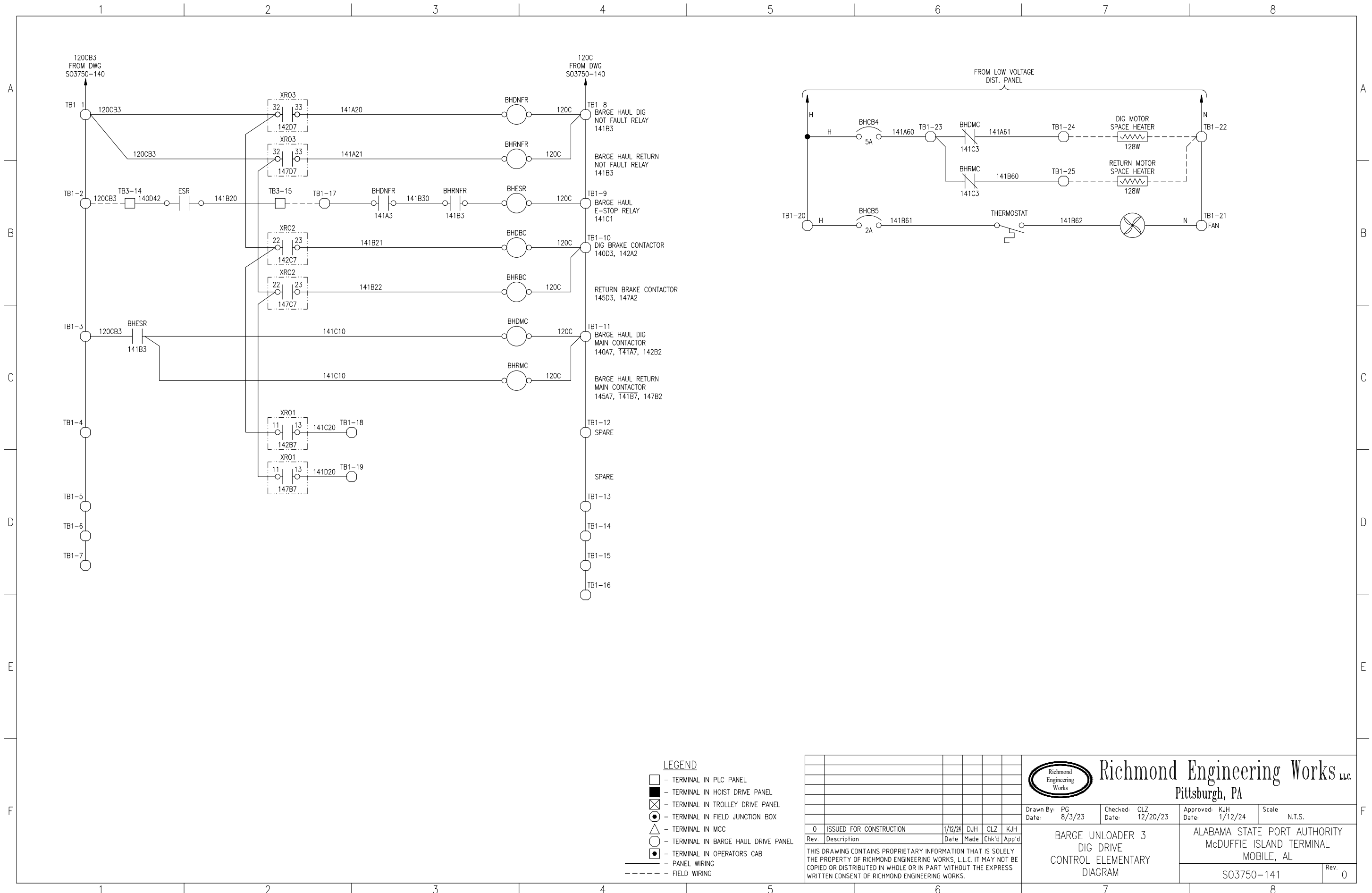
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Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: PG Date: 8/3/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
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BARGE UNLOADER 3 DIG DRIVE POWER ELEMENTARY DIAGRAM	ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL
S03750-140	Rev. 0



- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - ⊙ - TERMINAL IN OPERATORS CAB
 - - - - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	DJH	CLZ	KJH

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Pittsburgh, PA

Drawn By: PG Date: 8/3/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
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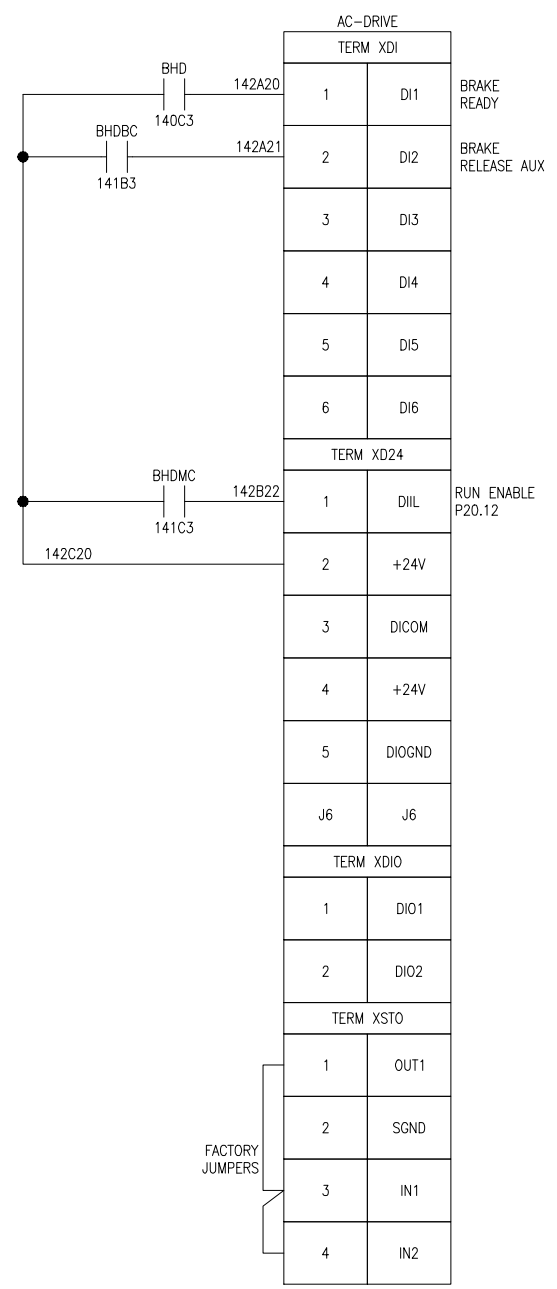
**BARGE UNLOADER 3
DIG DRIVE
CONTROL ELEMENTARY
DIAGRAM**

ALABAMA STATE PORT AUTHORITY
McDUFFIE ISLAND TERMINAL
MOBILE, AL

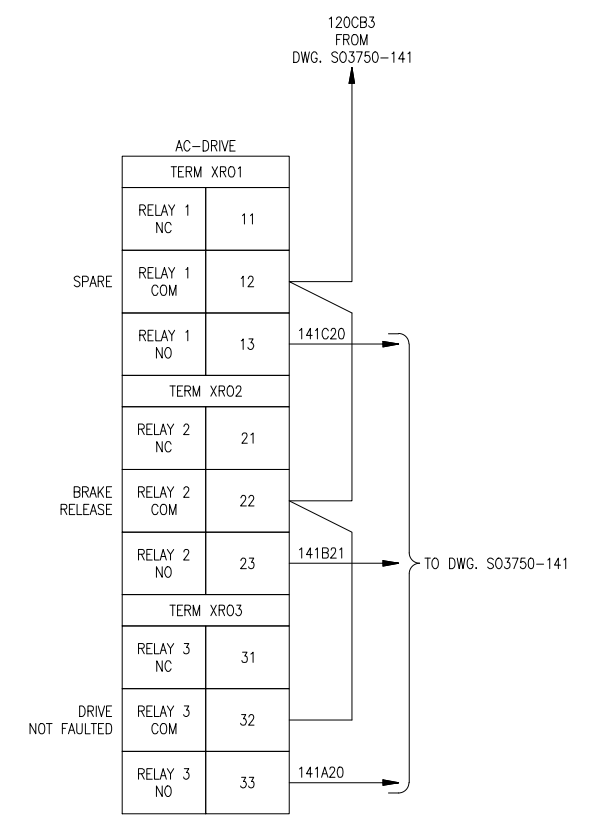
S03750-141
Rev. 0

1 2 3 4 5 6 7 8

A
B
C
D
E
F



AC-DRIVE	
TERM XPOW	
1	+24VI
2	GND
TERM XAI	
1	+VREF
2	-VERF
3	AGND
4	AI1+
5	AI1-
6	AI2+
7	AI2-
J1	J1
J2	J2
TERM XAO	
1	A01
2	AGND
3	A02
4	AGND
TERM XD2D	
1	B
2	A
3	BGND
J3	J3



- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - ⦿ - TERMINAL IN OPERATORS CAB
 - - PANEL WIRING
 - - - - - FIELD WIRING

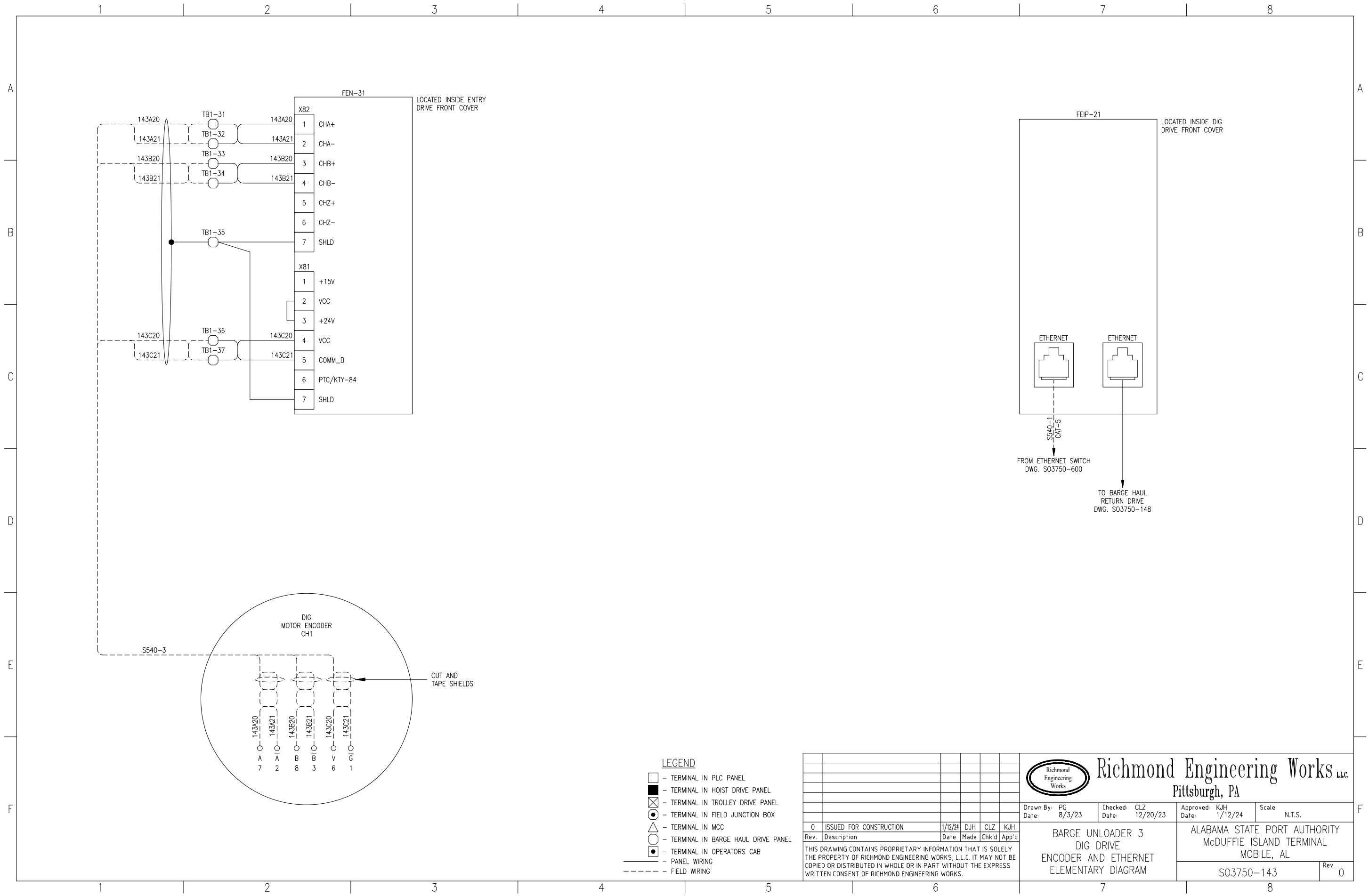
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Pittsburgh, PA

Drawn By: PG Date: 8/3/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
BARGE UNLOADER 3 DIG DRIVE CONTROL ELEMENTARY DIAGRAM		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-142			Rev. 0

1 2 3 4 5 6 7 8



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Pittsburgh, PA

Drawn By: PG
Date: 8/3/23

Checked: CLZ
Date: 12/20/23

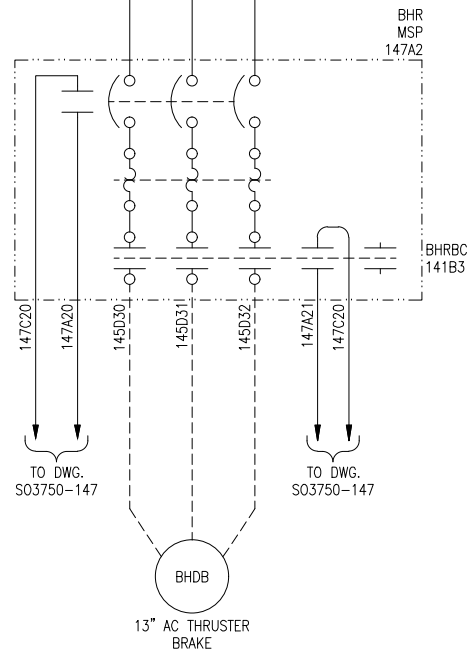
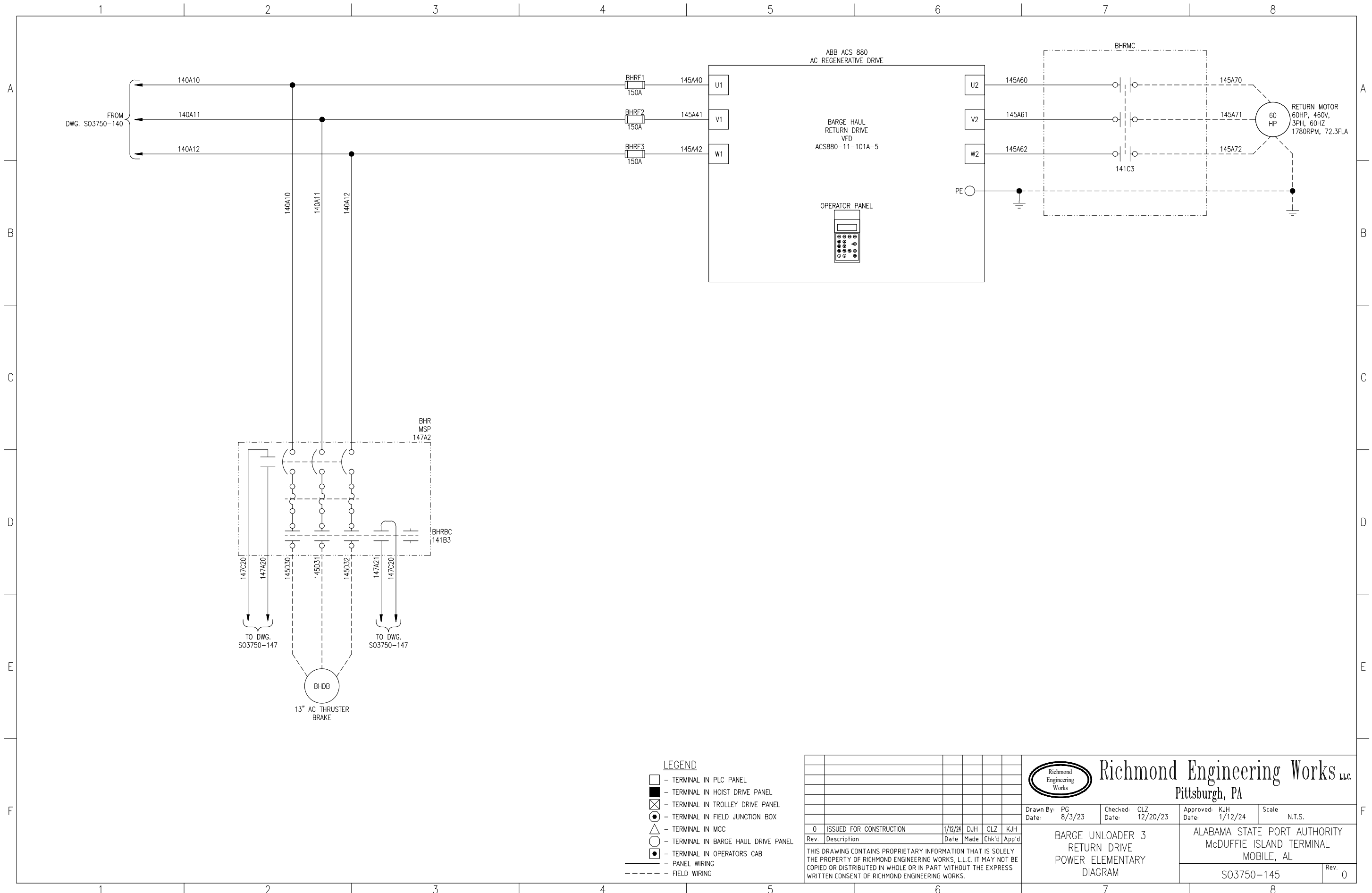
Approved: KJH
Date: 1/12/24

Scale: N.T.S.

**BARGE UNLOADER 3
DIG DRIVE
ENCODER AND ETHERNET
ELEMENTARY DIAGRAM**

ALABAMA STATE PORT AUTHORITY
McDUFFIE ISLAND TERMINAL
MOBILE, AL


S03750-143 Rev. 0



- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - - TERMINAL IN OPERATORS CAB
 - - - - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	DJH	CLZ	KJH

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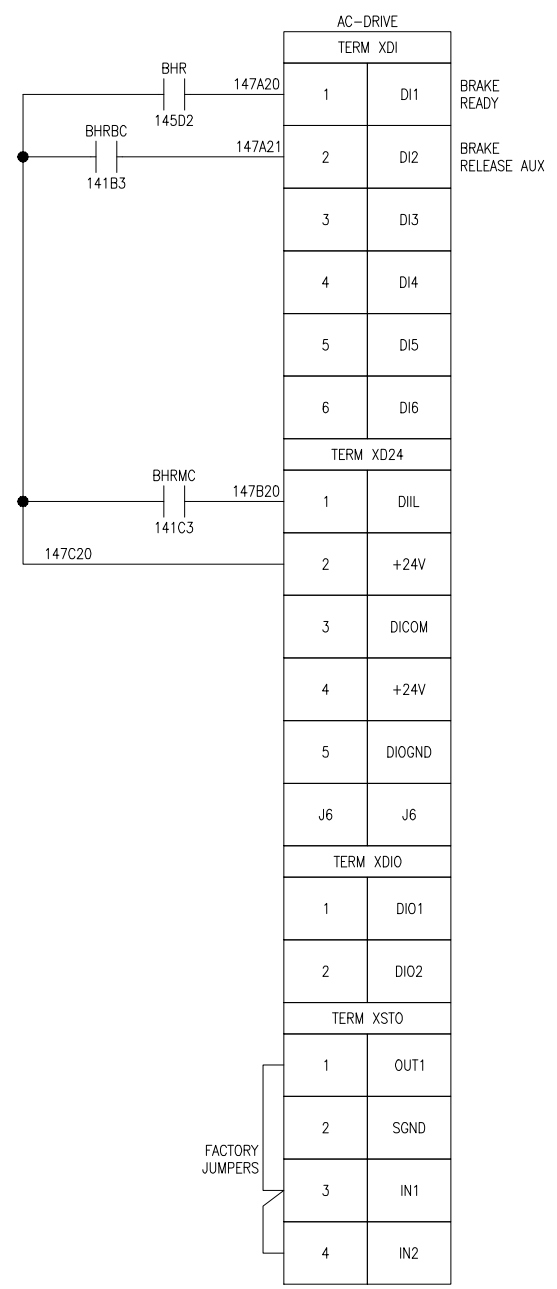
Richmond Engineering Works LLC.
Pittsburgh, PA

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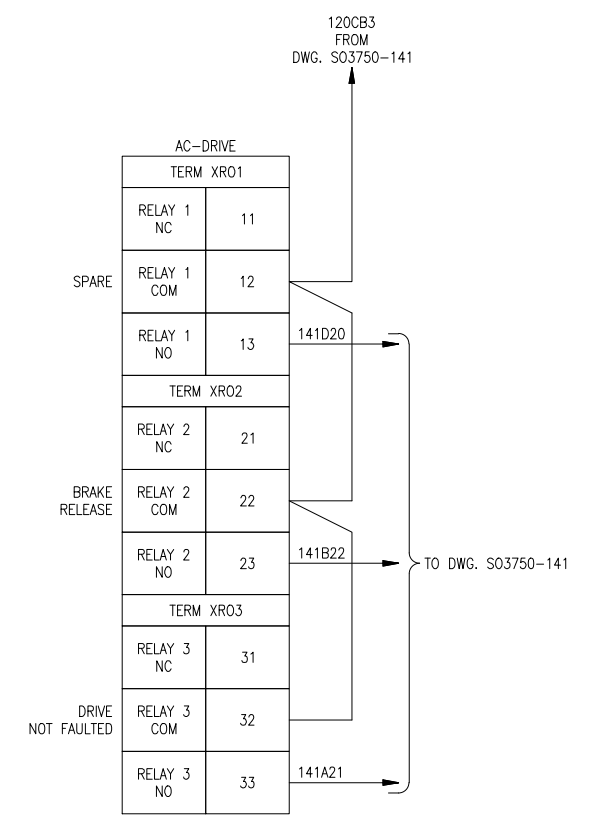
BARGE UNLOADER 3 RETURN DRIVE POWER ELEMENTARY DIAGRAM	ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL
S03750-145	Rev. 0

1 2 3 4 5 6 7 8

A
B
C
D
E
F



AC-DRIVE	
TERM XPOW	
1	+24VI
2	GND
TERM XAI	
1	+VREF
2	-VERF
3	AGND
4	AI1+
5	AI1-
6	AI2+
7	AI2-
J1	J1
J2	J2
TERM XAO	
1	A01
2	AGND
3	A02
4	AGND
TERM XD2D	
1	B
2	A
3	BGND
J3	J3



- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - ⦿ - TERMINAL IN OPERATORS CAB
 - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	DJH	CLZ	KJH

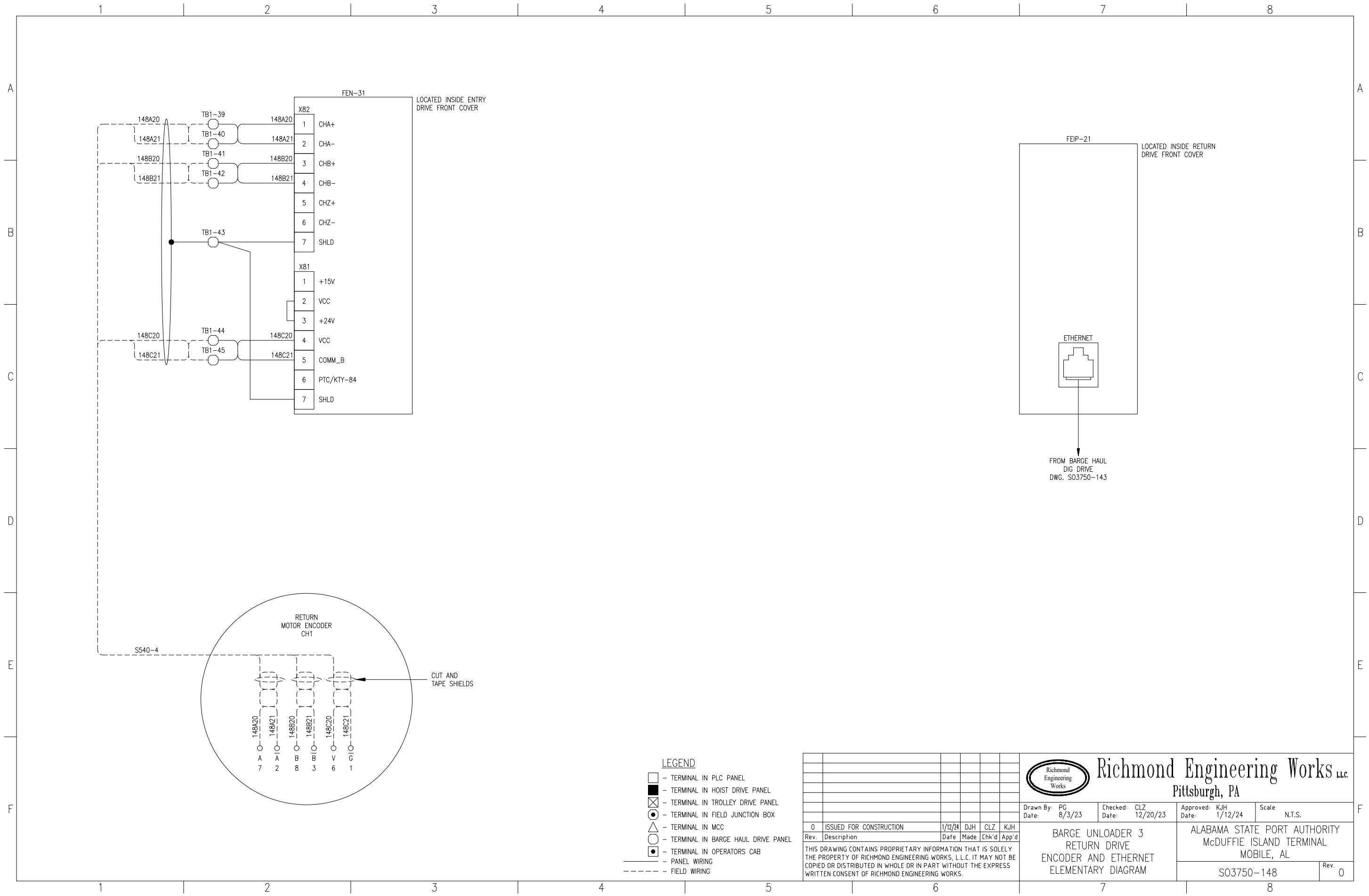
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BARGE UNLOADER 3 RETURN DRIVE CONTROL ELEMENTARY DIAGRAM	ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL
S03750-147	Rev. 0

1 2 3 4 5 6 7 8



1 2 3 4 5 6 7 8

A A

B B

C C

D D

E E

F F

1 2 3 4 5 6 7 8

FEN-31
LOCATED INSIDE ENTRY
DRIVE FRONT COVER

FEIP-21
LOCATED INSIDE RETURN
DRIVE FRONT COVER

RETURN
MOTOR ENCODER
CH1


CUT AND
TAPE SHIELDS

FROM BARGE HAUL
DIG DRIVE
DWG. S03750-143

- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - ◐ - TERMINAL IN OPERATORS CAB
 - - PANEL WIRING
 - - - - - FIELD WIRING

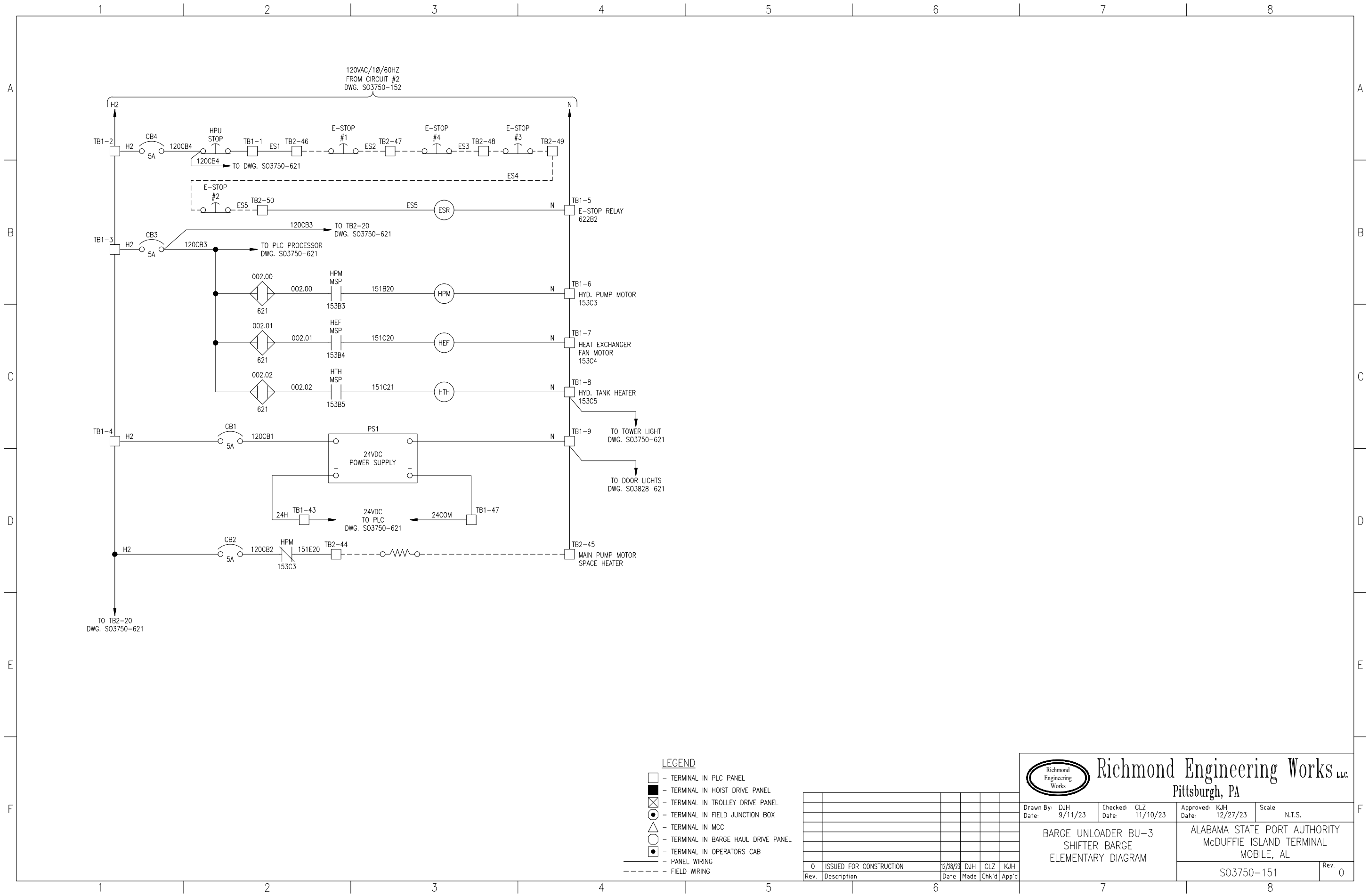
Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	DJH	CLZ	KJH

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Pittsburgh, PA

Drawn By: PG Date: 8/3/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
BARGE UNLOADER 3 RETURN DRIVE ENCODER AND ETHERNET ELEMENTARY DIAGRAM		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-148			Rev. 0



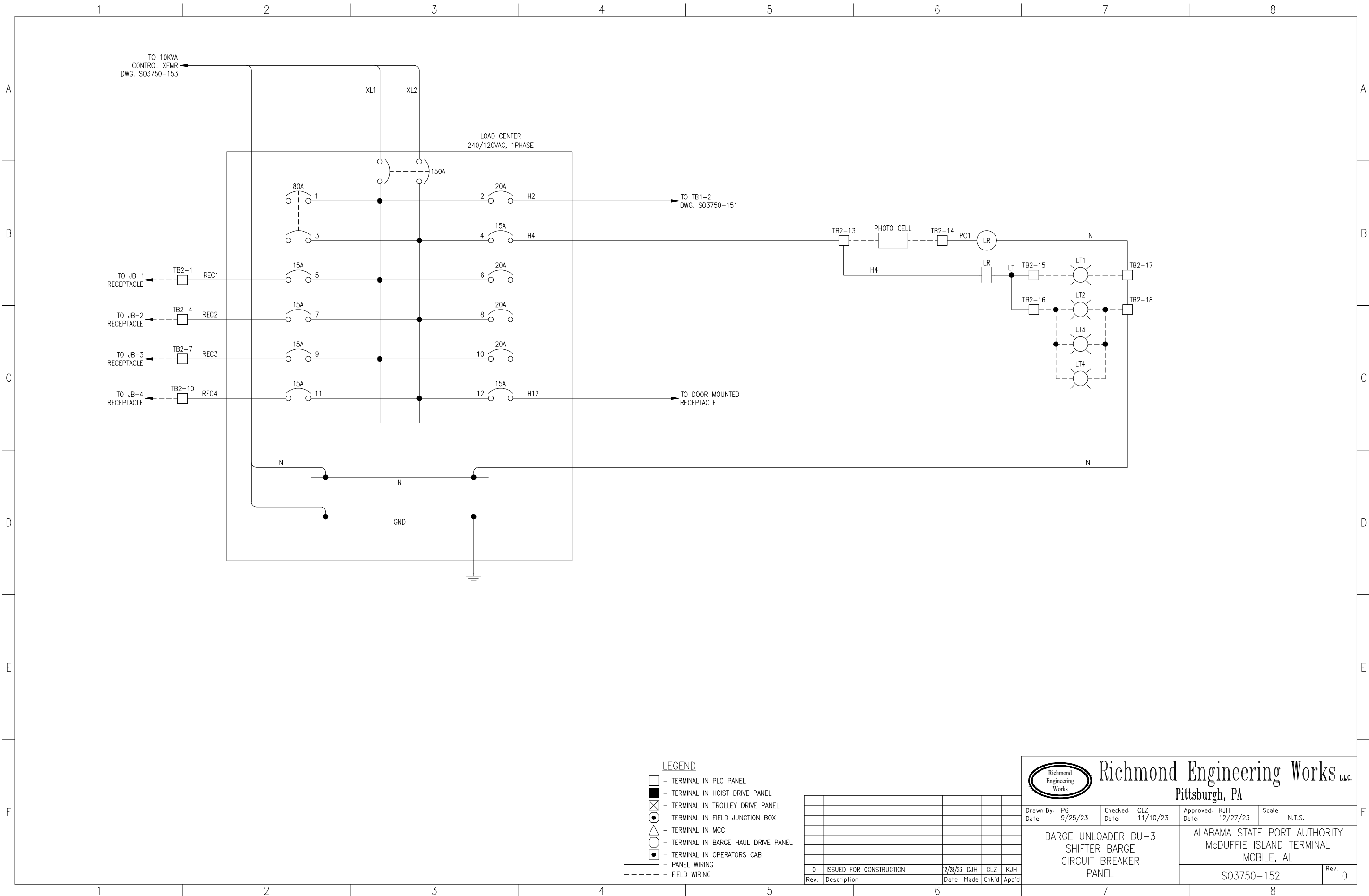
- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - ⊙ - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - - TERMINAL IN OPERATORS CAB
 - - - - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/28/23	DJH	CLZ	KJH



Richmond Engineering Works LLC.
Pittsburgh, PA


Drawn By: DJH Date: 9/11/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/27/23	Scale: N.T.S.
BARGE UNLOADER BU-3 SHIFTER BARGE ELEMENTARY DIAGRAM		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-151			Rev. 0



LEGEND

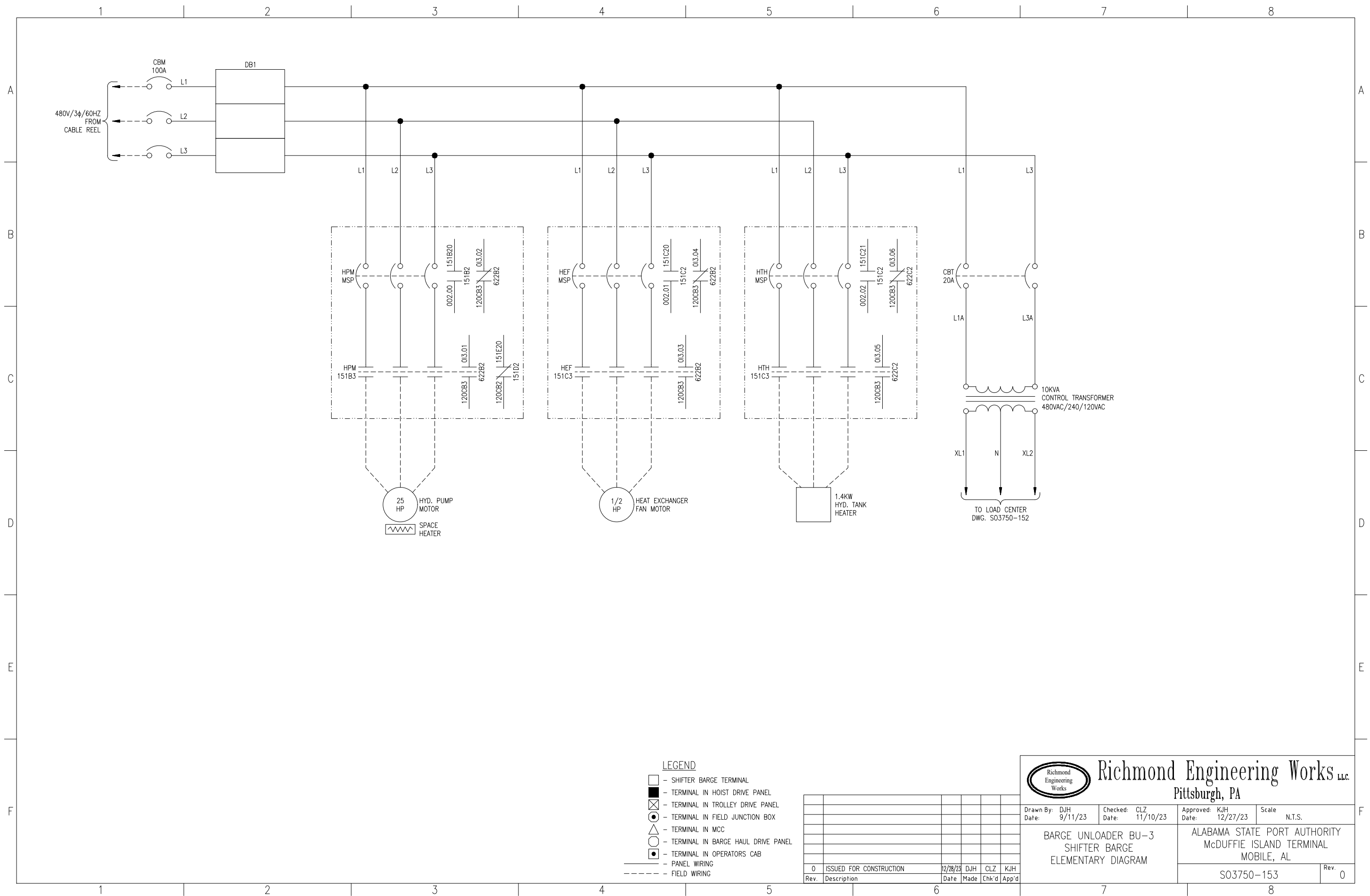
- - TERMINAL IN PLC PANEL
- - TERMINAL IN HOIST DRIVE PANEL
- ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
- - TERMINAL IN FIELD JUNCTION BOX
- △ - TERMINAL IN MCC
- - TERMINAL IN BARGE HAUL DRIVE PANEL
- ◐ - TERMINAL IN OPERATORS CAB
- - PANEL WIRING
- - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/28/23	DJH	CLZ	KJH




Richmond Engineering Works LLC.
Pittsburgh, PA

Drawn By: PG Date: 9/25/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/27/23	Scale: N.T.S.
BARGE UNLOADER BU-3 SHIFTER BARGE CIRCUIT BREAKER PANEL		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-152			Rev. 0



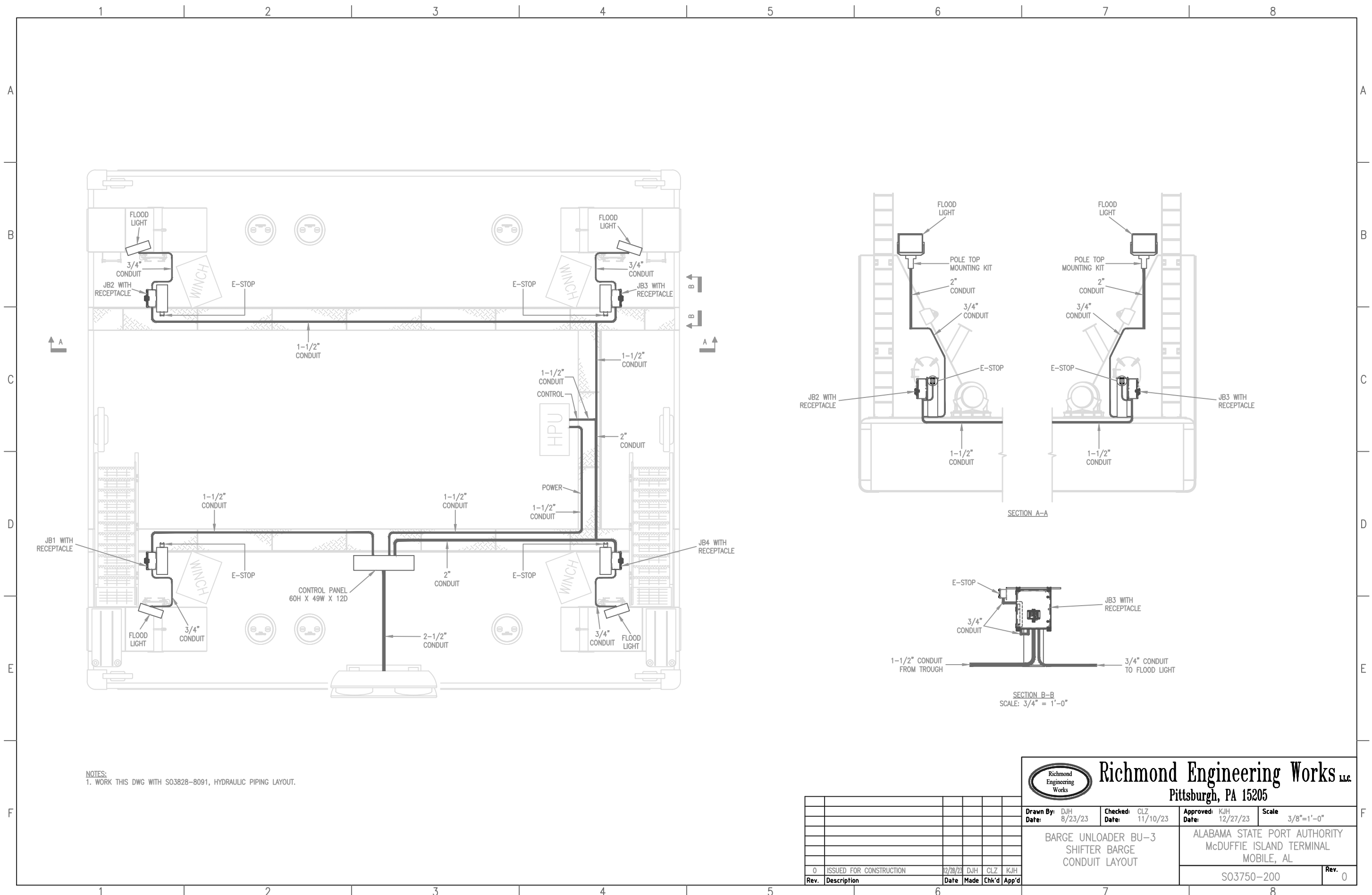
- LEGEND**
- - SHIFTER BARGE TERMINAL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - ◐ - TERMINAL IN OPERATORS CAB
 - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/28/23	DJH	CLZ	KJH



Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: DJH Date: 9/11/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/27/23	Scale: N.T.S.
BARGE UNLOADER BU-3 SHIFTER BARGE ELEMENTARY DIAGRAM		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-153			Rev. 0

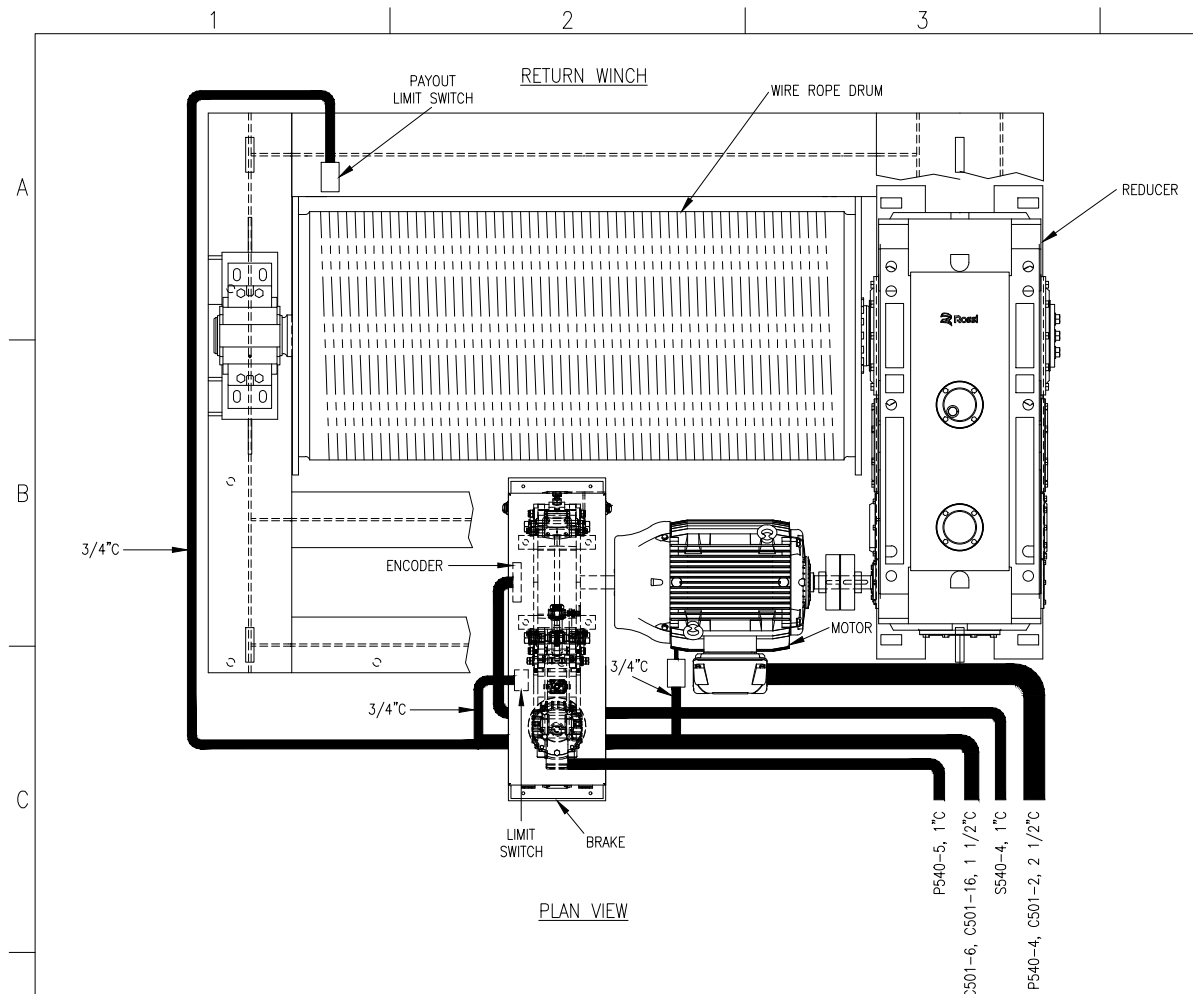


NOTES:
1. WORK THIS DWG WITH S03828-8091, HYDRAULIC PIPING LAYOUT.

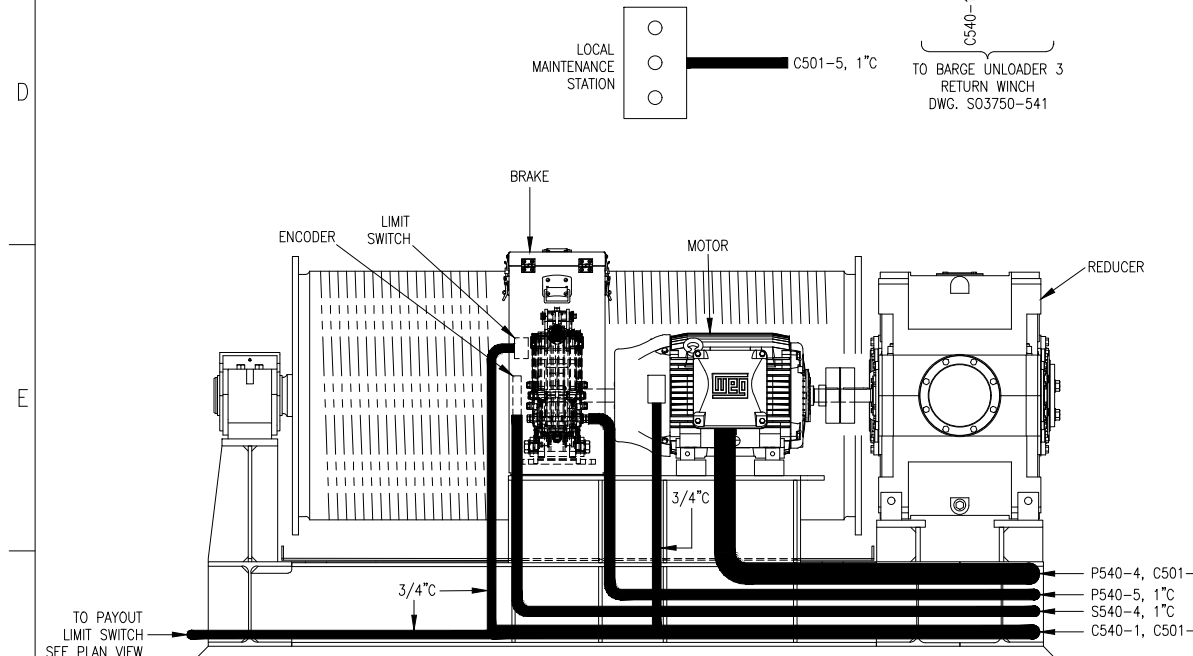

Richmond Engineering Works LLC
 Pittsburgh, PA 15205

Drawn By: DJH Date: 8/23/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/27/23	Scale: 3/8"=1'-0"
BARGE UNLOADER BU-3 SHIFTER BARGE CONDUIT LAYOUT		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-200			Rev. 0

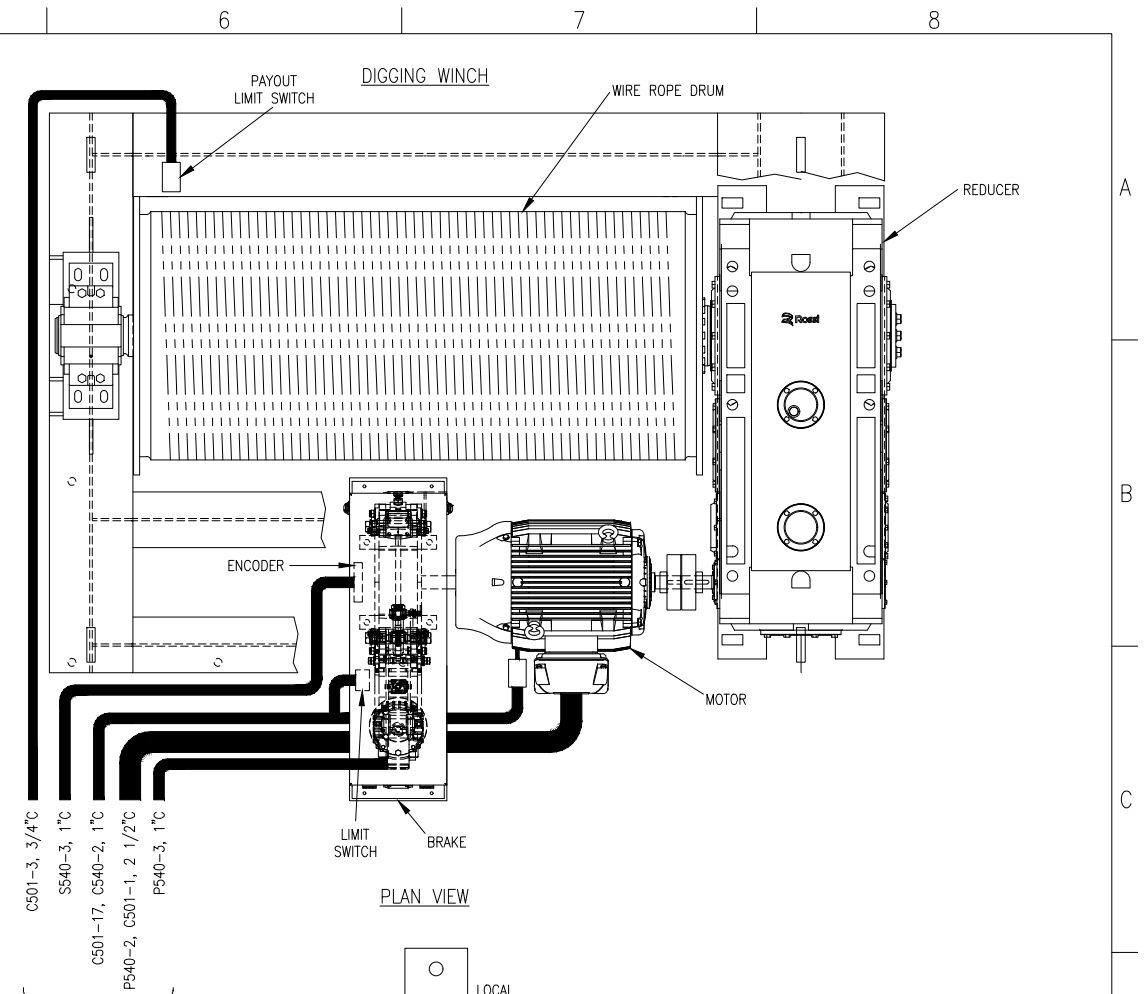
Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/28/23	DJH	CLZ	KJH



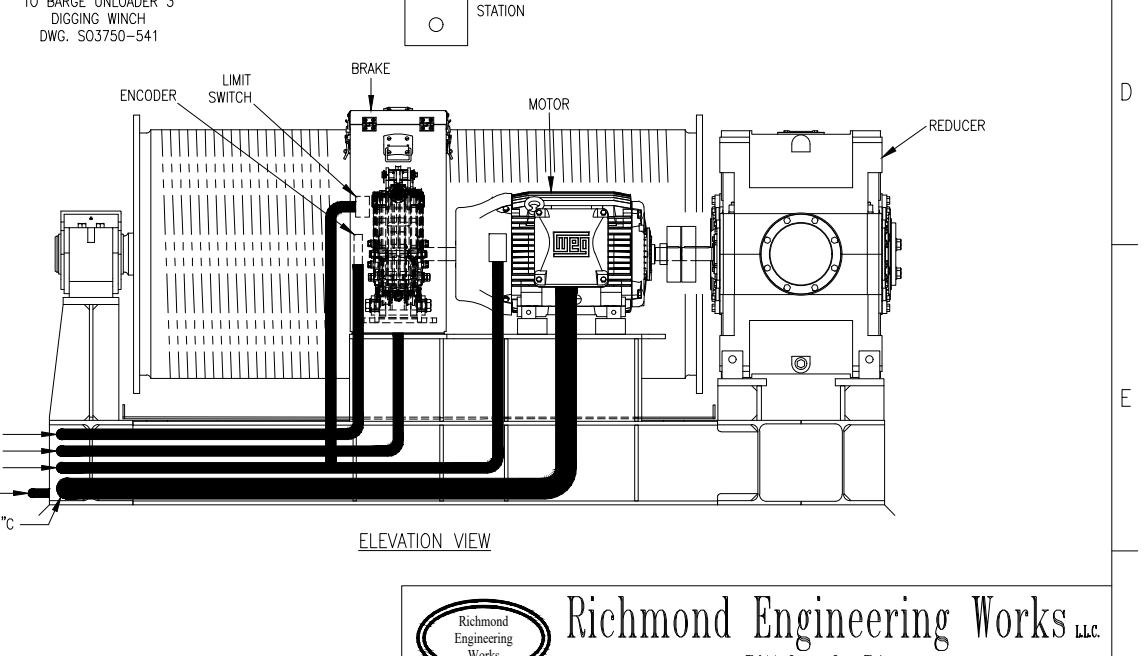
PLAN VIEW



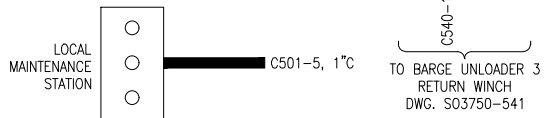
ELEVATION VIEW



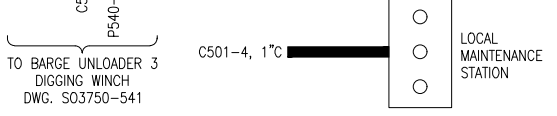
PLAN VIEW



ELEVATION VIEW



TO BARGE UNLOADER 3
RETURN WINCH
DWG. S03750-541



TO BARGE UNLOADER 3
DIGGING WINCH
DWG. S03750-541

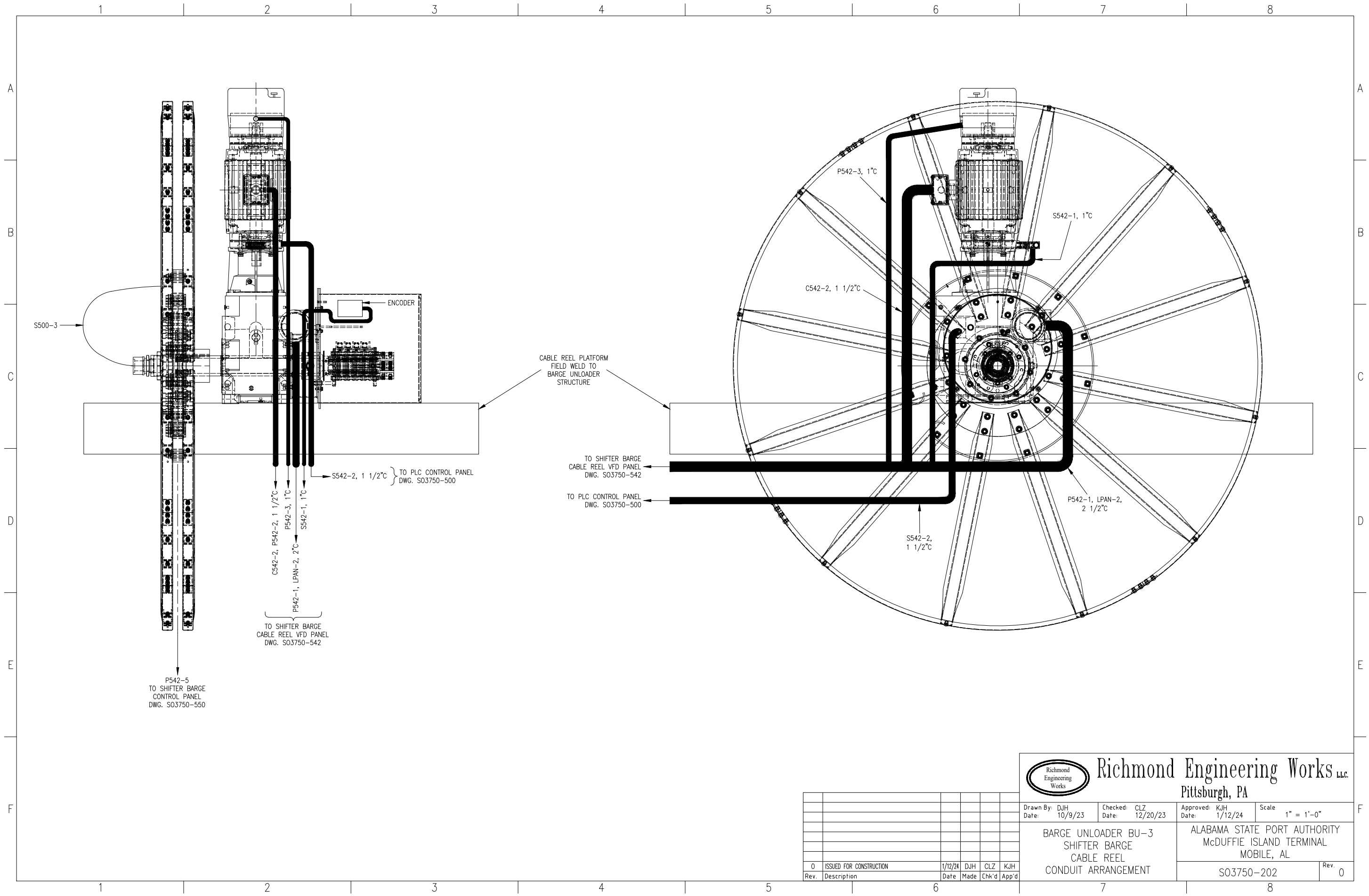
TO BARGE UNLOADER 3
DIGGING WINCH
DWG. S03750-541


TO BARGE UNLOADER 3
RETURN WINCH
DWG. S03750-541


Richmond Engineering Works LLC.
 Pittsburgh, PA

Drawn By: DJH Date: 10/9/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: 1" = 1'-0"
BARGE UNLOADER BU-3 BARGE HAUL WINCH CONDUIT ARRANGEMENT		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-201			Rev. 0

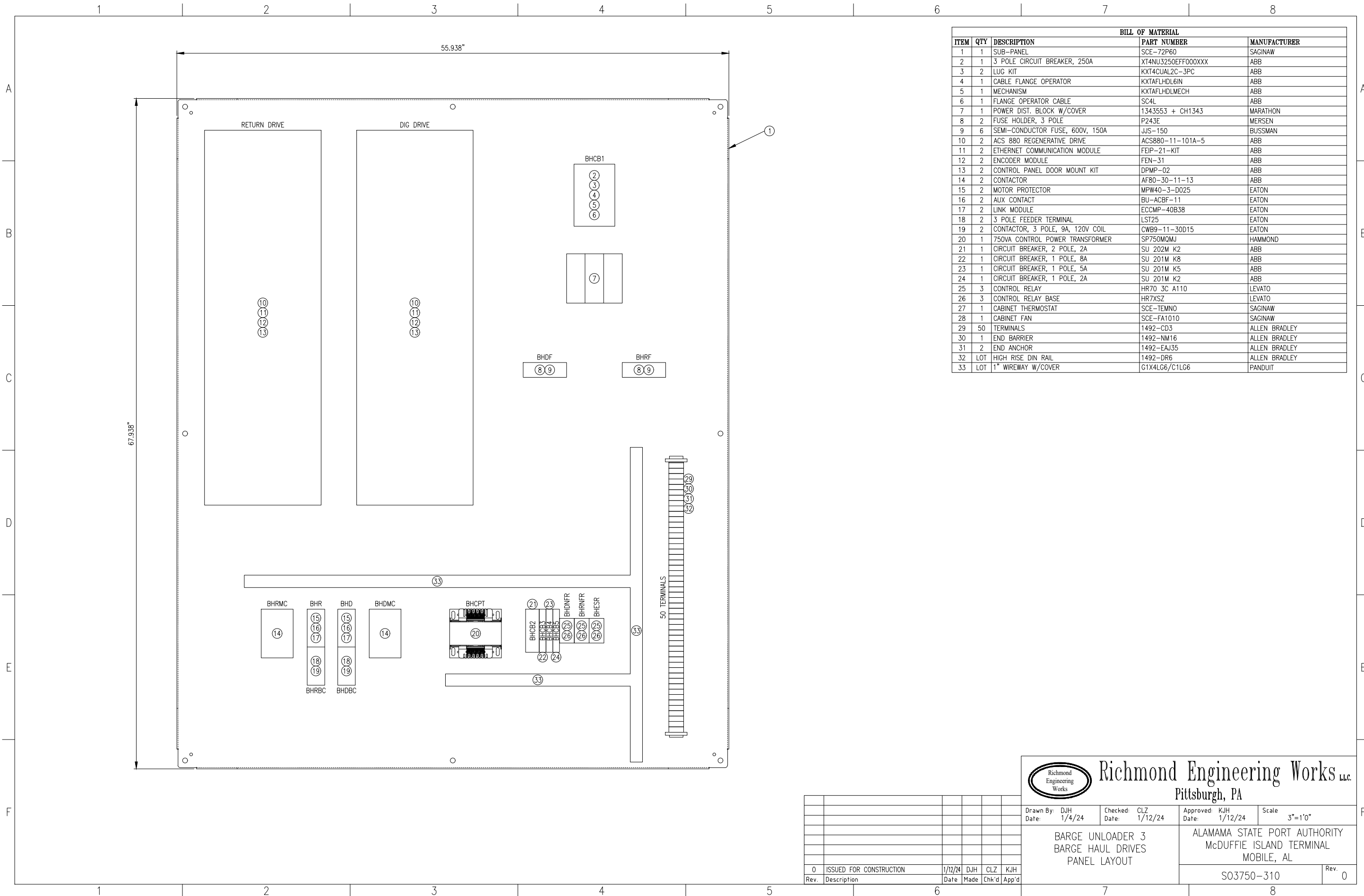
Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	DJH	CLZ	KJH





Richmond Engineering Works LLC.
 Pittsburgh, PA

Drawn By: DJH Date: 10/9/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: 1" = 1'-0"
BARGE UNLOADER BU-3 SHIFTER BARGE CABLE REEL CONDUIT ARRANGEMENT		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-202		Rev. 0	

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	DJH	CLZ	KJH



BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	PART NUMBER	MANUFACTURER
1	1	SUB-PANEL	SCE-72P60	SAGINAW
2	1	3 POLE CIRCUIT BREAKER, 250A	XT4NU3250EFF000XXX	ABB
3	2	LUG KIT	KXT4CUAL2C-3PC	ABB
4	1	CABLE FLANGE OPERATOR	KXTAFHDL6IN	ABB
5	1	MECHANISM	KXTAFHDLMECH	ABB
6	1	FLANGE OPERATOR CABLE	SC4L	ABB
7	1	POWER DIST. BLOCK W/COVER	1343553 + CH1343	MARATHON
8	2	FUSE HOLDER, 3 POLE	P243E	MERSEN
9	6	SEMI-CONDUCTOR FUSE, 600V, 150A	JJS-150	BUSSMAN
10	2	ACS 880 REGENERATIVE DRIVE	ACS880-11-101A-5	ABB
11	2	ETHERNET COMMUNICATION MODULE	FEIP-21-KIT	ABB
12	2	ENCODER MODULE	FEN-31	ABB
13	2	CONTROL PANEL DOOR MOUNT KIT	DPMP-02	ABB
14	2	CONTACTOR	AF80-30-11-13	ABB
15	2	MOTOR PROTECTOR	MPW40-3-D025	EATON
16	2	AUX CONTACT	BU-ACBF-11	EATON
17	2	LINK MODULE	ECCMP-40B38	EATON
18	2	3 POLE FEEDER TERMINAL	LST25	EATON
19	2	CONTACTOR, 3 POLE, 9A, 120V COIL	CWB9-11-30D15	EATON
20	1	750VA CONTROL POWER TRANSFORMER	SP750MQMJ	HAMMOND
21	1	CIRCUIT BREAKER, 2 POLE, 2A	SU 202M K2	ABB
22	1	CIRCUIT BREAKER, 1 POLE, 8A	SU 201M K8	ABB
23	1	CIRCUIT BREAKER, 1 POLE, 5A	SU 201M K5	ABB
24	1	CIRCUIT BREAKER, 1 POLE, 2A	SU 201M K2	ABB
25	3	CONTROL RELAY	HR70 3C A110	LEVATO
26	3	CONTROL RELAY BASE	HR7XSZ	LEVATO
27	1	CABINET THERMOSTAT	SCE-TEMNO	SAGINAW
28	1	CABINET FAN	SCE-FA1010	SAGINAW
29	50	TERMINALS	1492-CD3	ALLEN BRADLEY
30	1	END BARRIER	1492-NM16	ALLEN BRADLEY
31	2	END ANCHOR	1492-EAJ35	ALLEN BRADLEY
32	LOT	HIGH RISE DIN RAIL	1492-DR6	ALLEN BRADLEY
33	LOT	1" WIREWAY W/COVER	G1X4LG6/C1LG6	PANDUIT



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Pittsburgh, PA

Drawn By: DJH
Date: 1/4/24

Checked: CLZ
Date: 1/12/24

Approved: KJH
Date: 1/12/24

Scale: 3"=1'0"

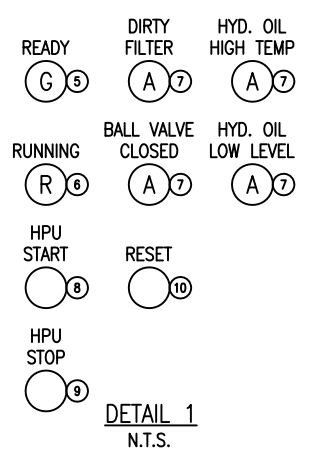
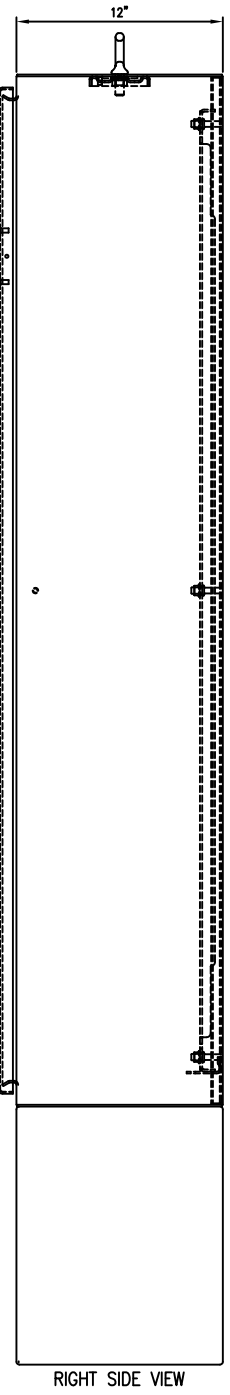
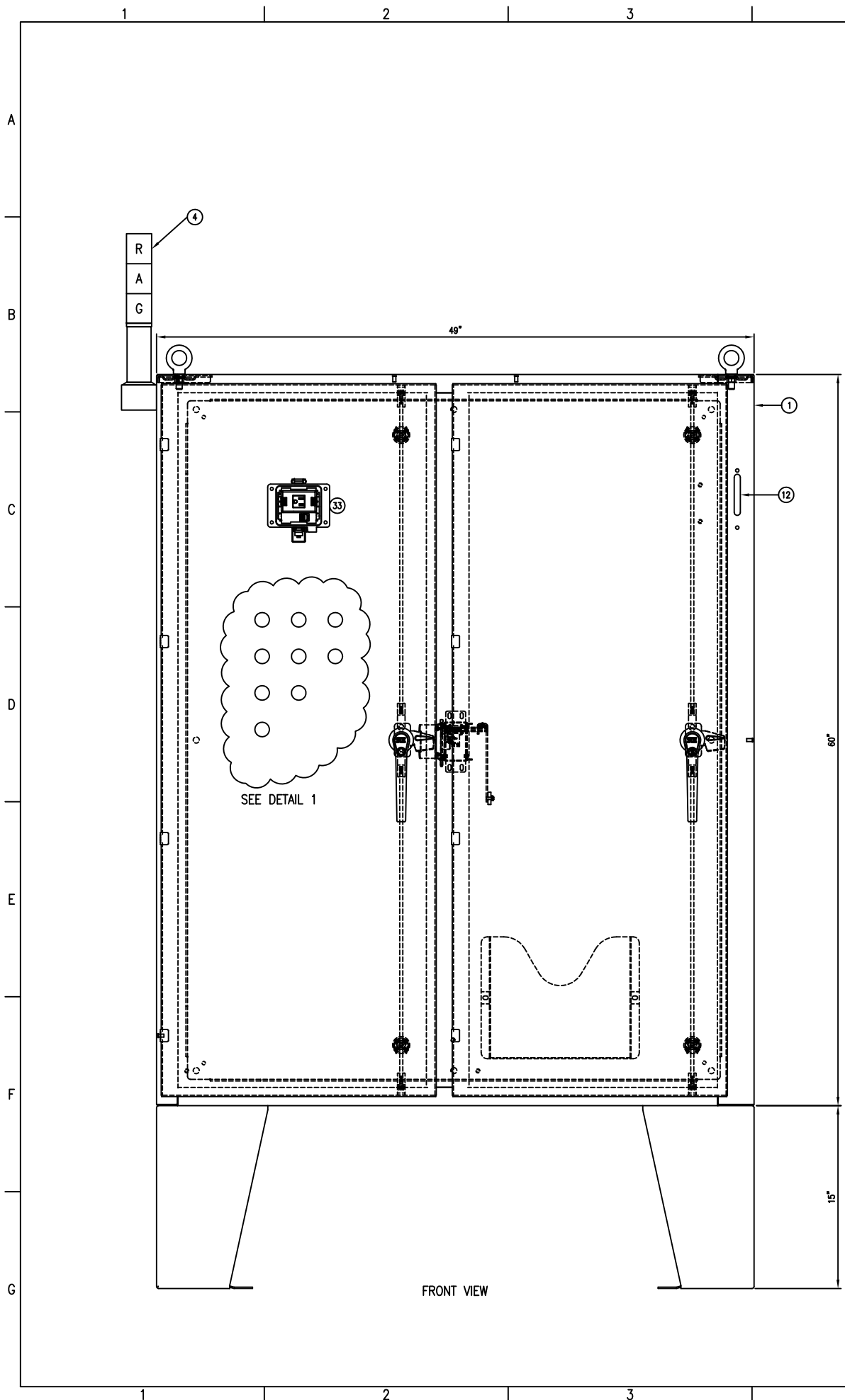
BARGE UNLOADER 3
BARGE HAUL DRIVES
PANEL LAYOUT

ALAMAMA STATE PORT AUTHORITY
McDUFFIE ISLAND TERMINAL
MOBILE, AL

0	ISSUED FOR CONSTRUCTION	1/12/24	DJH	CLZ	KJH
Rev.	Description	Date	Made	Chk'd	App'd

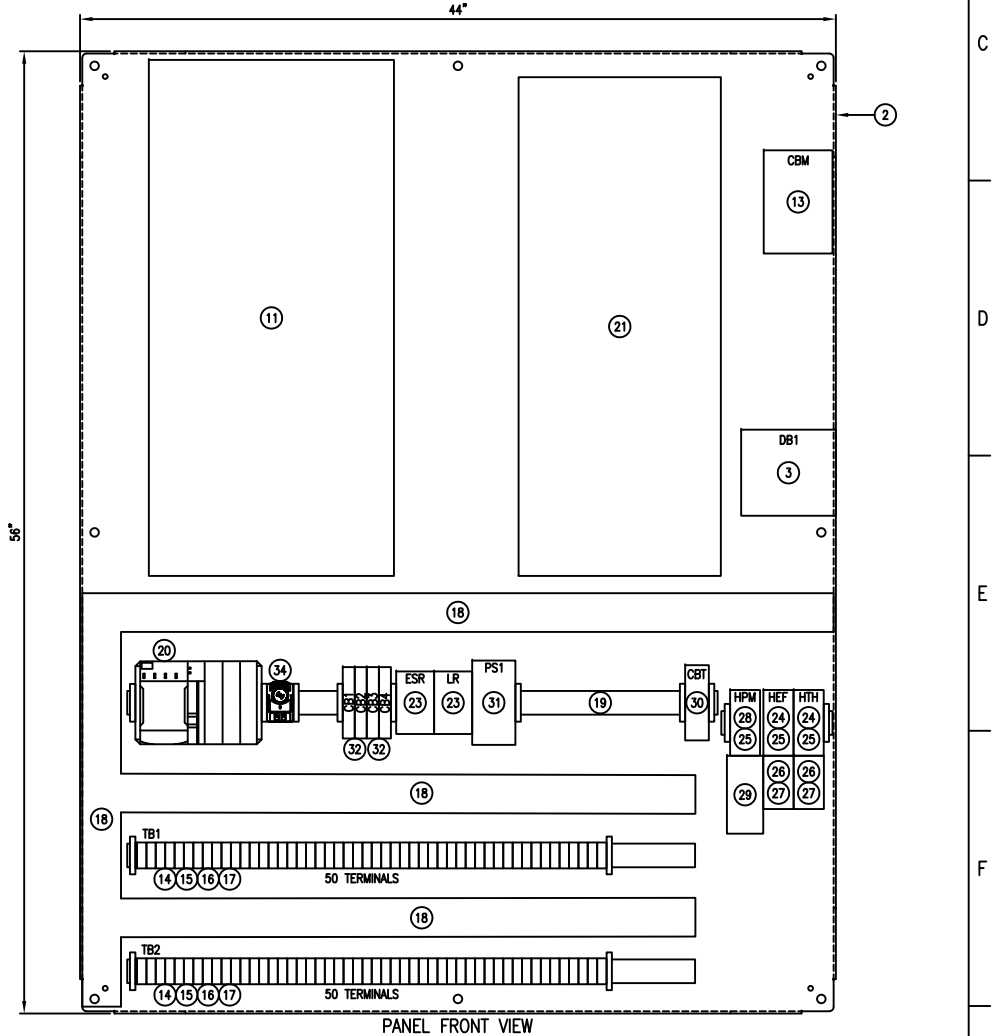
S03750-310

Rev. 0



DETAIL 1
N.T.S.

BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	PART NUMBER	MANUFACTURER
1	1	NEMA 4X STAINLESS STEEL ENCLOSURE	SCE-60XEL4912SSLP	SAGINAW
2	1	SUB-PANEL	SCE-60P48	SAGINAW
3	1	DISTRIBUTION BLOCK W/COVER	1343580 W/CH1343	MARATHON
4	1	3 LIGHT TOWER W/VERTICAL MOUNTING BASE	WTL-50P2-DDGDADR/WTL-50BPV	C3 CONTROLS
5	1	GREEN PILOT LIGHT	800H-QRH10G	ALLEN BRADLEY
6	1	RED PILOT LIGHT	800H-QRH10R	ALLEN BRADLEY
7	4	AMBER PILOT LIGHT	800H-QRH10A	ALLEN BRADLEY
8	1	GREEN PUSH BUTTON	800H-AR1D1	ALLEN BRADLEY
9	1	RED MUSHROOM HEAD PUSH BUTTON	800H-FRXT6A5	ALLEN BRADLEY
10	1	BLACK PUSH BUTTON	800H-AR2D1	ALLEN BRADLEY
11	1	LOAD CENTER W/BREAKERS	HOMELINE SERIES	SQUARE D
12	1	HANDLE MECHANISM W/CABLE	FHP5X-UBW225	WEG
13	1	CIRCUIT BREAKER	UBW225NFTU1003A	WEG
14	100	TERMINALS	1492-CD3	ALLEN BRADLEY
15	2	END BARRIER	1492-NM16	ALLEN BRADLEY
16	4	END ANCHOR	1492-EAJ35	ALLEN BRADLEY
17	LOT	HIGH RISE DIN RAIL	1492-DR6	ALLEN BRADLEY
18	LOT	2\" WIREWAY W/COVER	G2X4LG6/C2LG6	ALLEN BRADLEY
19	LOT	LOW RISE DIN RAIL	199-DR1	ALLEN BRADLEY
20	1	PLC	5069 COMPACTLOGIX	ALLEN BRADLEY
21	1	10KVA CONTROL TRANSFORMER	C1F01LES	HAMMOND
22	1	PHOTO CELL	INTR EK 4236S	WEG
23	2	CONTROL RELAY	700P400A1	ALLEN BRADLEY
24	2	ROTARY MANUAL MOTOR PROTECTOR 1.6-2.5A	MPW40-3-D025	WEG
25	3	AUXILIARY CONTACT	ACBF-11-B	WEG
26	2	CONTACTOR	CWB9-11-30D15	WEG
27	2	CONTACTOR CONNECTOR	ECCMP-40B38	WEG
28	1	ROTARY MANUAL MOTOR PROTECTOR 32-40A	MPW40-3-U040	WEG
29	1	CONTACTOR	CWB2-11-30D15	WEG
30	1	2 POLE CIRCUIT BREAKER 20A	SU202M-K20A	ABB
31	1	24VDC POWER SUPPLY 5A	PSL1 120 24	LOWATO
32	4	1 POLE CIRCUIT BREAKER 5A	UMBW-4D1-5	WEG
33	1	DUPLEX RECEPTACLE W/ENET	P-R2-K2RFO	GRACE
34	1	TEMPERATURE SWITCH	SCE-TEMNO	SAGINAW

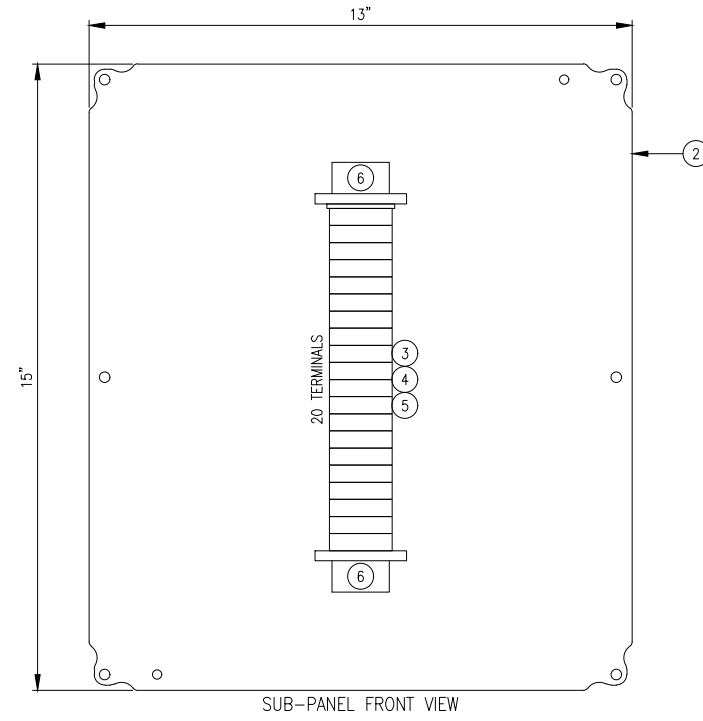
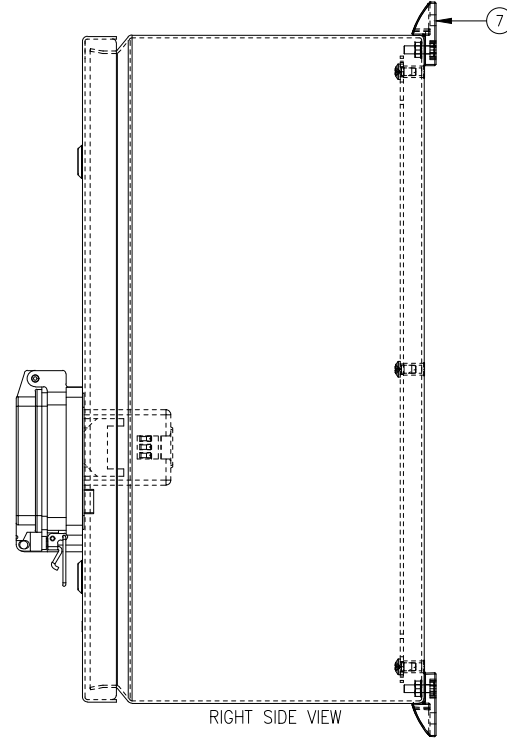
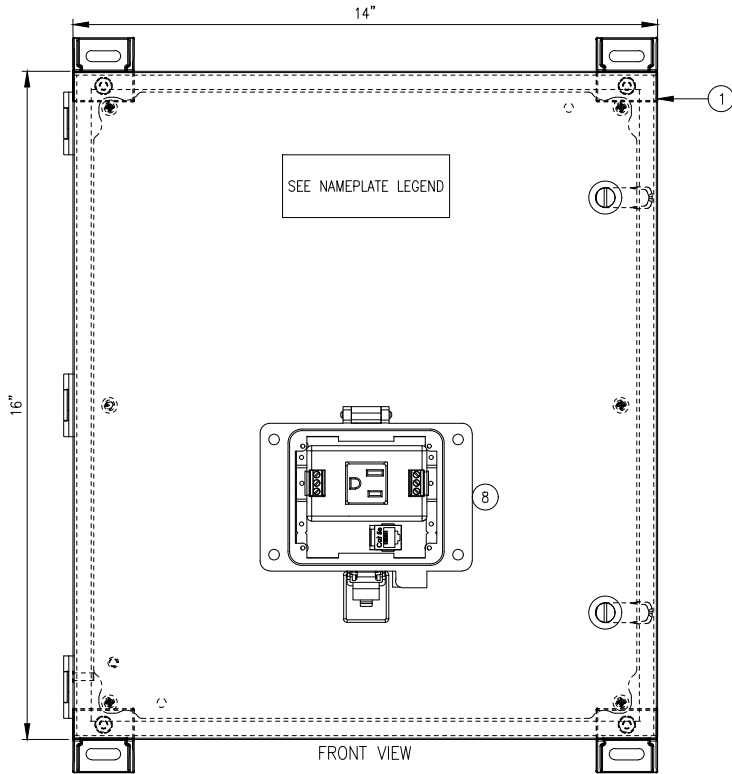
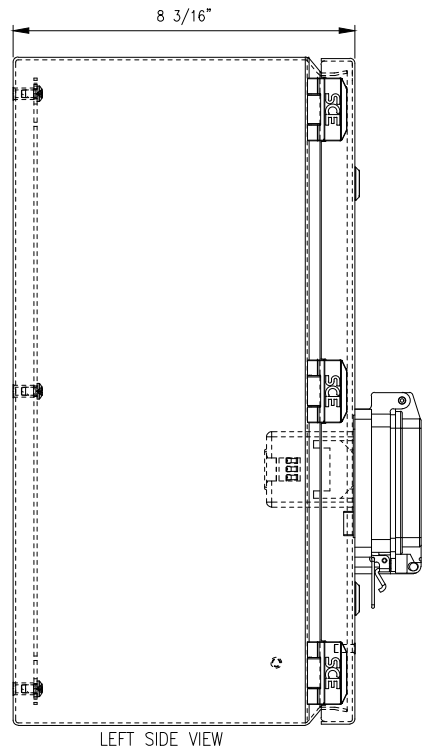


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Pittsburgh, PA

Drawn By: PG Date: 9/12/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/27/23	Scale: 3" = 1'-0"
BARGE UNLOADER BU-3 SHIFTER BARGE CONTROL PANEL LAYOUT		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
		S03750-320	Rev. 0

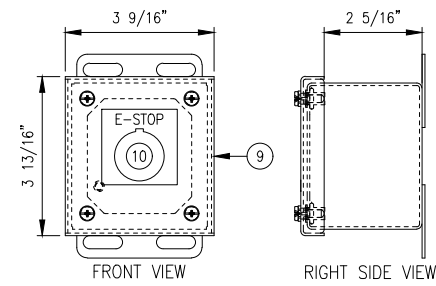
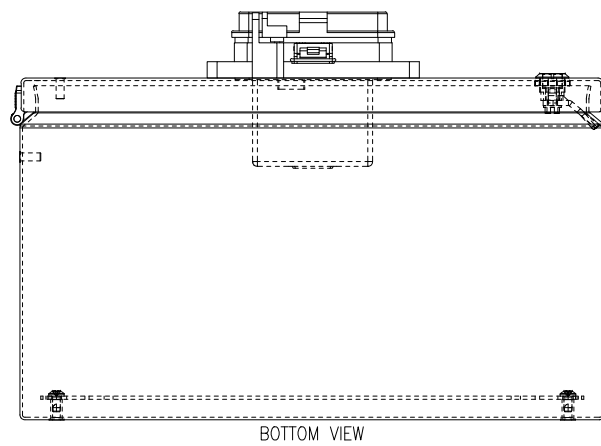
Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/28/23	DJH	CLZ	KJH

BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	PART NUMBER	MANUFACTURER
1	4	STAINLESS STEEL ENCLOSURE NEMA 4X	SCE-16148ELJSS	SAGINAW
2	4	SUB-PANELS	SCE-16P14	SAGINAW
3	80	TERMINAL BLOCKS	1492-CAM1L	ALLEN BRADLEY
4	4	END BARRIERS	1492-NM16	ALLEN BRADLEY
5	8	END ANCHORS	1492-ERL35	ALLEN BRADLEY
6	LOT	35mm LOW RISE DIN RAIL	0801733	PHOENIX
7	4	FOOT MOUNT KIT	SCE-ELJMFK	SAGINAW
8	4	DUPLEX OUTLET	P-R2-K2RFO	GRACE
9	4	1-HOLE ENCLOSURE	SCE-1PBSS	SAGINAW
10	4	RED MUSHROOM HEAD PB	800H-FRXT6A5	ALLEN BRADLEY
11				
12				




NAME PLATE LEGEND

- BOX #1 - "JB-1"
- BOX #2 - "JB-2"
- BOX #3 - "JB-3"
- BOX #4 - "JB-4"



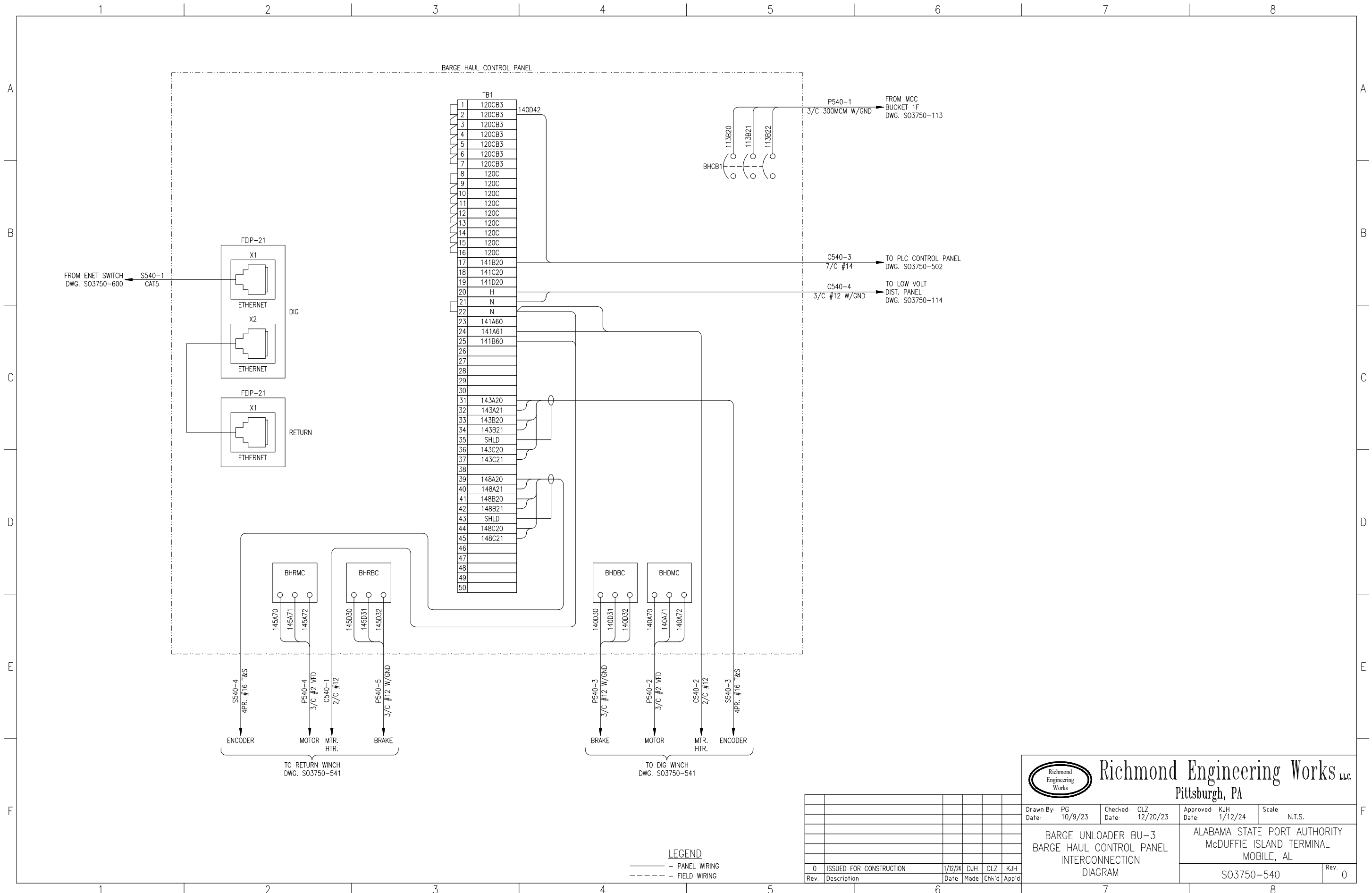
Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/28/23	DJH	CLZ	KJH


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Pittsburgh, PA

Drawn By: PG Date: 9/27/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/27/23	Scale: 6" = 1'-0"
BARGE UNLOADER BU-3 SHIFTER BARGE JUNCTION BOX ENCLOSURE & SUB-PANEL LAYOUT		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
		S03750-321	
		Rev. 0	

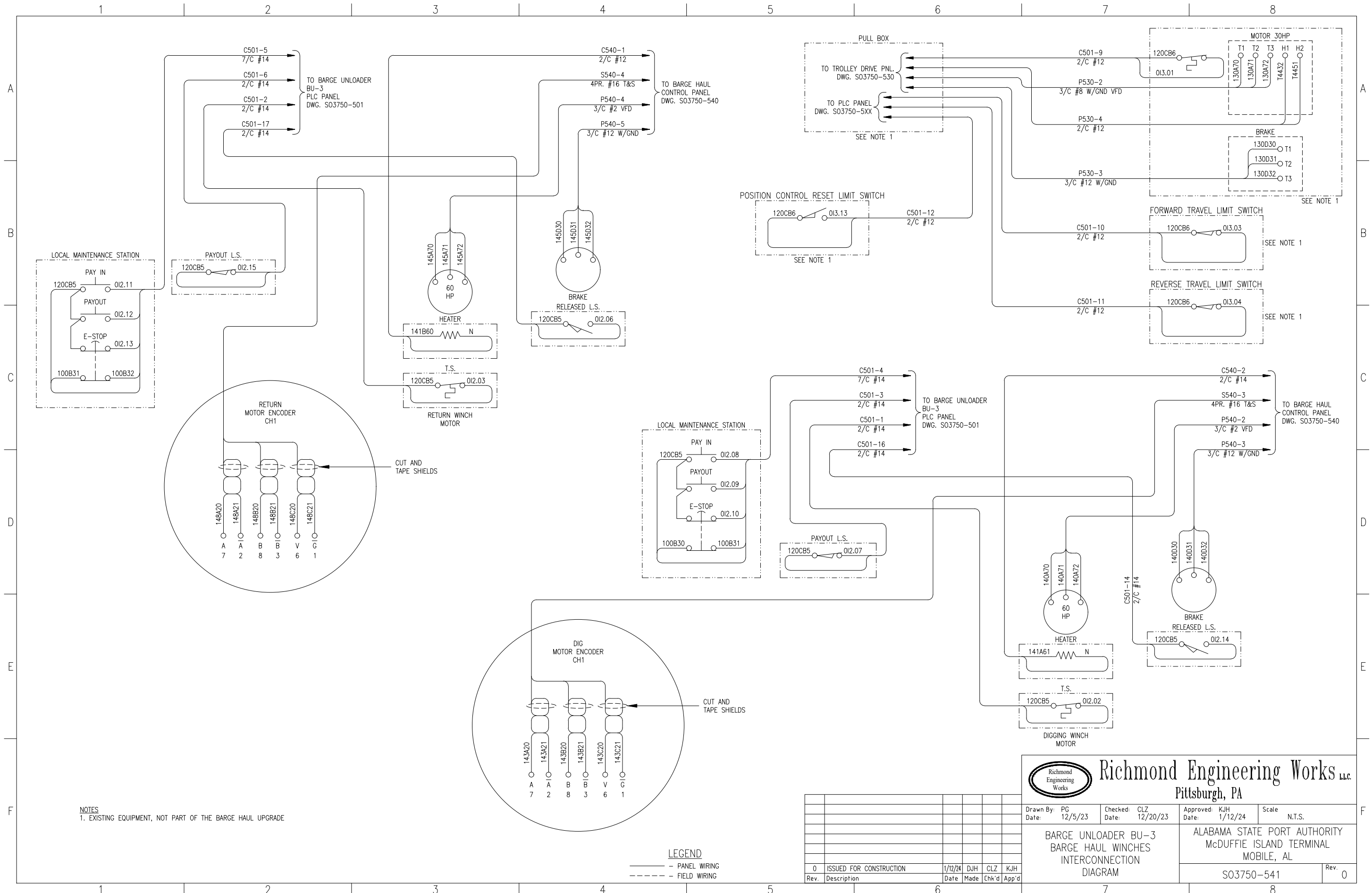




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Pittsburgh, PA

Drawn By: PG Date: 10/9/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
BARGE UNLOADER BU-3 BARGE HAUL CONTROL PANEL INTERCONNECTION DIAGRAM		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-540			Rev. 0


Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	DJH	CLZ	KJH



NOTES
 1. EXISTING EQUIPMENT, NOT PART OF THE BARGE HAUL UPGRADE

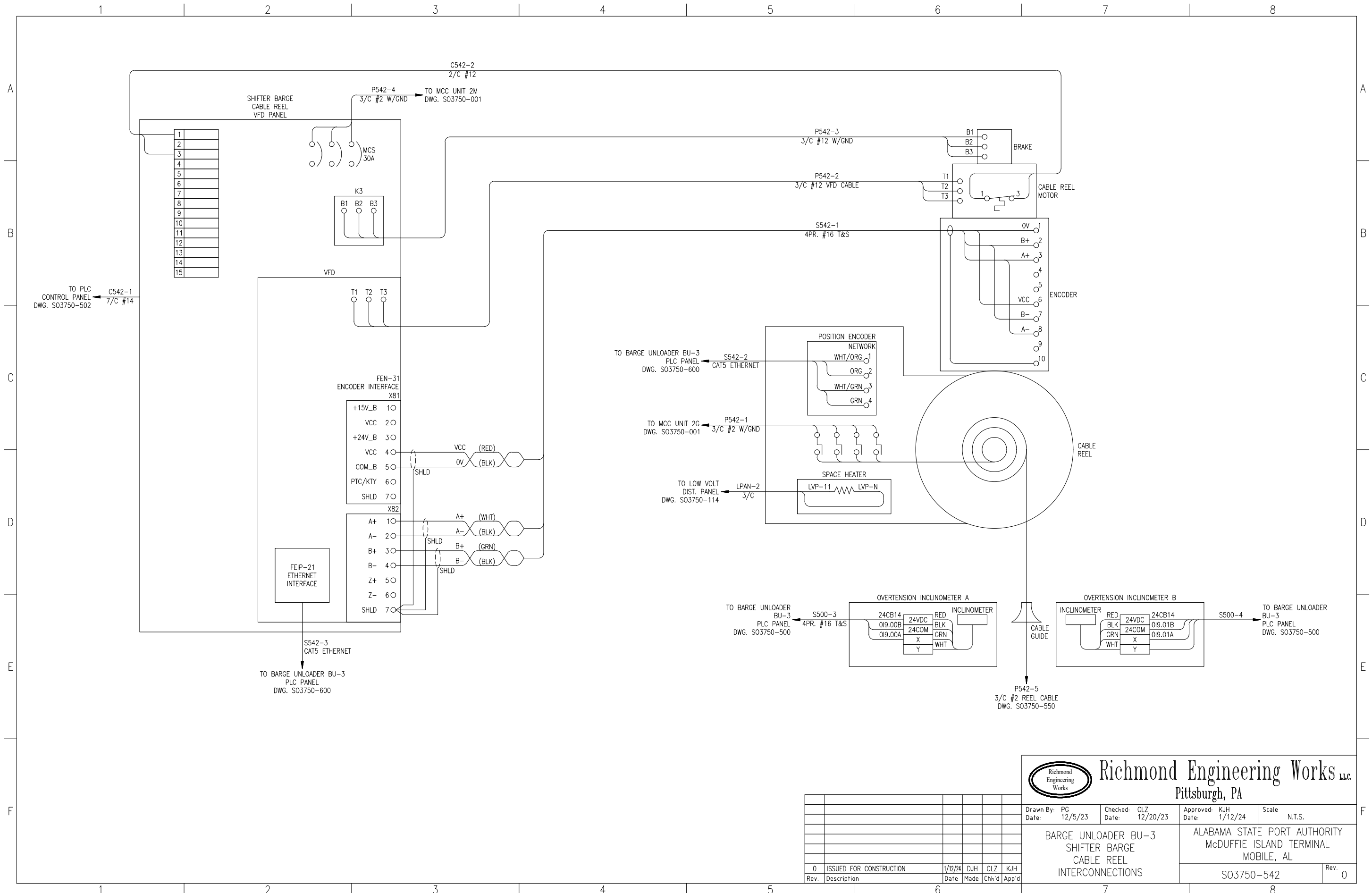
LEGEND
 ———— PANEL WIRING
 - - - - - FIELD WIRING


Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	DJH	CLZ	KJH



Richmond Engineering Works LLC.
 Pittsburgh, PA

Drawn By: PG Date: 12/5/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
BARGE UNLOADER BU-3 BARGE HAUL WINCHES INTERCONNECTION DIAGRAM		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-541			Rev. 0

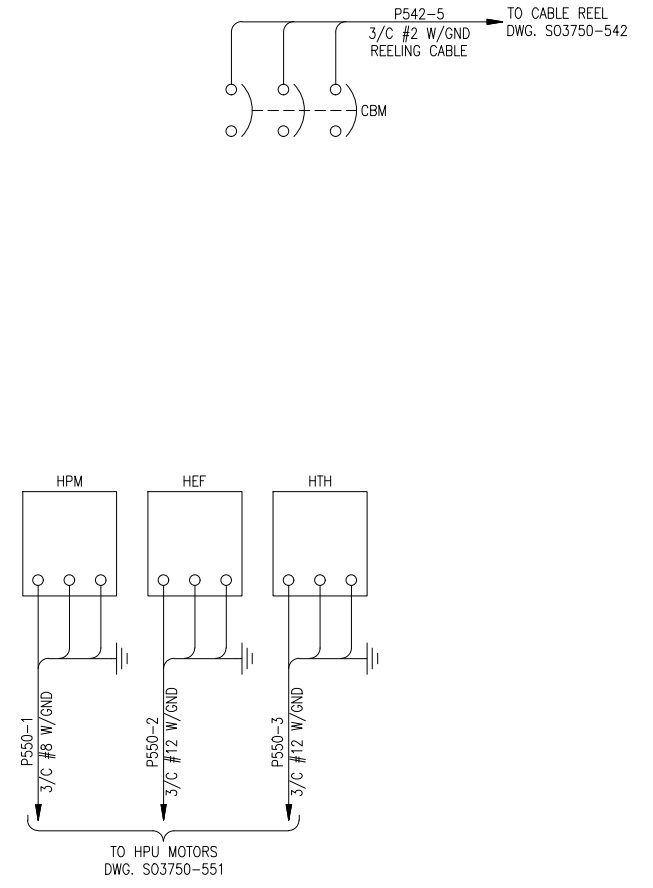
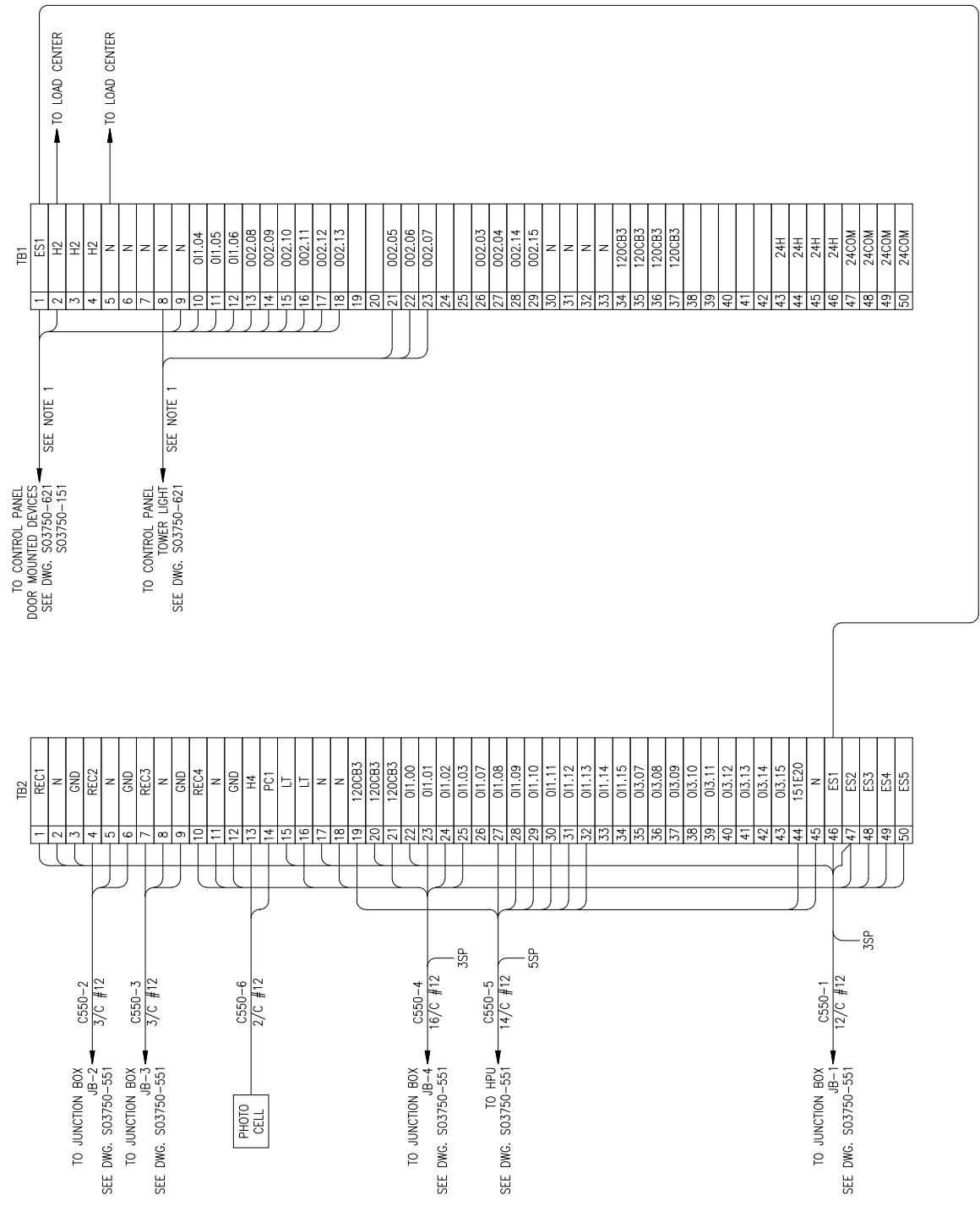




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Drawn By: PG Date: 12/5/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
BARGE UNLOADER BU-3 SHIFTER BARGE CABLE REEL INTERCONNECTIONS		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-542			Rev. 0


Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	DJH	CLZ	KJH



NOTES:
1. WIRES CONNECTED BY PANEL FABRICATOR

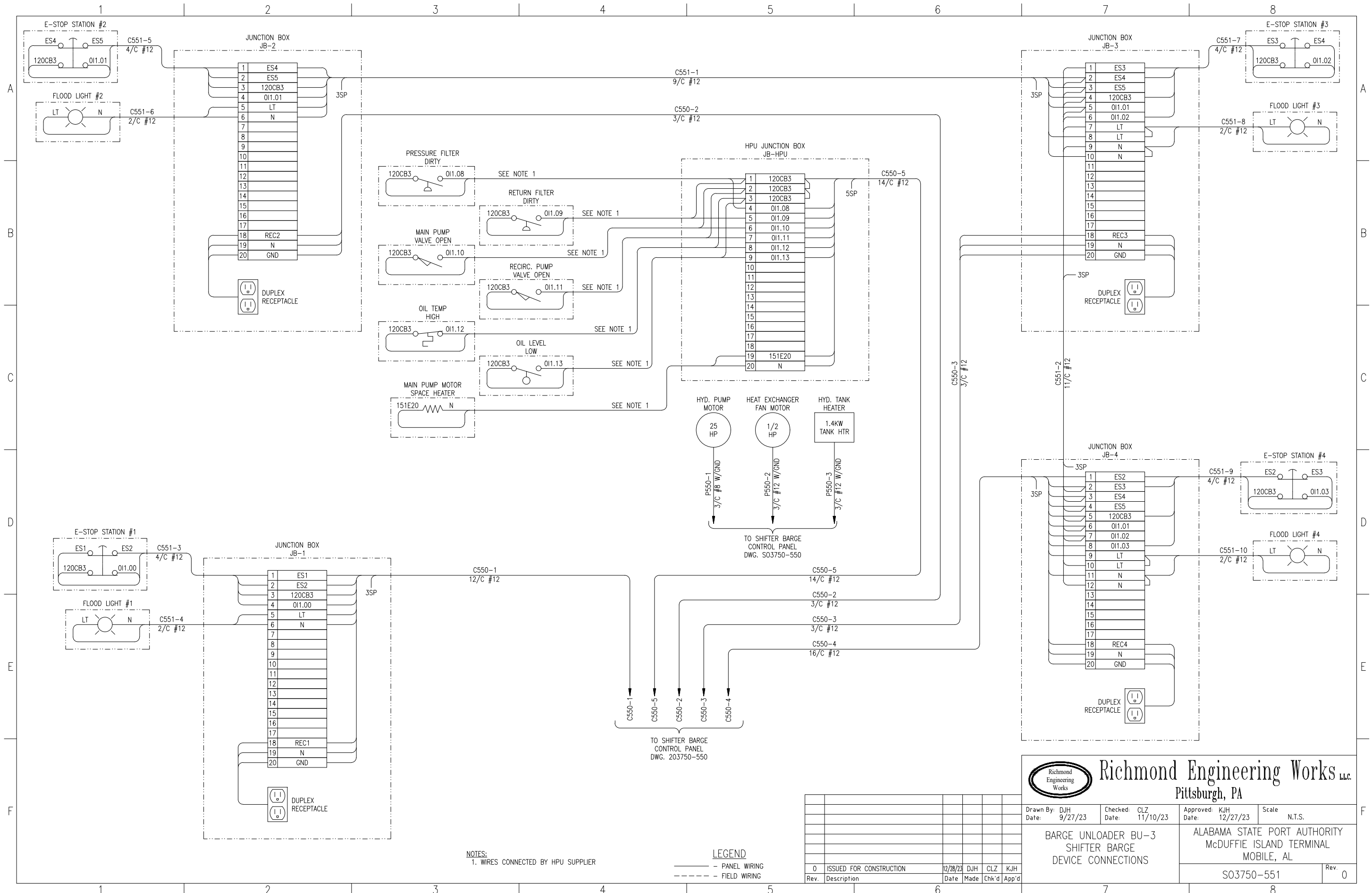
LEGEND
 - - - - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
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Pittsburgh, PA


Drawn By: DJH Date: 9/22/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/27/23	Scale: N.T.S.
BARGE UNLOADER BU-3 SHIFTER BARGE CONTROL PANEL TB1, TB2 INTERCONNECTION		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-550			Rev. 0



NOTES:
1. WIRES CONNECTED BY HPU SUPPLIER

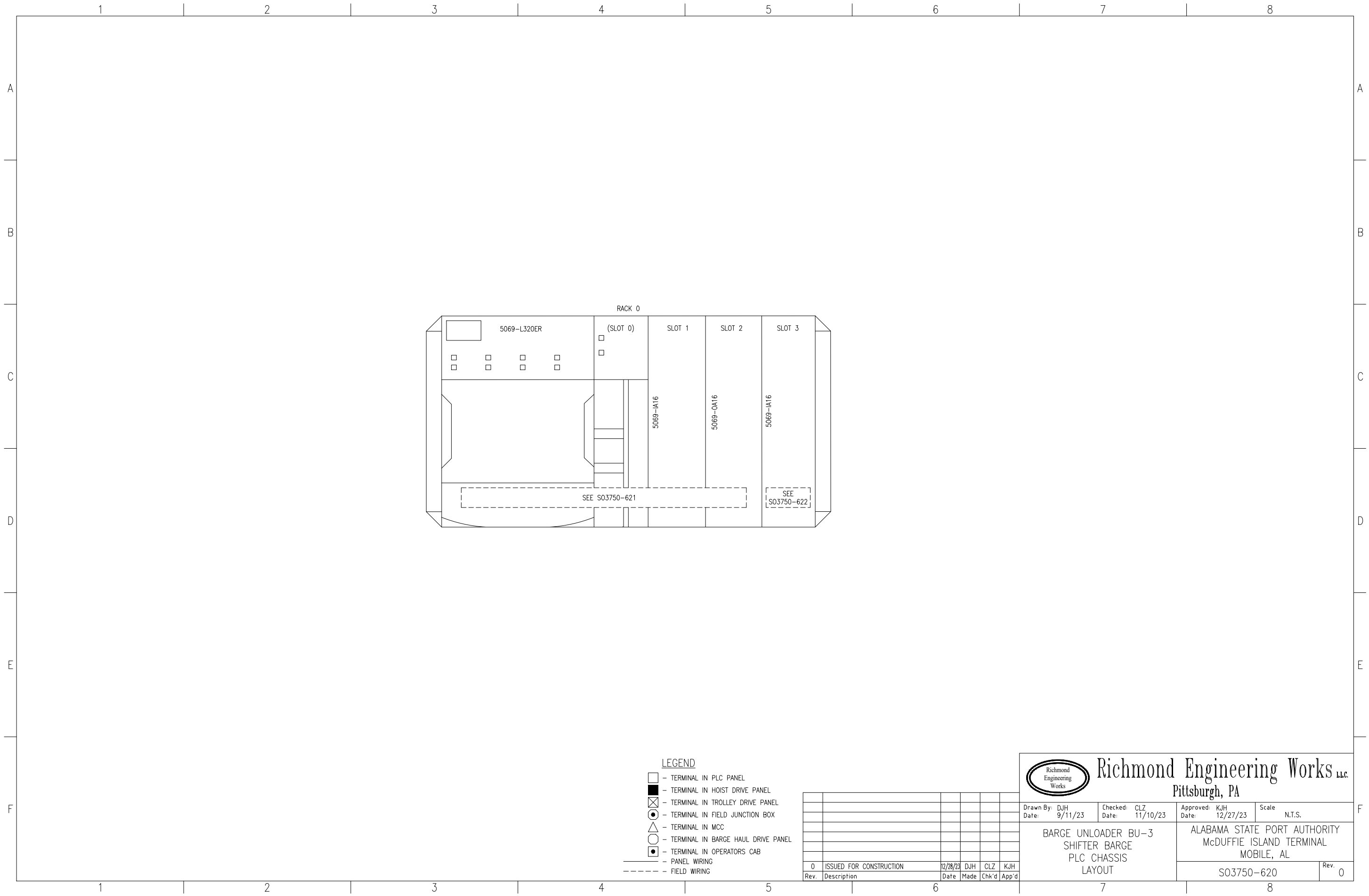
LEGEND
 ———— - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/28/23	DJH	CLZ	KJH




Richmond Engineering Works LLC.
Pittsburgh, PA

Drawn By: DJH Date: 9/27/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/27/23	Scale: N.T.S.
BARGE UNLOADER BU-3 SHIFTER BARGE DEVICE CONNECTIONS		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03750-551			Rev. 0



- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - - TERMINAL IN OPERATORS CAB
 - - - - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/28/23	DJH	CLZ	KJH



Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: DJH
Date: 9/11/23

Checked: CLZ
Date: 11/10/23

Approved: KJH
Date: 12/27/23

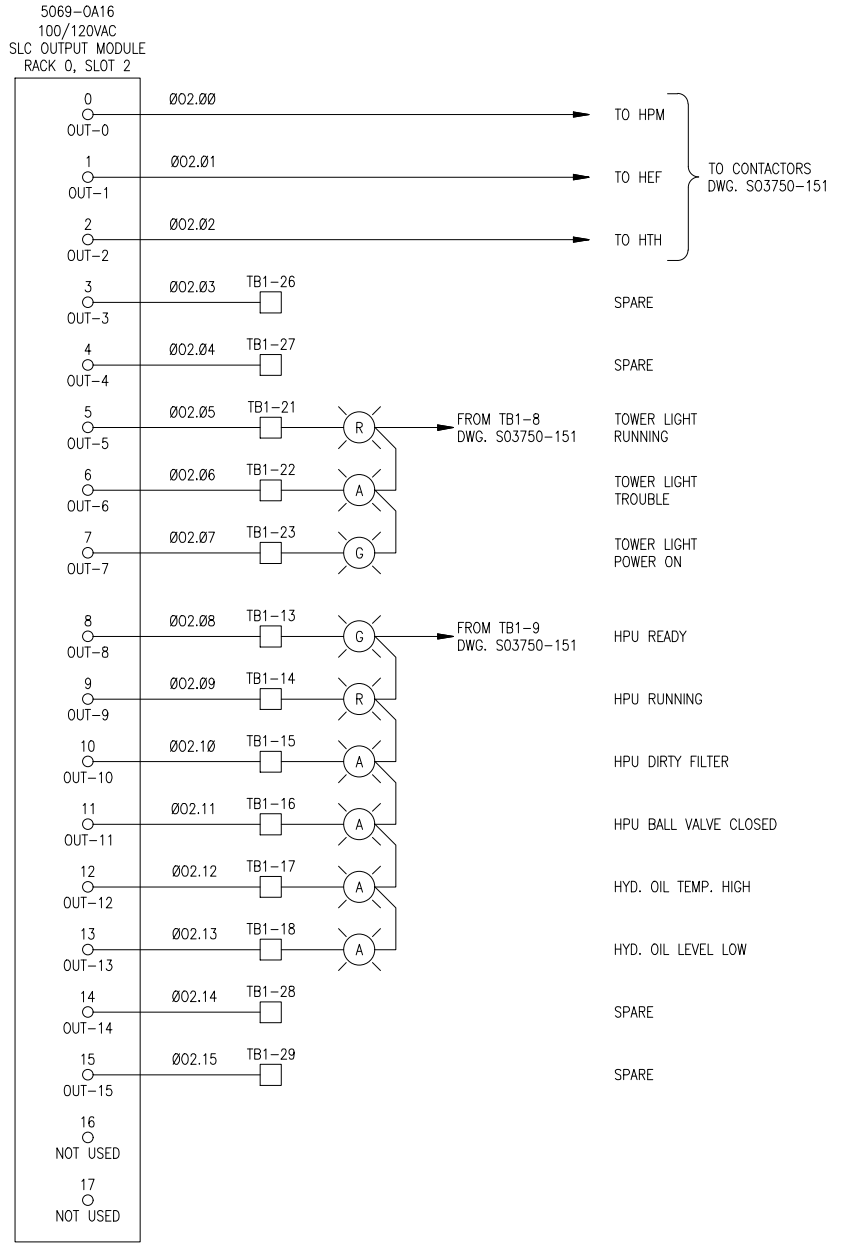
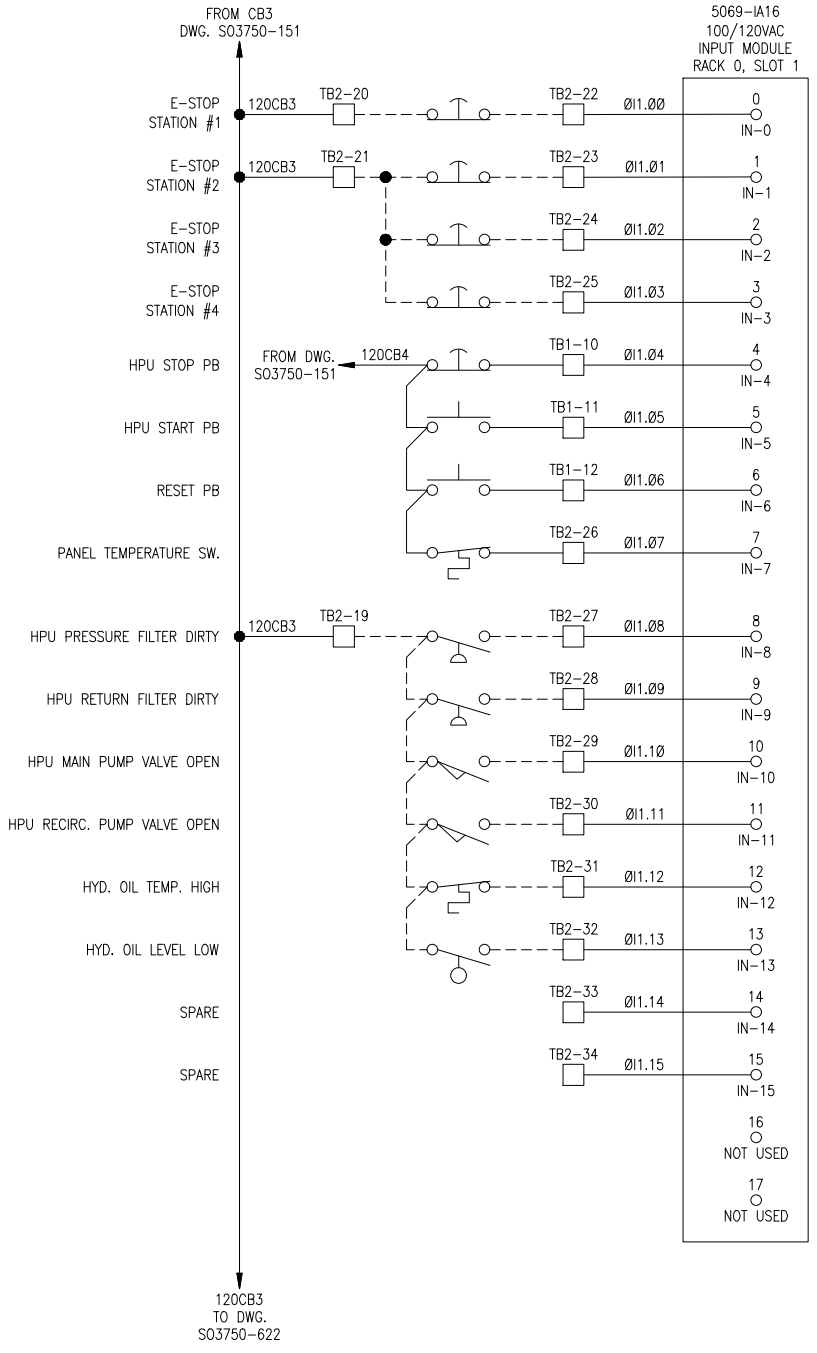
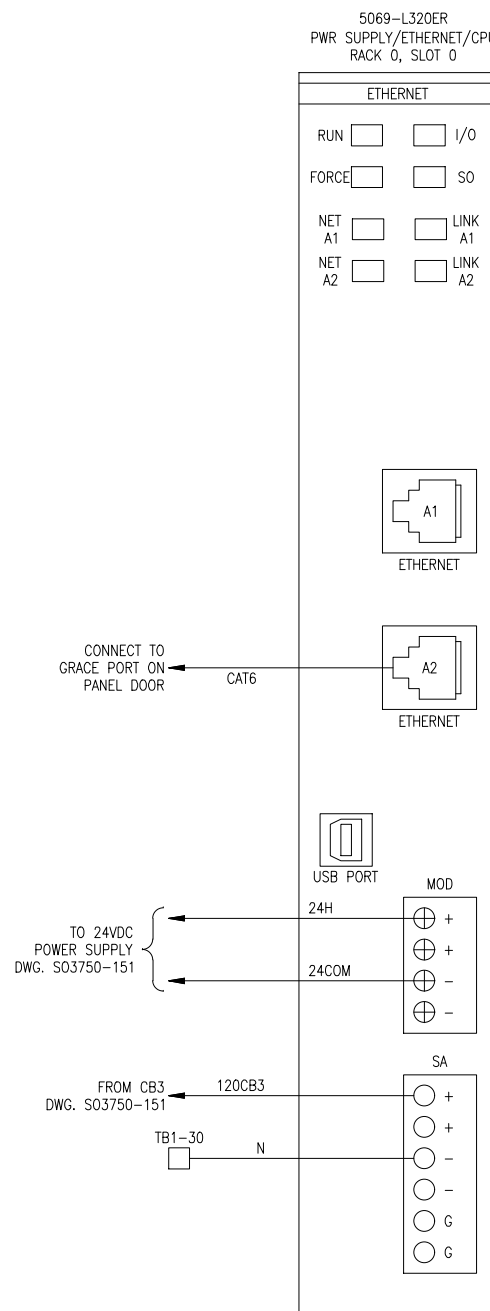
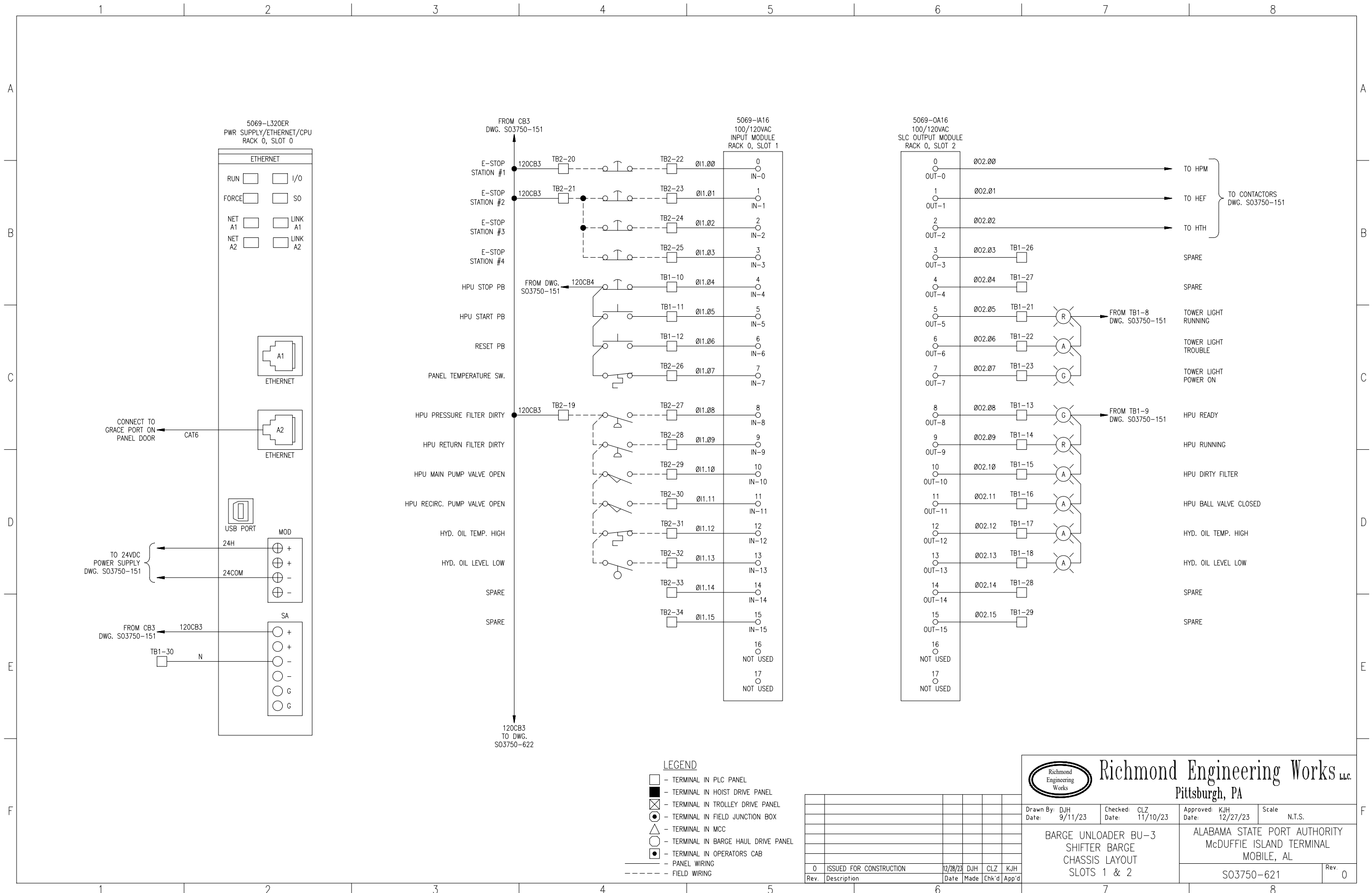
Scale: N.T.S.

**BARGE UNLOADER BU-3
SHIFTER BARGE
PLC CHASSIS
LAYOUT**

ALABAMA STATE PORT AUTHORITY
McDUFFIE ISLAND TERMINAL
MOBILE, AL

S03750-620

Rev. 0



- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - ◐ - TERMINAL IN OPERATORS CAB
 - - - - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/28/23	DJH	CLZ	KJH

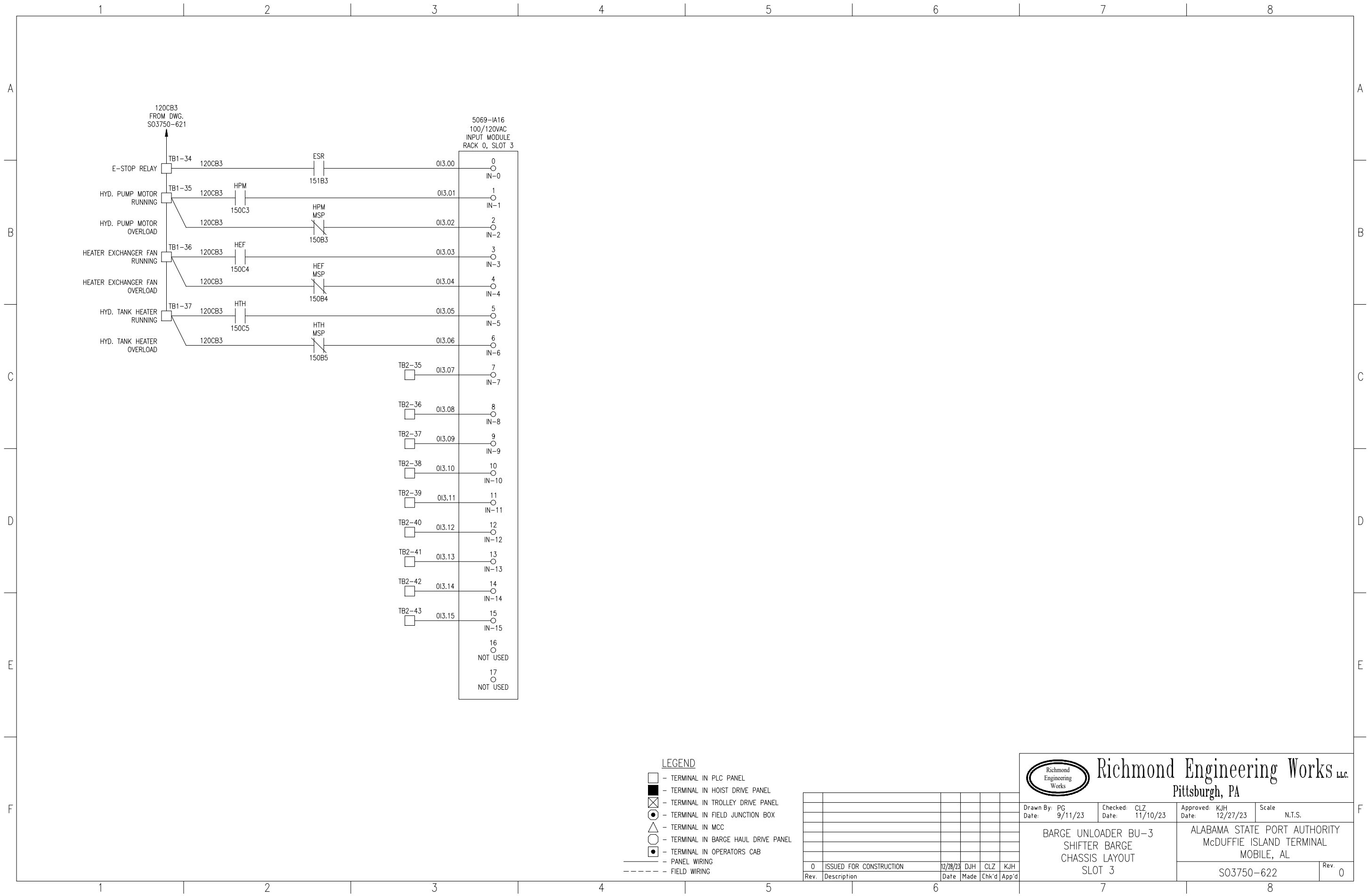
Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: DJH Date: 9/11/23
Checked: CLZ Date: 11/10/23
Approved: KJH Date: 12/27/23
Scale: N.T.S.

**BARGE UNLOADER BU-3
SHIFTER BARGE
CHASSIS LAYOUT
SLOTS 1 & 2**


ALABAMA STATE PORT AUTHORITY
McDUFFIE ISLAND TERMINAL
MOBILE, AL

S03750-621 Rev. 0



- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - - TERMINAL IN OPERATORS CAB
 - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/28/23	DJH	CLZ	KJH



Richmond Engineering Works LLC.
Pittsburgh, PA

Drawn By: PG
Date: 9/11/23

Checked: CLZ
Date: 11/10/23

Approved: KJH
Date: 12/27/23

Scale: N.T.S.

BARGE UNLOADER BU-3
SHIFTER BARGE
CHASSIS LAYOUT
SLOT 3

ALABAMA STATE PORT AUTHORITY
McDUFFIE ISLAND TERMINAL
MOBILE, AL

S03750-622

Rev. 0

ASPA - McDuffie Island Terminal
 BU3 - Barge Haul System
 Field Cables

CABLE #	FROM	TO	ESTIMATED LENGTH	3C #8 AWG w/GND, 600V	3C #2 AWG VFD CABLE	3C #12 AWG VFD CABLE	3C #2 AWG w/GND	3C #12 AWG w/GND, 600V	3C #300MCM w/GND, 600V	3C #2 AWG w/GND Reeling Cable	0	2C-#14AWG, 600V	7C-#14AWG, 600V	3C-#12AWG, 600V	0	0	0	0	0	0	4 Pair #16 T&S	Cat5 Ethernet	0	0	0	0	0	0	NOTES
				0	480	320	390	800	70	400	0	2150	610	280	0	0	0	0	0	0	0	0	1270	470	0	0	0	0	0
Power Cables																													
P540-1	MCC Bucket 1F	Barge Haul Control Panel							70																				
P540-2	Barge Haul Control Panel	Digging Winch Motor		220																									
P540-3	Barge Haul Control Panel	Digging Winch Brake						220																					
P540-4	Barge Haul Control Panel	Return Winch Motor		260																									
P540-5	Barge Haul Control Panel	Return Winch Brake						260																					
P542-1	MCC Unit 2G	Cable Reel Slip Rings					320																						
P542-2	Cable Reel VFD Panel	Cable Reel Motor			320																								
P542-3	Cable Reel VFD Panel	Cable Reel Brake						320																					
P542-4	MCC Unit 2M	Cable Reel VFD Panel					70																						
P542-5	Shifter Barge Control Panel	Cable Reel							400																				Cable Supplied by REW
Control Cables																													
C501-1	PLC Control Panel	Digging Winch Motor Temp. Sw.										215																	
C501-2	PLC Control Panel	Return Winch Motor Temp. Sw.										255																	
C501-3	PLC Control Panel	Digging Winch Payout Limit Sw.										240																	
C501-4	PLC Control Panel	Digging Local Maintenance Station											215																
C501-5	PLC Control Panel	Return Local Maintenance Station											255																
C501-6	PLC Control Panel	Return Winch Payout Limit Sw.										280																	
C501-16	PLC Control Panel	Digging Winch Released Limit Sw.										215																	
C501-17	PLC Control Panel	Return Winch Released Limit Sw.										255																	
C540-1	Barge Haul Control Panel	Return Winch Heater										255																	
C540-2	Barge Haul Control Panel	Digging Winch Heater										215																	
C540-3	PLC Control Panel	Barge Haul Control Panel											70																
C540-4	Low Voltage Distribution Panel	Barge Haul Control Panel												60															
C542-1	Cable Reel VFD Panel	PLC Control Panel											70																

Cable lengths are estimated, final length determined by actual routing.

Rev. 1

1/26/2024

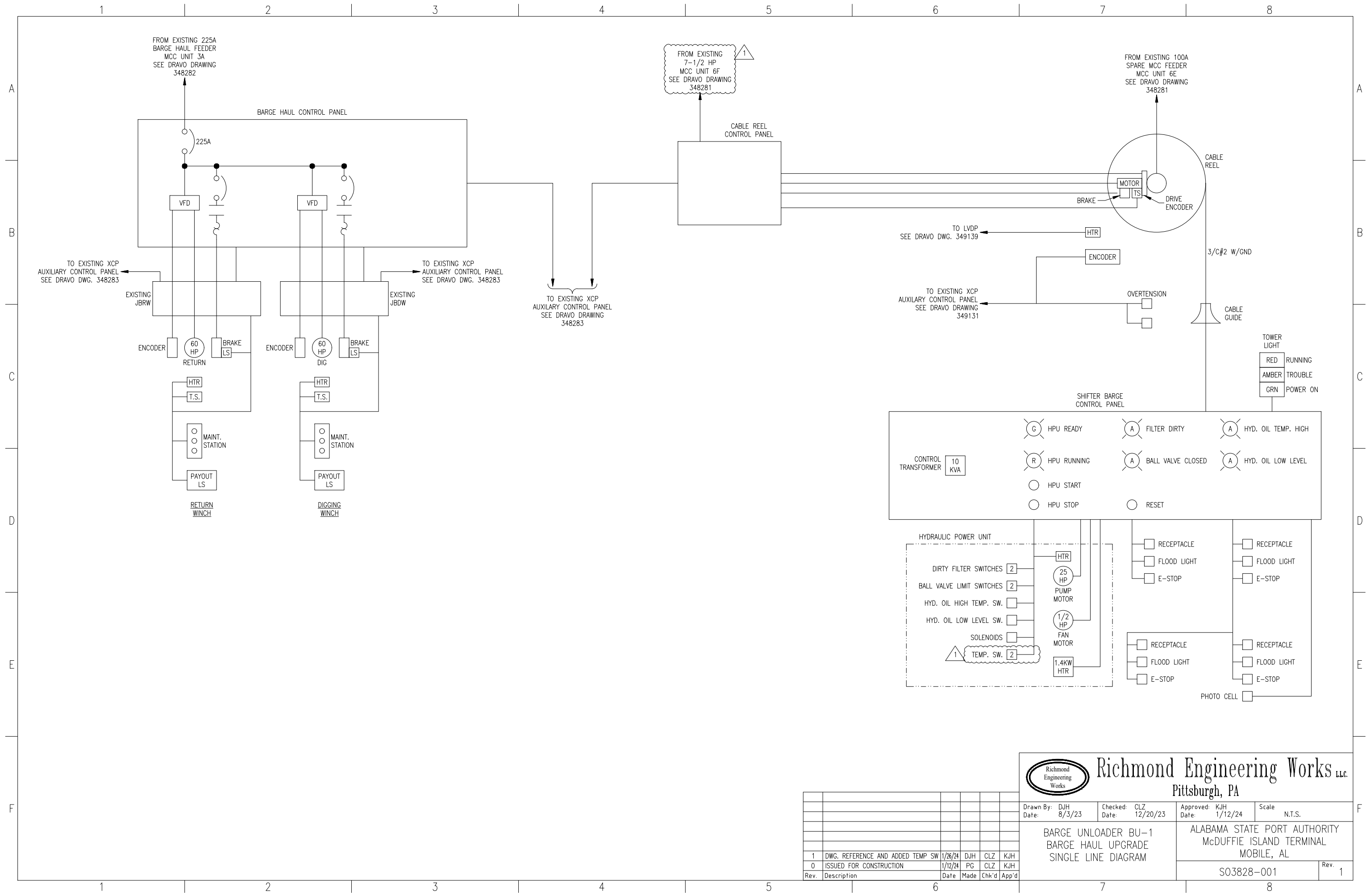
ASPA - McDuffie Island Terminal
 BU3 - Barge Haul System
 Field Cables

CABLE #	FROM	TO	ESTIMATED LENGTH	3C #8 AWG w/GND, 600V	3C #2 AWG VFD CABLE	3C #12 AWG VFD CABLE	3C #2 AWG w/GND	3C #12 AWG w/GND, 600V	3C #300MCM w/GND, 600V	3C #2 AWG w/GND Reeling Cable	0	2C-#14AWG, 600V	7C-#14AWG, 600V	3C-#12AWG, 600V	0	0	0	0	0	4 Pair #16 T&S	Cat5 Ethernet	0	0	0	0	0	0	NOTES
				0	480	320	390	800	70	400	0	2150	610	280	0	0	0	0	0	0	1270	470	0	0	0	0	0	0
C542-2	Cable Reel VFD Panel	Cable Reel Motor Temp. Sw.										220																
LPAN-2	Low Voltage Distribution Panel	Cable Reel Space Heater											220															
Signal/Communication Cables																												
S500-3	PLC Control Panel	Cable Reel Inclinomter A																			235							
S500-4	PLC Control Panel	Cable Reel Inclinomter B																			235							
S540-1	PLC Control Panel	Barge Haul Control Panel																				70						
S540-2																												
S540-3	Barge Haul Control Panel	Digging Winch Encoder																				220						
S540-4	Barge Haul Control Panel	Return Winch Encoder																				260						
S542-1	Cable Reel VFD Panel	Cable Reel Motor Encoder																				320						
S542-2	PLC Control Panel	Cable Reel Position Encoder																					320					
S542-3	PLC Control Panel	Cable Reel VFD Panel																					70					
S600-10	PLC Control Panel	POE Ethernet Switch for Cable Reel Position Encoder																					10					


Cable lengths are estimated, final length determined by actual routing.

Rev. 1

1/26/2024

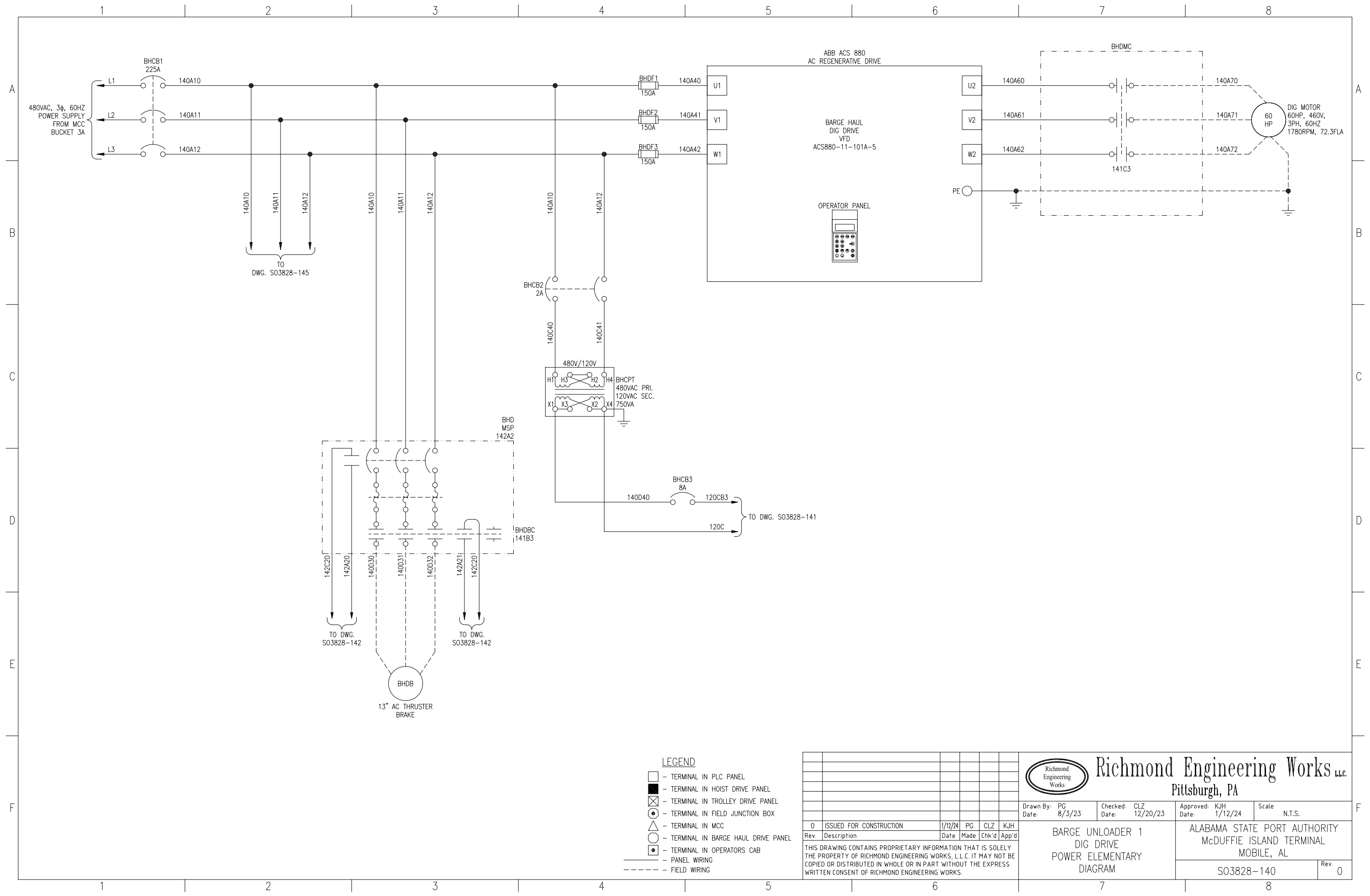


Rev.	Description	Date	Made	Chk'd	App'd
1	DWG. REFERENCE AND ADDED TEMP SW	1/28/24	DJH	CLZ	KJH
0	ISSUED FOR CONSTRUCTION	1/12/24	PG	CLZ	KJH



Richmond Engineering Works LLC.
Pittsburgh, PA


Drawn By: DJH Date: 8/3/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
BARGE UNLOADER BU-1 BARGE HAUL UPGRADE SINGLE LINE DIAGRAM		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03828-001			Rev. 1



- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - - TERMINAL IN MCC
 - △ - TERMINAL IN BARGE HAUL DRIVE PANEL
 - ◐ - TERMINAL IN OPERATORS CAB
 - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	PG	CLZ	KJH

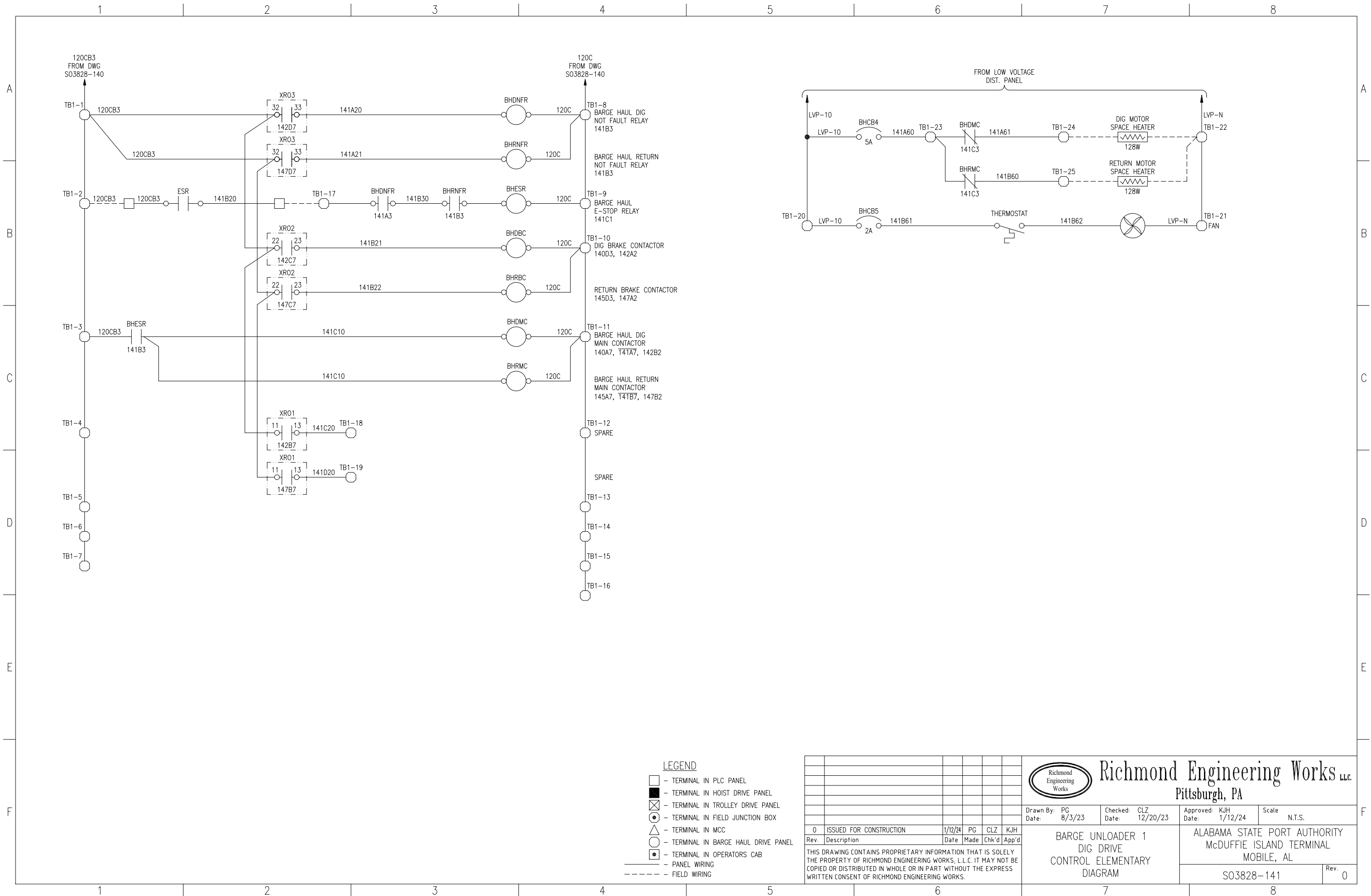
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Pittsburgh, PA

Drawn By: PG Date: 8/3/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
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BARGE UNLOADER 1 DIG DRIVE POWER ELEMENTARY DIAGRAM	ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL
S03828-140	Rev. 0



- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - - TERMINAL IN MCC
 - △ - TERMINAL IN BARGE HAUL DRIVE PANEL
 - ◐ - TERMINAL IN OPERATORS CAB
 - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	PG	CLZ	KJH

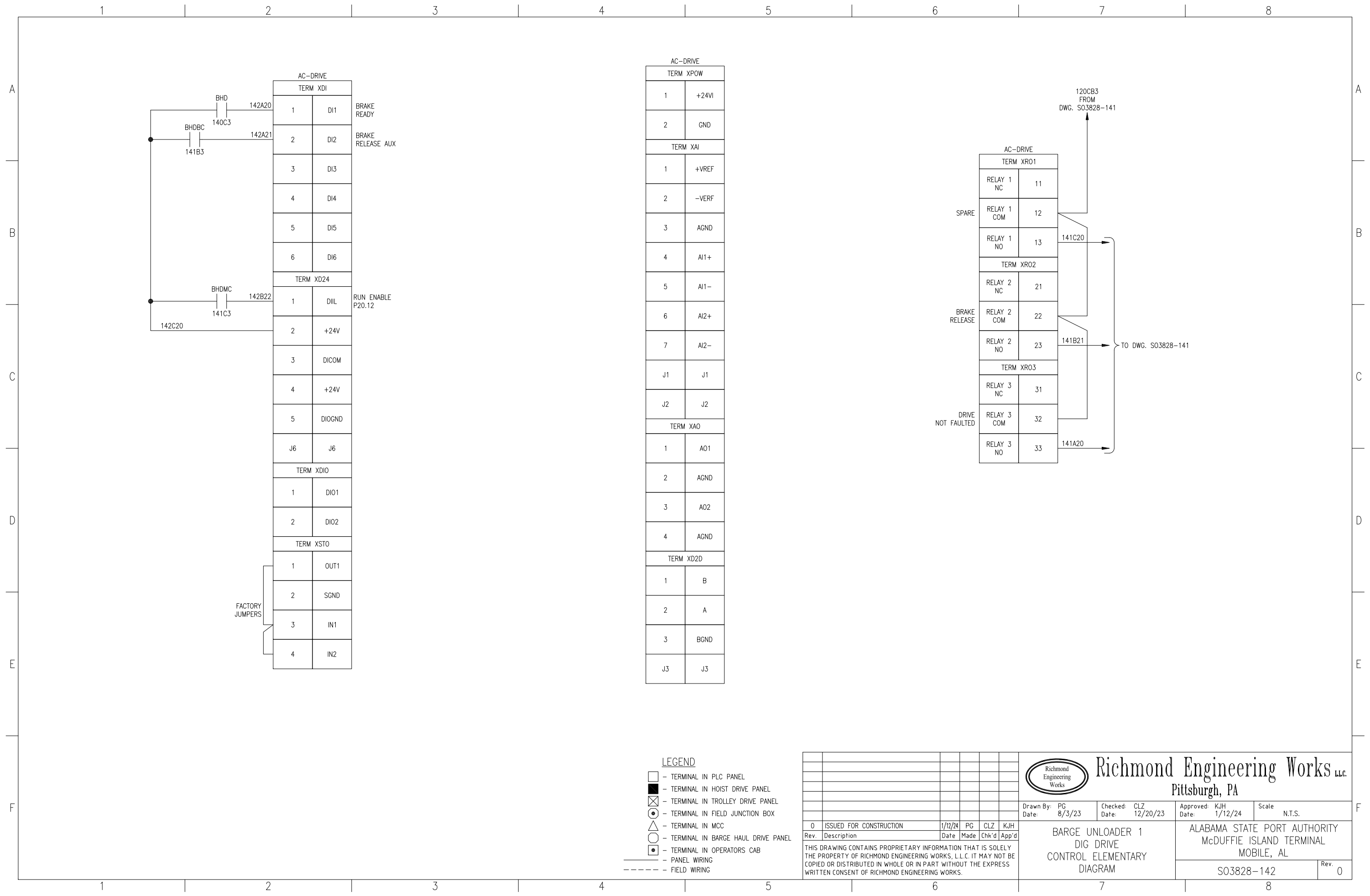
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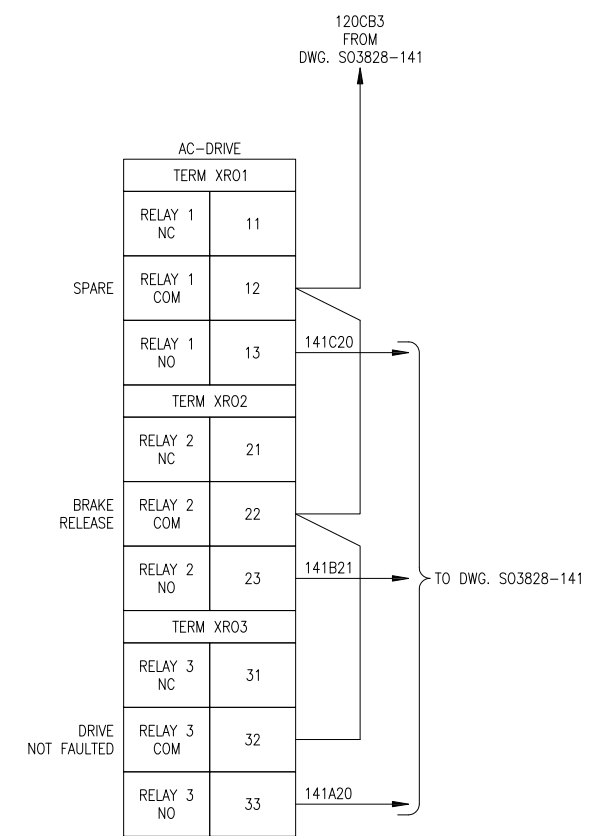
Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: PG Date: 8/3/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
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BARGE UNLOADER 1 DIG DRIVE CONTROL ELEMENTARY DIAGRAM	ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL
S03828-141	Rev. 0

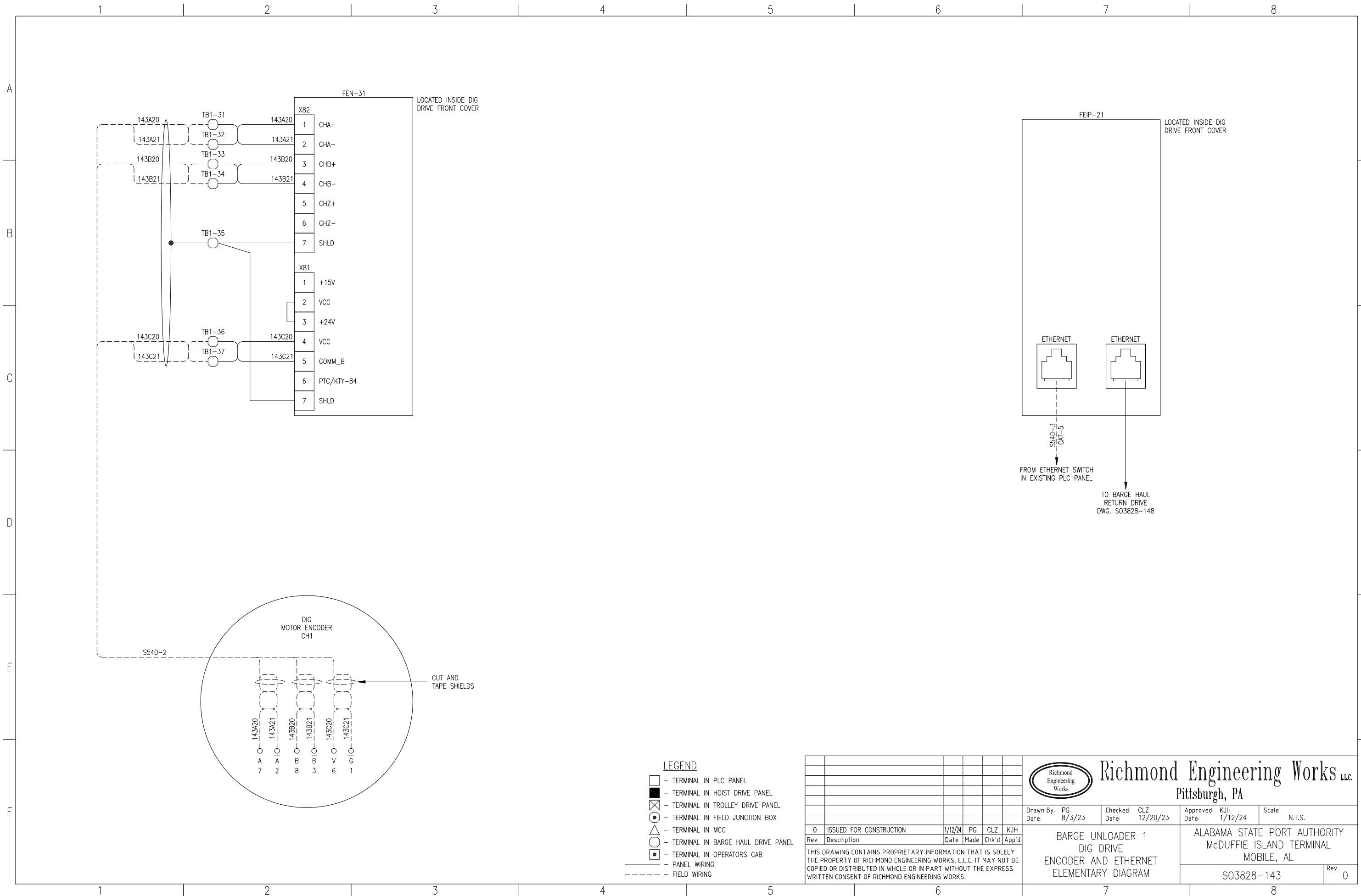


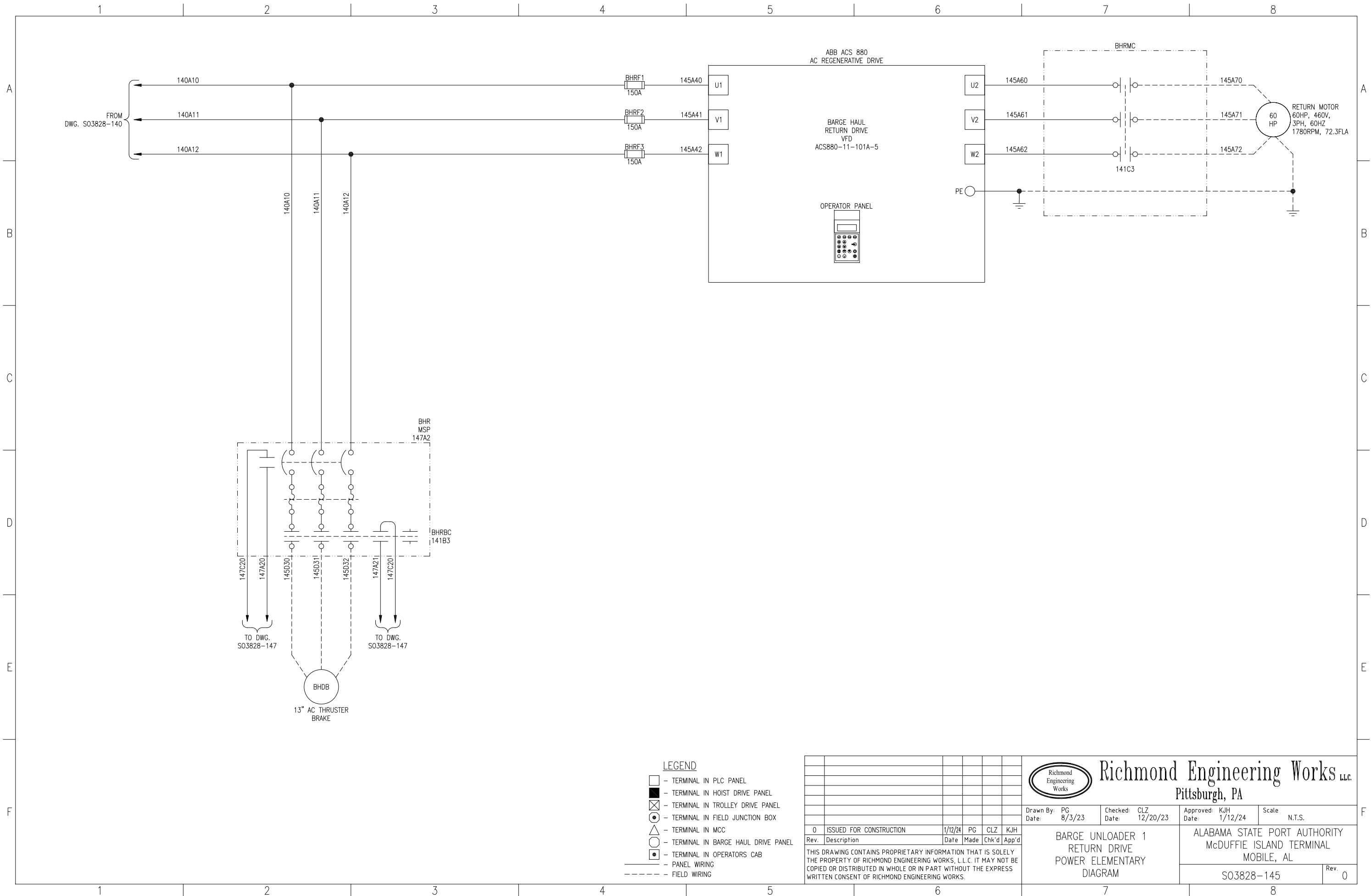
AC-DRIVE	
TERM XPOW	
1	+24VI
2	GND
TERM XAI	
1	+VREF
2	-VERF
3	AGND
4	A1+
5	A1-
6	A2+
7	A2-
J1	J1
J2	J2
TERM XAO	
1	A01
2	AGND
3	A02
4	AGND
TERM XD2D	
1	B
2	A
3	BGND
J3	J3



- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - ◻ - TERMINAL IN OPERATORS CAB
 - - PANEL WIRING
 - - - - - FIELD WIRING

		Richmond Engineering Works LLC Pittsburgh, PA	
		Drawn By: PG Date: 8/3/23	Checked: CLZ Date: 12/20/23
0 ISSUED FOR CONSTRUCTION 1/12/24 PG CLZ KJH		BARGE UNLOADER 1 DIG DRIVE CONTROL ELEMENTARY DIAGRAM	
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		S03828-142 Rev. 0	






- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - ⊙ - TERMINAL IN FIELD JUNCTION BOX
 - - TERMINAL IN MCC
 - △ - TERMINAL IN BARGE HAUL DRIVE PANEL
 - - TERMINAL IN OPERATORS CAB
 - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	PG	CLZ	KJH

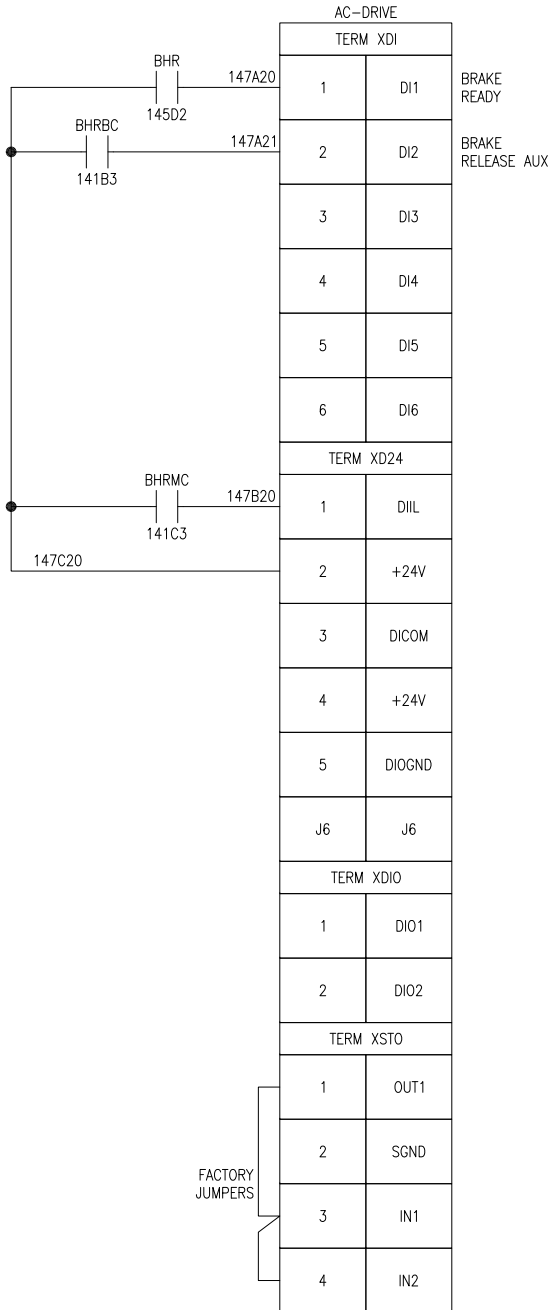
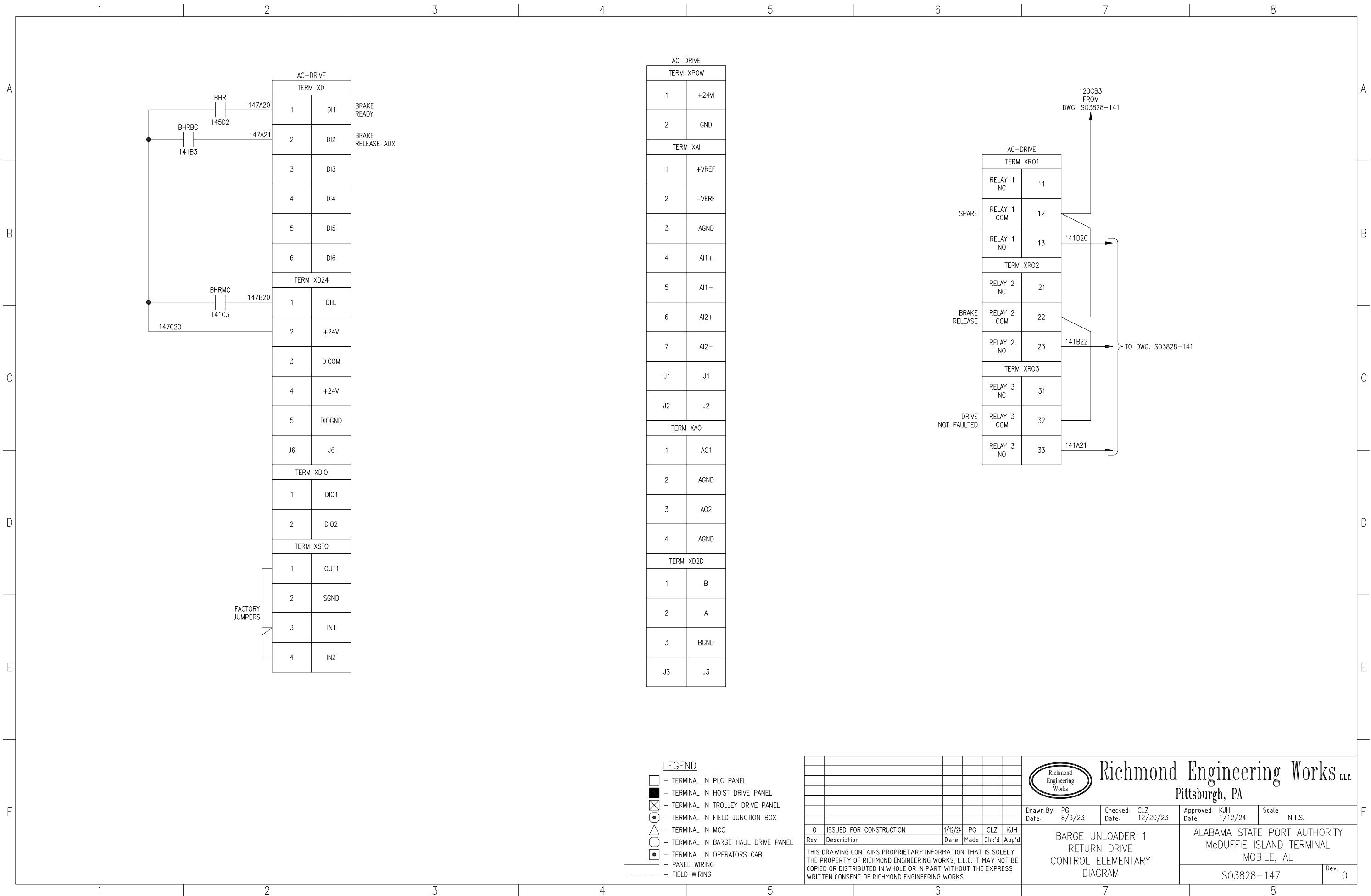
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Pittsburgh, PA

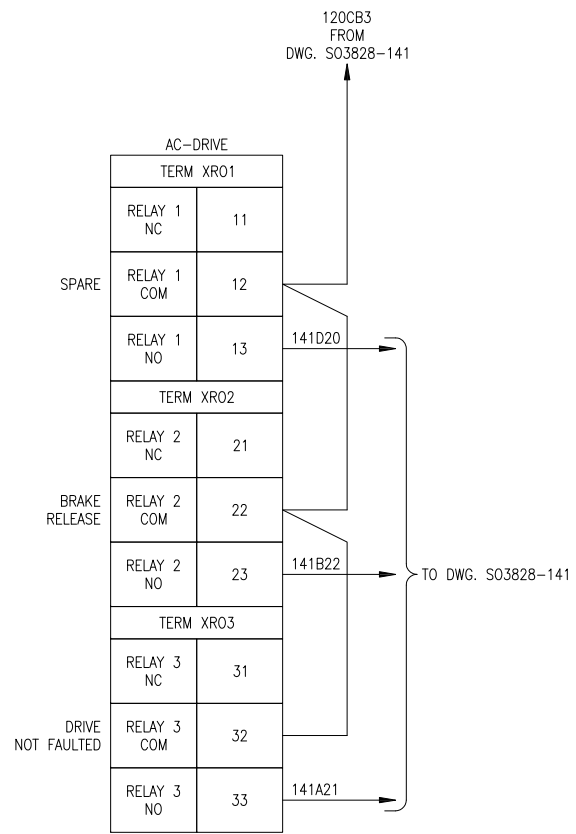
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BARGE UNLOADER 1 RETURN DRIVE POWER ELEMENTARY DIAGRAM	ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL
S03828-145	Rev. 0



AC-DRIVE

TERM XPOW	
1	+24VI
2	GND
TERM XAI	
1	+VREF
2	-VERF
3	AGND
4	AI1+
5	AI1-
6	AI2+
7	AI2-
J1	J1
J2	J2
TERM XAO	
1	A01
2	AGND
3	A02
4	AGND
TERM XD2D	
1	B
2	A
3	BGND
J3	J3

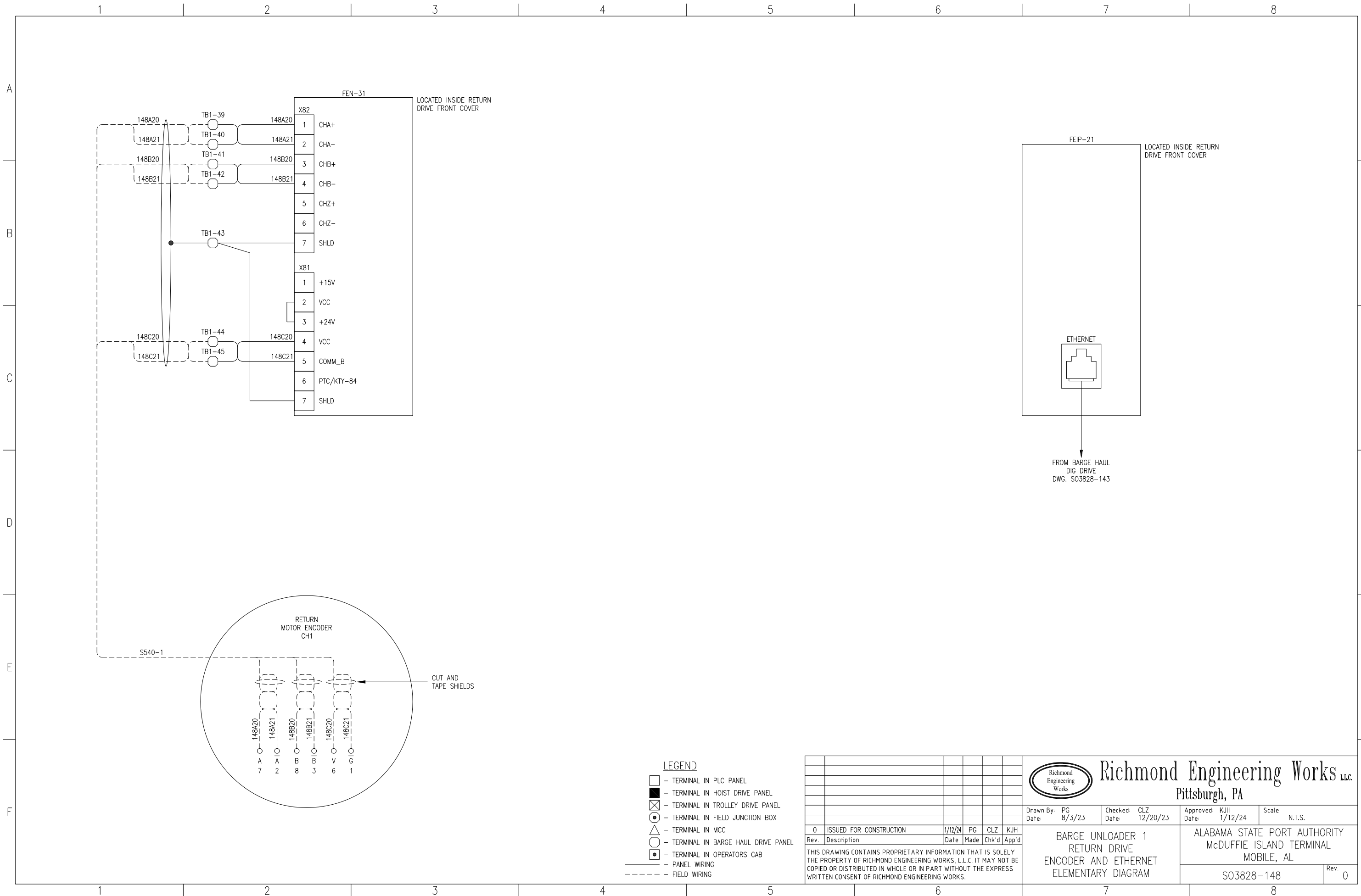


- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - ◻ - TERMINAL IN OPERATORS CAB
 - - PANEL WIRING
 - - - - - FIELD WIRING

0	ISSUED FOR CONSTRUCTION	1/12/24	PG	CLZ	KJH
Rev.	Description	Date	Made	Chk'd	App'd
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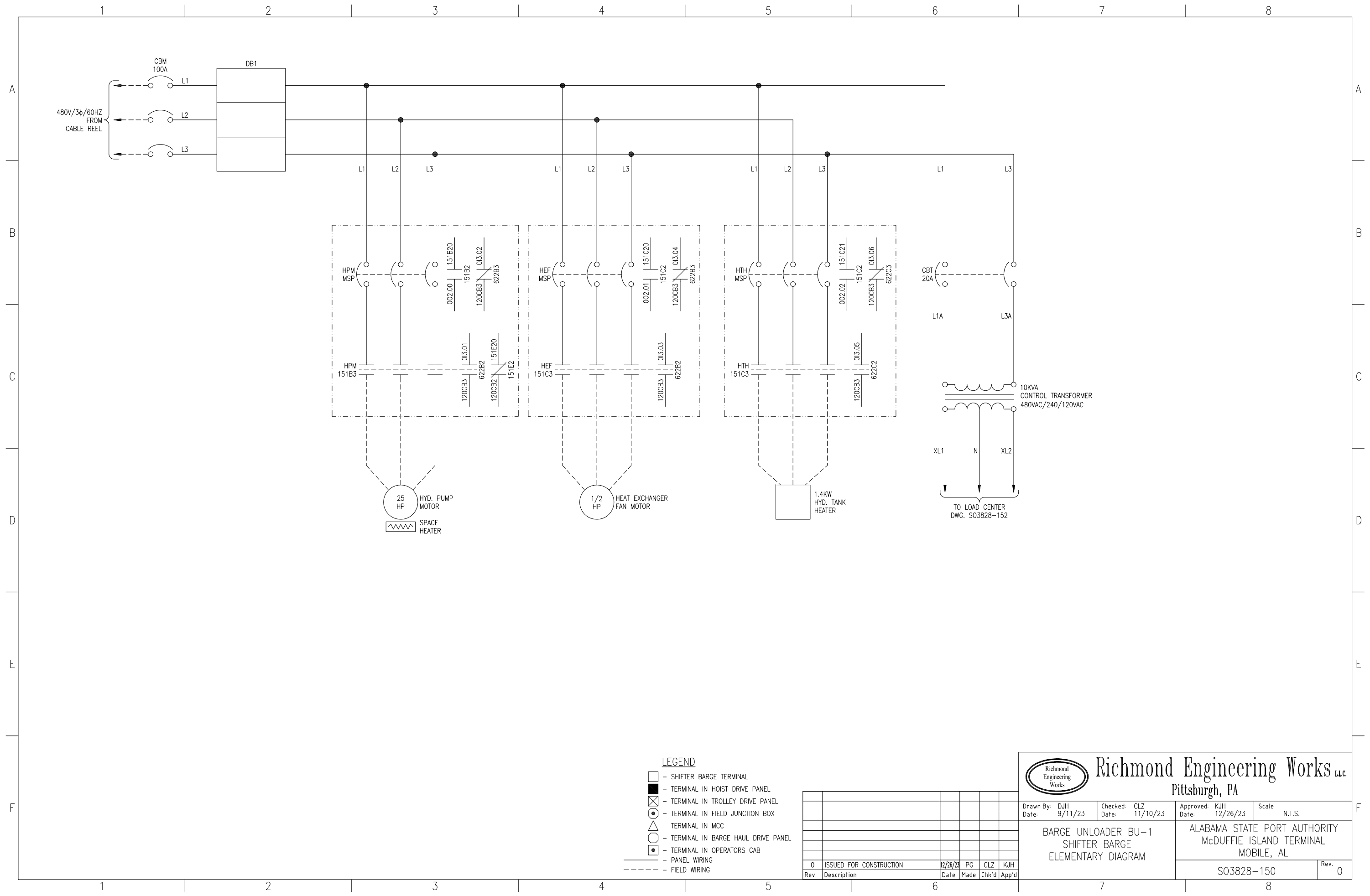
Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: PG Date: 8/3/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
BARGE UNLOADER 1 RETURN DRIVE CONTROL ELEMENTARY DIAGRAM		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
		S03828-147	Rev. 0




Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: PG Date: 8/3/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
BARGE UNLOADER 1 RETURN DRIVE ENCODER AND ETHERNET ELEMENTARY DIAGRAM		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
		S03828-148	Rev. 0



- LEGEND**
- - SHIFTER BARGE TERMINAL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - - TERMINAL IN FIELD JUNCTION BOX
 - - TERMINAL IN MCC
 - △ - TERMINAL IN BARGE HAUL DRIVE PANEL
 - ◻ - TERMINAL IN OPERATORS CAB
 - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/26/23	PG	CLZ	KJH



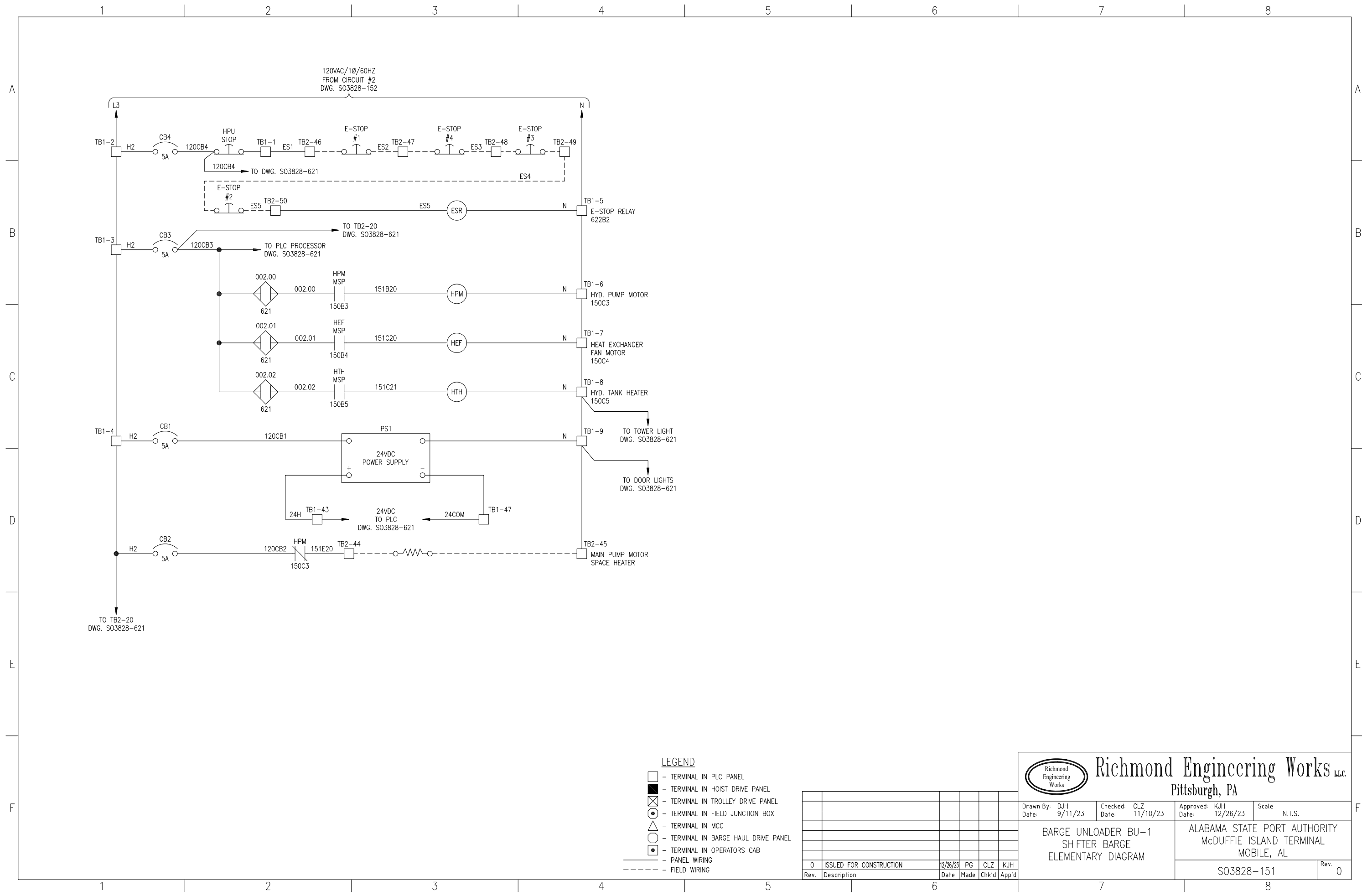
Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: DJH Date: 9/11/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/26/23	Scale: N.T.S.
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**BARGE UNLOADER BU-1
SHIFTER BARGE
ELEMENTARY DIAGRAM**

ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	Rev. 0
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S03828-150



LEGEND

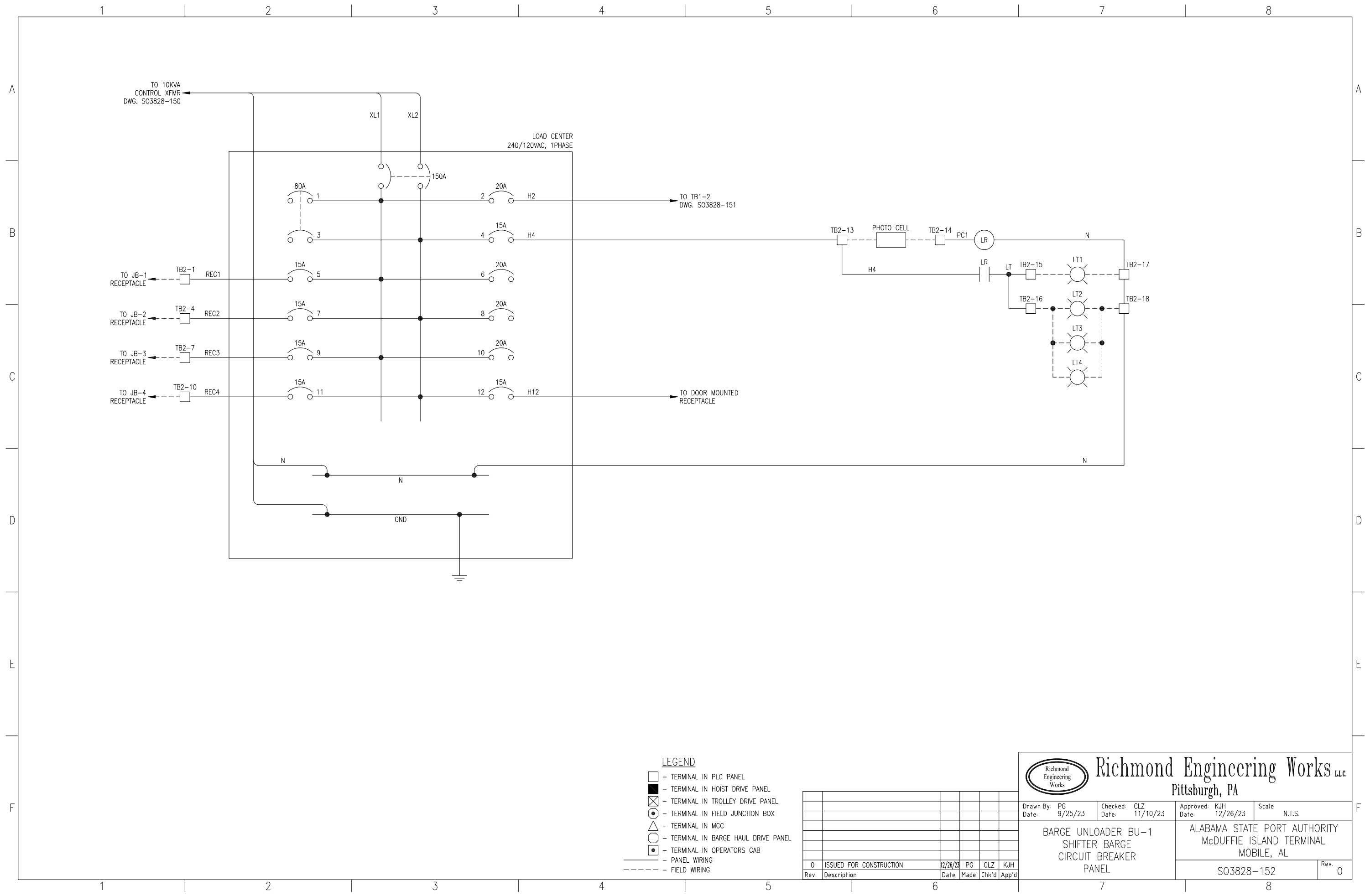
- - TERMINAL IN PLC PANEL
- - TERMINAL IN HOIST DRIVE PANEL
- ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
- ⊙ - TERMINAL IN FIELD JUNCTION BOX
- △ - TERMINAL IN MCC
- - TERMINAL IN BARGE HAUL DRIVE PANEL
- - TERMINAL IN OPERATORS CAB
- - PANEL WIRING
- - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/26/23	PG	CLZ	KJH




Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: DJH Date: 9/11/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/26/23	Scale: N.T.S.
BARGE UNLOADER BU-1 SHIFTER BARGE ELEMENTARY DIAGRAM		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03828-151			Rev. 0



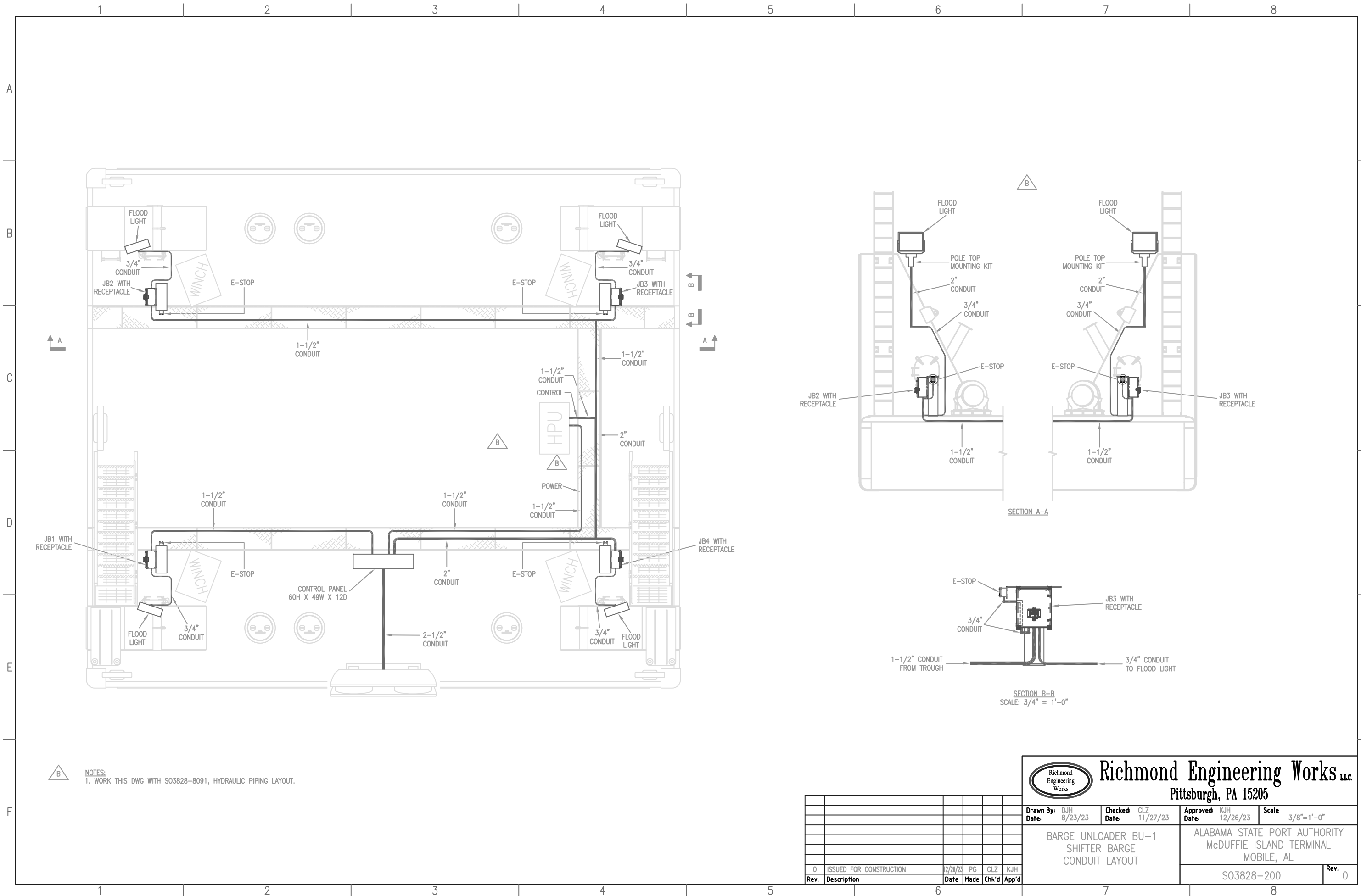
- LEGEND**
- - TERMINAL IN PLC PANEL
 - - TERMINAL IN HOIST DRIVE PANEL
 - ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
 - ⊙ - TERMINAL IN FIELD JUNCTION BOX
 - △ - TERMINAL IN MCC
 - - TERMINAL IN BARGE HAUL DRIVE PANEL
 - - TERMINAL IN OPERATORS CAB
 - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Make	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/26/23	PG	CLZ	KJH



Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: PG Date: 9/25/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/26/23	Scale: N.T.S.
BARGE UNLOADER BU-1 SHIFTER BARGE CIRCUIT BREAKER PANEL		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
		S03828-152	Rev. 0



NOTES:
1. WORK THIS DWG WITH S03828-8091, HYDRAULIC PIPING LAYOUT.

Richmond Engineering Works LLC
Pittsburgh, PA 15205

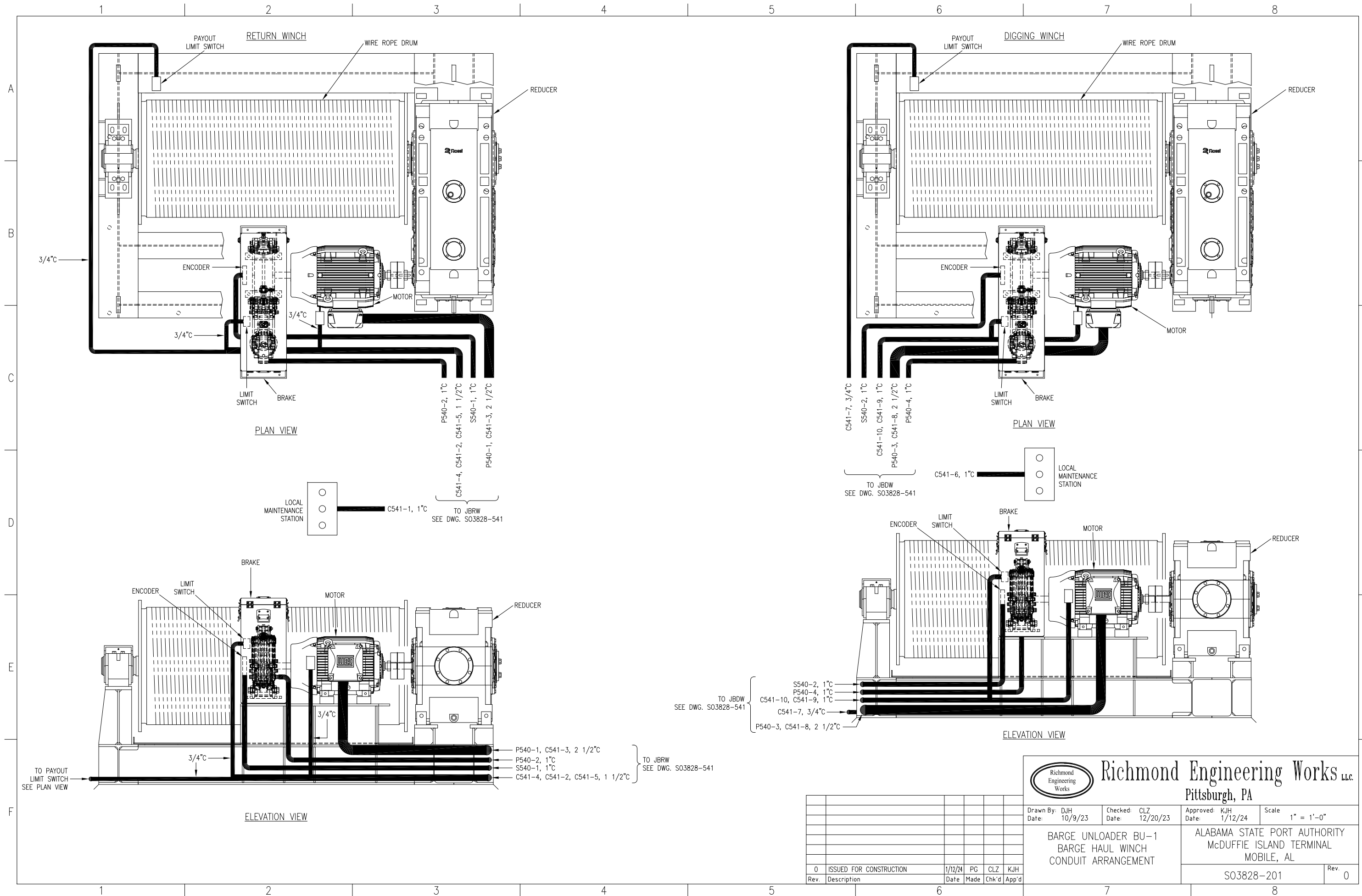
Drawn By: DJH Date: 8/23/23
Checked: CLZ Date: 11/27/23
Approved: KJH Date: 12/26/23
Scale: 3/8"=1'-0"

BARGE UNLOADER BU-1
SHIFTER BARGE
CONDUIT LAYOUT

ALABAMA STATE PORT AUTHORITY
McDUFFIE ISLAND TERMINAL
MOBILE, AL

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/26/23	PG	CLZ	KJH

S03828-200 Rev. 0



Richmond Engineering Works LLC
 Pittsburgh, PA

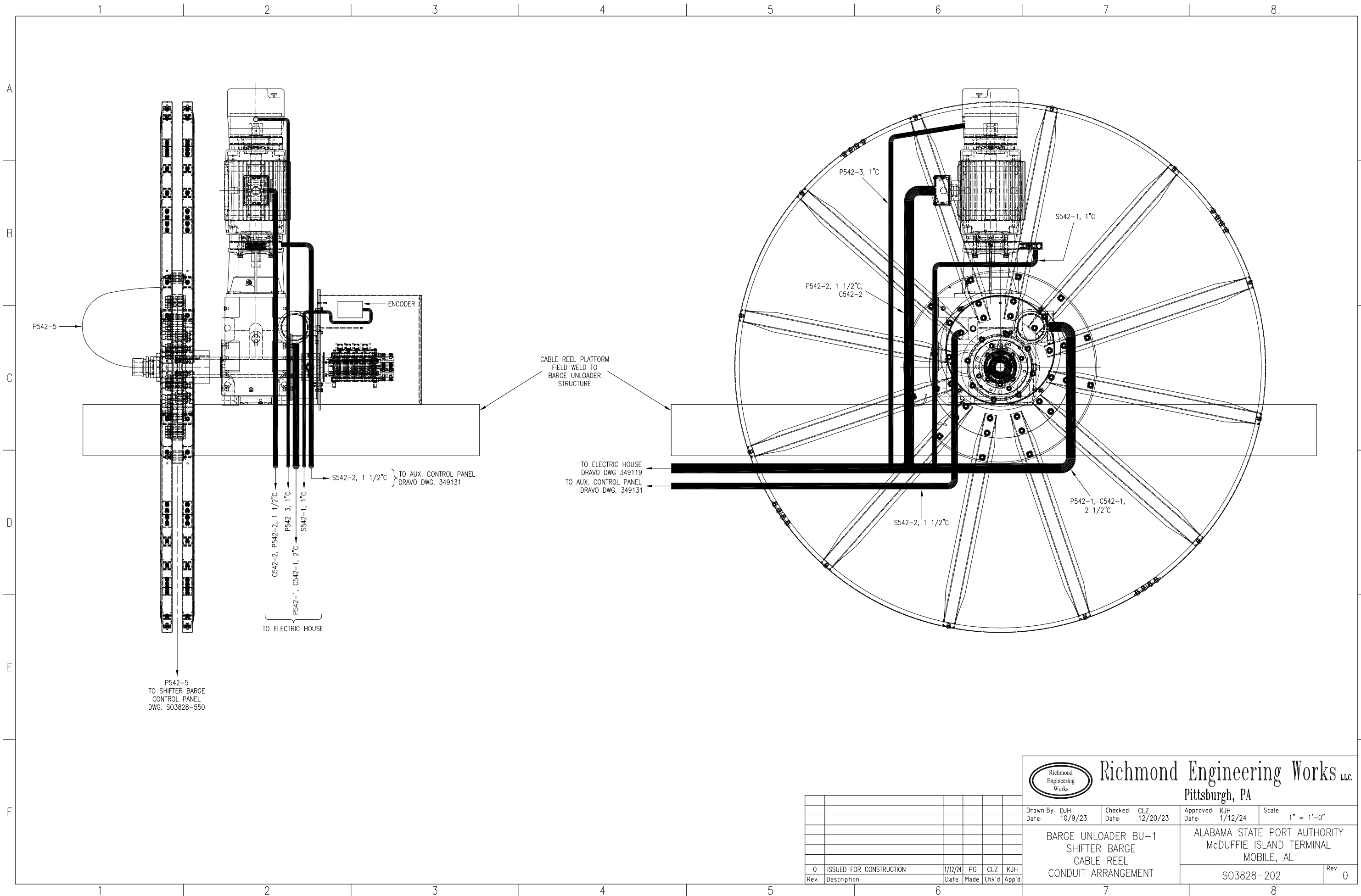
Drawn By: DJH Date: 10/9/23
 Checked: CLZ Date: 12/20/23
 Approved: KJH Date: 1/12/24
 Scale: 1" = 1'-0"

BARGE UNLOADER BU-1
 BARGE HAUL WINCH
 CONDUIT ARRANGEMENT

ALABAMA STATE PORT AUTHORITY
 McDUFFIE ISLAND TERMINAL
 MOBILE, AL

S03828-201 Rev. 0

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	PG	CLZ	KJH




Richmond Engineering Works LLC.
 Pittsburgh, PA

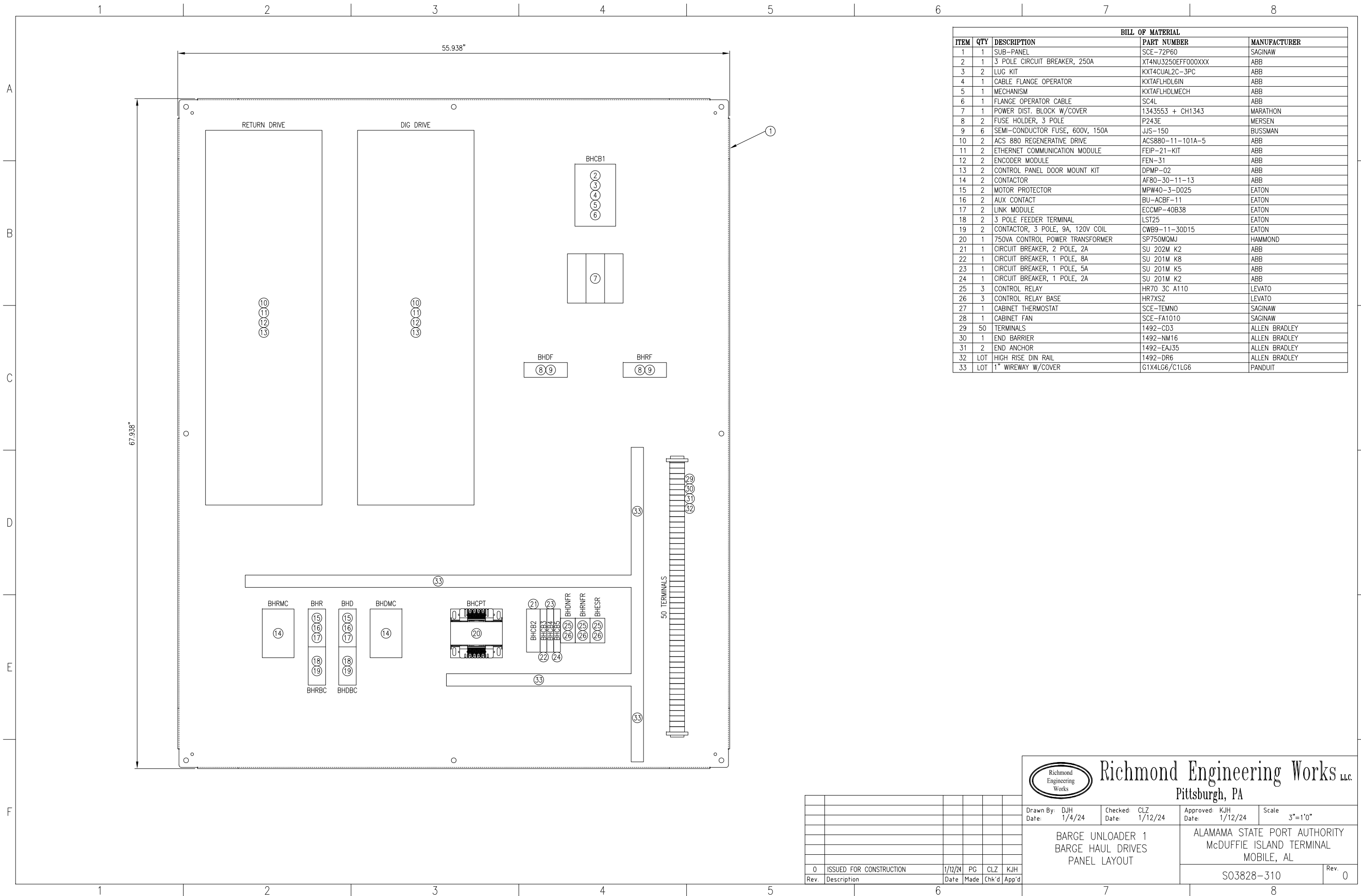
Drawn By: DJH Date: 10/9/23
 Checked: CLZ Date: 12/20/23
 Approved: KJH Date: 1/12/24
 Scale: 1" = 1'-0"

BARGE UNLOADER BU-1
SHIFTER BARGE
CABLE REEL
CONDUIT ARRANGEMENT

ALABAMA STATE PORT AUTHORITY
 McDUFFIE ISLAND TERMINAL
 MOBILE, AL

S03828-202 Rev. 0

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	PG	CLZ	KJH



BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	PART NUMBER	MANUFACTURER
1	1	SUB-PANEL	SCE-72P60	SAGINAW
2	1	3 POLE CIRCUIT BREAKER, 250A	XT4NU3250EFF000XXX	ABB
3	2	LUG KIT	KXT4CUAL2C-3PC	ABB
4	1	CABLE FLANGE OPERATOR	KXTAFHLDL6IN	ABB
5	1	MECHANISM	KXTAFHLDLMECH	ABB
6	1	FLANGE OPERATOR CABLE	SC4L	ABB
7	1	POWER DIST. BLOCK W/COVER	1343553 + CH1343	MARATHON
8	2	FUSE HOLDER, 3 POLE	P243E	MERSEN
9	6	SEMI-CONDUCTOR FUSE, 600V, 150A	JJS-150	BUSSMAN
10	2	ACS 880 REGENERATIVE DRIVE	ACS880-11-101A-5	ABB
11	2	ETHERNET COMMUNICATION MODULE	FEIP-21-KIT	ABB
12	2	ENCODER MODULE	FEN-31	ABB
13	2	CONTROL PANEL DOOR MOUNT KIT	DPMP-02	ABB
14	2	CONTACTOR	AF80-30-11-13	ABB
15	2	MOTOR PROTECTOR	MPW40-3-D025	EATON
16	2	AUX CONTACT	BU-ACBF-11	EATON
17	2	LINK MODULE	ECCMP-40B38	EATON
18	2	3 POLE FEEDER TERMINAL	LST25	EATON
19	2	CONTACTOR, 3 POLE, 9A, 120V COIL	CWB9-11-30D15	EATON
20	1	750VA CONTROL POWER TRANSFORMER	SP750MQMJ	HAMMOND
21	1	CIRCUIT BREAKER, 2 POLE, 2A	SU 202M K2	ABB
22	1	CIRCUIT BREAKER, 1 POLE, 8A	SU 201M K8	ABB
23	1	CIRCUIT BREAKER, 1 POLE, 5A	SU 201M K5	ABB
24	1	CIRCUIT BREAKER, 1 POLE, 2A	SU 201M K2	ABB
25	3	CONTROL RELAY	HR70 3C A110	LEVATO
26	3	CONTROL RELAY BASE	HR7XSZ	LEVATO
27	1	CABINET THERMOSTAT	SCE-TEMNO	SAGINAW
28	1	CABINET FAN	SCE-FA1010	SAGINAW
29	50	TERMINALS	1492-CD3	ALLEN BRADLEY
30	1	END BARRIER	1492-NM16	ALLEN BRADLEY
31	2	END ANCHOR	1492-EAJ35	ALLEN BRADLEY
32	LOT	HIGH RISE DIN RAIL	1492-DR6	ALLEN BRADLEY
33	LOT	1" WIREWAY W/COVER	G1X4LG6/C1LG6	PANDUIT


Richmond Engineering Works LLC
 Pittsburgh, PA

Drawn By: DJH Checked: CLZ Approved: KJH Scale: 3"=1'0"
 Date: 1/4/24 Date: 1/12/24 Date: 1/12/24

BARGE UNLOADER 1
BARGE HAUL DRIVES
PANEL LAYOUT

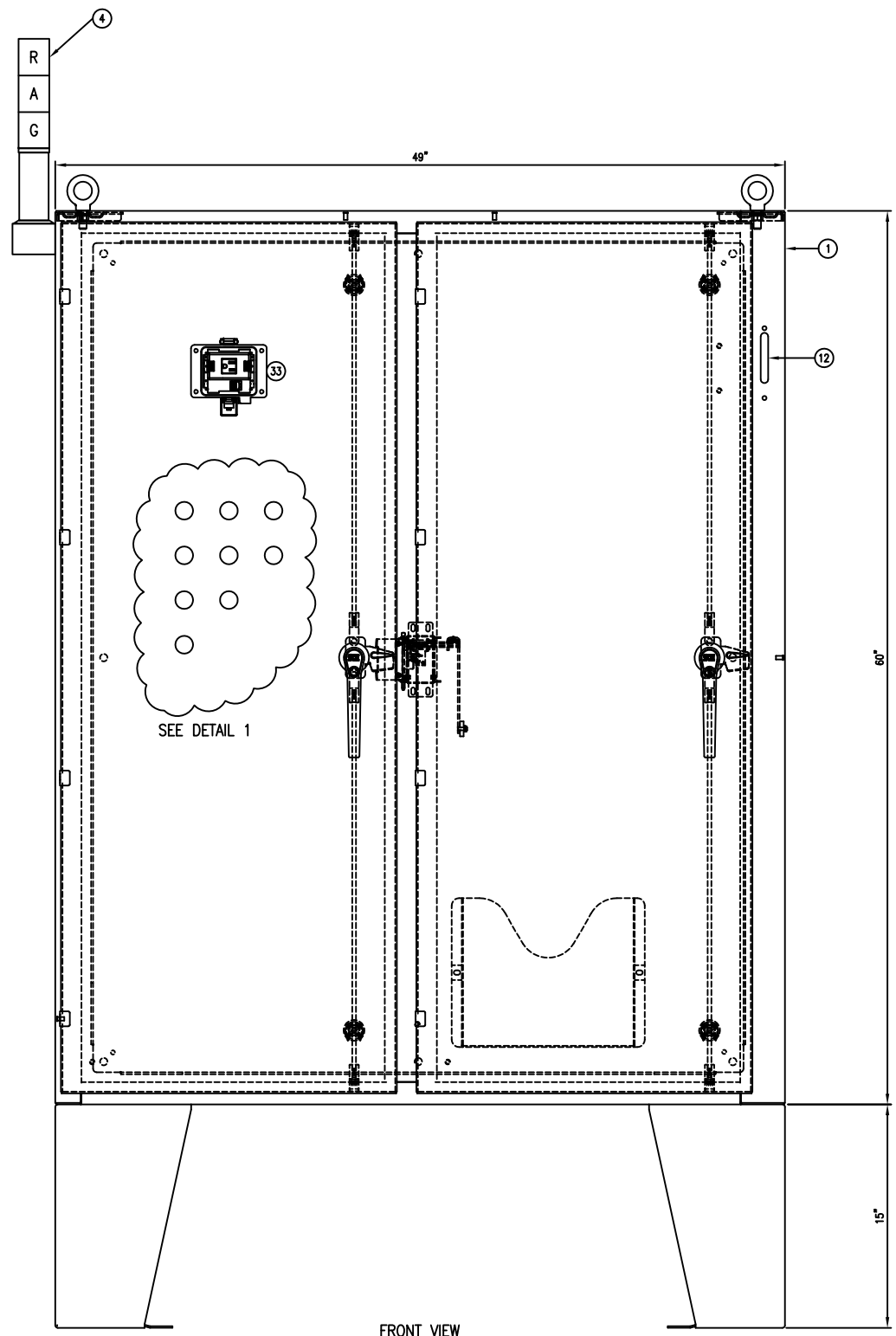
ALAMAMA STATE PORT AUTHORITY
 McDUFFIE ISLAND TERMINAL
 MOBILE, AL

S03828-310 Rev. 0

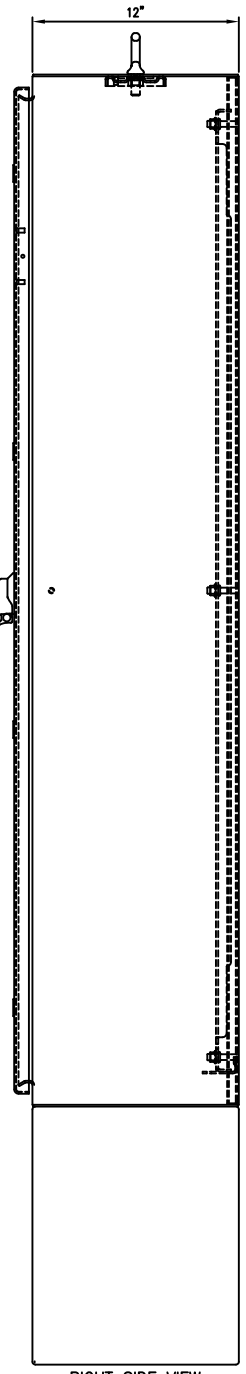
Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	PG	CLZ	KJH

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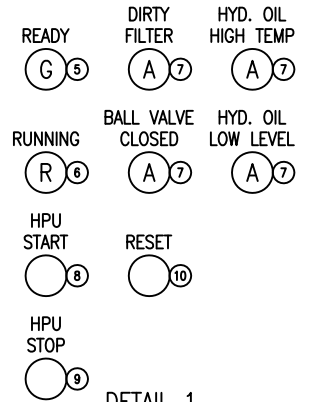
A
B
C
D
E
F
G



FRONT VIEW

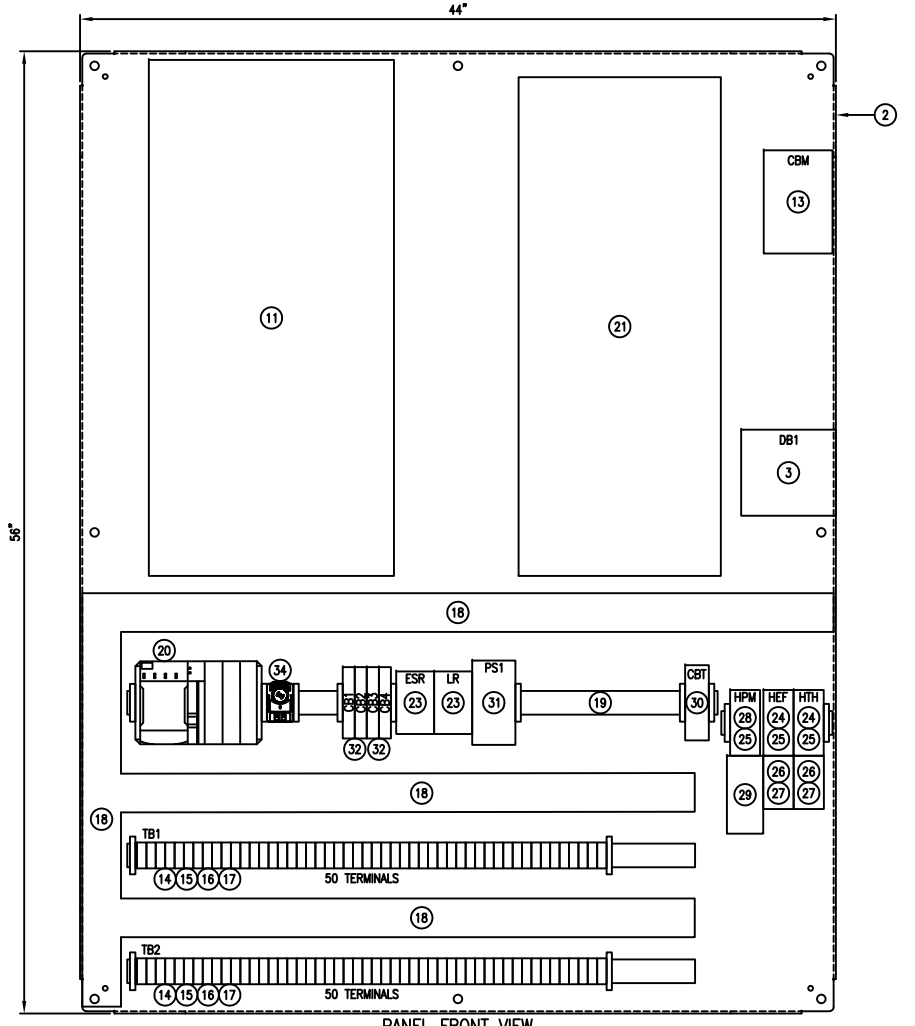


RIGHT SIDE VIEW



DETAIL 1
N.T.S.

BILL OF MATERIAL			
ITEM	QTY	DESCRIPTION	MANUFACTURER
1	1	NEMA 4X STAINLESS STEEL ENCLOSURE	SCE-60XEL4912SSLP
2	1	SUB-PANEL	SCE-60P48
3	1	DISTRIBUTION BLOCK W/COVER	1343580 W/CH1343
4	1	3 LIGHT TOWER W/VERTICAL MOUNTING BASE	WTL-50P2-DDGDADR/WTL-50BPV
5	1	GREEN PILOT LIGHT	800H-QRH10G
6	1	RED PILOT LIGHT	800H-QRH10R
7	4	AMBER PILOT LIGHT	800H-QRH10A
8	1	GREEN PUSH BUTTON	800H-AR1D1
9	1	RED MUSHROOM HEAD PUSH BUTTON	800H-FRX16A5
10	1	BLACK PUSH BUTTON	800H-AR2D1
11	1	LOAD CENTER W/BREAKERS	HOMELINE SERIES
12	1	HANDLE MECHANISM W/CABLE	FHP5X-UBW225
13	1	CIRCUIT BREAKER	UBW225NFTU1003A
14	100	TERMINALS	1492-CD3
15	2	END BARRIER	1492-NM16
16	4	END ANCHOR	1492-EAJ35
17	LOT	HIGH RISE DIN RAIL	1492-DR6
18	LOT	2" WIREWAY W/COVER	G2X4L66/C2L66
19	LOT	LOW RISE DIN RAIL	199-DR1
20	1	PLC	5069 COMPACTLOGIX
21	1	10KVA CONTROL TRANSFORMER	C1FD1LES
22	1	PHOTO CELL	INTR EK 4236S
23	2	CONTROL RELAY	700P400A1
24	2	ROTARY MANUAL MOTOR PROTECTOR 1.6-2.5A	MPW40-3-D025
25	3	AUXILIARY CONTACT	ACBF-11-B
26	2	CONTACTOR	CWB9-11-30D15
27	2	CONTACTOR CONNECTOR	ECCMP-40B38
28	1	ROTARY MANUAL MOTOR PROTECTOR 32-40A	MPW40-3-U040
29	1	CONTACTOR	CWB2-11-30D15
30	1	2 POLE CIRCUIT BREAKER 20A	SU202M-K20A
31	1	24VDC POWER SUPPLY 5A	PSL1 120 24
32	2	1 POLE CIRCUIT BREAKER 5A	UMBW-4D1-5
33	1	DUPLEX RECEPTACLE W/ENET	P-R2-K2RFO
34	1	TEMPERATURE SWITCH	SCE-TEMNO



PANEL FRONT VIEW

Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: PG 9/12/23 Date: 11/10/23
Checked: CLZ 11/10/23 Date: 12/26/23
Approved: KJH 12/26/23 Date: 12/26/23
Scale: 3" = 1'-0"

BARGE UNLOADER BU-1
SHIFTER BARGE
CONTROL PANEL
LAYOUT

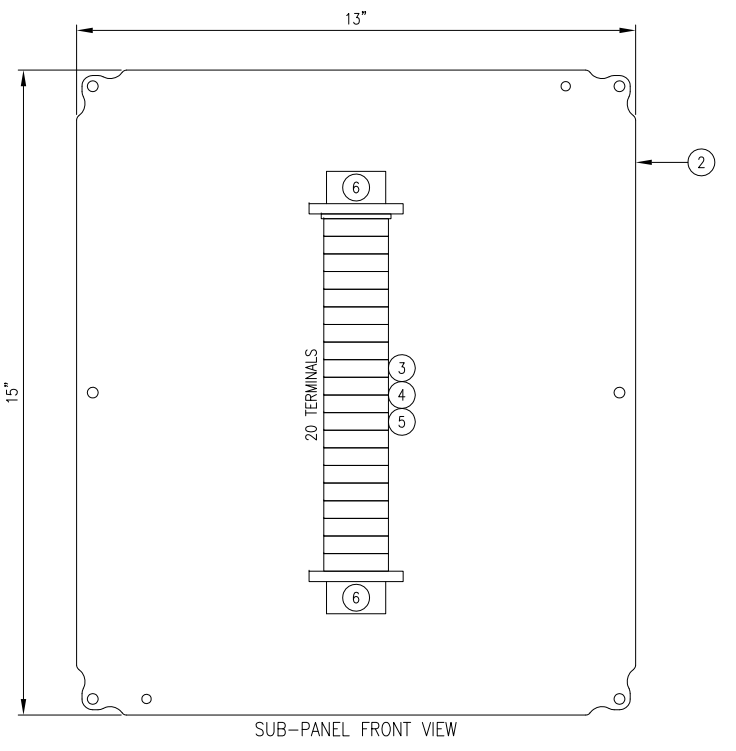
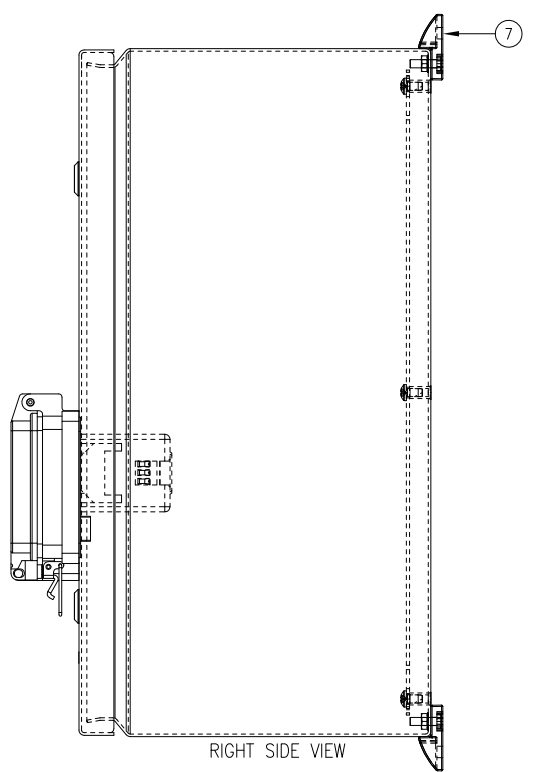
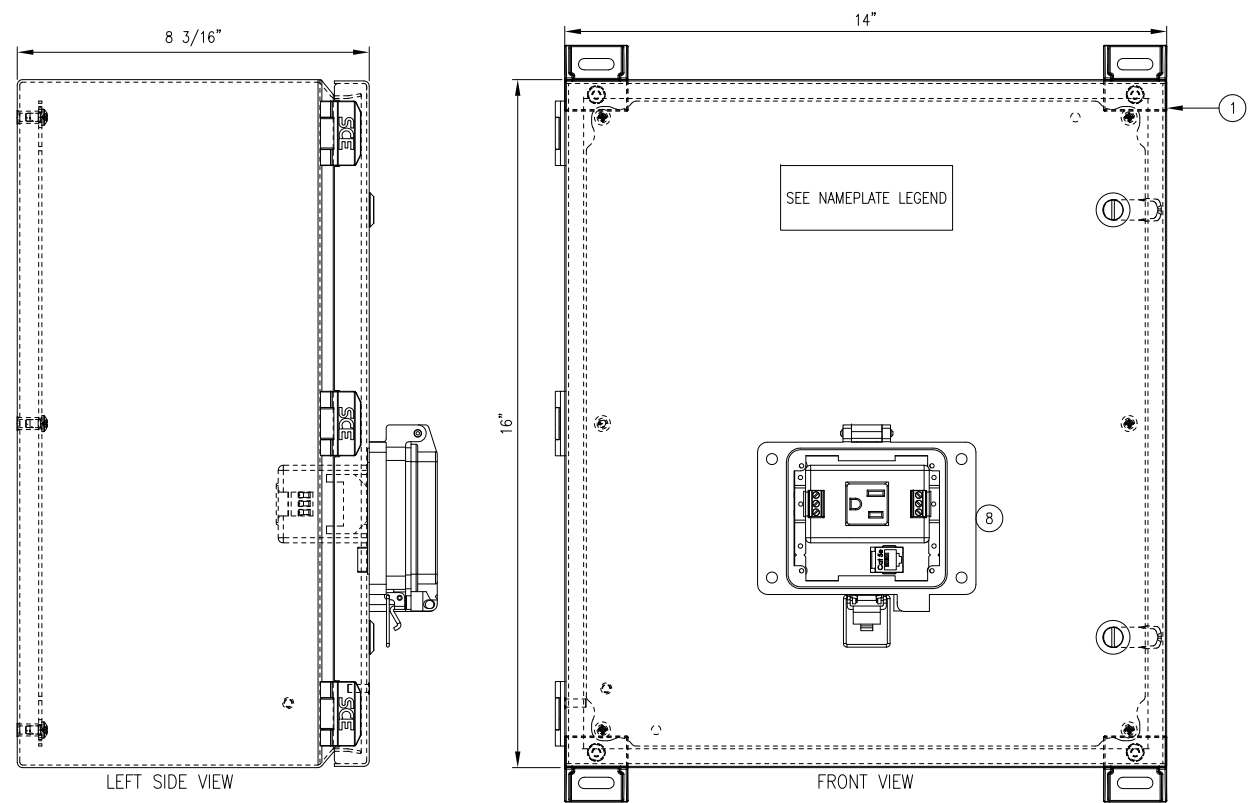
ALABAMA STATE PORT AUTHORITY
McDUFFIE ISLAND TERMINAL
MOBILE, AL

S03828-320 Rev. 0

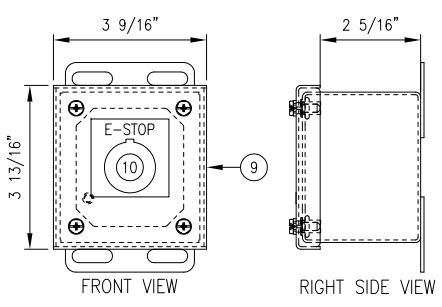
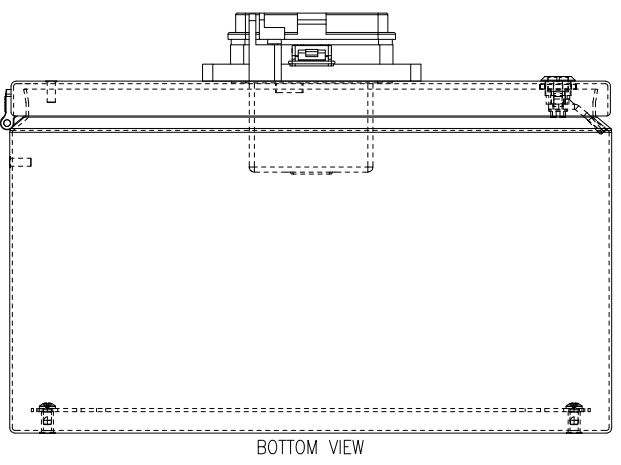
Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/26/23	PG	CLZ	KJH

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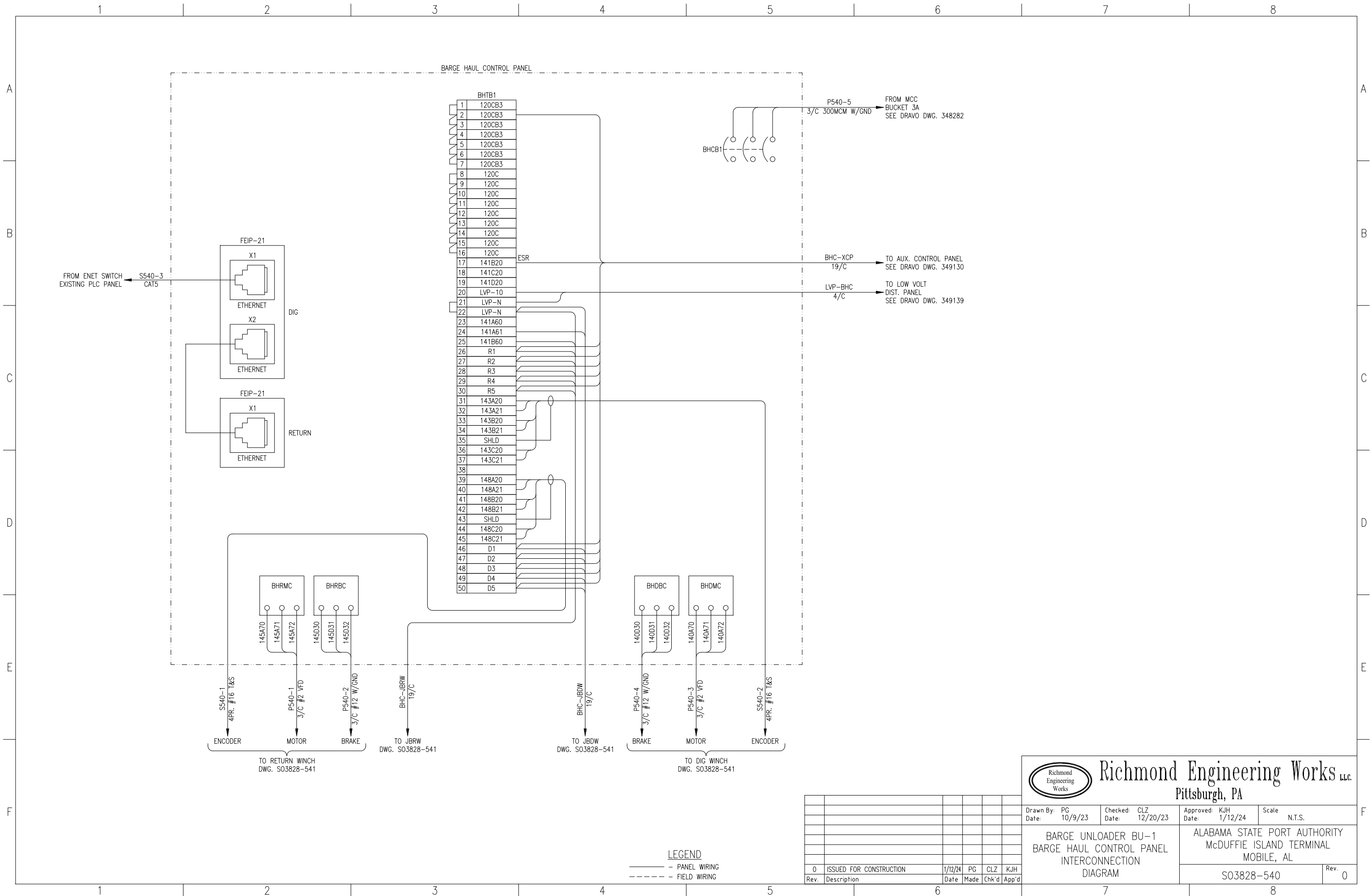
BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	PART NUMBER	MANUFACTURER
1	4	STAINLESS STEEL ENCLOSURE NEMA 4X	SCE-16148LJSS	SAGINAW
2	4	SUB-PANELS	SCE-16P14	SAGINAW
3	80	TERMINAL BLOCKS	1492-CAM1L	ALLEN BRADLEY
4	4	END BARRIERS	1492-NM16	ALLEN BRADLEY
5	8	END ANCHORS	1492-ERL35	ALLEN BRADLEY
6	LOT	35mm LOW RISE DIN RAIL	0801733	PHOENIX
7	4	FOOT MOUNT KIT	SCE-ELJMFK	SAGINAW
8	4	DUPLEX OUTLET	P-R2-K2RFO	GRACE
9	4	1-HOLE ENCLOSURE	SCE-1PBSS	SAGINAW
10	4	RED MUSHROOM HEAD PB	800H-FRXT6A5	ALLEN BRADLEY
11				
12				



NAME PLATE LEGEND
 BOX #1 - "JB-1"
 BOX #2 - "JB-2"
 BOX #3 - "JB-3"
 BOX #4 - "JB-4"



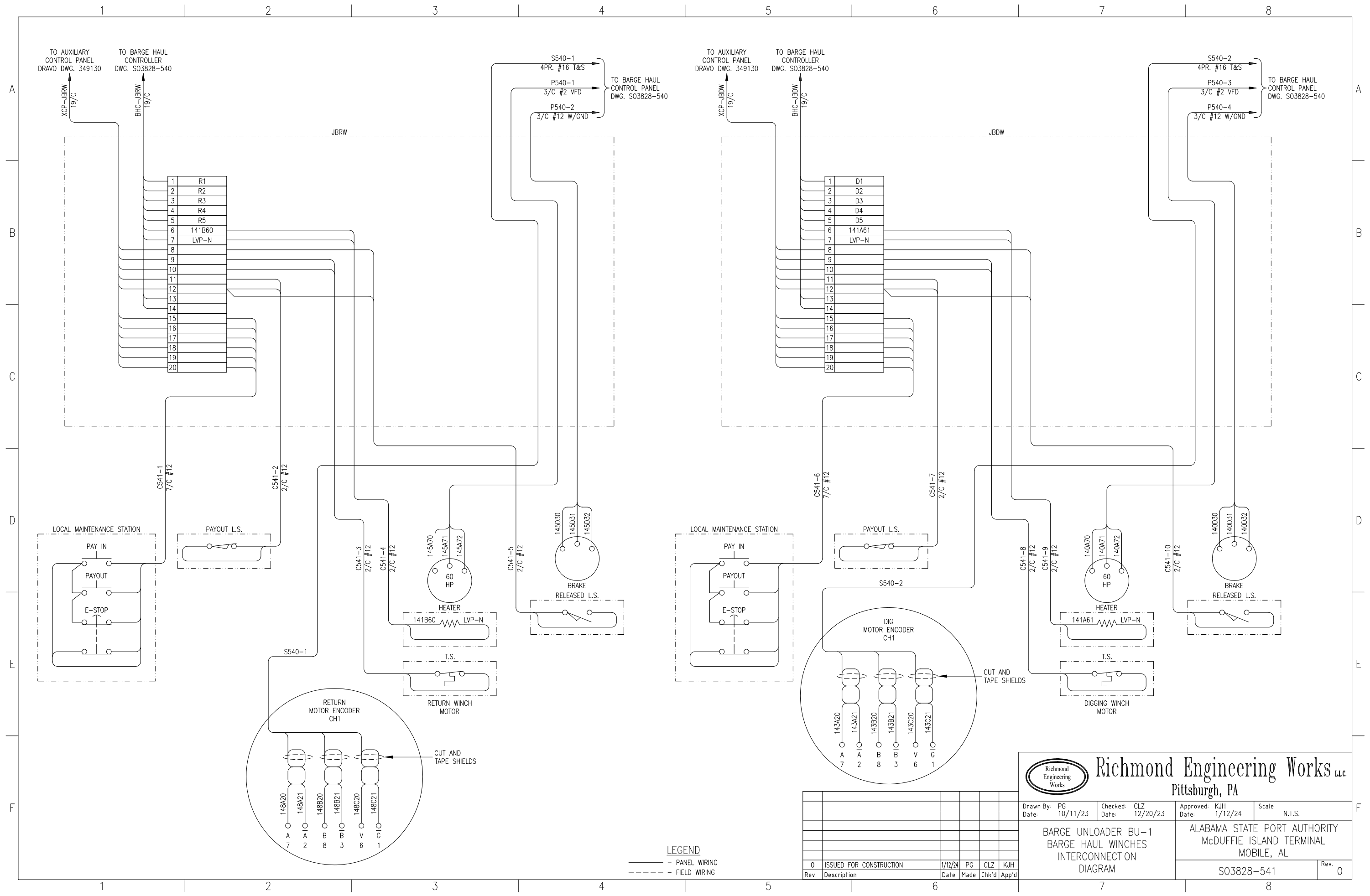
		Richmond Engineering Works LLC Pittsburgh, PA	
		Drawn By: PG Date: 9/27/23	Checked: CLZ Date: 11/10/23
0 ISSUED FOR CONSTRUCTION Rev. Description Date Made Chk'd App'd		BARGE UNLOADER BU-1 SHIFTER BARGE JUNCTION BOX ENCLOSURE & SUB-PANEL LAYOUT	
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Richmond Engineering Works LLC
Pittsburgh, PA


Drawn By: PG Date: 10/9/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
BARGE UNLOADER BU-1 BARGE HAUL CONTROL PANEL INTERCONNECTION DIAGRAM		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
Rev. 0		S03828-540	

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	PG	CLZ	KJH



LEGEND
 ———— PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	1/12/24	PG	CLZ	KJH

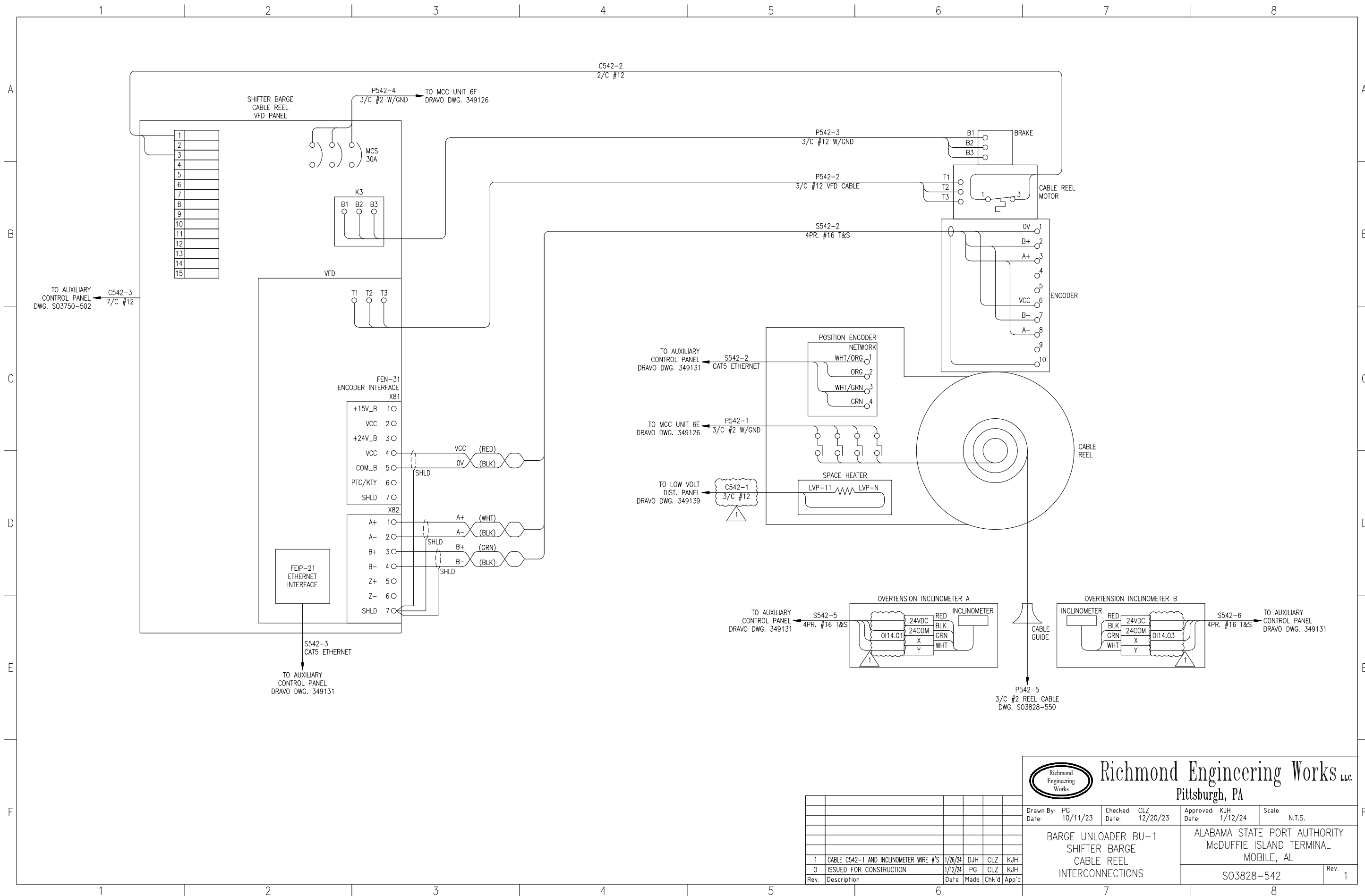


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Pittsburgh, PA

Drawn By: PG Date: 10/11/23	Checked: CLZ Date: 12/20/23	Approved: KJH Date: 1/12/24	Scale: N.T.S.
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**BARGE UNLOADER BU-1
BARGE HAUL WINCHES
INTERCONNECTION
DIAGRAM**

ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	S03828-541	Rev. 0
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 Pittsburgh, PA

Drawn By: PG Date: 10/11/23
 Checked: CLZ Date: 12/20/23
 Approved: KJH Date: 1/12/24
 Scale: N.T.S.

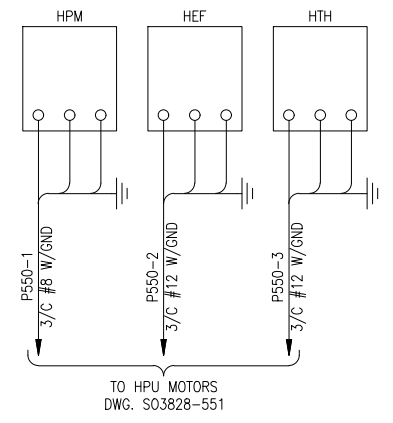
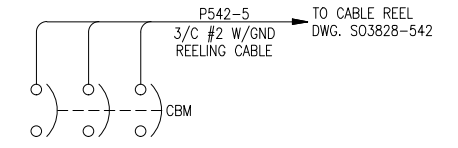
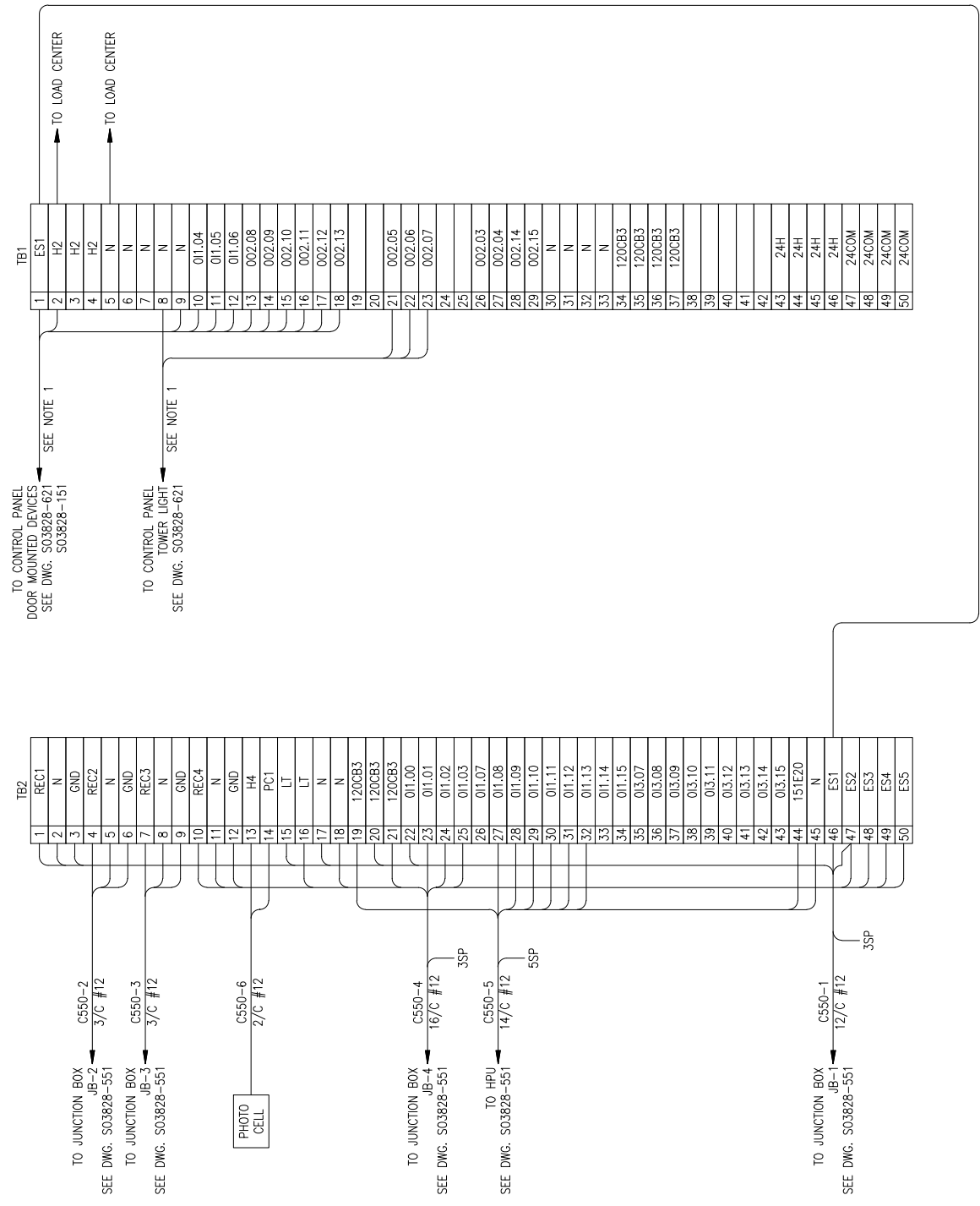
BARGE UNLOADER BU-1
SHIFTER BARGE
CABLE REEL
INTERCONNECTIONS

ALABAMA STATE PORT AUTHORITY
 McDUFFIE ISLAND TERMINAL
 MOBILE, AL

S03828-542


Rev.	Description	Date	PG	CLZ	KJH
1	CABLE C542-1 AND INCLINOMETER WIRE #'S	1/26/24	DJH	CLZ	KJH
0	ISSUED FOR CONSTRUCTION	1/12/24	PG	CLZ	KJH

Rev. 1



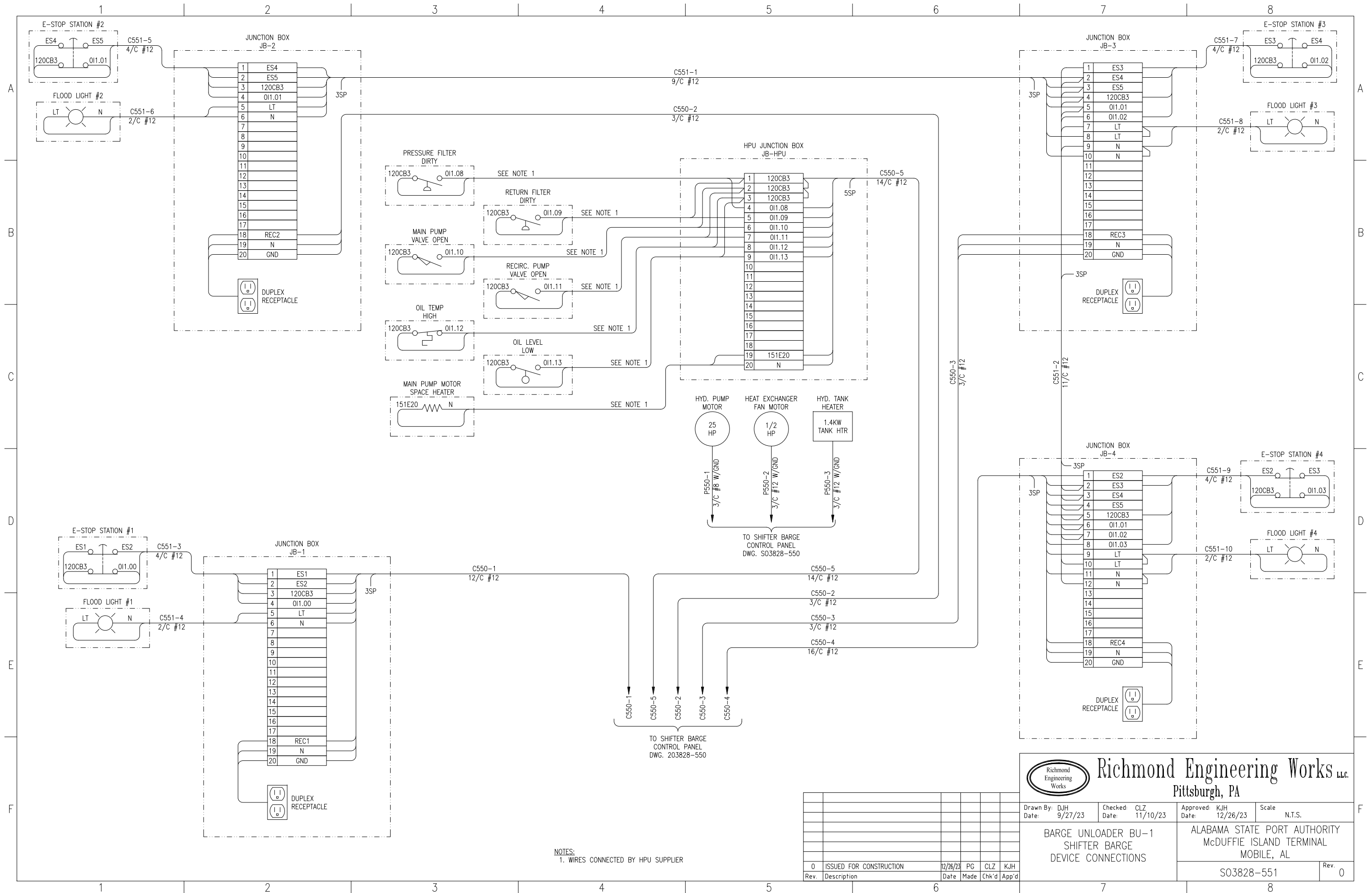
NOTES:
1. WIRES CONNECTED BY PANEL FABRICATOR

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/26/23	PG	CLZ	KJH




Richmond Engineering Works LLC.
Pittsburgh, PA

Drawn By: DJH Date: 9/22/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/26/23	Scale: N.T.S.
BARGE UNLOADER BU-1 SHIFTER BARGE CONTROL PANEL TB1 & TB2 INTERCONNECTION		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03828-550			Rev. 0



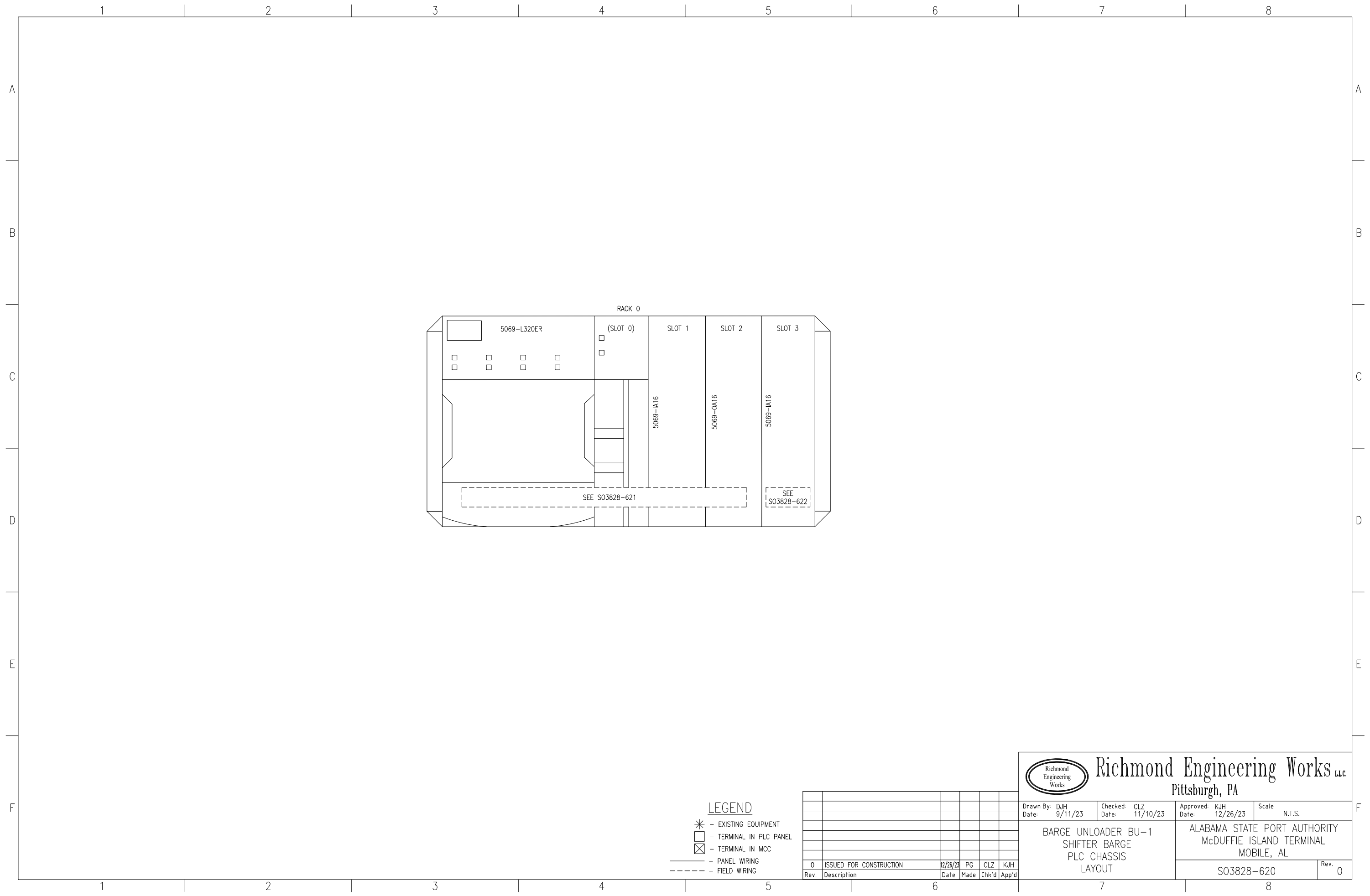
NOTES:
1. WIRES CONNECTED BY HPU SUPPLIER

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/26/23	PG	CLZ	KJH




Richmond Engineering Works LLC.
Pittsburgh, PA

Drawn By: DJH Date: 9/27/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/26/23	Scale: N.T.S.
BARGE UNLOADER BU-1 SHIFTER BARGE DEVICE CONNECTIONS		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03828-551			Rev. 0



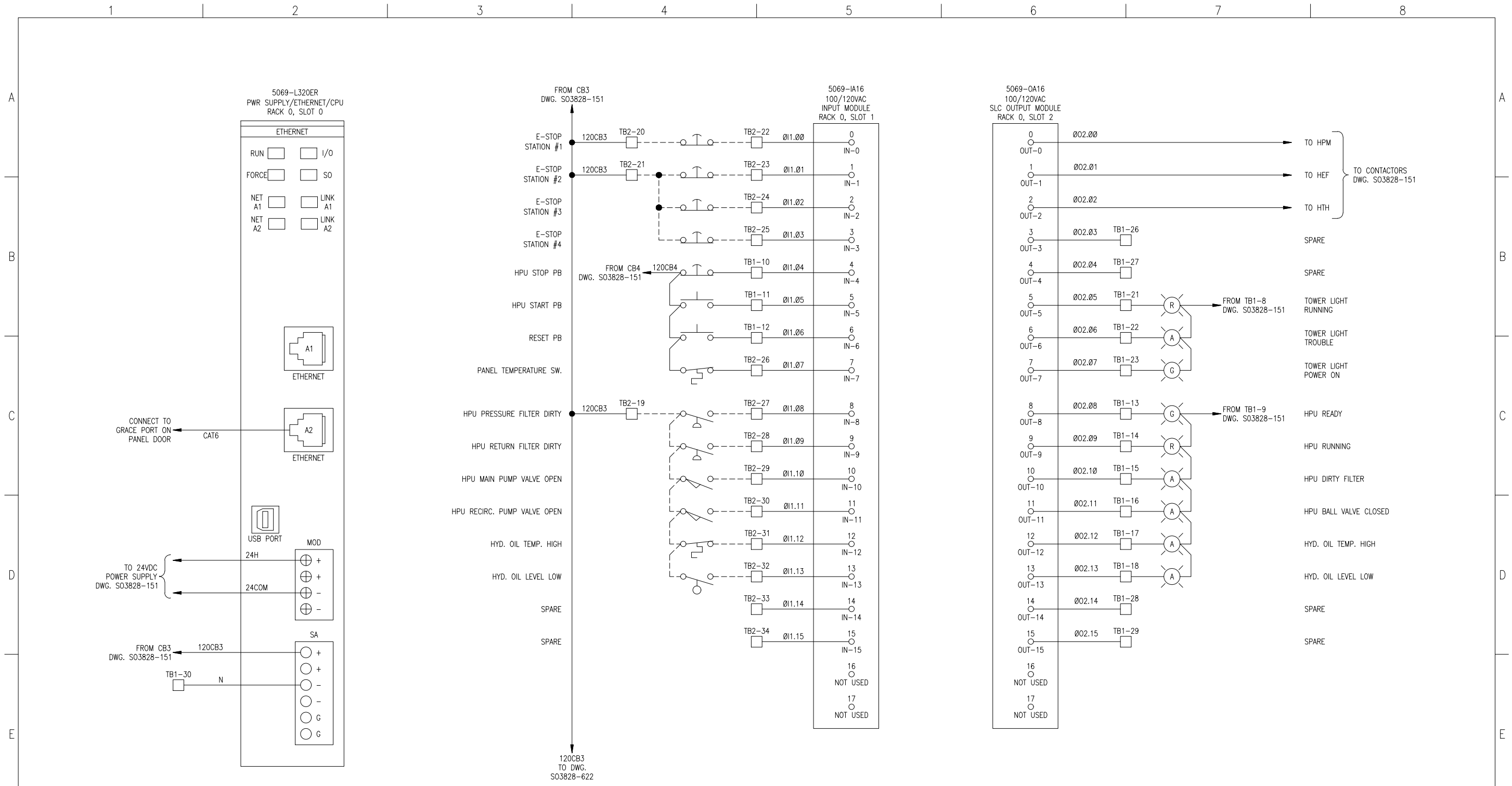
- LEGEND**
- * - EXISTING EQUIPMENT
 - - TERMINAL IN PLC PANEL
 - ⊗ - TERMINAL IN MCC
 - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Make	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/26/23	PG	CLZ	KJH



Richmond Engineering Works LLC.
Pittsburgh, PA

Drawn By: DJH Date: 9/11/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/26/23	Scale: N.T.S.
BARGE UNLOADER BU-1 SHIFTER BARGE PLC CHASSIS LAYOUT		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03828-620			Rev. 0



CONNECT TO GRACE PORT ON PANEL DOOR
CAT6

TO 24VDC POWER SUPPLY
DWG. S03828-151

FROM CB3
DWG. S03828-151

FROM CB3
DWG. S03828-151

120CB3
TO DWG.
S03828-622

5069-IA16
100/120VAC
INPUT MODULE
RACK 0, SLOT 1

5069-OA16
100/120VAC
SLC OUTPUT MODULE
RACK 0, SLOT 2

TO CONTACTORS
DWG. S03828-151

FROM TB1-8
DWG. S03828-151

FROM TB1-9
DWG. S03828-151

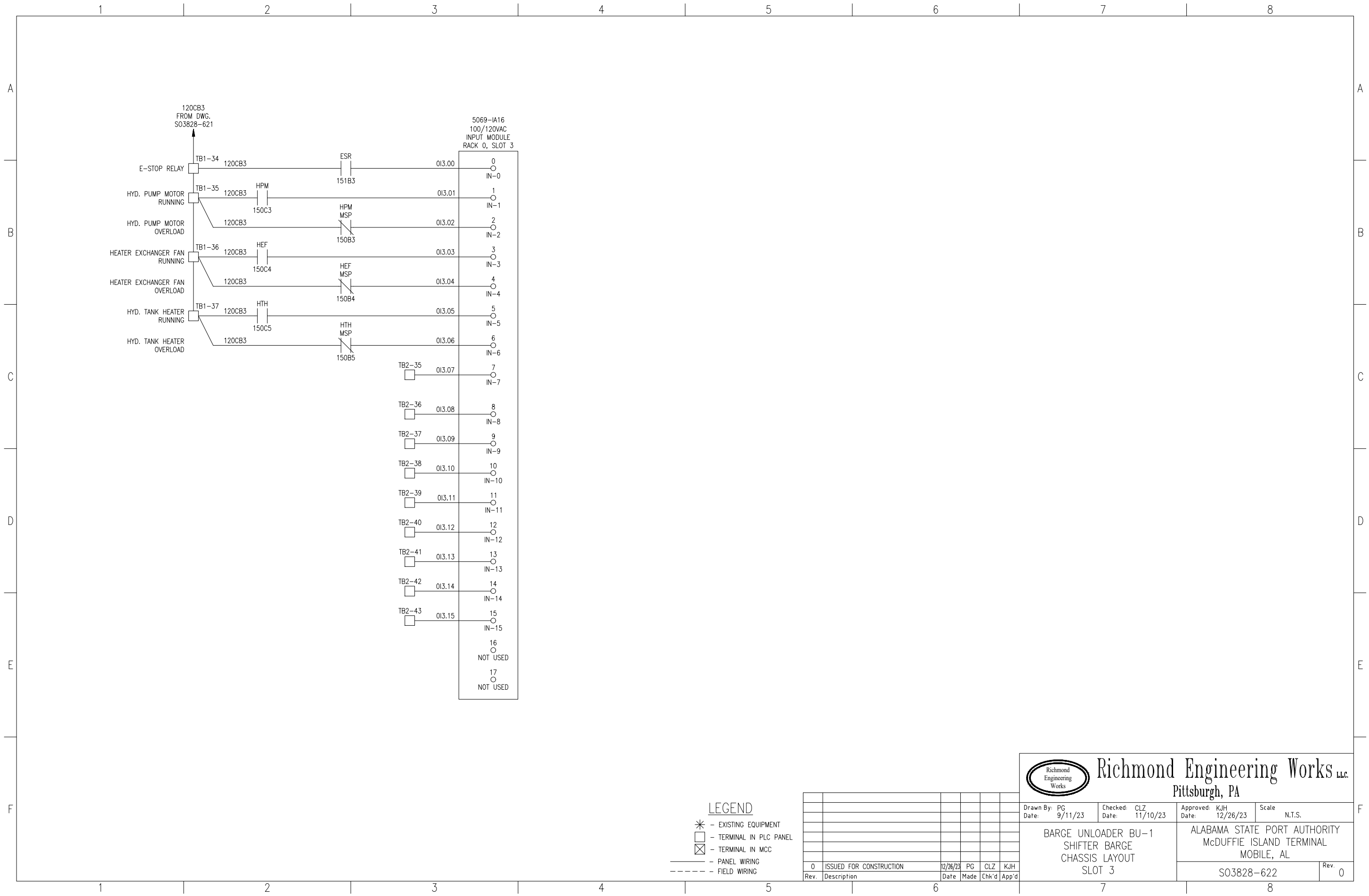
LEGEND

- * - EXISTING EQUIPMENT
- - TERMINAL IN PLC PANEL
- ⊠ - TERMINAL IN MCC
- - PANEL WIRING
- - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/26/23	PG	CLZ	KJH


Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: DJH Date: 9/11/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/26/23	Scale: N.T.S.
BARGE UNLOADER BU-1 SHIFTER BARGE CHASSIS LAYOUT SLOTS 1 & 2		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03828-621			Rev. 0



- LEGEND**
- * - EXISTING EQUIPMENT
 - - TERMINAL IN PLC PANEL
 - ⊠ - TERMINAL IN MCC
 - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	12/26/23	PG	CLZ	KJH



Richmond Engineering Works LLC.
Pittsburgh, PA

Drawn By: PG Date: 9/11/23	Checked: CLZ Date: 11/10/23	Approved: KJH Date: 12/26/23	Scale: N.T.S.
BARGE UNLOADER BU-1 SHIFTER BARGE CHASSIS LAYOUT SLOT 3		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
S03828-622			Rev. 0

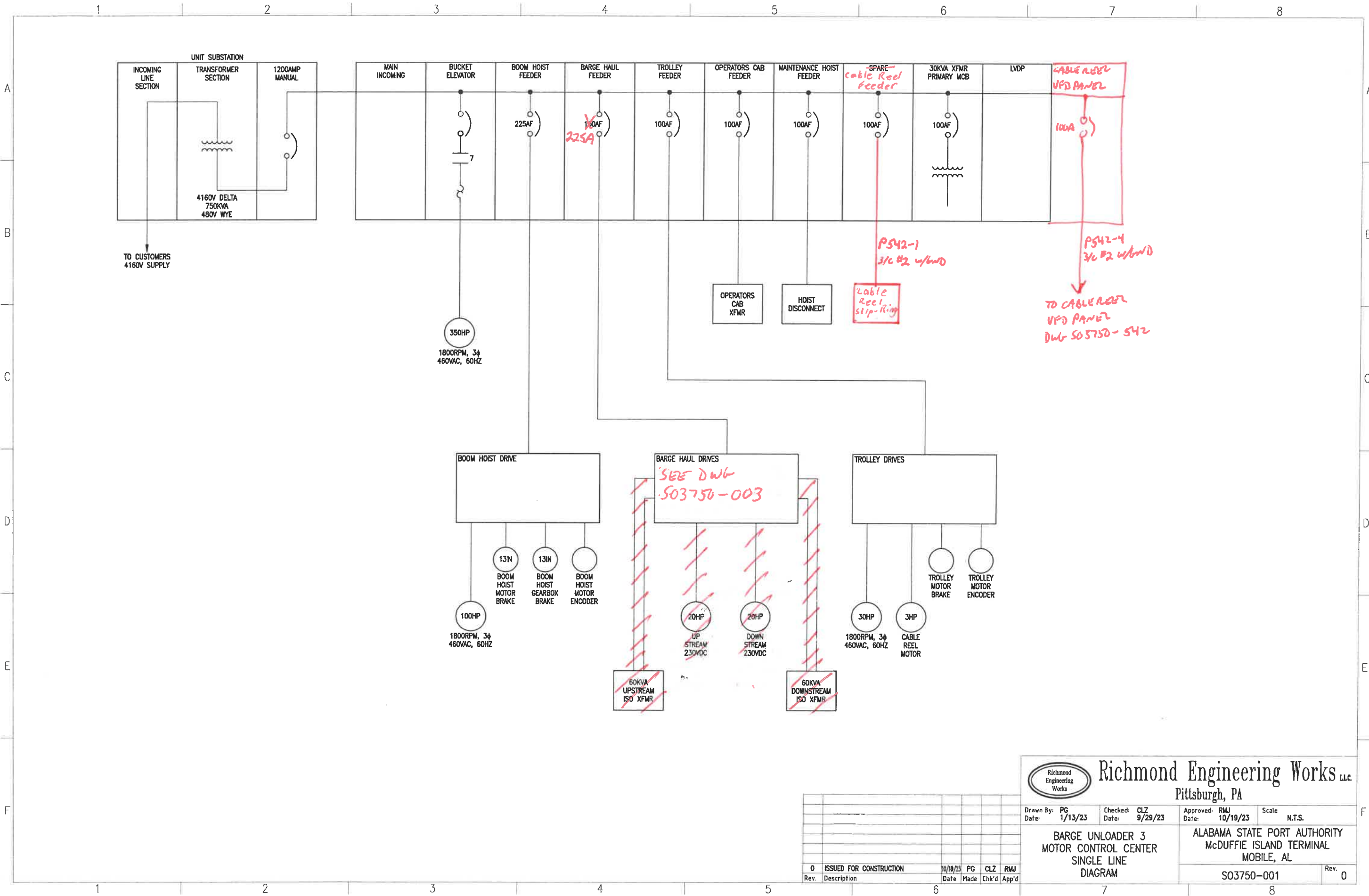
ASPA - McDuffie Island Terminal
 BU1 - Barge Haul System
 Field Cables

CABLE #	FROM	TO	ESTIMATED LENGTH	3C #8 AWG w/GND, 600V	3C #2 AWG VFD CABLE	3C #12 AWG VFD CABLE	3C #2 AWG w/GND	3C #12 AWG w/GND, 600V	3C #300MCM w/GND, 600V	3C #2 AWG w/GND Reeling Cable	2C-#14AWG, 600V	7C-#14AWG, 600V	3C-#12AWG, 600V							4 Pair #16 T&S	Cat5 Ethernet								NOTES
				0	480	320	390	800	70	400	0	440	100	320	0	0	0	0	0	0	0	0	1400	530	0	0	0	0	0
Signal/Communication Cables																													
S540-1	Barge Haul Control Panel	Return Winch Motor Encoder																			260								
S540-2	Barge Haul Control Panel	Digging Winch Motor Encoder																			220								
S540-3	Barge Haul Control Panel	Auxiliary Control Panel																				70							
S540-4	Barge Haul Control Panel	Auxiliary Control Panel																				70							Spare
S542-1	Cable Reel VFD Panel	Cable Reel Motor Encoder																				320							
S542-2	Auxiliary Control Panel	Cable Reel Position Encoder																					320						
S542-3	Cable Reel VFD Panel	Auxiliary Control Panel																					70						
S542-5	Auxiliary Control Panel	Cable Reel Tension Inclinator A																						300					
S542-6	Auxiliary Control Panel	Cable Reel Tension Inclinator B																							300				

Cable lengths are estimated, final length determined by actual routing.

Rev. 1

1/26/2024



Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: PG Date: 1/13/23
Checked: CLZ Date: 9/29/23
Approved: RMJ Date: 10/19/23
Scale: N.T.S.

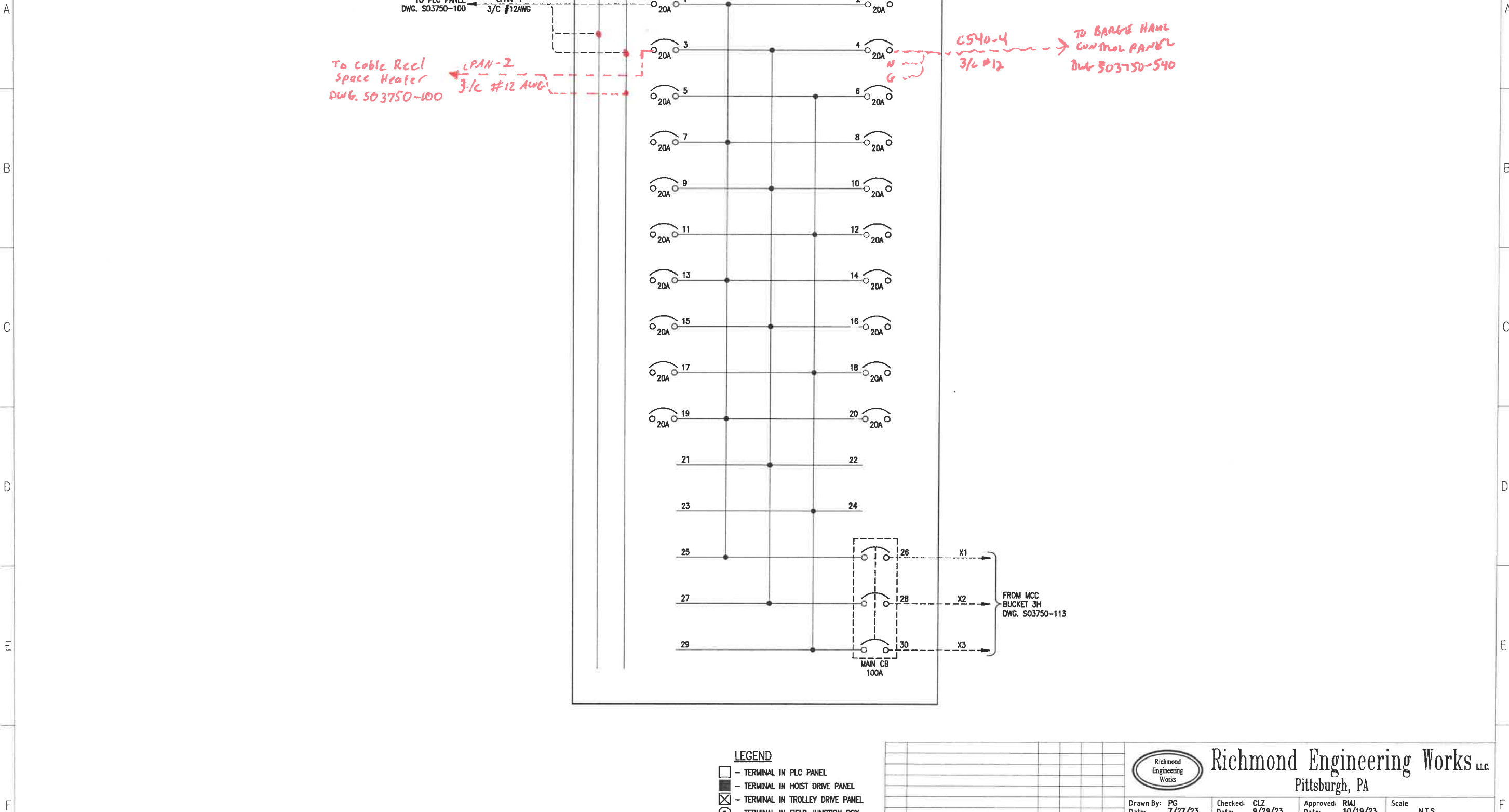
**BARGE UNLOADER 3
MOTOR CONTROL CENTER
SINGLE LINE
DIAGRAM**

ALABAMA STATE PORT AUTHORITY
McDUFFIE ISLAND TERMINAL
MOBILE, AL

SO3750-001 Rev. 0

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	10/19/23	PG	CLZ	RMJ

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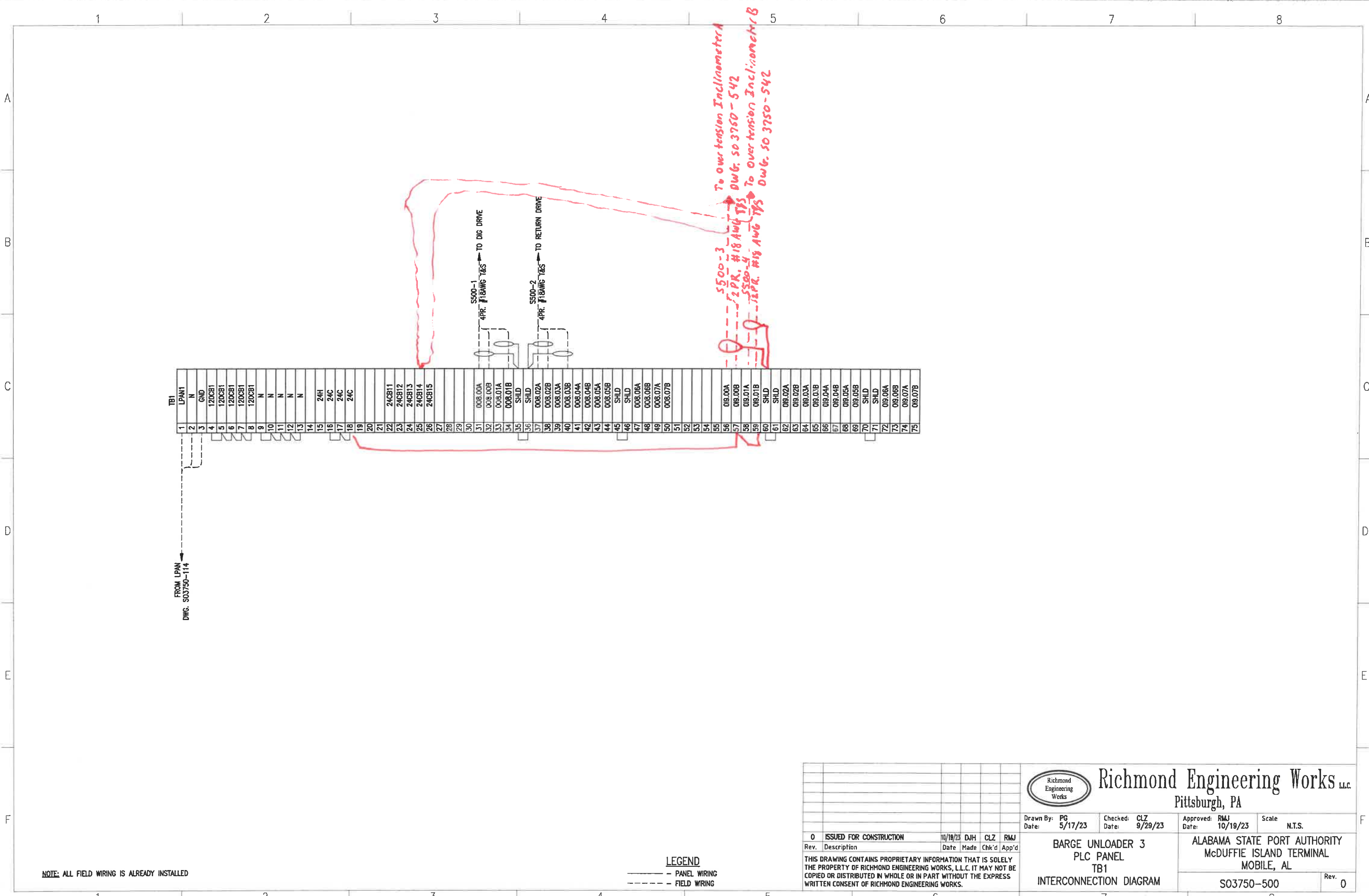
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Richmond Engineering Works LLC
Pittsburgh, PA

Drawn By: PG Date: 7/27/23	Checked: CLZ Date: 9/29/23	Approved: RMJ Date: 10/19/23	Scale: N.T.S.
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BARGE UNLOADER 3 MCC BUCKET 3C	ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL
	Rev. 0

S03750-114




NOTE: ALL FIELD WIRING IS ALREADY INSTALLED

LEGEND
 - - - - - PANEL WIRING
 - - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	10/19/23	DJH	CLZ	RMJ

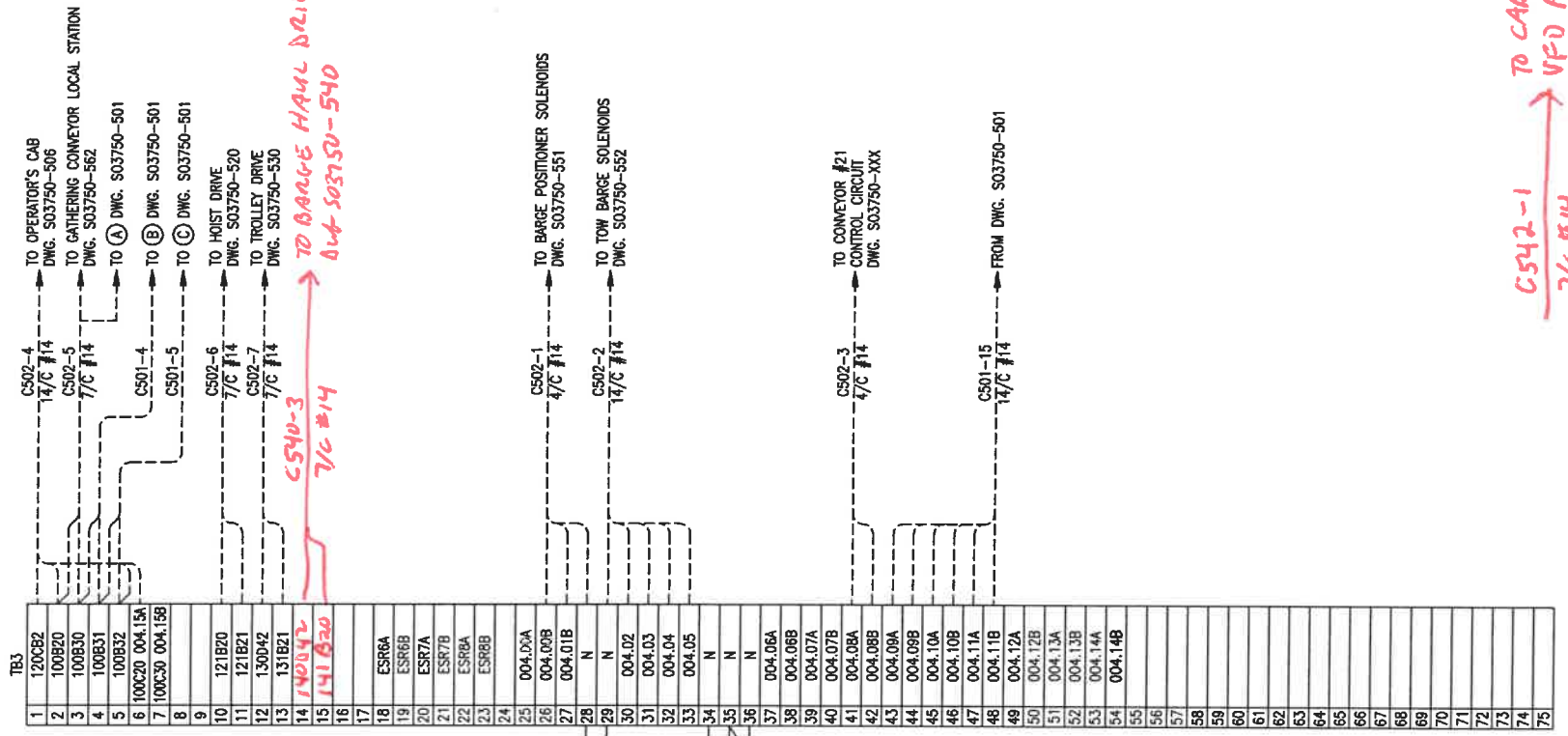
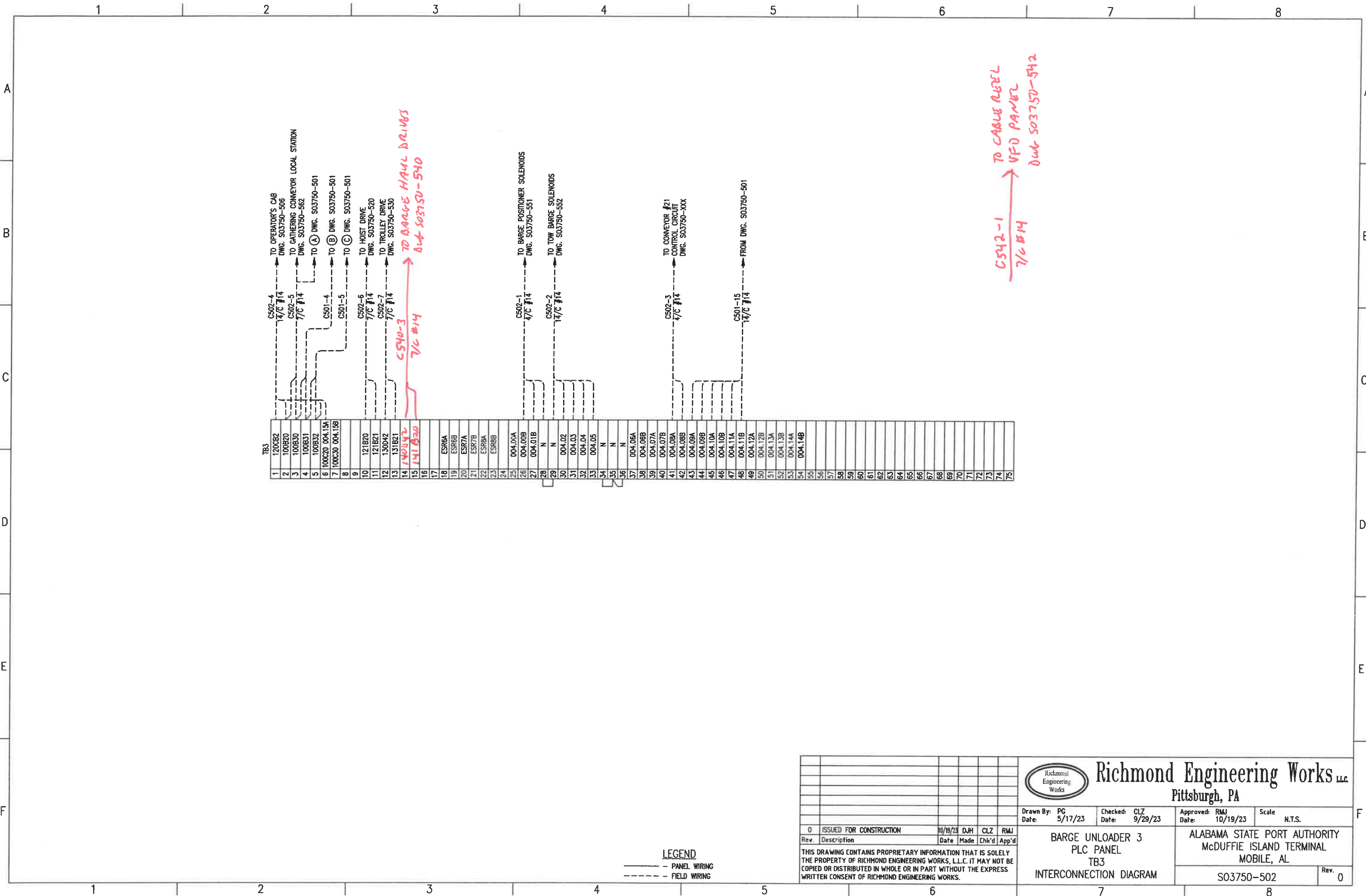
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Pittsburgh, PA

Drawn By: PG Date: 5/17/23	Checked: CLZ Date: 9/29/23	Approved: RMJ Date: 10/19/23	Scale: N.T.S.
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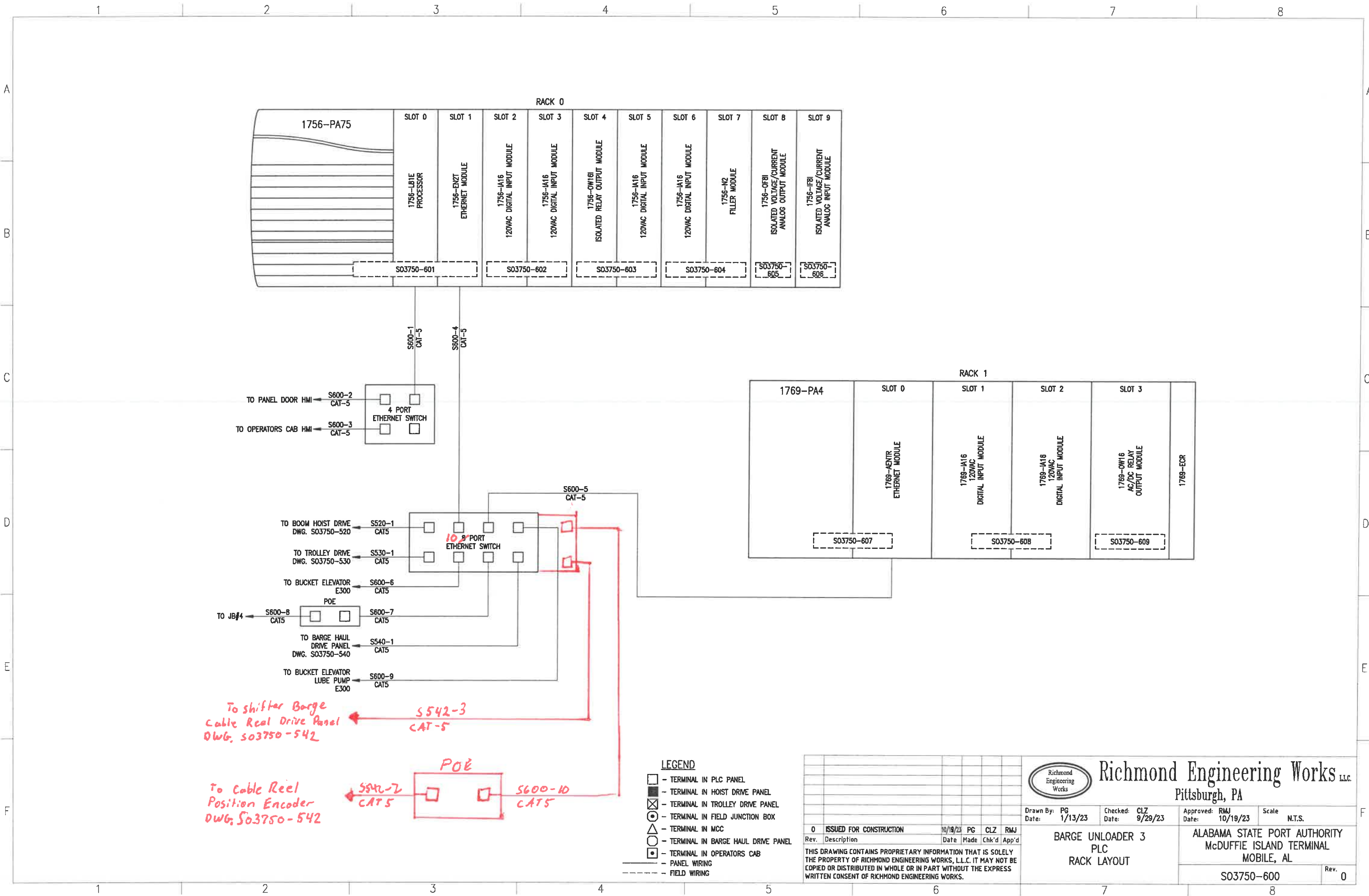
BARGE UNLOADER 3 PLC PANEL TB1 INTERCONNECTION DIAGRAM	ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL
SO3750-500	Rev. 0



CS42-1
7/6 #14
TO CABLE REEL
VFD PANEL
Out S03750-542

		Richmond Engineering Works LLC Pittsburgh, PA	
Drawn By: PG Date: 5/17/23	Checked: CLZ Date: 9/29/23	Approved: RMJ Date: 10/19/23	Scale: N.T.S.
BARGE UNLOADER 3 PLC PANEL TB3 INTERCONNECTION DIAGRAM		ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	
		S03750-502	Rev. 0

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To shifter Barge
Cable Reel Drive Panel
DWG: S03750-542


To Cable Reel
Position Encoder
DWG: S03750-542

LEGEND

- - TERMINAL IN PLC PANEL
- - TERMINAL IN HOIST DRIVE PANEL
- ⊗ - TERMINAL IN TROLLEY DRIVE PANEL
- ⊙ - TERMINAL IN FIELD JUNCTION BOX
- - TERMINAL IN MCC
- ⊠ - TERMINAL IN BARGE HAUL DRIVE PANEL
- ⊡ - TERMINAL IN OPERATORS CAB
- - PANEL WIRING
- - - - - FIELD WIRING

Rev.	Description	Date	Made	Chk'd	App'd
0	ISSUED FOR CONSTRUCTION	10/19/23	PG	CLZ	RMJ

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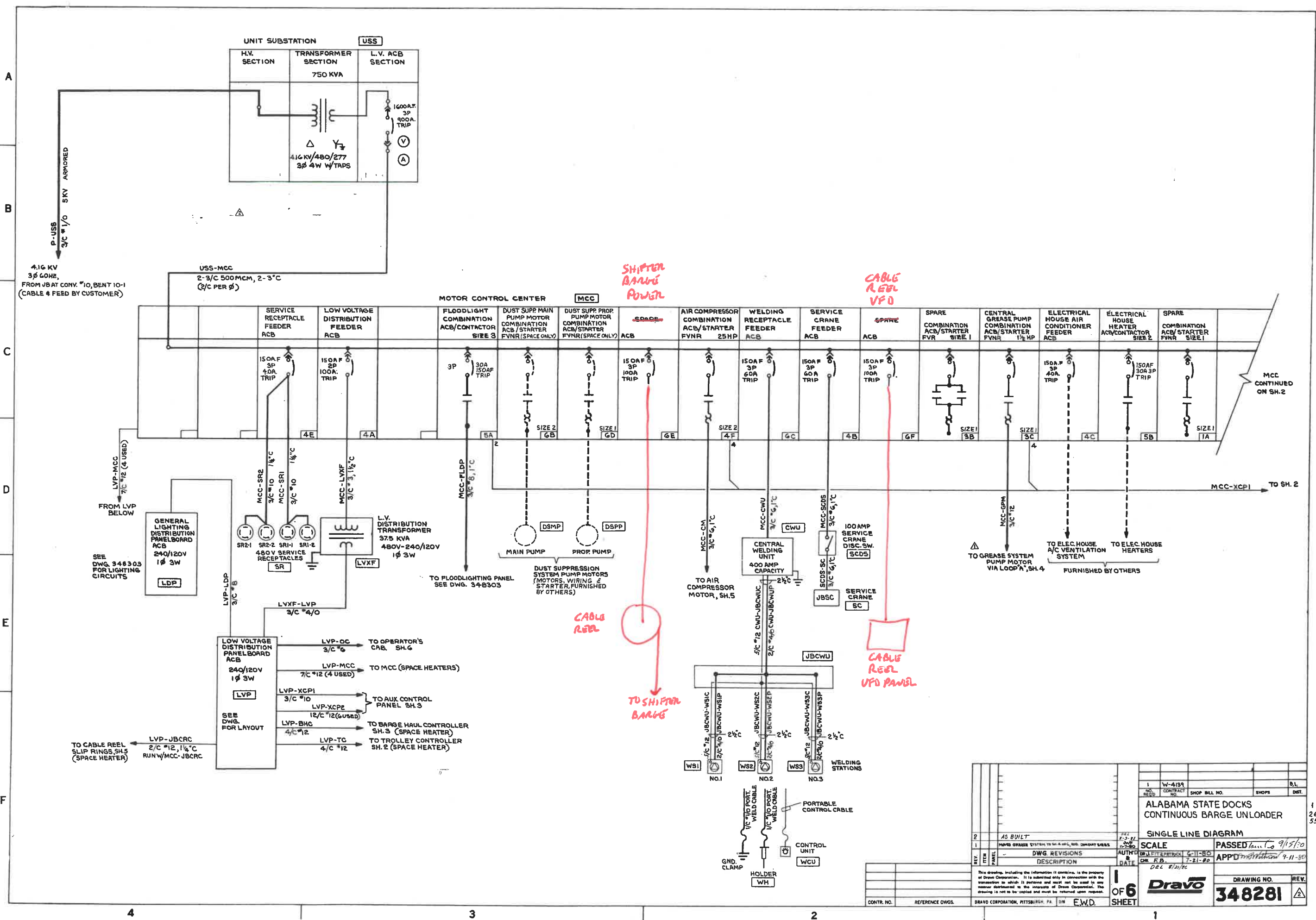
Richmond Engineering Works L.L.C.
Pittsburgh, PA

Drawn By: PG Date: 1/13/23	Checked: CLZ Date: 9/29/23	Approved: RMJ Date: 10/19/23	Scale: N.T.S.
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**BARGE UNLOADER 3
PLC
RACK LAYOUT**

ALABAMA STATE PORT AUTHORITY McDUFFIE ISLAND TERMINAL MOBILE, AL	Rev. 0
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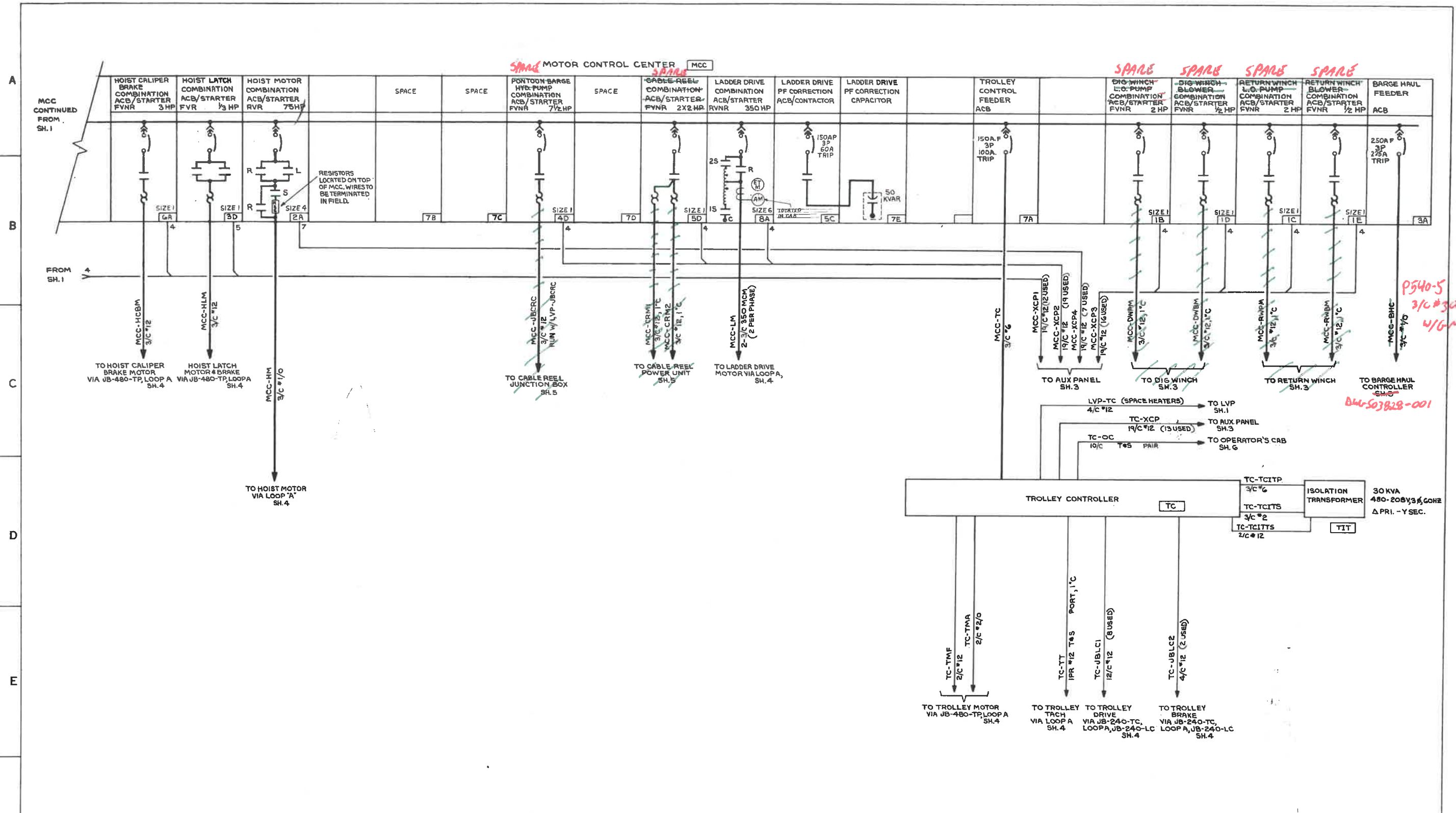
S03750-600



1	W-4159	SHOP BILL NO.	SHOPS	DIST.
ALABAMA STATE DOCKS CONTINUOUS BARGE UNLOADER				
SINGLE LINE DIAGRAM				
SCALE	PASSED	DATE	9/15/00	
DWG REVISIONS	AUTH	DATE	7-21-00	
DESCRIPTION	DATE	7-21-00		
DRAWING NO. 348281				
REV. 1				

1 OF 6 SHEETS

DRAWING NO. 348281



1 W-4139 ALABAMA STATE DOCKS CONTINUOUS BARGE UNLOADER SINGLE LINE DIAGRAM		B.L. DIST.
1 ADDS CONDUIT SIZES DWG. REVISIONS DESCRIPTION DATE		SCALE AUTH'D DATE 6-11-80 7-21-80
2 OF 6 SHEET		PASSED APP'D DRAWING NO. 348282
CONTR. NO. REFERENCE DWGS.		DRACO CORPORATION, PITTSBURGH, PA. DIV. E.W.D.

4

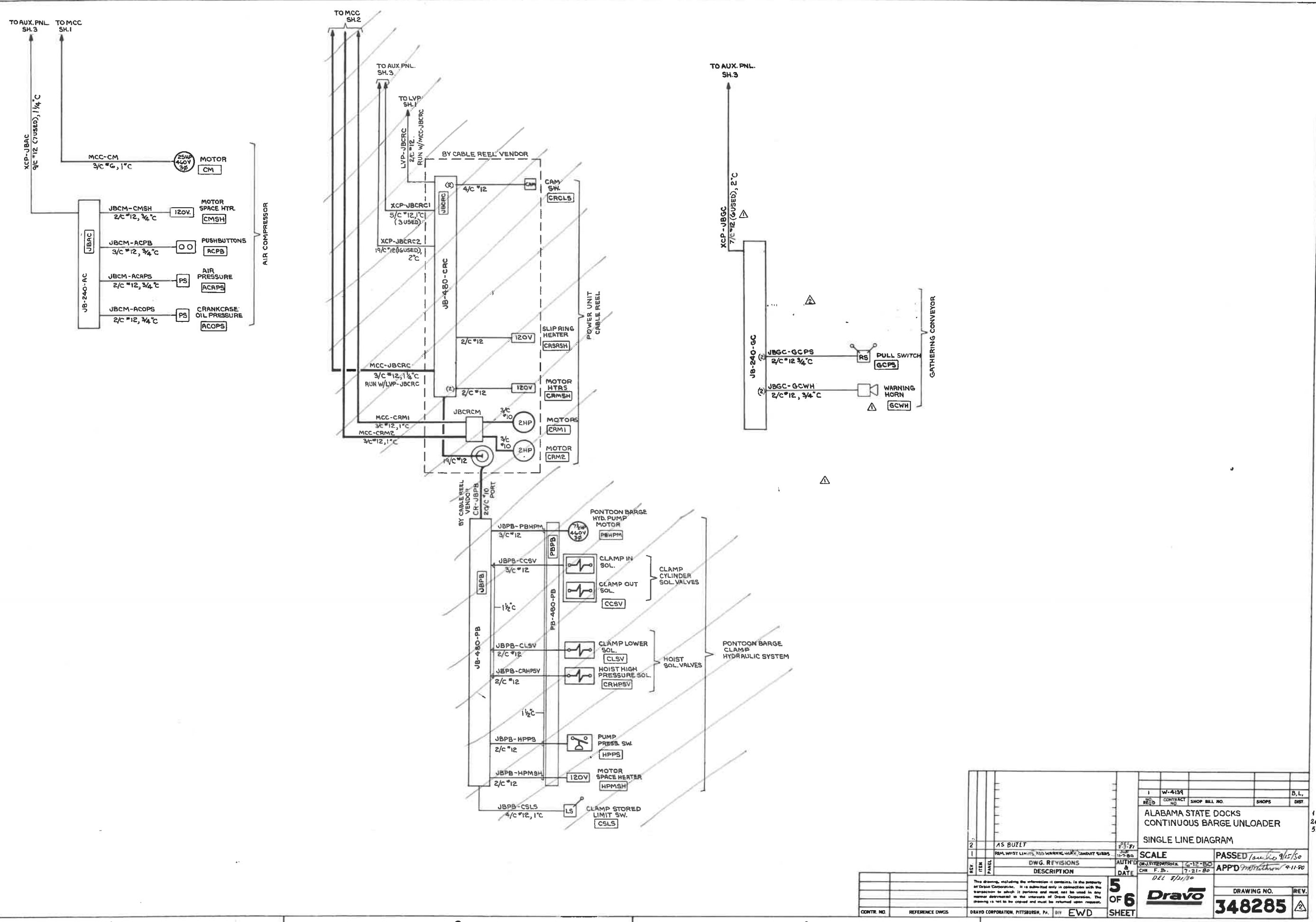
3

2

1

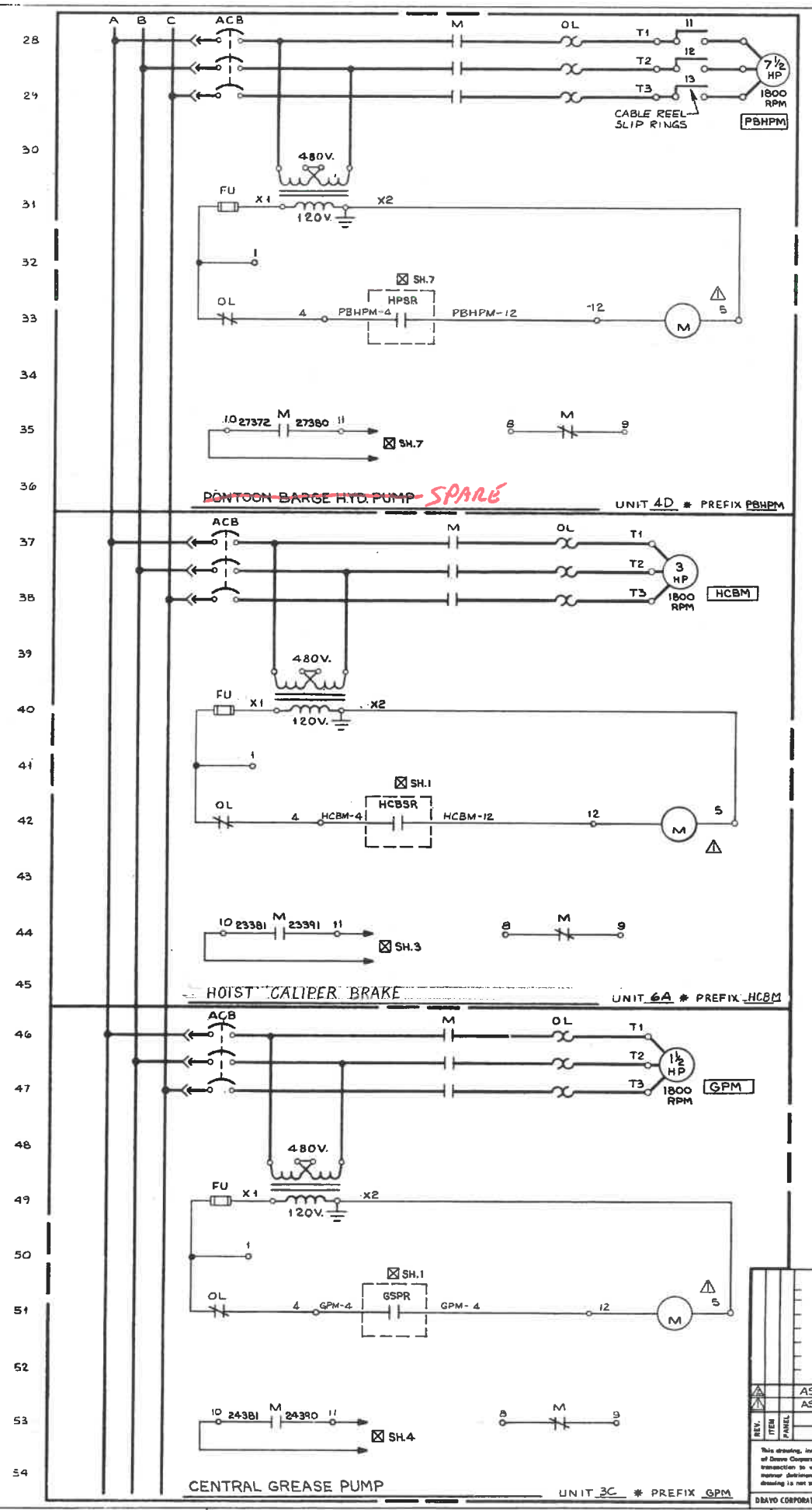
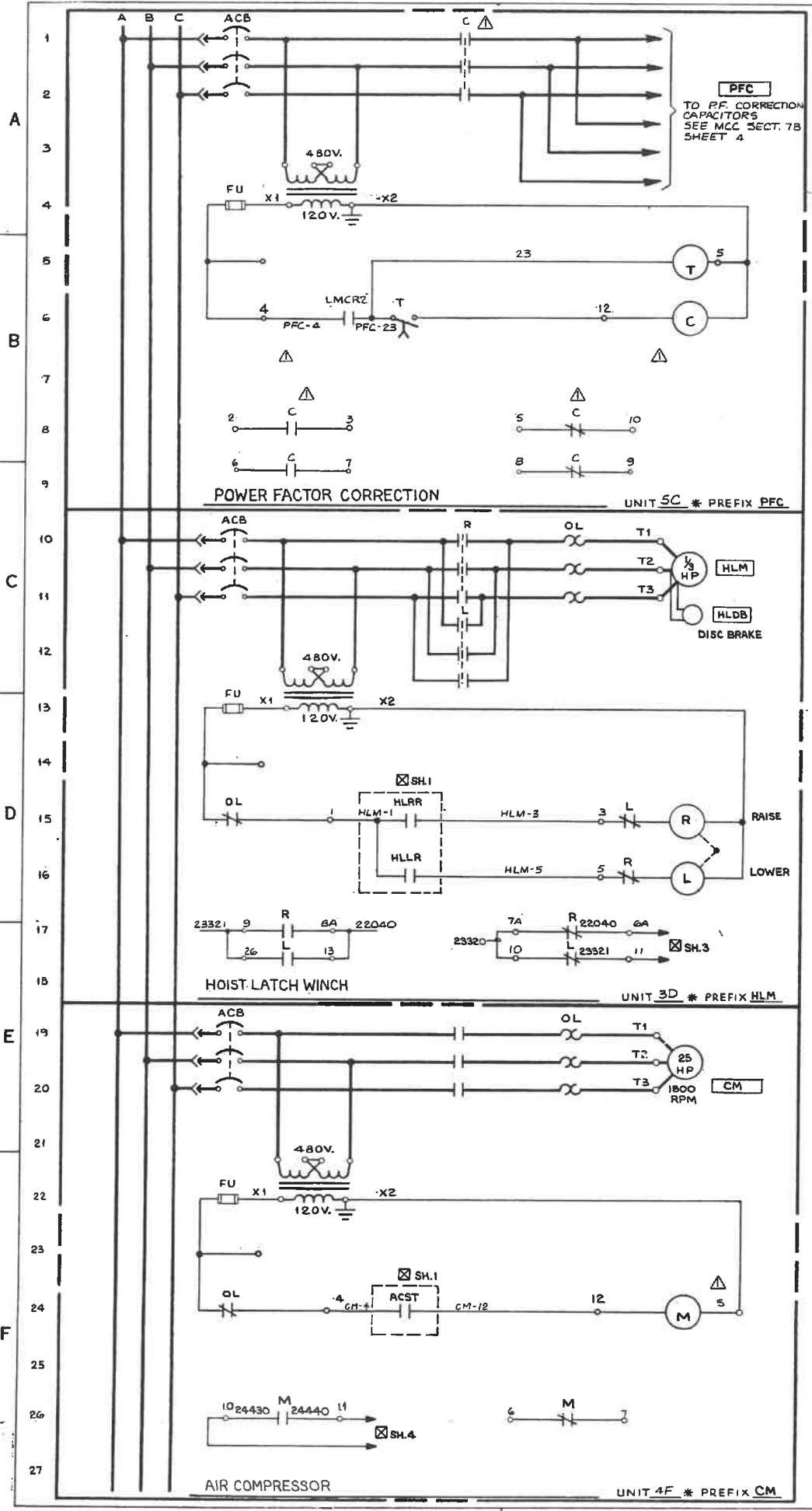
1
26
55

A
B
C
D
E
F

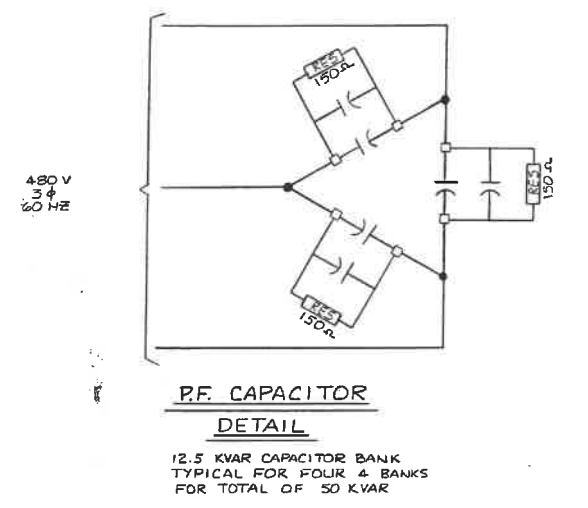
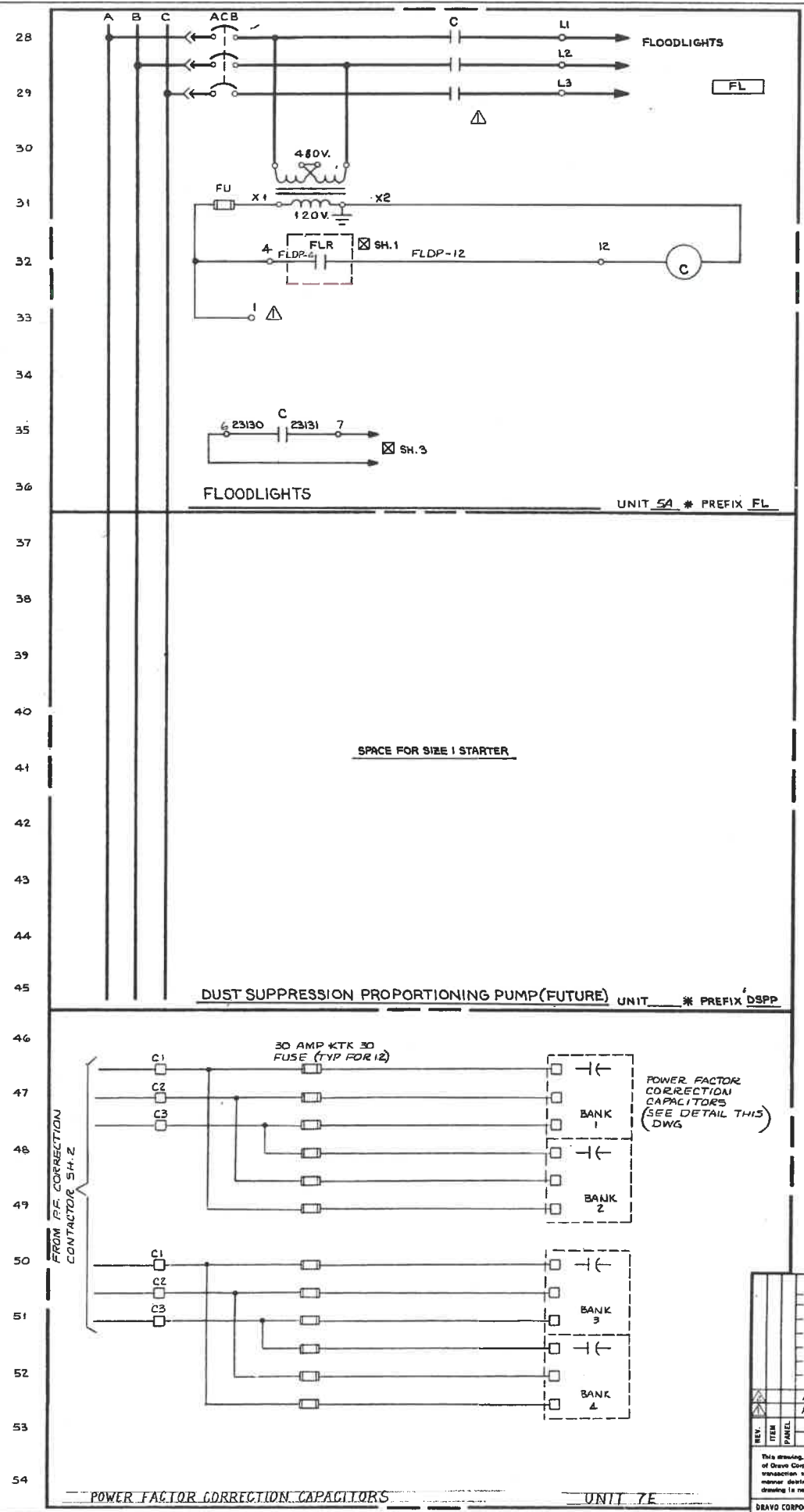
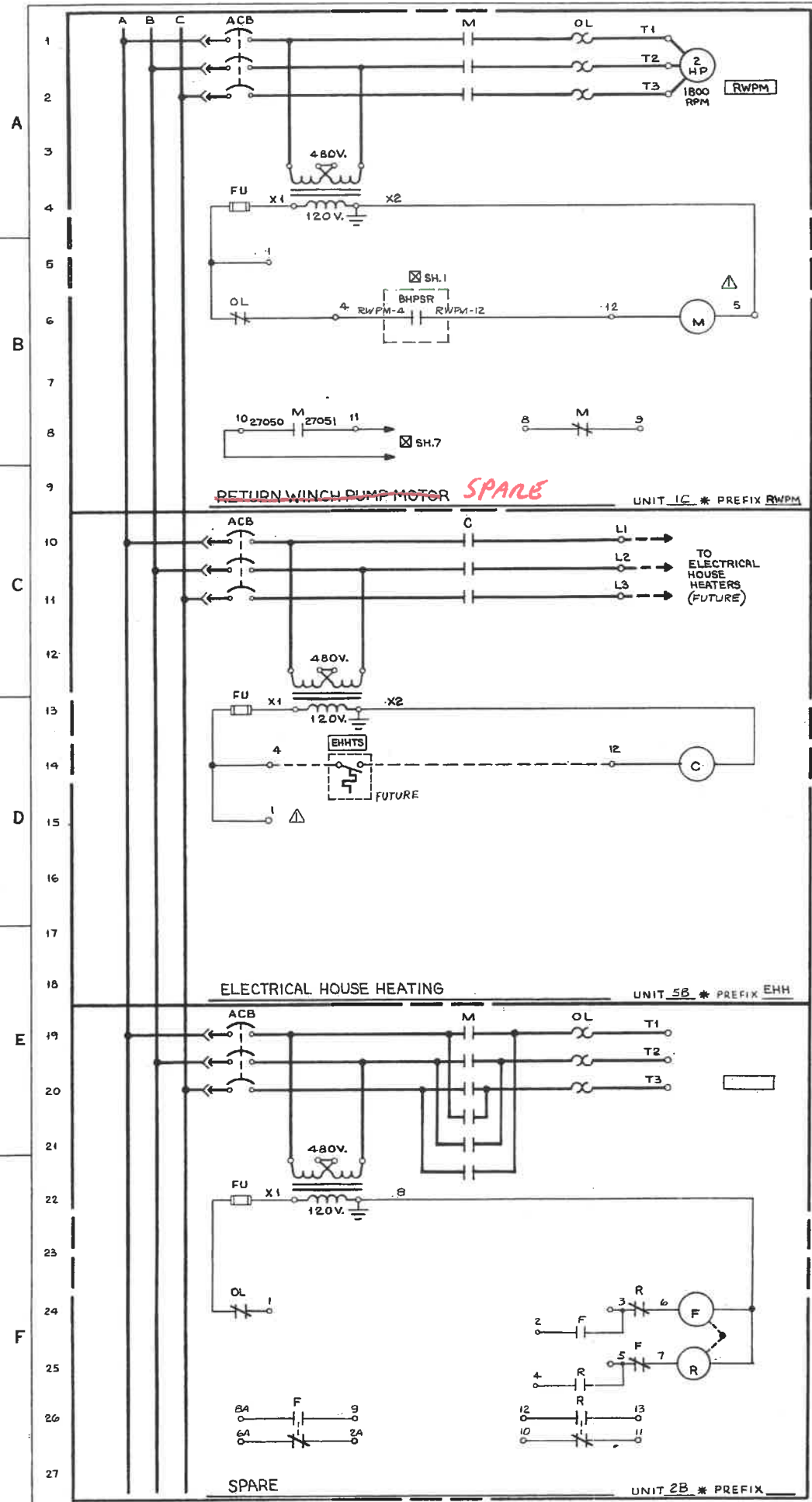


1		W-4139	B.L.
REV.	ITEM	DESCRIPTION	DATE
1	AS BUILT		7-21-80
2	REV. HOIST LIMITS, ADD WARNING HORNS, CONDUIT SIZES		11-7-80
DWG. REVISIONS		AUTHOR	DATE
DESCRIPTION		DR. J. PATRICK	7-21-80
		CHK. F. B.	7-21-80
SCALE		PASSED <i>Tambie 9/15/80</i>	
5 OF 6 SHEET		APPD <i>M. B. 9-11-80</i>	
DRAWING NO.		REV.	
348285		A	

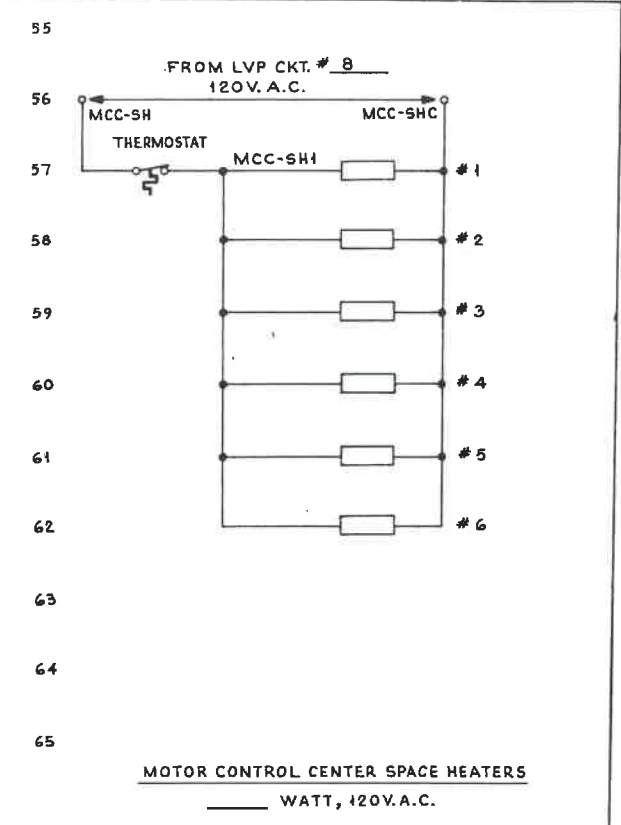
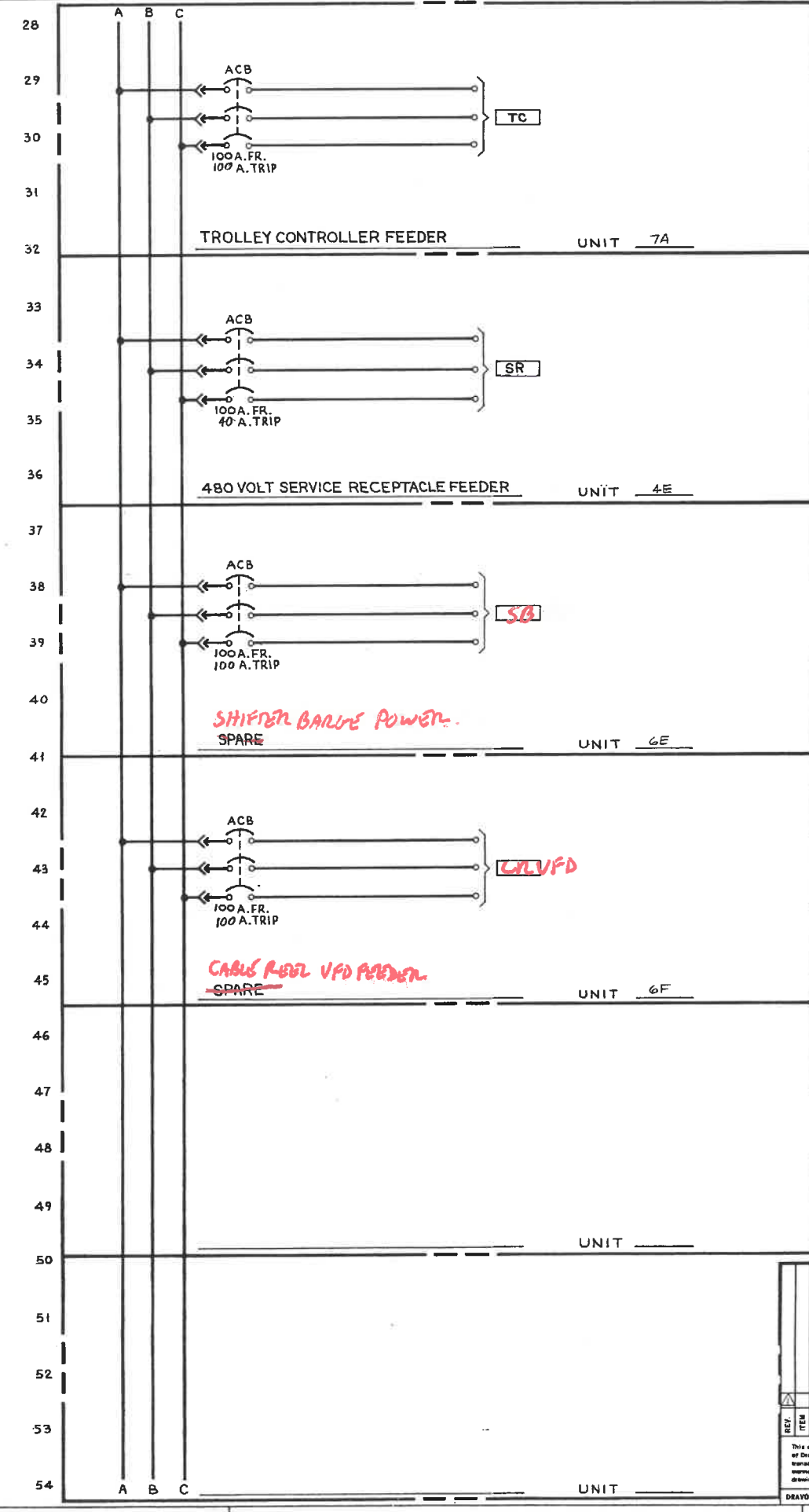
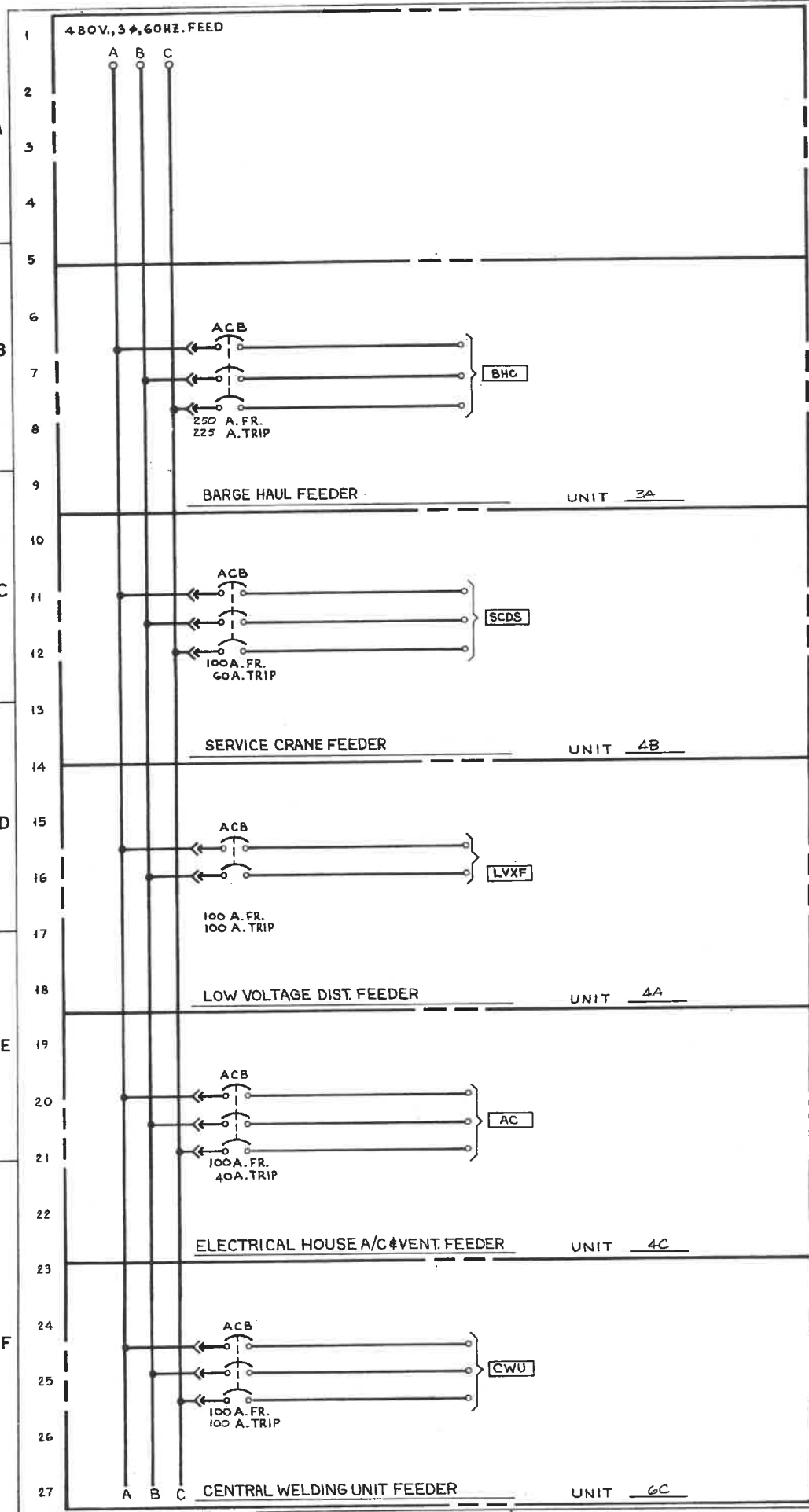
DRAWING 44-31-20112



REV.	ITEM	DATE	DESCRIPTION	SCALE	APPROVED
AS BUILT	FWP 7/7/80				
AS NOTED BY	PSC 9-24-80				
DWG. REVISIONS					
DESCRIPTION					
This drawing, including the information it contains, is the property of Dravo Corporation. It is submitted only in connection with the transaction to which it pertains and must not be used in any manner detrimental to the interests of Dravo Corporation. The drawing is not to be copied and used for retransmission without request.			SCALE ~ AUTHORITY & DATE DR. PITTSBURGH 6-5-80 CH. F.B. 7-21-80 DEL 8/1/80	PASSED <i>lanahan 9/15/80</i> APP'D <i>menthew 9-15-80</i>	DRAWING NO. REV. 348288 2
DRAVO CORPORATION, PITTSBURGH, PA. DIV. E. W. D.				SHEET 2 OF 5	1



NO.	W-4151	SHOP BILL NO.	SHOPS	B.L.
REVISION				DIST.
ALABAMA STATE DOCKS CONTINUOUS BARGE UNLOADER MOTOR CONTROL CENTER ELEMENTARY WIRING DIAGRAM				
SCALE	AS BUILT FWP 7/8/81	AUTH	PASSED <i>Tomlinson 9/15/80</i>	
DWG. REVISIONS	AS NOTED BY REC 2-24-80	DATE	APP'D <i>9/15/80</i>	
DESCRIPTION		DATE	DEL 9/30/80	
<small>This drawing, including the information it contains, is the property of Dravo Corporation. It is admitted only in connection with the transaction to which it pertains and must not be used in any manner detrimental to the interests of Dravo Corporation. The drawing is not to be copied and must be returned upon request.</small>				
4 OF 5 SHEET			DRAWING NO. 348290	
DRAVO CORPORATION, PITTSBURGH, PA. DIV. E. W. D.			REV. 2	



GENERAL NOTES

LEGEND:

- XXX - INDICATES DRAGO EQUIPMENT DESIGNATIONS.
- SH - INDICATES SHEET NUMBER OF PANEL ELEMENTARY DIAGRAM.
- ⊠ - LOCATED IN AUXILIARY CONTROL PANEL.
- ▲ - LOCATED IN OPERATOR'S CAB.

NOTES:

1. ALL CABLE TO HAVE STRANDED COPPER CONDUCTORS.
2. NEMA STARTER SIZE 1 THRU 4 TO PROVIDE SCREW TYPE TERMINAL BLOCKS FOR MOTOR LEADS.

REV.	ITEM	DESCRIPTION	DATE	APP'D.
1	AS BUILT	FWP 7/18/81		
2	DWG. REVISIONS			
3				
4				
5				

NO. W-4191	CONTRACT NO.	SHOP BILL NO.	SHOPS	B.L.
ALABAMA STATE DOCKS CONTINUOUS BARGE UNLOADER MOTOR CONTROL CENTER ELEMENTARY WIRING DIAGRAM				
SCALE	PASSED	DATE		
	Jan 26 9/15/80			
APP'D.	DATE			
	9-15-80			
DRAWING NO.		REV.		
348291		1		

NEW RETURN WINCH
SEE DWG 503828-201

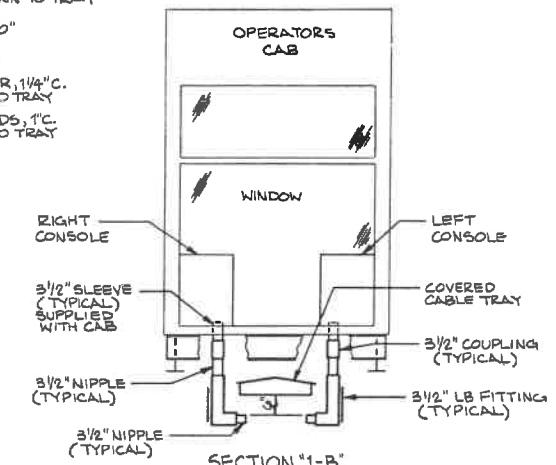
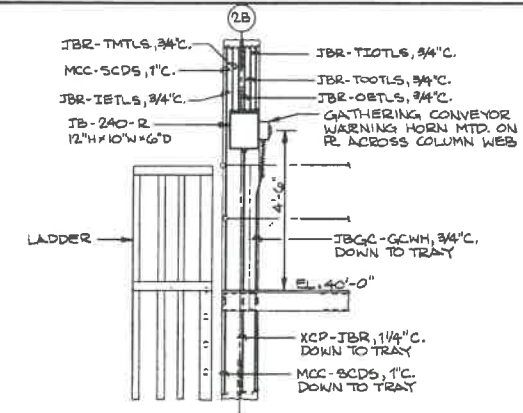
NEW DIBBLE WINCH
SEE DWG 503828-201

FOR BEST POSSIBLE ROUTING RUN CONDUIT IN FIELD TO SUIT

NEW CONDUIT TO BE FIELD INSTALLED TO DEVICES ON BARGE HAUL WINCH

GROUP #1 OPERATORS CAB		GROUP #2 TRAY TRAYS		GROUP #3 TRAY TRAYS		GROUP #4 TRAY TRAYS		GROUP #5 TRAY TRAYS	
LVP-OC	XCP-OC9	LVP-OC	BHC-OC2	XCP-OC3	MCC-GPM	XCP-HSS	P-USS	*CIC#6	
TC-OC	XCP-OC10	JBCWU-WS1C	BHC-OC3	XCP-OC4	MCC-HCBM	XCP-JBH	*CIC#1	*CIC#7	
BHC-OC1	XCP-ANN1	JBCWU-WS1P	BHC-DNB	XCP-OC5	MCC-HLM	XCP-L2SS	*CIC#2	*CIC#8	
BHC-OC2	XCP-ANN2	JBCWU-WS2C	BHC-DMF	XCP-OC6	MCC-HM	XCP-JBLC1	*CIC#3	*CIC#9	
BHC-OC3	*CIC#3	JBCWU-WS2P	BHC-DM	XCP-OC7	MCC-LM	XCP-JBLC2	*CIC#4	*CIC#10	
XCP-OC1	*CIC#4	JBCWU-WS3C	XCP-JBDW	XCP-OC8	TC-TMF	XCP-JBLC3	*CIC#5		
XCP-OC2	*CIC#5	JBCWU-WS3P	BHC-DWTC	XCP-OC9	TC-TMA	XCP-JBLC4			
XCP-OC3	*CIC#6	MCC-SCDS	BHC-JBDW	XCP-OC10	TC-TT	XCP-JBLC5			
XCP-OC4	*CIC#7	MCC-JBCRC	BHC-JBRW	XCP-ANN1	TC-JBLC1	XCP-ORLCA			
XCP-OC5	*CIC#8	MCC-CRM	BHC-RWTS	XCP-ANN2	TC-JBLC2	XCP-IRLCA			
XCP-OC6	*CIC#9	MCC-JBCRC	TC-OC	LVP-JBCRC					
XCP-OC7	*CIC#10	MCC-DNPM	BHC-EM	XCP-JBR					
XCP-OC8	LDP-55	MCC-RNBM	BHC-EMF	XCP-JBGC					
		MCC-RNBM	BHC-RWB	XCP-JBCRC1					
		BHC-OC1	XCP-OC1	XCP-JBCRC2					
			XCP-OC2						

REV.	ITEM	DESCRIPTION	AUTH'D	DATE	REF.

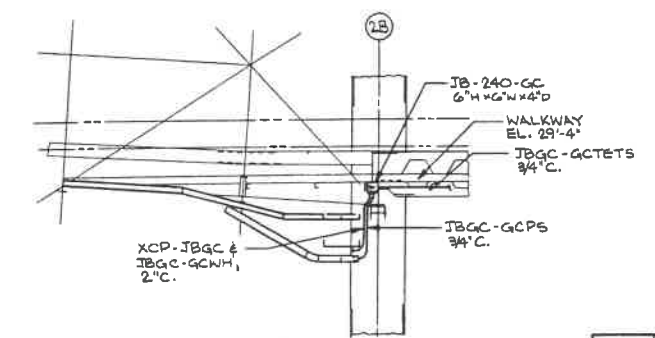
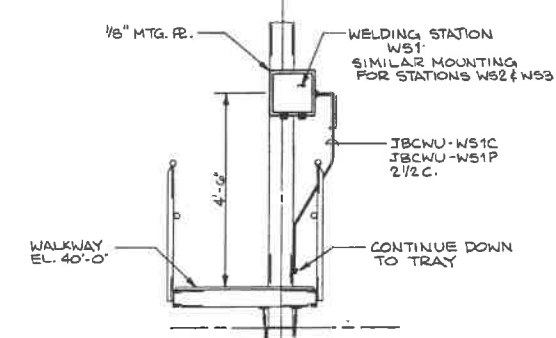


ELECTRICAL HOUSE
DWG. 349119

GROUP #3 TRAY TRAYS		GROUP #4 TRAY TRAYS		GROUP #5 TRAY TRAYS	
MCC-GPM	XCP-HSS	P-USS	*CIC#6		
MCC-HCBM	XCP-JBH	*CIC#1	*CIC#7		
MCC-HLM	XCP-L2SS	*CIC#2	*CIC#8		
MCC-HM	XCP-JBLC1	*CIC#3	*CIC#9		
MCC-LM	XCP-JBLC2	*CIC#4	*CIC#10		
TC-TMF	XCP-JBLC3				
TC-TMA	XCP-JBLC4				
TC-TT	XCP-JBLC5				
TC-JBLC1	XCP-ORLCA				
TC-JBLC2	XCP-IRLCA				

GROUP #4 TRAY TRAYS		GROUP #5 TRAY TRAYS	
JBGC-GCP5	*CIC#7	P-USS	*CIC#6
*CIC#3	*CIC#8	*CIC#1	*CIC#7
*CIC#4	*CIC#9	*CIC#2	*CIC#8
*CIC#5	*CIC#10	*CIC#3	*CIC#9
*CIC#6		*CIC#4	*CIC#10
		*CIC#5	

- NOTES:
1. ALL CONDUIT SHALL BE RIGID GALVANIZED STEEL AND CONFORM TO FEDERAL SPECIFICATIONS WW-C-551.
 2. ALL JUNCTION BOXES AND PULLBOXES IN OUTDOOR APPLICATIONS SHALL BE NEMA TYPE 4X WITH CONTINUOUS HINGE DOOR.
 3. FOR BEST POSSIBLE ROUTING ALL CONDUIT TO BE RUN IN FIELD TO SUIT.
 4. ALL CONDUIT JUNCTION BOXES & PULLBOXES TO BE SUPPORTED IN FIELD TO SUIT.
 5. FOR OPERATORS FLOOR SLEEVES SEE DWG. 348306.
 6. FOR TRAY LOCATION AND IDENTIFICATION SEE DWG. 349116 & 349117.
 7. * INDICATES CUSTOMER INTERFACE CABLE ORIGINATING AT CONTROL TERMINAL BOX LOCATED AT COLUMN 10-1.
 8. WORK THIS DWG. WITH DWG. 349119, 349120.



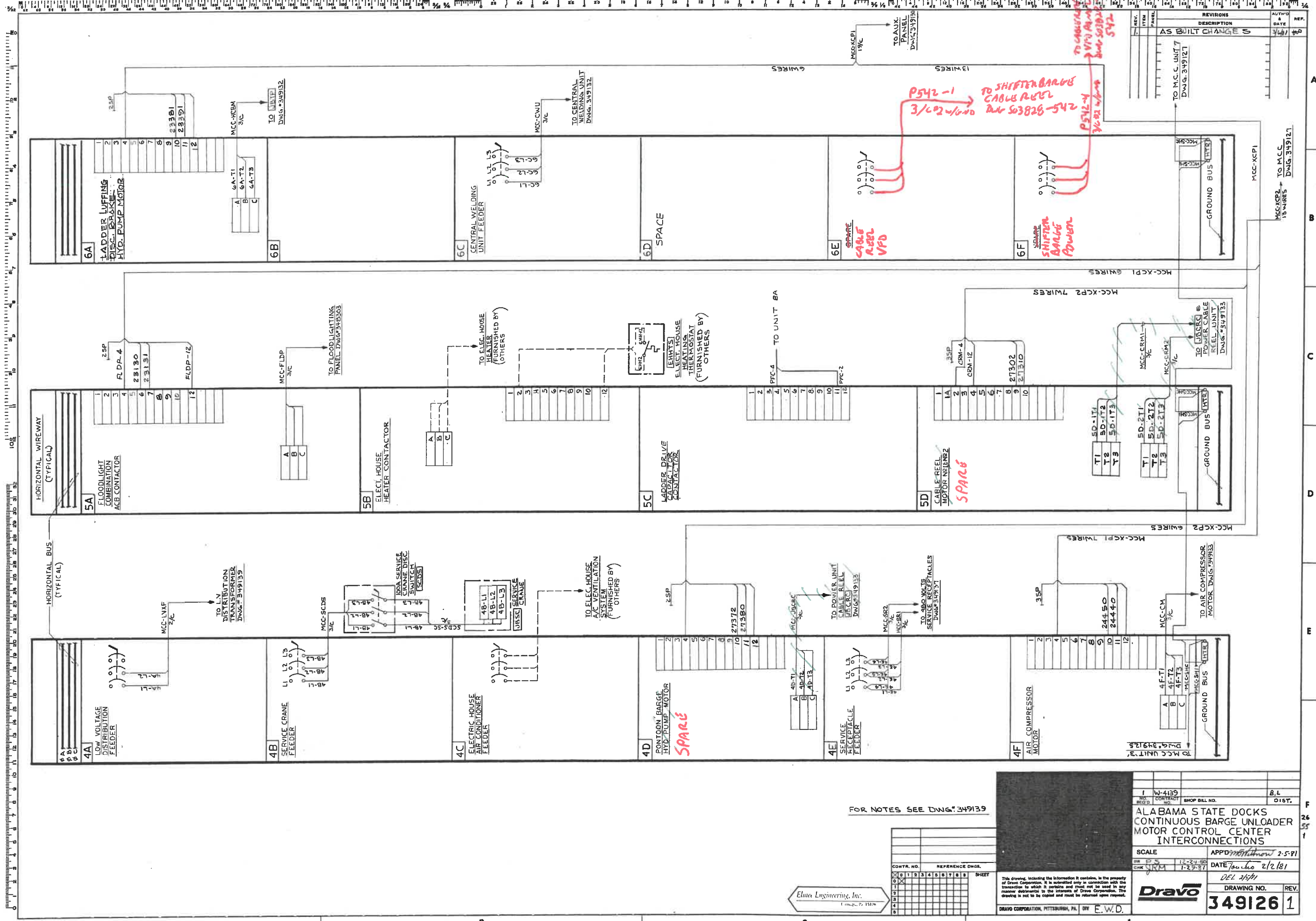
SECTION 4-F
TAKEN AT 4-B
THIS DWG.
3/8\"/>

SECTION 3-F
TAKEN AT 2-C
THIS DWG.
1/2\"/>

SECTION 2-F
TAKEN AT 2-D
THIS DWG.
1/4\"/>

CONTR. NO.	REFERENCE DWG.	SHEET
01	3	4
02	3	4
03	3	4
04	3	4
05	3	4
06	3	4
07	3	4
08	3	4
09	3	4
10	3	4

1	W-4139	B.L.
NO.	CONTRACT	DIST.
ALABAMA STATE DOCKS		
CONTINUOUS BARGE UNLOADER		
POWER & CONTROL ARRANGEMENT		
PLAN & SECTIONS		
SCALE 1/4\"/>		
DATE 10/15/80	APP'D [Signature]	REV. 1
DRAWING NO. 349118		
DRAYO CORPORATION, PITTSBURGH, PA. DIV. E.W.D.		



CONTR. NO.										REFERENCE DWG.									
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
SHEET										SHEET									

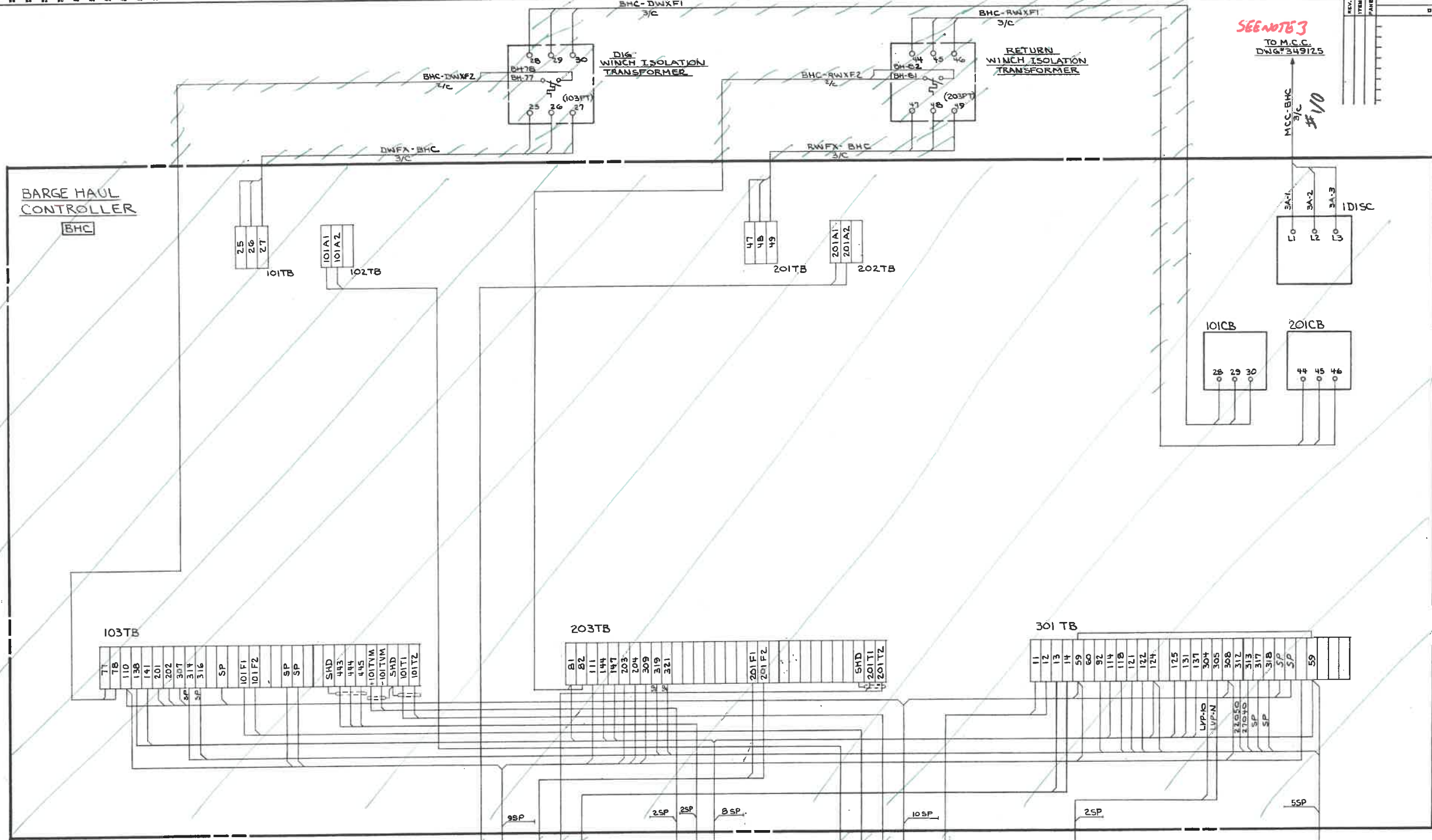
Elma Engineering, Inc.
 1100 S. 15th St.
 Pittsburgh, Pa. 15203

FOR NOTES SEE DWG. 349139

1 W-4139		B.L	
CONTRACT NO.		DIST.	
ALABAMA STATE DOCKS CONTINUOUS BARGE UNLOADER MOTOR CONTROL CENTER INTERCONNECTIONS			
SCALE		APP'D 2/12/81	
DATE 2/12/81		DATE 2/12/81	
DRAWING NO.		REV.	
349126		1	

DRAGO CORPORATION, PITTSBURGH, PA. DRG E.W.D.

REV.	ITEM	DESCRIPTION	DATE	REF.



SEE NOTE 3
TO M.C.C.
DWG#349125
#110
MCC-BHC
3/C

99

FOR NOTES SEE DWG# 349139

THIS DWG VOID
SEE NEW DWG
503828-540

TO JBRW
DWG#349138
BHC-JBRW 19/C
BHC-JBRW 19/C
BHC-JBRW 19/C
BHC-JBRW 19/C
BHC-JBRW 19/C

TO OPERATOR
CAB DWG#348309
SEE NOTE 3
BH-OC3 19/C
BH-OC2 19/C
BH-OC1 19/C

TO JBDW
DWG#349138
BHC-JBDW 19/C
BHC-JBDW 19/C
BHC-JBDW 19/C
BHC-JBDW 19/C

TO LOW VOLTAGE
DISTRIBUTION PANEL
DWG#349139
LVP-BHC 4/C
SEE NOTE 3

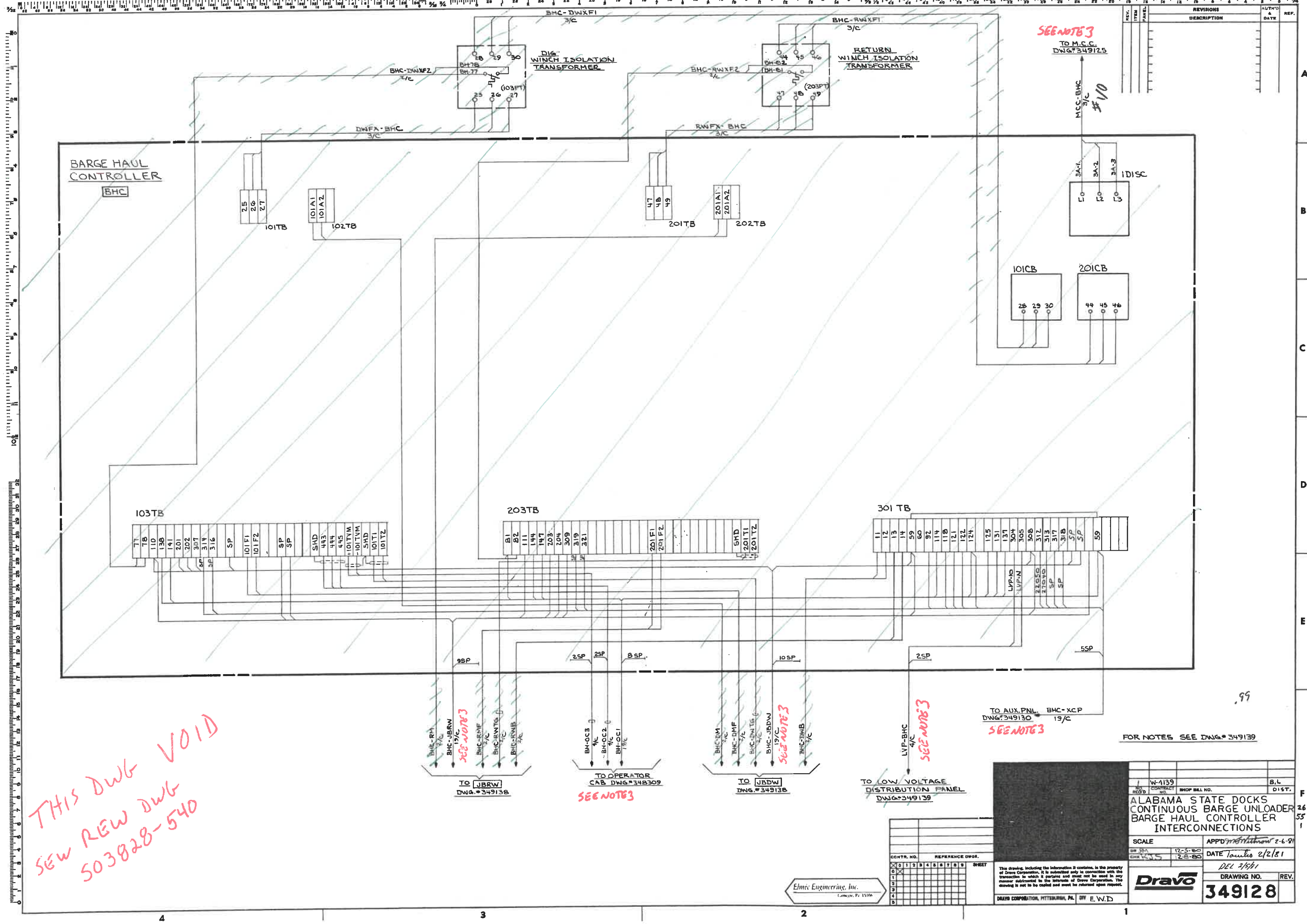
TO AUX. PNL
BHC-XCP
DWG#349130
19/C
SEE NOTE 3

CONTR. NO.	REFERENCE DWG.	SHEET

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W-1139	B.L.
CONTRACT NO.	DIST.
ALABAMA STATE DOCKS CONTINUOUS BARGE UNLOADER BARGE HAUL CONTROLLER INTERCONNECTIONS	
SCALE	APP'D <i>[Signature]</i> 2-6-81
DATE	10/2/81
DEL 2/5/81	DRAWING NO.
Dravo	REV.
349128	

Elmic Engineering, Inc.
Lynchburg, PA 17306



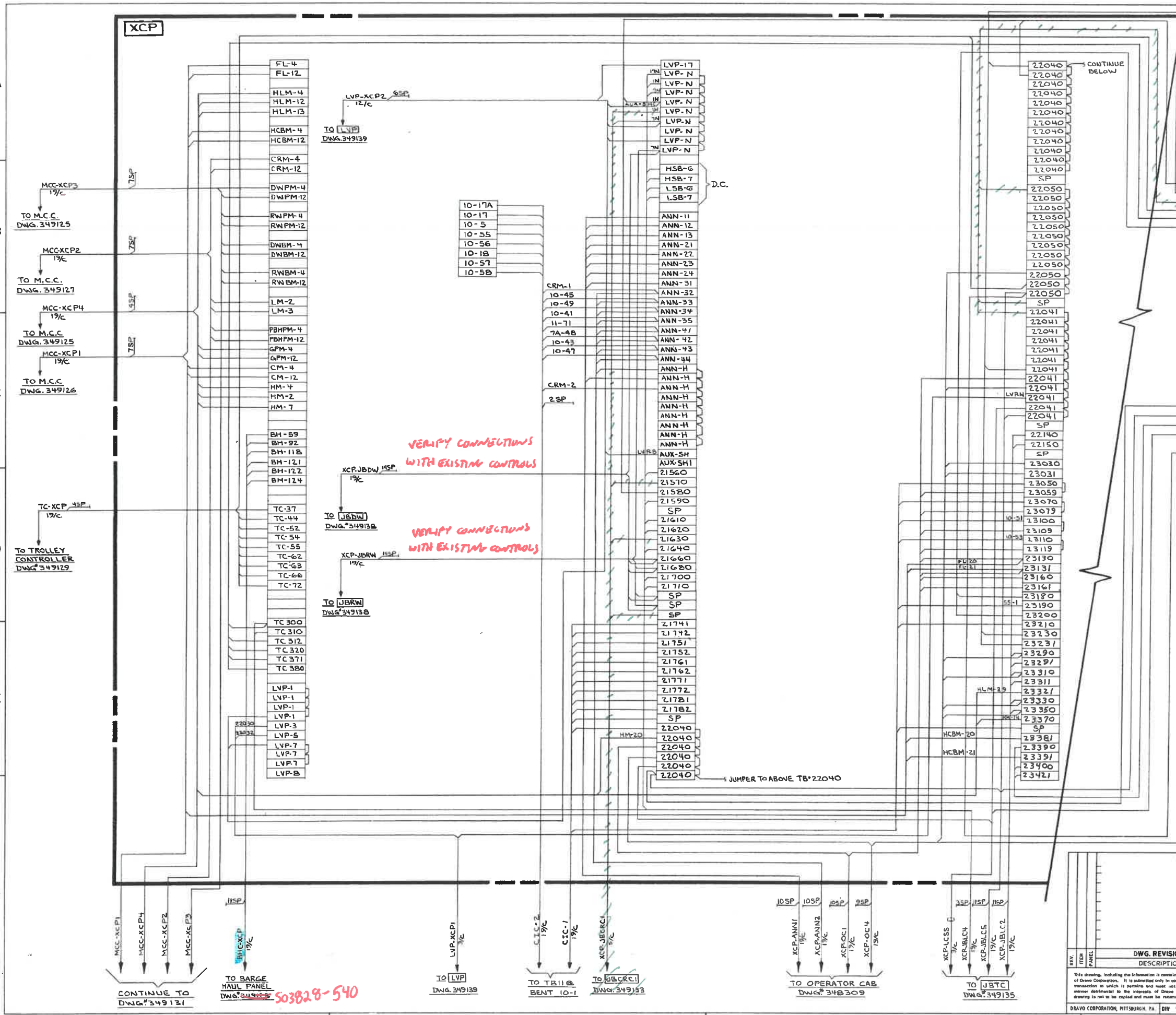
NO.	REV.	DESCRIPTION	DATE
1			
2			

NO.	REV.	DESCRIPTION	DATE
1			
2			

NO.	REV.	DESCRIPTION	DATE
1			
2			

NO.	REV.	DESCRIPTION	DATE
1			
2			

NO.	REV.	DESCRIPTION	DATE
1			
2			



VERIFY CONNECTIONS WITH EXISTING CONTROLS

VERIFY CONNECTIONS WITH EXISTING CONTROLS

FOR NOTES SEE DWG. 349139

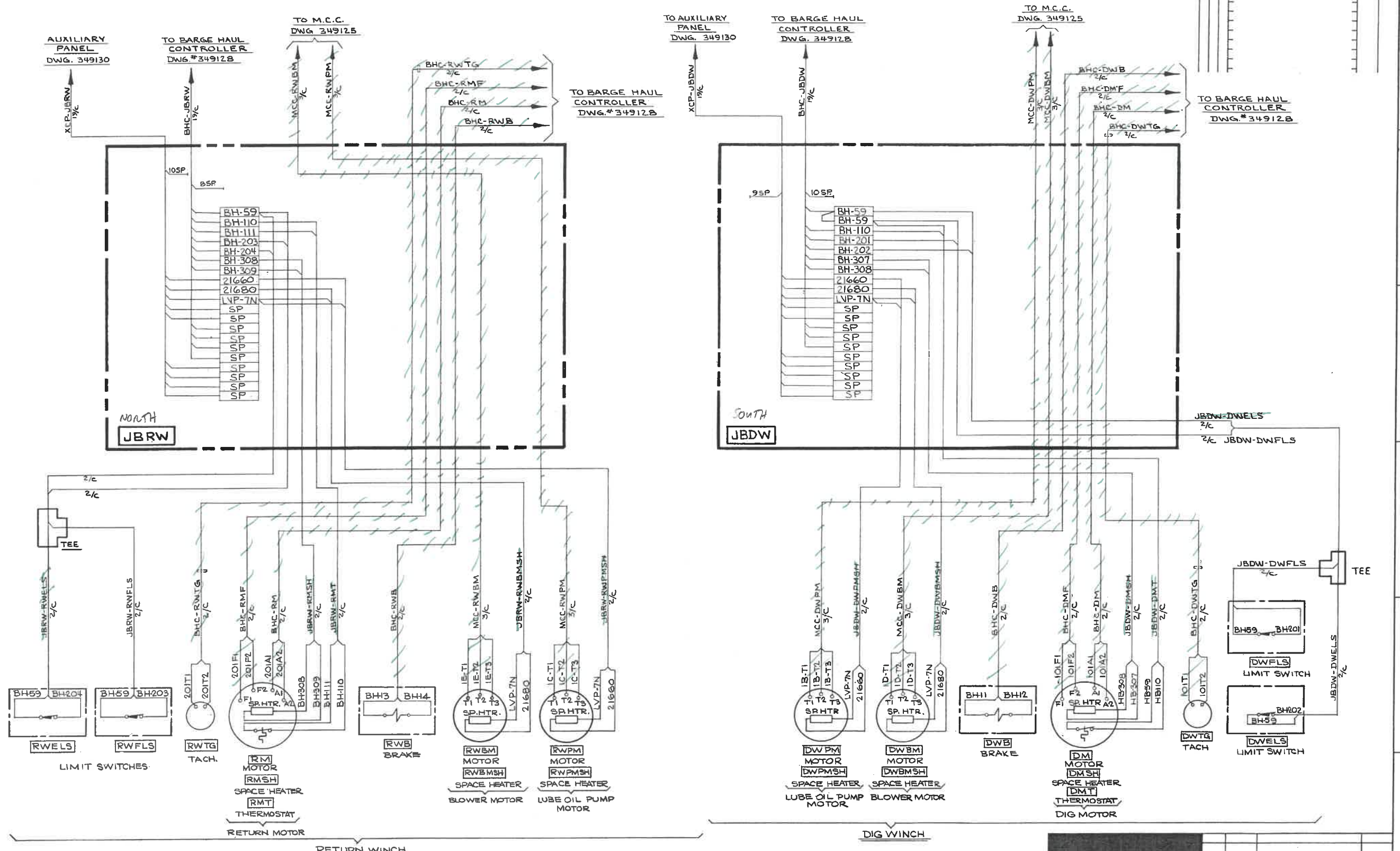
Elmer Engineering, Inc.
Lancaster, Pa. 17606

NO. REV.	CONTRACT NO.	SHOP BILL NO.	B.L. DIST.
	W-4139		
ALABAMA STATE DOCKS CONTINUOUS BARGE UNLOADER AUXILIARY PANEL SHEET 1 OF 2 INTERCONNECTIONS			
SCALE		PASSED (initials) 2/2/81	
OR DATE		APP'D (initials) 2-5-81	
DWG. REVISIONS		DEL 2/4/81	
DESCRIPTION		DRAWING NO.	
		349130	
DRAWING NO.		REV.	
349130			
DRAWING NO. 349130			
SHEET 1			

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DRAVO CORPORATION, PITTSBURGH, PA. DIV. E.W.D.

REV.	ITEM	DESCRIPTION	DATE	REF.



THIS DRAWING VOID
SEE NEW DRAWING
503828-541

FOR NOTES SEE DWG. 349139

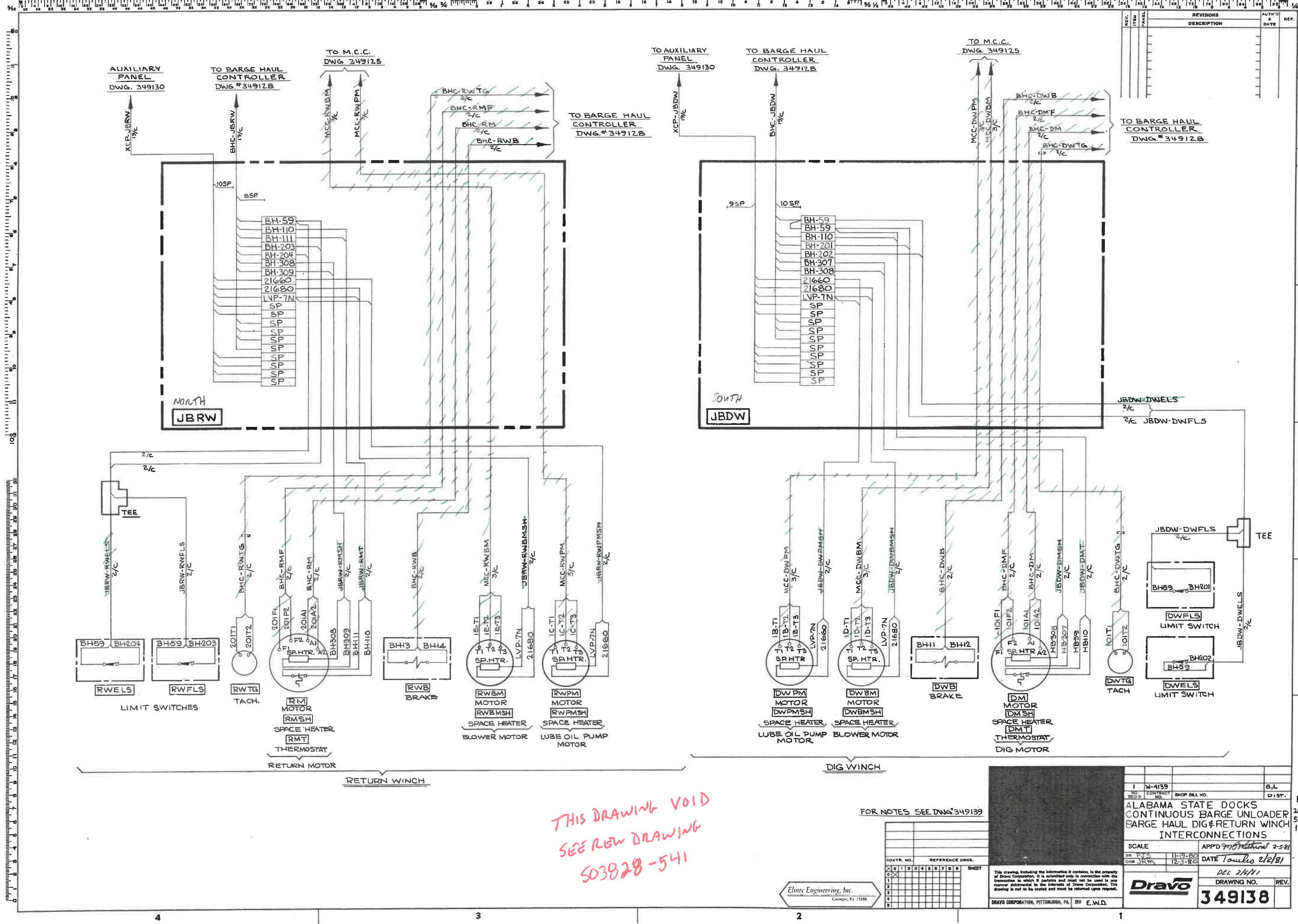
CONTR. NO.	REFERENCE DWGS.	SHEET

Elitec Engineering, Inc.
Canaan, Pa. 15106

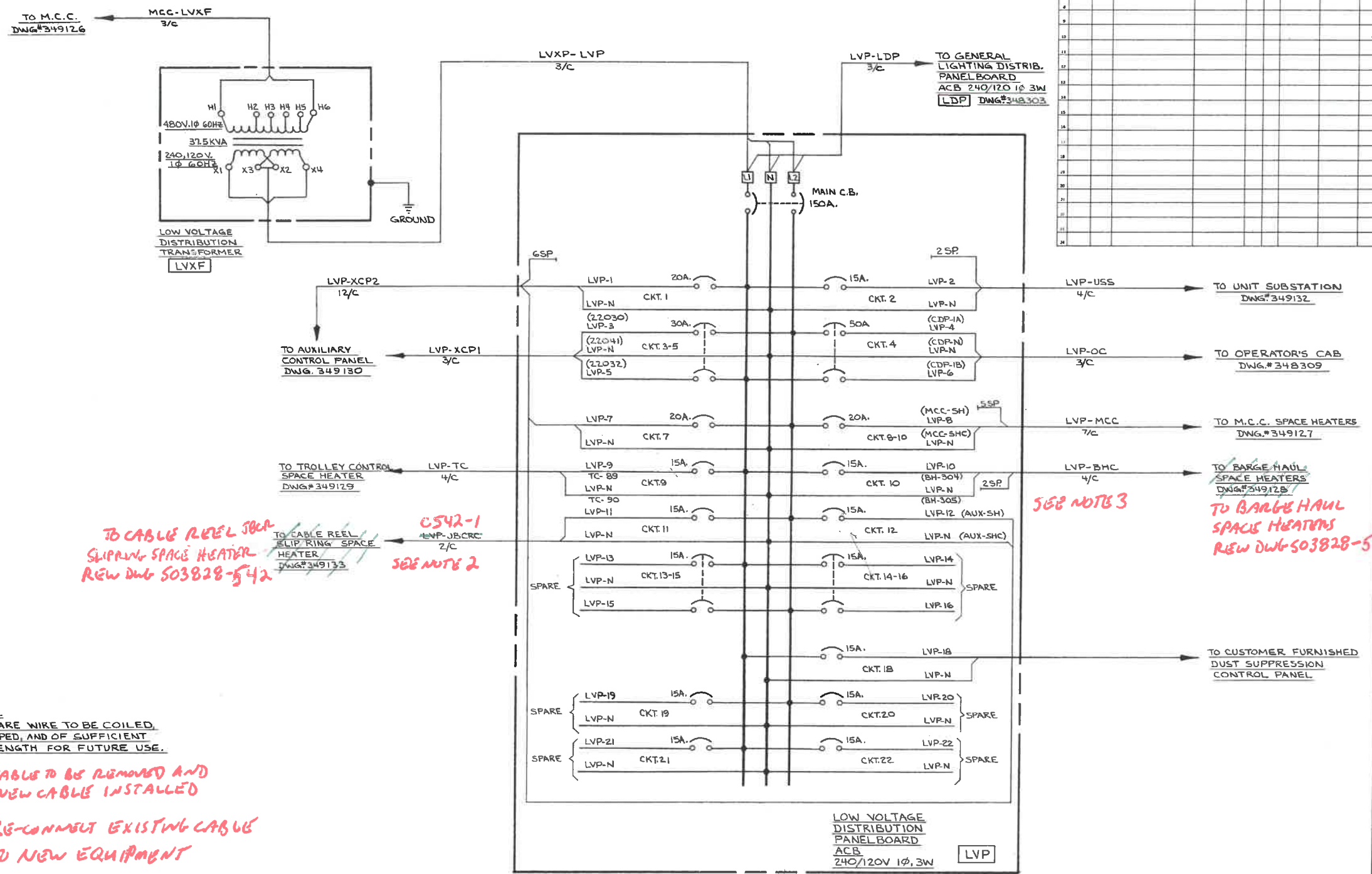
W-4139	SHOP BILL NO.	B,L
ALABAMA STATE DOCKS CONTINUOUS BARGE UNLOADER BARGE HAUL DIG & RETURN WINCH INTERCONNECTIONS		DIST.
SCALE	APP'D 9/10/81	DATE 2/18/81
DRW J.W.D.	DATE 10/15/80	REV.
DEL 2/4/81		
DRAWING NO.		
349138		

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DRAVO CORPORATION, PITTSBURGH, PA. DRW E.W.D.



No.	REV.	DATE	DESCRIPTION	Length		Piece or Panel Number	Drawing Number	Start
				FT.	INCH.			
1								
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22								
23								
24								



- NOTES**
1. SPARE WIRE TO BE COILED, TAPED, AND OF SUFFICIENT LENGTH FOR FUTURE USE.
 2. CABLE TO BE REMOVED AND NEW CABLE INSTALLED
 3. RE-CONNECT EXISTING CABLE TO NEW EQUIPMENT

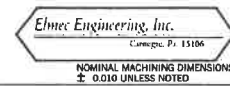
TO CABLE REEL JBCA SLIPRING SPACE HEATER R&W DWG 503828-542

0542-1 LVP-JBCRC 2/C SEE NOTE 2

SEE NOTE 3

TO BARGE HAUL SPACE HEATERS R&W DWG 503828-540

REV.	ITEM	DATE	DESCRIPTION	SCALE	DR. JEM 1-3-87	CHK. RJS 1-29-87	APP'D. [Signature]	DEL. 2/15/91
DWG. REVISIONS DESCRIPTION				AUTHORITY & DATE		ALABAMA STATE DOCKS CONTINUOUS BARGE UNLOADER LOW VOLTAGE DISTRIBUTION PNL INTERCONNECTIONS		
DWG. NO. 349139				SHOP BILL NO.		26 55 1		
DRAWING NO. 349139				REV. 1		DRAGO CORPORATION, PITTSBURGH, PA. DIV. EWD SHEET 1		



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