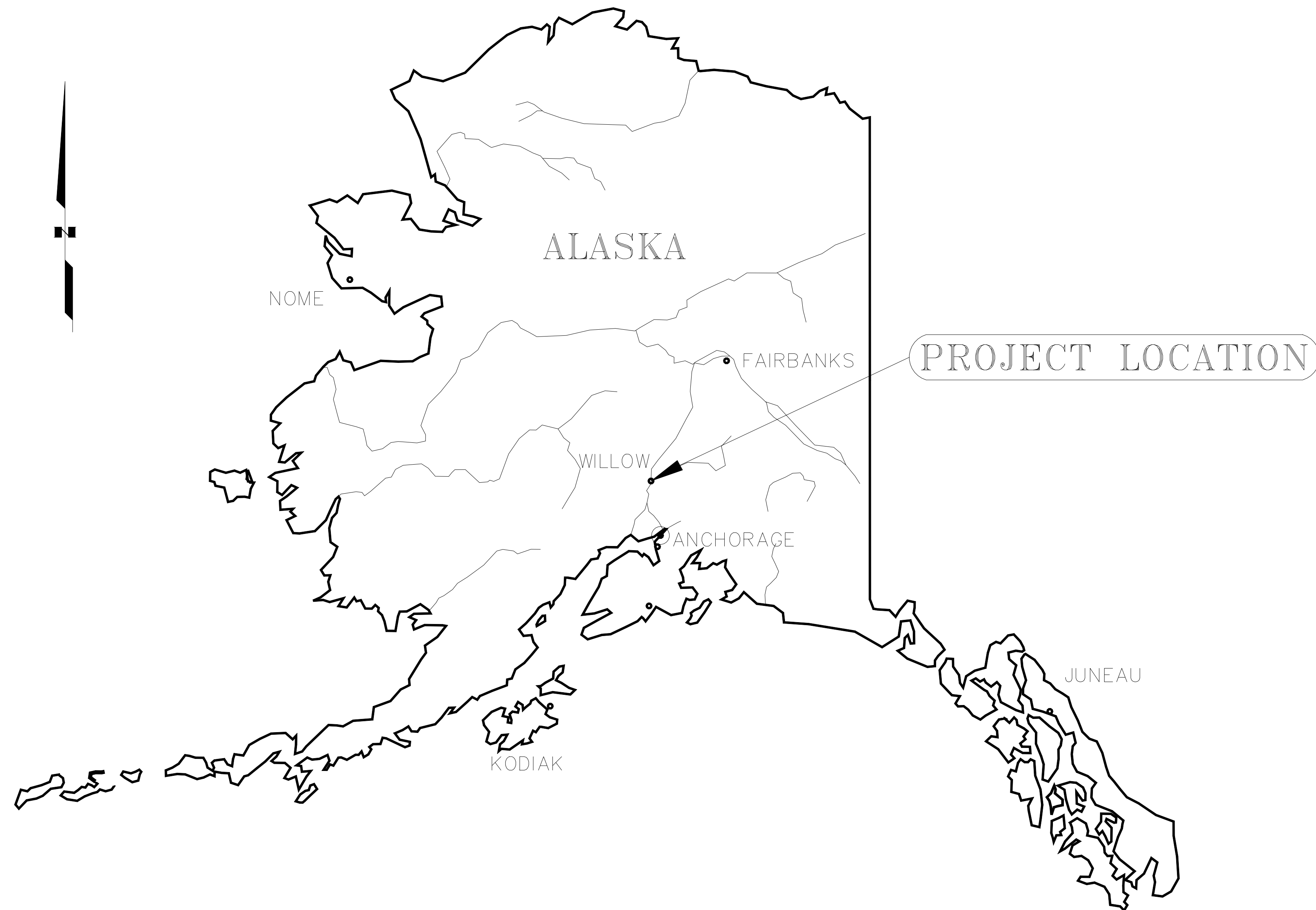


MATANUSKA ELECTRIC ASSOCIATION, INC.
 ROBERT DOUGLAS SUBSTATION
 24060 WEST WILLOW FISHHOOK ROAD, WILLOW, ALASKA
 WORK ORDER NO. EN16-3.2



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LOCATE CALL CENTER OF ALASKA (LCCA)	
ANCHORAGE AREA.....	278-3121
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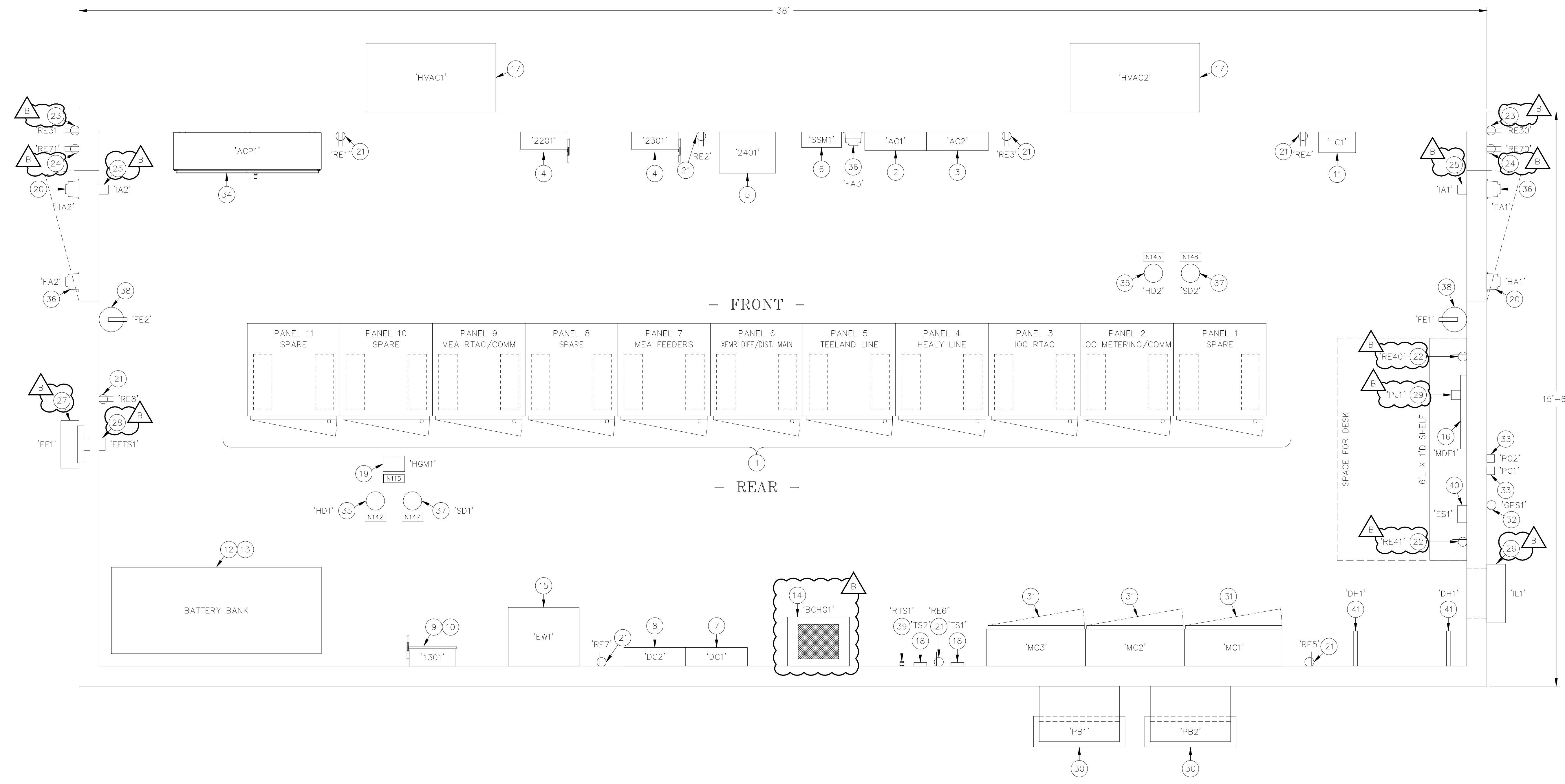
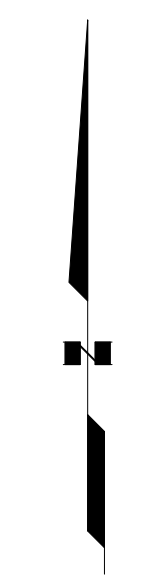
DRAWING INDEX

TITLE	DRAWING NUMBER	SHEET	REVISION	NOTES
CONTROL ENCLOSURE PLAN	DGSS-SS-2009	1	B	
CONTROL ENCLOSURE NORTH AND SOUTH EXTERIOR ELEVATIONS	DGSS-SS-2009	2	B	
CONTROL ENCLOSURE EAST AND WEST EXTERIOR ELEVATIONS	DGSS-SS-2009	3	B	
CONTROL ENCLOSURE NORTH AND SOUTH INTERIOR ELEVATIONS	DGSS-SS-2009	4	B	
CONTROL ENCLOSURE EAST AND WEST INTERIOR ELEVATIONS	DGSS-SS-2009	5	B	
CONTROL ENCLOSURE CABLE TRAY PLAN	DGSS-SS-2009	6	B	
CONTROL ENCLOSURE LIGHTING PLAN	DGSS-SS-2009	7	B	
CONTROL ENCLOSURE NAMEPLATES	DGSS-SS-2009	8	B	
CONTROL ENCLOSURE BILL OF MATERIAL	DGSS-SS-2009	9	B	
ELECTRICAL GENERAL INFORMATION	DGSS-EL-0000	1	A	
ELECTRICAL CABLE & WIRE STANDARD	DGSS-EL-0000	2	A	
138 kV ONE-LINE DIAGRAM	DGSS-EL-0010	1	A	
24.9 kV ONE-LINE DIAGRAM	DGSS-EL-0011	1	A	
STATION SERVICE ONE-LINE DIAGRAM	DGSS-EL-0012	1	A	
125 VDC ONE LINE DIAGRAM	DGSS-EL-0013	1	A	
SCADA NETWORK TOPOLOGY	DGSS-EL-0014	1	A	
SCADA NETWORK TOPOLOGY	DGSS-EL-0014	2	A	
SCADA NETWORK TOPOLOGY	DGSS-EL-0014	3	A	
SCADA NETWORK TOPOLOGY	DGSS-EL-0014	4	A	
SCADA NETWORK TOPOLOGY	DGSS-EL-0014	5	A	
SCADA NETWORK TOPOLOGY	DGSS-EL-0014	6	A	
SCADA NETWORK TOPOLOGY	DGSS-EL-0014	7	A	
TIME SYNCHRONIZATION NETWORK TOPOLOGY	DGSS-EL-0015	1	A	
138 kV BREAKER B1 THREE-LINE DIAGRAM	DGSS-EL-0100	1	A	PROVIDED AFTER BID AWARD
138 kV SYNC CVT THREE-LINE DIAGRAM	DGSS-EL-0101	1	A	PROVIDED AFTER BID AWARD
138 kV BUS PT THREE-LINE DIAGRAM	DGSS-EL-0102	1	A	PROVIDED AFTER BID AWARD
138/24.9 kV TRANSFORMER T1 THREE-LINE DIAGRAM	DGSS-EL-0103	1	A	PROVIDED AFTER BID AWARD
24.9 kV MAIN PT THREE-LINE DIAGRAM	DGSS-EL-0104	1	A	PROVIDED AFTER BID AWARD
STATION SERVICE THREE-LINE DIAGRAM	DGSS-EL-0105	1	A	PROVIDED AFTER BID AWARD
24.9 kV RECLOSER TD415 THREE-LINE DIAGRAM	DGSS-EL-0106	1	A	PROVIDED AFTER BID AWARD
24.9 kV RECLOSER TD425 THREE-LINE DIAGRAM	DGSS-EL-0107	1	A	PROVIDED AFTER BID AWARD
24.9 kV RECLOSER TD435 THREE-LINE DIAGRAM	DGSS-EL-0108	1	A	PROVIDED AFTER BID AWARD
125 VDC DC PANEL #1 SCHEMATIC & SCHEDULE	DGSS-EL-2000	1	A	PROVIDED AFTER BID AWARD
125 VDC DC PANEL #2 SCHEMATIC & SCHEDULE	DGSS-EL-2000	2	A	PROVIDED AFTER BID AWARD
240 VAC AC PANEL #1 SCHEMATIC & SCHEDULE	DGSS-EL-2001	1	A	PROVIDED AFTER BID AWARD
240 VAC AC PANEL #2 SCHEMATIC & SCHEDULE	DGSS-EL-2001	2	A	PROVIDED AFTER BID AWARD
2488A, 2620A, 2730MA & 2730MB DC SCHEMATIC	DGSS-EL-2002	1	A	PROVIDED AFTER BID AWARD
735-HLY1 DC SCHEMATIC	DGSS-EL-2003	1	A	PROVIDED AFTER BID AWARD
735-HLY2 DC SCHEMATIC	DGSS-EL-2004	1	A	PROVIDED AFTER BID AWARD
3530A DC SCHEMATIC	DGSS-EL-2005	1	A	PROVIDED AFTER BID AWARD
2240A DC SCHEMATIC	DGSS-EL-2006	1	A	PROVIDED AFTER BID AWARD
2411A DC SCHEMATIC	DGSS-EL-2007	1	A	PROVIDED AFTER BID AWARD
421-HLY DC SCHEMATIC	DGSS-EL-2008	1	A	PROVIDED AFTER BID AWARD
311L-HLY DC SCHEMATIC	DGSS-EL-2009	1	A	PROVIDED AFTER BID AWARD
DFR1 DC SCHEMATIC	DGSS-EL-2010	1	A	PROVIDED AFTER BID AWARD
421-TLND DC SCHEMATIC	DGSS-EL-2011	1	A	PROVIDED AFTER BID AWARD
311L-TLND DC SCHEMATIC	DGSS-EL-2012	1	A	PROVIDED AFTER BID AWARD
487E-T1 DC SCHEMATIC	DGSS-EL-2013	1	A	PROVIDED AFTER BID AWARD
86T1 DC SCHEMATIC	DGSS-EL-2014	1	A	PROVIDED AFTER BID AWARD
735-T1-1 DC SCHEMATIC	DGSS-EL-2015	1	A	PROVIDED AFTER BID AWARD
735-T1-2 DC SCHEMATIC	DGSS-EL-2016	1	A	PROVIDED AFTER BID AWARD
451-TD325 DC SCHEMATIC	DGSS-EL-2017	1	A	PROVIDED AFTER BID AWARD
451-TD415 DC SCHEMATIC	DGSS-EL-2018	1	A	PROVIDED AFTER BID AWARD
451-TD425 DC SCHEMATIC	DGSS-EL-2019	1	A	PROVIDED AFTER BID AWARD
451-TD435 DC SCHEMATIC	DGSS-EL-2020	1	A	PROVIDED AFTER BID AWARD
2730MC & 2725A DC SCHEMATIC	DGSS-EL-2021	1	A	PROVIDED AFTER BID AWARD
3530B DC SCHEMATIC	DGSS-EL-2022	1	A	PROVIDED AFTER BID AWARD
2240B DC SCHEMATIC	DGSS-EL-2023	1	A	PROVIDED AFTER BID AWARD
2523A DC SCHEMATIC	DGSS-EL-2024	1	A	PROVIDED AFTER BID AWARD
125 VDC BATTERY CHARGER AC & DC SCHEMATIC	DGSS-EL-2025	1	A	PROVIDED AFTER BID AWARD
MS200DA AC & DC SCHEMATIC	DGSS-EL-2026	1	A	PROVIDED AFTER BID AWARD
HYDROGEN DETECTION AC SYSTEM SCHEMATIC	DGSS-EL-2027	1	A	PROVIDED AFTER BID AWARD
FIRE DETECTION SYSTEM AC SCHEMATIC	DGSS-EL-2028	1	A	PROVIDED AFTER BID AWARD
HVAC SYSTEM SCHEMATIC	DGSS-EL-2029	1	A	PROVIDED AFTER BID AWARD
HVAC SYSTEM SCHEMATIC	DGSS-EL-2029	2	A	PROVIDED AFTER BID AWARD
INTERIOR LIGHT & RECEPTACLE AC SCHEMATIC	DGSS-EL-2030	1	A	PROVIDED AFTER BID AWARD
EXTERIOR LIGHT & RECEPTACLE AC SCHEMATIC	DGSS-EL-2031	1	A	PROVIDED AFTER BID AWARD
RELAY PANELS LIGHT & RECEPTACLE AC SCHEMATIC	DGSS-EL-2032	1	A	PROVIDED AFTER BID AWARD
MAINTENANCE LIGHTING AC SCHEMATIC	DGSS-EL-2500	1	A	PROVIDED AFTER BID AWARD
138 kV BREAKER B1 AC & DC SCHEMATIC	DGSS-EL-2501	1	A	PROVIDED AFTER BID AWARD
138 kV MOTOR OPERATED SWITCH DG-138-2S3 AC & DC SCHEMATIC	DGSS-EL-2502	1	A	PROVIDED AFTER BID AWARD
138 kV CIRCUIT SWITCHER TD200 AC & DC SCHEMATIC	DGSS-EL-2503	1	A	PROVIDED AFTER BID AWARD
138 kV TRANSFORMER T1 AC & DC SCHEMATIC	DGSS-EL-2504	1	A	PROVIDED AFTER BID AWARD

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			ENG. STAMP
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS			163 East Industrial Way Palmer, AK 99645 (907) 761-9300 WWW.MEA.COOP
JOB #: MEA W.O. EN16-3.2			
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	KER/09-19-2016	TCC/09-19-2016

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DOUGLAS SUBSTATION CONTROL ENCLOSURE AND RELAY PANELS TITLE & DRAWING INDEX		dgss-pr-0000_1.dwg
REF. DWG(S):		
DRAWING NO.:	DGSS-PR-0000	SHEET 1 OF 2



NOTES:
 ① SEE DRAWING REFERENCE 1 FOR BILL OF MATERIAL.
 ② SEE DRAWING REFERENCE 2 FOR NAMEPLATES (INXXX).

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
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B	ISSUED FOR BID REVIEW	KER/09-19-2016

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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-SS-2009/9	CONTROL ENCLOSURE BILL OF MATERIAL
2	DGSS-SS-2009/8	CONTROL ENCLOSURE NAMEPLATES

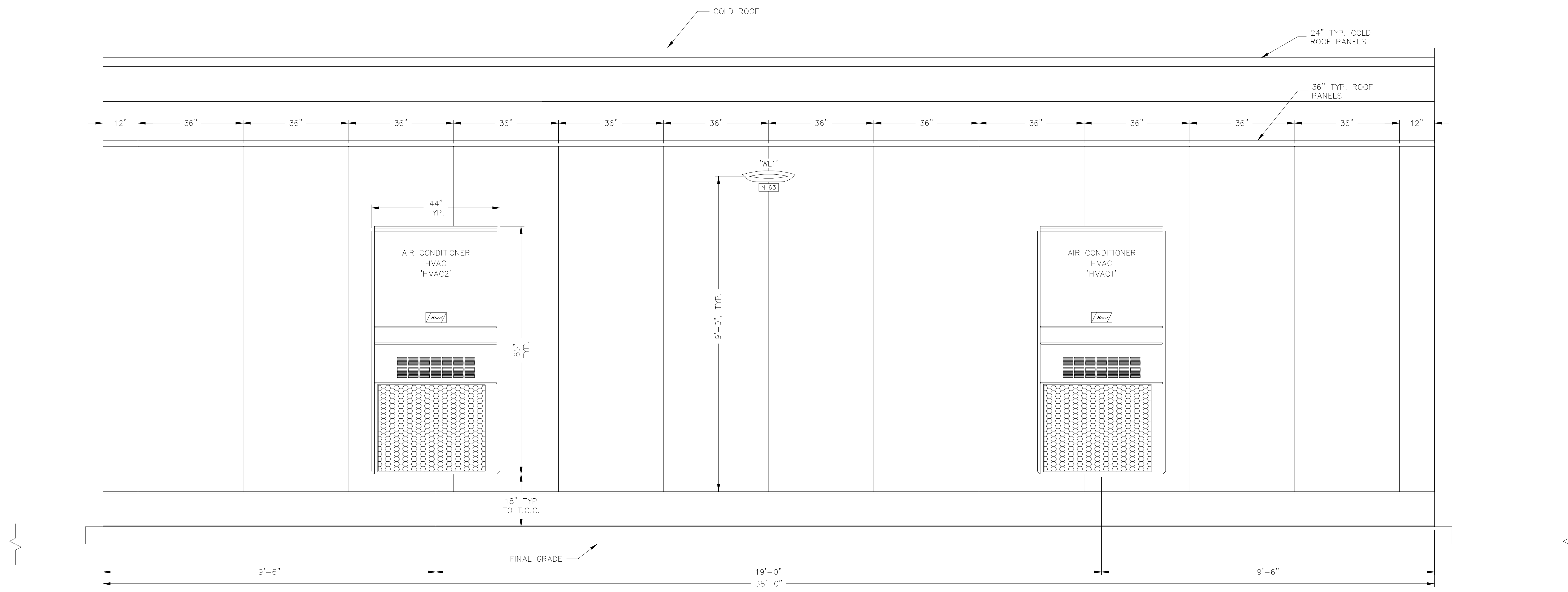
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REF. DWG(S):

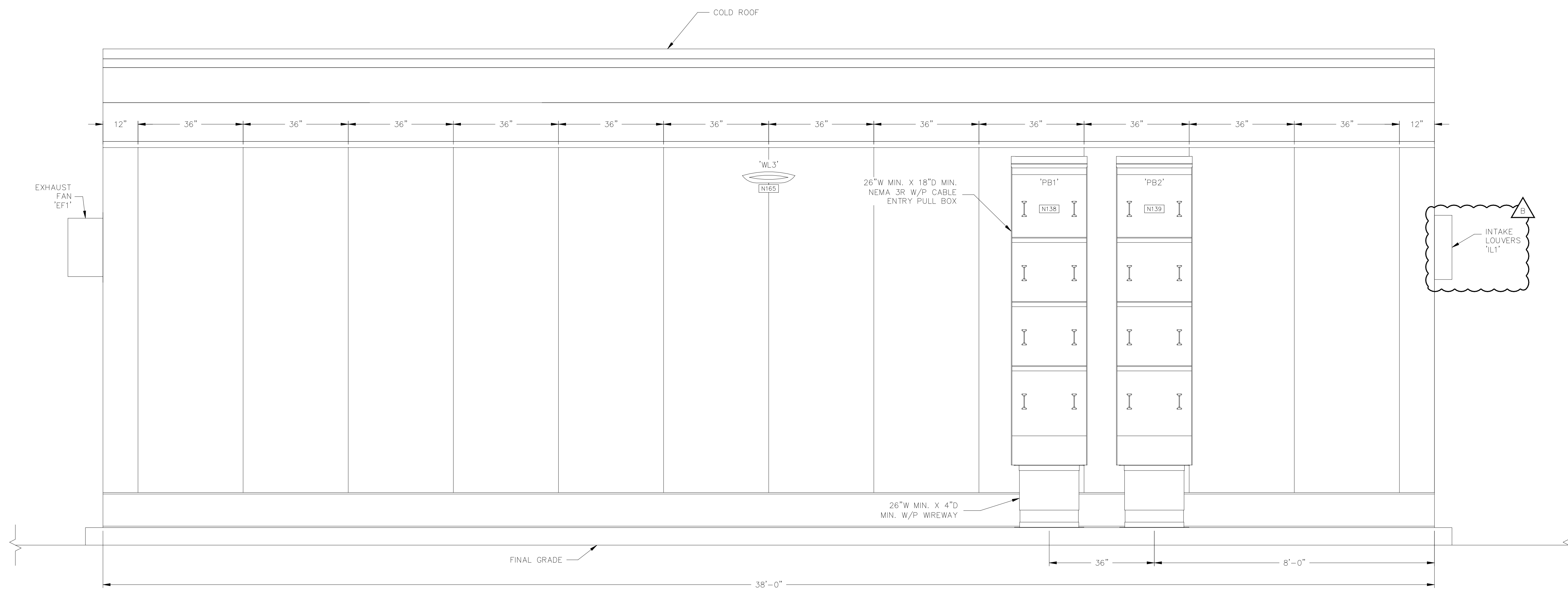
DRAWING NO.: DGSS-SS-2009

SHEET 1 OF 9

dgss-ss-2009 1.dwg

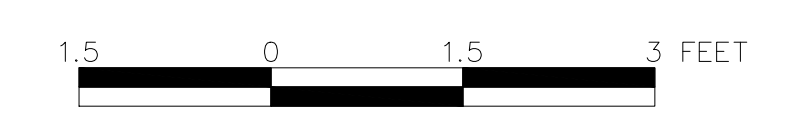


1 NORTH ELEVATION



2 SOUTH ELEVATION

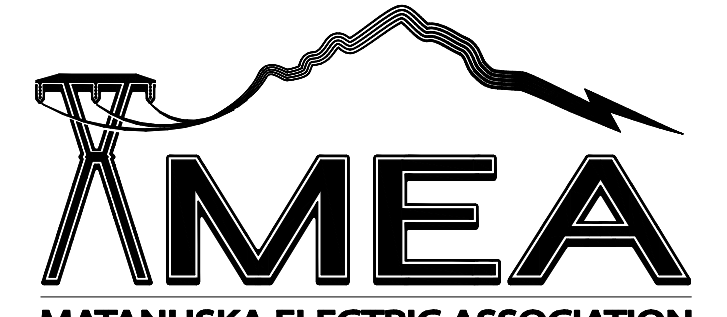
NOTES:
 ① SEE DRAWING REFERENCE 1 FOR NAMEPLATES (Nxxx).



PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
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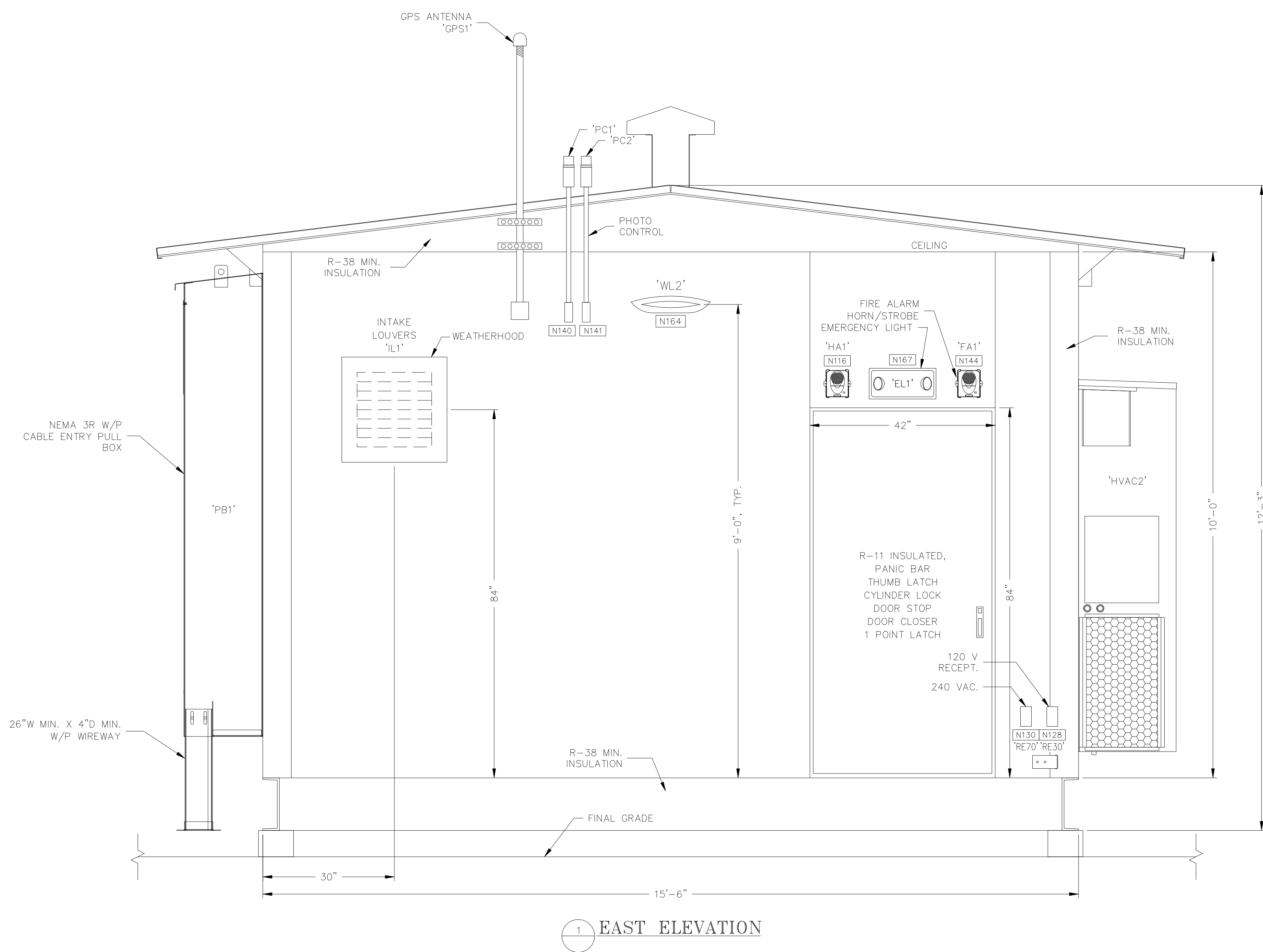
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-SS-2009/8	CONTROL ENCLOSURE NAMEPLATES

DRAWING NAME: DOUGLAS SUBSTATION CONTROL ENCLOSURE NORTH AND SOUTH EXTERIOR ELEVATIONS

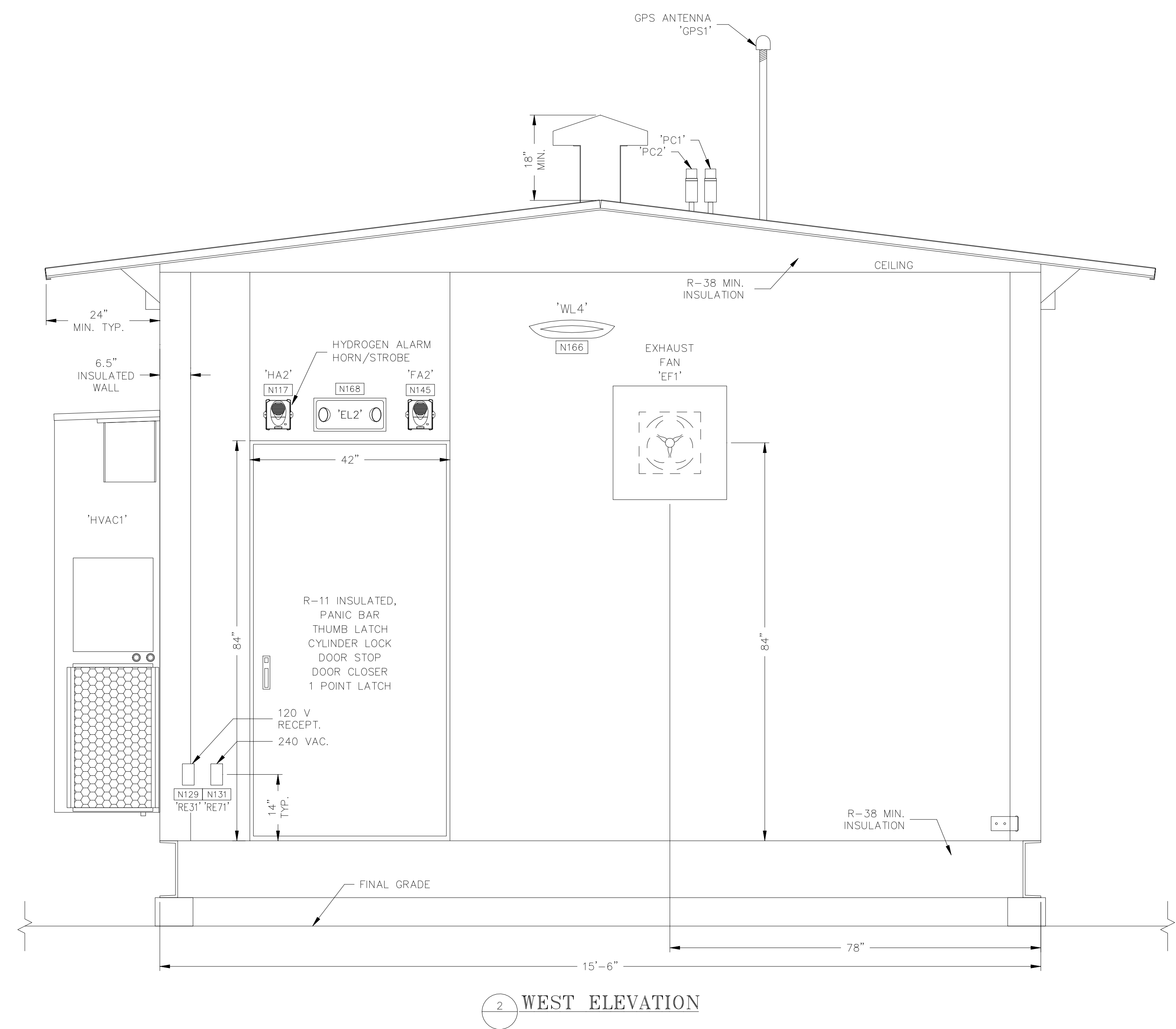
REF. DWG(S):

DRAWING NO.: DGSS-SS-2009

SHEET 2 OF 9

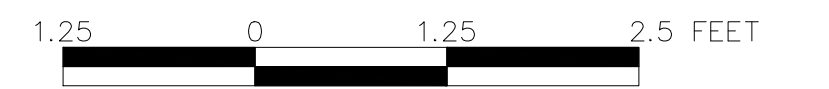


1 EAST ELEVATION



2 WEST ELEVATION

NOTES:
 (1) SEE DRAWING REFERENCE 1 FOR NAMEPLATES ((XXXX)).



PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
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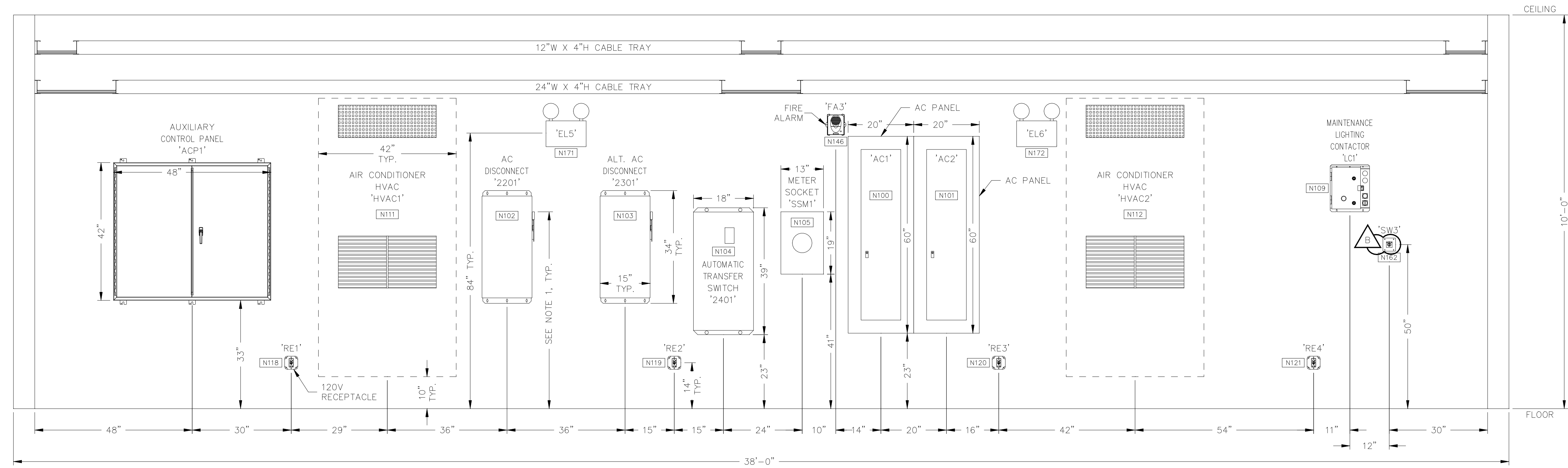
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-SS-2009/8	CONTROL ENCLOSURE NAMEPLATES

DRAWING NAME: DOUGLAS SUBSTATION CONTROL ENCLOSURE EAST AND WEST EXTERIOR ELEVATIONS

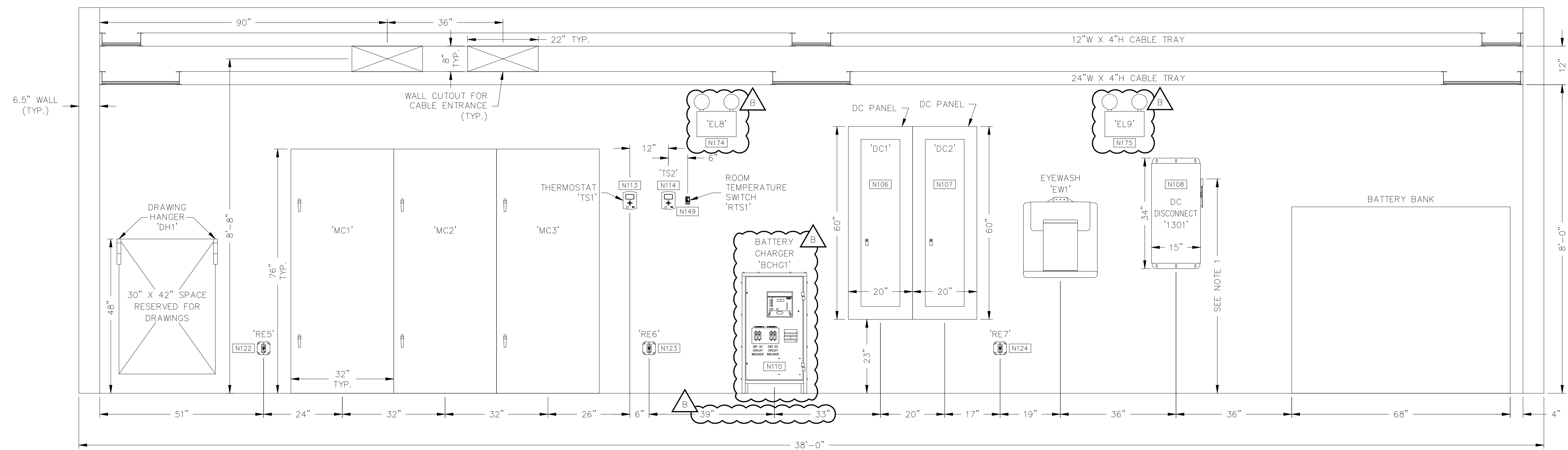
REF. DWG(S):

DRAWING NO.: DGSS-SS-2009

SHEET 3 OF 9



1 NORTH ELEVATION



2 SOUTH ELEVATION

- NOTES:
- 1 MAXIMUM HEIGHT OF 6' FROM FLOOR TO THE TOP OF OPERATING HANDLE WHEN IN THE UP POSITION.
 - 2 SEE DRAWING REFERENCE 3 FOR NAMEPLATES (XXXX).
 - 3 SEE DRAWING REFERENCE 4 FOR BILL OF MATERIAL.



PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
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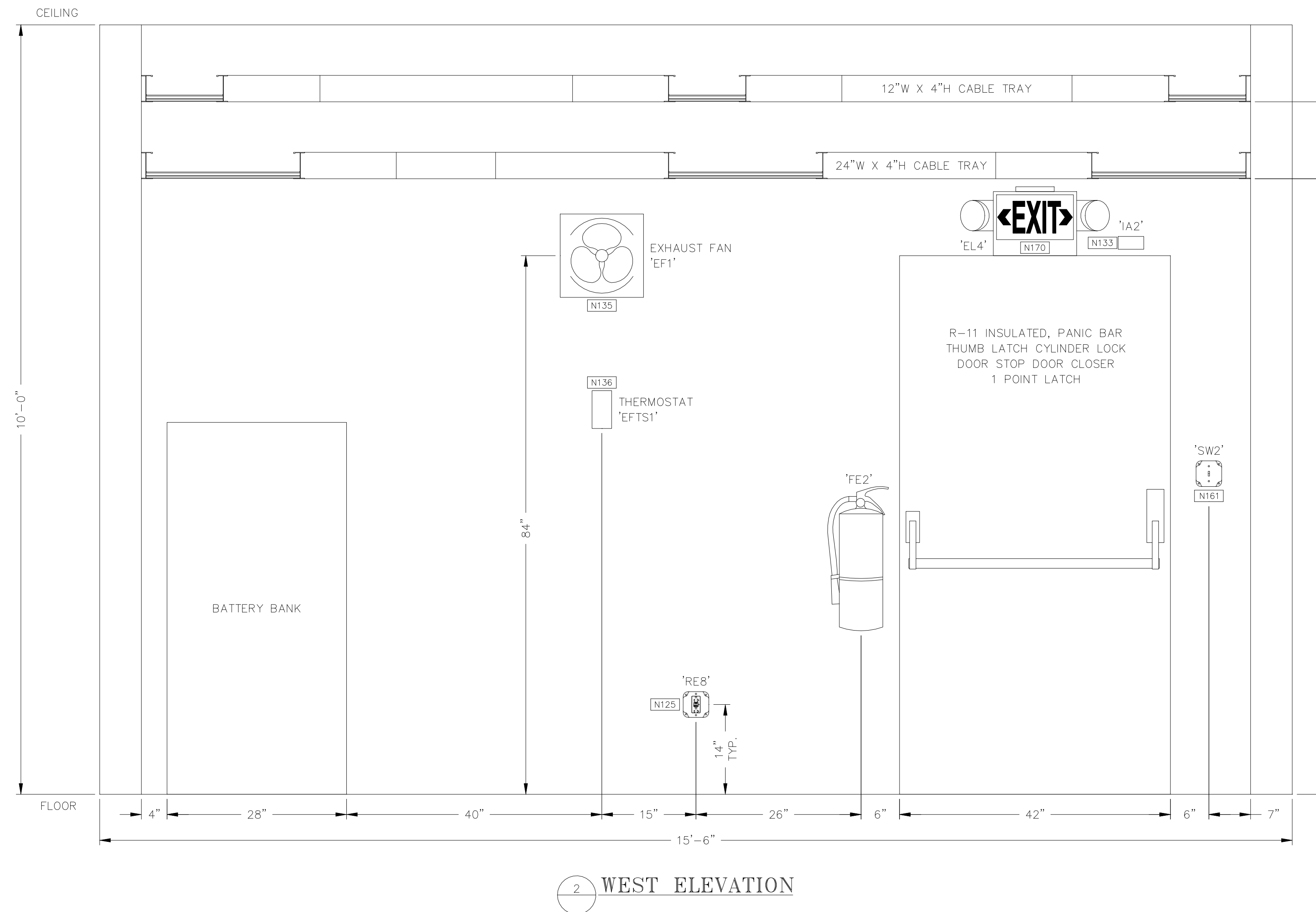
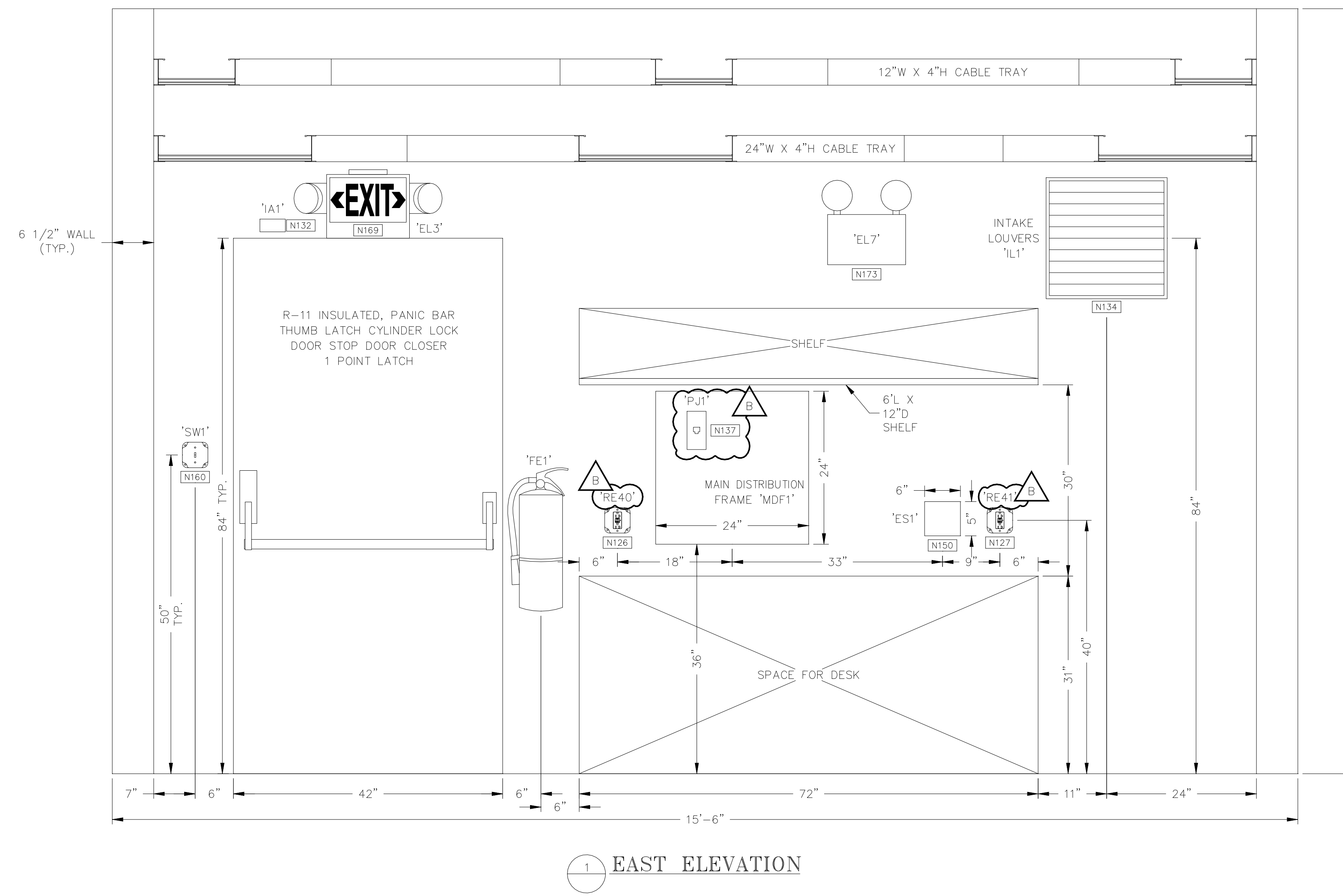
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	NORTH ELEVATION
2	-	SOUTH ELEVATION
3	DGSS-SS-2009/8	CONTROL ENCLOSURE NAMEPLATES
4	DGSS-SS-2009/9	CONTROL ENCLOSURE BILL OF MATERIAL

DRAWING NAME:		DOUGLAS SUBSTATION CONTROL ENCLOSURE NORTH AND SOUTH INTERIOR ELEVATIONS
REF. DWG(S):		
DRAWING NO.:		DGSS-SS-2009
		SHEET 4 OF 9



NOTES:
 (1) SEE DRAWING REFERENCE 3 FOR NAMEPLATES (XXXX).



PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
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B	ISSUED FOR BID REVIEW	KER/09-19-2016	TCC/09-19-2016

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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	EAST ELEVATION
2	-	WEST ELEVATION
3	DGSS-SS-2009/8	CONTROL ENCLOSURE NAMEPLATES

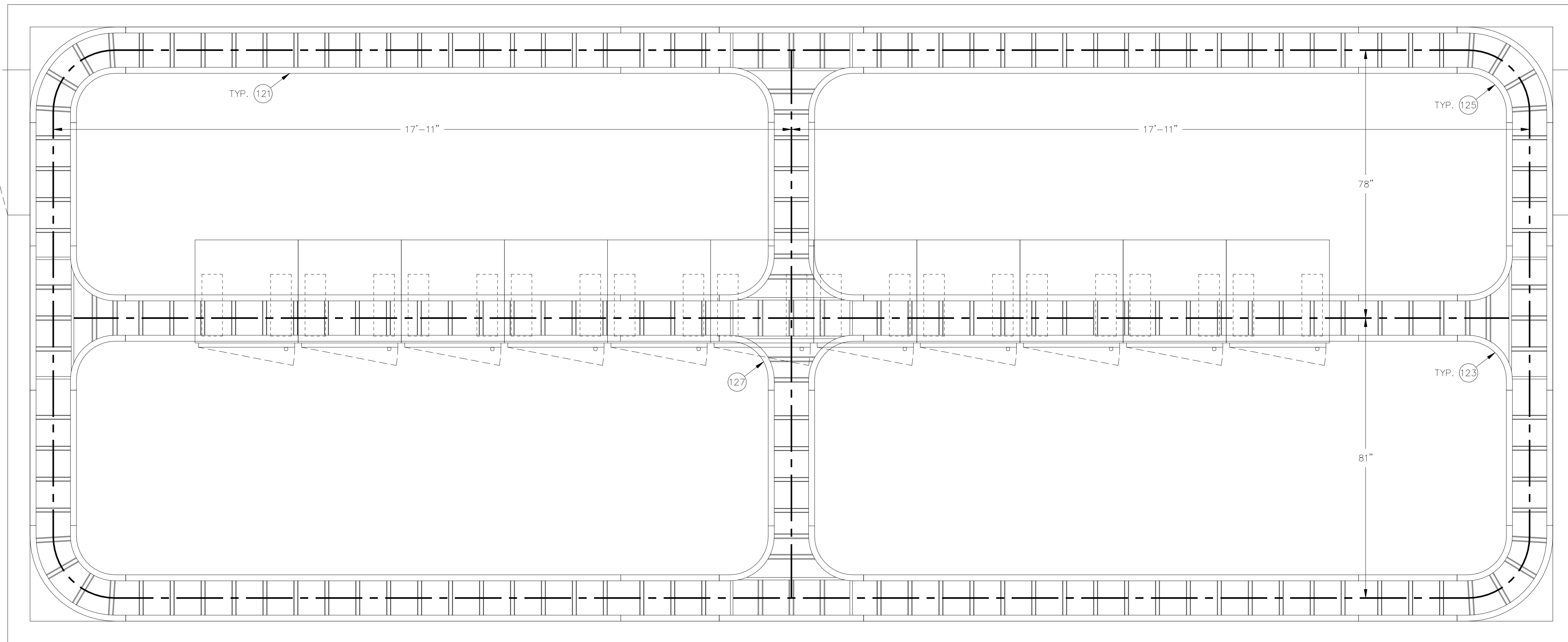
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REF. DWG(S):

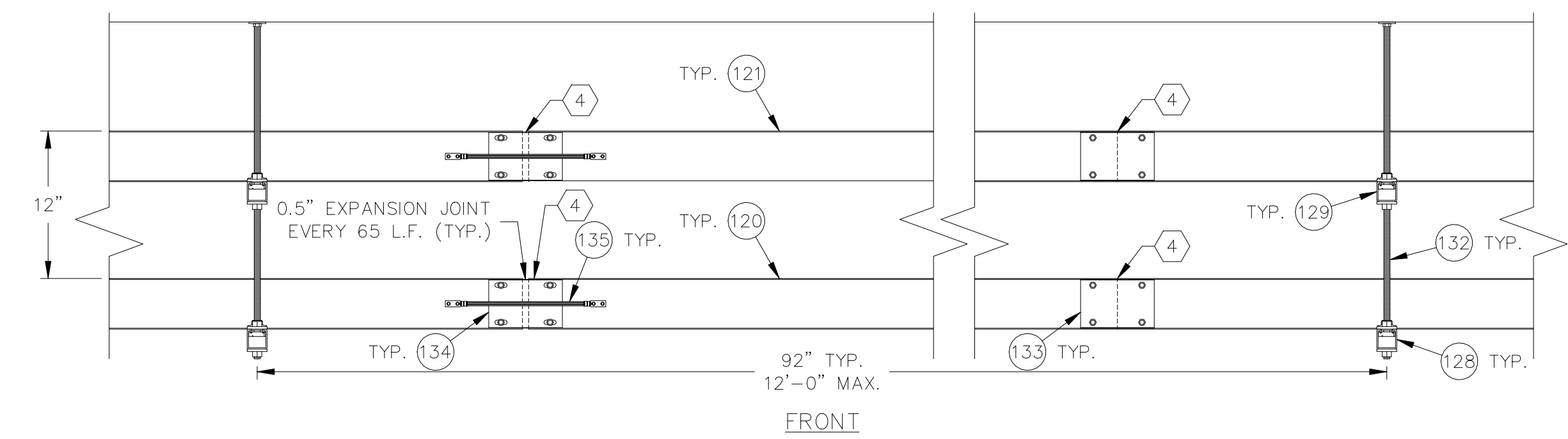
DRAWING NO.: DGSS-SS-2009

SHEET 5 OF 9

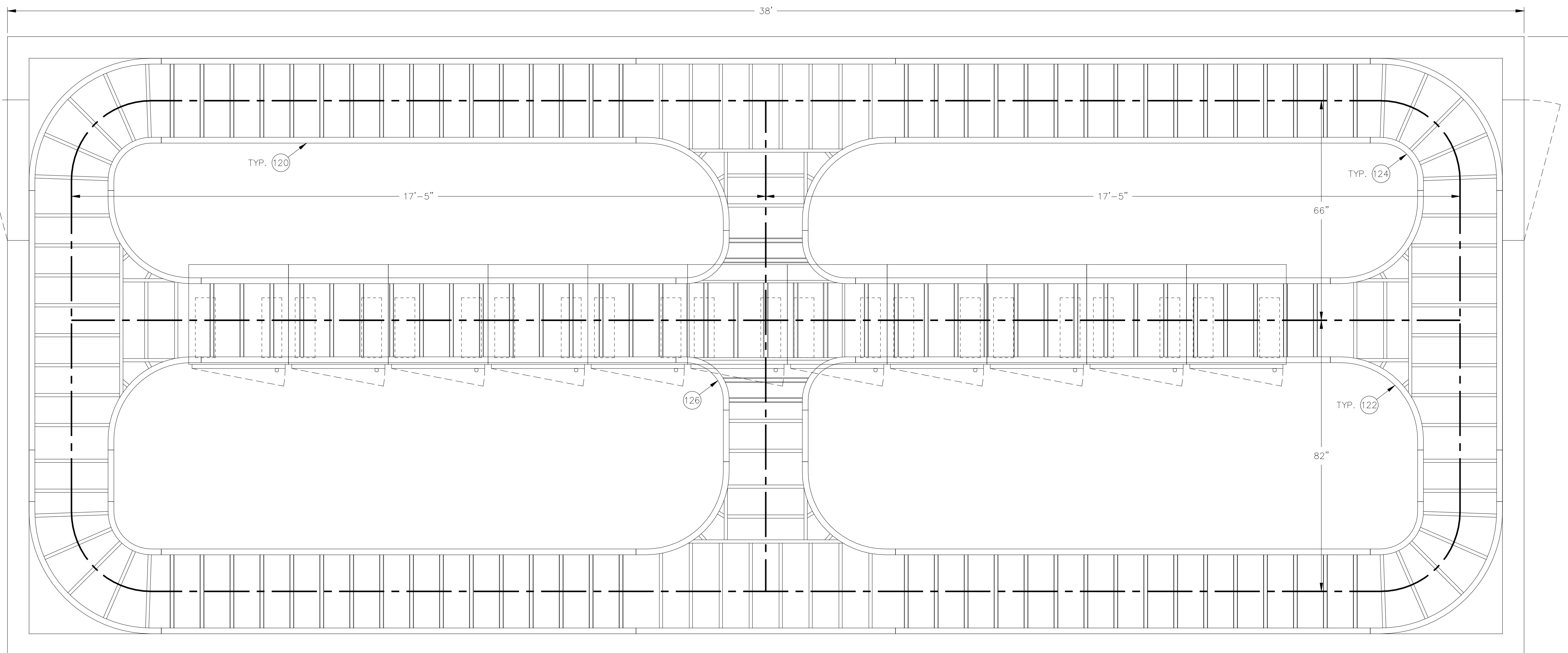
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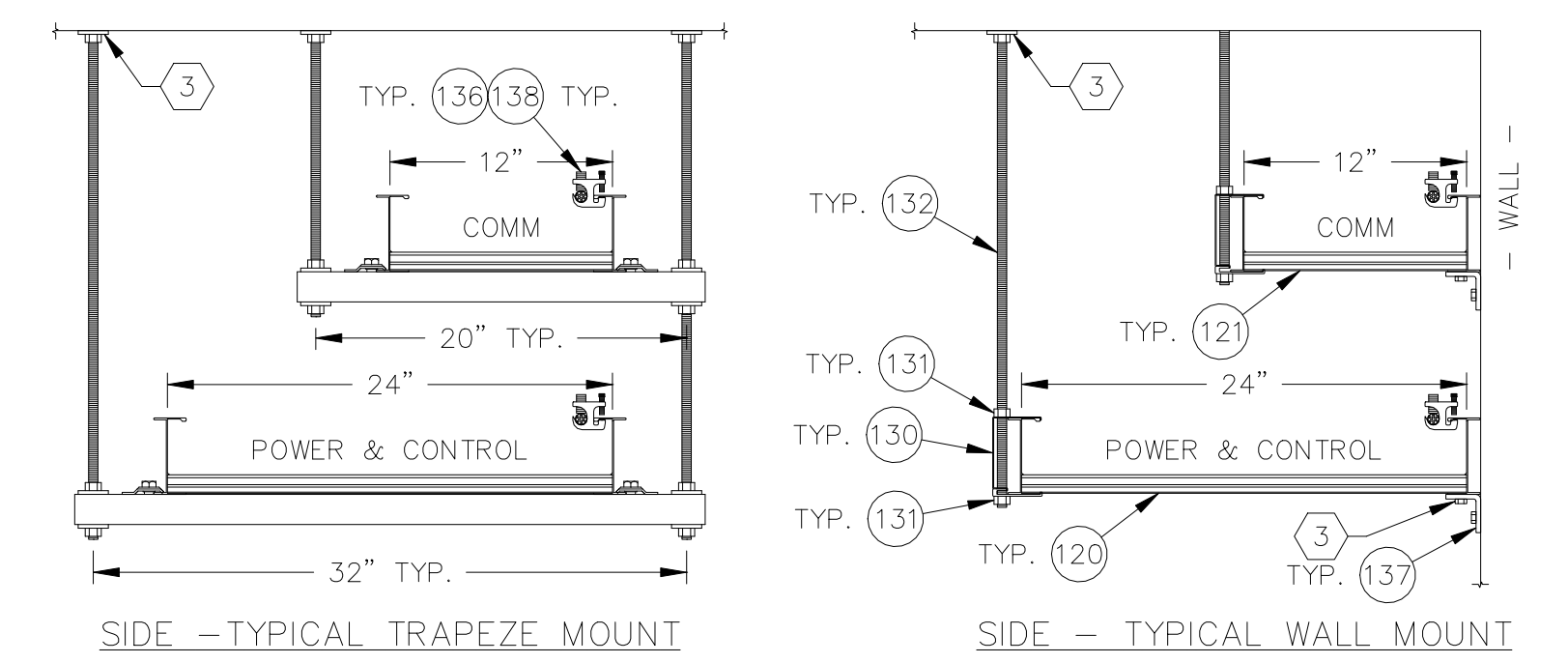
1 UPPER TIER



FRONT



2 LOWER TIER



SIDE - TYPICAL TRAPEZE MOUNT

SIDE - TYPICAL WALL MOUNT

3 CABLE TRAY ELEVATION
N.T.S.



- NOTES:
- 1 CEILING/WALL ATTACHMENT DETAILS AND HARDWARE TBD BY CONTROL ENCLOSURE MFR.
 - 2 THERE SHALL NOT BE MORE THAN ONE SPLICE IN BETWEEN ANY TWO VERTICAL SUPPORTS.
 - 3 SEE DRAWING REFERENCE 4 FOR BILL OF MATERIAL.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
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B	ISSUED FOR BID REVIEW	KER/09-19-2016	TCC/09-19-2016

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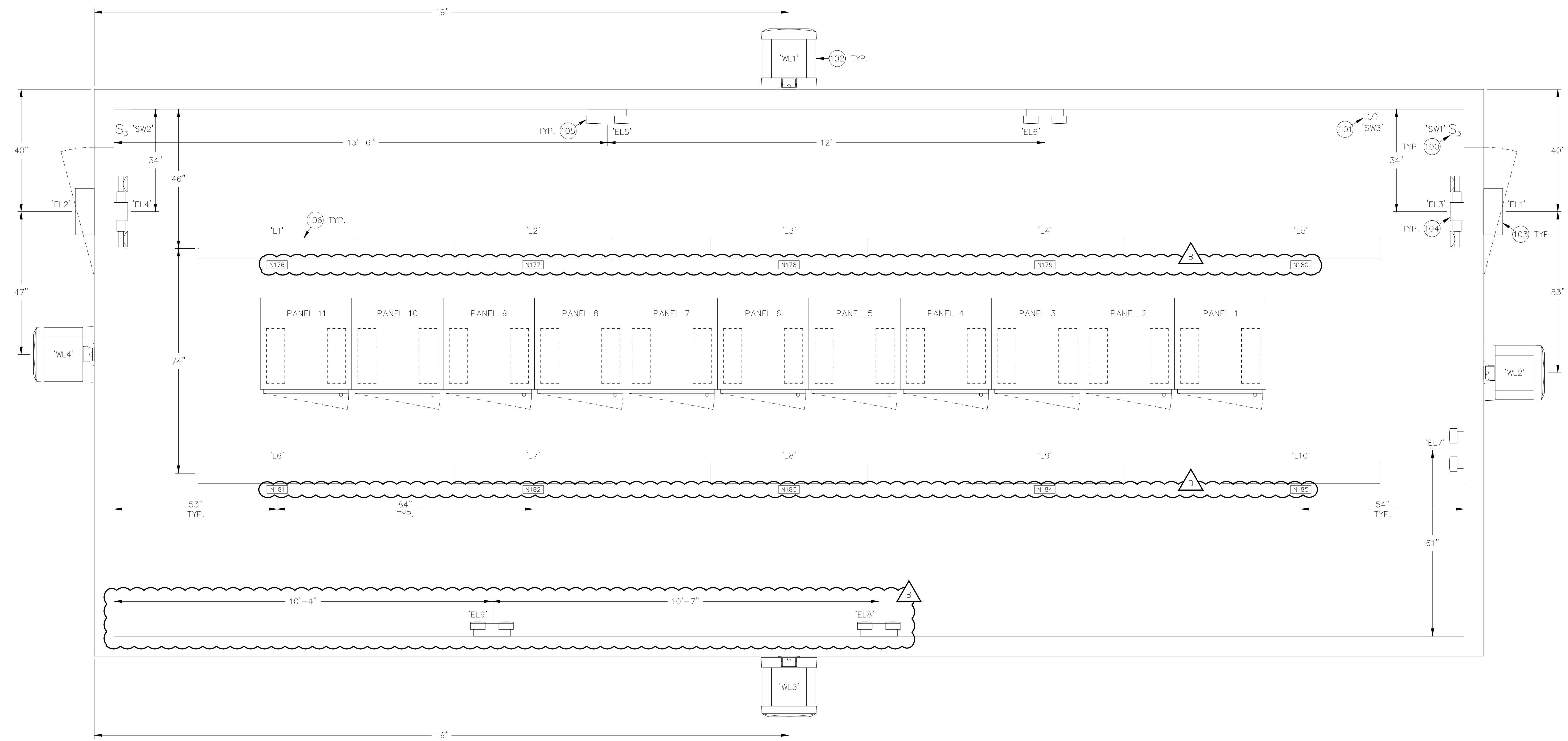
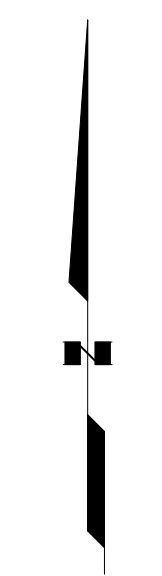


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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	UPPER TIER
2	-	LOWER TIER
3	-	CABLE TRAY ELEVATION
4	DGSS-SS-2009/9	CONTROL ENCLOSURE BILL OF MATERIAL

DRAWING NAME:	DOUGLAS SUBSTATION CONTROL ENCLOSURE CABLE TRAY PLAN
REF. DWG(S):	
DRAWING NO.:	DGSS-SS-2009
SHEET	6 OF 9

dgss-ss-2009_6.dwg



NOTES:

- ① SEE DRAWING REFERENCE 1 FOR BILL OF MATERIAL.
- ② SEE DRAWING REFERENCE 2 FOR NAMEPLATES (NXXXX).



PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
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(907) 761-9300
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-SS-2009/9	CONTROL ENCLOSURE BILL OF MATERIAL
2	DGSS-SS-2009/8	CONTROL ENCLOSURE NAMEPLATES

DRAWING NAME:	DOUGLAS SUBSTATION CONTROL ENCLOSURE LIGHTING PLAN
REF. DWG(S):	
DRAWING NO.:	DGSS-SS-2009
SHEET:	7 OF 9

dgss-ss-2009_7.dwg

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N100	1	AC PANEL	AC1		1 x 3	1/4
N101	1	AC PANEL	AC2		1 x 3	1/4
N102	1	AC DISCONNECT	2201		1 x 4	1/4
N103	1	AC DISCONNECT	2301		1 x 4	1/4
N104	1	AUTO TRANSFER	SWITCH 2401		1 x 4	1/4
N105	1	STATION SERVICE	METER 1		1 x 4	1/4
N106	1	DC PANEL	DC1		1 x 3	1/4
N107	1	DC PANEL	DC2		1 x 3	1/4
N108	1	DC FUSED DISCONNECT	1301		1 x 5	1/4
N109	1	MAINTENANCE LIGHTING	CONTACTOR	LC1	1-1/2 x 5	1/4
N110	1	BATTERY CHARGER	BCHG1		1 x 4	1/4
N111	1	HVAC UNIT	HVAC1		1 x 3	1/4
N112	1	HVAC UNIT	HVAC2		1 x 3	1/4
N113	1	HVAC1 THERMOSTAT	TS1		1 x 4	1/4
N114	1	HVAC2 THERMOSTAT	TS2		1 x 4	1/4
N115	1	H2 GAS MON.	HGM1		1 x 3	1/4
N116	1	HYDROGEN ALARM	HA1		1 x 4	1/4
N117	1	HYDROGEN ALARM	HA2		1 x 4	1/4
N118	1	120 VAC	RECEPTACLE	RE1	1-1/2 x 3	1/4
N119	1	120 VAC	RECEPTACLE	RE2	1-1/2 x 3	1/4
N120	1	120 VAC	RECEPTACLE	RE3	1-1/2 x 3	1/4
N121	1	120 VAC	RECEPTACLE	RE4	1-1/2 x 3	1/4
N122	1	120 VAC	RECEPTACLE	RE5	1-1/2 x 3	1/4
N123	1	120 VAC	RECEPTACLE	RE6	1-1/2 x 3	1/4
N124	1	120 VAC	RECEPTACLE	RE7	1-1/2 x 3	1/4
N125	1	120 VAC	RECEPTACLE	RE8	1-1/2 x 3	1/4
N126	1	120 VAC	RECEPTACLE	RE40	1-1/2 x 3	1/4
N127	1	120 VAC	RECEPTACLE	RE41	1-1/2 x 3	1/4
N128	1	120 VAC	RECEPTACLE	RE30	1-1/2 x 3	1/4
N129	1	120 VAC	RECEPTACLE	RE31	1-1/2 x 3	1/4
N130	1	240 VAC	RECEPTACLE	RE70	1-1/2 x 3	1/4
N131	1	240 VAC	RECEPTACLE	RE71	1-1/2 x 3	1/4
N132	1	INTRUSION ALM	IA1		1 x 4	1/4
N133	1	INTRUSION ALM	IA2		1 x 4	1/4
N134	1	INTAKE LOUVER	IL1		1 x 4	1/4
N135	1	EXHAUST FAN	EF1		1 x 4	1/4
N136	1	EXHAUST SYSTEM	THERMOSTAT	EFTS1	1-1/2 x 4	1/4
N137	1	TELEPHONE JACK	PJ1		1 x 4	1/4
N138	1	PULL BOX 1	PB1		1 x 4	1/4
N139	1	PULL BOX 2	PB2		1 x 4	1/4
N140	1	PHOTO CONTROL	PC1		1 x 4	1/4
N141	1	PHOTO CONTROL	PC2		1 x 4	1/4
N142	1	HEAT DETECTOR	HD1		1 x 4	1/4
N143	1	HEAT DETECTOR	HD2		1 x 4	1/4

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N144	1	FIRE ALARM	FA1		1 x 3	1/4
N145	1	FIRE ALARM	FA2		1 x 3	1/4
N146	1	FIRE ALARM	FA3		1 x 3	1/4
N147	1	SMOKE DETECTOR	SD1		1 x 4	1/4
N148	1	SMOKE DETECTOR	SD2		1 x 4	1/4
N149	1	ROOM TEMPERATURE	SWITCH	RTS1	1-1/2 x 5	1/4
N150	1	ES1	ETHERNET SWITCH	SEL-2725	1 x 3	1/8
N151						
N152						
N153						
N154						
N155						
N156						
N157						
N158						
N159						
N160	1	INTERIOR LIGHT SW	SW1		1 x 4	1/4
N161	1	INTERIOR LIGHT SW	SW2		1 x 4	1/4
N162	1	EXTERIOR LIGHT SW	SW3		1 x 4	1/4
N163	1	WALLPACK LIGHT	WL1		1 x 4	1/4
N164	1	WALLPACK LIGHT	WL2		1 x 4	1/4
N165	1	WALLPACK LIGHT	WL3		1 x 4	1/4
N166	1	WALLPACK LIGHT	WL4		1 x 4	1/4
N167	1	EMERGENCY LIGHT	EL1		1 x 4	1/4
N168	1	EMERGENCY LIGHT	EL2		1 x 4	1/4
N169	1	EMERGENCY EXIT LIGHT	EL3		1 x 5	1/4
N170	1	EMERGENCY EXIT LIGHT	EL4		1 x 5	1/4
N171	1	EMERGENCY LIGHT	EL5		1 x 4	1/4
N172	1	EMERGENCY LIGHT	EL6		1 x 4	1/4
N173	1	EMERGENCY LIGHT	EL7		1 x 4	1/4
N174	1	EMERGENCY LIGHT	EL8		1 x 4	1/4
N175	1	EMERGENCY LIGHT	EL9		1 x 4	1/4
N176	1	CEILING LIGHT	L1		1 x 3	1/4
N177	1	CEILING LIGHT	L2		1 x 3	1/4
N178	1	CEILING LIGHT	L3		1 x 3	1/4
N179	1	CEILING LIGHT	L4		1 x 3	1/4
N180	1	CEILING LIGHT	L5		1 x 3	1/4
N181	1	CEILING LIGHT	L6		1 x 3	1/4
N182	1	CEILING LIGHT	L7		1 x 3	1/4
N183	1	CEILING LIGHT	L8		1 x 3	1/4
N184	1	CEILING LIGHT	L9		1 x 3	1/4
N185	1	CEILING LIGHT	L10		1 x 3	1/4
N186						
N187						

NOTES:

- 1) ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
- 2) ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
- 3) ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
- 4) ALL TEXT SHALL BE "ARIAL BOLD" FONT.
- 5) EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
- 6) ALL TEXT SHALL BE UPPER CASE.
- 7) ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR DESIGN CONCEPT REVIEW	KER/07-01-2016	TCC/07-01-2016
B	ISSUED FOR BID REVIEW	KER/09-19-2016	TCC/09-19-2016

ENG. STAMP

Matanuska Electric Association



163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
WWW.MEA.COOP

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION CONTROL ENCLOSURE NAMEPLATES

doss-ss-2009_8.dwg

REF. DWG(S):

DRAWING NO.: DGSS-SS-2009

SHEET 8 OF 9

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
1	LOT	1	RELAY PANELS (PANEL 1 - PANEL 11)	SEE DRAWING REFERENCE 1	C
2	EA	1	AC PANEL (AC1)	EATON/PRL2A (OAE) WITH: COPPER LUGS (MOD 8) COPPER MAIN BUS (MOD 9) COPPER GROUND BAR (MOD 13) SERVICE ENTRANCE RATED (MOD 28) THROUGH-FEED LUGS (MOD 36) MAIN BREAKER SHALL BE TYPE FD BRANCH BREAKER SHALL BE TYPE GHB 42 CIRCUITS 65K AIC FULLY RATED 1-PHASE, 3-WIRE, 120/240 VAC, 225 AMP EZ BOX, EZB2060R EZ TRIM, EZT2060S	C
3	EA	1	AC PANEL (AC2)	EATON/PRL2A (OAE) WITH: COPPER LUGS (MOD 8) COPPER MAIN BUS (MOD 9) COPPER GROUND BAR (MOD 13) SERVICE ENTRANCE RATED (MOD 28) SUB-FEED BREAKER (MOD 33) MAIN BREAKER SHALL BE TYPE FD SUB-FEED BREAKER SHALL BE TYPE FD BRANCH BREAKER SHALL BE TYPE GHB 42 CIRCUITS 65K AIC FULLY RATED 1-PHASE, 3-WIRE, 120/240 VAC, 225 AMP EZ BOX, EZB2060R EZ TRIM, EZT2060S	C
4	LOT	1	AC DISCONNECT (2201 & 2301) DISCONNECT POWER TERMINAL BLOCK, GROUND	EATON (OAE): EATON/DH264UDKWLGN EATON/CH16204-1	C
5	EA	1	AUTOMATIC TRANSFER SWITCH (2401)	EATON/AT-3-CS-K-2-2000-W-L-U (OAE) WITH AUTO/MANUAL SELECTOR SWITCH (MOD 29G)	C
6	LOT	1	METER SOCKET (SSM1)	EATON (OAE): EATON/JUH4213CCH EATON/CH18303-1 EATON/CH16204-1	C
7	EA	1	DC PANEL (DC1)	EATON/PRL2A (OAE) WITH: COPPER LUGS (MOD 8) COPPER MAIN BUS (MOD 9) COPPER GROUND BAR (MOD 13) THROUGH-FEED LUGS (MOD 36) MAIN BREAKER SHALL BE TYPE HFD BRANCH BREAKER SHALL BE TYPE GHB 42 CIRCUITS 14K AIC FULLY RATED 2-WIRE, 125 VDC, 225 AMP EZ BOX, EZB2060R EZ TRIM, EZT2060S	C
8	EA	1	DC PANEL (DC2)	EATON/PRL2A (OAE) WITH: COPPER LUGS (MOD 8) COPPER MAIN BUS (MOD 9) COPPER GROUND BAR (MOD 13) THROUGH-FEED LUGS (MOD 36) MAIN BREAKER SHALL BE TYPE HFD BRANCH BREAKER SHALL BE TYPE GHB 42 CIRCUITS 14K AIC FULLY RATED 2-WIRE, 125 VDC, 225 AMP EZ BOX, EZB2060R EZ TRIM, EZT2060S	C
9	EA	1	DC FUSED DISCONNECT (1301)	EATON/DH224NDKW5CLG (OAE)	C
10	EA	2	DUAL-ELEMENT TIME-DELAY FUSE	BUSSMANN/FRN-R-150 (OAE)	C
11	EA	1	LIGHTING CONTACTOR (LC1)	EATON/ECC04C8ABA-S3P23A29 (OAE)	C
12	EA	2	LOW VOLTAGE BLANKET	SALISBURY/1212YLV (OAE)	C
13	LOT	30	BATTERY BANK ASSEMBLY 2DDm85-13 (TWO CELLS IN STEEL CAN)	ENERSYS (OAE) ENERSYS/868403-CW ENERSYS/S060861336100611 ENERSYS/HAWK 28-68 FM	C
14	EA	1	BATTERY CHARGER (BCHG1)	ENERSYS/TPE AT10.1 1-PHASE (OAE) AT10-GROUP 2 ORDER NO. AT10-130-75-E-240-B-X-H-X-A-G-X-X-Y	C
15	LOT	1	EYEWASH (EW1)	BRADLEY (OAE): BRADLEY/S19-921 BRADLEY/S19-899	C
16	EA	1	MAIN DISTRIBUTION FRAME (MDF1)	READYSPEC/RB-A2424W (OAE)	C
17	LOT	1	HVAC (HVAC1 & HVAC2)	BARD (OAE): BARD/W48AA-A15BP4XXJ	C
18	EA	2	PROGRAMMABLE THERMOSTAT (TS1 & TS2)	BARD (OAE): BARD/CS9B-TH0	C
19	LOT	1	HYDROGEN GAS MONITOR (HGM1)	ENERSYS: ENERSYS/801550-DR, WITH 120 VAC POWER SUPPLY, DUAL RELAY, FORM C CONTACT & BUZZER ENERSYS/801550-BOX	C
20	LOT	1	HYDROGEN ALARM (HA1 & HA2)	POTTER (OAE): POTTER/SH-120W POTTER/BBX-5	C

NOTES:
1 BILL OF MATERIAL QUANTITIES ARE ESTIMATED. ACTUAL QUANTITIES SHALL BE VERIFIED BY THE CONTRACTOR.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
21	LOT	1	120V INTERIOR RECEPTACLE (RE1-RE8)	HUBBELL: KELLEMS/CFR53625GR RACO/239 (OAE) RACO/808C (OAE)	C
22	LOT	1	120V INTERIOR RECEPTACLE (RE40 & RE41)	HUBBELL: KELLEMS/CFR53625GR RACO/239 (OAE) RACO/808C (OAE)	C
23	LOT	2	120V EXTERIOR RECEPTACLE (RE30 & RE31)	HUBBELL: KELLEMS/CFR53625GR RACO/6356-0 (OAE) KELLEMS/MP26V (OAE)	C
24	LOT	1	240V EXTERIOR RECEPTACLE (RE70 & RE71)	HUBBELL: KELLEMS/HBL9430A RACO/5386-0 (OAE) KELLEMS/HBL9420 (OAE)	C
25	EA	2	INTRUSION ALARM (IA1 & IA2)	ABB/L535P41B11 (OAE)	C
26	LOT	1	MOTORIZED DAMPER INTAKE LOUVER (LI1)	DAYTON (OAE): DAYTON/4C560 CUSTOM BUILT (SFA)	C
27	LOT	1	EXHAUST FAN (EF1)	DAYTON (OAE): DAYTON/1HLA2 CUSTOM BUILT (SFA)	C
28	EA	1	EXHAUST FAN COOLING THERMOSTAT (EFTS1)	DAYTON/2E869 (OAE)	C
29	LOT	1	WALL TELEPHONE JACK (PJ1)	HUBBELL: KELLEMS/NS726SS RACO/660 (OAE)	C
30	EA	2	NEMA 3R WEATHER-PROOF CABLE ENTRY BOX (PB1 & PB2)	TBD BY CONTROL ENCLOSURE MFR (SFA)	C
31	EA	3	MARSHALLING CABINET (MC1 - MC3)	SEE DRAWING REFERENCE 2	C
32	LOT	1	GPS ANTENNA, COMPLETE KIT (GPST)	SCHWEITZER ENGINEERING LABORATORIES: SCHWEITZER/SEL-9524B SCHWEITZER/SEL-C961-050 SCHWEITZER/915900139 SCHWEITZER/SEL-C961-025 SCHWEITZER/915900043	C
33	LOT	1	PHOTO CONTROL (PC1 & PC2)	INTERMATIC: INTERMATIC/LC4536C INTERMATIC/K122 HUBBELL-RACO/5386-0 (OAE) HUBBELL-RACO/5173-0 (OAE)	C
34	EA	1	AUXILIARY CONTROL PANEL (ACP1)	SEE DRAWING REFERENCE 3	C
35	LOT	1	HEAT DETECTOR (HD1 & HD2)	POTTER: POTTER/CR-200W HUBBELL-RACO/167 (OAE)	C
36	LOT	1	FIRE ALARM (FA1 - FA3)	POTTER: POTTER/SH-120R POTTER/BBX-5	C
37	LOT	1	PHOTOELECTRIC SMOKE DETECTOR (SD1 & SD2)	GENTEX: GENTEX/8100PY/908-1240-002 HUBBELL-RACO/167 (OAE)	C
38	LOT	1	FIRE EXTINGUISHER, CLEANAGUARD, 25 LB. (FE1 & FE2)	ANSUL: ANSUL/FE13/429022 ANSUL/30937	C
39	LOT	1	ROOM TEMPERATURE SWITCH (RTS1)	HOFFMAN: HOFFMAN/ATEMNO RACO/239 (OAE) RACO/752 (OAE)	C
40	EA	1	ETHERNET SWITCH (ES1)	SCHWEITZER/2725S22X0	C
41	LOT	1	DRAWING HANGER (DH1)	SAFCO: SAFCO/5030 SAFCO/50036	C
42	LOT	1	DROP/LIFT WALL RACK HANGING CLAMP, 30"		C
43					
44					
45					
46					
47					
48					
49					
50					

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
100	LOT	1	LIGHT SWITCH, THREE WAY (SW1-SW2)	HUBBELL: KELLEMS/HBL1223I RACO/239 (OAE) RACO/808C (OAE)	C
101	LOT	1	LIGHT SWITCH, HOA, 2-POLE (SW3)	EATON: EATON/E34VHBK1-Y1 EATON/E34SP51 EATON/E34N11	C
102	EA	4	EXTERIOR LED WALL PACK LIGHT (WL1-WL4)	CREE/SEC-EDG-4M-WM-06-E-UL-SV-350	C
103	EA	2	EXTERIOR EMERGENCY LIGHT (EL1-EL2)	COOPER SURE-LITE/UEL1SD	C
104	LOT	1	INTERIOR EMERGENCY EXIT LIGHT (EL3-EL4)	COOPER SURE-LITE: COOPER SURE-LITE/LPXH7DH COOPER SURE-LITE/WG12	C
105	EA	1	INTERIOR EMERGENCY LIGHT (EL5-EL9)	COOPER SURE-LITE/HR121173BRWH	C
106	EA	10	INTERIOR CEILING LIGHT (L1-L10)	CREE/WS4-50L-50K-10V-FD	C

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
120	EA	1	CABLE TRAY, STRAIGHT, 24" WIDTH, 12' LENGTH	COOPER B-LINE/24A09-24-144 (OAE)	C
121	EA	10	CABLE TRAY, STRAIGHT, 12" WIDTH, 12' LENGTH	COOPER B-LINE/24A09-12-144 (OAE)	C
122	EA	4	HORIZONTAL TEE, 24" WIDTH	COOPER B-LINE/4A-24-HT12 (OAE)	C
123	EA	4	HORIZONTAL TEE, 12" WIDTH	COOPER B-LINE/4A-12-HT12 (OAE)	C
124	EA	4	HORIZONTAL BEND, 90°, 24" WIDTH	COOPER B-LINE/4A-24-90HB12 (OAE)	C
125	EA	4	HORIZONTAL BEND, 90°, 12" WIDTH	COOPER B-LINE/4A-12-90HB12 (OAE)	C
126	EA	1	HORIZONTAL CROSS, 24" WIDTH	COOPER B-LINE/4A-24-HX12 (OAE)	C
127	EA	1	HORIZONTAL CROSS, 12" WIDTH	COOPER B-LINE/4A-12-HX12 (OAE)	C
128	LOT	1	TRAPEZE SUPPORT KIT, 24" TRAY	COOPER B-LINE/9P-5524-22SH (OAE)	C
129	LOT	1	TRAPEZE SUPPORT KIT, 12" TRAY	COOPER B-LINE/9P-5512-22SH (OAE)	C
130	LOT	1	HANGER ROD CLAMP	COOPER B-LINE/92N-5324 (OAE)	C
131	LOT	1	HEX NUT, 1/2"-13	COOPER B-LINE/1/2" HN (OAE)	C
132	LOT	1	ALL THREADED ROD, 1/2"-13	COOPER B-LINE/AIR 1/2" X REQ'D LENGTH (OAE)	C
133	LOT	1	WEDGE LOCK SPLICE PLATE	COOPER B-LINE/9A-1004 (OAE)	C
134	LOT	1	EXPANSION SPLICE PLATE	COOPER B-LINE/9A-1014 (OAE)	C
135	LOT	1	BONDING JUMPER, 4/0	COOPER B-LINE/99-40 (OAE)	C
136	LOT	1	GROUNDING CLAMP	COOPER B-LINE/9A-2130 (OAE)	C
137	LOT	1	TWO HOLE CORNER ANGLE	COOPER B-LINE/B230-AL (OAE)	C
138	LF	AS REQ'D	4/0 STRANDED BARE COPPER	HOUSTON WIRE & CABLE/HW000 40101 (OAE)	C

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR DESIGN CONCEPT REVIEW	KER/07-01-2016	TCC/07-01-2016
B	ISSUED FOR BID REVIEW	KER/09-19-2016	TCC/09-19-2016

ENG. STAMP



NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION	DESCRIPTION
1	DGSS-EL-4500	PANEL ELEVATIONS PANELS 1-11	
2	DGSS-EL-4512 THRU 4514	MARSHALLING CABINET ELEVATIONS CABINETS 1 THRU 3	
3	DGSS-EL-4515	PANEL ELEVATIONS AUXILIARY CONTROL PANEL 1	

DRAWING NAME:		DOUGLAS SUBSTATION CONTROL ENCLOSURE BILL OF MATERIAL
REF. DWG(S):	dgss-ss-2009_9.dwg	
DRAWING NO.:	DGSS-SS-2009	
		SHEET 9 OF 9

DOUGLAS SUBSTATION

MATANUSKA ELECTRIC ASSOCIATION, INC.
P.O. BOX 2929
PALMER, ALASKA 99645

STANDARD ABBREVIATIONS – ELECTRICAL

& AND	EIA ELECTRONICS INDUSTRY ASSOCIATION	MW MEGAWATT	THK THICK(NESS)
⊕ AT	EJ EXPANSION JOINT	N NEUTRAL	TIA TELECOMMUNICATIONS INDUSTRY ASSOCIATION
⊕ CENTERLINE	EL ELECTRICAL	N NEWTON	TLND REDINGTON – TEELAND TRANSMISSION LINE
∅ PHASE	ELEV ELEVATION	N NORTH	TRP TRIP
# POUND OR NUMBER	ENCL ENCLOSURE	NC NORMALLY CLOSED	TURB TURBINE
ACB AIR CIRCUIT BREAKER	EQ EQUIP	N/C NO CONNECTION	TX TRANSMIT
AB AIR BREAK	EST ESTIMATE	NIC NOT IN CONTRACT	TYP TYPICAL
ABV ABOVE	EXIST EXISTING	NO NORMALLY OPEN	UG UNDERGROUND
AC ALTERNATING CURRENT	F FARAD	NOC NORMALLY OPEN CONTACT	MNO UNLESS NOTED OTHERWISE
ADJ ADJUSTABLE	F FUSE	NS SYNCHRONIZING NEUTRAL	VOLT VOLT
ADJT ADJACENT	FREQ FREQUENCY	NTS NOT TO SCALE	VA VOLTAMPERE
ALT ALTERNATE	FT FEET	OD OUTSIDE DIAMETER	VA PHASE A VOLTAGE
APPRX APPROXIMATE	FT FEED THROUGH	OUT OUTPUT	VAR REACTIVE POWER
B BUS	FUT FUTURE	P REAL POWER OR PRIMARY	VB PHASE B VOLTAGE
BF BREAKER FAIL	G CONDUCTANCE OR GROUND	PB PUSH BUTTON	VAC ALTERNATING CURRENT VOLTAGE
BFI BREAKER FAIL INITIATE	GA GAUGE	PF POWER FACTOR	VC PHASE C VOLTAGE
BKR BREAKER	GALV GALVANIZED	PLC PROGRAMMABLE LOGIC CONTROLLER	VCB VACUUM CIRCUIT BREAKER
BLDG BUILDING	GB GROUND BUS	PM PAD-MOUNT TRANSFORMER	VDC DIRECT CURRENT VOLTAGE
BLK BLOCK	GCB GAS CIRCUIT BREAKER	PT POINT	VERT VERTICAL
BOT BOTTOM	GEN GENERATOR	PT POTENTIAL TRANSFORMER	VIF VERIFY IN FIELD
BTU BRITISH THERMAL UNIT	GI GALVANIZED IRON	PVC POLYVINYL CHLORIDE	VN NEUTRAL VOLTAGE
BTWN BETWEEN	OND GROUND	PVMT PAVEMENT	VR VOLTAGE REGULATOR
BU BACKUP	GOAB GANG OPERATED AIR-BREAK SWITCH	PWR POWER	VREG VOLTAGE REGULATOR
C COULOMB	GRC GALVANIZED RIGID CONDUIT	Q REACTIVE POWER	VS SYNCHRONIZING VOLTAGE
CAP CAPACITOR OR CAPACITANCE	GRD GRADE, GRADING	R RESISTANCE OR RESISTOR	VT VOLTAGE TRANSFORMER
CAP CORRUGATED ALUMINUM PIPE	GRSC GALVANIZED RIGID STEEL CONDUIT	RCLS RECLOSE	W WEST
CB CENTER BREAK	H HENRY	RD RADIUS	W WATT
CBL CABLE	HDPE HIGH-DENSITY POLYETHYLENE	RD RADIUS	W/ WITH
CEM CEMENT	HLO HOT LINE ORDER	RD ROAD	W/O WITHOUT
CF CUBIC FOOT	HORIZ HORIZONTAL	RE REMOTE END	REACTANCE REACTANCE
CHK CHECK	HP HORSEPOWER	REF REFERENCE	XFMR TRANSFORMER
CI CAST IRON	HZ HERTZ	REQD REQUIRED	XMSSN TRANSMISSION
CIP CAST IRON PIPE	IA PHASE A CURRENT	RET REMOTE END TRIP	ADMITTANCE ADMITTANCE
CIPC CAST-IN-PLACE CONCRETE	IB PHASE B CURRENT	RET RETURN	XL YELLOW
CIR CIRCLE	IC PHASE C CURRENT	REV REVISION	2 IMPEDANCE
CKT CIRCUIT	ID INSIDE DIAMETER	RLY RELAY	TIME-DELAY
CLK CLOCK	IN INPUT	RNSS REDINGTON SUBSTATION	21 DISTANCE
CLS CLOSE	IN INCH	RR RAILROAD	25 SYNCHRONISM CHECK
CMIL CIRCULAR MIL	IN NEUTRAL CURRENT	ROW RIGHT OF WAY	27 UNDERVOLTAGE
CMP CORRUGATED METAL PIPE	INCL INCLUDE(D), INCLUDING	RTS READY TO SEND	30 ANNUNCIATOR
COS COSINE	IND INDUSTRY	RTU REMOTE TERMINAL UNIT	32 DIRECTIONAL POWER
CONC CONCRETE	INT INTERSECTION	RX RECEIVE	37 UNDERCURRENT OR UNDERPOWER
CONST CONSTRUCTION	INV INVERT	S APPARENT POWER	38 BEARING
CONT CONTINUOUS	IP POLARIZING CURRENT	S SOUTH	40 FIELD
CONTR CONTRACTOR	J COMPLEX NUMBER	S SOURCE	43 MANUAL TRANSFER OR SELECTOR DEVICE
CS CIRCUIT SWITCHER OR CONTROL SWITCH	J JOULE	S-L SOURCE-LOAD	46 REVERSE-PHASE
CSP CORRUGATED STEEL PIPE	JB JUNCTION BOX	SA SURGE-ARRESTOR	47 PHASE-SEQUENCE VOLTAGE
CT CURRENT TRANSFORMER	JPSS JUSTINE PARKS SUBSTATION	SC SWITCH CABINET	49 MACHINE OR TRANSFORMER THERMAL RELAY
CTRL CONTROL	JSSS JOHN SHAW SUBSTATION	SEC SECTION	50 INSTANTANEOUS OVERCURRENT
CTS CLEAR TO SEND	KA KILOAMPERE	SEC SECONDARY	51 AC TIME OVERCURRENT
DC DIRECT CURRENT	KV KILOVOLT	SVC SERVICE	52 AC CIRCUIT BREAKER
DCD DATA CARRIER DETECT	KW KILOWATT	SVC STATIC VAR COMPENSATOR	52o NORMALLY OPEN BREAKER CONTACT
DCE DATA COMMUNICATIONS EQUIPMENT	L INDUCTANCE	SHT SHEET	52b NORMALLY CLOSED BREAKER CONTACT
DDE DOUBLE DEAD END	L LINE	SIM SIMILAR	59 OVERVOLTAGE
DE DEAD END	L LOAD	SIN SINE	60 VOLTAGE BALANCE
DEM DEMOLISH, DEMOLITION	LB LOAD BREAK	SPEC SPECIFICATION	63 PRESSURE SWITCH
DEMOB DEMOBILIZE	LT LIGHT	SPECS SPECIFICATIONS	64 APPARATUS GROUND
DET DETAIL	M METER(S)	SS SYNCHRONIZING SWITCH	67 AC DIRECTIONAL OVERCURRENT
DGSS DOUGLAS SUBSTATION	MAT MATERIAL	STA STATION	68 BLOCKING
DFR DISTURBANCE FAULT RECORDER	MAX MAXIMUM	STD STANDARD	69 PERMISSIVE
DI DIGITAL INPUT	MEA MATANUSKA ELECTRIC ASSOCIATION	SW SWITCH	71 LEVEL SWITCH
DIA DIAMETER	MFG MANUFACTURER	SWGR SWITCHGEAR	74 ALARM
DIAG DIAGONAL	MILE MILE	SYM SYMMETRICAL	76 DC OVERCURRENT
DIM DIMENSION	MIN MINIMUM	SYNCH SYNCHRONIZE	78 OUT-OF-STEP
DIST DISTRIBUTION	MISC MISCELLANEOUS	T TIME OR TRANSFORMER	79 RECLOSING RELAY
DNP DISTRIBUTED NETWORK PROTOCOL	MM MILLIMETER(S)	TAN TANGENT	81 FREQUENCY
DO DIGITAL OUTPUT	MO MOTOR OPERATED (OR)	TCM TRIP COIL MONITOR	85 CARRIER OR PILOT WIRE
DTE DATA TERMINAL EQUIPMENT	MOB MOBILIZE	TEL TELEPHONE	86 LOCK OUT
DWG DRAWING	MS MOBILE SUBSTATION	TERM TERMINAL	87 DIFFERENTIAL
EA EACH	MTR METER	TEMP TEMPORARY	94 TRIPPING

ABBREVIATIONS: WHEN USED IN THESE ELECTRICAL DRAWINGS SHALL CONFORM TO THE ABOVE LIST, UNLESS NOTED OTHERWISE. OTHER SECTIONS (SUCH AS ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING AND CIVIL PLANS) MAY CONTAIN SPECIFIC REFERENCES AND LEGENDS WITH INTERPRETATIONS INTENDED ONLY FOR THOSE SECTIONS. NOT ALL ABBREVIATIONS MAY BE USED IN THIS DRAWING SET.

STANDARD BLOCKS – ELECTRICAL



CONTRACT NOTES

- THE FOLLOWING TRIANGLES AND CLOUDING WILL BE USED ON DRAWINGS TO IDENTIFY THE CONTRACTOR'S SCOPE OF WORK IN SPECIFIC AREAS. AREAS NOT CLOUDED ON DRAWINGS SHALL NOT BE IN THE CONTRACTOR'S SCOPE OF WORK.
- THE FOLLOWING TRIANGLES AND CLOUDING WILL BE USED ON DRAWINGS TO IDENTIFY SPECIFIC AREAS OUTSIDE OF THE CONTRACTOR'S SCOPE OF WORK. AREAS NOT CLOUDED ON DRAWINGS SHALL BE IN THE CONTRACTOR'S SCOPE OF WORK.
- IF NO CLOUDS ARE NOTED ON THE DRAWING, THE CONTRACTOR'S SCOPE OF WORK SHALL INCLUDE THE ENTIRE DRAWING.
- IF THE DRAWING IS ISSUED FOR REFERENCE ONLY, IT WILL BE IDENTIFIED WITH THE FOLLOWING BLOCK. THE PURPOSE OF AN "ISSUED FOR REFERENCE ONLY" DRAWING IS TO CONVEY INFORMATION THAT MAY BE USEFUL TO THE CONTRACTOR IN PERFORMANCE OF THE CONTRACT. NONE OF THE MATERIAL SHOWN ON THE DRAWING IS WITHIN THE CONTRACTOR'S SCOPE OF WORK TO SUPPLY.
- SCOPE OF WORK OR PERFORMANCE INFORMATION FOR THE CONTRACTOR MAY BE CONVEYED WITH "CONSTRUCTION NOTES". BELOW IS AN EXAMPLE OF CONSTRUCTION NOTES.

ISSUED FOR REFERENCE ONLY
- DO NOT EDIT -

CONSTRUCTION NOTES:
(1) EXAMPLE NOTE
(2) EXAMPLE NOTE

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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(907) 761-9300
WWW.MEA.COOP

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION ELECTRICAL GENERAL INFORMATION

REF. DWG(S):

DRAWING NO.: DGSS-EL-0000

1 of 2

DOUGLAS SUBSTATION

CABLE AND WIRE STANDARD

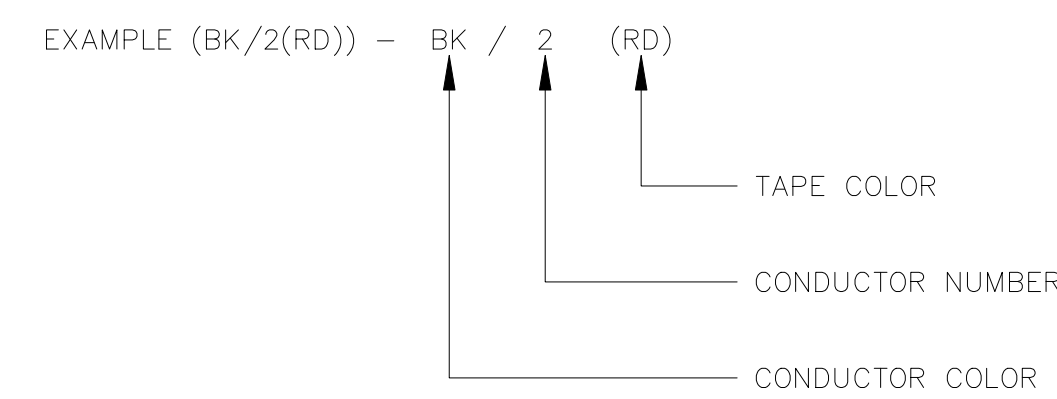
A. CABLE COLOR CODES

COND. NO.	BASE COLOR	TRACER COLOR	ABBR.
1	BLACK	—	BK
2	WHITE	—	WH
3	RED	—	RD
4	GREEN	—	GN
5	ORANGE	—	OR
6	BLUE	—	BL
7	WHITE	BLACK	WH/BK
8	RED	BLACK	RD/BK
9	GREEN	BLACK	GN/BK
10	ORANGE	BLACK	OR/BK
11	BLUE	BLACK	BL/BK
12	BLACK	WHITE	BK/WH
13	RED	WHITE	RD/WH
14	GREEN	WHITE	GN/WH
15	BLUE	WHITE	BL/WH
16	BLACK	RED	BK/RD
17	WHITE	RED	WH/RD
18	ORANGE	RED	OR/RD
19	BLUE	RED	BL/RD

PAIR NO.	COLOR
1	BLACK
1	WHITE
2	BLACK
2	WHITE
3	BLACK
3	WHITE
4	BLACK
4	WHITE
5	BLACK
5	WHITE
6	BLACK
6	WHITE
7	BLACK
7	WHITE
8	BLACK
8	WHITE
9	BLACK
9	WHITE
10	BLACK
10	WHITE
11	BLACK
11	WHITE
12	BLACK
12	WHITE

NO.	COLOR	TAPE COLORS			
		240 VAC		DC	
1	BLACK	L1	BLACK	POS	RED
2	BLACK	L2	RED	NEG	BLACK
3	BLACK	N	WHITE	N/A	N/A
—	BARE	GND	N/A	N/A	N/A

NOTES:
 ① POWER CABLES WITH ICEA METHOD 4 COLOR CODING SHALL HAVE THEIR CONDUCTORS IDENTIFIED WITH COLORED TAPE ACCORDING TO TABLE A-3, AND AS IDENTIFIED IN THE DRAWINGS. THE FOLLOWING IS AN EXAMPLE OF TAPE APPLICATION FOR A CONDUCTOR IN A POWER CABLE WITH ICEA METHOD 4 COLOR CODE.



B. CABLE AND WIRE FINISHING

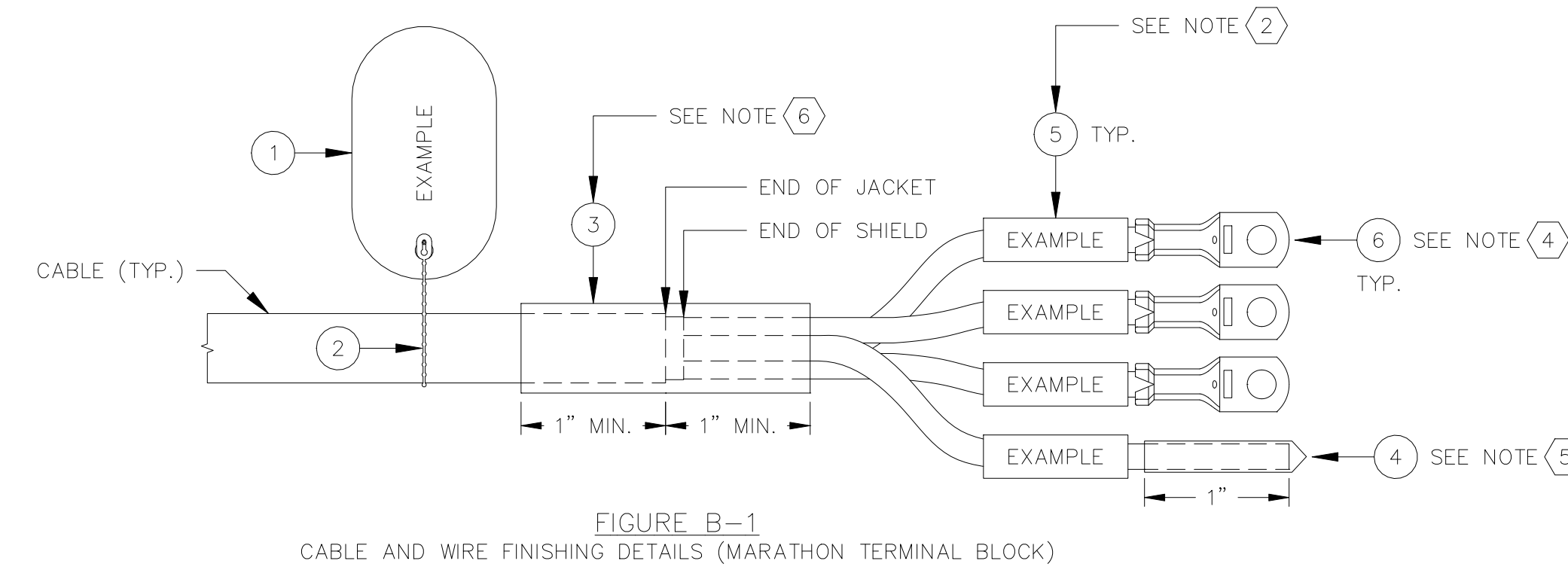


FIGURE B-1
CABLE AND WIRE FINISHING DETAILS (MARATHON TERMINAL BLOCK)

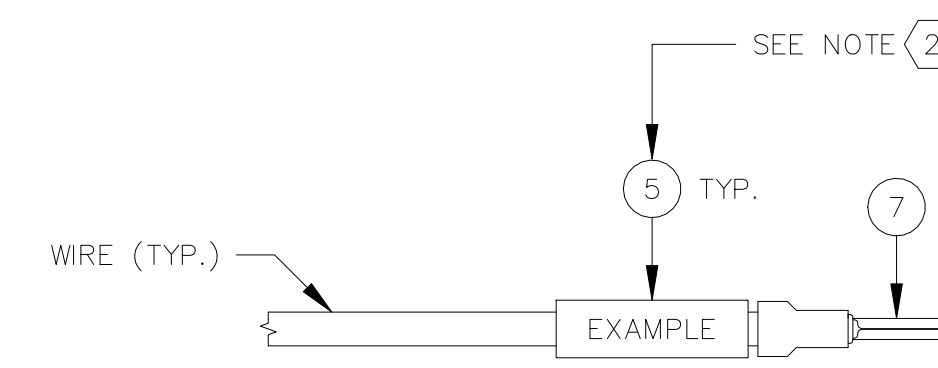


FIGURE B-2
WIRE FINISHING DETAILS (ENTRELEC TERMINAL BLOCK)

REF. NO.	DESCRIPTION	MANUFACTURER/CATALOG NUMBER
①	CABLE TAG, FLAME RETARDANT, 1.75" X 1.00"	BRADY/B-145 (OAE)
②	CABLE TAG FASTENER	BRADY/B1761 (OAE)
③	HEAVY WALL HEAT-SHRINKABLE TUBING	THOMAS & BETTS/HS-SERIES (OAE)
④	THIN WALL HEAT-SHRINKABLE TUBING	THOMAS & BETTS/CPO-SERIES (OAE)
⑤	WIRE LABEL	BRADY/B-342 (OAE)
⑥	RING TERMINAL 10-12 AWG, 8-10 STUD 10-12 AWG, 1/4" STUD 8 AWG, 8-10 STUD 6 AWG, 8-10 STUD NOT LISTED	BURNDY/YAV10-H BURNDY/YAV10-H3 BURNDY/YAV8C-L BURNDY/YAV6C-L1 SUBMIT FOR APPROVAL
⑦	PIN TERMINAL 22-18 AWG 16-14 AWG 12-10 AWG	BURNDY/PTV18 BURNDY/PTV14 BURNDY/PTV10

NOTES:
 ① CABLE AND WIRE FINISHING MATERIAL QUANTITIES TO BE DETERMINED BY THE CONTRACTOR.
 ② LABELS ARE NOT TO BE HEAT SHRUNK. LABELS SHALL BE CLEARLY VISIBLE IN THE AS-LEFT POSITION.
 ③ SHIELDED COMMUNICATION CABLES SHALL HAVE ONLY ONE END OF THE SHIELD GROUNDED. SHIELD-GROUND CONNECTION SHALL BE MADE IN THE SWITCHGEAR ENCLOSURE FOR CABLES THAT EXTEND OUTSIDE OF THE SWITCHGEAR ENCLOSURE.
 ④ TERMINATED CONDUCTORS SHALL HAVE SUFFICIENT LENGTH TO BE RE-TERMINATED AT ANY LOCATION WITHIN THE CABINET OR RACK.
 ⑤ SPARE CONDUCTORS SHALL HAVE SUFFICIENT LENGTH TO BE RE-TERMINATED AT ANY LOCATION WITHIN THE CABINET OR RACK. ENDS OF SPARE CONDUCTORS SHALL BE HEAT SHRUNK.
 ⑥ AFTER THE CABLE JACKET HAS BEEN STRIPPED BACK TO THE APPROPRIATE LENGTH, EACH CABLE SHALL HAVE A MINIMUM 2 INCH PIECE OF HEAT SHRINK TUBING WITH INTERNAL HOT MELT SEALING COMPOUND INSTALLED. THE PURPOSE OF THE HEAT SHRINK TUBING IS TO SEAL THE END OF THE CABLE AND PROVIDE A CLEAN INSTALLATION. THE HEAT SHRINK TUBING SHALL BE LONG ENOUGH AND POSITIONED SO THAT APPROXIMATELY 1 INCH OF HEAT SHRINK TUBING IS POSITIONED OVER THE CABLE JACKET AND 1 INCH OF HEAT SHRINK TUBING IS POSITIONED OVER THE CONDUCTORS. HEAT SHRINK TUBING SHALL BE THOMAS & BETTS HS-SERIES, HEAVY-WALL HEAT-SHRINKABLE TUBING, BLACK.

C. CABLE TAGGING

NOTES:
 ① ALL CABLE TAGS SHALL BE TYPED, NOT HAND WRITTEN, AND INSTALLED SUCH THAT THEY ARE CLEARLY VISIBLE IN THE AS-LEFT POSITION.
 ② CABLE TAG TEXT SHALL BE UPPER CASE "ARIAL BOLD" FONT WITH A MINIMUM HEIGHT OF 0.125 INCHES (9PT).
 ③ TEXT SHALL BE CENTERED ON THE CABLE TAG.
 ④ CABLE NUMBER SHALL BE ACCORDING TO THE CABLE SCHEDULE.
 ⑤ PRINTED CABLE TAG EXAMPLE (BOTH SIDES):

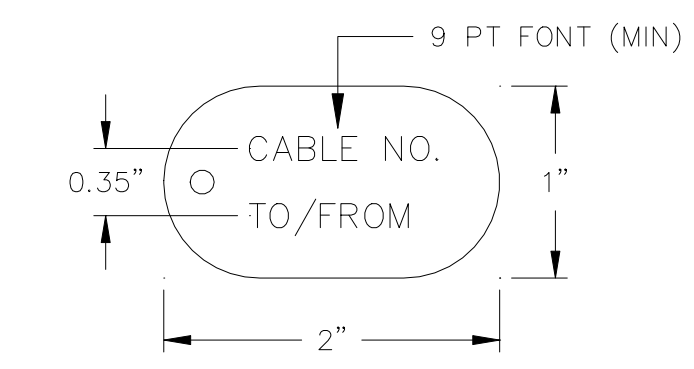
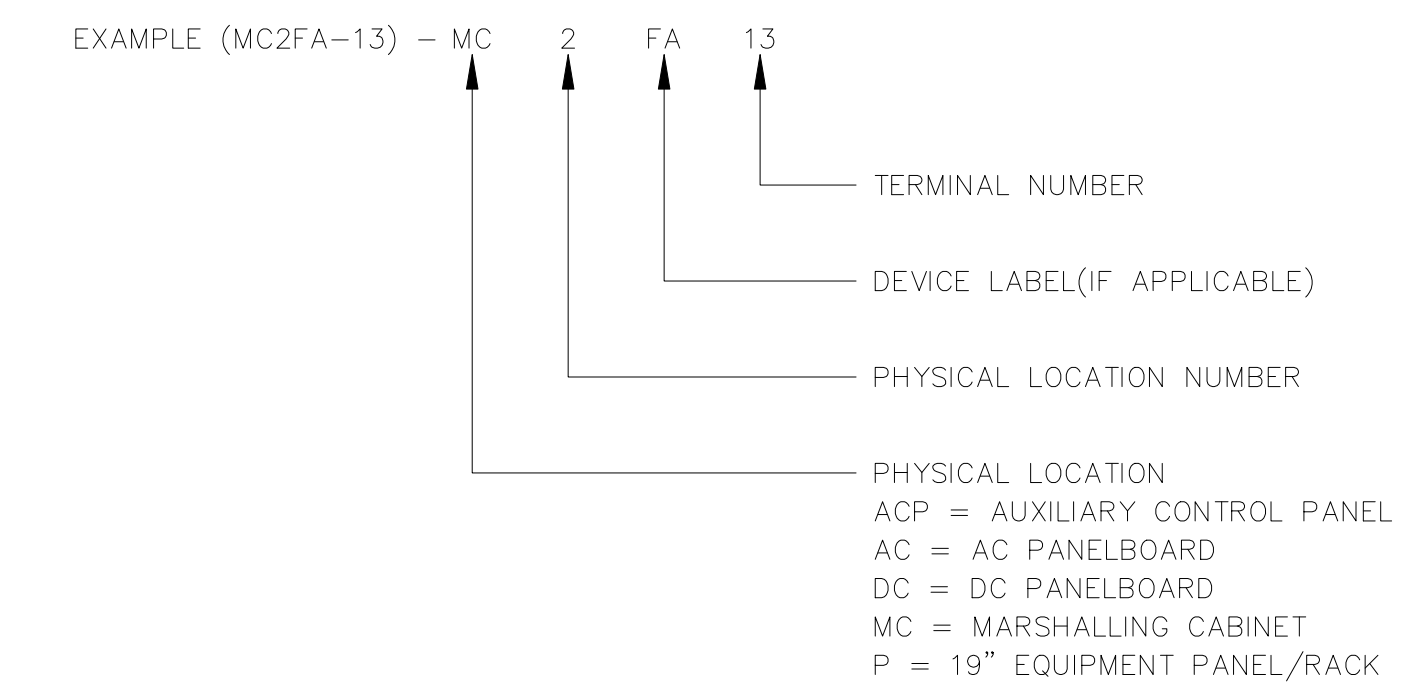


FIGURE C-1
PRINTED CABLE TAG EXAMPLE

D. WIRE LABELING

NOTES:
 ① ALL WIRE LABELS SHALL BE TYPED, NOT HAND WRITTEN, AND INSTALLED SUCH THAT THEY ARE CLEARLY VISIBLE IN THE AS-LEFT POSITION.
 ② WIRE LABEL TEXT SHALL BE UPPER CASE "ARIAL BOLD" FONT WITH A HEIGHT OF 0.125 INCHES (9PT).
 ③ TEXT SHALL BE CENTERED ON THE WIRE LABEL.
 ④ WIRE LABELING WILL USE THE "DESTINATION" METHOD TO LABEL INDIVIDUAL WIRES. THE FOLLOWING IS AN EXAMPLE OF WIRE TERMINAL NUMBERING:



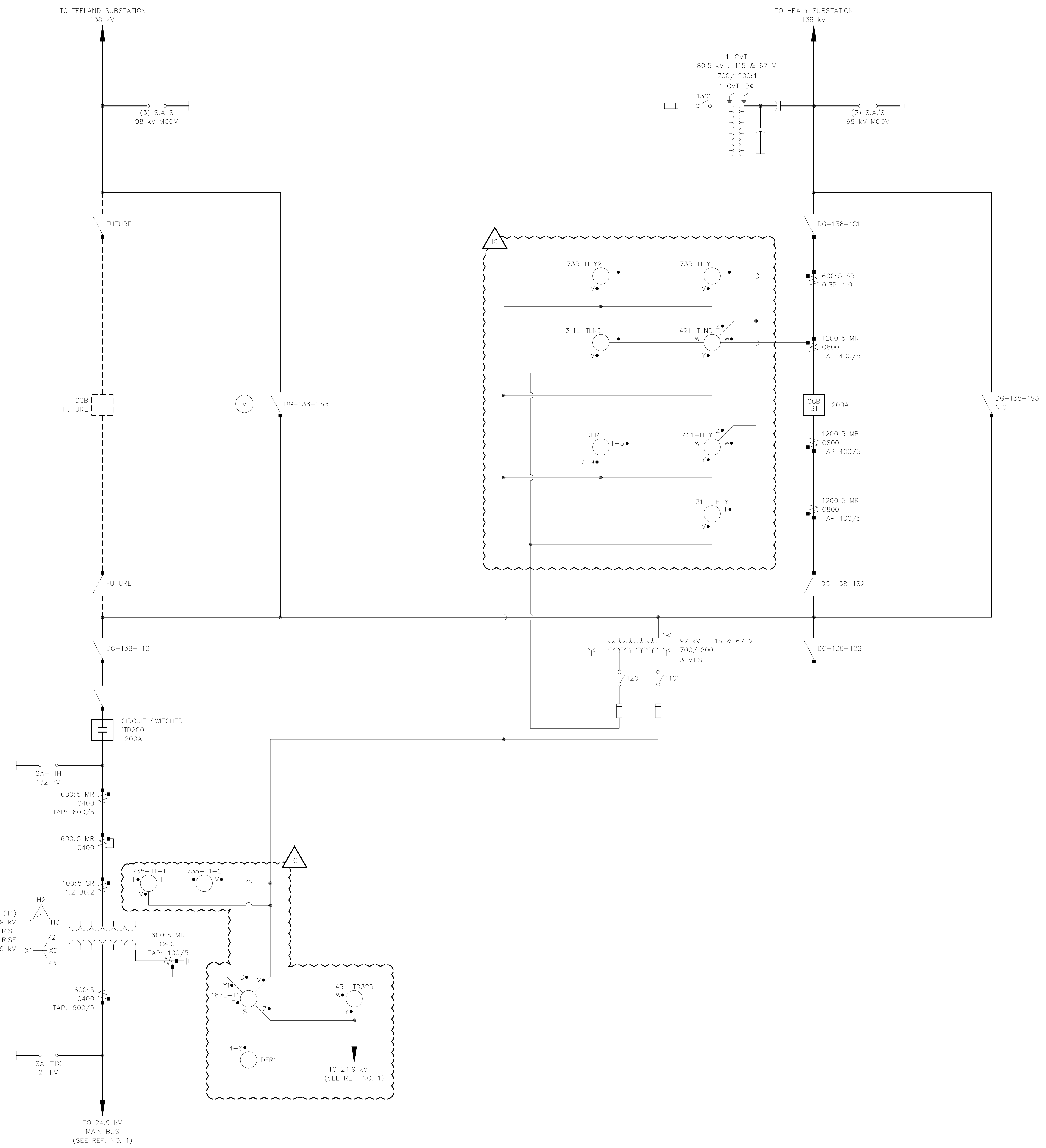
PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			ENG. STAMP
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS			
JOB #: MEA W.O. EN16-3.2			
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION ELECTRICAL CABLE & WIRE STANDARD	
REF. DWG(S):	
DRAWING NO.:	DGSS-EL-0000
SHEET 2 OF 2	



PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	TCC/09-19-2016

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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-EL-0011/1	24.9 kV ONE-LINE DIAGRAM

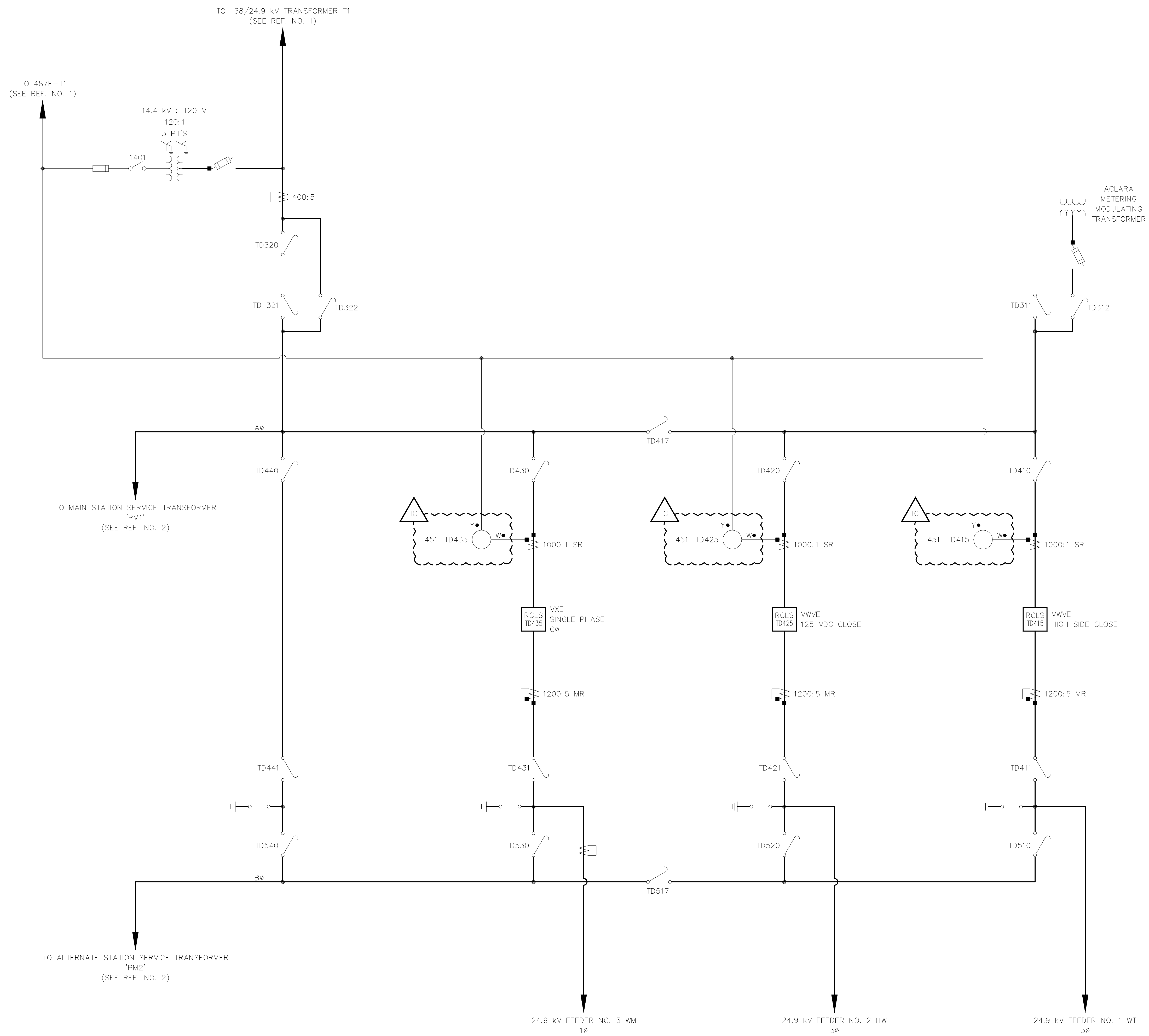
DRAWING NAME: DOUGLAS SUBSTATION
138 kV
ONE-LINE DIAGRAM

dass-el-0010_1.dwg

REF. DWG(S): E-F802/1

DRAWING NO.: DGSS-EL-0010

SHEET 1 OF 1



PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	TCC/09-19-2016

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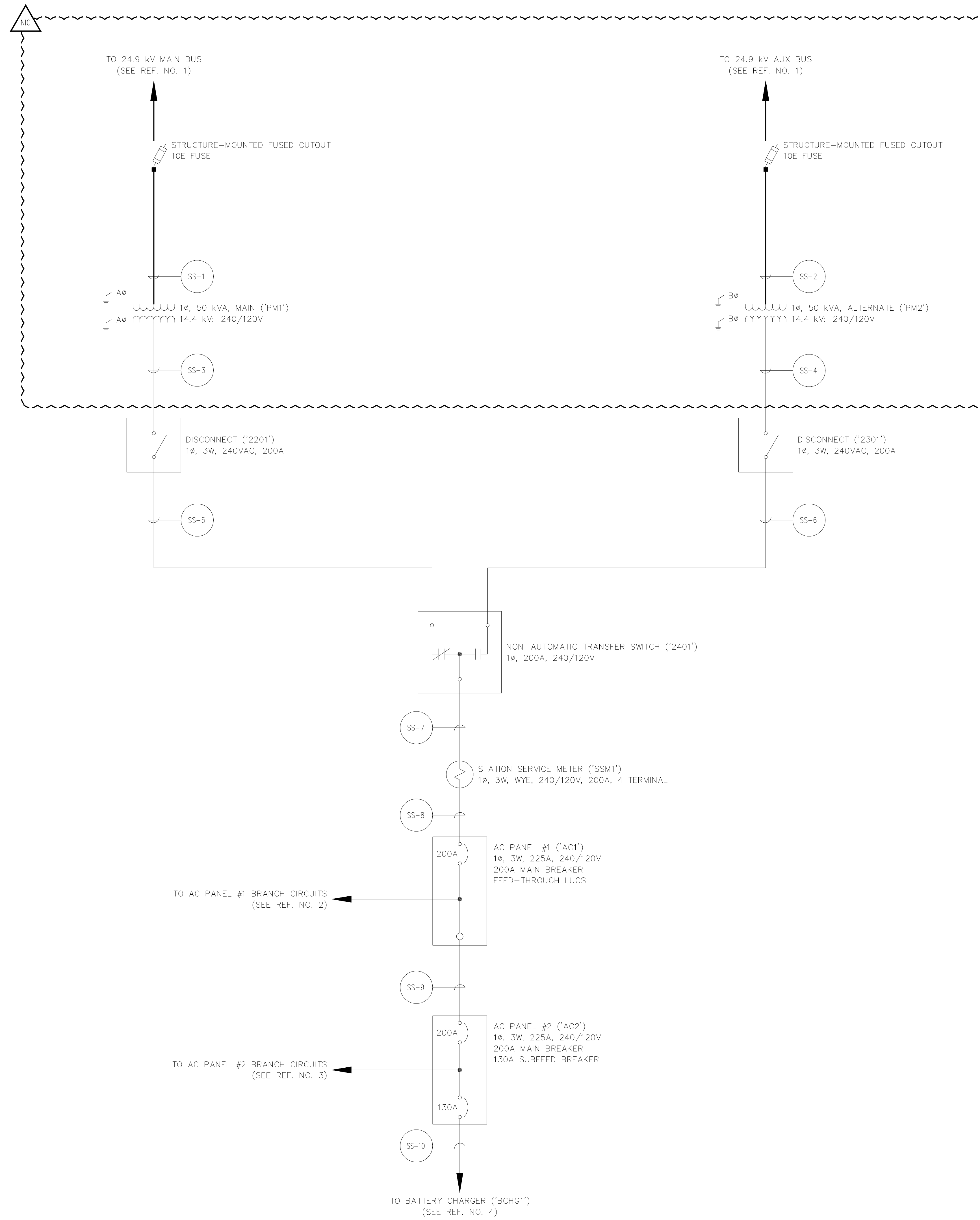
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-EL-0010/1	138 kV ONE-LINE DIAGRAM
2	DGSS-EL-0012/1	STATION SERVICE ONE-LINE DIAGRAM

DRAWING NAME: DOUGLAS SUBSTATION
24.9 kV
ONE-LINE DIAGRAM

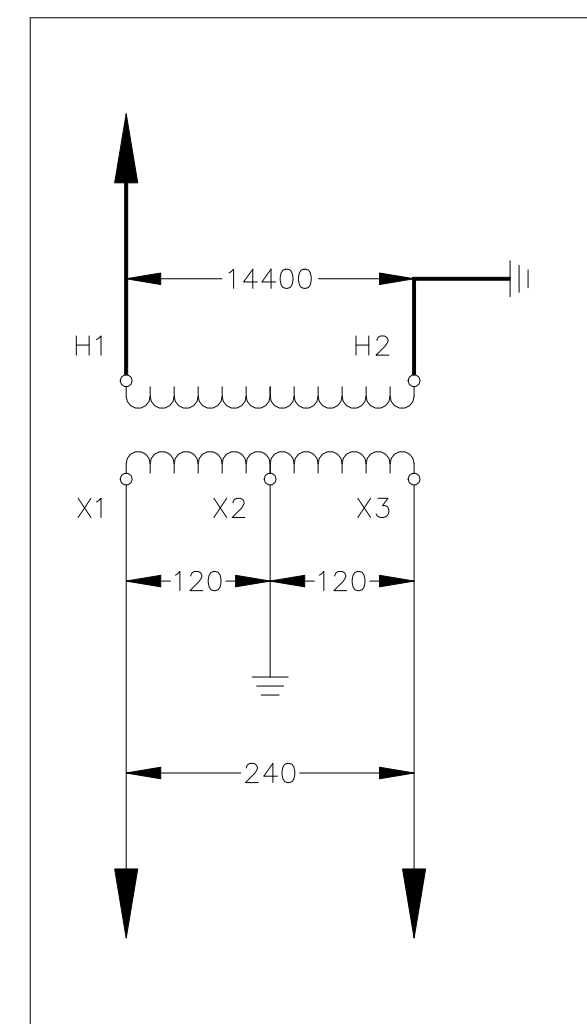
REF. DWG(S): E-F802/1

DRAWING NO.: DGSS-EL-0011

SHEET 1 OF 1



TRANSFORMER CONNECTION DIAGRAM



PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016
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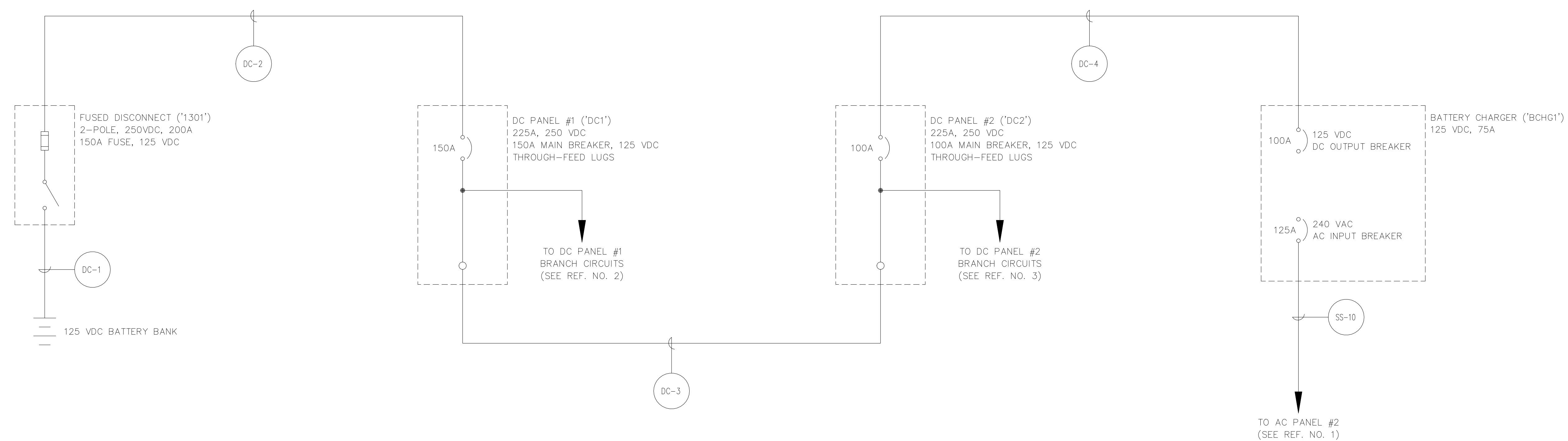
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-EL-0011/1	24.9 kV ONE-LINE DIAGRAM
2	DGSS-EL-2001/1	240 VAC AC PANEL #1 SCHEMATIC & SCHEDULE
3	DGSS-EL-2001/2	240 VAC AC PANEL #2 SCHEMATIC & SCHEDULE
4	DGSS-EL-0013/1	125 VDC ONE-LINE DIAGRAM

DRAWING NAME:	DOUGLAS SUBSTATION STATION SERVICE ONE-LINE DIAGRAM
REF. DWG(S):	
DRAWING NO.:	DGSS-EL-0012
SHEET	1 OF 1

125 VDC LOADING SCHEDULE			
DESCRIPTION	LOADING	DURATION	PERIOD
RELAY, CONTROL, & COMMUNICATIONS	23 AMPS	480 MINUTES	1, 2, 3
WORST CASE CLOSE (1 GCB'S @ 2.8 AMPS & 1 CIRCUIT SWITCHER @ 30 AMPS EA.)	22 AMPS	1 MINUTE	2
WORST CASE TRIP (1 CIRCUIT SWITCHER @ 78 AMPS, 1 GCB @ 3.1 AMPS EA.)	70 AMPS	1 MINUTE	3
TOTAL LOADING FOR PERIOD 1 (478 MINUTES)	23 AMPS		
TOTAL LOADING FOR PERIOD 2 (1 MINUTE)	56 AMPS		
TOTAL LOADING FOR PERIOD 3 (1 MINUTE)	102 AMPS		

125 VDC BATTERY DESIGN CRITERIA	
DESCRIPTION	VALUE
SPECIFIC GRAVITY	1.215
BATTERY END VOLTS PER CELL	1.75
MINIMUM ELECTROLYTE OPERATING TEMPERATURE	48°F
MINIMUM BATTERY AGING FACTOR	1.25
MINIMUM DESIGN MARGIN	25%
PERIODS IN DUTY CYCLE	3
QUANTITY OF CELLS	60
MINIMUM VOLTAGE DURING ANY PERIOD	105 VDC



PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016
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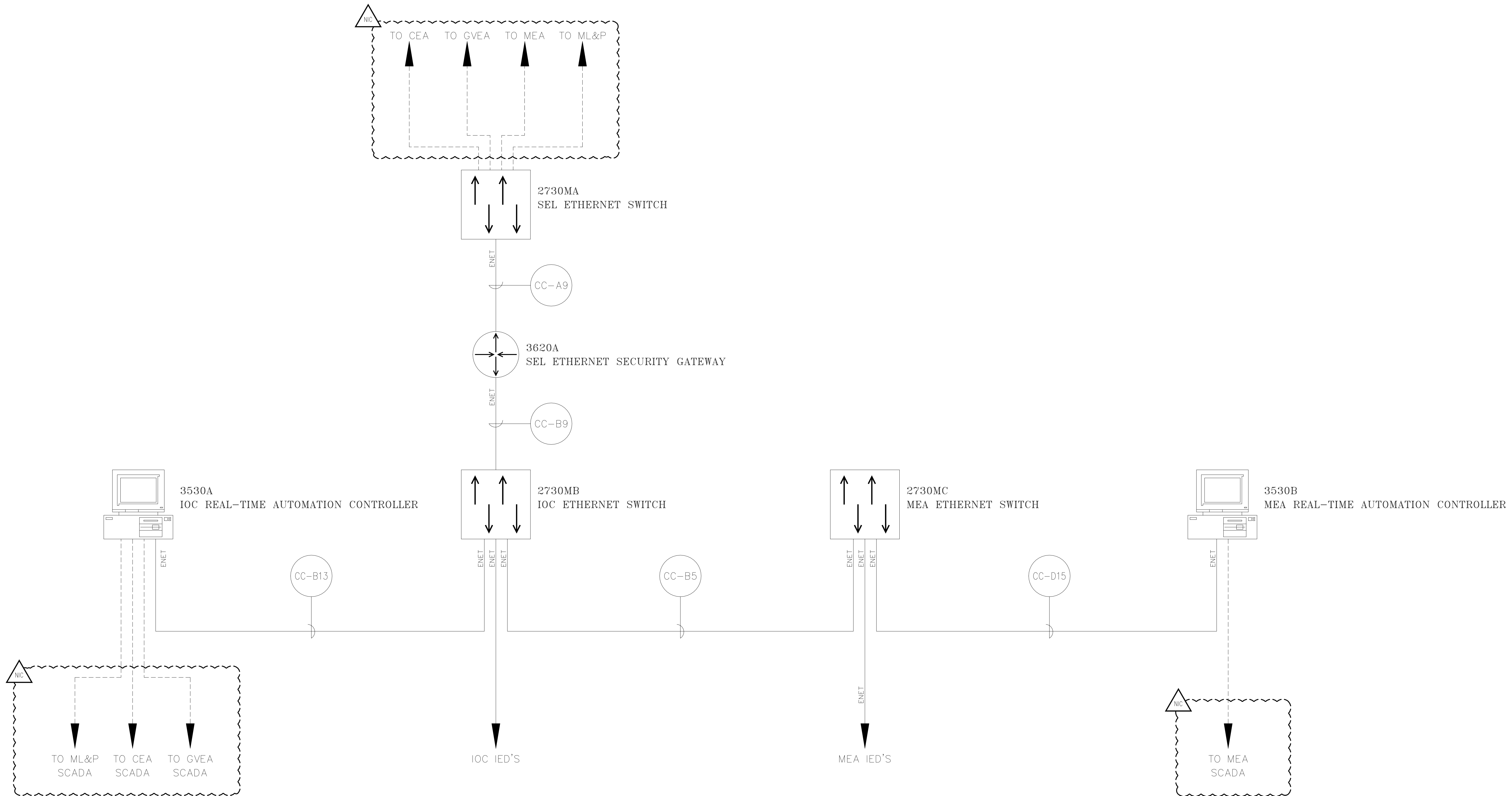
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-EL-0012/1	STATION SERVICE ONE-LINE DIAGRAM
2	DGSS-EL-2000/1	125 VDC DC PANEL #1 SCHEMATIC & SCHEDULE
3	DGSS-EL-2000/2	125 VDC DC PANEL #2 SCHEMATIC & SCHEDULE

DRAWING NAME:	DOUGLAS SUBSTATION 125 VDC ONE-LINE DIAGRAM
REF. DWG(S):	
DRAWING NO.:	DGSS-EL-0013
SHEET	1 OF 1

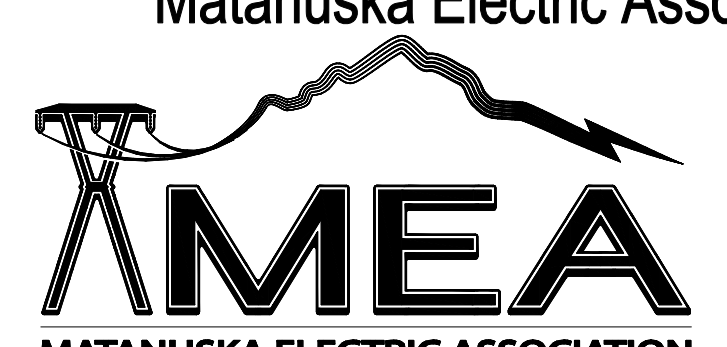
dass-el-0013.1.dwg



- LEGEND:**
- ADDR COMMUNICATION ADDRESS
 - ASCII AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE
 - BNC BAYONNET NELL-CONCELMAN CONNECTOR
 - DEMOD DEMODULATED IRIG-B (SAME AS UNMOD)
 - DNP3 DISTRIBUTED NETWORK PROTOCOL
 - EIA ELECTRONICS INDUSTRY ASSOCIATION
 - ENET 10BASE-T/100BASE-TX ETHERNET (802.3/802.3u)
 - FB SEL FAST BINARY PROTOCOL
 - FNET 10BASE-FX/100BASE-FX ETHERNET (802.3z)
 - GPS GLOBAL POSITIONING SYSTEM
 - IDLC ISDN DATA LINK CONTROL PROTOCOL
 - IGN POWERLOGIC IGN PROTOCOL
 - INTERNET PROTOCOL
 - IRIG-B INTER-RANGE INSTRUMENTATION GROUP MOD B
 - ISDN INTEGRATED SERVICE DIGITAL NETWORK
 - MB SEL MIRRORED BITS PROTOCOL
 - MOD MODULATED IRIG-B
 - NTP NETWORK TIME PROTOCOL
 - P# PORT NUMBER
 - PPS PULSE PER SECOND
 - RG RADIO GUIDE
 - RXID RECEIVE IDENTIFIER
 - SEL SCHWEITZER ENGINEERING LABORATORIES
 - TCP TRANSMISSION CONTROL PROTOCOL
 - TXID TRANSMIT IDENTIFIER
 - UNMOD UNMODULATED IRIG-B (SAME AS DEMOD)
 -  FIBER-TO-COPPER CONVERTER
 -  ETHERNET-TO-SERIAL CONVERTER

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE
1	ISSUED FOR BID REVIEW	MSC/09-19-2016
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

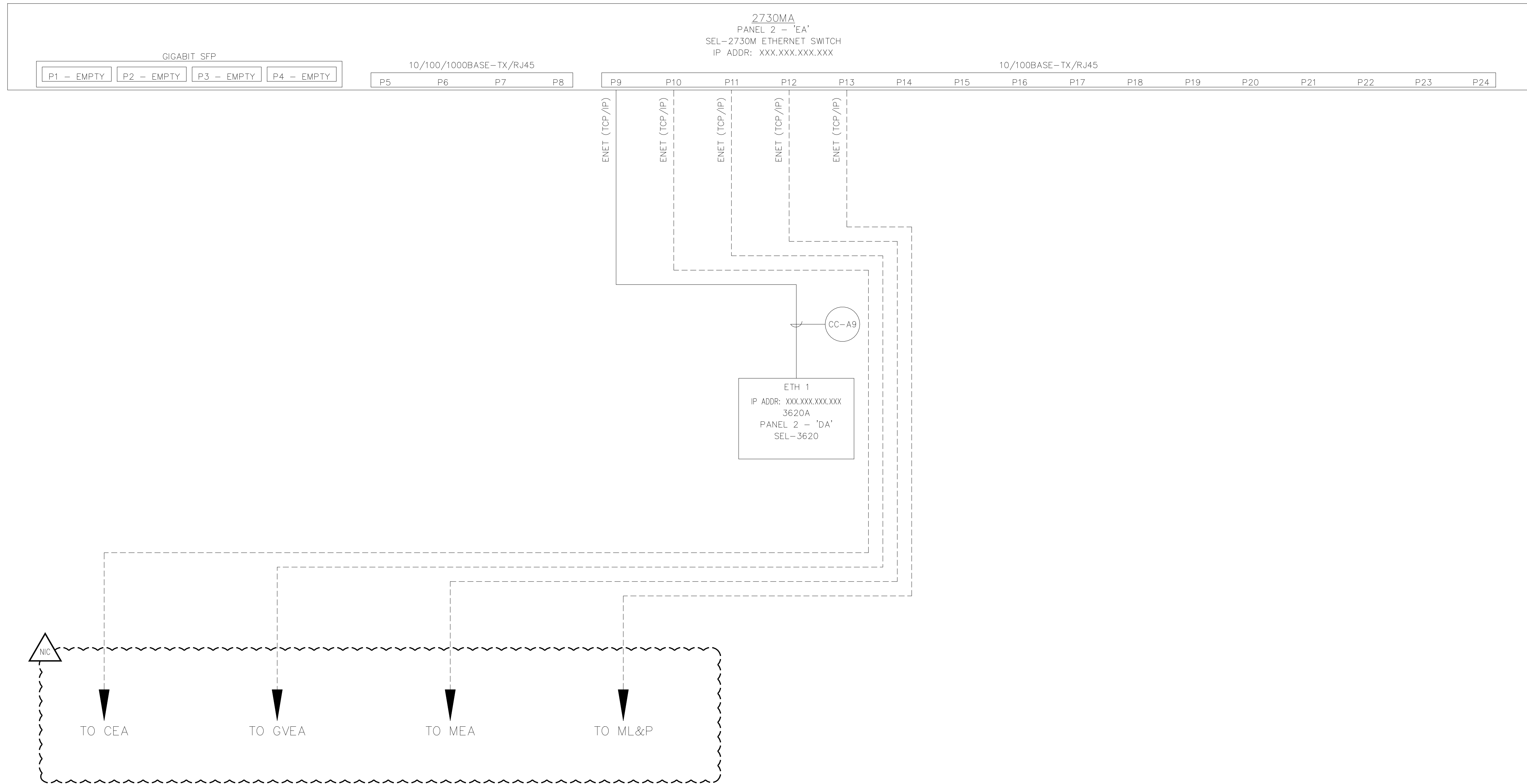
DRAWING NAME: **DOUGLAS SUBSTATION SCADA NETWORK TOPOLOGY**

dass-el-0014 1.dwg

REF. DWG(S):



DRAWING NO.: **DGSS-EL-0014**

SHEET **1** OF **7**



LEGEND:

- ADDR COMMUNICATION ADDRESS
- ASCII AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE
- BNC BAYONNET NELL-CONCELMAN CONNECTOR
- DEMOD DEMODULATED IRIG-B (SAME AS UNMOD)
- DNP3 DISTRIBUTED NETWORK PROTOCOL
- EIA ELECTRONICS INDUSTRY ASSOCIATION
- ENET 10BASE-T/100BASE-TX ETHERNET (802.3/802.3u)
- FB SEL FAST BINARY PROTOCOL
- FNET 10BASE-FX/100BASE-FX ETHERNET (802.3z)
- GPS GLOBAL POSITIONING SYSTEM
- IDLC ISDN DATA LINK CONTROL PROTOCOL
- IGN POWERLOGIC IGN PROTOCOL
- INTERNET PROTOCOL
- IRIG-B INTER-RANGE INSTRUMENTATION GROUP MOD B
- ISDN INTEGRATED SERVICE DIGITAL NETWORK
- MB SEL MIRRORED BITS PROTOCOL
- MOD MODULATED IRIG-B
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- UNMOD UNMODULATED IRIG-B (SAME AS DEMOD)

-  FIBER-TO-COPPER CONVERTER
-  ETHERNET-TO-SERIAL CONVERTER

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE
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		REVIEWED BY/DATE
		TCC/09-19-2016

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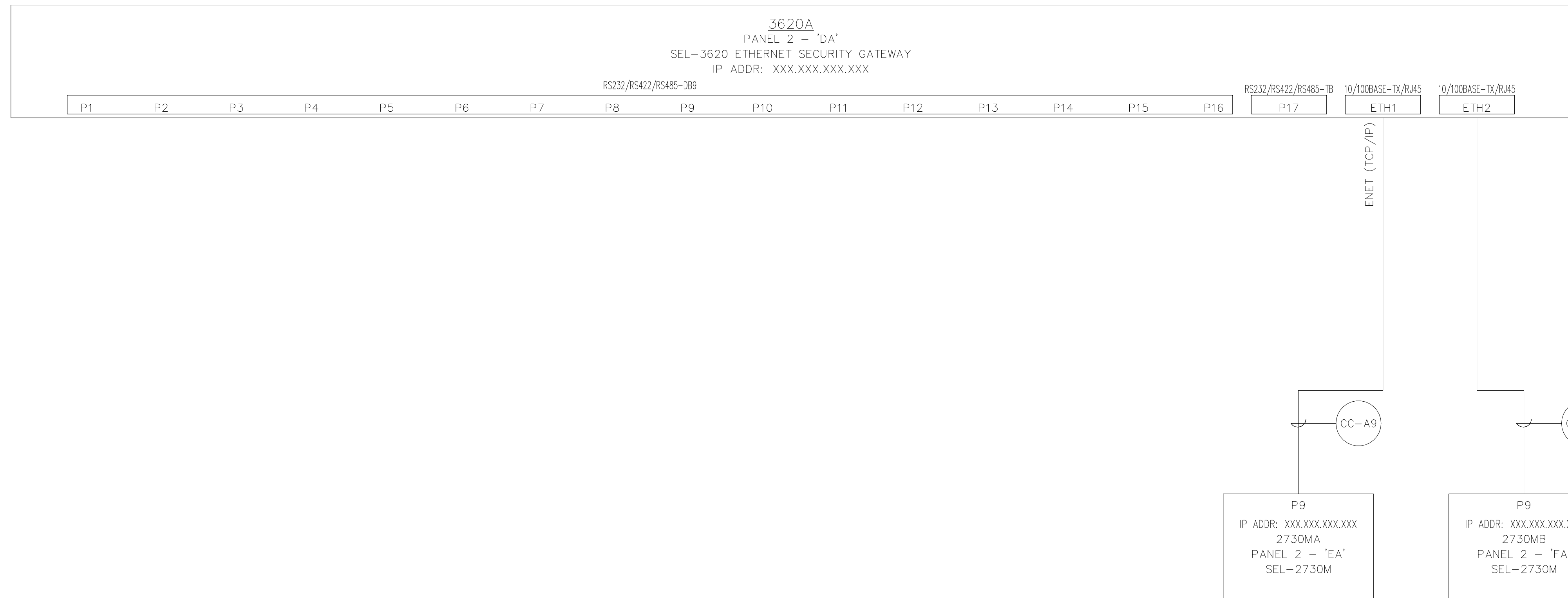
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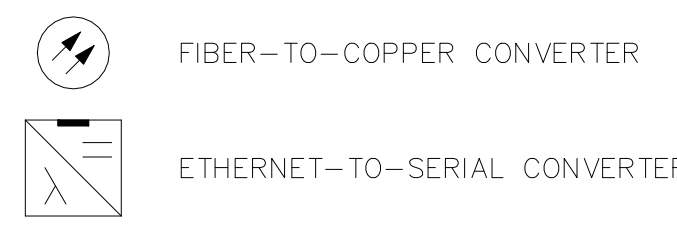
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:	DOUGLAS SUBSTATION SCADA NETWORK TOPOLOGY
REF. DWG(S):	
DRAWING NO.:	DGSS-EL-0014
SHEET:	2 OF 7



LEGEND:

- ADDR COMMUNICATION ADDRESS
- ASCII AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE
- BNC BAYONET NELL-CONCELMAN CONNECTOR
- DEM0D DEMODULATED IRIG-B (SAME AS UNMOD)
- DNP3 DISTRIBUTED NETWORK PROTOCOL
- EIA ELECTRONICS INDUSTRY ASSOCIATION
- ENET 10BASE-T/100BASE-TX ETHERNET (802.3/802.3u)
- FB SEL FAST BINARY PROTOCOL
- FNET 10BASE-FX/100BASE-FX ETHERNET (802.3z)
- GPS GLOBAL POSITIONING SYSTEM
- IDLC ISDN DATA LINK CONTROL PROTOCOL
- IGN POWERLOGIC IGN PROTOCOL
- IGN INTERNET PROTOCOL
- IRIG-B INTER-RANGE INSTRUMENTATION GROUP MOD B
- ISDN INTEGRATED SERVICE DIGITAL NETWORK
- MB SEL MIRRORED BITS PROTOCOL
- MOD MODULATED IRIG-B
- NTP NETWORK TIME PROTOCOL
- P# PORT NUMBER
- PPS PULSE PER SECOND
- RG RADIO GUIDE
- RXID RECEIVE IDENTIFIER
- SEL SCHWEITZER ENGINEERING LABORATORIES
- TCP TRANSMISSION CONTROL PROTOCOL
- TXID TRANSMIT IDENTIFIER
- UNMOD UNMODULATED IRIG-B (SAME AS DEMOD)



PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

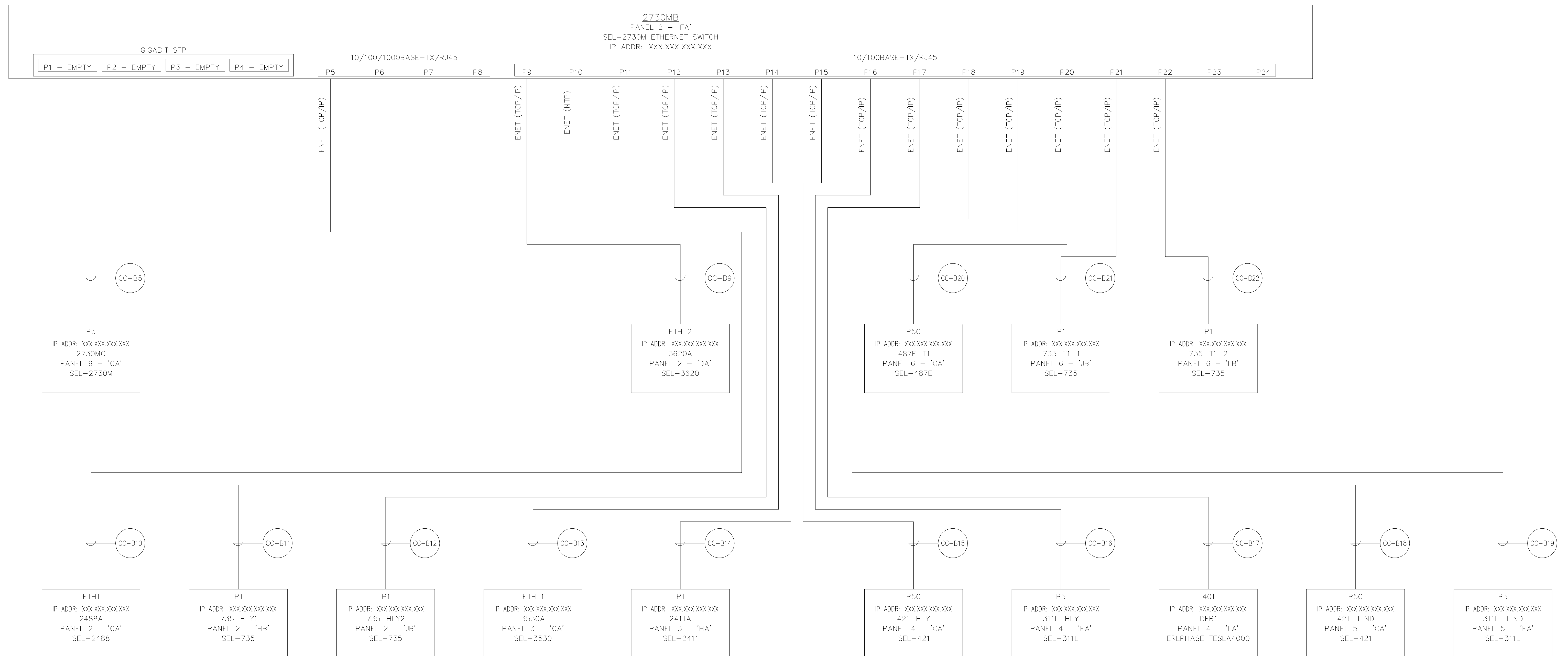
DRAWING NAME: **DOUGLAS SUBSTATION SCADA NETWORK TOPOLOGY**


dgss-el-0014_3.dwg

REF. DWG(S):

DRAWING NO.: **DGSS-EL-0014**

SHEET **3** OF **7**



- LEGEND:
- ADDR COMMUNICATION ADDRESS
 - ASCII AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE
 - BNC BAYONNET NELL-CONCELMAN CONNECTOR
 - DEMOD DEMODULATED IRIG-B (SAME AS UNMOD)
 - DNP3 DISTRIBUTED NETWORK PROTOCOL
 - EIA ELECTRONICS INDUSTRY ASSOCIATION
 - ENET 10BASE-T/100BASE-TX ETHERNET (802.3/802.3u)
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 - FNET 10BASE-FX/100BASE-FX ETHERNET (802.3z)
 - GPS GLOBAL POSITIONING SYSTEM
 - IDLC ISDN DATA LINK CONTROL PROTOCOL
 - IGN POWERLOGIC IGN PROTOCOL
 - INTERNET PROTOCOL
 - IRIG-B INTER-RANGE INSTRUMENTATION GROUP MOD B
 - ISDN INTEGRATED SERVICE DIGITAL NETWORK
 - MB SEL MIRRORED BITS PROTOCOL
 - MOD MODULATED IRIG-B
 - NTP NETWORK TIME PROTOCOL
 - P# PORT NUMBER
 - PPS PULSE PER SECOND
 - RC RADIO GUIDE
 - RXID RECEIVE IDENTIFIER
 - SEL SCHWEITZER ENGINEERING LABORATORIES
 - TCP TRANSMISSION CONTROL PROTOCOL
 - TXID TRANSMIT IDENTIFIER
 - UNMOD UNMODULATED IRIG-B (SAME AS DEMOD)
-  FIBER-TO-COPPER CONVERTER
 ETHERNET-TO-SERIAL CONVERTER

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016
		REVIEWED BY/DATE
		TCC/09-19-2016

ENG. STAMP

Matanuska Electric Association

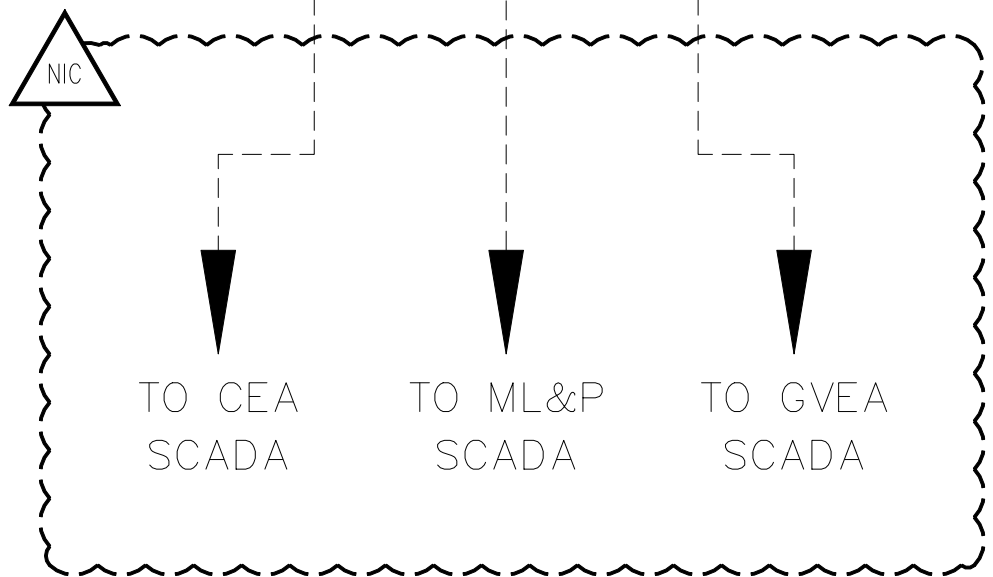




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 Palmer, AK 99645
 (907) 761-9300
 WWW.MEA.COOP

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:		DOUGLAS SUBSTATION SCADA NETWORK TOPOLOGY
REF. DWG(S):		
DRAWING NO.:		DGSS-EL-0014
SHEET		4 OF 7

dass-el-0014_4.dwg

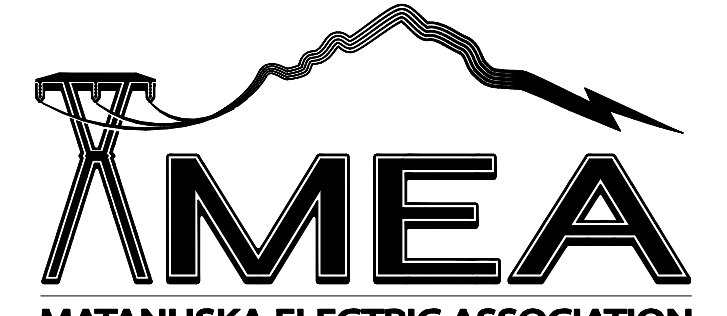


- LEGEND:**
- ADDR COMMUNICATION ADDRESS
 - ASCII AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE
 - BNC BAYONET NELL-CONCELMAN CONNECTOR
 - DEMOD DEMODULATED IRIG-B (SAME AS UNMOD)
 - DNP3 DISTRIBUTED NETWORK PROTOCOL
 - EIA ELECTRONICS INDUSTRY ASSOCIATION
 - ENET 10BASE-T/100BASE-TX ETHERNET (802.3/802.3u)
 - FB SEL FAST BINARY PROTOCOL
 - FNET 10BASE-FX/100BASE-FX ETHERNET (802.3z)
 - GPS GLOBAL POSITIONING SYSTEM
 - IDLC ISDN DATA LINK CONTROL PROTOCOL
 - IGN POWERLOGIC IGN PROTOCOL
 - INTERNET PROTOCOL
 - IRIG-B INTER-RANGE INSTRUMENTATION GROUP MOD B
 - ISDN INTEGRATED SERVICE DIGITAL NETWORK
 - MB SEL MIRRORED BITS PROTOCOL
 - MOD MODULATED IRIG-B
 - NTP NETWORK TIME PROTOCOL
 - P# PORT NUMBER
 - PPS PULSE PER SECOND
 - RG RADIO GUIDE
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PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS			
JOB #: MEA W.O. EN16-3.2			
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
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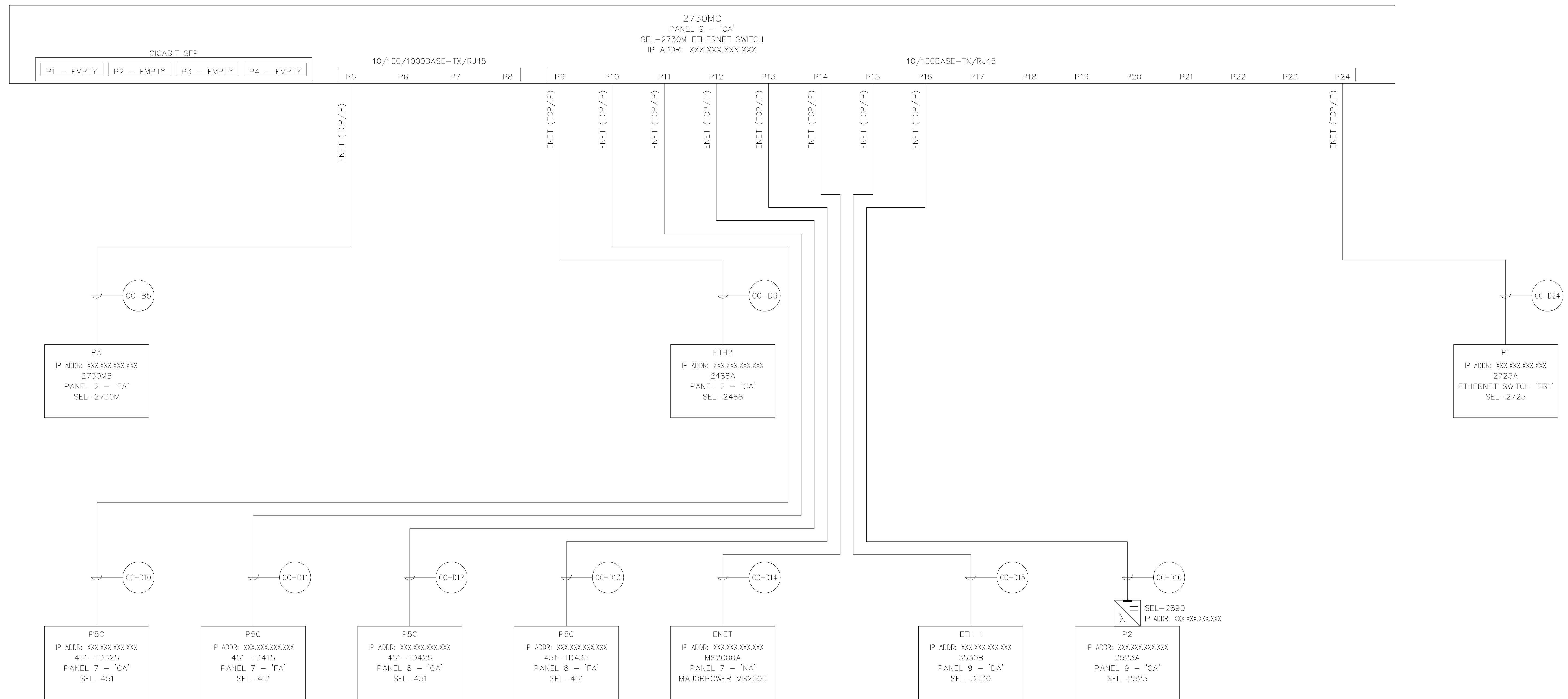
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: **DOUGLAS SUBSTATION SCADA NETWORK TOPOLOGY**

REF. DWG(S):

DRAWING NO.: **DGSS-EL-0014**

SHEET **5** OF **7**



LEGEND:

- ADDR COMMUNICATION ADDRESS
 - ASCII AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE
 - BNC BAYONNET NELL-CONCELMAN CONNECTOR
 - DEM0D DEMODULATED IRIG-B (SAME AS UNMOD)
 - DNP3 DISTRIBUTED NETWORK PROTOCOL
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 - IDLC ISDN DATA LINK CONTROL PROTOCOL
 - IGN POWERLOGIC IGN PROTOCOL
 - INTERNET PROTOCOL
 - IRIG-B INTER-RANGE INSTRUMENTATION GROUP MOD B
 - ISDN INTEGRATED SERVICE DIGITAL NETWORK
 - MB SEL MIRRORED BITS PROTOCOL
 - MOD MODULATED IRIG-B
 - NTP NETWORK TIME PROTOCOL
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 - UNMOD UNMODULATED IRIG-B (SAME AS DEMOD)
-
- FIBER-TO-COPPER CONVERTER
 - ETHERNET-TO-SERIAL CONVERTER

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: **DOUGLAS SUBSTATION SCADA NETWORK TOPOLOGY**

dass-el-0014_6.dwg

REF. DWG(S):

DRAWING NO.: **DGSS-EL-0014**

SHEET **6** OF **7**



LEGEND:

- ADDR COMMUNICATION ADDRESS
- ASCII AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE
- BNC BAYONET NELL-CONCELMAN CONNECTOR
- DEMOD DEMODULATED IRIG-B (SAME AS UNMOD)
- DNP3 DISTRIBUTED NETWORK PROTOCOL
- EIA ELECTRONICS INDUSTRY ASSOCIATION
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- INTERNET PROTOCOL
- IRIG-B INTER-RANGE INSTRUMENTATION GROUP MOD B
- ISDN INTEGRATED SERVICE DIGITAL NETWORK
- MB SEL MIRRORED BITS PROTOCOL
- MOD MODULATED IRIG-B
- NTP NETWORK TIME PROTOCOL
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- UNMOD UNMODULATED IRIG-B (SAME AS DEMOD)

- FIBER-TO-COPPER CONVERTER
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PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE
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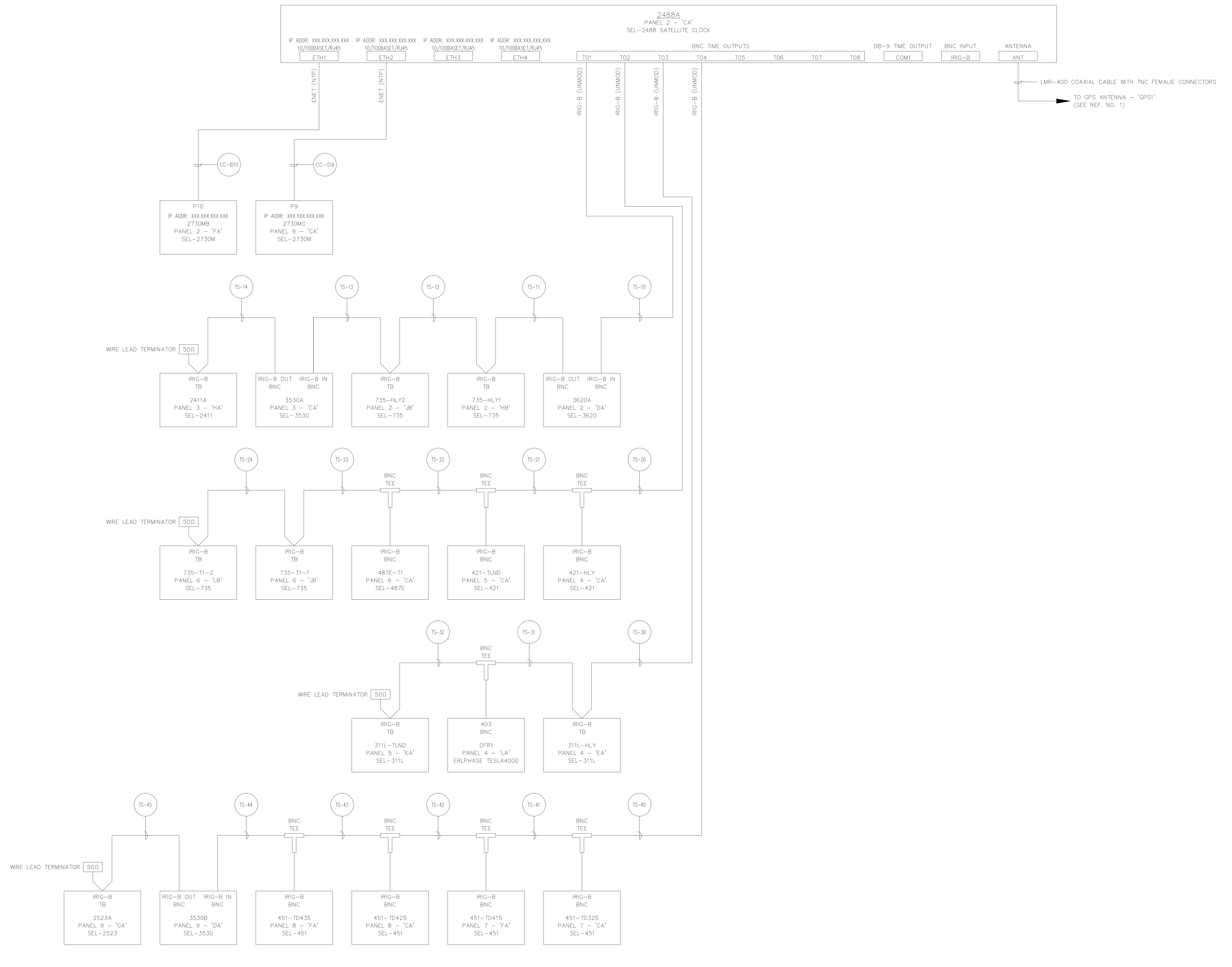
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:	DOUGLAS SUBSTATION SCADA NETWORK TOPOLOGY
REF. DWG(S):	
DRAWING NO.:	DGSS-EL-0014
SHEET 7 OF 7	



PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-55-2009/1	CONTROL ENCLOSURE PLAN

DRAWING NAME: DOUGLAS SUBSTATION TIME SYNCHRONIZATION NETWORK TOPOLOGY

REF. DWG(S):

DRAWING NO.: DGSS-EL-0015

SHEET 1 OF 1

CABLE OR WIRE NO.	CATALOG NUMBER	ESTIMATED LENGTH (FT)	FROM	TO	FUNCTION	VIA	DRAWING NUMBER	FURNISHED BY
SS-1	TBD	TBD	24.9 kV MAIN BUS, FUSED CUTOUT	STATION SERVICE XFMR, 'PM1'	24.9 kV STATION SVC CIRCUIT	CONDUIT TBD	DGSS-EL-0012	NIC
SS-2	TBD	TBD	24.9 kV AUX BUS, FUSED CUTOUT	STATION SERVICE XFMR, 'PM2'	24.9 kV STATION SVC CIRCUIT	CONDUIT TBD	DGSS-EL-0012	NIC
SS-3	3 X HW010 40101 & 1 X HW010 10101 GREEN	TBD	STATION SERVICE XFMR, 'PM1'	DISCONNECT, '2301'	NORMAL STATION SVC CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY CONDUIT TBD	DGSS-EL-0012	NIC
SS-4	3 X HW010 40101 & 1 X HW010 10101 GREEN	TBD	STATION SERVICE XFMR, 'PM2'	DISCONNECT, '2301'	ALTERNATE STATION SVC CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY CONDUIT TBD	DGSS-EL-0012	NIC
SS-5	3 X HW010 40101 & 1 X HW010 10101 GREEN	30	DISCONNECT, '2201'	TRANSFER SWITCH, '2401'	STATION SVC CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0012	C
SS-6	3 X HW010 40101 & 1 X HW010 10101 GREEN	30	DISCONNECT, '2301'	TRANSFER SWITCH, '2401'	STATION SVC CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0012	C
SS-7	3 X HW010 40101 & 1 X HW010 10101 GREEN	30	TRANSFER SWITCH, '2401'	STATION SERVICE METER, 'SSM1'	STATION SVC CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0012	C
SS-8	3 X HW010 40101 & 1 X HW010 10101 GREEN	30	STATION SERVICE METER, 'SSM1'	AC PANEL 1, 'AC1'	STATION SVC CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0012	C
SS-9	3 X HW010 40101 & 1 X HW010 10101 GREEN	20	AC PANEL 1, 'AC1'	AC PANEL 2, 'AC2'	STATION SVC CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0012	C
SS-10	HW172 0203G	40	AC PANEL 1, 'AC1'	BATTERY CHARGER, 'BCHG1'	BATTERY CHARGER CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0012	C
AC1-HT1A	HW172 0603G	40	AC PANEL 1, 'AC1'	HVAC UNIT 1, 'HVAC1'	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-HT1B	HW173 01004	40	AC PANEL 1, 'AC1'	HVAC UNIT 1, 'HVAC1'	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-HT2A	HW172 0603G	30	AC PANEL 1, 'AC1'	HVAC UNIT 2, 'HVAC2'	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-HT2B	HW173 01004	30	AC PANEL 1, 'AC1'	HVAC UNIT 2, 'HVAC2'	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-HT3	HW173 01204	40	AC PANEL 1, 'AC1'	AUXILIARY CONTROL PANEL 1, 'ACP1'	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-RE1	HW173 01004	100	AC PANEL 1, 'AC1'	EXTERIOR RECEPTACLES	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-RE2	HW173 01204	100	AC PANEL 1, 'AC1'	EXTERIOR RECEPTACLES	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-RE3	HW173 01204	270	AC PANEL 1, 'AC1'	INTERIOR RECEPTACLES	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-RE4	HW173 01204	50	AC PANEL 1, 'AC1'	RELAY PANEL 1	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-LT1	HW173 01204	160	AC PANEL 1, 'AC1'	EXTERIOR LIGHTING	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-LT2	HW173 01204	200	AC PANEL 1, 'AC1'	INTERIOR EMERGENCY LIGHTING	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-LT3	HW173 01204	160	AC PANEL 1, 'AC1'	INTERIOR LIGHTING	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-LT4	HW173 01204	40	AC PANEL 1, 'AC1'	LIGHTING CONTACTOR, 'LC1'	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-LT5	HW172 0803G	40	AC PANEL 1, 'AC1'	LIGHTING CONTACTOR, 'LC1'	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-LT6	HW172 0803G	40	AC PANEL 1, 'AC1'	LIGHTING CONTACTOR, 'LC1'	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-HD1	HW173 01204	40	AC PANEL 1, 'AC1'	AUXILIARY CONTROL PANEL 1, 'ACP1'	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-FD1	HW173 01204	40	AC PANEL 1, 'AC1'	AUXILIARY CONTROL PANEL 1, 'ACP1'	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC1-MS2000A	HW173 01004	40	AC PANEL 1, 'AC1'	RELAY PANEL 7 INVERTER	AC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC-RE40	HW173 01204	60	PANEL 7	RECEPTACLES RE40 & RE41	UPS RECEPTACLE CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2026	C
AC2-B1-1	HW172 0803G	60	AC PANEL 2, 'AC2'	MARSHALLING CABINET 1, 'MC1'	AC PANEL 2 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC2-B1-2	HW172 0803G	60	AC PANEL 2, 'AC2'	MARSHALLING CABINET 1, 'MC1'	AC PANEL 2 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC2-TD200-1	HW173 01004	60	AC PANEL 2, 'AC2'	MARSHALLING CABINET 1, 'MC1'	AC PANEL 2 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC2-2S3-1	HW173 01004	60	AC PANEL 2, 'AC2'	MARSHALLING CABINET 1, 'MC1'	AC PANEL 2 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC2-T1-1	HW172 0603G	60	AC PANEL 2, 'AC2'	MARSHALLING CABINET 2, 'MC2'	AC PANEL 2 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2001	C
AC2-B1-3	HW174 0803G	TBD	MARSHALLING CABINET 1, 'MC1'	GCB B1 INTERFACE CABINET	AC POWER (B1 - 240 VAC)	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
AC2-B1-4	HW174 0803G	TBD	MARSHALLING CABINET 1, 'MC1'	GCB B1 CONTROL CABINET	AC POWER (B1 - 120 VAC)	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
AC2-TD200-2	HW173 01004	TBD	MARSHALLING CABINET 1, 'MC1'	CIRCUIT SWITCHER TD-200	AC POWER TD-200 120V	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
AC2-2S3-2	HW173 01004	TBD	MARSHALLING CABINET 1, 'MC1'	MOAS 2S3	AC POWER 2S3 - 120VAC	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
AC2-T1-2	HW174 0603G	TBD	MARSHALLING CABINET 2, 'MC2'	POWER TRANSFORMER 'T1'	AC POWER (T1 - 240 VAC)	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

NOTES:

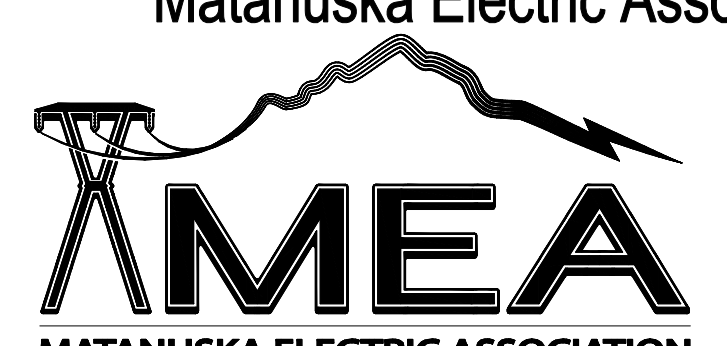
- ① ALL CABLE AND WIRE SHALL BE BY HOUSTON WIRE & CABLE UNLESS NOTED OTHERWISE.

CABLE OR WIRE NO.	CATALOG NUMBER	ESTIMATED LENGTH (FT)	FROM	TO	FUNCTION	VIA	DRAWING NUMBER	FURNISHED BY
CT-B1-1A	HW173 01004	50	MARSHALLING CABINET 1, 'MC1'	RELAY PANEL 2	CT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0101	C
CT-B1-2A	HW173 01004	50	MARSHALLING CABINET 1, 'MC1'	RELAY PANEL 5	CT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0101	C
CT-B1-3A	HW173 01004	50	MARSHALLING CABINET 1, 'MC1'	RELAY PANEL 4	CT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0101	C
CT-B1-4A	HW173 01004	50	MARSHALLING CABINET 1, 'MC1'	RELAY PANEL 4	CT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0101	C
CT-T1-1A	HW173 01004	40	MARSHALLING CABINET 3, 'MC3'	RELAY PANEL 6	CT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0100	C
CT-T1-3A	HW173 01004	40	MARSHALLING CABINET 3, 'MC3'	RELAY PANEL 6	CT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0100	C
CT-T1-4A	HW173 01004	40	MARSHALLING CABINET 3, 'MC3'	RELAY PANEL 6	CT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0100	C
CT-T1-4B	HW173 01004	30	RELAY PANEL 6	RELAY PANEL 7	CT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0100	C
CT-T1-5A	HW173 01004	30	MARSHALLING CABINET 3, 'MC3'	RELAY PANEL 6	CT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0100	C
PT-1-3	HW173 01204	50	MARSHALLING CABINET 3, 'MC3'	RELAY PANEL 4	138 kV BUS PT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0101	C
PT-1-4	HW173 01204	50	MARSHALLING CABINET 3, 'MC3'	RELAY PANEL 4	138 kV BUS PT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0101	C
PT-2-2	HW173 01204	50	MARSHALLING CABINET 3, 'MC3'	RELAY PANEL 4	138 kV SYNC CVT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0101	C
PT-3-2	HW173 01204	50	MARSHALLING CABINET 3, 'MC3'	RELAY PANEL 7	24.9 kV MAIN PT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0101	C
CT-B1-1	HW173 01004	TBD	MARSHALLING CABINET 1, 'MC1'	GCB B1 INTERFACE CABINET	B1 CURRENT	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
CT-B1-2	HW173 01004	TBD	MARSHALLING CABINET 1, 'MC1'	GCB B1 INTERFACE CABINET	B1 CURRENT	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
CT-B1-3	HW173 01004	TBD	MARSHALLING CABINET 1, 'MC1'	GCB B1 INTERFACE CABINET	B1 CURRENT	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
CT-B1-4	HW173 01004	TBD	MARSHALLING CABINET 1, 'MC1'	GCB B1 INTERFACE CABINET	B1 CURRENT	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
CT-T1-1	HW173 01004	TBD	MARSHALLING CABINET 3, 'MC3'	POWER TRANSFORMER 'T1'	T1 CURRENT	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
CT-T1-2	HW173 01004	TBD	MARSHALLING CABINET 3, 'MC3'	POWER TRANSFORMER 'T1'	T1 CURRENT	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
CT-T1-3	HW173 01004	TBD	MARSHALLING CABINET 3, 'MC3'	POWER TRANSFORMER 'T1'	T1 CURRENT	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
CT-T1-4	HW173 01004	TBD	MARSHALLING CABINET 3, 'MC3'	POWER TRANSFORMER 'T1'	T1 CURRENT	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
CT-T1-5	HW173 01004	TBD	MARSHALLING CABINET 3, 'MC3'	POWER TRANSFORMER 'T1'	T1 CURRENT	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
CT-25KV-1	HW173 01004	TBD	MARSHALLING CABINET 2, 'MC2'	24.9KV CT / PT J-BOX	25KV BUS CURRENT	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
CT-415-1	HW173 01004	TBD	MARSHALLING CABINET 2, 'MC2'	RECLOSER TD-415	METERING CURRENTS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
CT-425-1	HW173 01004	TBD	MARSHALLING CABINET 2, 'MC2'	RECLOSER TD-425	METERING CURRENTS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
CT-435-1	HW173 01004	TBD	MARSHALLING CABINET 2, 'MC2'	RECLOSER TD-435	METERING CURRENTS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
PT-1-1	HW173 01212	TBD	MARSHALLING CABINET 3, 'MC3'	138 kV POTENTIAL J-BOX	138KV POTENTIALS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
PT-2-1	HW173 01204	TBD	MARSHALLING CABINET 3, 'MC3'	138 kV B PHASE CVT J-BOX	138KV SYNC POTENTIAL	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
PT-3-1	HW173 01204	TBD	MARSHALLING CABINET 3, 'MC3'	24.9KV CT / PT J-BOX	25KV POTENTIALS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
PT-3-3	HW173 01204	TBD	MARSHALLING CABINET 3, 'MC3'	POWER TRANSFORMER 'T1'	25KV POTENTIALS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC

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PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			JOB #: MEA W.O. EN16-3.2		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS			ENG. STAMP		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE		
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016		

Matanuska Electric Association



163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
WWW.MEA.COOP

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION AC CABLE & WIRE SCHEDULE

DRAWING NO.: DGSS-EL-4000

SHEET 1 OF 2

CABLE OR WIRE NO.	CATALOG NUMBER	ESTIMATED LENGTH (FT)	FROM	TO	FUNCTION	VIA	DRAWING NUMBER	FURNISHED BY
C-HGM1-1	HW173 01207	50	AUXILIARY CONTROL PANEL 1, 'ACP1'	HYDROGEN GAS MONITOR, 'HGM1'	HYDROGEN DETECTOR CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2027	C
C-EFTS1-1	HW173 01204	40	AUXILIARY CONTROL PANEL 1, 'ACP1'	EXHAUST FAN THERMOSTAT, 'EFTS1'	EXHAUST FAN T-STAT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2027	C
C-EF1-1	HW173 01204	50	AUXILIARY CONTROL PANEL 1, 'ACP1'	EXHAUST FAN, 'EF1'	EXHAUST FAN CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2027	C
C-IL1-1	HW173 01204	80	AUXILIARY CONTROL PANEL 1, 'ACP1'	INTAKE LOUVRE, 'LI1'	INTAKE LOUVRE CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2027	C
C-HA1-1	HW173 01204	60	AUXILIARY CONTROL PANEL 1, 'ACP1'	HYDROGEN ALARM/STROBE, 'HA1'	HYDROGEN ALARM CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2027	C
C-HA2-1	HW173 01204	30	AUXILIARY CONTROL PANEL 1, 'ACP1'	HYDROGEN ALARM/STROBE, 'HA2'	HYDROGEN ALARM CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2027	C
C-SD1-1	HW173 01207	50	AUXILIARY CONTROL PANEL 1, 'ACP1'	SMOKE DETECTOR, 'SD1'	SMOKE DETECTOR CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2028	C
C-SD2-1	HW173 01207	50	AUXILIARY CONTROL PANEL 1, 'ACP1'	SMOKE DETECTOR, 'SD2'	SMOKE DETECTOR CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2028	C
C-HD1-1	HW173 01204	50	AUXILIARY CONTROL PANEL 1, 'ACP1'	HEAT DETECTOR, 'HD1'	HEAT DETECTOR CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2028	C
C-HD2-1	HW173 01204	50	AUXILIARY CONTROL PANEL 1, 'ACP1'	HEAT DETECTOR, 'HD2'	HEAT DETECTOR CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2028	C
C-FA1-1	HW173 01204	60	AUXILIARY CONTROL PANEL 1, 'ACP1'	FIRE ALARM/STROBE, 'FA1'	FIRE ALARM CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2028	C
C-FA2-1	HW173 01204	30	AUXILIARY CONTROL PANEL 1, 'ACP1'	FIRE ALARM/STROBE, 'FA2'	FIRE ALARM CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2028	C
C-FA3-1	HW173 01204	40	AUXILIARY CONTROL PANEL 1, 'ACP1'	FIRE ALARM/STROBE, 'FA3'	FIRE ALARM CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2028	C
C-HVAC1-1	HW120 01604	30	AUXILIARY CONTROL PANEL 1, 'ACP1'	HVAC UNIT 1, 'HVAC1'	HVAC CONTROL CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2029	C
C-HVAC1-2	HW120 01604	60	AUXILIARY CONTROL PANEL 1, 'ACP1'	THERMOSTAT, 'TS1'	HVAC CONTROL CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2029	C
C-HVAC2-1	HW120 01604	50	AUXILIARY CONTROL PANEL 1, 'ACP1'	HVAC UNIT 2, 'HVAC2'	HVAC CONTROL CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2029	C
C-HVAC2-2	HW120 01604	60	AUXILIARY CONTROL PANEL 1, 'ACP1'	THERMOSTAT, 'TS2'	HVAC CONTROL CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2029	C
C-LT1	HW173 01204	40	LIGHTING CONTACTOR, 'LC1'	PHOTOCELL, 'PC1'	MAINT. LIGHTING CONTROL CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2033	C

CABLE OR WIRE NO.	CATALOG NUMBER	ESTIMATED LENGTH (FT)	FROM	TO	FUNCTION	VIA	DRAWING NUMBER	FURNISHED BY

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

NOTES:
 ① ALL CABLE AND WIRE SHALL BE BY HOUSTON WIRE & CABLE UNLESS NOTED OTHERWISE.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT				ENG. STAMP	
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS				JOB #: MEA W.O. EN16-3.2	
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DRAWING NAME: DOUGLAS SUBSTATION AC CABLE & WIRE SCHEDULE

REF. DWG(S):

DRAWING NO.: DGSS-EL-4000

SHEET 2 OF 2

CABLE OR WIRE NO.	CATALOG NUMBER	ESTIMATED LENGTH (FT)	FROM	TO	FUNCTION	VIA	DRAWING NUMBER	FURNISHED BY
DC-1	2 X HW010 10101	30	BATTERY BANK TERMINALS	FUSED DISCONNECT, '1301'	DC PLANT CIRCUIT	WALL-MOUNTED CONDUIT	DGSS-EL-0013	C
DC-2	2 X HW010 10101	40	FUSED DISCONNECT, '1301'	DC PANEL 1, 'DC1'	DC PLANT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0013	C
DC-3	2 X HW010 10101	10	DC PANEL 1, 'DC1'	DC PANEL 2, 'DC2'	DC PLANT CIRCUIT	INTER-PANEL CONDUIT	DGSS-EL-0013	C
DC-4	2 X HW010 10101	30	BATTERY CHARGER, 'BCHG1'	DC PANEL 2, 'DC2'	DC PLANT CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0013	C
DC1-P5	HW173 01004	40	DC PANEL 1, 'DC1'	RELAY PANEL 5	DC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2000	C
DC1-P6	HW173 01004	40	DC PANEL 1, 'DC1'	RELAY PANEL 6	DC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2000	C
DC1-MS2000A	HW173 01004	40	DC PANEL 1, 'DC1'	RELAY PANEL 7 INVERTER	DC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2000	C
DC1-B1-1	HW172 0803G	40	DC PANEL 1, 'DC1'	MARSHALLING CABINET 1, 'MC1'	DC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2000	C
DC1-TD200-1	HW172 0803G	40	DC PANEL 1, 'DC1'	MARSHALLING CABINET 1, 'MC1'	DC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2000	C
DC1-2S3-1	HW172 0803G	40	DC PANEL 1, 'DC1'	MARSHALLING CABINET 1, 'MC1'	DC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2000	C
DC1-T1-1	HW173 01004	40	DC PANEL 1, 'DC1'	MARSHALLING CABINET 2, 'MC2'	DC PANEL 1 BRANCH CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2000	C
DC-ES1	HW173 01404	60	RELAY PANEL 9	ETHERNET SWITCH 'ES1'	DC POWER CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2021	C
C-B1-1	HW173 01212	50	RELAY PANEL 4	MARSHALLING CABINET 1, 'MC1'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2500	C
C-B1-2	HW173 01212	50	RELAY PANEL 4	MARSHALLING CABINET 1, 'MC1'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2500	C
C-B1-3	HW173 01212	50	RELAY PANEL 4	MARSHALLING CABINET 1, 'MC1'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2500	C
C-TD200-1	HW173 01212	50	RELAY PANEL 6	MARSHALLING CABINET 1, 'MC1'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2501	C
C-TD200-2	HW173 01212	50	RELAY PANEL 6	MARSHALLING CABINET 1, 'MC1'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2501	C
C-2S3-1	HW173 01212	50	RELAY PANEL 5	MARSHALLING CABINET 1, 'MC1'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2502	C
C-T1-1	HW173 01212	50	RELAY PANEL 6	MARSHALLING CABINET 2, 'MC2'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2503	C
C-T1-2	HW120 01612	50	RELAY PANEL 9	MARSHALLING CABINET 2, 'MC2'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2503	C
C-T1-3	HW120 01612	50	RELAY PANEL 9	MARSHALLING CABINET 2, 'MC2'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2503	C
C-415-1	HW173 01212	50	RELAY PANEL 7	MARSHALLING CABINET 2, 'MC2'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	TBD	C
C-425-1	HW173 01212	50	RELAY PANEL 8	MARSHALLING CABINET 2, 'MC2'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	TBD	C
C-435-1	HW173 01212	50	RELAY PANEL 8	MARSHALLING CABINET 2, 'MC2'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	TBD	C
C-BCHG1-1	HW120 01608	60	BATTERY CHARGER, 'BCHG1'	AUXILIARY CONTROL PANEL 1, 'ACP1'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2023	C
C-IA1-1	HW120 01601	60	INTRUSION ALARM, 'IA1'	AUXILIARY CONTROL PANEL 1, 'ACP1'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2023	C
C-IA2-1	HW120 01601	30	INTRUSION ALARM, 'IA2'	AUXILIARY CONTROL PANEL 1, 'ACP1'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2023	C
C-RTS1-1	HW120 01601	60	TEMPERATURE SWITCH, 'RTS1'	AUXILIARY CONTROL PANEL 1, 'ACP1'	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2023	C
C-ACP1-1	HW120 01612	40	AUXILIARY CONTROL PANEL 1, 'ACP1'	RELAY PANEL 9	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2023	C
C-ACP1-2	HW120 01612	40	AUXILIARY CONTROL PANEL 1, 'ACP1'	RELAY PANEL 9	CONTROL/INDICATION CIRCUIT	LOWER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-2023	C

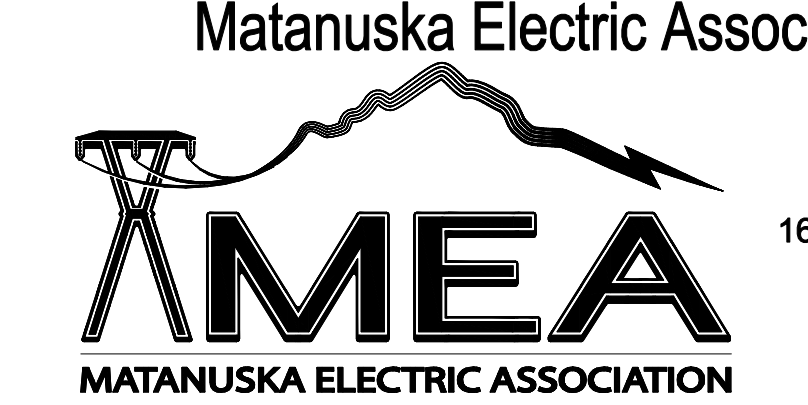
CABLE OR WIRE NO.	CATALOG NUMBER	ESTIMATED LENGTH (FT)	FROM	TO	FUNCTION	VIA	DRAWING NUMBER	FURNISHED BY
DC1-B1-2	HW174 0803G	TBD	MARSHALLING CABINET 1, 'MC1'	GCB B1 INTERFACE CABINET	DC POWER (B1 - 125VDC)	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
DC1-TD200-2	HW174 0803G	TBD	MARSHALLING CABINET 1, 'MC1'	CIRCUIT SWITCHER TD-200	DC POWER TD-200 125VDC	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
DC1-T1-2	HW173 01004	TBD	MARSHALLING CABINET 2, 'MC2'	POWER TRANSFORMER 'T1'	DC POWER (T1 - 125VDC)	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
DC1-2S3-2	HW174 0803G	TBD	MARSHALLING CABINET 1, 'MC1'	MOAS 2S3	DC POWER (2S3 - 125 VDC)	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
C-B1-4	HW173 01212	TBD	MARSHALLING CABINET 1, 'MC1'	GCB B1 INTERFACE CABINET	B1 CONTROLS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
C-B1-5	HW173 01212	TBD	MARSHALLING CABINET 1, 'MC1'	GCB B1 INTERFACE CABINET	B1 CONTROLS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
C-B1-6	HW173 01212	TBD	MARSHALLING CABINET 1, 'MC1'	GCB B1 INTERFACE CABINET	B1 CONTROLS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
C-TD200-3	HW173 01212	TBD	MARSHALLING CABINET 1, 'MC1'	CIRCUIT SWITCHER TD-200	TD-200 CONTROLS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
C-TD200-4	HW173 01212	TBD	MARSHALLING CABINET 1, 'MC1'	CIRCUIT SWITCHER TD-200	TD-200 CONTROLS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
C-2S3-2	HW173 01212	TBD	MARSHALLING CABINET 1, 'MC1'	MOAS 2S3	MOAS 2S3 CONTROLS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
C-T1-4	HW173 01212	TBD	MARSHALLING CABINET 2, 'MC2'	POWER TRANSFORMER 'T1'	T1 CONTROLS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
C-T1-5	HW120 01612	TBD	MARSHALLING CABINET 2, 'MC2'	POWER TRANSFORMER 'T1'	T1 CONTROLS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
C-T1-6	HW120 01612	TBD	MARSHALLING CABINET 2, 'MC2'	POWER TRANSFORMER 'T1'	T1 CONTROLS	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
C-415-1	HW173 01212	TBD	MARSHALLING CABINET 2, 'MC2'	RECLOSER TD-415	TD-415 CT & CONTROL	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
C-425-1	HW173 01212	TBD	MARSHALLING CABINET 2, 'MC2'	RECLOSER TD-425	TD-425 CT & CONTROL	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC
C-435-1	HW173 01212	TBD	MARSHALLING CABINET 2, 'MC2'	RECLOSER TD-435	TD-435 CT & CONTROL	LOWER TIER OF OVERHEAD CABLE TRAY TRENCH, CONDUIT TBD	TBD	NIC

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NOTES:
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PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
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ENG. STAMP



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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION DC CABLE & WIRE SCHEDULE

REF. DWG(S):

DRAWING NO.: DGSS-EL-4001

SHEET 1 OF 1

dass-el-4001_1.dwg

CABLE OR WIRE NO.	CATALOG NUMBER	ESTIMATED LENGTH (FT)	FROM	TO	FUNCTION	VIA	DRAWING NUMBER	FURNISHED BY
CC-A9	SEL C627	6	RELAY PANEL 2, DEVICE 'EA'	RELAY PANEL 2, DEVICE 'DA'	SCADA DATA CIRCUIT	INTRA-PANEL	DGSS-EL-0014	C
CC-B5	SEL C627	50	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 9, DEVICE 'CA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-B9	SEL C627	6	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 2, DEVICE 'DA'	SCADA DATA CIRCUIT	INTRA-PANEL	DGSS-EL-0014	C
CC-B10	SEL C627	6	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 2, DEVICE 'CA'	SCADA DATA CIRCUIT	INTRA-PANEL	DGSS-EL-0014	C
CC-B11	SEL C627	10	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 2, DEVICE 'HB'	SCADA DATA CIRCUIT	INTRA-PANEL	DGSS-EL-0014	C
CC-B12	SEL C627	10	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 2, DEVICE 'JB'	SCADA DATA CIRCUIT	INTRA-PANEL	DGSS-EL-0014	C
CC-B13	SEL C627	30	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 3, DEVICE 'CA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-B14	SEL C627	30	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 3, DEVICE 'HA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-B15	SEL C627	30	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 4, DEVICE 'CA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-B16	SEL C627	30	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 4, DEVICE 'EA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-B17	SEL C627	30	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 4, DEVICE 'LA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-B18	SEL C627	40	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 5, DEVICE 'CA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-B19	SEL C627	40	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 5, DEVICE 'EA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-B20	SEL C627	40	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 6, DEVICE 'CA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-B21	SEL C627	40	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 6, DEVICE 'JB'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-B22	SEL C627	40	RELAY PANEL 2, DEVICE 'FA'	RELAY PANEL 6, DEVICE 'LB'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-C35	SEL 627F	6	RELAY PANEL 3, DEVICE 'CA'	RELAY PANEL 3, DEVICE 'EA'	SCADA DATA CIRCUIT	INTRA-PANEL	DGSS-EL-0014	C
CC-D9	SEL C627	50	RELAY PANEL 9, DEVICE 'CA'	RELAY PANEL 2, DEVICE 'CA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-D10	SEL C627	30	RELAY PANEL 9, DEVICE 'CA'	RELAY PANEL 7, DEVICE 'CA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-D11	SEL C627	30	RELAY PANEL 9, DEVICE 'CA'	RELAY PANEL 7, DEVICE 'FA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-D12	SEL C627	30	RELAY PANEL 9, DEVICE 'CA'	RELAY PANEL 8, DEVICE 'CA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-D13	SEL C627	30	RELAY PANEL 9, DEVICE 'CA'	RELAY PANEL 8, DEVICE 'FA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-D14	SEL C627	30	RELAY PANEL 9, DEVICE 'CA'	RELAY PANEL 7, DEVICE 'NA'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-D15	SEL C627	6	RELAY PANEL 9, DEVICE 'CA'	RELAY PANEL 9, DEVICE 'DA'	SCADA DATA CIRCUIT	INTRA-PANEL	DGSS-EL-0014	C
CC-D16	SEL C627	10	RELAY PANEL 9, DEVICE 'CA'	RELAY PANEL 9, DEVICE 'GA'	SCADA DATA CIRCUIT	INTRA-PANEL	DGSS-EL-0014	C
CC-D24	SEL C627	70	RELAY PANEL 9, DEVICE 'CA'	ETHERNET SWITCH, 'ESI'	SCADA DATA CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0014	C
CC-E35	SEL 627F	6	RELAY PANEL 9, DEVICE 'DA'	RELAY PANEL 9, DEVICE 'EA'	SCADA DATA CIRCUIT	INTRA-PANEL	DGSS-EL-0014	C

CABLE OR WIRE NO.	CATALOG NUMBER	ESTIMATED LENGTH (FT)	FROM	TO	FUNCTION	VIA	DRAWING NUMBER	FURNISHED BY
TS-10	SEL C953	6	PANEL 2, DEVICE 'CA'	PANEL 2, DEVICE 'DA'	TIME SYNCHRONIZATION CIRCUIT	INTRA-PANEL	DGSS-EL-0015	C
TS-11	SEL C962	10	PANEL 2, DEVICE 'DA'	PANEL 2, DEVICE 'HB'	TIME SYNCHRONIZATION CIRCUIT	INTRA-PANEL	DGSS-EL-0015	C
TS-12	SEL C963	6	PANEL 2, DEVICE 'HB'	PANEL 2, DEVICE 'JB'	TIME SYNCHRONIZATION CIRCUIT	INTRA-PANEL	DGSS-EL-0015	C
TS-13	SEL C962	30	PANEL 2, DEVICE 'JB'	PANEL 3, DEVICE 'CA'	TIME SYNCHRONIZATION CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0015	C
TS-14	SEL C962	10	PANEL 3, DEVICE 'CA'	PANEL 3, DEVICE 'HA'	TIME SYNCHRONIZATION CIRCUIT	INTRA-PANEL	DGSS-EL-0015	C
TS-20	SEL C953	30	PANEL 2, DEVICE 'CA'	PANEL 4, DEVICE 'CA'	TIME SYNCHRONIZATION CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0015	C
TS-21	SEL C953	30	PANEL 4, DEVICE 'CA'	PANEL 5, DEVICE 'CA'	TIME SYNCHRONIZATION CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0015	C
TS-22	SEL C953	30	PANEL 5, DEVICE 'CA'	PANEL 6, DEVICE 'CA'	TIME SYNCHRONIZATION CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0015	C
TS-23	SEL C962	10	PANEL 6, DEVICE 'CA'	PANEL 6, DEVICE 'JB'	TIME SYNCHRONIZATION CIRCUIT	INTRA-PANEL	DGSS-EL-0015	C
TS-24	SEL C963	6	PANEL 6, DEVICE 'JB'	PANEL 6, DEVICE 'LB'	TIME SYNCHRONIZATION CIRCUIT	INTRA-PANEL	DGSS-EL-0015	C
TS-30	SEL C962	30	PANEL 2, DEVICE 'CA'	PANEL 4, DEVICE 'EA'	TIME SYNCHRONIZATION CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0015	C
TS-31	SEL C962	10	PANEL 4, DEVICE 'EA'	PANEL 4, DEVICE 'LA'	TIME SYNCHRONIZATION CIRCUIT	INTRA-PANEL	DGSS-EL-0015	C
TS-32	SEL C962	30	PANEL 4, DEVICE 'LA'	PANEL 5, DEVICE 'EA'	TIME SYNCHRONIZATION CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0015	C
TS-40	SEL C953	40	PANEL 2, DEVICE 'CA'	PANEL 7, DEVICE 'CA'	TIME SYNCHRONIZATION CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0015	C
TS-41	SEL C953	10	PANEL 7, DEVICE 'CA'	PANEL 7, DEVICE 'FA'	TIME SYNCHRONIZATION CIRCUIT	INTRA-PANEL	DGSS-EL-0015	C
TS-42	SEL C953	30	PANEL 7, DEVICE 'FA'	PANEL 8, DEVICE 'CA'	TIME SYNCHRONIZATION CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0015	C
TS-43	SEL C953	10	PANEL 8, DEVICE 'CA'	PANEL 8, DEVICE 'FA'	TIME SYNCHRONIZATION CIRCUIT	INTRA-PANEL	DGSS-EL-0015	C
TS-44	SEL C953	30	PANEL 8, DEVICE 'FA'	PANEL 9, DEVICE 'DA'	TIME SYNCHRONIZATION CIRCUIT	UPPER TIER OF OVERHEAD CABLE TRAY	DGSS-EL-0015	C
TS-45	SEL C962	10	PANEL 9, DEVICE 'DA'	PANEL 9, DEVICE 'GA'	TIME SYNCHRONIZATION CIRCUIT	INTRA-PANEL	DGSS-EL-0015	C


C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

NOTES:
 ① ALL CABLE AND WIRE SHALL BE BY HOUSTON WIRE & CABLE UNLESS NOTED OTHERWISE.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016
		REVIEWED BY/DATE
		TCC/09-19-2016

ENG. STAMP

Matanuska Electric Association



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 (907) 761-9300
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

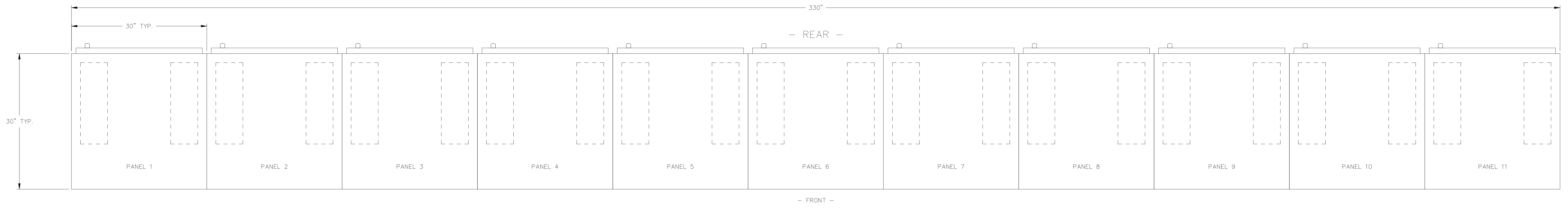
DRAWING NAME: DOUGLAS SUBSTATION COMMUNICATION CABLE & WIRE SCHEDULE

REF. DWG(S):

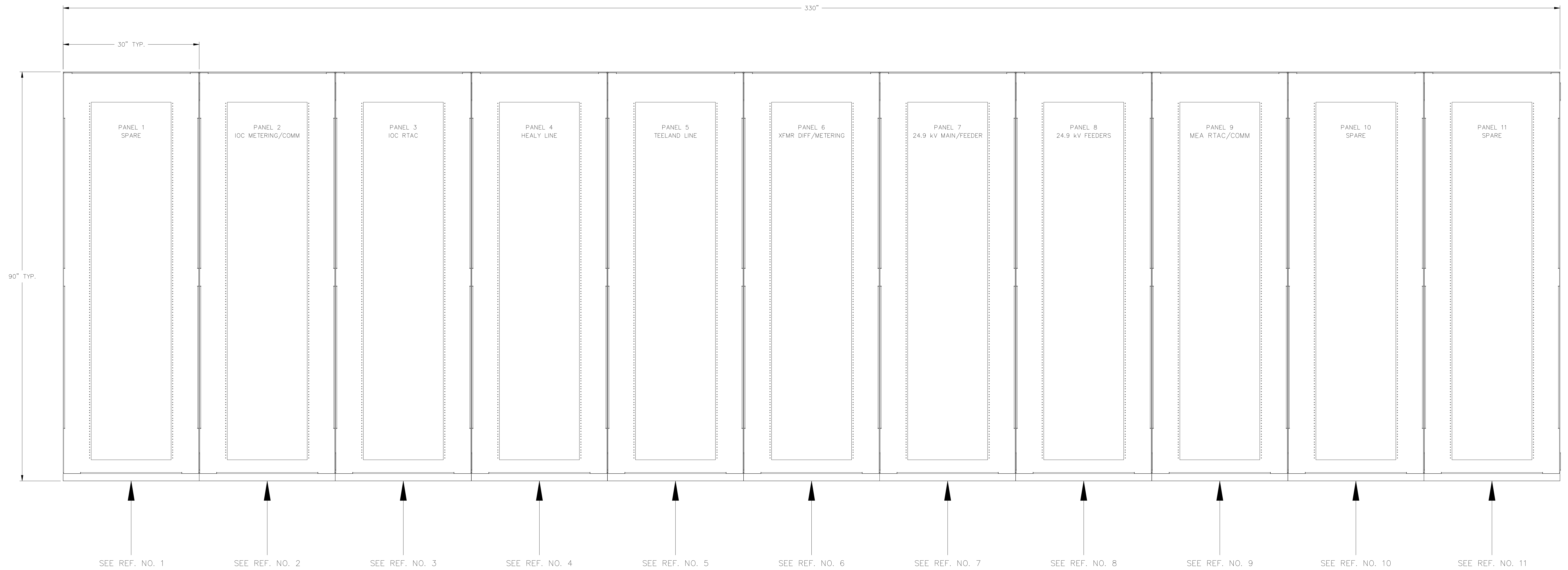
DRAWING NO.: DGSS-EL-4002

SHEET 1 OF 1

dass-el-4002_1.dwg



TOP VIEW
N.T.S



FRONT VIEW
N.T.S

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
9	DGSS-EL-4509/1	PANEL 9 ELEVATION
10	DGSS-EL-4510/1	PANEL 10 ELEVATION
11	DGSS-EL-4511/1	PANEL 11 ELEVATION

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS			
JOB #: MEA W.O. EN16-3.2			
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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(907) 761-9300
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-EL-4501/1	PANEL 1 ELEVATION
2	DGSS-EL-4502/1	PANEL 2 ELEVATION
3	DGSS-EL-4503/1	PANEL 3 ELEVATION
4	DGSS-EL-4504/1	PANEL 4 ELEVATION
5	DGSS-EL-4505/1	PANEL 5 ELEVATION
6	DGSS-EL-4506/1	PANEL 6 ELEVATION
7	DGSS-EL-4507/1	PANEL 7 ELEVATION
8	DGSS-EL-4508/1	PANEL 8 ELEVATION

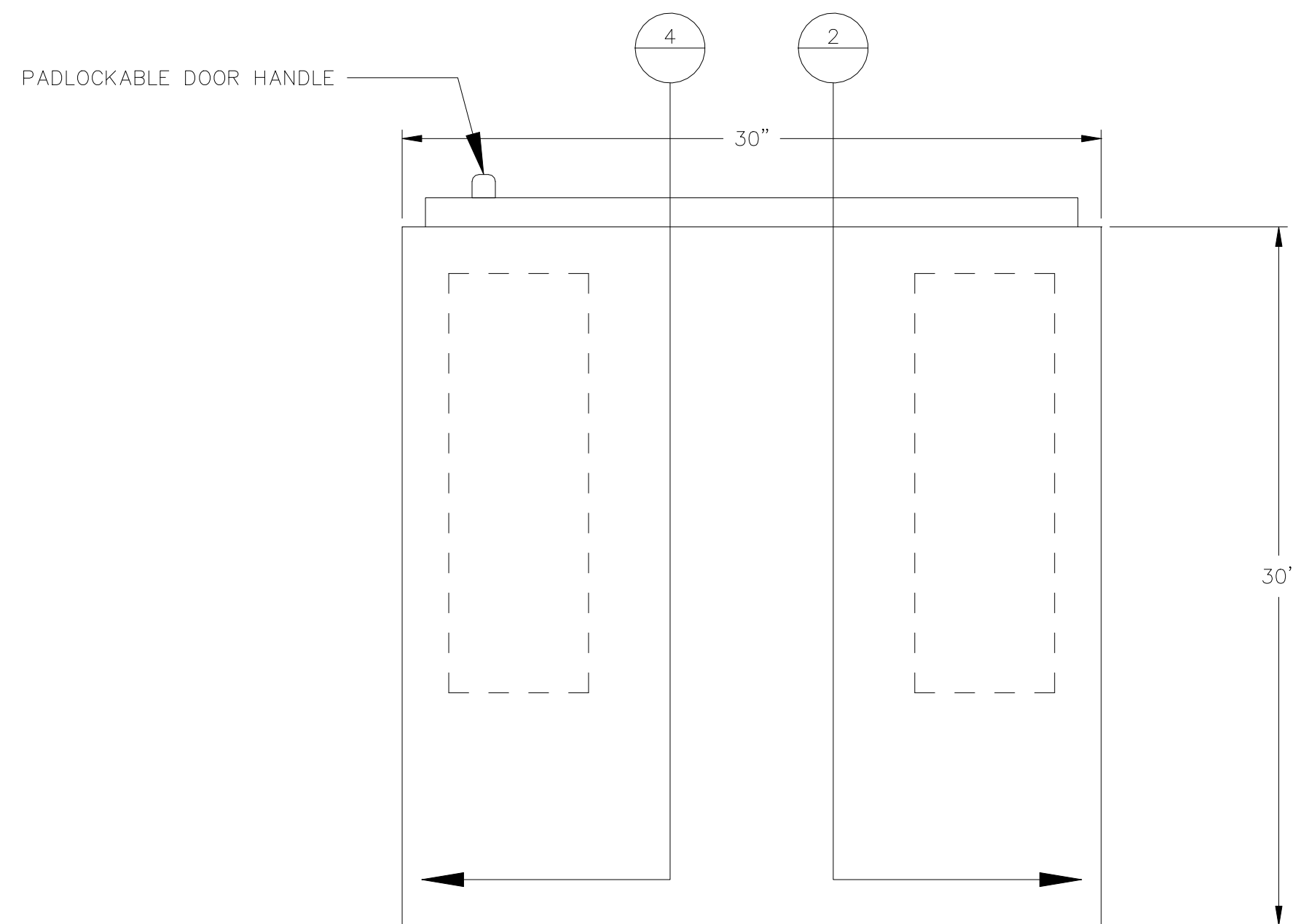
DRAWING NAME: DOUGLAS SUBSTATION
PANEL ELEVATIONS
PANELS 1-11

REF. DWG(S):

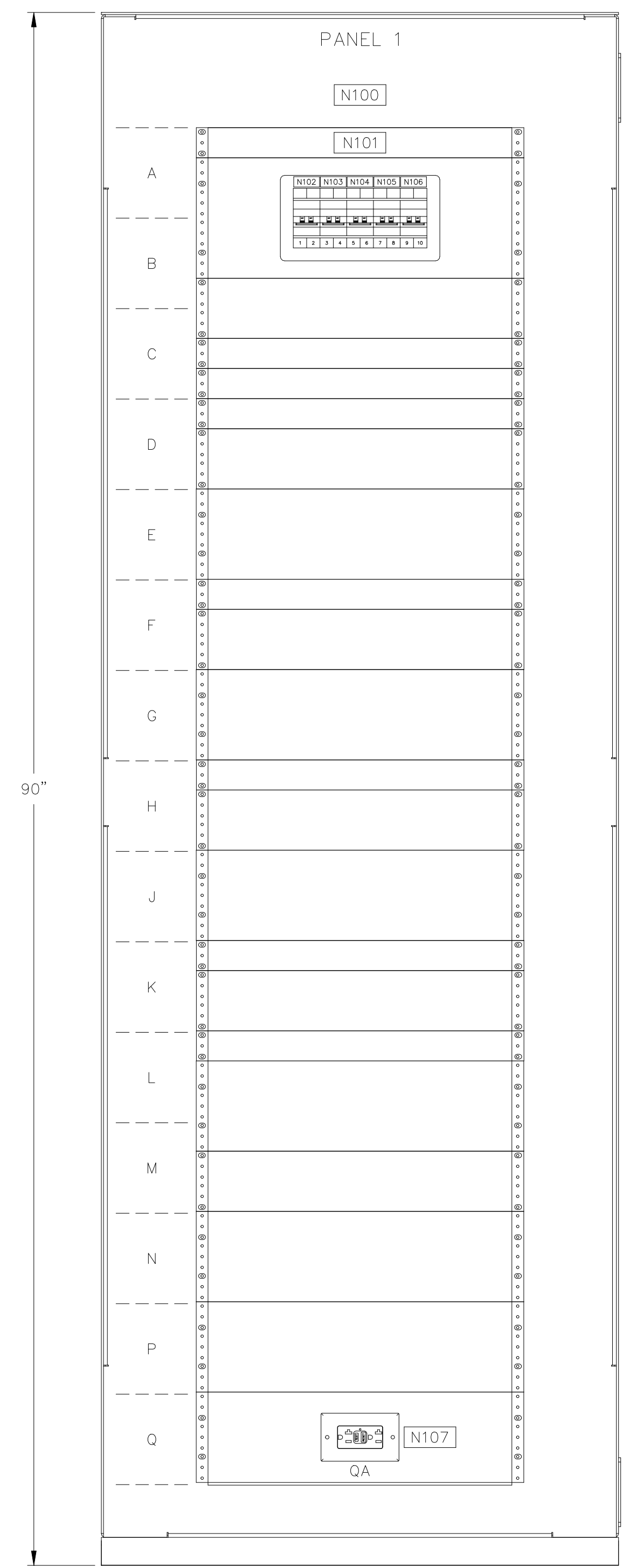
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DATE: dgs-el-4500_1.dwg

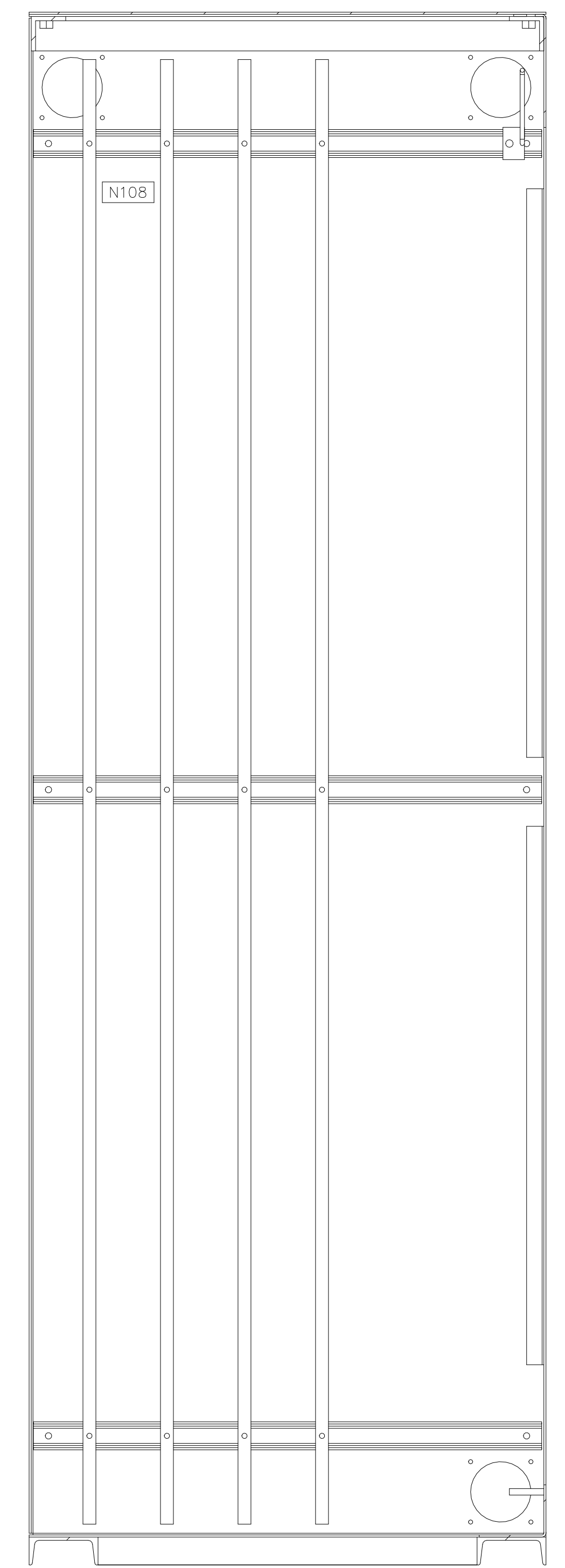
SHEET 1 OF 1



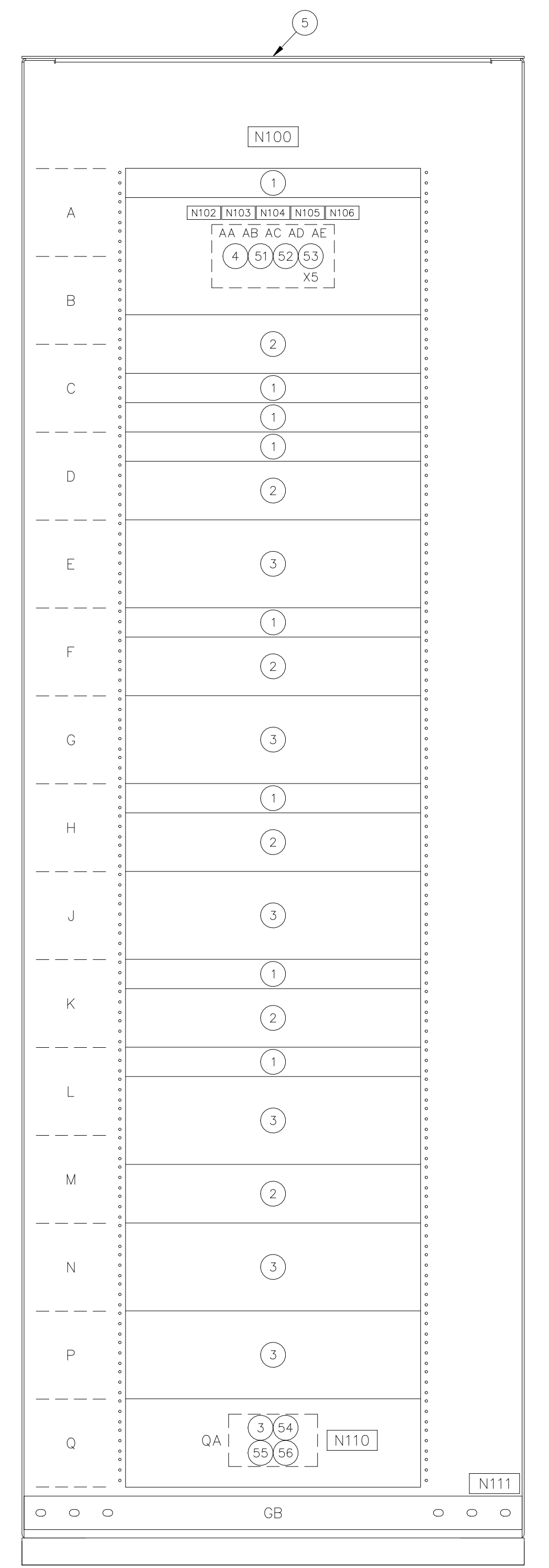
5 PANEL 1 (TOP)
N.T.S.



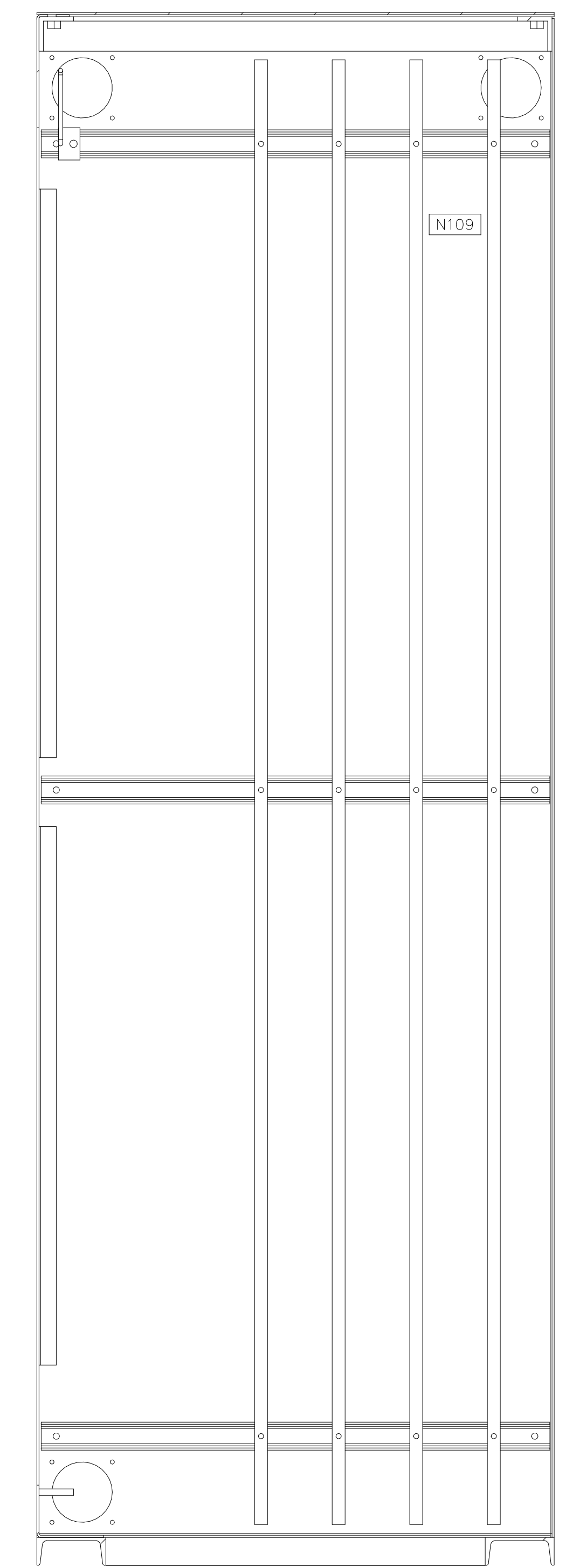
1 PANEL 1 (FRONT)
N.T.S.



2 PANEL 1 (A-SIDE)
N.T.S.



3 PANEL 1 (REAR)
N.T.S.



4 PANEL 1 (B-SIDE)
N.T.S.

NOTES:
 ① SEE REFERENCE 6 FOR NAMEPLATES (NXXX)
 ② SEE REFERENCE 7 FOR BILL OF MATERIAL.
 ③ ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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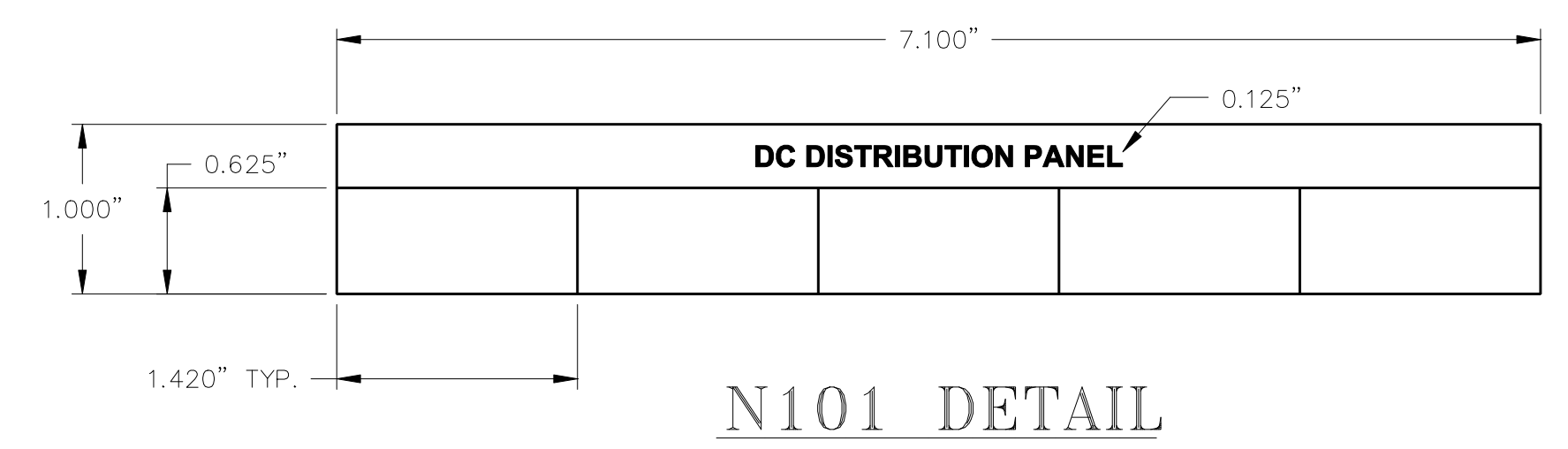
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Palmer, AK 99645
(907) 761-9300
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	PANEL 1 (FRONT)
2	-	PANEL 1 (A-SIDE)
3	-	PANEL 1 (REAR)
4	-	PANEL 1 (B-SIDE)
5	-	PANEL 1 (TOP)
6	DGSS-EL-4501/2	PANEL 1 NAMEPLATES
7	DGSS-EL-4501/3	PANEL 1 BILL OF MATERIAL

DRAWING NAME:		DOUGLAS SUBSTATION PANEL 1 ELEVATION
REF. DWG(S):		
DRAWING NO.:		DGSS-EL-4501
SHEET		1 of 3

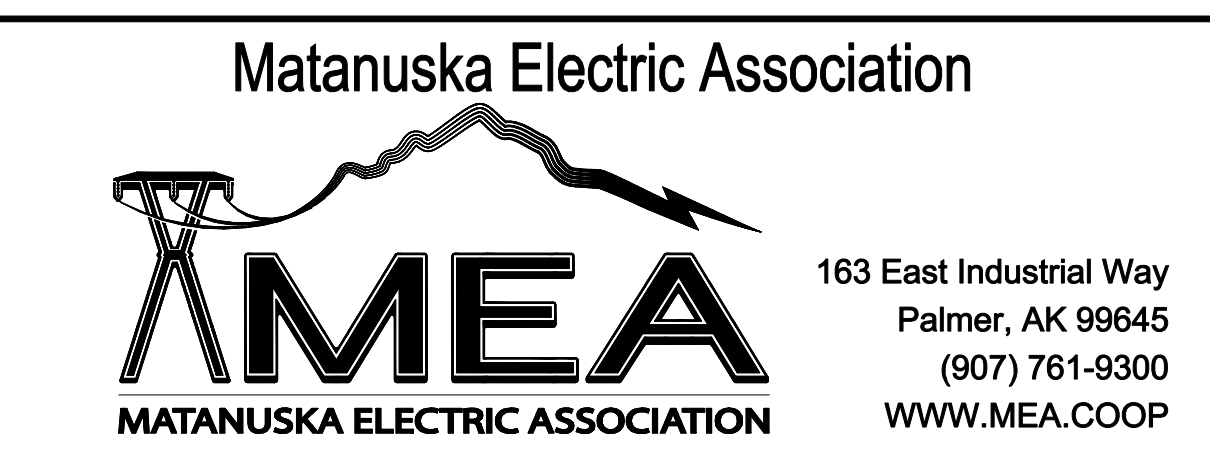
dass-el-4501_1.dwg

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N100	2	PANEL 1			1-1/2 x 5	1/4
N101	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N102	2	AA			1/2 x 3/4	1/4
N103	2	AB			1/2 x 3/4	1/4
N104	2	AC			1/2 x 3/4	1/4
N105	2	AD			1/2 x 3/4	1/4
N106	2	AE			1/2 x 3/4	1/4
N107	1	RE21	120 VAC	RECEPTACLE	1 x 3	1/8
N108	1	A			1/2 x 3/4	1/4
N109	1	B			1/2 x 3/4	1/4
N110	1	QA	RE21	RECEPTACLE	1 X 1-1/2	1/8
N111	1	GB	GROUND BUS		1 x 1-1/2	1/8
N112	1	WORK LIGHT			1 x 1-1/2	1/8



- NOTES:
- ① ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
 - ② ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
 - ③ ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
 - ④ ALL TEXT SHALL BE "ARIAL BOLD" FONT.
 - ⑤ EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
 - ⑥ ALL TEXT SHALL BE UPPER CASE.
 - ⑦ ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			ENG. STAMP
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS			JOB #: MEA W.O. EN16-3.2
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016



NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:	DOUGLAS SUBSTATION PANEL 1 NAMEPLATES
REF. DWG(S):	
DRAWING NO.:	DGSS-EL-4501

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
1	EA	8	BLANK FILLER PANEL, METALLIC GREY, 1U	BUD/PA-1101-MG (OAE)	C
2	EA	6	BLANK FILLER PANEL, METALLIC GREY, 2U	BUD/PA-1102-MG (OAE)	C
3	EA	7	BLANK FILLER PANEL, METALLIC GREY, 3U	BUD/PA-1103-MG (OAE)	C
4	EA	1	BLANK FILLER PANEL, METALLIC GREY, 4U	BUD/PA-1104-MG (OAE)	C
5	EA	1	RELAY CABINET WITH DOOR AND COPPER GROUND BUS	TBD	C
6	LOT	1 1 1	LED ENCLOSURE LIGHT LIGHT CABLE ASSEMBLY, 120 VAC	HOFFMAN: HOFFMAN/LEDA1S35 HOFFMAN/LEDA20C	C
7	LOT	1 1 1	LIGHT SWITCH, SINGLE POLE SWITCH BOX COVER	HUBBELL: KELLEMS/HBL12211 (OAE) RACO/239 (OAE) RACO/800C (OAE)	C
8			NOT USED		
9			NOT USED		
10			NOT USED		
11			NOT USED		
12			NOT USED		
13			NOT USED		
14			NOT USED		
15			NOT USED		
16			NOT USED		
17			NOT USED		
18			NOT USED		
19			NOT USED		
20			NOT USED		
21			NOT USED		
22			NOT USED		
23			NOT USED		
24			NOT USED		
25			NOT USED		
26			NOT USED		
27			NOT USED		
28			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
51	EA	5	CIRCUIT BREAKER, 15 AMP	SCHNEIDER ELECTRIC/MG17436	C
52	EA	1	MULTI-POLE BREAKER FRONT MOUNTING KIT	SCHNEIDER ELECTRIC/14210	C
53	EA	1	DIN RAIL WITH SUPPORT	SCHNEIDER ELECTRIC/14211	C
54	EA	1	RECEPTACLE, 125V, 20A, DUPLEX, GFI (RE21)	HUBBELL-KELLEMS/GFR53625GI	C
55	EA	1	COVER PLATE, 1-GANG, STAINLESS STEEL	HUBBELL-KELLEMS/SS26 (OAE)	C
56	EA	1	SINGLE GANG BOX, ALUMINUM	HUBBELL-RACO/5386-0 (OAE)	C
57			NOT USED		
58			NOT USED		
59			NOT USED		
60			NOT USED		
61			NOT USED		
62			NOT USED		
63			NOT USED		
64			NOT USED		
65			NOT USED		
66			NOT USED		
67			NOT USED		
68			NOT USED		
69			NOT USED		
70			NOT USED		
71			NOT USED		
72			NOT USED		
73			NOT USED		
74			NOT USED		
75			NOT USED		
76			NOT USED		
77			NOT USED		
78			NOT USED		
79			NOT USED		
80			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
101			NOT USED		
102			NOT USED		
103			NOT USED		
104			NOT USED		
105			NOT USED		
106			NOT USED		
107			NOT USED		
108			NOT USED		
109			NOT USED		
110			NOT USED		
111			NOT USED		
112			NOT USED		
113			NOT USED		
114			NOT USED		
115			NOT USED		
116			NOT USED		
117			NOT USED		
118			NOT USED		
119			NOT USED		
120			NOT USED		
121			NOT USED		
122			NOT USED		
123			NOT USED		
124			NOT USED		
125			NOT USED		
126			NOT USED		
127			NOT USED		
128			NOT USED		
129			NOT USED		
130			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

NOTES:

- 1 BILL OF MATERIAL QUANTITIES ARE ESTIMATED. ACTUAL QUANTITIES SHALL BE VERIFIED BY THE CONTRACTOR.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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Matanuska Electric Association



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Palmer, AK 99645
(907) 761-9300
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

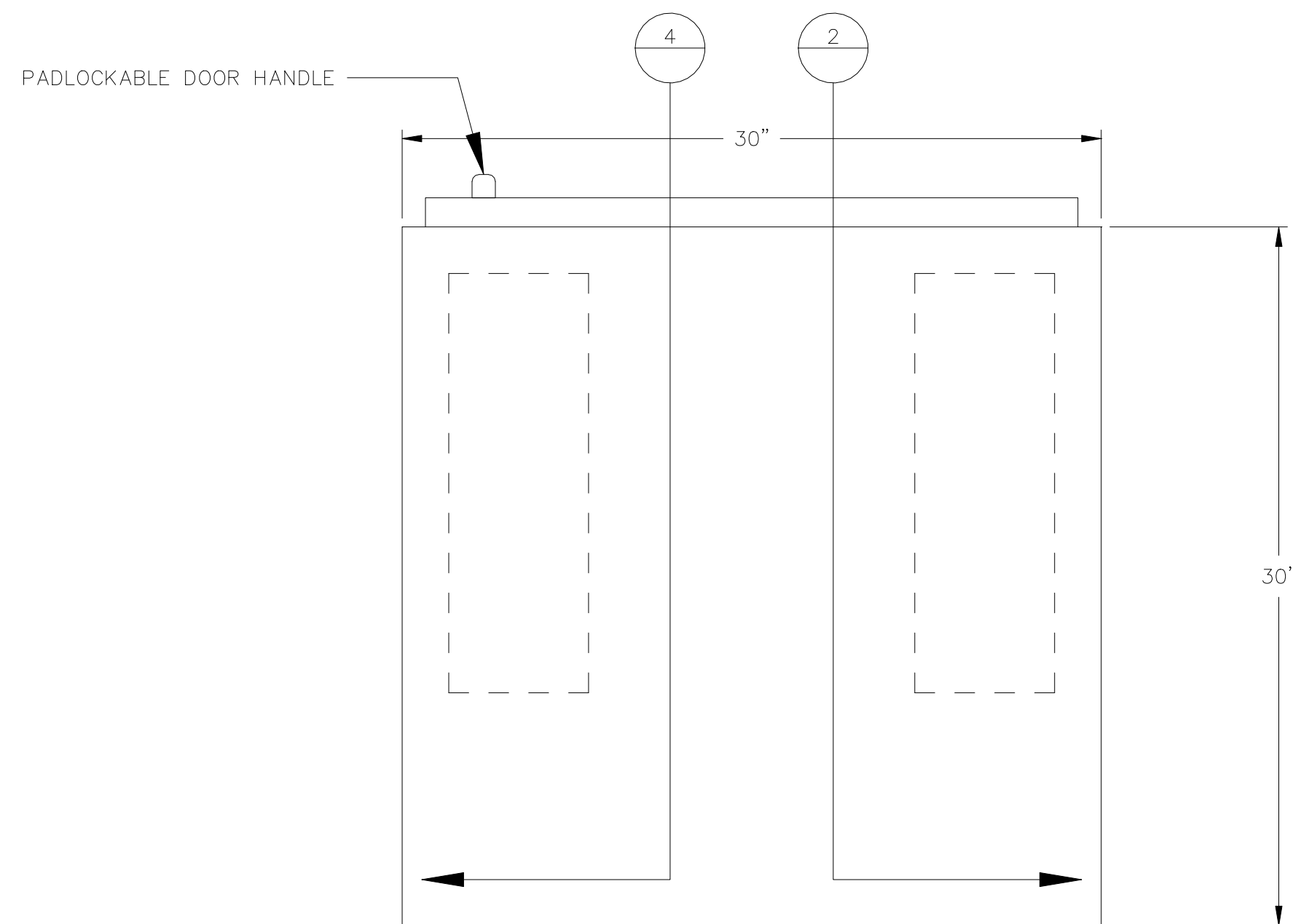
DRAWING NAME: DOUGLAS SUBSTATION PANEL 1 BILL OF MATERIAL

REF. DWG(S):

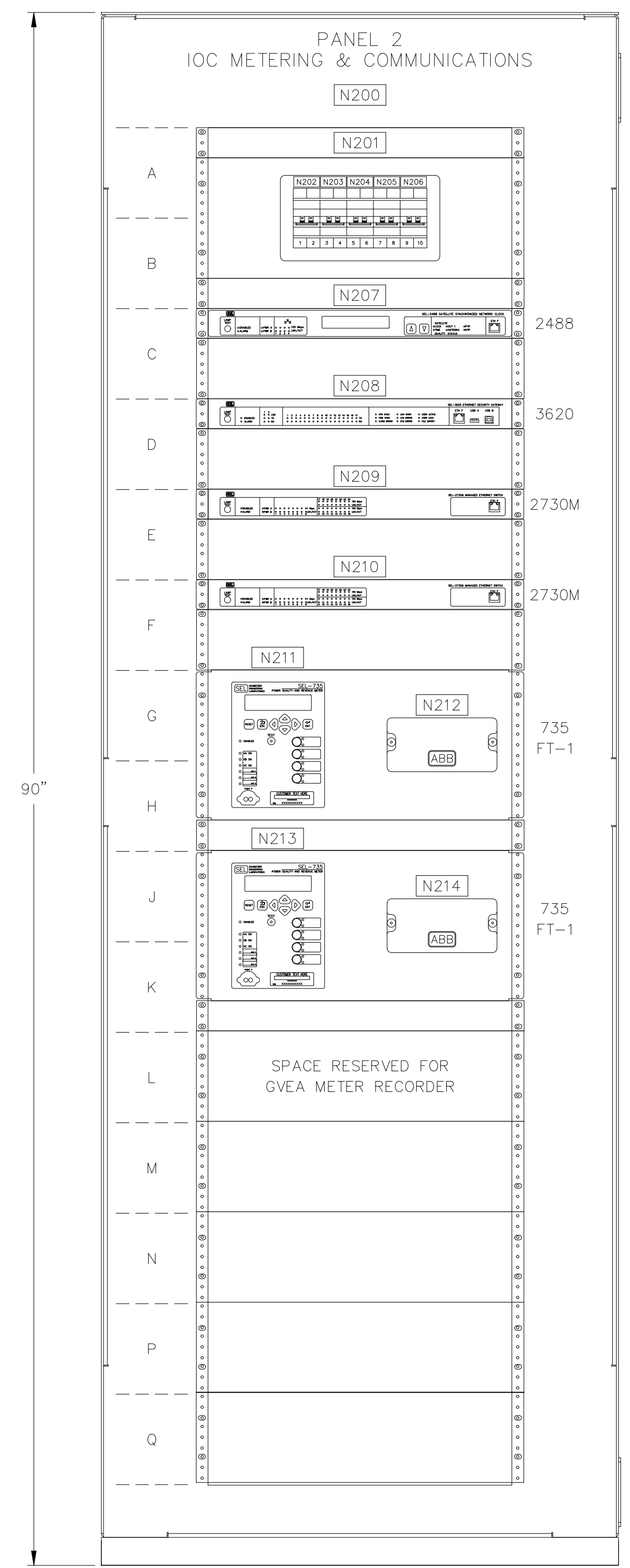
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dass-el-4501_3.dwg

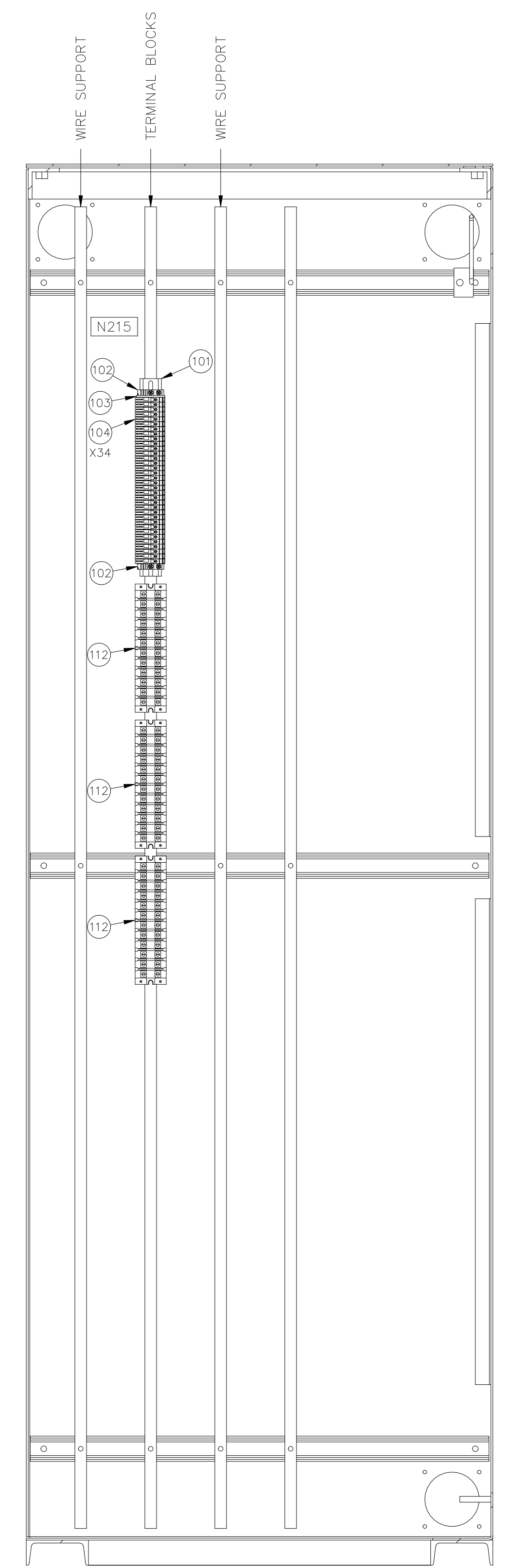
SHEET 3 of 3



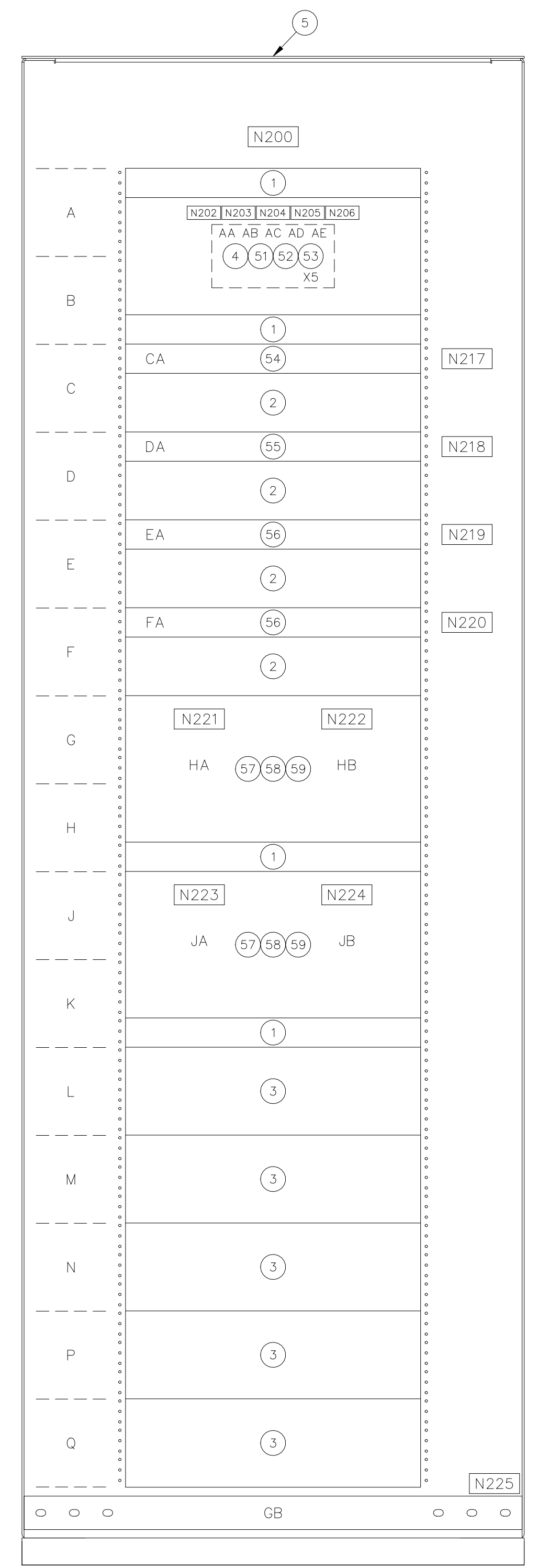
5 PANEL 2 (TOP)
N.T.S.



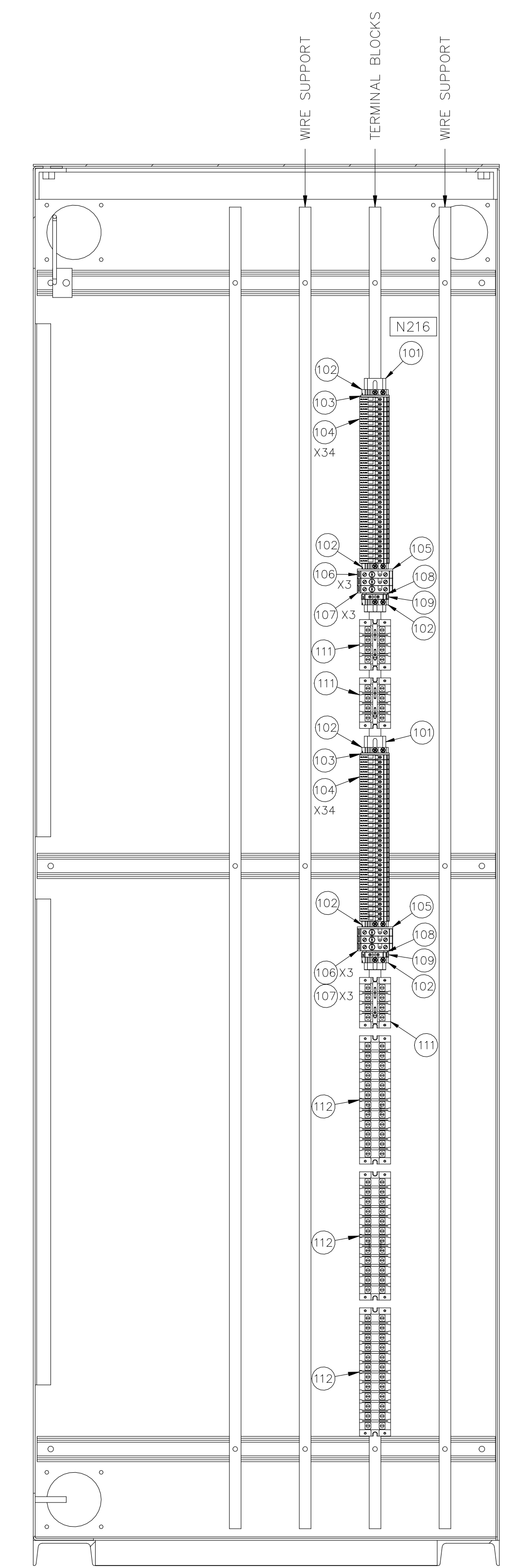
1 PANEL 2 (FRONT)
N.T.S.



2 PANEL 2 (A-SIDE)
N.T.S.



3 PANEL 2 (REAR)
N.T.S.



4 PANEL 2 (B-SIDE)
N.T.S.

NOTES:

1 SEE REFERENCE 6 FOR NAMEPLATES (NXXX)

2 SEE REFERENCE 7 FOR BILL OF MATERIAL.

3 ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	PANEL 2 (FRONT)
2	-	PANEL 2 (A-SIDE)
3	-	PANEL 2 (REAR)
4	-	PANEL 2 (B-SIDE)
5	-	PANEL 2 (TOP)
6	DGSS-EL-4502/2	PANEL 2 NAMEPLATES
7	DGSS-EL-4502/3	PANEL 2 BILL OF MATERIAL

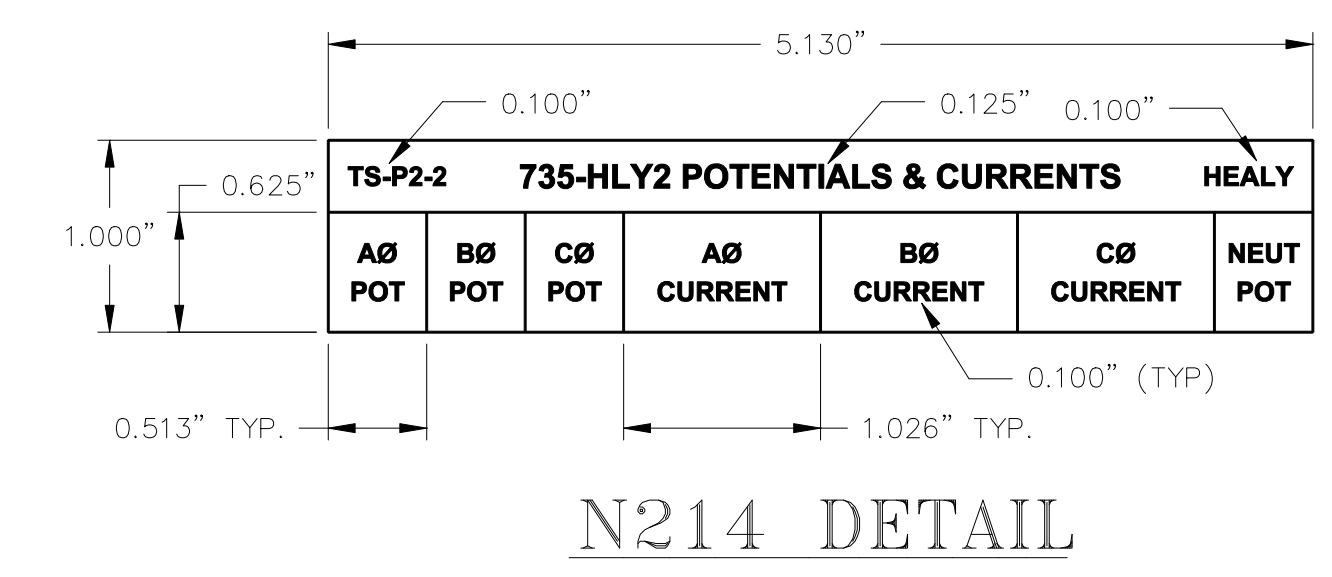
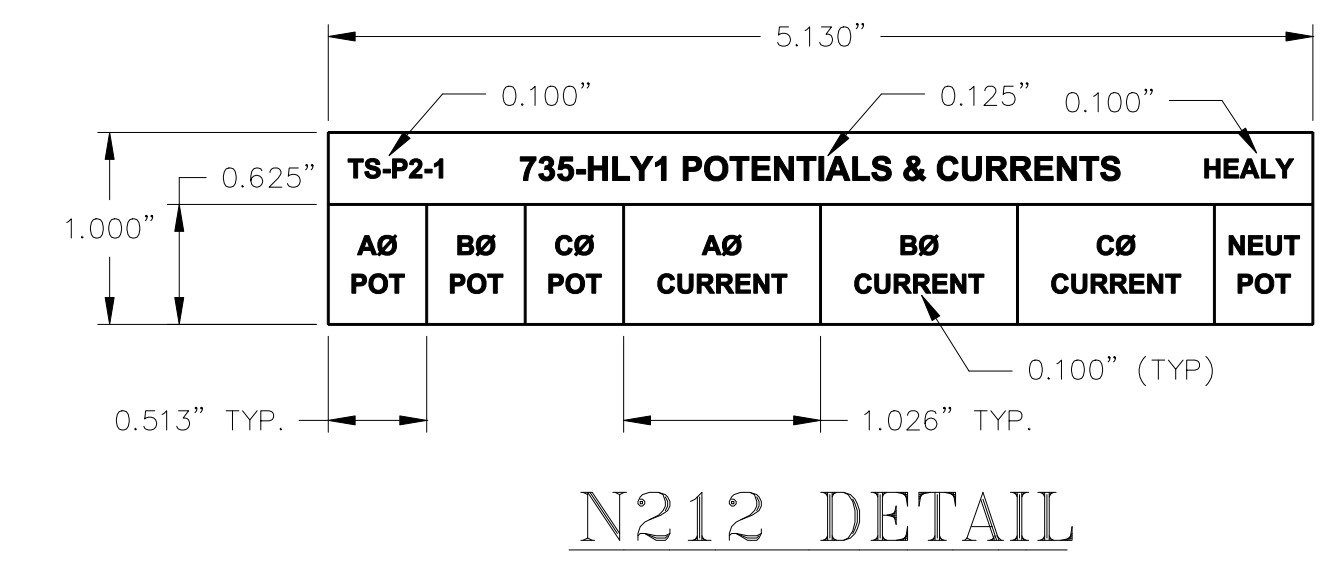
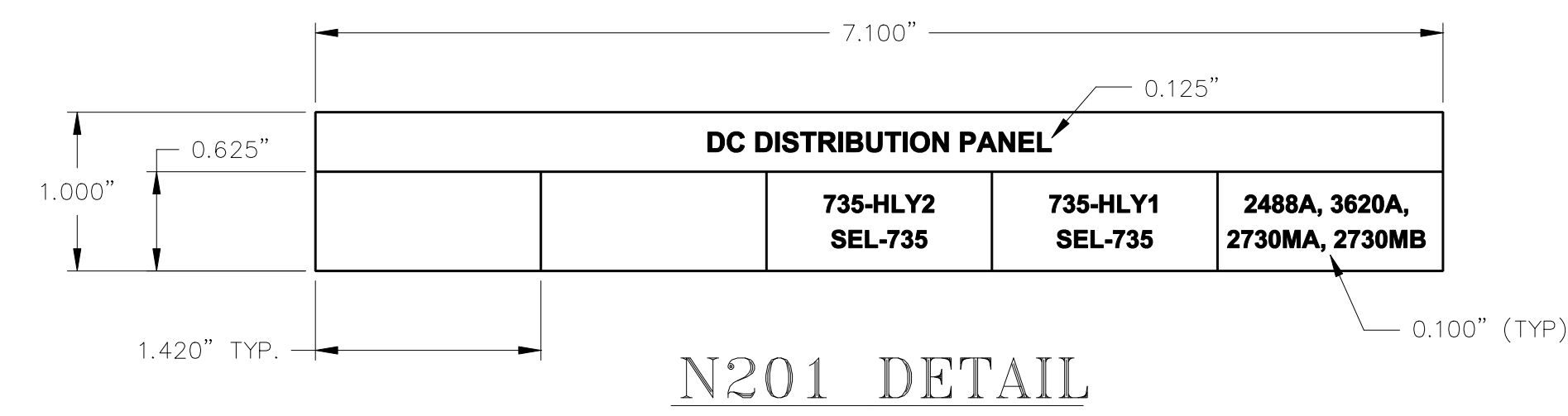
DRAWING NAME: DOUGLAS SUBSTATION
PANEL 2
ELEVATION

REF. DWG(S):

DRAWING NO.: DGSS-EL-4502

1 of 3

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N200	2	PANEL 2	IOC METERING/COMM		1-1/2 x 5	1/4
N201	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N202	2	AA			1/2 x 3/4	1/4
N203	2	AB			1/2 x 3/4	1/4
N204	2	AC			1/2 x 3/4	1/4
N205	2	AD			1/2 x 3/4	1/4
N206	2	AE			1/2 x 3/4	1/4
N207	1	2488A	SATELLITE CLOCK	SEL-2488	1 x 3	1/8
N208	1	3620A	ETHERNET GATEWAY	SEL-3620	1 x 3	1/8
N209	1	2730MA	ETHERNET SWITCH	SEL-2730M	1 x 3	1/8
N210	1	2730MB	ETHERNET SWITCH	SEL-2730M	1 x 3	1/8
N211	1	735-HLY1	INTERTIE METER	SEL-735	1 x 3	1/8
N212	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N213	1	735-HLY2	INTERTIE METER (BACKUP)	SEL-735	1 x 3	1/8
N214	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N215	1	A			1/2 x 3/4	1/4
N216	1	B			1/2 x 3/4	1/4
N217	1	CA	2488A	SEL-2488	1 x 1-1/2	1/8
N218	1	DA	3620A	SEL-3620	1 x 1-1/2	1/8
N219	1	EA	2730MA	SEL-2730M	1 x 1-1/2	1/8
N220	1	FA	2730MB	SEL-2730M	1 x 1-1/2	1/8
N221	1	HA	TS-P2-1	735 TEST SW	1 x 1-1/2	1/8
N222	1	HB	735-HLY1	SEL-735	1 x 1-1/2	1/8
N223	1	JA	TS-P2-2	735 TEST SW	1 x 1-1/2	1/8
N224	1	JB	735-HLY2	SEL-735	1 x 1-1/2	1/8
N225	1	GB	GROUND BUS		1 x 1-1/2	1/8
N226	1	WORK LIGHT			1 x 1-1/2	1/8



- NOTES:
- 1) ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
 - 2) ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
 - 3) ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
 - 4) ALL TEXT SHALL BE "ARIAL BOLD" FONT.
 - 5) EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
 - 6) ALL TEXT SHALL BE UPPER CASE.
 - 7) ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION PANEL 2 NAMEPLATES

REF. DWG(S):

DRAWING NO.: DGSS-EL-4502

SHEET 2 OF 3

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
1	EA	4	BLANK FILLER PANEL, METALLIC GREY, 1U	BUD/PA-1101-MG (OAE)	C
2	EA	4	BLANK FILLER PANEL, METALLIC GREY, 2U	BUD/PA-1102-MG (OAE)	C
3	EA	5	BLANK FILLER PANEL, METALLIC GREY, 3U	BUD/PA-1103-MG (OAE)	C
4	EA	1	BLANK FILLER PANEL, METALLIC GREY, 4U	BUD/PA-1104-MG (OAE)	C
5	EA	1	RELAY CABINET WITH DOOR AND COPPER GROUND BUS	TBD	C
6	LOT	1 1 1	LED ENCLOSURE LIGHT LIGHT CABLE ASSEMBLY, 120 VAC	HOFFMAN: HOFFMAN/LEDA1S35 HOFFMAN/LEDA20C	C
7	LOT	1 1 1	LIGHT SWITCH, SINGLE POLE SWITCH BOX COVER	HUBBELL: KELLEMS/HBL12211 (OAE) RACO/239 (OAE) RACO/800C (OAE)	C
8			NOT USED		
9			NOT USED		
10			NOT USED		
11			NOT USED		
12			NOT USED		
13			NOT USED		
14			NOT USED		
15			NOT USED		
16			NOT USED		
17			NOT USED		
18			NOT USED		
19			NOT USED		
20			NOT USED		
21			NOT USED		
22			NOT USED		
23			NOT USED		
24			NOT USED		
25			NOT USED		
26			NOT USED		
27			NOT USED		
28			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
51	EA	5	CIRCUIT BREAKER, 15 AMP	SCHNEIDER ELECTRIC/MG17436	C
52	EA	1	MULTI-POLE BREAKER FRONT MOUNTING KIT	SCHNEIDER ELECTRIC/14210	C
53	EA	1	DIN RAIL WITH SUPPORT	SCHNEIDER ELECTRIC/14211	C
54	EA	1	SATELLITE CLOCK (2488A)	SCHWEITZER/2488PRAA1181AX2XX	C
55	EA	1	ETHERNET SECURITY GATEWAY (3620A)	SCHWEITZER/3620XHBOXXX0	C
56	EA	2	ETHERNET SWITCH (2730MA, 2730MB)	SCHWEITZER/2730M0AAA1111AAAAX0	C
57	EA	2	REVENUE METER (735-HLY1, 735-HLY2)	SCHWEITZER/0735VX20944CXXA4XX16101XX	C
58	EA	2	RACK BEZEL, VERTICAL 735 & FT-1 TEST SWITCH	SCHWEITZER/915900216	C
59	EA	2	TEST SWITCH, FT-1 STYLE. (6-C, 4-P) (TS-P2-1, TS-P2-2)	ABB/C7148325G32	C
60	EA	6	SWITCH HANDLE INTERLOCKING BAR, 2-POSITION	ABB/1270547	C
61			NOT USED		
62			NOT USED		
63			NOT USED		
64			NOT USED		
65			NOT USED		
66			NOT USED		
67			NOT USED		
68			NOT USED		
69			NOT USED		
70			NOT USED		
71			NOT USED		
72			NOT USED		
73			NOT USED		
74			NOT USED		
75			NOT USED		
76			NOT USED		
77			NOT USED		
78			NOT USED		
79			NOT USED		
80			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
101	EA	1	MOUNTING RAIL, PR30	ABB/1SNA 173 220 R0500	C
102	EA	8	END STOP, BAM2	ABB/1SNA 206 351 R1600	C
103	EA	3	END SECTION, FEM8	ABB/1SNA 113 373 R2600	C
104	EA	102	TERMINAL, SWITCH BLOCK, TYPE M6/8.SNB	ABB/1SNA 115 688 R2500	C
105	EA	2	END SECTION, FEM12S	ABB/1SNA 117 628 R2200	C
106	EA	6	TERMINAL, FUSE BLOCK, TYPE MB10/12.SF	ABB/1SNA 111 033 R0300	C
107	EA	6	FUSE, FU520, 3.15A	ABB/1SNA 008 289 R1600	C
108	EA	2	END SECTION, FEM6	ABB/1SNA 118 368 R1600	C
109	EA	2	TERMINAL BLOCK, FEED THRU, TYPE M6/8	ABB/1SNA 115 118 R1100	C
110	EA	2	TERMINAL MARKERS, VERTICAL, RCB10, 1-100	ABB/1SNA 234 060 R0500	C
111	EA	3	TERMINAL BLOCK, 4 POLE, 30 AMP, SHORTING	MARATHON/1504 SC 01C WITH CC 1504	C
112	EA	6	TERMINAL BLOCK, 12 POLE, 30 AMP, STANDARD	MARATHON/1512 STD 01C	C
113			NOT USED		
114			NOT USED		
115			NOT USED		
116			NOT USED		
117			NOT USED		
118			NOT USED		
119			NOT USED		
120			NOT USED		
121			NOT USED		
122			NOT USED		
123			NOT USED		
124			NOT USED		
125			NOT USED		
126			NOT USED		
127			NOT USED		
128			NOT USED		
129			NOT USED		
130			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.


NOTES:

- 1 BILL OF MATERIAL QUANTITIES ARE ESTIMATED. ACTUAL QUANTITIES SHALL BE VERIFIED BY THE CONTRACTOR.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

ENG. STAMP

Matanuska Electric Association



163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
WWW.MEA.COOP

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

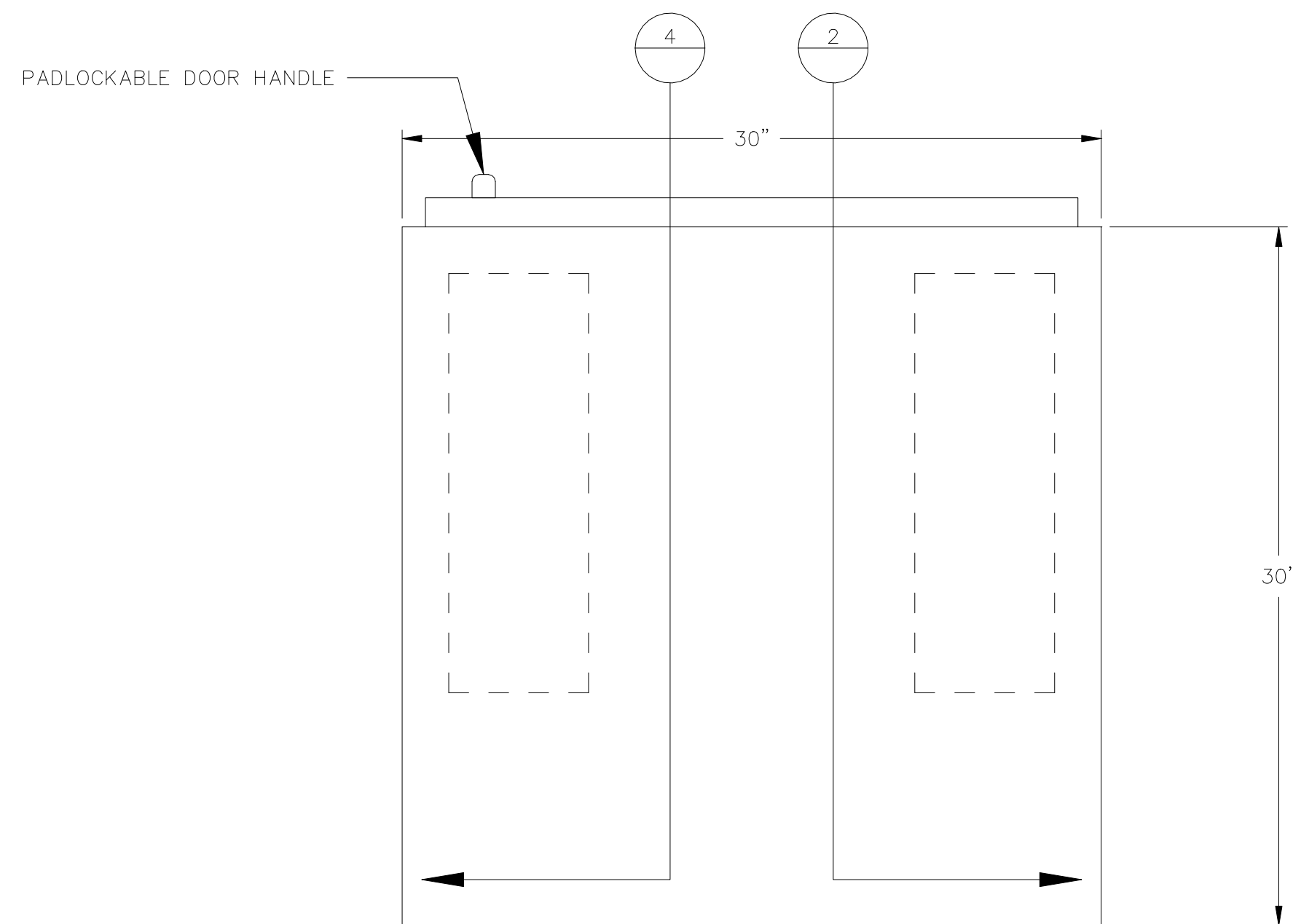
DRAWING NAME: DOUGLAS SUBSTATION
PANEL 2
BILL OF MATERIAL

REF. DWG(S):

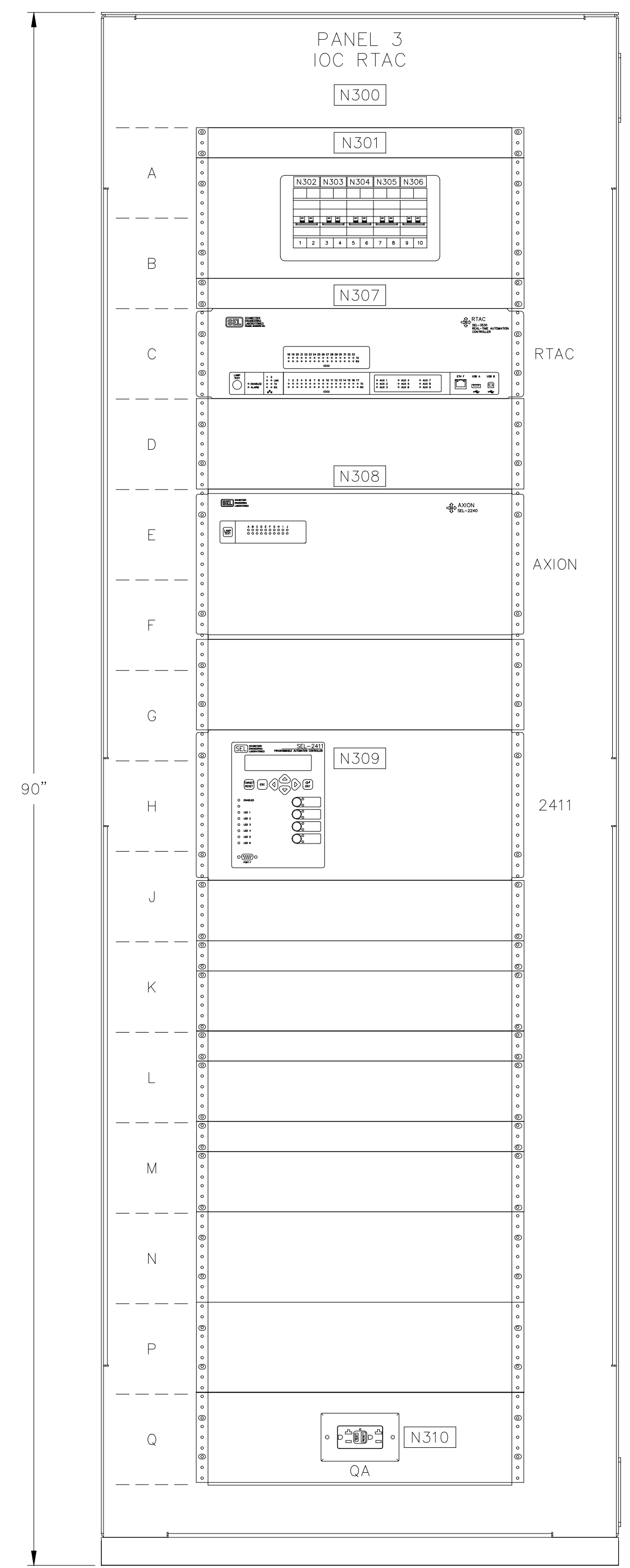
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dass-el-4502_3.dwg

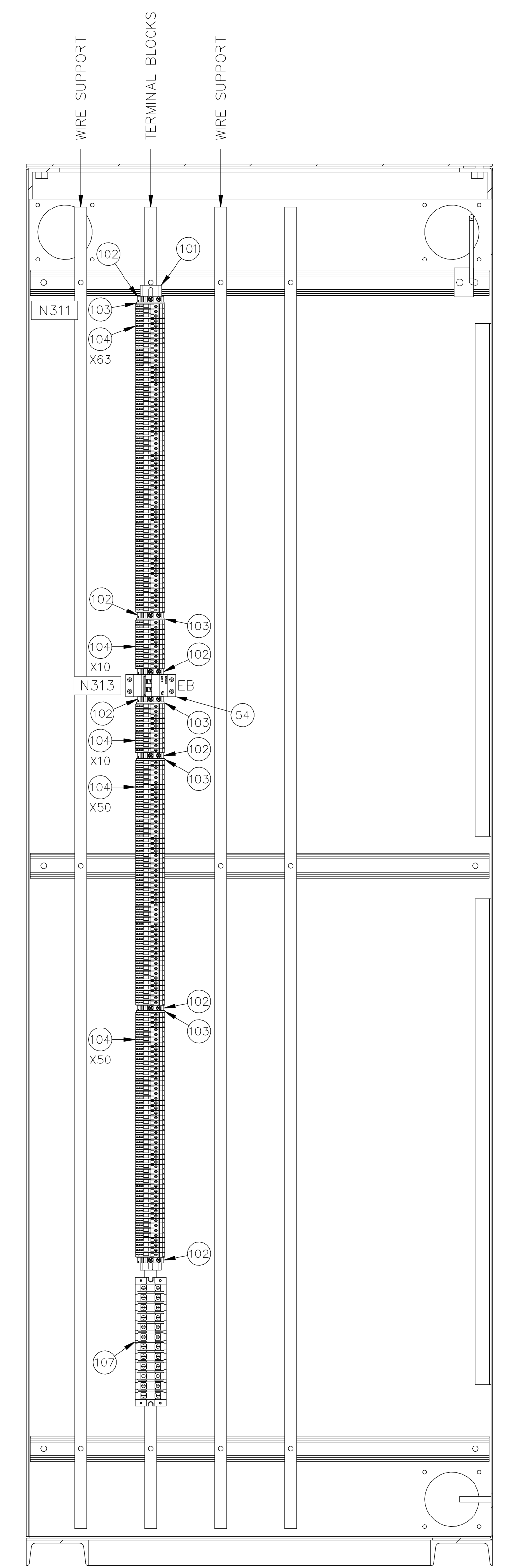
SHEET 3 OF 3



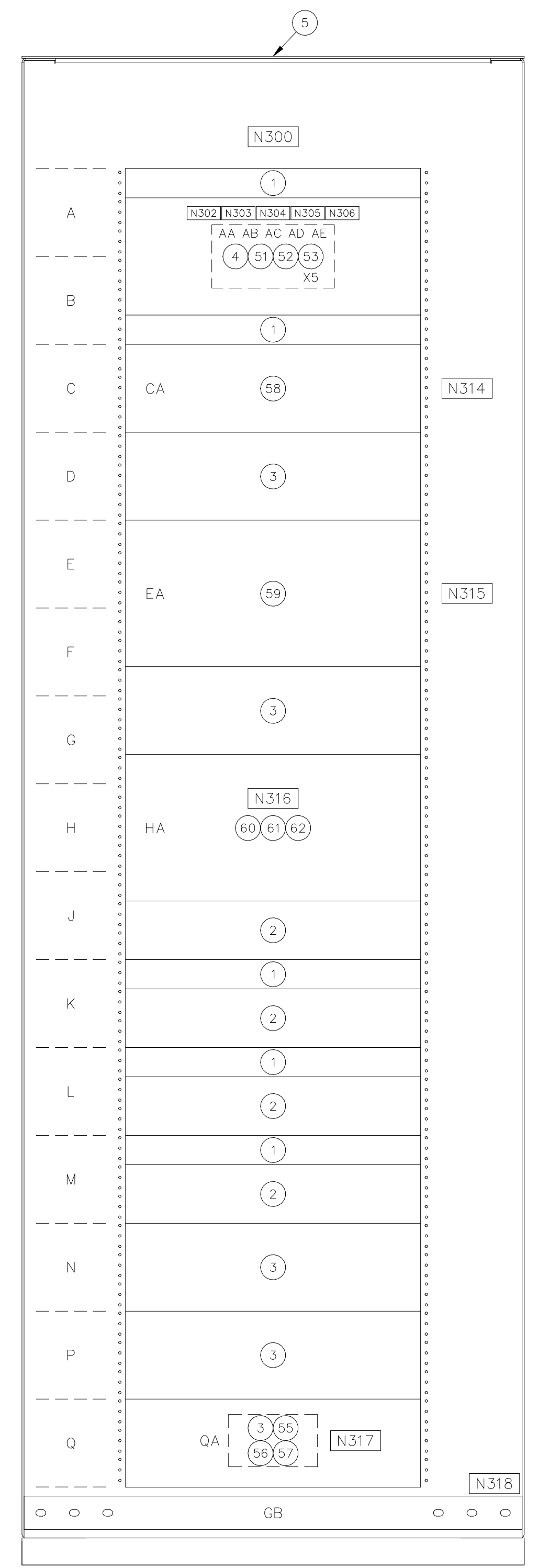
5 PANEL 3 (TOP)
N.T.S.



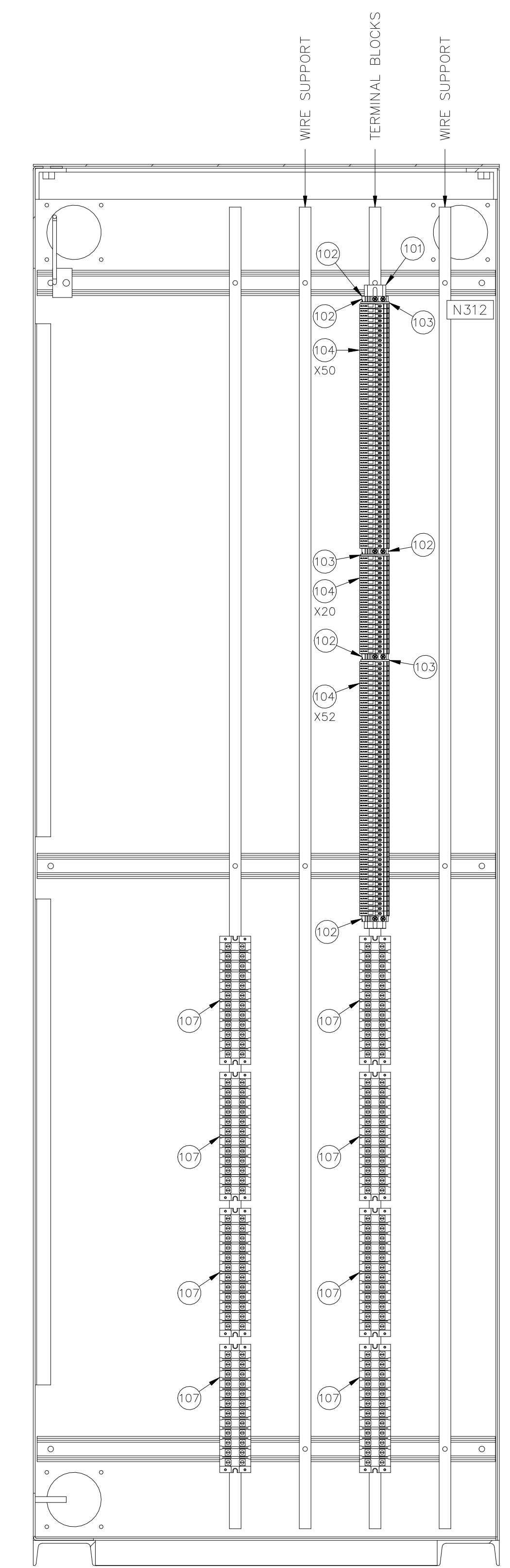
1 PANEL 3 (FRONT)
N.T.S.



2 PANEL 3 (A-SIDE)
N.T.S.



3 PANEL 3 (REAR)
N.T.S.



4 PANEL 3 (B-SIDE)
N.T.S.

NOTES:
 1 SEE REFERENCE 6 FOR NAMEPLATES (NXXX)
 2 SEE REFERENCE 7 FOR BILL OF MATERIAL.
 3 ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

ENG. STAMP

Matanuska Electric Association

163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	PANEL 3 (FRONT)
2	-	PANEL 3 (A-SIDE)
3	-	PANEL 3 (REAR)
4	-	PANEL 3 (B-SIDE)
5	-	PANEL 3 (TOP)
6	DGSS-EL-4503/2	PANEL 3 NAMEPLATES
7	DGSS-EL-4503/3	PANEL 3 BILL OF MATERIAL

DRAWING NAME: DOUGLAS SUBSTATION
PANEL 3
ELEVATION

REF. DWG(S):

DRAWING NO.: DGSS-EL-4503

163-4503-1.dwg

SHEET 1 OF 3

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
1	EA	5	BLANK FILLER PANEL, METALLIC GREY, 1U	BUD/PA-1101-MG (OAE)	C
2	EA	4	BLANK FILLER PANEL, METALLIC GREY, 2U	BUD/PA-1102-MG (OAE)	C
3	EA	5	BLANK FILLER PANEL, METALLIC GREY, 3U	BUD/PA-1103-MG (OAE)	C
4	EA	1	BLANK FILLER PANEL, METALLIC GREY, 4U	BUD/PA-1104-MG (OAE)	C
5	EA	1	RELAY CABINET WITH DOOR AND COPPER GROUND BUS	TBD	C
6	LOT	1 1 1	LED ENCLOSURE LIGHT LIGHT CABLE ASSEMBLY, 120 VAC	HOFFMAN: HOFFMAN/LEDA1S35 HOFFMAN/LEDA20C	C
7	LOT	1 1 1	LIGHT SWITCH, SINGLE POLE SWITCH BOX COVER	HUBBELL: KELLEMS/HBL12211 (OAE) RACO/239 (OAE) RACO/800C (OAE)	C
8			NOT USED		
9			NOT USED		
10			NOT USED		
11			NOT USED		
12			NOT USED		
13			NOT USED		
14			NOT USED		
15			NOT USED		
16			NOT USED		
17			NOT USED		
18			NOT USED		
19			NOT USED		
20			NOT USED		
21			NOT USED		
22			NOT USED		
23			NOT USED		
24			NOT USED		
25			NOT USED		
26			NOT USED		
27			NOT USED		
28			NOT USED		

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BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
51	EA	5	CIRCUIT BREAKER, 15 AMP	SCHNEIDER ELECTRIC/MG17436	C
52	EA	1	MULTI-POLE BREAKER FRONT MOUNTING KIT	SCHNEIDER ELECTRIC/14210	C
53	EA	1	DIN RAIL WITH SUPPORT	SCHNEIDER ELECTRIC/14211	C
54	EA	1	CIRCUIT BREAKER, 5 AMP	SCHNEIDER ELECTRIC/MG17434	C
55	EA	1	RECEPTACLE, 125V, 20A, DUPLEX, GF1 (RE22)	HUBBELL-KELLEMS/GFR5362SGI	C
56	EA	1	COVER PLATE, 1-GANG, STAINLESS STEEL	HUBBELL-KELLEMS/SS26 (OAE)	C
57	EA	1	SINGLE GANG BOX, ALUMINUM	HUBBELL-RACO/5386-0 (OAE)	C
58	EA	1	REAL TIME AUTOMATION CONTROLLER (3530A)	SCHWEITZER/3530HB0DX211A0XXXXXX	C
59	LOT	1 1 1 1 1 1	AXION PLATFORM, SEL-2240 (2240A) AXION CHASSIS, SEL-2242 POWER COUPLER, SEL-2243 (SLOTS: A, B) I/O MODULE, 10 FHCDO OUTPUTS, SEL-2244 (SLOT: C) I/O MODULE, 24 DI INPUTS, SEL-2244 (SLOTS: D, E, F) WETTING VOLTAGE JUMPER KIT, 24 JUMPERS, 4-PRONG	SCHWEITZER: SCHWEITZER/2242R1X0 SCHWEITZER/224311X0 SCHWEITZER/22443131X0 SCHWEITZER/22442424X0 SCHWEITZER/915900240	C
60	EA	1	PROGRAMMABLE AUTOMATION CONTROLLER (2411A)	SCHWEITZER/241121ABA2X3A0X0130	C
61	EA	1	RACK BEZEL, VERTICAL 2411	SCHWEITZER/915900050	C
62	EA	1	WIRE LEAD TERMINATOR, 50 OHM	SCHWEITZER/915900036	C
63			NOT USED		
64			NOT USED		
65			NOT USED		
66			NOT USED		
67			NOT USED		
68			NOT USED		
69			NOT USED		
70			NOT USED		
71			NOT USED		
72			NOT USED		
73			NOT USED		
74			NOT USED		
75			NOT USED		
76			NOT USED		
77			NOT USED		
78			NOT USED		


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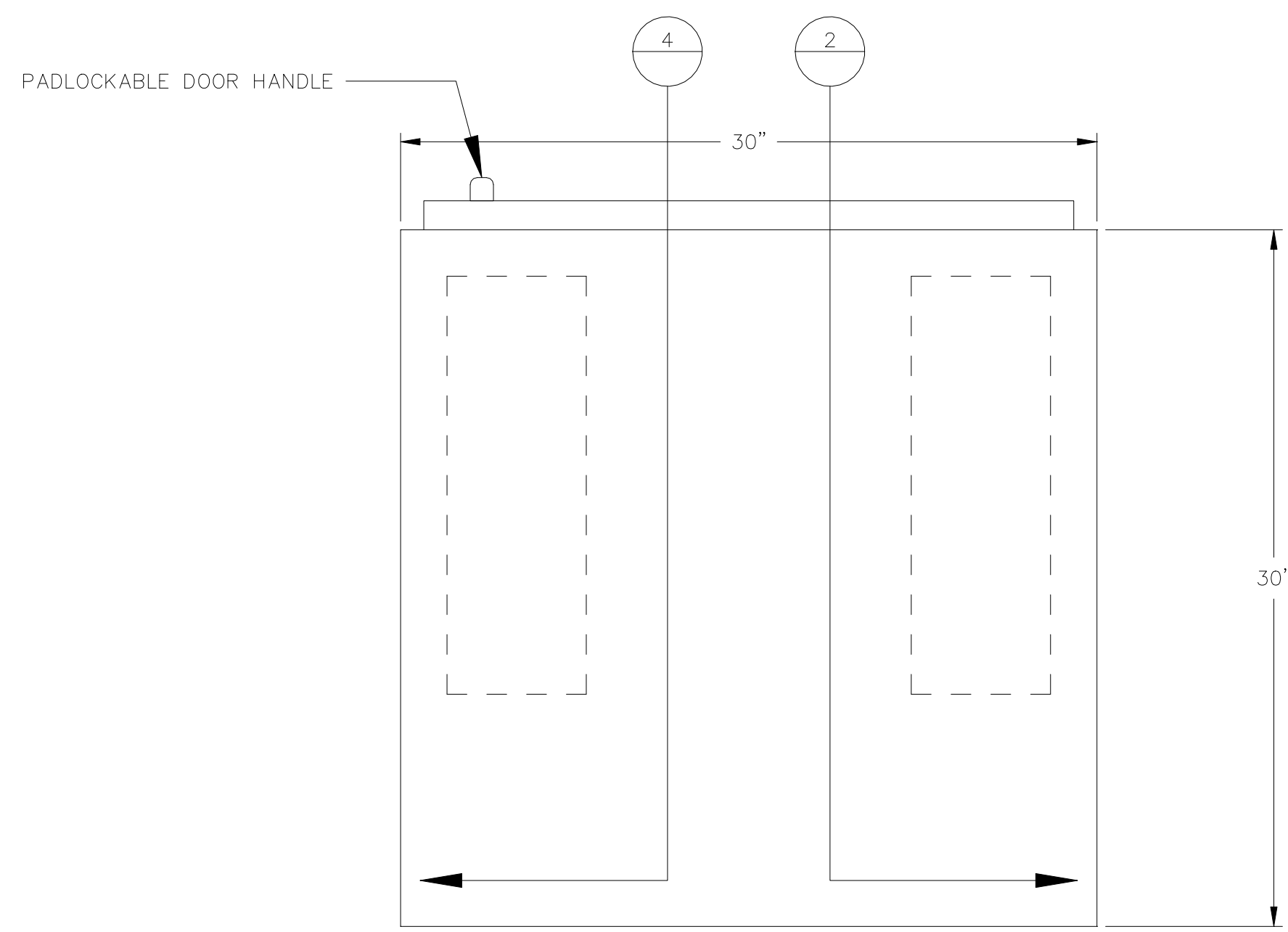
BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
101	EA	2	MOUNTING RAIL, PR30	ABB/1SNA 173 220 R0500	C
102	EA	11	END STOP, BAM2	ABB/1SNA 206 351 R1600	C
103	EA	8	END SECTION, FEM8	ABB/1SNA 113 373 R2600	C
104	EA	305	TERMINAL, SWITCH BLOCK, TYPE M6/8.SNB	ABB/1SNA 115 688 R2500	C
105	EA	2	TERMINAL MARKERS, VERTICAL, RC810, 1-100	ABB/1SNA 234 060 R0500	C
106	EA	2	TERMINAL MARKERS, VERTICAL, RC810, 101-200	ABB/1SNA 234 061 R2200	C
107	EA	9	TERMINAL BLOCK, 12 POLE, 30 AMP, STANDARD	MARATHON/1512 STD 01C	C
108			NOT USED		
109			NOT USED		
110			NOT USED		
111			NOT USED		
112			NOT USED		
113			NOT USED		
114			NOT USED		
115			NOT USED		
116			NOT USED		
117			NOT USED		
118			NOT USED		
119			NOT USED		
120			NOT USED		
121			NOT USED		
122			NOT USED		
123			NOT USED		
124			NOT USED		
125			NOT USED		
126			NOT USED		
127			NOT USED		
128			NOT USED		
129			NOT USED		
130			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

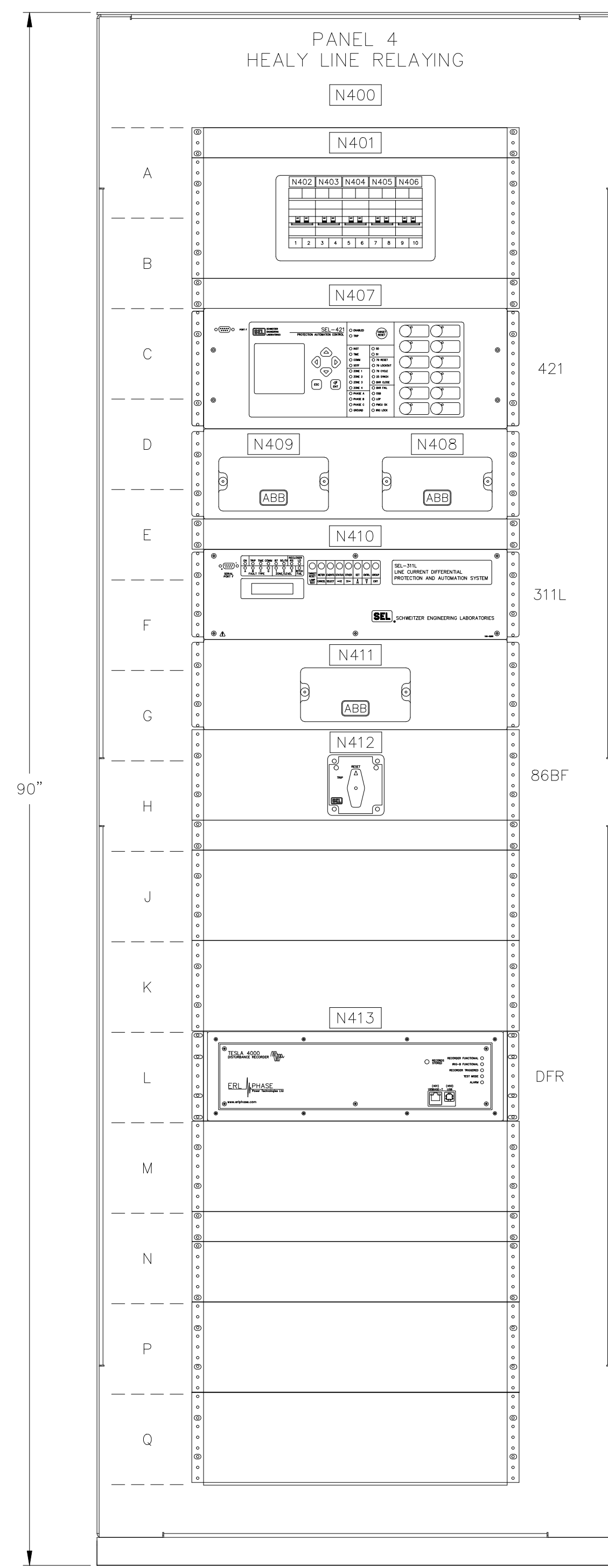
NOTES:

- 1 BILL OF MATERIAL QUANTITIES ARE ESTIMATED. ACTUAL QUANTITIES SHALL BE VERIFIED BY THE CONTRACTOR.

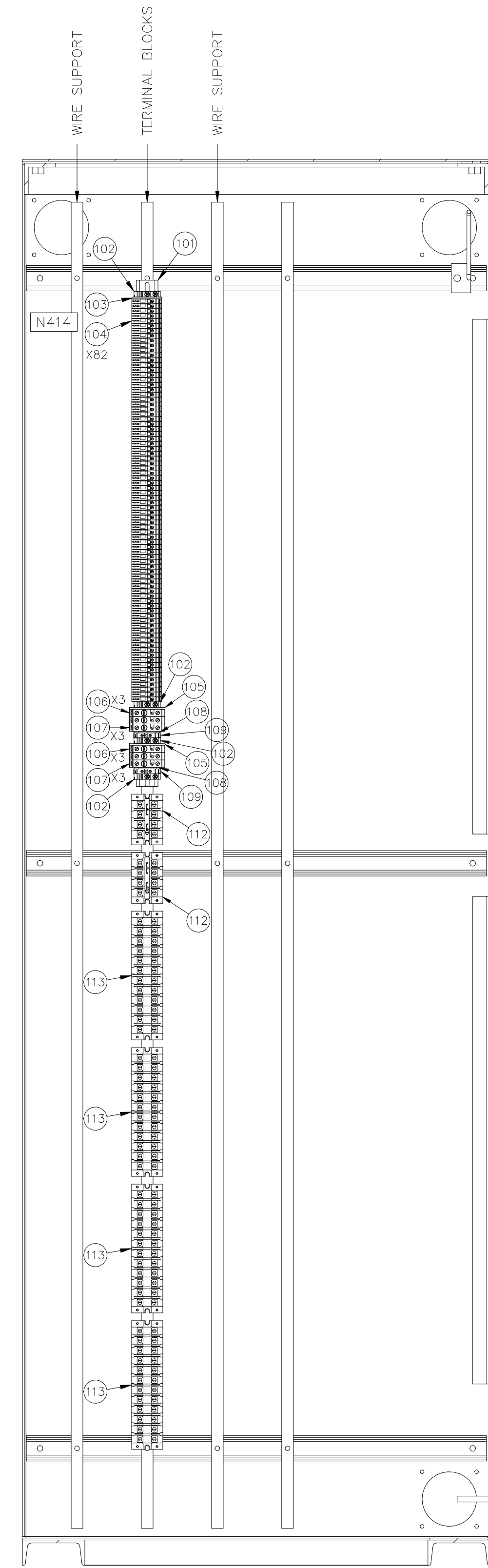
PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			JOB #: MEA W.O. EN16-3.2		ENG. STAMP	 <p>Matanuska Electric Association 163 East Industrial Way Palmer, AK 99645 (907) 761-9300 WWW.MEA.COOP</p>	<table border="1"> <tr><th>NO.</th><th>DRAWING NO./SHEET</th><th>REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION</th></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION										DRAWING NAME: DOUGLAS SUBSTATION PANEL 3 BILL OF MATERIAL	REF. DWG(S):	DRAWING NO.: DGSS-EL-4503	dass-el-4503_3.dwg	SHEET 3 OF 3
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION																						
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		NO. DESIGN/CONSTRUCTION/ASBUILT REVISION		DWN BY/DATE		REVIEWED BY/DATE																		
A ISSUED FOR BID REVIEW		MSC/09-19-2016		TCC/09-19-2016																				



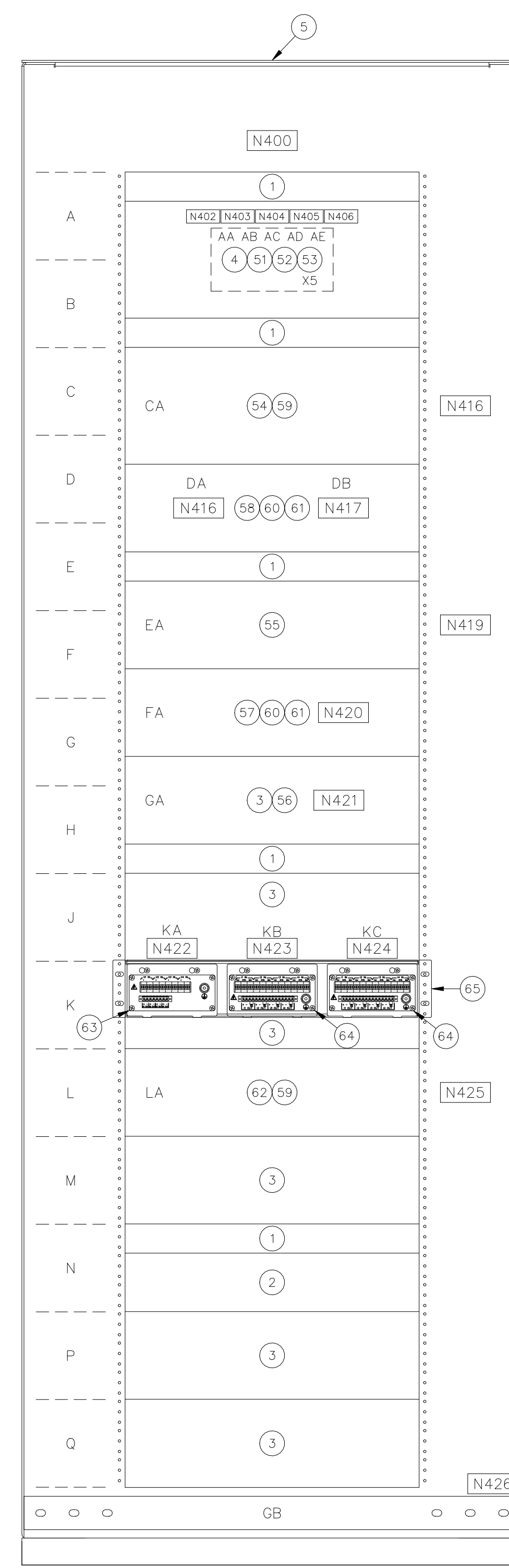
5 PANEL 4 (TOP)
N.T.S.



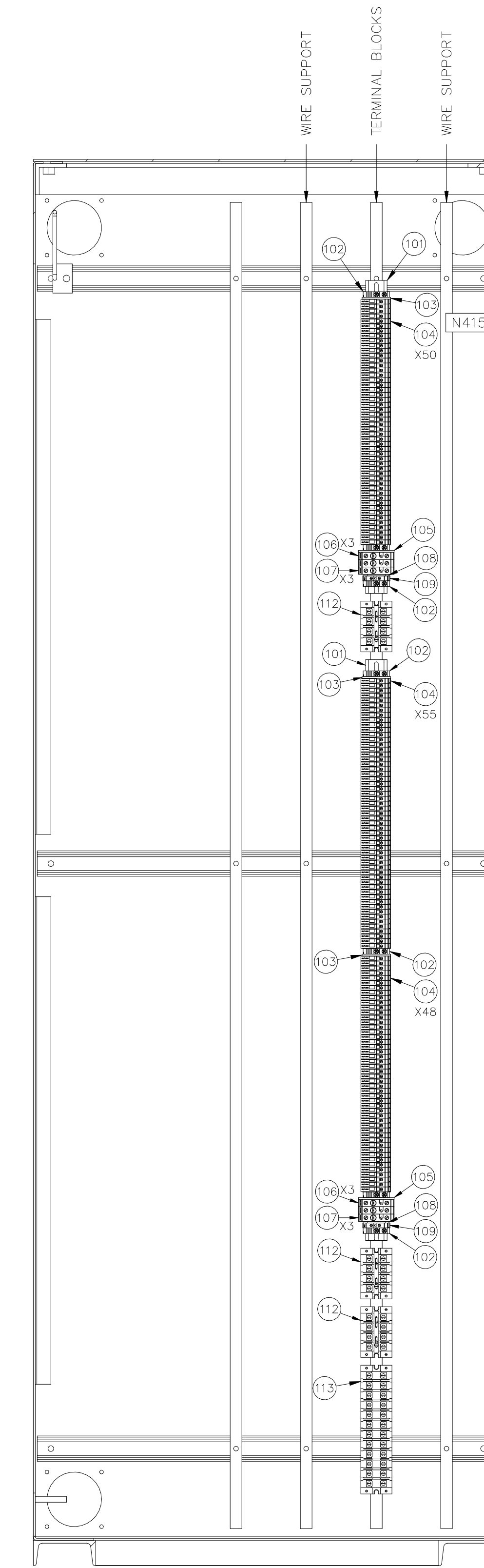
1 PANEL 4 (FRONT)
N.T.S.



2 PANEL 4 (A-SIDE)
N.T.S.



3 PANEL 4 (REAR)
N.T.S.



4 PANEL 4 (B-SIDE)
N.T.S.

- NOTES:
- 1 SEE REFERENCE 6 FOR NAMEPLATES (NXXX)
 - 2 SEE REFERENCE 7 FOR BILL OF MATERIAL.
 - 3 ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

ENG. STAMP

Matanuska Electric Association

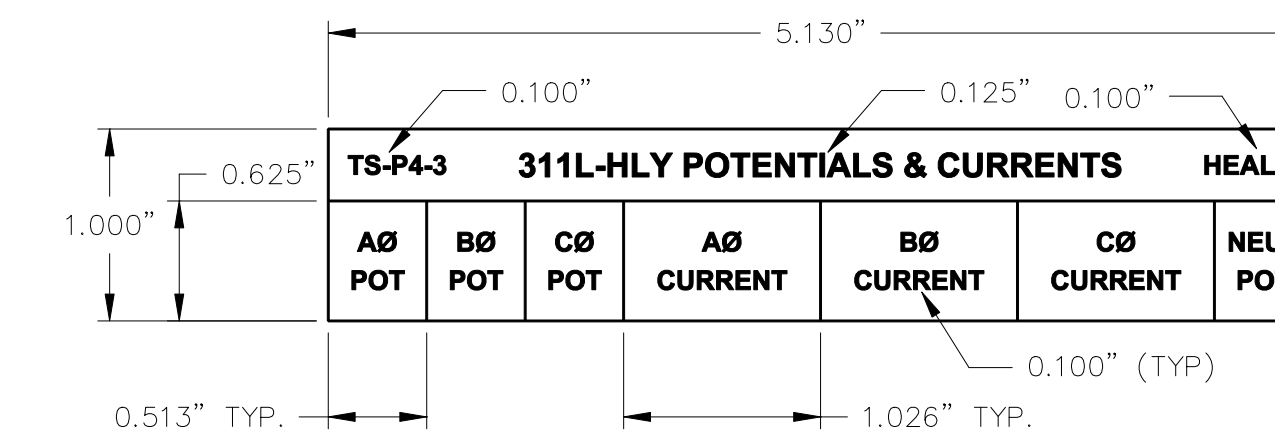
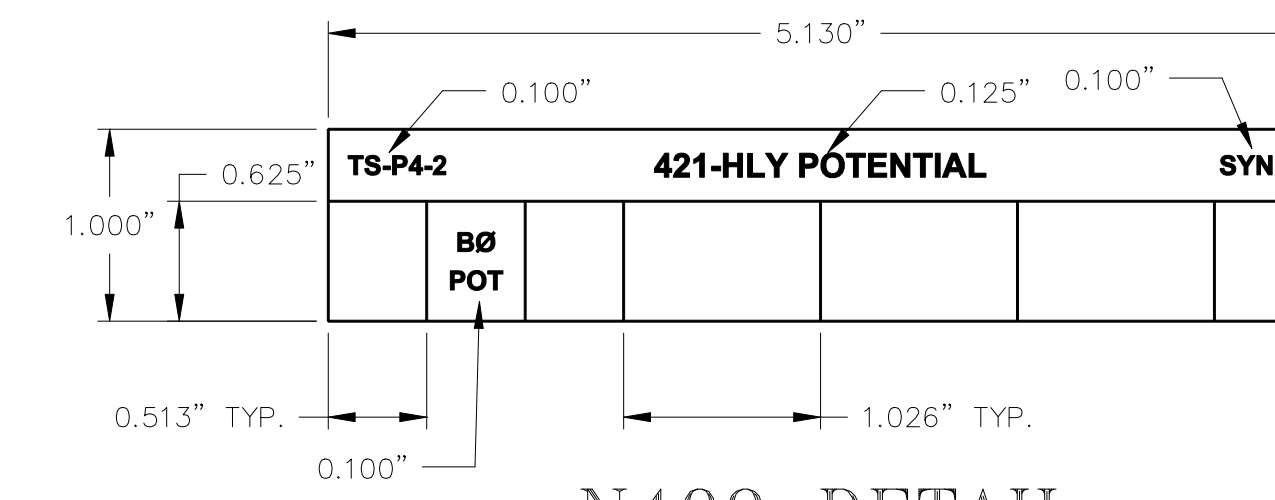
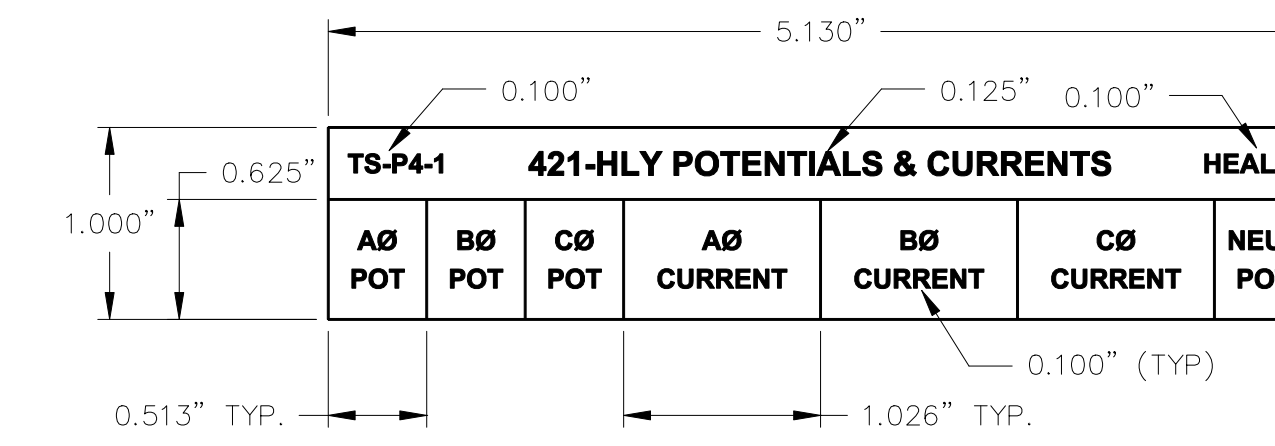
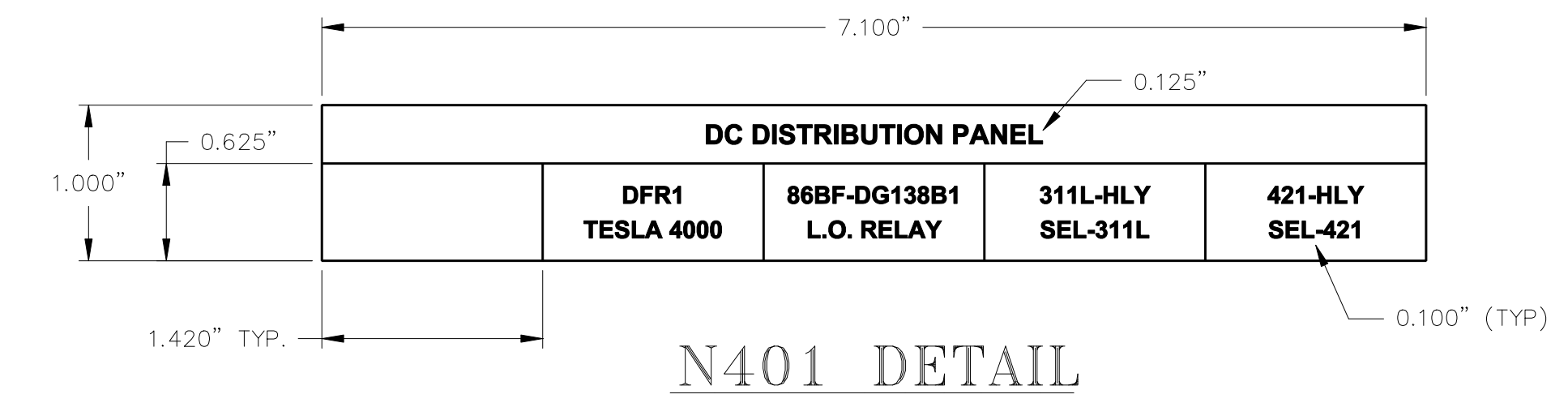
MEEA
MATANUSKA ELECTRIC ASSOCIATION

163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
WWW.MEA.COOP

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	PANEL 4 (FRONT)
2	-	PANEL 4 (A-SIDE)
3	-	PANEL 4 (REAR)
4	-	PANEL 4 (B-SIDE)
5	-	PANEL 4 (TOP)
6	DGSS-EL-4504/2	PANEL 4 NAMEPLATES
7	DGSS-EL-4504/3	PANEL 4 BILL OF MATERIAL

DRAWING NAME:		DOUGLAS SUBSTATION PANEL 4 ELEVATION
REF. DWG(S):	dass-el-4504_1.dwg	
DRAWING NO.:	DGSS-EL-4504	
SHEET		1 OF 3

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N400	2	PANEL 4	HEALY LINE RELAYING		1-1/2 x 5	1/4
N401	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N402	2	AA			1/2 x 3/4	1/4
N403	2	AB			1/2 x 3/4	1/4
N404	2	AC			1/2 x 3/4	1/4
N405	2	AD			1/2 x 3/4	1/4
N406	2	AE			1/2 x 3/4	1/4
N407	1	421-HLY	HEALY LINE RELAY	SEL-421	1 x 3	1/8
N408	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N409	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N410	1	311L-HLY	HEALY LINE RELAY	SEL-311L	1 x 3	1/8
N411	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N412	1	86BF-DG138B1	BKR FAIL LOCK-OUT RELAY	GCB DG-138-B1	1 x 3	1/8
N413	1	DFR1	POWER SYSTEM RECORDER	TESLA 4000	1 x 3	1/8
N414	1	A			1/2 x 3/4	1/4
N415	1	B			1/2 x 3/4	1/4
N416	1	CA	421-HLY	SEL-421	1 x 1-1/2	1/8
N417	1	DA	TS-P4-1	421 TEST SW	1 x 1-1/2	1/8
N418	1	DB	TS-P4-2	421 TEST SW	1 x 1-1/2	1/8
N419	1	EA	311L-HLY	SEL-311L	1 x 1-1/2	1/8
N420	1	FA	TS-P4-3	311L TEST SW	1 x 1-1/2	1/8
N421	1	GA	86BF-DG138B1	BF LO RELAY	1 x 1-1/2	1/8
N422	1	KA	DFR1-PT1	138 kV VT	1 x 1-1/2	1/8
N423	1	KB	DFR1-CT1	138 kV BKR CT	1 x 1-1/2	1/8
N424	1	KC	DFR1-CT2	138 kV XFMR CT	1 x 1-1/2	1/8
N425	1	LA	DFR1	TESLA 4000	1 x 1-1/2	1/8
N426	1	GB	GROUND BUS		1 x 1-1/2	1/8
N427	1	WORK LIGHT			1 x 1-1/2	1/8



- NOTES:
- ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
 - ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
 - ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
 - ALL TEXT SHALL BE "ARIAL BOLD" FONT.
 - EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
 - ALL TEXT SHALL BE UPPER CASE.
 - ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		JOB #: MEA W.O. EN16-3.2	
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		ENG. STAMP	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
WWW.MEA.COOP

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION PANEL 4 NAMEPLATES

REF. DWG(S):

DRAWING NO.: DGSS-EL-4504

SHEET 2 OF 3

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
①	EA	5	BLANK FILLER PANEL, METALLIC GREY, 1U	BUD/PA-1101-MG (OAE)	C
②	EA	1	BLANK FILLER PANEL, METALLIC GREY, 2U	BUD/PA-1102-MG (OAE)	C
③	EA	6	BLANK FILLER PANEL, METALLIC GREY, 3U	BUD/PA-1103-MG (OAE)	C
④	EA	1	BLANK FILLER PANEL, METALLIC GREY, 4U	BUD/PA-1104-MG (OAE)	C
⑤	EA	1	RELAY CABINET WITH DOOR AND COPPER GROUND BUS	TBD	C
⑥	LOT	1 1 1	LED ENCLOSURE LIGHT LIGHT CABLE ASSEMBLY, 120 VAC	HOFFMAN: HOFFMAN/LEDA1S35 HOFFMAN/LEDA20C	C
⑦	LOT	1 1 1	LIGHT SWITCH, SINGLE POLE SWITCH BOX COVER	HUBBELL: KELLEMS/HBL12211 (OAE) RACO/239 (OAE) RACO/800C (OAE)	C
⑧			NOT USED		
⑨			NOT USED		
⑩			NOT USED		
⑪			NOT USED		
⑫			NOT USED		
⑬			NOT USED		
⑭			NOT USED		
⑮			NOT USED		
⑯			NOT USED		
⑰			NOT USED		
⑱			NOT USED		
⑲			NOT USED		
⑳			NOT USED		
㉑			NOT USED		
㉒			NOT USED		
㉓			NOT USED		
㉔			NOT USED		
㉕			NOT USED		
㉖			NOT USED		
㉗			NOT USED		
㉘			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
⑤1	EA	5	CIRCUIT BREAKER, 15 AMP	SCHNEIDER ELECTRIC/MG17436	C
⑤2	EA	1	MULTI-POLE BREAKER FRONT MOUNTING KIT	SCHNEIDER ELECTRIC/14210	C
⑤3	EA	1	DIN RAIL WITH SUPPORT	SCHNEIDER ELECTRIC/14211	C
⑤4	EA	1	PROTECTIVE RELAY (421-HLY)	SCHWEITZER/04214415XC0X4H384XXX	C
⑤5	EA	1	PROTECTIVE RELAY (311L-HLY)	SCHWEITZER/0311L7HCC3254X4XX	C
⑤6	EA	1	LOCKOUT RELAY (86BF-DG138B1)	SCHWEITZER/RS86=DKB9	C
⑤7	EA	1	19" RACK BEZEL, FT-1 STYLE, SINGLE CUTOUT	SCHWEITZER/915900178	C
⑤8	EA	1	19" RACK BEZEL, FT-1 STYLE, DUAL CUTOUT	SCHWEITZER/915900179	C
⑤9	EA	2	BNC TEE, F/M/F	SCHWEITZER/240-1799	C
⑥0	EA	3	TEST SWITCH, FT-1 STYLE, (6-C, 4-P) (TS-P4-1, TS-P4-2, TS-P4-3)	ABB/C7148325G32	C
⑥1	EA	9	SWITCH HANDLE INTERLOCKING BAR, 2-POSITION	ABB/1270547	C
⑥2	EA	1	POWER SYSTEM RECORDER (DFR1)	ERLPHASE/109312-TESLA4000-18-16P-0-2-60	C
⑥3	EA	1	AC VOLTAGE INPUT MODULE, TESLA 4000 (DFR1-PT1)	ERLPHASE/114258	C
⑥4	EA	2	AC CURRENT INPUT MODULE, TESLA 4000 (DFR1-CT1, DFR1-CT2)	ERLPHASE/114260	C
⑥5	EA	1	MODULE RACK MOUNT PLATE, TESLA 4000	ERLPHASE/114248	C
⑥6			NOT USED		
⑥7			NOT USED		
⑥8			NOT USED		
⑥9			NOT USED		
⑦0			NOT USED		
⑦1			NOT USED		
⑦2			NOT USED		
⑦3			NOT USED		
⑦4			NOT USED		
⑦5			NOT USED		
⑦6			NOT USED		
⑦7			NOT USED		
⑦8			NOT USED		
⑦9			NOT USED		
⑧0			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

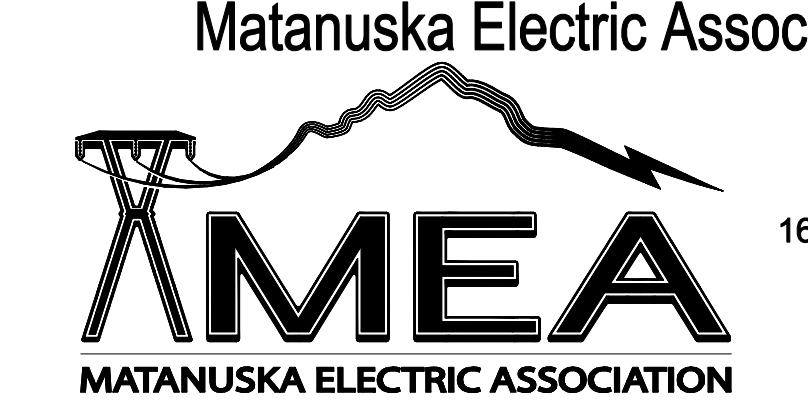
BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
⑩1	EA	2	MOUNTING RAIL, PR30	ABB/1SNA 173 220 R0500	C
⑩2	EA	11	END STOP, BAM2	ABB/1SNA 206 351 R1600	C
⑩3	EA	4	END SECTION, FEM8	ABB/1SNA 113 373 R2600	C
⑩4	EA	235	TERMINAL, SWITCH BLOCK, TYPE M6/8.SNB	ABB/1SNA 115 688 R2500	C
⑩5	EA	4	END SECTION, FEM12S	ABB/1SNA 117 628 R2200	C
⑩6	EA	12	TERMINAL, FUSE BLOCK, TYPE MB10/12.SF	ABB/1SNA 111 033 R0300	C
⑩7	EA	12	FUSE, FU520, 3.15A	ABB/1SNA 008 289 R1600	C
⑩8	EA	4	END SECTION, FEM6	ABB/1SNA 118 368 R1600	C
⑩9	EA	4	TERMINAL BLOCK, FEED THRU, TYPE M6/8	ABB/1SNA 115 118 R1100	C
⑪0	EA	2	TERMINAL MARKERS, VERTICAL, RC810, 1-100	ABB/1SNA 234 060 R0500	C
⑪1	EA	1	TERMINAL MARKERS, VERTICAL, RC810, 101-200	ABB/1SNA 234 061 R2200	C
⑪2	EA	5	TERMINAL BLOCK, 4 POLE, 30 AMP, SHORTING	MARATHON/1504 SC 01C WITH CC 1504	C
⑪3	EA	5	TERMINAL BLOCK, 12 POLE, 30 AMP, STANDARD	MARATHON/1512 STD 01C	C
⑪4			NOT USED		
⑪5			NOT USED		
⑪6			NOT USED		
⑪7			NOT USED		
⑪8			NOT USED		
⑪9			NOT USED		
⑫0			NOT USED		
⑫1			NOT USED		
⑫2			NOT USED		
⑫3			NOT USED		
⑫4			NOT USED		
⑫5			NOT USED		
⑫6			NOT USED		
⑫7			NOT USED		
⑫8			NOT USED		
⑫9			NOT USED		
⑬0			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

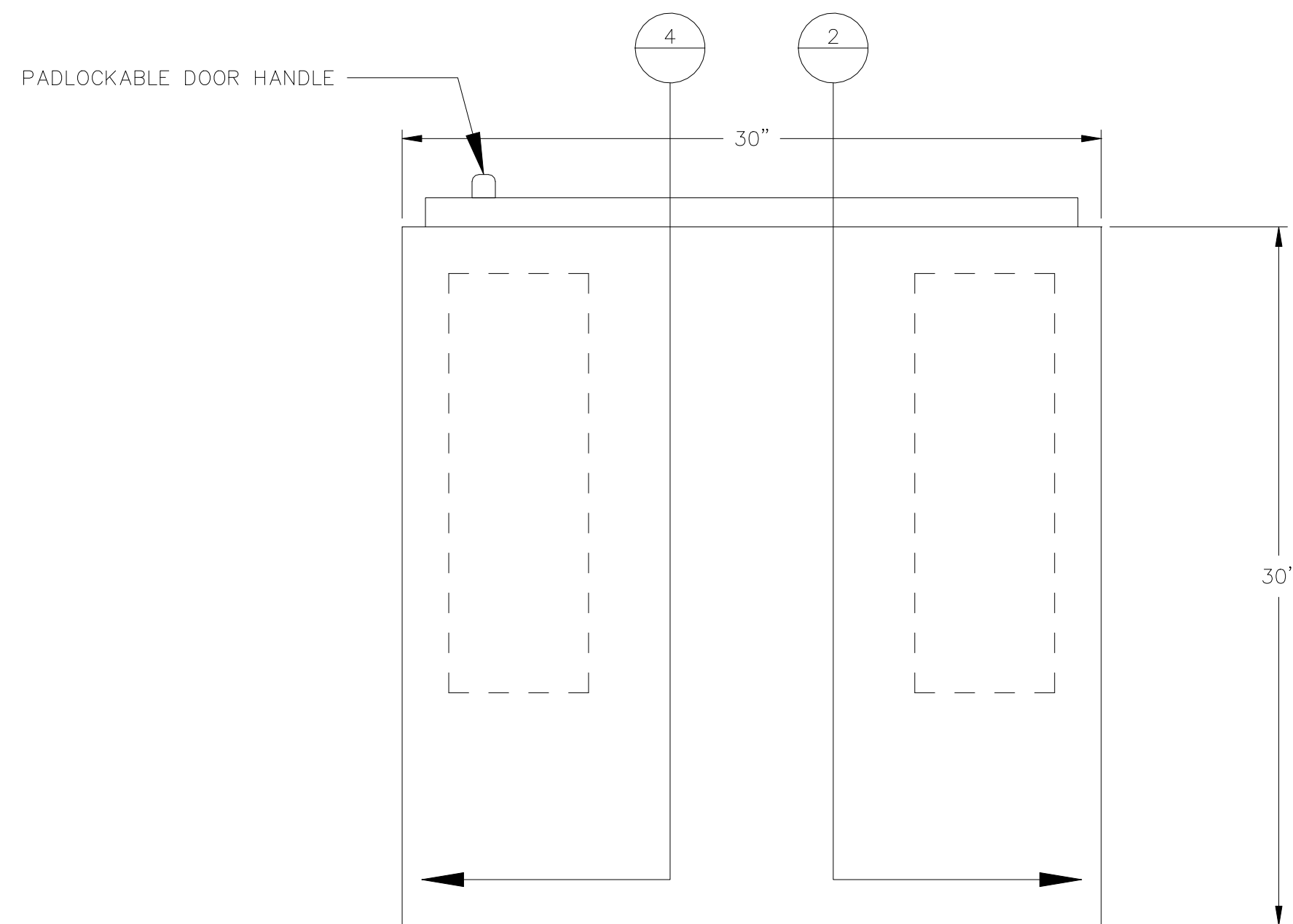
NOTES:

- BILL OF MATERIAL QUANTITIES ARE ESTIMATED. ACTUAL QUANTITIES SHALL BE VERIFIED BY THE CONTRACTOR.

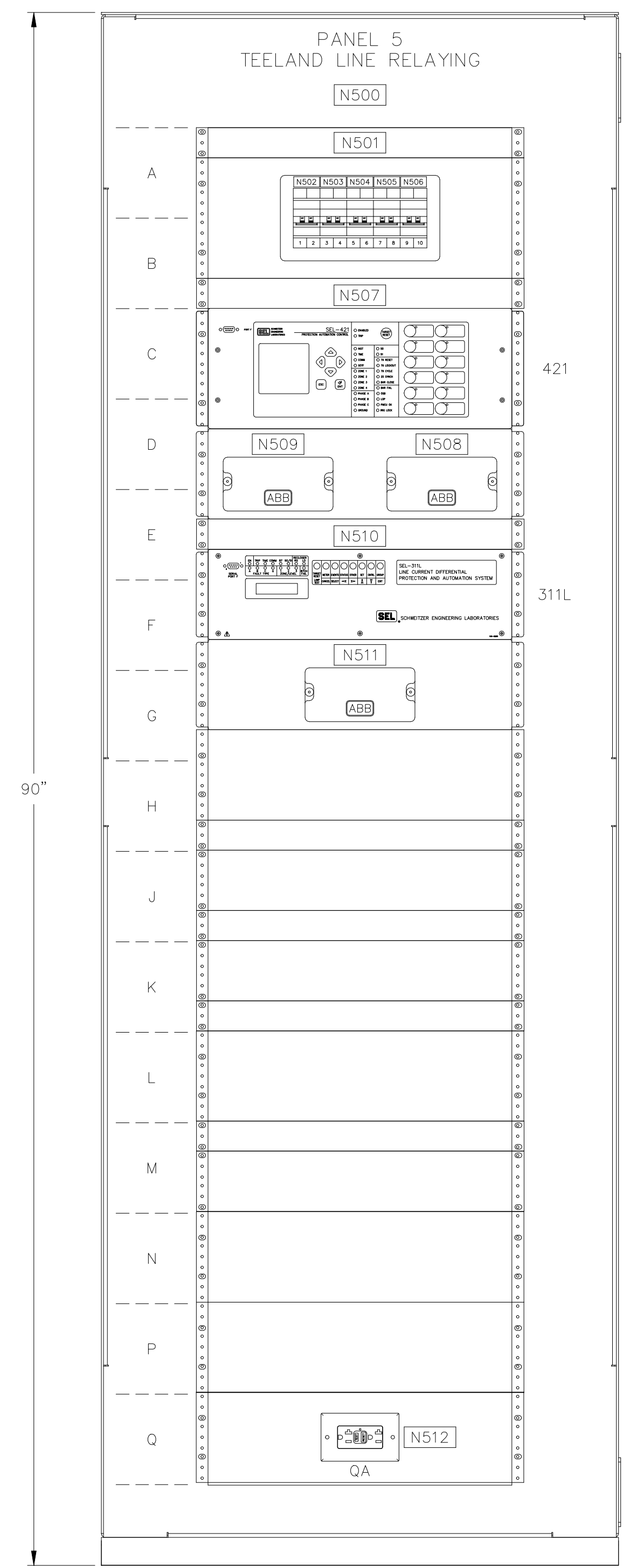
PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			JOB #: MEA W.O. EN16-3.2			ENG. STAMP			DRAWING NO./SHEET			REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION			DRAWING NAME:		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS															DOUGLAS SUBSTATION PANEL 4 BILL OF MATERIAL		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE										REF. DWG(S):				
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016										DRAWING NO.:				
													DGSS-EL-4504				
													SHEET 3 OF 3				



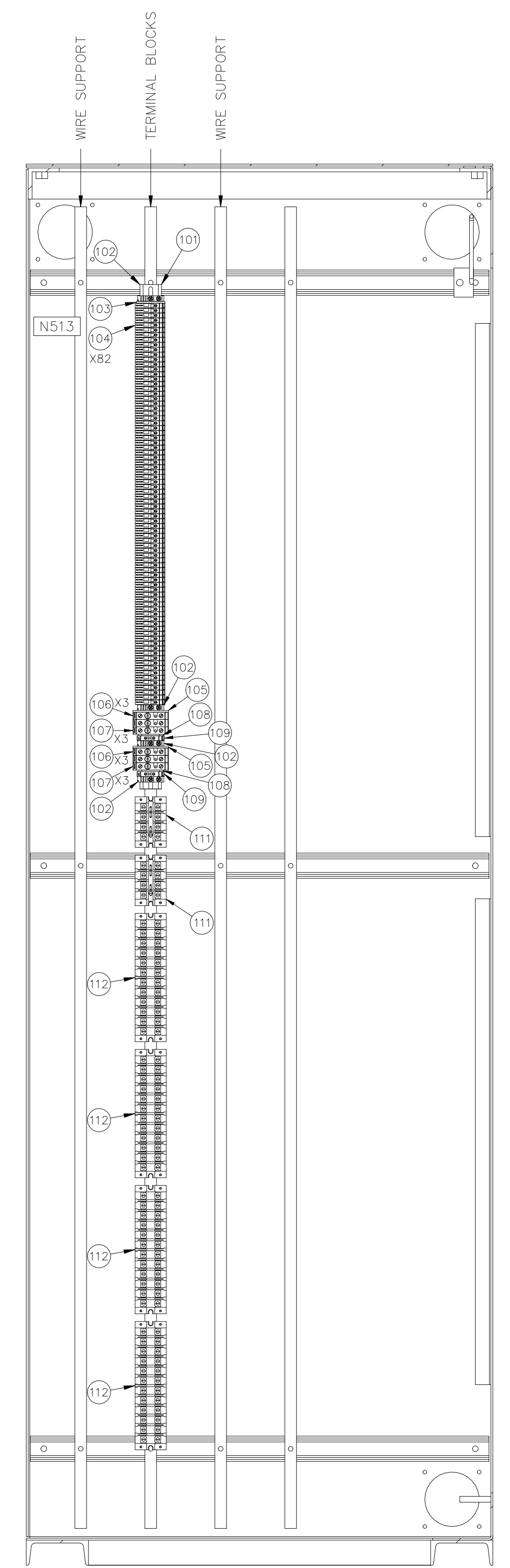
Matanuska Electric Association
163 East Industrial Way
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(907) 761-9300
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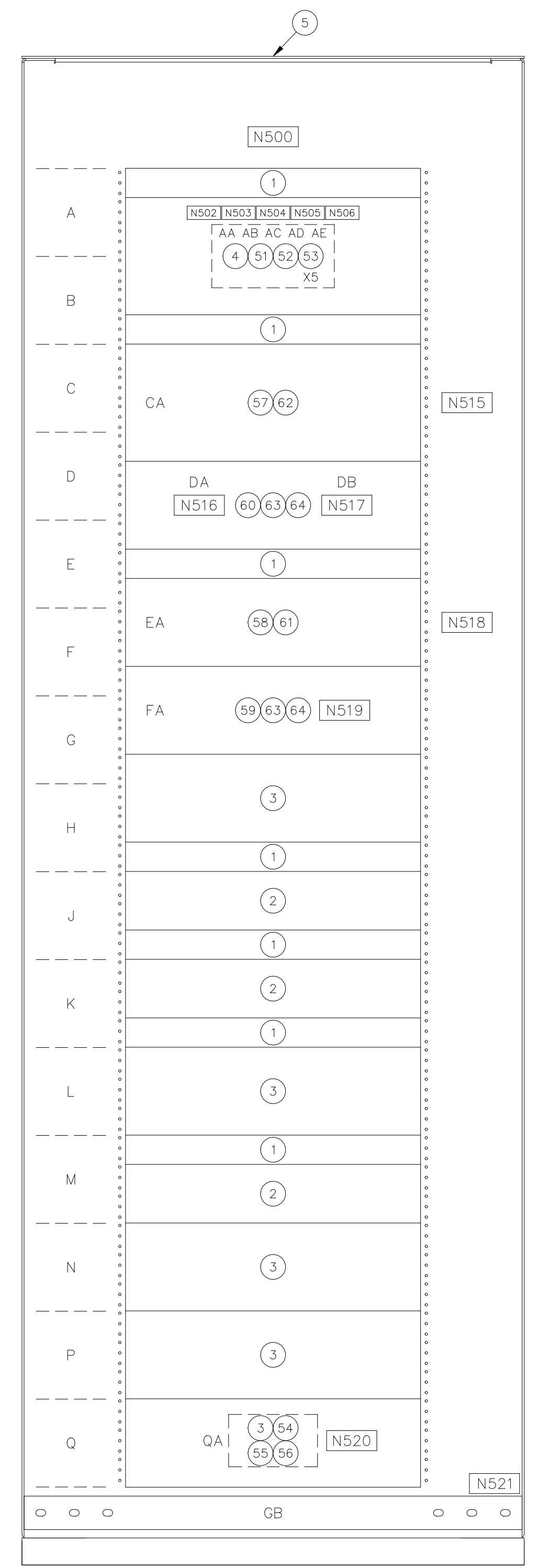
5 PANEL 5 (TOP)
N.T.S.



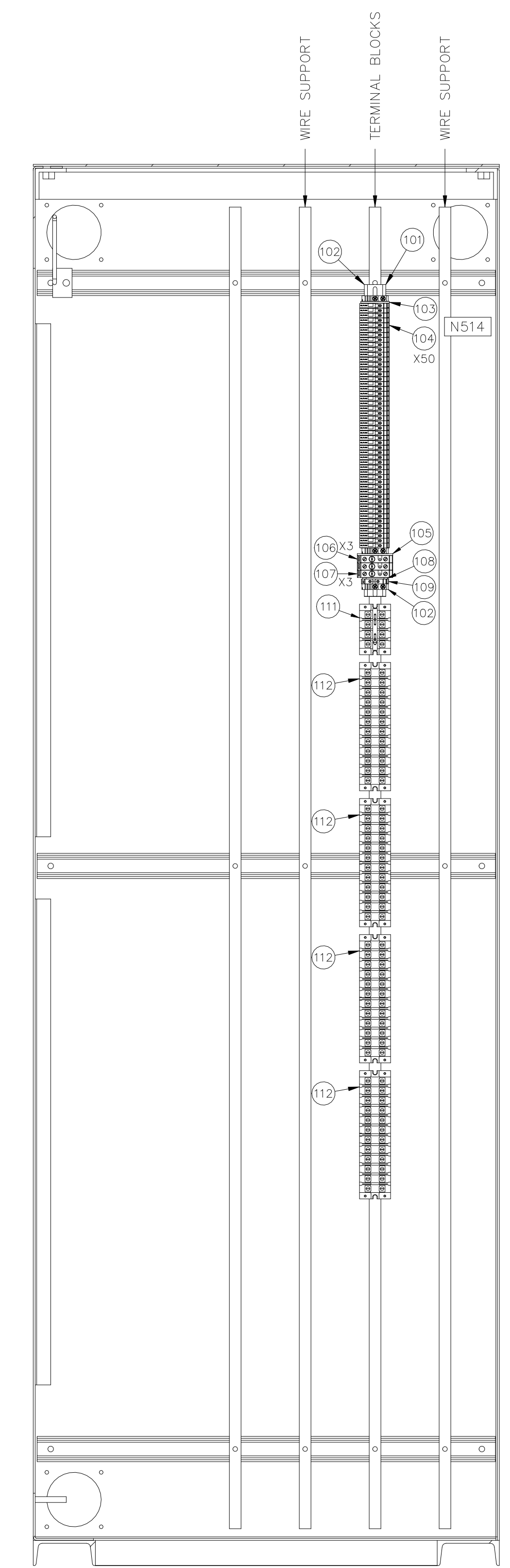
1 PANEL 5 (FRONT)
N.T.S.



2 PANEL 5 (A-SIDE)
N.T.S.



3 PANEL 5 (REAR)
N.T.S.



4 PANEL 5 (B-SIDE)
N.T.S.

- NOTES:
- 1 SEE REFERENCE 6 FOR NAMEPLATES (NXXX)
 - 2 SEE REFERENCE 7 FOR BILL OF MATERIAL.
 - 3 ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	PANEL 5 (FRONT)
2	-	PANEL 5 (A-SIDE)
3	-	PANEL 5 (REAR)
4	-	PANEL 5 (B-SIDE)
5	-	PANEL 5 (TOP)
6	DGSS-EL-4505/2	PANEL 5 NAMEPLATES
7	DGSS-EL-4505/3	PANEL 5 BILL OF MATERIAL

DRAWING NAME: DOUGLAS SUBSTATION
PANEL 5
ELEVATION

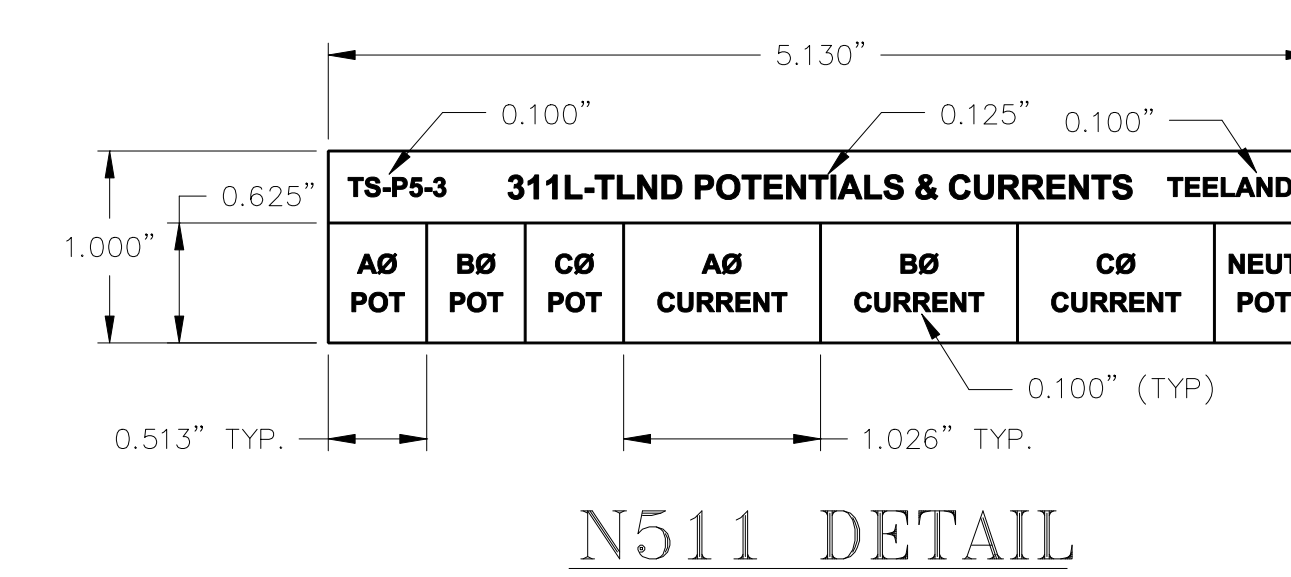
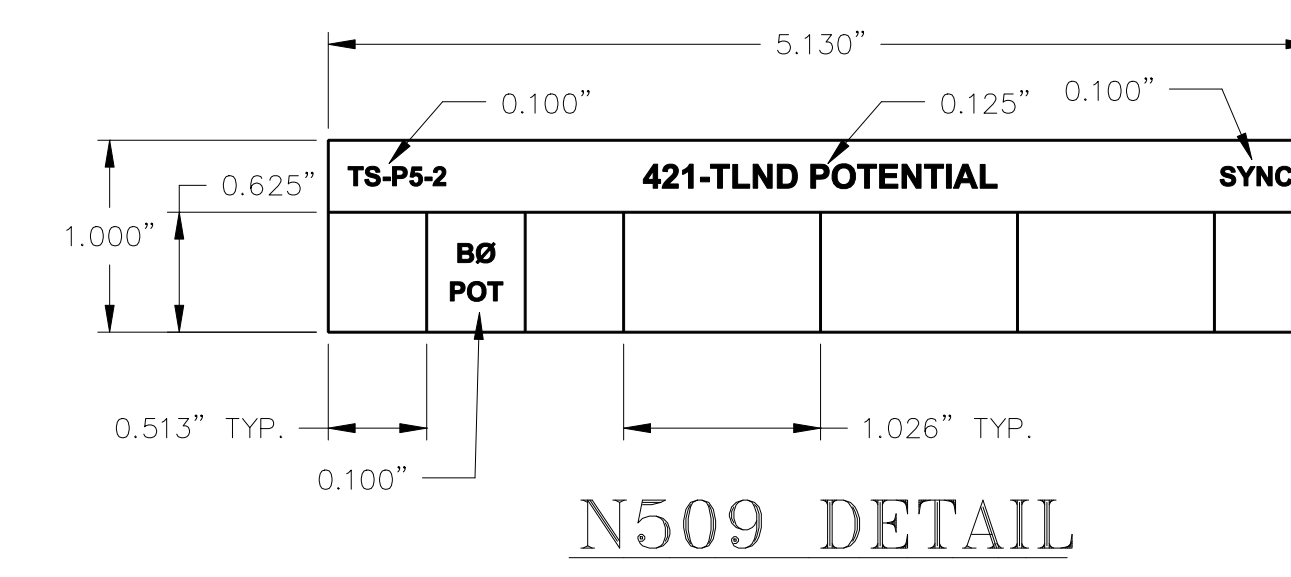
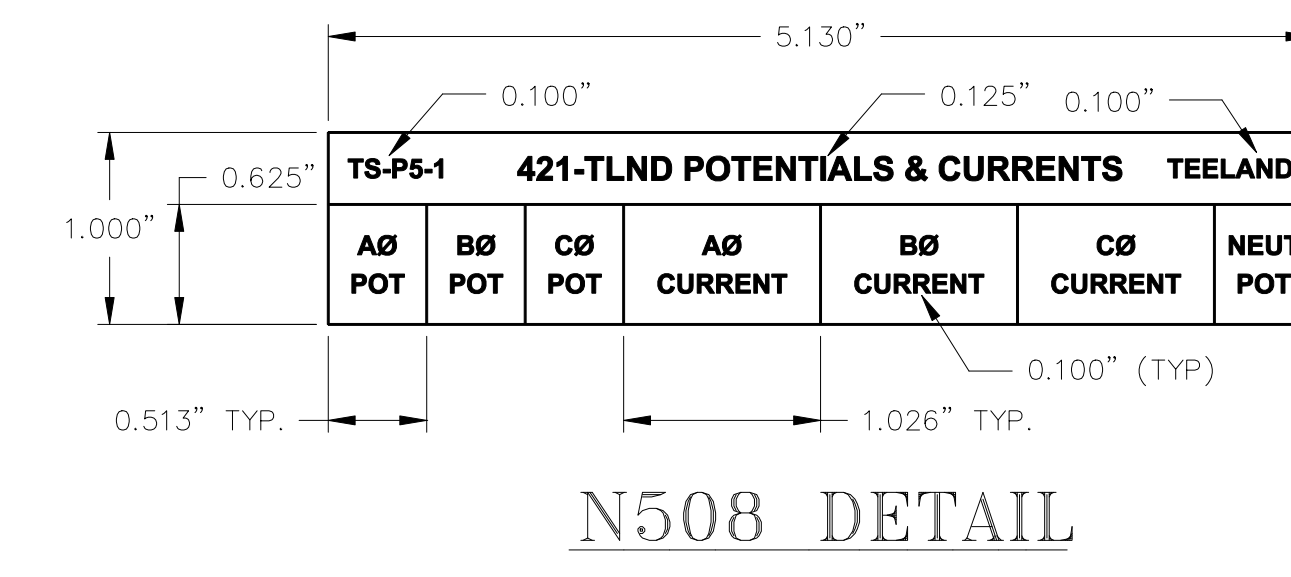
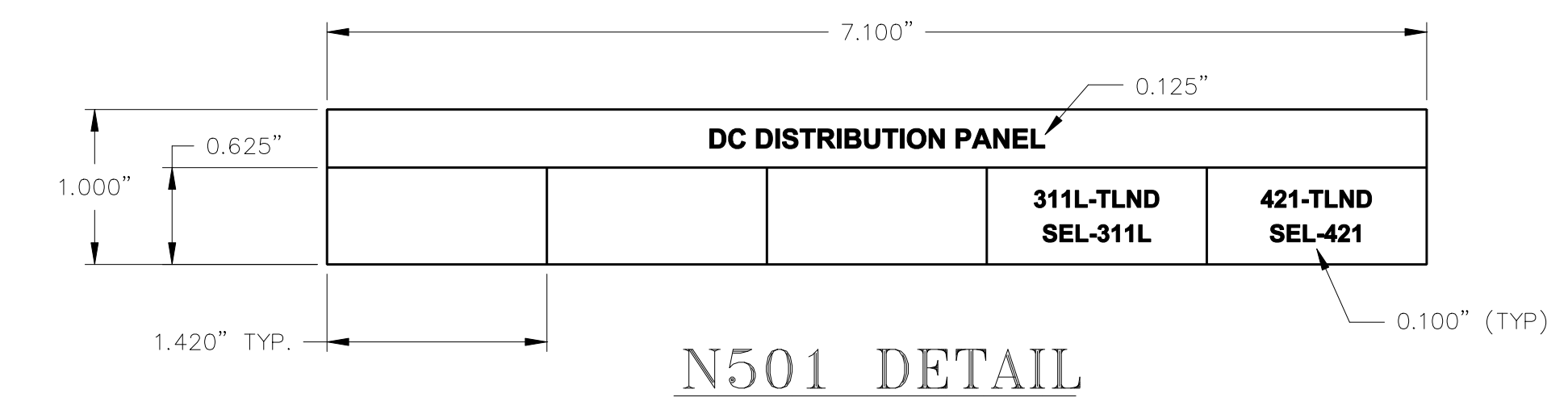
dass-el-4505_1.dwg

REF. DWG(S):

DRAWING NO.: DGSS-EL-4505

SHEET 1 OF 3

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N500	2	PANEL 5	TEELAND LINE RELAYING		1-1/2 x 5	1/4
N501	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N502	2	AA			1/2 x 3/4	1/4
N503	2	AB			1/2 x 3/4	1/4
N504	2	AC			1/2 x 3/4	1/4
N505	2	AD			1/2 x 3/4	1/4
N506	2	AE			1/2 x 3/4	1/4
N507	1	421-TLND	TEELAND LINE RELAY	SEL-421	1 x 3	1/8
N508	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N509	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N510	1	311L-TLND	TEELAND LINE RELAY	SEL-311L	1 x 3	1/8
N511	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N512	1	RE23	120 VAC	RECEPTACLE	1 x 3	1/8
N513	1	A			1/2 x 3/4	1/4
N514	1	B			1/2 x 3/4	1/4
N515	1	CA	421-TLND	SEL-421	1 x 1-1/2	1/8
N516	1	DA	TS-P5-1	421 TEST SW	1 x 1-1/2	1/8
N517	1	DB	TS-P5-2	421 TEST SW	1 x 1-1/2	1/8
N518	1	EA	311L-TLND	SEL-311L	1 x 1-1/2	1/8
N519	1	FA	TS-P5-3	311L TEST SW	1 x 1-1/2	1/8
N520	1	QA	RE23	RECEPTACLE	1 X 1-1/2	1/8
N521	1	GB	GROUND BUS		1 x 1-1/2	1/8
N522	1	WORK LIGHT			1 x 1-1/2	1/8



- NOTES:
- ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
 - ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
 - ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
 - ALL TEXT SHALL BE "ARIAL BOLD" FONT.
 - EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
 - ALL TEXT SHALL BE UPPER CASE.
 - ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		JOB #: MEA W.O. EN16-3.2	
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		ENG. STAMP	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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(907) 761-9300
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION PANEL 5 NAMEPLATES

REF. DWG(S):

DRAWING NO.: DGSS-EL-4505

SHEET 2 OF 3

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
1	EA	7	BLANK FILLER PANEL, METALLIC GREY, 1U	BUD/PA-1101-MG (OAE)	C
2	EA	3	BLANK FILLER PANEL, METALLIC GREY, 2U	BUD/PA-1102-MG (OAE)	C
3	EA	5	BLANK FILLER PANEL, METALLIC GREY, 3U	BUD/PA-1103-MG (OAE)	C
4	EA	1	BLANK FILLER PANEL, METALLIC GREY, 4U	BUD/PA-1104-MG (OAE)	C
5	EA	1	RELAY CABINET WITH DOOR AND COPPER GROUND BUS	TBD	C
6	LOT	1 1 1	LED ENCLOSURE LIGHT LIGHT CABLE ASSEMBLY, 120 VAC	HOFFMAN: HOFFMAN/LEDA1S35 HOFFMAN/LEDA20C	C
7	LOT	1 1 1	LIGHT SWITCH, SINGLE POLE SWITCH BOX COVER	HUBBELL: KELLEMS/HBL12211 (OAE) RACO/239 (OAE) RACO/800C (OAE)	C
8			NOT USED		
9			NOT USED		
10			NOT USED		
11			NOT USED		
12			NOT USED		
13			NOT USED		
14			NOT USED		
15			NOT USED		
16			NOT USED		
17			NOT USED		
18			NOT USED		
19			NOT USED		
20			NOT USED		
21			NOT USED		
22			NOT USED		
23			NOT USED		
24			NOT USED		
25			NOT USED		
26			NOT USED		
27			NOT USED		
28			NOT USED		

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BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
51	EA	5	CIRCUIT BREAKER, 15 AMP	SCHNEIDER ELECTRIC/MG17436	C
52	EA	1	MULTI-POLE BREAKER FRONT MOUNTING KIT	SCHNEIDER ELECTRIC/14210	C
53	EA	1	DIN RAIL WITH SUPPORT	SCHNEIDER ELECTRIC/14211	C
54	EA	1	RECEPTACLE, 125V, 20A, DUPLEX, GFI (RE23)	HUBBELL-KELLEMS/GFR53625GI	C
55	EA	1	COVER PLATE, 1-GANG, STAINLESS STEEL	HUBBELL-KELLEMS/SS26 (OAE)	C
56	EA	1	SINGLE GANG BOX, ALUMINUM	HUBBELL-RACO/5386-0 (OAE)	C
57	EA	1	PROTECTIVE RELAY (421-TLND)	SCHWEITZER/04214415XC0X4H384XXXX	C
58	EA	1	PROTECTIVE RELAY (311L-TLND)	SCHWEITZER/0311L7HCC3254X4XX	C
59	EA	1	19" RACK BEZEL, FT-1 STYLE, SINGLE CUTOUT	SCHWEITZER/915900178	C
60	EA	1	19" RACK BEZEL, FT-1 STYLE, DUAL CUTOUT	SCHWEITZER/915900179	C
61	EA	1	WIRE LEAD TERMINATOR, 50 OHM	SCHWEITZER/915900036	C
62	EA	1	BNC TEE, F/M/F	SCHWEITZER/240-1799	C
63	EA	3	TEST SWITCH, FT-1 STYLE, (6-C, 4-P) (TS-P5-1, TS-P5-2, TS-P5-3)	ABB/C714B325G32	C
64	EA	9	SWITCH HANDLE INTERLOCKING BAR, 2-POSITION	ABB/1270547	C
65			NOT USED		
66			NOT USED		
67			NOT USED		
68			NOT USED		
69			NOT USED		
70			NOT USED		
71			NOT USED		
72			NOT USED		
73			NOT USED		
74			NOT USED		
75			NOT USED		
76			NOT USED		
77			NOT USED		
78			NOT USED		
79			NOT USED		
80			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
101	EA	2	MOUNTING RAIL, PR30	ABB/1SNA 173 220 R0500	C
102	EA	7	END STOP, BAM2	ABB/1SNA 206 351 R1600	C
103	EA	2	END SECTION, FEM8	ABB/1SNA 113 373 R2600	C
104	EA	132	TERMINAL, SWITCH BLOCK, TYPE M6/8.SNB	ABB/1SNA 115 688 R2500	C
105	EA	3	END SECTION, FEM12S	ABB/1SNA 117 628 R2200	C
106	EA	9	TERMINAL, FUSE BLOCK, TYPE MB10/12.SF	ABB/1SNA 111 033 R0300	C
107	EA	9	FUSE, FU520, 3.15A	ABB/1SNA 008 289 R1600	C
108	EA	3	END SECTION, FEM6	ABB/1SNA 118 368 R1600	C
109	EA	3	TERMINAL BLOCK, FEED THRU, TYPE M6/8	ABB/1SNA 115 118 R1100	C
110	EA	2	TERMINAL MARKERS, VERTICAL, RCB10, 1-100	ABB/1SNA 234 060 R0500	C
111	EA	3	TERMINAL BLOCK, 4 POLE, 30 AMP, SHORTING	MARATHON/1504 SC 01C WITH CC 1504	C
112	EA	8	TERMINAL BLOCK, 12 POLE, 30 AMP, STANDARD	MARATHON/1512 STD 01C	C
113			NOT USED		
114			NOT USED		
115			NOT USED		
116			NOT USED		
117			NOT USED		
118			NOT USED		
119			NOT USED		
120			NOT USED		
121			NOT USED		
122			NOT USED		
123			NOT USED		
124			NOT USED		
125			NOT USED		
126			NOT USED		
127			NOT USED		
128			NOT USED		
129			NOT USED		
130			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

NOTES:

- 1 BILL OF MATERIAL QUANTITIES ARE ESTIMATED. ACTUAL QUANTITIES SHALL BE VERIFIED BY THE CONTRACTOR.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

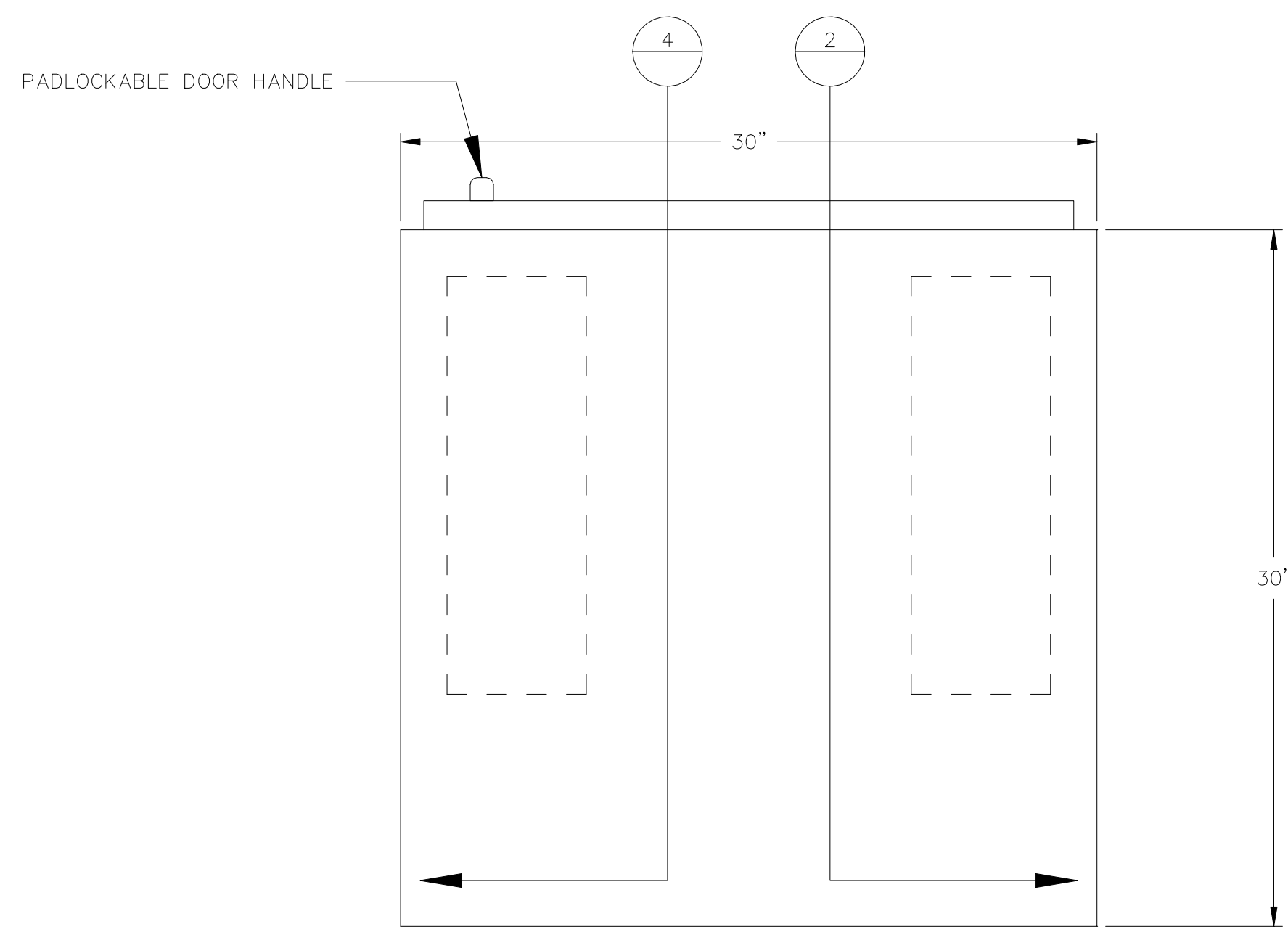
DRAWING NAME: DOUGLAS SUBSTATION
PANEL 5
BILL OF MATERIAL

REF. DWG(S):

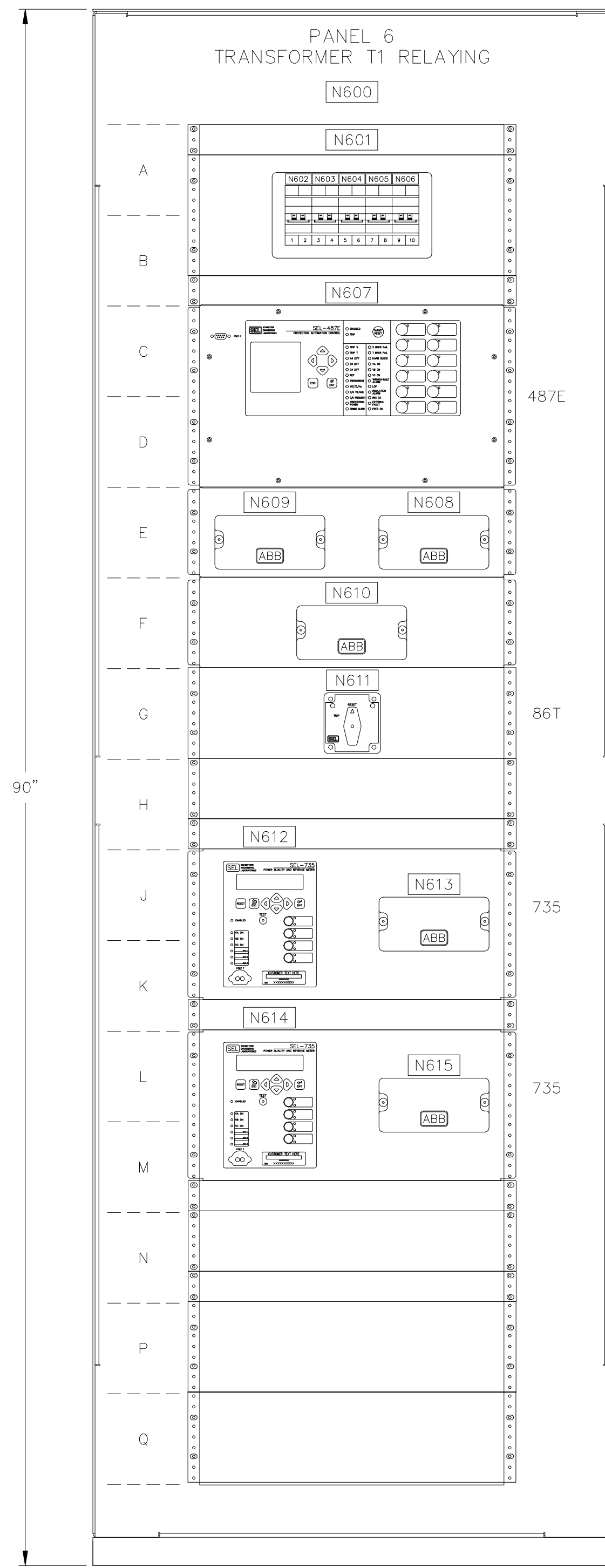
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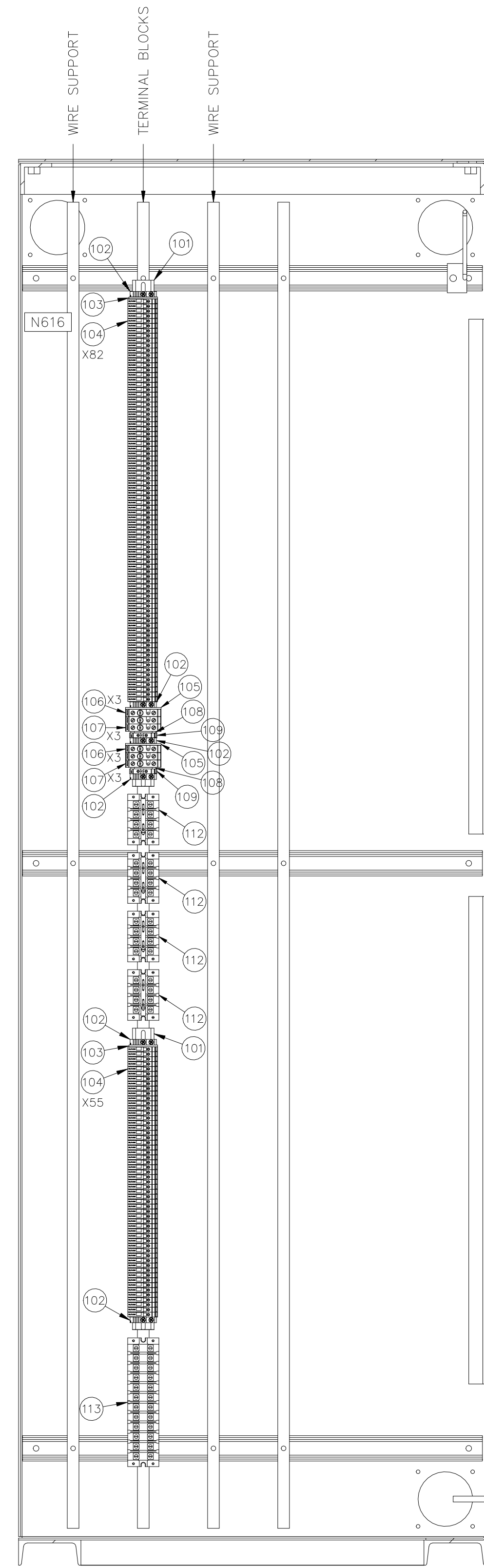
SHEET 3 OF 3



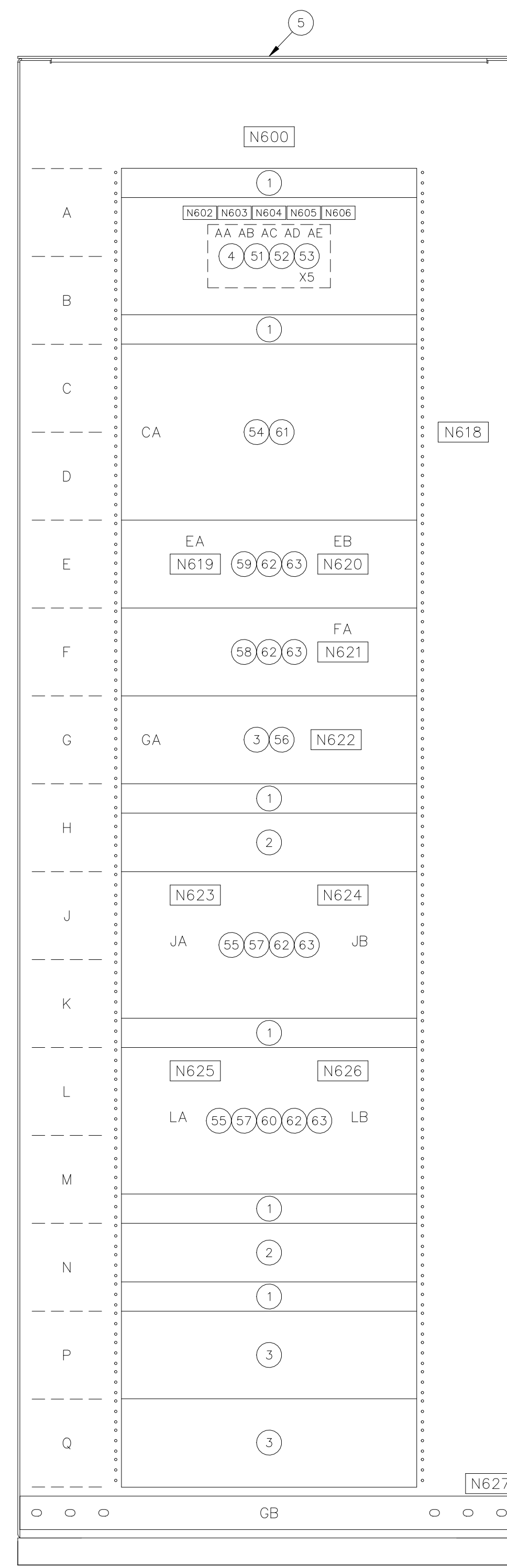
5 PANEL 6 (TOP)
N.T.S.



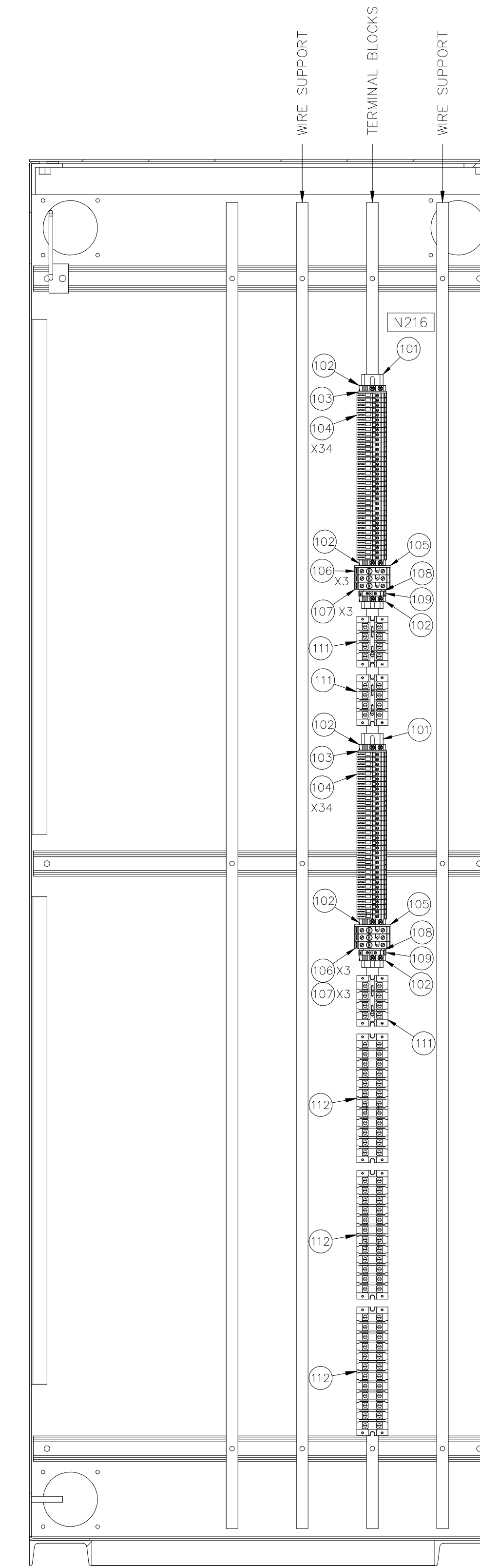
1 PANEL 6 (FRONT)
N.T.S.



2 PANEL 6 (A-SIDE)
N.T.S.



3 PANEL 6 (REAR)
N.T.S.



4 PANEL 6 (B-SIDE)
N.T.S.

- NOTES:
- 1 SEE REFERENCE 6 FOR NAMEPLATES (NXXX)
 - 2 SEE REFERENCE 7 FOR BILL OF MATERIAL.
 - 3 ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

ENG. STAMP

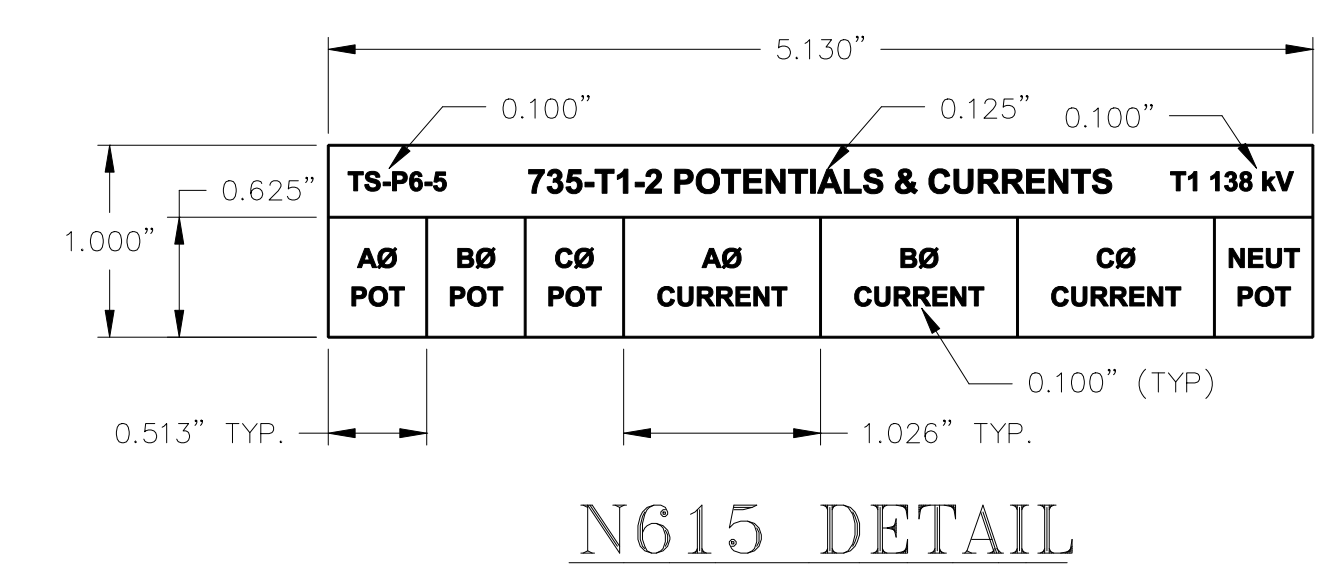
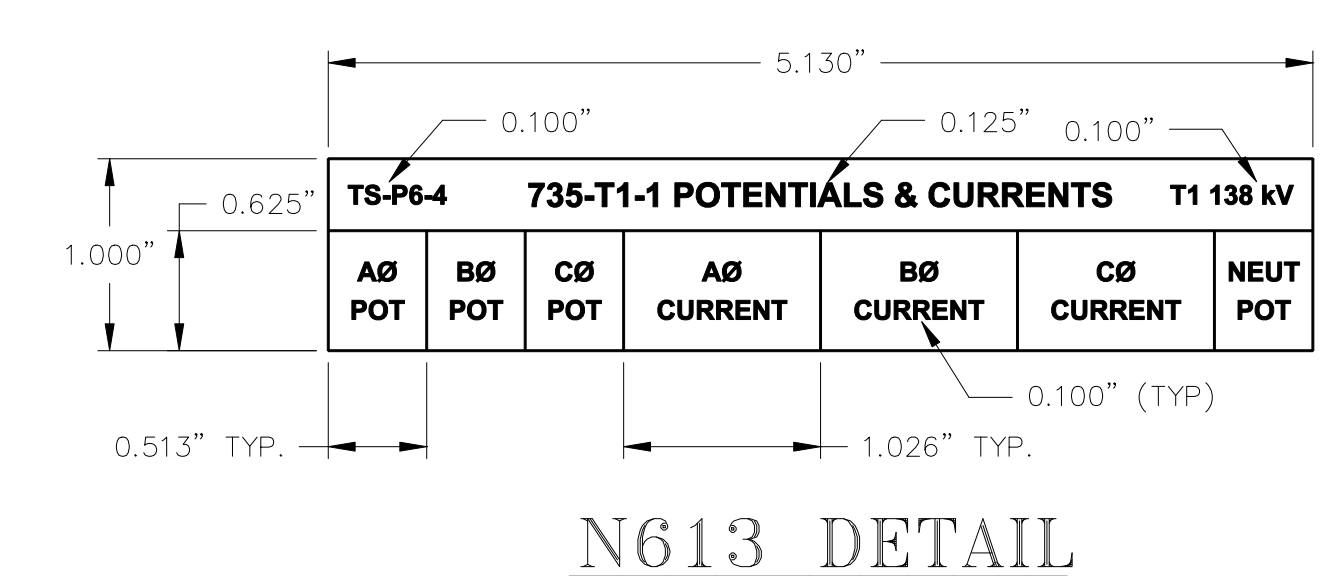
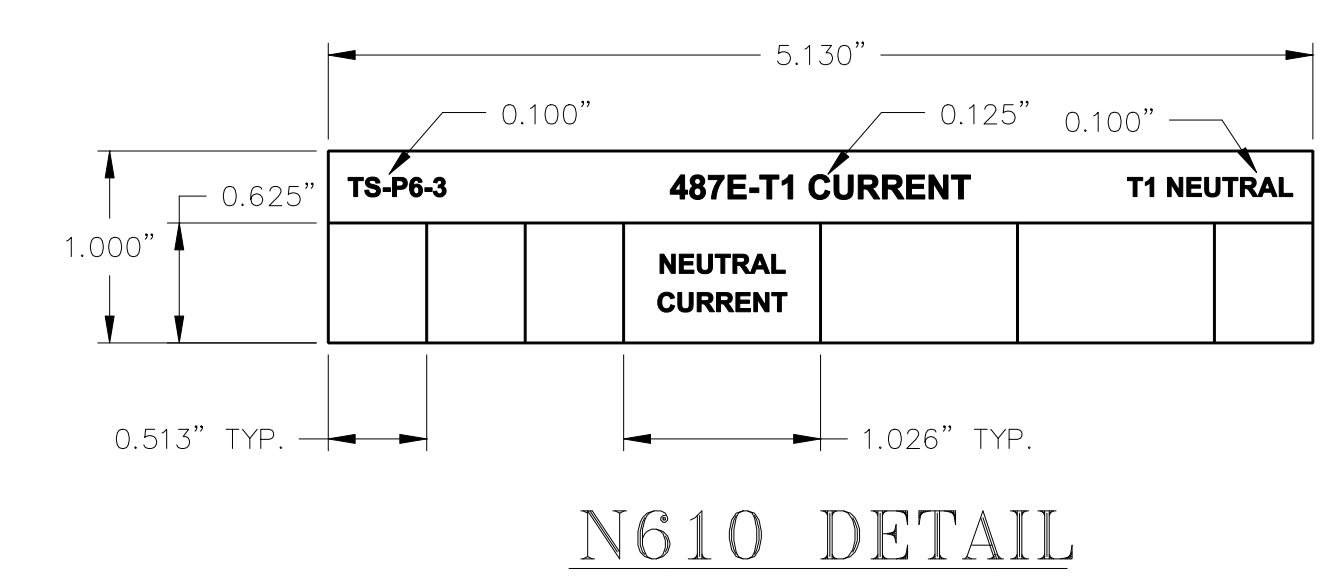
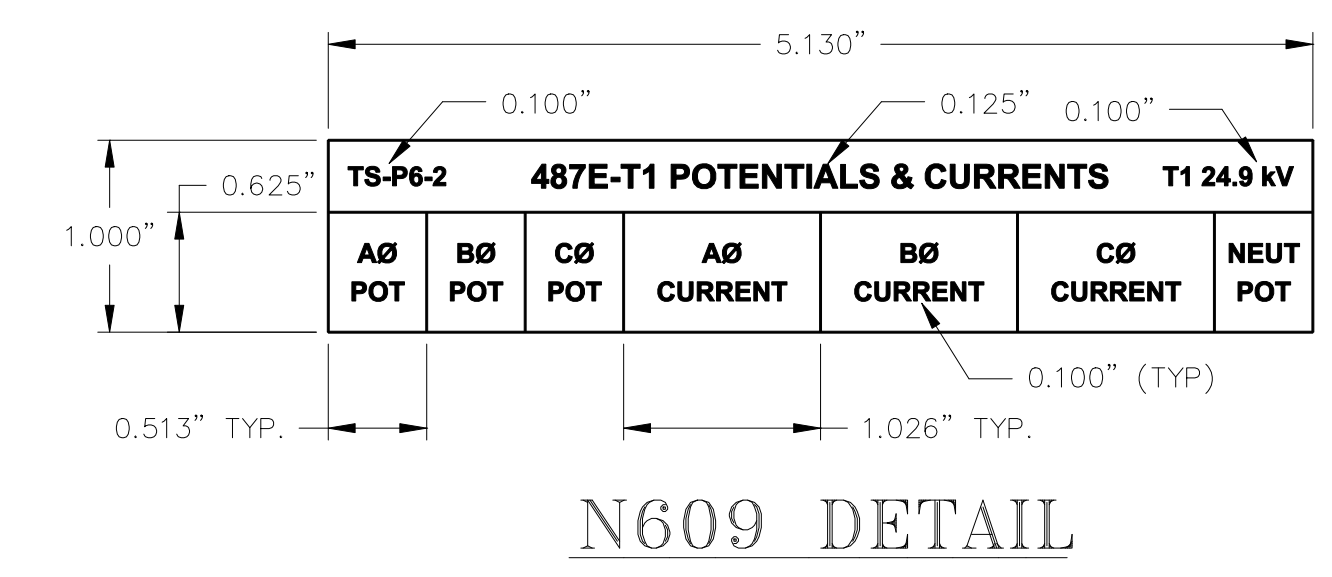
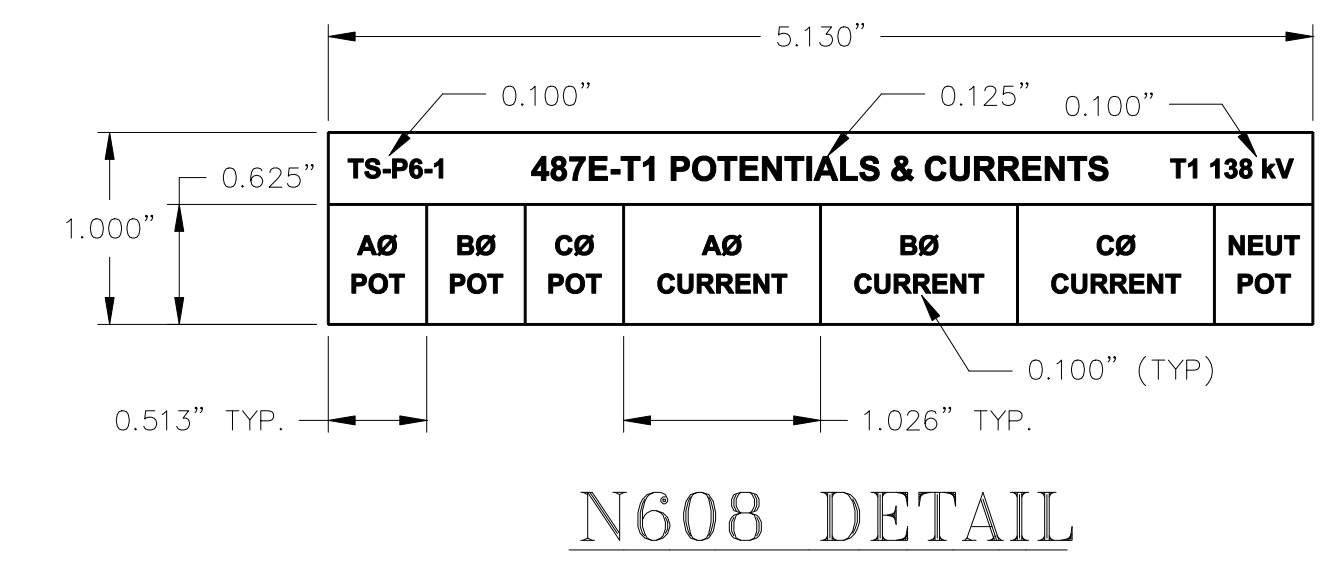
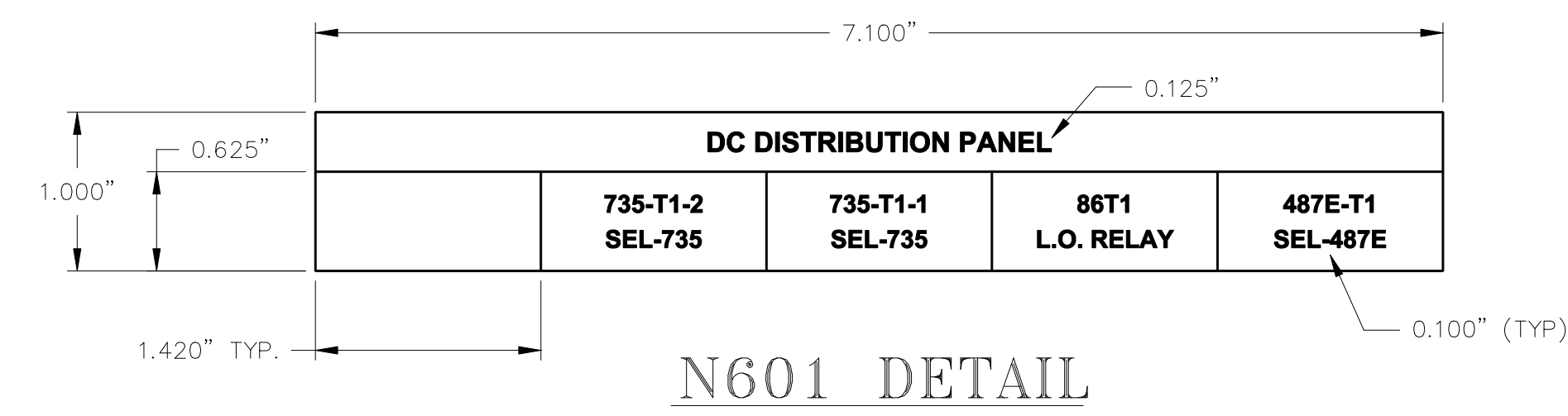
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	PANEL 6 (FRONT)
2	-	PANEL 6 (A-SIDE)
3	-	PANEL 6 (REAR)
4	-	PANEL 6 (B-SIDE)
5	-	PANEL 6 (TOP)
6	DGSS-EL-4506/2	PANEL 6 NAMEPLATES
7	DGSS-EL-4506/3	PANEL 6 BILL OF MATERIAL

DRAWING NAME:		DOUGLAS SUBSTATION PANEL 6 ELEVATION
REF. DWG(S):		
DRAWING NO.:		DGSS-EL-4506
		SHEET 1 OF 3

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N600	2	PANEL 4	TRANSFORMER T1 RELAYING	TRANSFORMER T1 METERING	1-1/2 x 5	1/4
N601	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N602	2	AA			1/2 x 3/4	1/4
N603	2	AB			1/2 x 3/4	1/4
N604	2	AC			1/2 x 3/4	1/4
N605	2	AD			1/2 x 3/4	1/4
N606	2	AE			1/2 x 3/4	1/4
N607	1	487E-T1	TRANSFORMER T1 RELAY	SEL-487E	1 x 3	1/8
N608	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N609	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N610	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N611	1	86T1	XFMR LOCK-OUT RELAY	TRANSFORMER T1	1 x 3	1/8
N612	1	735-T1-1	XFMR T1 METER	SEL-735	1 x 3	1/8
N613	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N614	1	735-T1-2	XFMR T1 METER (BACKUP)	SEL-735	1 x 3	1/8
N615	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N616	1	A			1/2 x 3/4	1/4
N617	1	B			1/2 x 3/4	1/4
N618	1	CA	487E-T1	SEL-487E	1 x 1-1/2	1/8
N619	1	EA	TS-P6-1	487E TEST SW	1 x 1-1/2	1/8
N620	1	EB	TS-P6-2	487E TEST SW	1 x 1-1/2	1/8
N621	1	FA	TS-P6-3	487E TEST SW	1 x 1-1/2	1/8
N622	1	GA	86T1	XFMR LO RELAY	1 x 1-1/2	1/8
N623	1	JA	TS-P6-4	735 TEST SW	1 x 1-1/2	1/8
N624	1	JB	735-T1-1	SEL-735	1 x 1-1/2	1/8
N625	1	LA	TS-P6-5	735 TEST SW	1 x 1-1/2	1/8
N626	1	LB	735-T1-2	SEL-735	1 x 1-1/2	1/8
N627	1	GB	GROUND BUS		1 x 1-1/2	1/8
N628	1	WORK LIGHT			1 x 1-1/2	1/8



- NOTES:
- ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
 - ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
 - ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
 - ALL TEXT SHALL BE "ARIAL BOLD" FONT.
 - EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
 - ALL TEXT SHALL BE UPPER CASE.
 - ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

ENG. STAMP

Matanuska Electric Association

163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
WWW.MEA.COOP

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION PANEL 6 NAMEPLATES

REF. DWG(S):

DRAWING NO.: DGSS-EL-4506

SHEET 2 OF 3

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
1	EA	6	BLANK FILLER PANEL, METALLIC GREY, 1U	BUD/PA-1101-MG (OAE)	C
2	EA	2	BLANK FILLER PANEL, METALLIC GREY, 2U	BUD/PA-1102-MG (OAE)	C
3	EA	3	BLANK FILLER PANEL, METALLIC GREY, 3U	BUD/PA-1103-MG (OAE)	C
4	EA	1	BLANK FILLER PANEL, METALLIC GREY, 4U	BUD/PA-1104-MG (OAE)	C
5	EA	1	RELAY CABINET WITH DOOR AND COPPER GROUND BUS	TBD	C
6	LOT	1 1 1	LED ENCLOSURE LIGHT LIGHT CABLE ASSEMBLY, 120 VAC	HOFFMAN: HOFFMAN/LEDA1S35 HOFFMAN/LEDA20C	C
7	LOT	1 1 1	LIGHT SWITCH, SINGLE POLE SWITCH BOX COVER	HUBBELL: KELLEMS/HBL12211 (OAE) RACO/239 (OAE) RACO/800C (OAE)	C
8			NOT USED		
9			NOT USED		
10			NOT USED		
11			NOT USED		
12			NOT USED		
13			NOT USED		
14			NOT USED		
15			NOT USED		
16			NOT USED		
17			NOT USED		
18			NOT USED		
19			NOT USED		
20			NOT USED		
21			NOT USED		
22			NOT USED		
23			NOT USED		
24			NOT USED		
25			NOT USED		
26			NOT USED		
27			NOT USED		
28			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
51	EA	5	CIRCUIT BREAKER, 15 AMP	SCHNEIDER ELECTRIC/MG17436	C
52	EA	1	MULTI-POLE BREAKER FRONT MOUNTING KIT	SCHNEIDER ELECTRIC/14210	C
53	EA	1	DIN RAIL WITH SUPPORT	SCHNEIDER ELECTRIC/14211	C
54	EA	1	PROTECTIVE RELAY (487E-T1)	SCHWEITZER/0487E3X411XXCOX4H684XXX	C
55	EA	2	REVENUE METER (735-T1-1, 735-T1-2)	SCHWEITZER/0735VX20944CXXA4X16101XX	C
56	EA	1	LOCKOUT RELAY (86T1)	SCHWEITZER/RS86=DKB9	C
57	EA	2	RACK BEZEL, VERTICAL 735 & FT-1 TEST SWITCH	SCHWEITZER/915900216	C
58	EA	1	19" RACK BEZEL, FT-1 STYLE, SINGLE CUTOUT	SCHWEITZER/915900178	C
59	EA	1	19" RACK BEZEL, FT-1 STYLE, DUAL CUTOUT	SCHWEITZER/915900179	C
60	EA	1	WIRE LEAD TERMINATOR, 50 OHM	SCHWEITZER/915900036	C
61	EA	1	BNC TEE, F/M/F	SCHWEITZER/240-1799	C
62	EA	5	TEST SWITCH, FT-1 STYLE, (6-C, 4-P) (TS-P6-1, TS-P6-2, TS-P6-3, TS-P6-4, TS-P6-5)	ABB/C714B325G32	C
63	EA	15	SWITCH HANDLE INTERLOCKING BAR, 2-POSITION	ABB/1270547	C
64			NOT USED		
65			NOT USED		
66			NOT USED		
67			NOT USED		
68			NOT USED		
69			NOT USED		
70			NOT USED		
71			NOT USED		
72			NOT USED		
73			NOT USED		
74			NOT USED		
75			NOT USED		
76			NOT USED		
77			NOT USED		
78			NOT USED		
79			NOT USED		
80			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
101	EA	2	MOUNTING RAIL, PR30	ABB/1SNA 173 220 R0500	C
102	EA	12	END STOP, BAM2	ABB/1SNA 206 351 R1600	C
103	EA	4	END SECTION, FEM8	ABB/1SNA 113 373 R2600	C
104	EA	205	TERMINAL, SWITCH BLOCK, TYPE M6/8.SNB	ABB/1SNA 115 688 R2500	C
105	EA	4	END SECTION, FEM12S	ABB/1SNA 117 628 R2200	C
106	EA	12	TERMINAL, FUSE BLOCK, TYPE MB10/12.SF	ABB/1SNA 111 033 R0300	C
107	EA	12	FUSE, FU520, 3.15A	ABB/1SNA 008 289 R1600	C
108	EA	4	END SECTION, FEM6	ABB/1SNA 118 368 R1600	C
109	EA	4	TERMINAL BLOCK, FEED THRU, TYPE M6/8	ABB/1SNA 115 118 R1100	C
110	EA	2	TERMINAL MARKERS, VERTICAL, RC810, 1-100	ABB/1SNA 234 060 R0500	C
111	EA	2	TERMINAL MARKERS, VERTICAL, RC810, 101-200	ABB/1SNA 234 061 R2200	C
112	EA	7	TERMINAL BLOCK, 4 POLE, 30 AMP, SHORTING	MARATHON/1504 SC 01C WITH CC 1504	C
113	EA	4	TERMINAL BLOCK, 12 POLE, 30 AMP, STANDARD	MARATHON/1512 STD 01C	C
114			NOT USED		
115			NOT USED		
116			NOT USED		
117			NOT USED		
118			NOT USED		
119			NOT USED		
120			NOT USED		
121			NOT USED		
122			NOT USED		
123			NOT USED		
124			NOT USED		
125			NOT USED		
126			NOT USED		
127			NOT USED		
128			NOT USED		
129			NOT USED		
130			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

NOTES:

- 1 BILL OF MATERIAL QUANTITIES ARE ESTIMATED. ACTUAL QUANTITIES SHALL BE VERIFIED BY THE CONTRACTOR.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

ENG. STAMP

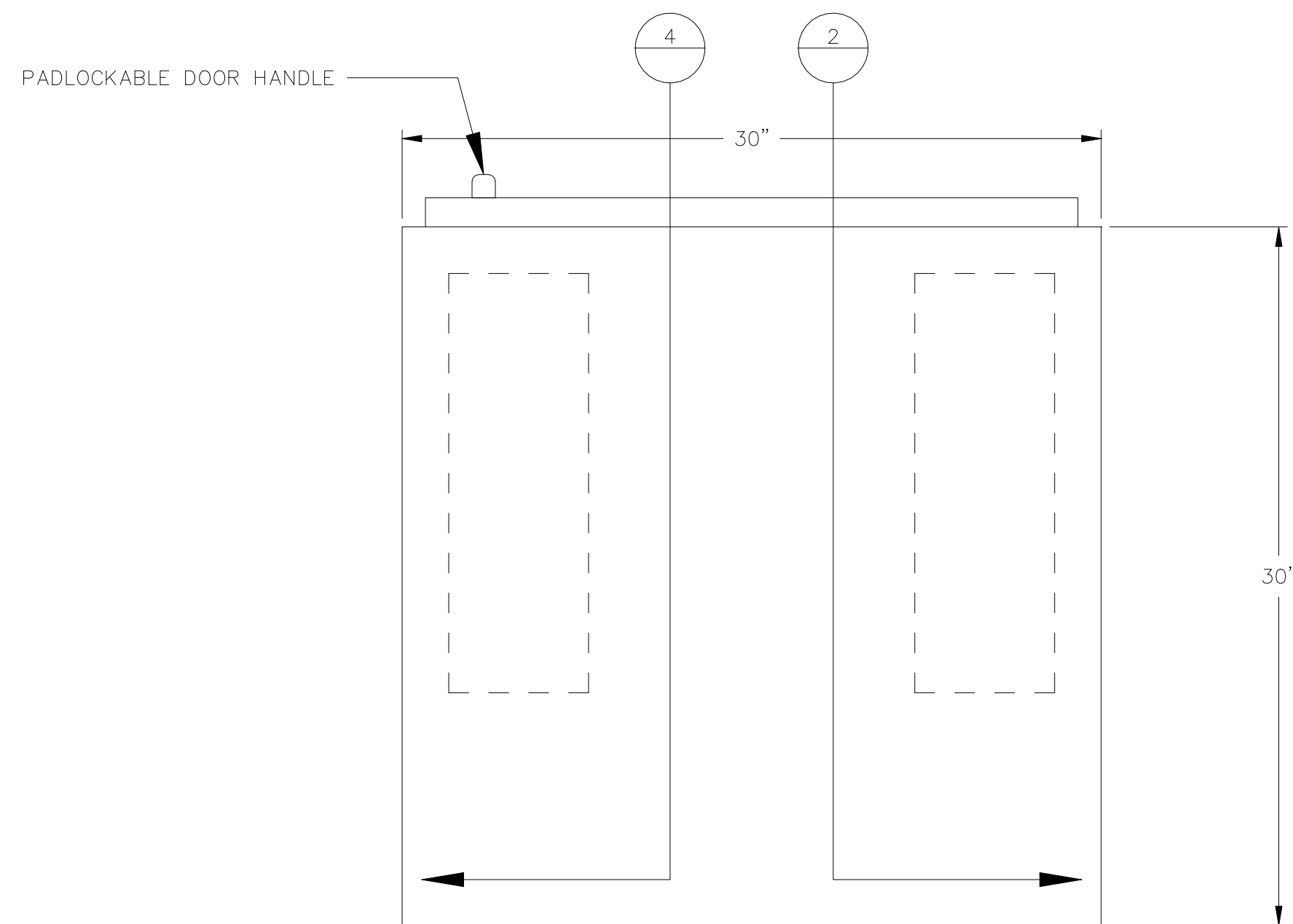
Matanuska Electric Association



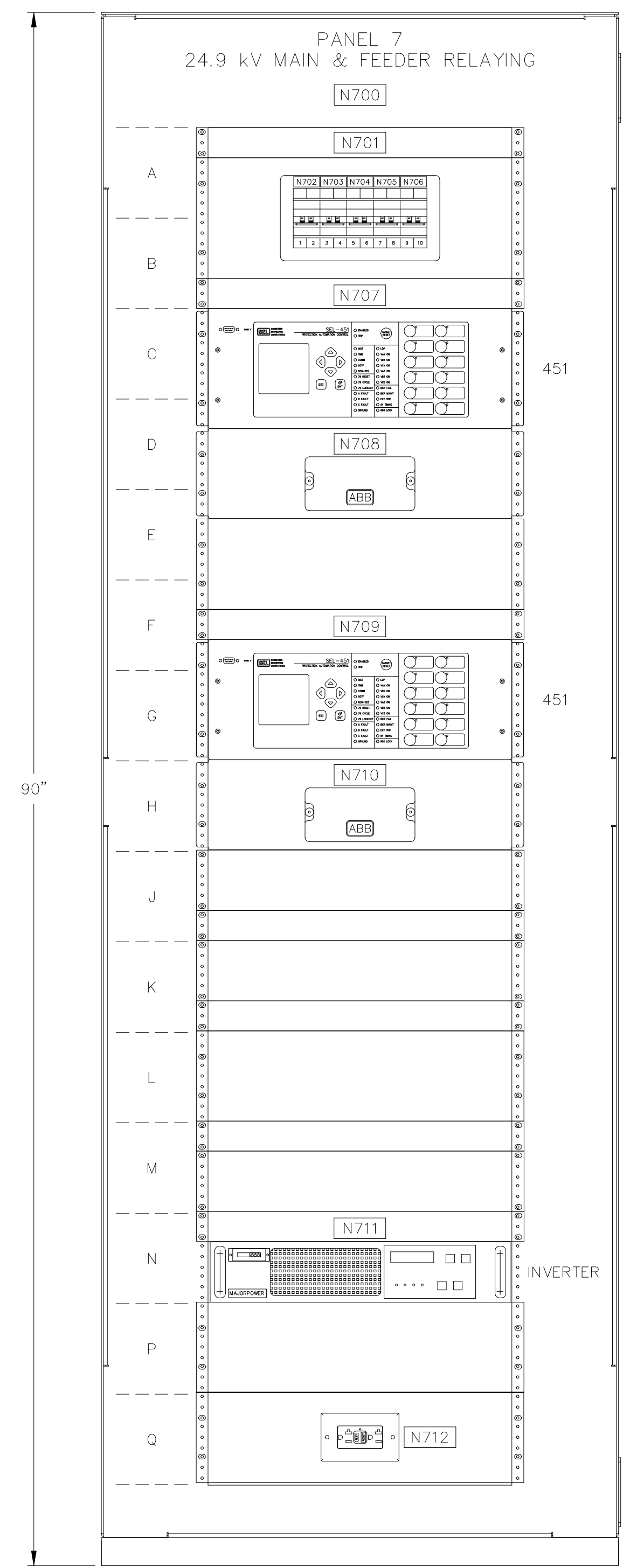
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Palmer, AK 99645
(907) 761-9300
WWW.MEA.COOP

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

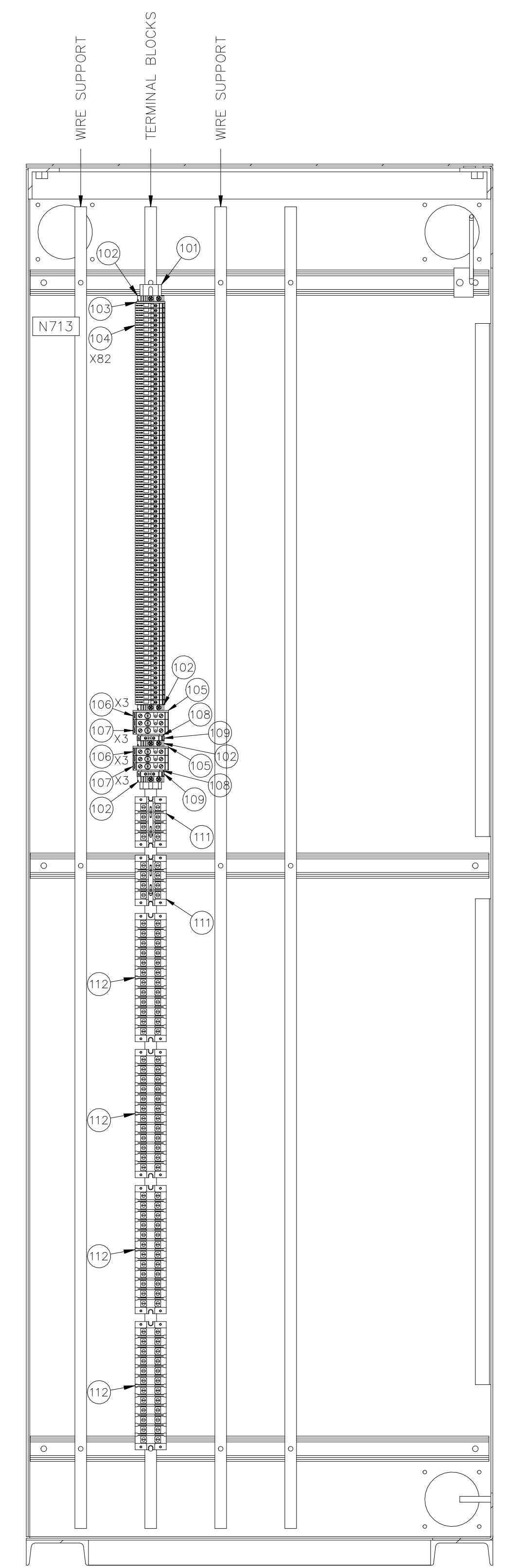
DOUGLAS SUBSTATION PANEL 6 BILL OF MATERIAL	
REF. DWG(S):	dass-el-4506_3.dwg
DRAWING NO.:	DGSS-EL-4506
SHEET	3 of 3



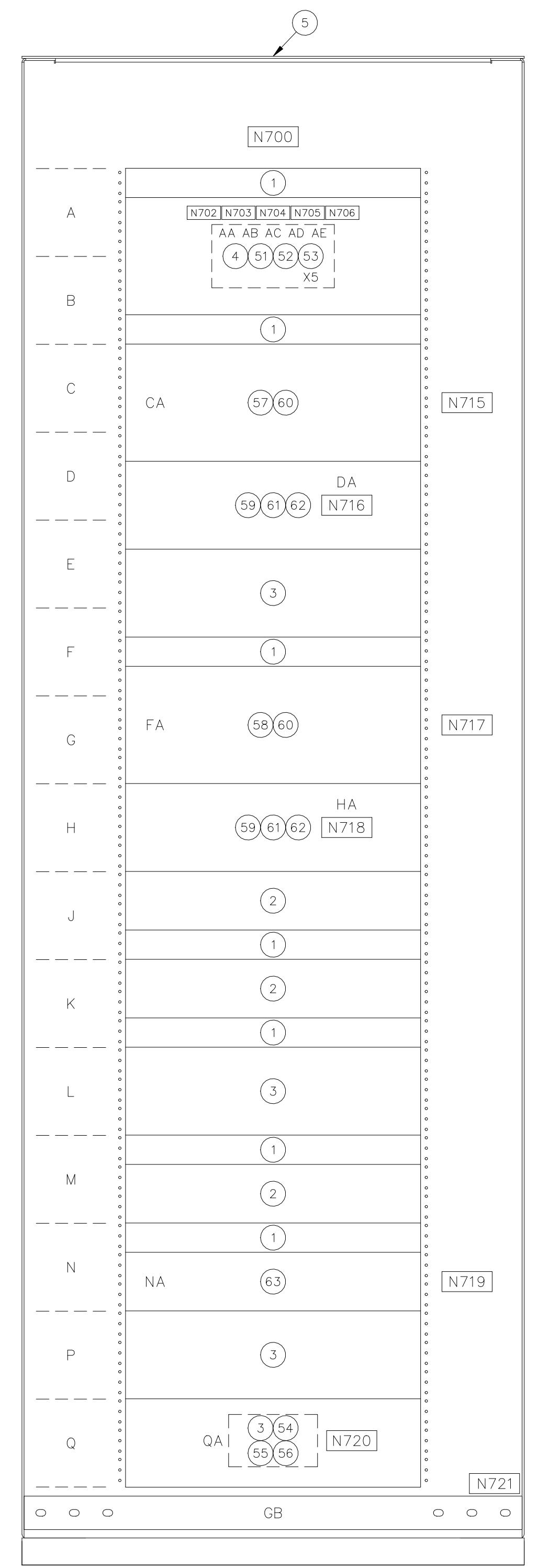
5 PANEL 7 (TOP)
N.T.S.



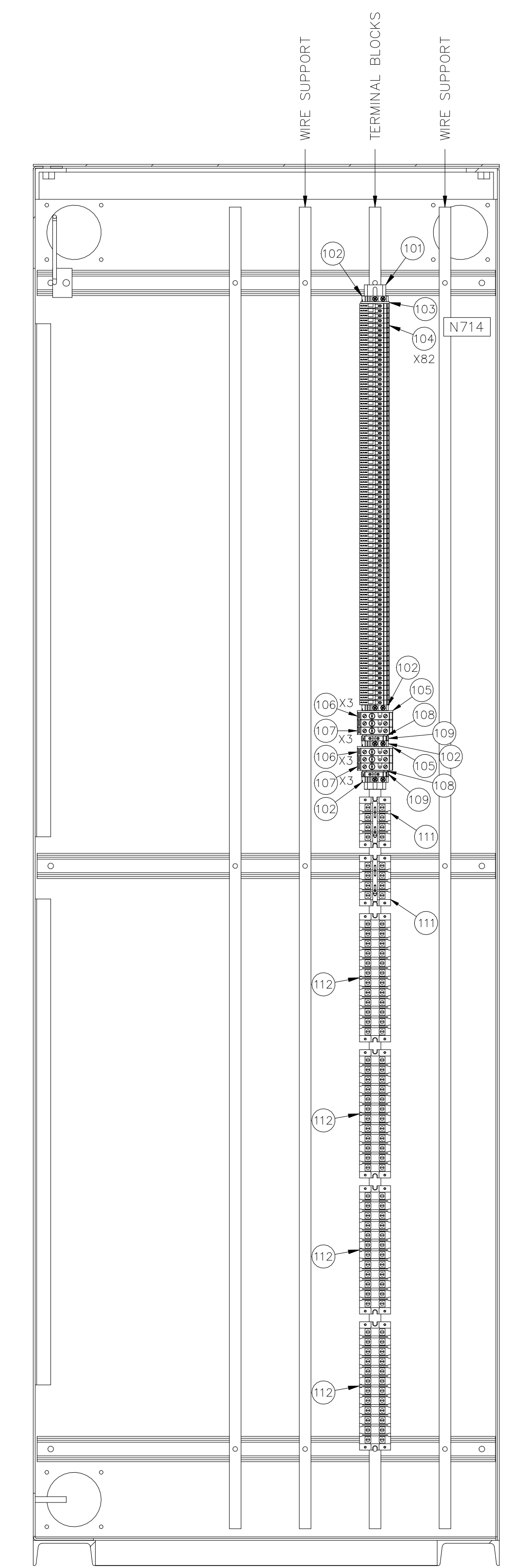
1 PANEL 7 (FRONT)
N.T.S.



2 PANEL 7 (A-SIDE)
N.T.S.



3 PANEL 7 (REAR)
N.T.S.



4 PANEL 7 (B-SIDE)
N.T.S.

- NOTES:
- 1 SEE REFERENCE 6 FOR NAMEPLATES (NXXX)
 - 2 SEE REFERENCE 7 FOR BILL OF MATERIAL.
 - 3 ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

ENG. STAMP

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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	PANEL 7 (FRONT)
2	-	PANEL 7 (A-SIDE)
3	-	PANEL 7 (REAR)
4	-	PANEL 7 (B-SIDE)
5	-	PANEL 7 (TOP)
6	DGSS-EL-4507/2	PANEL 7 NAMEPLATES
7	DGSS-EL-4507/3	PANEL 7 BILL OF MATERIAL

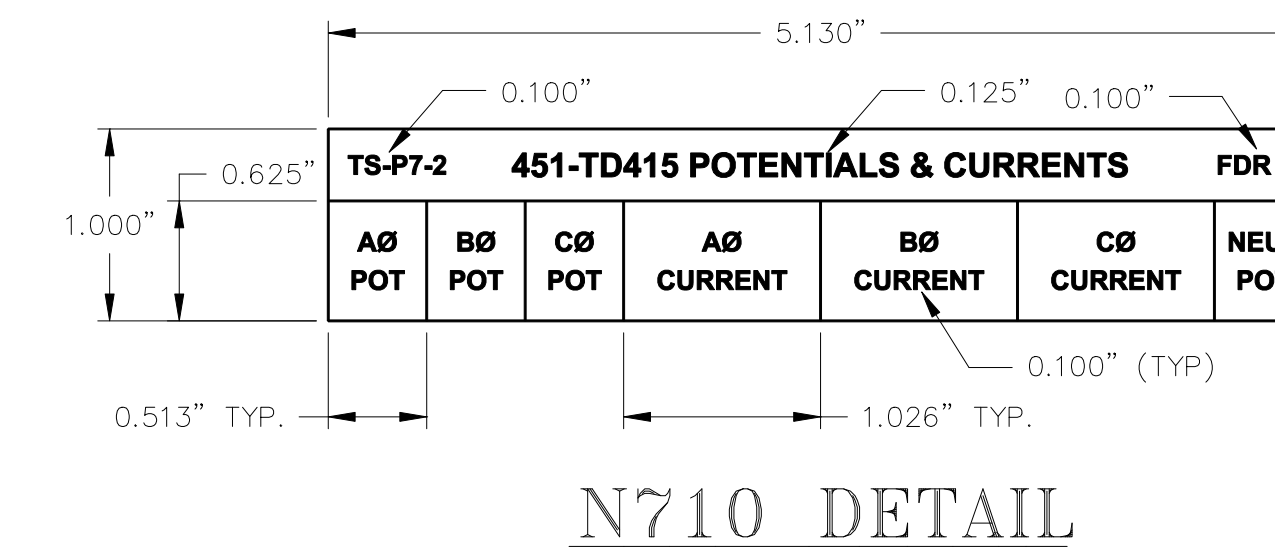
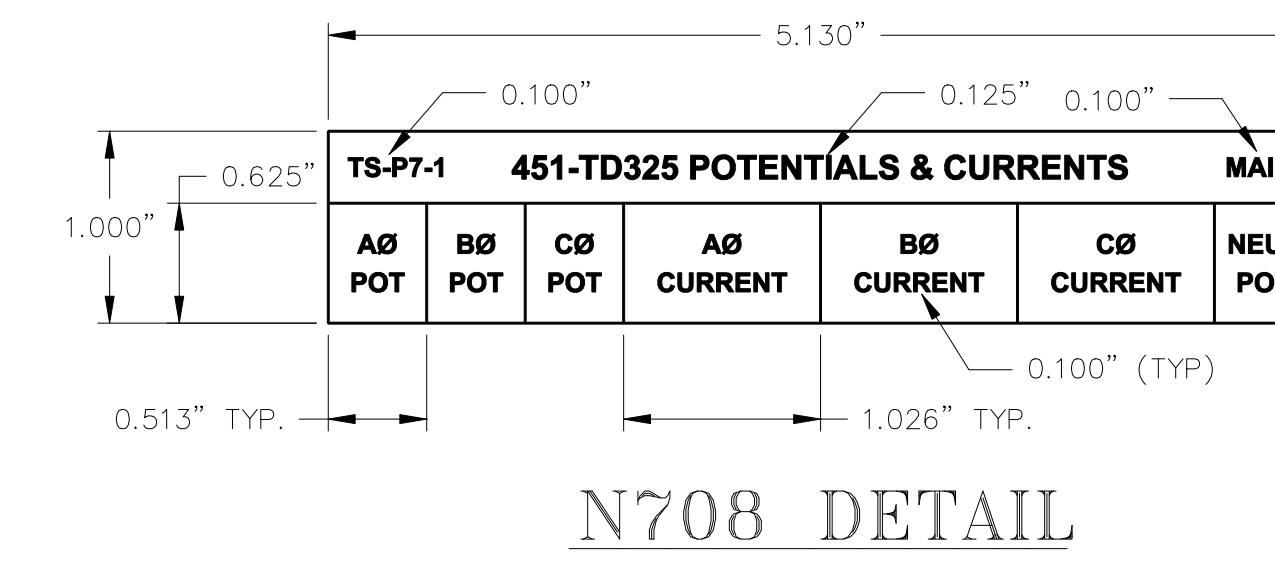
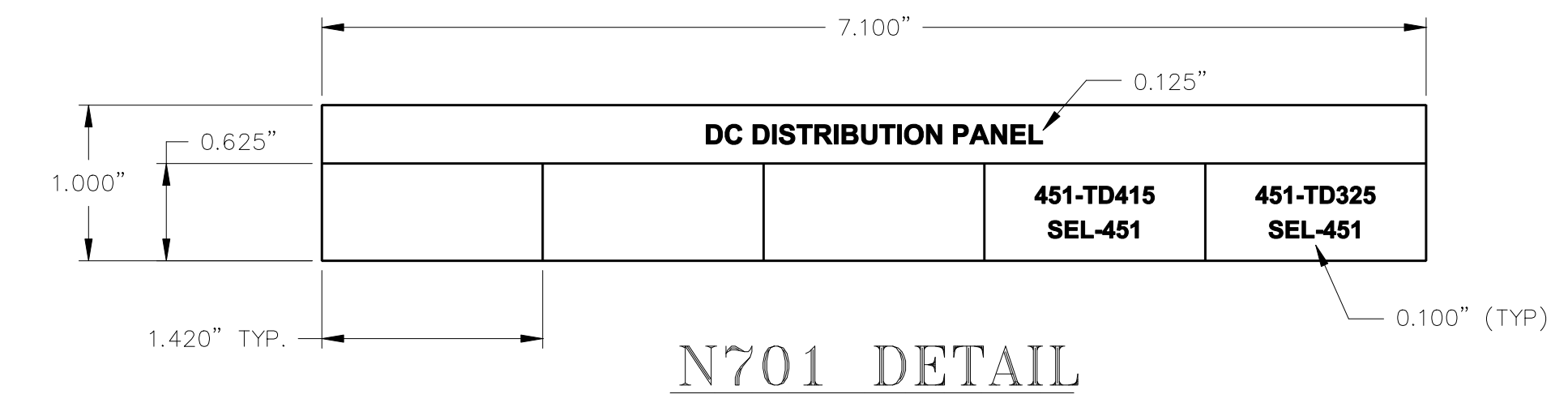
DRAWING NAME: DOUGLAS SUBSTATION
PANEL 7
ELEVATION

REF. DWG(S):

DRAWING NO.: DGSS-EL-4507

1 of 3

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N700	2	PANEL 7	24.9 kV MAIN BUS RELAYING	24.9 kV FEEDER 3 RELAYING	1-1/2 x 5	1/4
N701	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N702	2	AA			1/2 x 3/4	1/4
N703	2	AB			1/2 x 3/4	1/4
N704	2	AC			1/2 x 3/4	1/4
N705	2	AD			1/2 x 3/4	1/4
N706	2	AE			1/2 x 3/4	1/4
N707	1	451-TD325	24.9 kV MAIN BUS RELAY	SEL-451	1 x 3	1/8
N708	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N709	1	451-TD415	FEEDER NO. 1 RELAY	SEL-451	1 x 3	1/8
N710	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N711	1	MS2000A	125 VDC/120 VAC INVERTER	MAJORPOWER MS2000	1 x 3	1/8
N712	1	RE24	120 VAC	RECEPTACLE	1 x 3	1/8
N713	1	A			1/2 x 3/4	1/4
N714	1	B			1/2 x 3/4	1/4
N715	1	CA	451-TD325	SEL-451	1 x 1-1/2	1/8
N716	1	DA	TS-P7-1	451 TEST SW	1 x 1-1/2	1/8
N717	1	FA	451-TD415	SEL-451	1 x 1-1/2	1/8
N718	1	HA	TS-P7-2	451 TEST SW	1 x 1-1/2	1/8
N719	1	NA	MS2000A	INVERTER	1 x 1-1/2	1/8
N720	1	QA	RE24	RECEPTACLE	1 X 1-1/2	1/8
N721	1	GB	GROUND BUS		1 x 1-1/2	1/8
N722	1	WORK LIGHT			1 x 1-1/2	1/8



- NOTES:
- 1 ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
 - 2 ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
 - 3 ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
 - 4 ALL TEXT SHALL BE "ARIAL BOLD" FONT.
 - 5 EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
 - 6 ALL TEXT SHALL BE UPPER CASE.
 - 7 ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		JOB #: MEA W.O. EN16-3.2	
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		ENG. STAMP	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

Matanuska Electric Association

163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
WWW.MEA.COOP

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION
PANEL 7
NAMEPLATES

dass-el-4507_2.dwg

REF. DWG(S):
DRAWING NO.: DGSS-EL-4507

SHEET 2 OF 3

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
1	EA	6	BLANK FILLER PANEL, METALLIC GREY, 1U	BUD/PA-1101-MG (OAE)	C
2	EA	3	BLANK FILLER PANEL, METALLIC GREY, 2U	BUD/PA-1102-MG (OAE)	C
3	EA	5	BLANK FILLER PANEL, METALLIC GREY, 3U	BUD/PA-1103-MG (OAE)	C
4	EA	1	BLANK FILLER PANEL, METALLIC GREY, 4U	BUD/PA-1104-MG (OAE)	C
5	EA	1	RELAY CABINET WITH DOOR AND COPPER GROUND BUS	TBD	C
6	LOT	1 1 1	LED ENCLOSURE LIGHT LIGHT CABLE ASSEMBLY, 120 VAC	HOFFMAN: HOFFMAN/LEDA1S35 HOFFMAN/LEDA20C	C
7	LOT	1 1 1	LIGHT SWITCH, SINGLE POLE SWITCH BOX COVER	HUBBELL: KELLEMS/HBL12211 (OAE) RACO/239 (OAE) RACO/800C (OAE)	C
8			NOT USED		
9			NOT USED		
10			NOT USED		
11			NOT USED		
12			NOT USED		
13			NOT USED		
14			NOT USED		
15			NOT USED		
16			NOT USED		
17			NOT USED		
18			NOT USED		
19			NOT USED		
20			NOT USED		
21			NOT USED		
22			NOT USED		
23			NOT USED		
24			NOT USED		
25			NOT USED		
26			NOT USED		
27			NOT USED		
28			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
51	EA	5	CIRCUIT BREAKER, 15 AMP	SCHNEIDER ELECTRIC/MG17436	C
52	EA	1	MULTI-POLE BREAKER FRONT MOUNTING KIT	SCHNEIDER ELECTRIC/14210	C
53	EA	1	DIN RAIL WITH SUPPORT	SCHNEIDER ELECTRIC/14211	C
54	EA	1	RECEPTACLE, 125V, 20A, DUPLEX, GFI (RE23)	HUBBELL-KELLEMS/GFR53625GI	C
55	EA	1	COVER PLATE, 1-GANG, STAINLESS STEEL	HUBBELL-KELLEMS/SS26 (OAE)	C
56	EA	1	SINGLE GANG BOX, ALUMINUM	HUBBELL-RACO/5386-0 (OAE)	C
57	EA	1	PROTECTIVE RELAY (451-TD325)	SCHWEITZER/0451541EXCOX4H384XXXX	C
58	EA	1	PROTECTIVE RELAY (451-TD415)	SCHWEITZER/0451541DXCOX4H384XXXX	C
59	EA	2	19" RACK BEZEL, FT-1 STYLE, SINGLE CUTOUT	SCHWEITZER/915900178	C
60	EA	2	BNC TEE, F/M/F	SCHWEITZER/240-1799	C
61	EA	2	TEST SWITCH, FT-1 STYLE, (6-C, 4-P) (TS-P7-1, TS-P7-2)	ABB/C714B325G32	C
62	EA	6	SWITCH HANDLE INTERLOCKING BAR, 2-POSITION	ABB/1270547	C
63	EA	1	POWER INVERTER, 125 VDC/120 VAC/2 KVA (MS2000A)	MAJORPOWER/MAJORSINE2000-125-2U WITH SNMP	C
64			NOT USED		
65			NOT USED		
66			NOT USED		
67			NOT USED		
68			NOT USED		
69			NOT USED		
70			NOT USED		
71			NOT USED		
72			NOT USED		
73			NOT USED		
74			NOT USED		
75			NOT USED		
76			NOT USED		
77			NOT USED		
78			NOT USED		
79			NOT USED		
80			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
101	EA	2	MOUNTING RAIL, PR30	ABB/1SNA 173 220 R0500	C
102	EA	8	END STOP, BAM2	ABB/1SNA 206 351 R1600	C
103	EA	2	END SECTION, FEM8	ABB/1SNA 113 373 R2600	C
104	EA	164	TERMINAL, SWITCH BLOCK, TYPE M6/8.SNB	ABB/1SNA 115 688 R2500	C
105	EA	4	END SECTION, FEM12S	ABB/1SNA 117 628 R2200	C
106	EA	12	TERMINAL, FUSE BLOCK, TYPE MB10/12.SF	ABB/1SNA 111 033 R0300	C
107	EA	12	FUSE, FU520, 3.15A	ABB/1SNA 008 289 R1600	C
108	EA	4	END SECTION, FEM6	ABB/1SNA 118 368 R1600	C
109	EA	4	TERMINAL BLOCK, FEED THRU, TYPE M6/8	ABB/1SNA 115 118 R1100	C
110	EA	2	TERMINAL MARKERS, VERTICAL, RCB10, 1-100	ABB/1SNA 234 060 R0500	C
111	EA	4	TERMINAL BLOCK, 4 POLE, 30 AMP, SHORTING	MARATHON/1504 SC 01C WITH CC 1504	C
112	EA	8	TERMINAL BLOCK, 12 POLE, 30 AMP, STANDARD	MARATHON/1512 STD 01C	C
113			NOT USED		
114			NOT USED		
115			NOT USED		
116			NOT USED		
117			NOT USED		
118			NOT USED		
119			NOT USED		
120			NOT USED		
121			NOT USED		
122			NOT USED		
123			NOT USED		
124			NOT USED		
125			NOT USED		
126			NOT USED		
127			NOT USED		
128			NOT USED		
129			NOT USED		
130			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

NOTES:

- 1 BILL OF MATERIAL QUANTITIES ARE ESTIMATED. ACTUAL QUANTITIES SHALL BE VERIFIED BY THE CONTRACTOR.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

ENG. STAMP

Matanuska Electric Association



163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

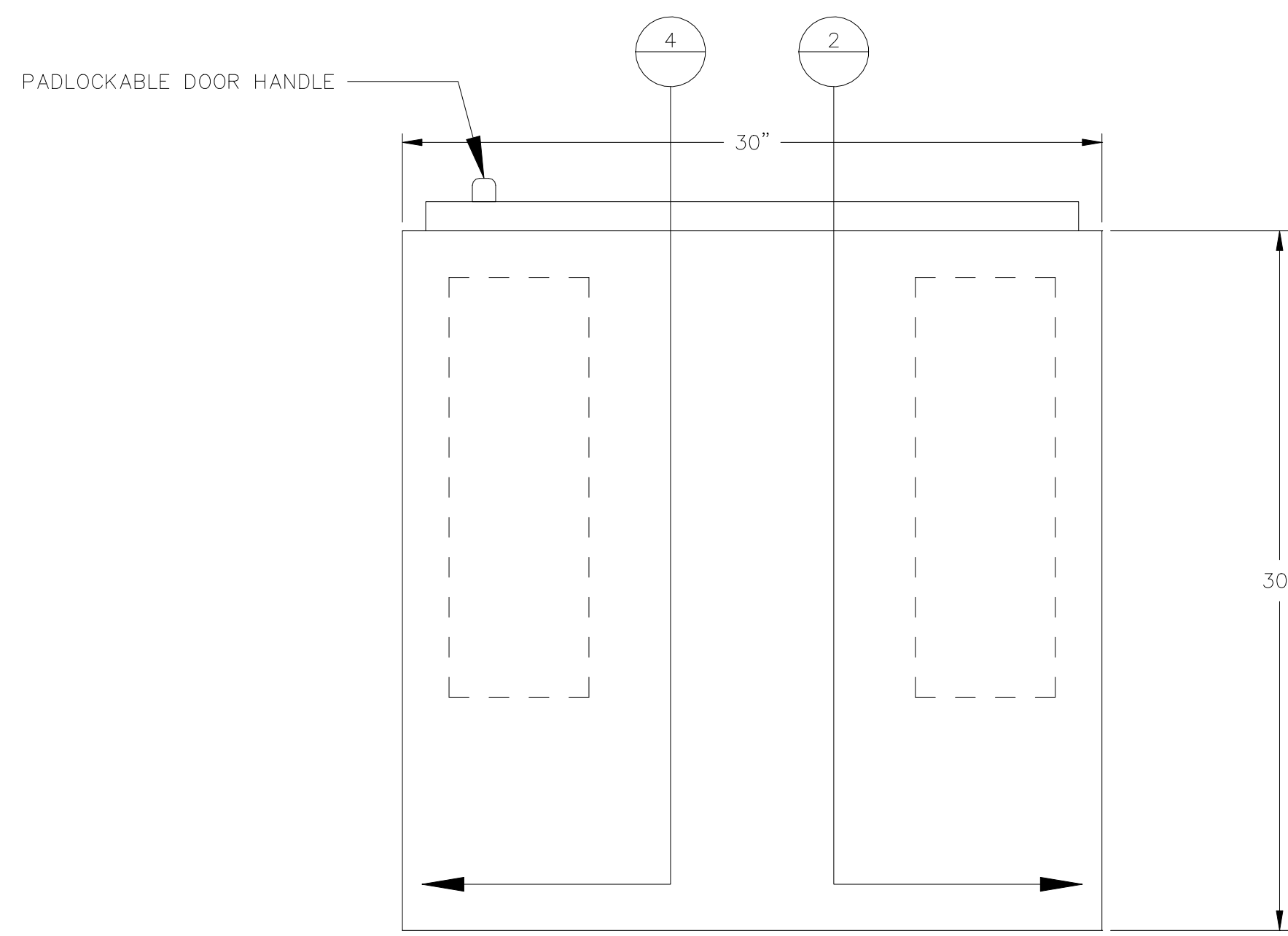
DRAWING NAME: DOUGLAS SUBSTATION
PANEL 7
BILL OF MATERIAL

REF. DWG(S):

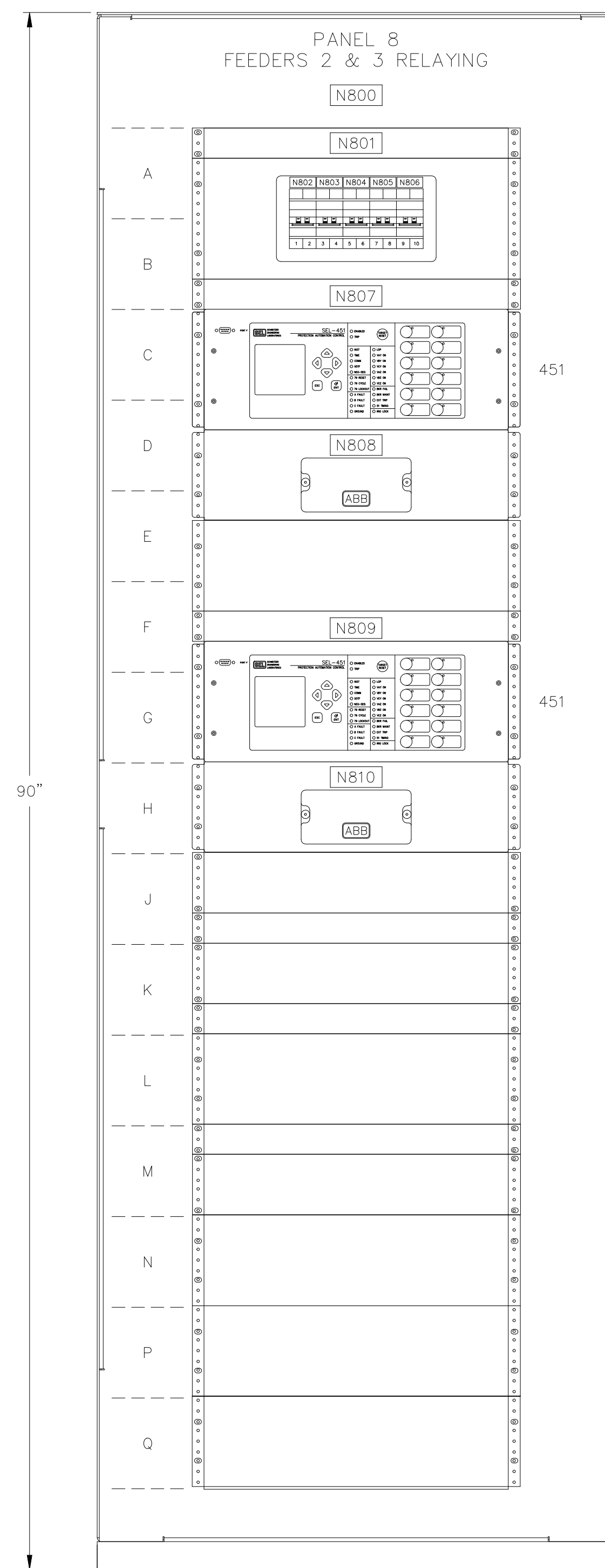
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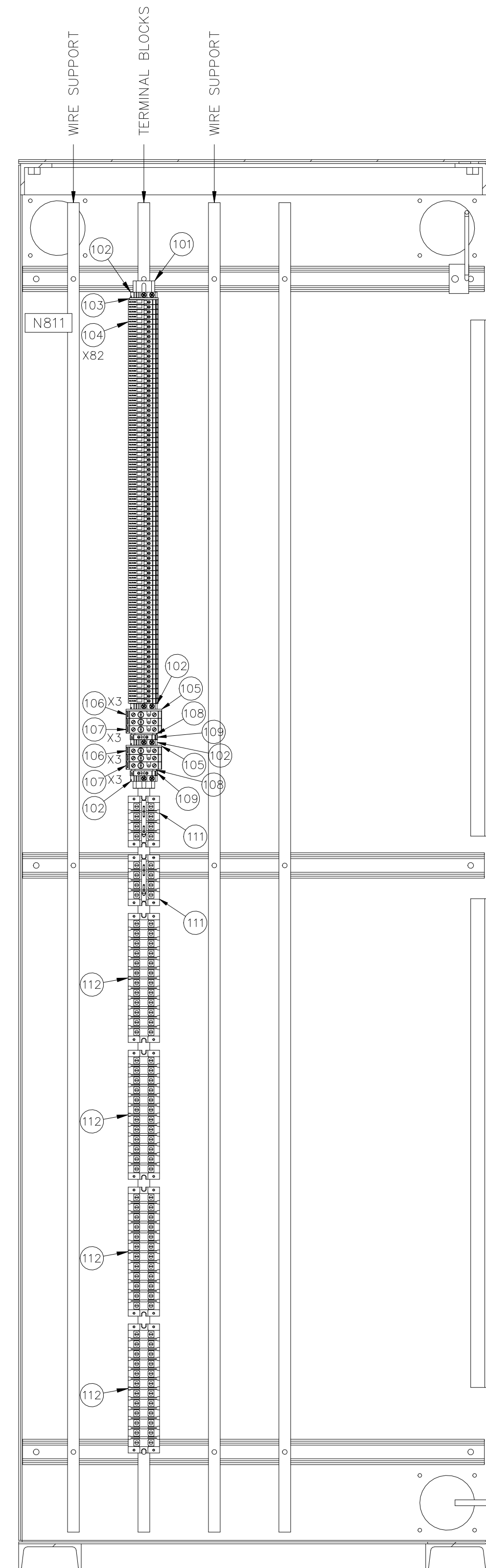
SHEET 3 OF 3



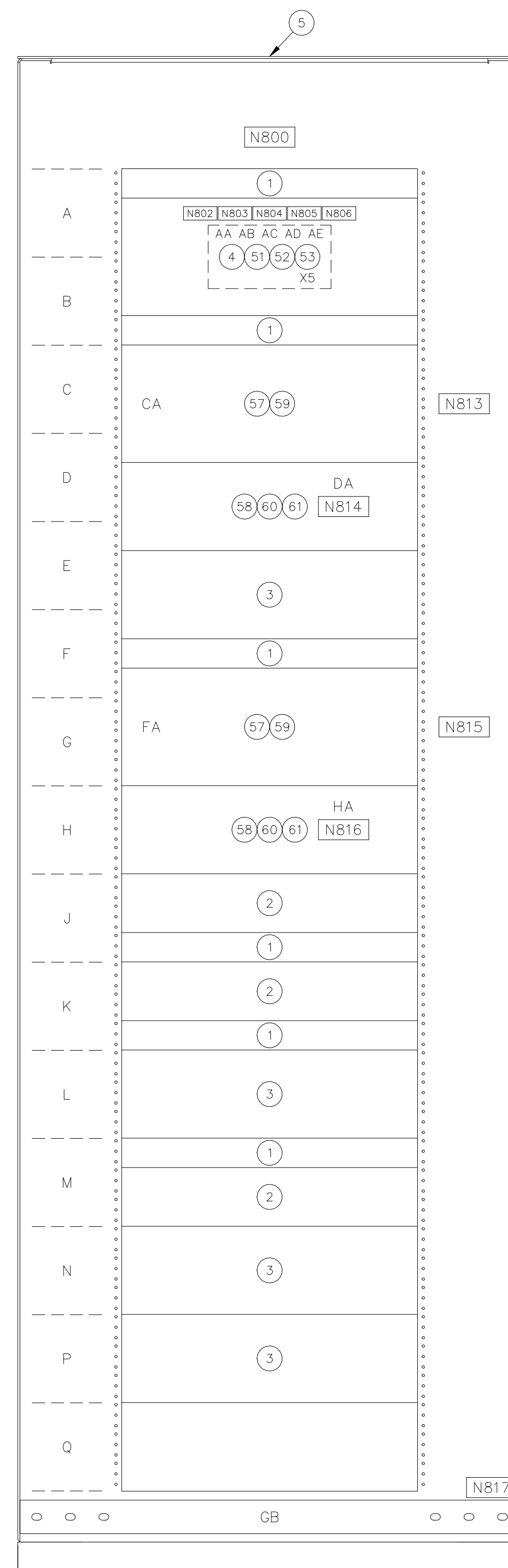
5 PANEL 8 (TOP)
N.T.S.



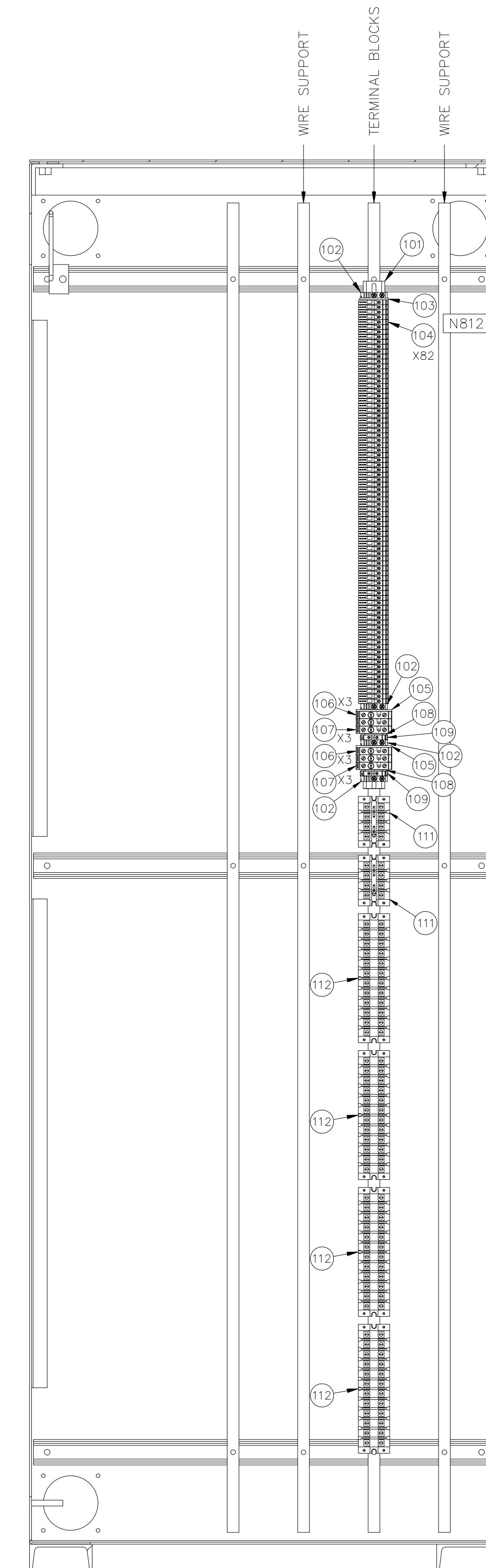
1 PANEL 8 (FRONT)
N.T.S.



2 PANEL 8 (A-SIDE)
N.T.S.



3 PANEL 8 (REAR)
N.T.S.



4 PANEL 8 (B-SIDE)
N.T.S.

- NOTES:
- SEE REFERENCE 6 FOR NAMEPLATES (NXXX)
 - SEE REFERENCE 7 FOR BILL OF MATERIAL.
 - ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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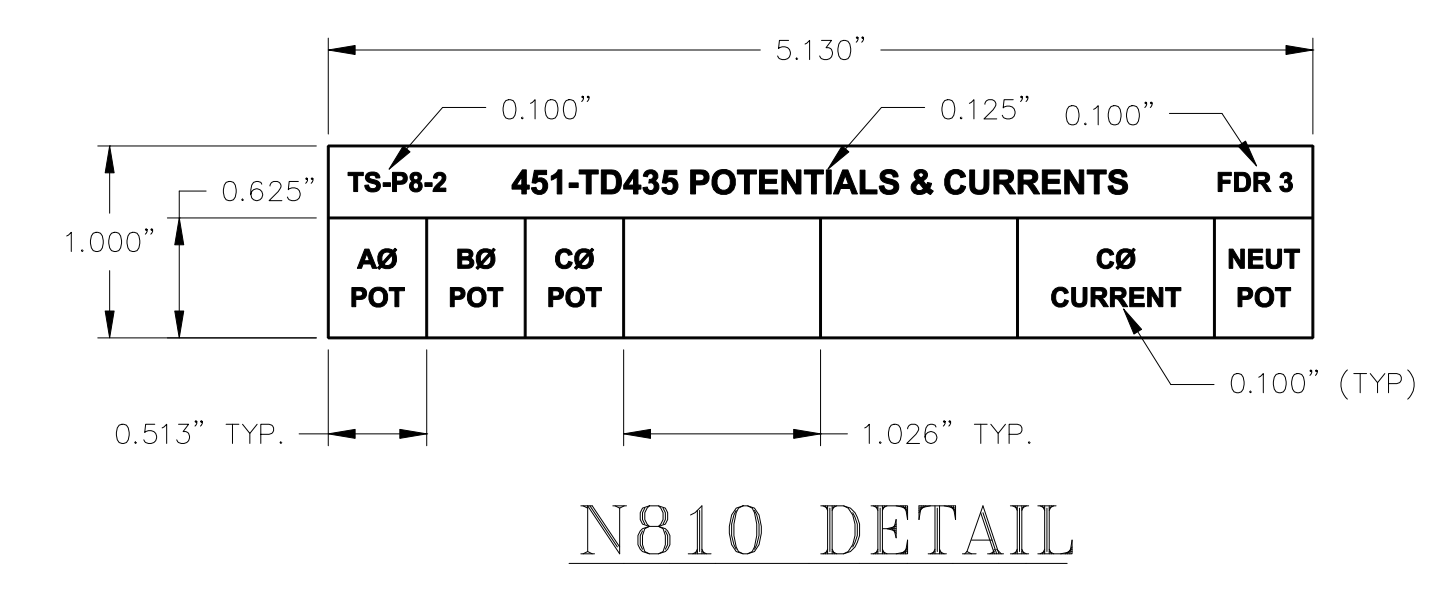
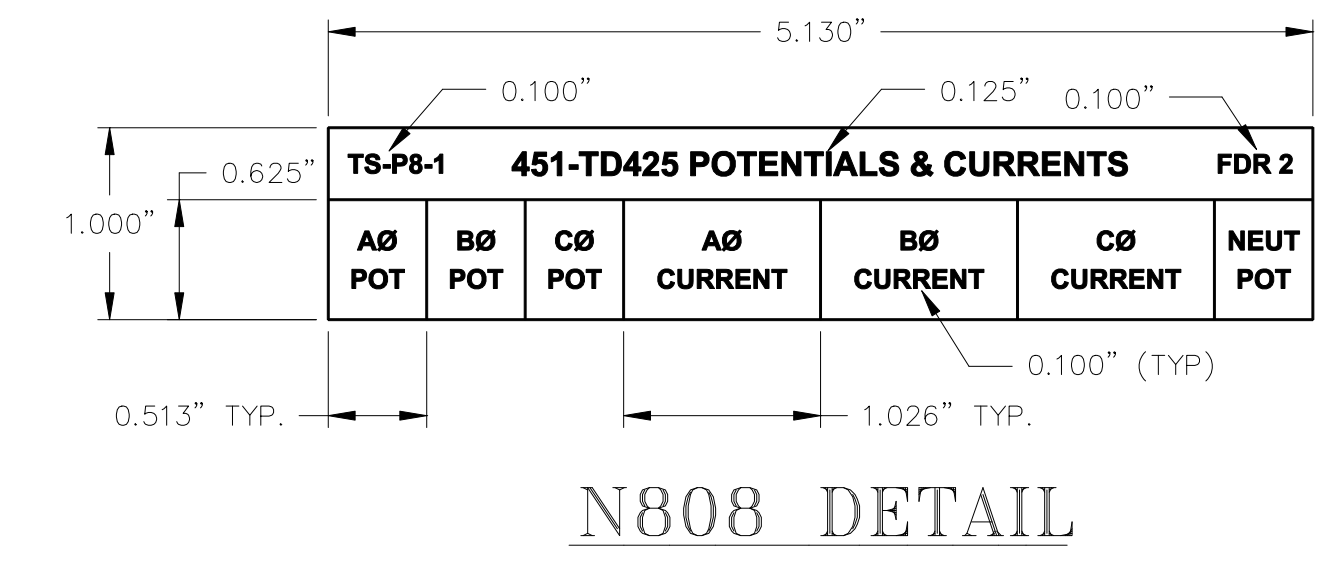
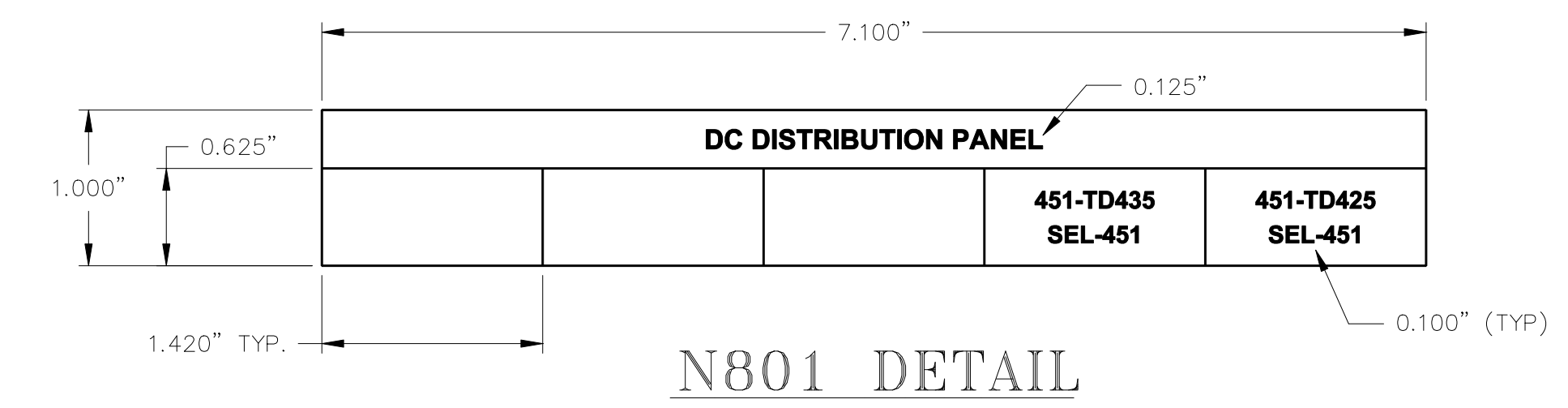
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	PANEL 8 (FRONT)
2	-	PANEL 8 (A-SIDE)
3	-	PANEL 8 (REAR)
4	-	PANEL 8 (B-SIDE)
5	-	PANEL 8 (TOP)
6	DGSS-EL-4508/2	PANEL 8 NAMEPLATES
7	DGSS-EL-4508/3	PANEL 8 BILL OF MATERIAL

DRAWING NAME:	DOUGLAS SUBSTATION PANEL 8 ELEVATION
REF. DWG(S):	
DRAWING NO.:	DGSS-EL-4508

dass-el-4508_1.dwg

SHEET 1 OF 3

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N800	2	PANEL 8	24.9 kV FEEDERS 2 & 3 RELAYING		1-1/2 x 5	1/4
N801	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N802	2	AA			1/2 x 3/4	1/4
N803	2	AB			1/2 x 3/4	1/4
N804	2	AC			1/2 x 3/4	1/4
N805	2	AD			1/2 x 3/4	1/4
N806	2	AE			1/2 x 3/4	1/4
N807	1	451-TD425	FEEDER NO. 2 RELAY	SEL-451	1 x 3	1/8
N808	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N809	1	451-TD435	FEEDER NO. 3 RELAY	SEL-451	1 x 3	1/8
N810	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N811	1	A			1/2 x 3/4	1/4
N812	1	B			1/2 x 3/4	1/4
N813	1	CA	451-TD425	SEL-451	1 x 1-1/2	1/8
N814	1	DA	TS-P8-1	451 TEST SW	1 x 1-1/2	1/8
N815	1	FA	451-TD435	SEL-451	1 x 1-1/2	1/8
N816	1	HA	TS-P8-2	451 TEST SW	1 x 1-1/2	1/8
N817	1	GB	GROUND BUS		1 x 1-1/2	1/8
N818	1	WORK LIGHT			1 x 1-1/2	1/8



- NOTES:
- 1 ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
 - 2 ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
 - 3 ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
 - 4 ALL TEXT SHALL BE "ARIAL BOLD" FONT.
 - 5 EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
 - 6 ALL TEXT SHALL BE UPPER CASE.
 - 7 ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION
PANEL 8
NAMEPLATES

REF. DWG(S):

DRAWING NO.: DGSS-EL-4508

dass-el-4508_2.dwg

SHEET 2 OF 3

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
1	EA	6	BLANK FILLER PANEL, METALLIC GREY, 1U	BUD/PA-1101-MG (OAE)	C
2	EA	3	BLANK FILLER PANEL, METALLIC GREY, 2U	BUD/PA-1102-MG (OAE)	C
3	EA	5	BLANK FILLER PANEL, METALLIC GREY, 3U	BUD/PA-1103-MG (OAE)	C
4	EA	1	BLANK FILLER PANEL, METALLIC GREY, 4U	BUD/PA-1104-MG (OAE)	C
5	EA	1	RELAY CABINET WITH DOOR AND COPPER GROUND BUS	TBD	C
6	LOT	1 1 1	LED ENCLOSURE LIGHT LIGHT CABLE ASSEMBLY, 120 VAC	HOFFMAN: HOFFMAN/LEDA1S35 HOFFMAN/LEDA20C	C
7	LOT	1 1 1	LIGHT SWITCH, SINGLE POLE SWITCH BOX COVER	HUBBELL: KELLEMS/HBL12211 (OAE) RACO/239 (OAE) RACO/800C (OAE)	C
8			NOT USED		
9			NOT USED		
10			NOT USED		
11			NOT USED		
12			NOT USED		
13			NOT USED		
14			NOT USED		
15			NOT USED		
16			NOT USED		
17			NOT USED		
18			NOT USED		
19			NOT USED		
20			NOT USED		
21			NOT USED		
22			NOT USED		
23			NOT USED		
24			NOT USED		
25			NOT USED		
26			NOT USED		
27			NOT USED		
28			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
51	EA	5	CIRCUIT BREAKER, 15 AMP	SCHNEIDER ELECTRIC/MG17436	C
52	EA	1	MULTI-POLE BREAKER FRONT MOUNTING KIT	SCHNEIDER ELECTRIC/14210	C
53	EA	1	DIN RAIL WITH SUPPORT	SCHNEIDER ELECTRIC/14211	C
54	EA	2	PROTECTIVE RELAY (451-TD425, 451-TD435)	SCHWEITZER/0451541DXC0X4H384XXXX	C
55	EA	2	19" RACK BEZEL, FT-1 STYLE, SINGLE CUTOFF	SCHWEITZER/915900178	C
56	EA	2	BNC TEE, F/M/F	SCHWEITZER/240-1799	C
57	EA	2	TEST SWITCH, FT-1 STYLE, (6-C, 4-P) (TS-P8-1, TS-P8-2)	ABB/C714B325G32	C
58	EA	6	SWITCH HANDLE INTERLOCKING BAR, 2-POSITION	ABB/1270547	C
59			NOT USED		
60			NOT USED		
61			NOT USED		
62			NOT USED		
63			NOT USED		
64			NOT USED		
65			NOT USED		
66			NOT USED		
67			NOT USED		
68			NOT USED		
69			NOT USED		
70			NOT USED		
71			NOT USED		
72			NOT USED		
73			NOT USED		
74			NOT USED		
75			NOT USED		
76			NOT USED		
77			NOT USED		
78			NOT USED		
79			NOT USED		
80			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
101	EA	2	MOUNTING RAIL, PR30	ABB/1SNA 173 220 R0500	C
102	EA	8	END STOP, BAM2	ABB/1SNA 206 351 R1600	C
103	EA	2	END SECTION, FEM8	ABB/1SNA 113 373 R2600	C
104	EA	164	TERMINAL, SWITCH BLOCK, TYPE M6/8.SNB	ABB/1SNA 115 688 R2500	C
105	EA	4	END SECTION, FEM12S	ABB/1SNA 117 628 R2200	C
106	EA	12	TERMINAL, FUSE BLOCK, TYPE MB10/12.SF	ABB/1SNA 111 033 R0300	C
107	EA	12	FUSE, FU520, 3.15A	ABB/1SNA 008 289 R1600	C
108	EA	4	END SECTION, FEM6	ABB/1SNA 118 368 R1600	C
109	EA	4	TERMINAL BLOCK, FEED THRU, TYPE M6/8	ABB/1SNA 115 118 R1100	C
110	EA	2	TERMINAL MARKERS, VERTICAL, RCB10, 1-100	ABB/1SNA 234 060 R0500	C
111	EA	4	TERMINAL BLOCK, 4 POLE, 30 AMP, SHORTING	MARATHON/1504 SC 01C WITH CC 1504	C
112	EA	8	TERMINAL BLOCK, 12 POLE, 30 AMP, STANDARD	MARATHON/1512 STD 01C	C
113			NOT USED		
114			NOT USED		
115			NOT USED		
116			NOT USED		
117			NOT USED		
118			NOT USED		
119			NOT USED		
120			NOT USED		
121			NOT USED		
122			NOT USED		
123			NOT USED		
124			NOT USED		
125			NOT USED		
126			NOT USED		
127			NOT USED		
128			NOT USED		
129			NOT USED		
130			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.


NOTES:

- 1 BILL OF MATERIAL QUANTITIES ARE ESTIMATED. ACTUAL QUANTITIES SHALL BE VERIFIED BY THE CONTRACTOR.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

ENG. STAMP

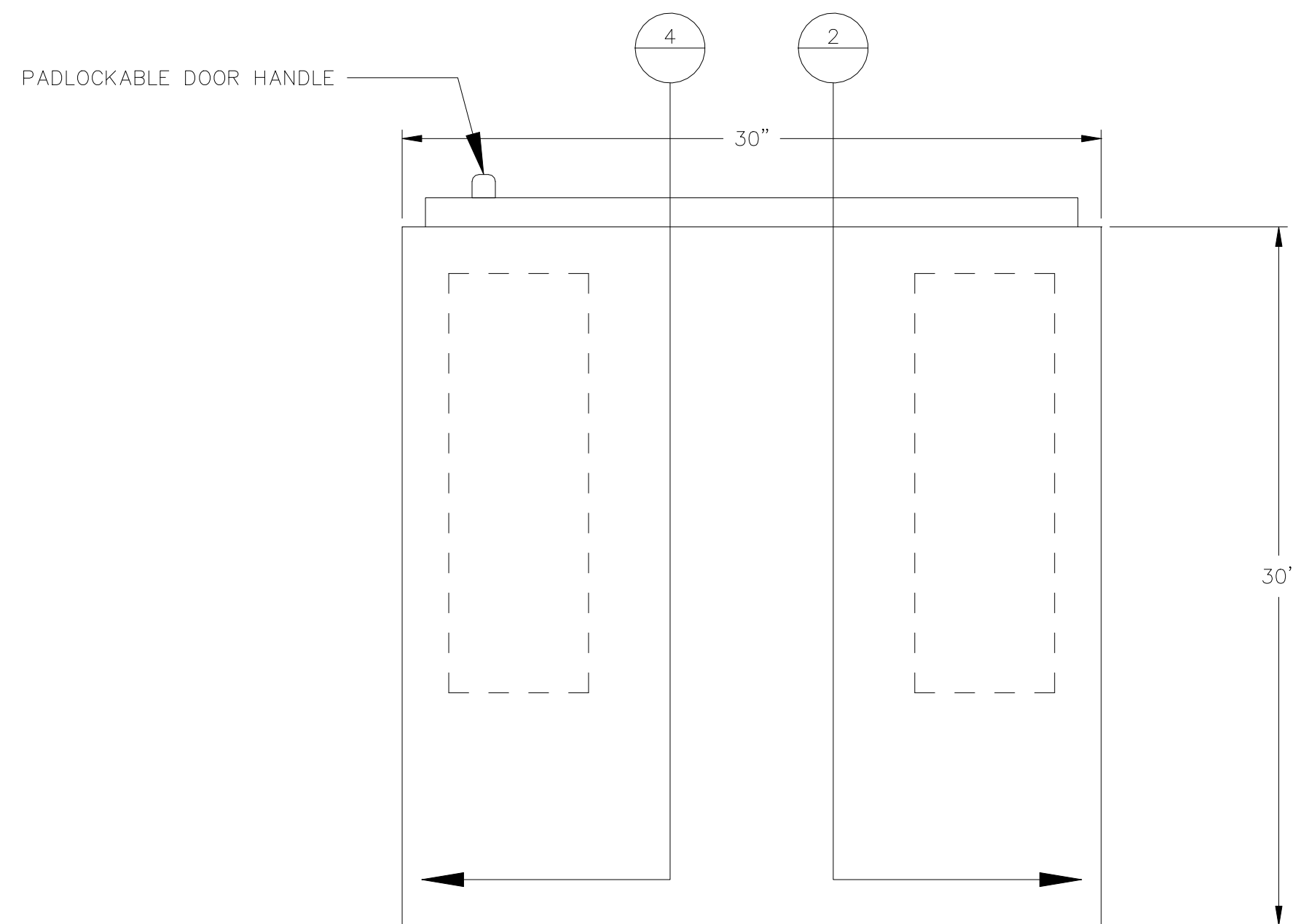
Matanuska Electric Association



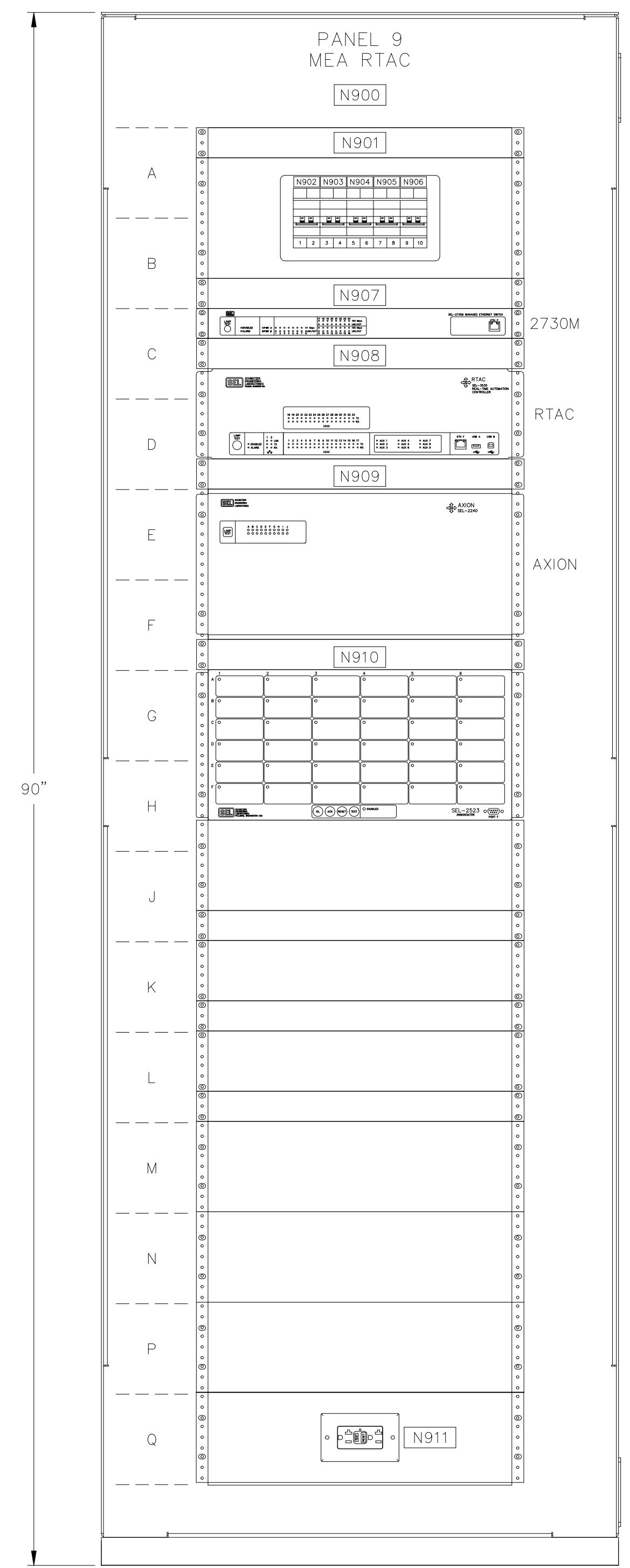
163 East Industrial Way
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

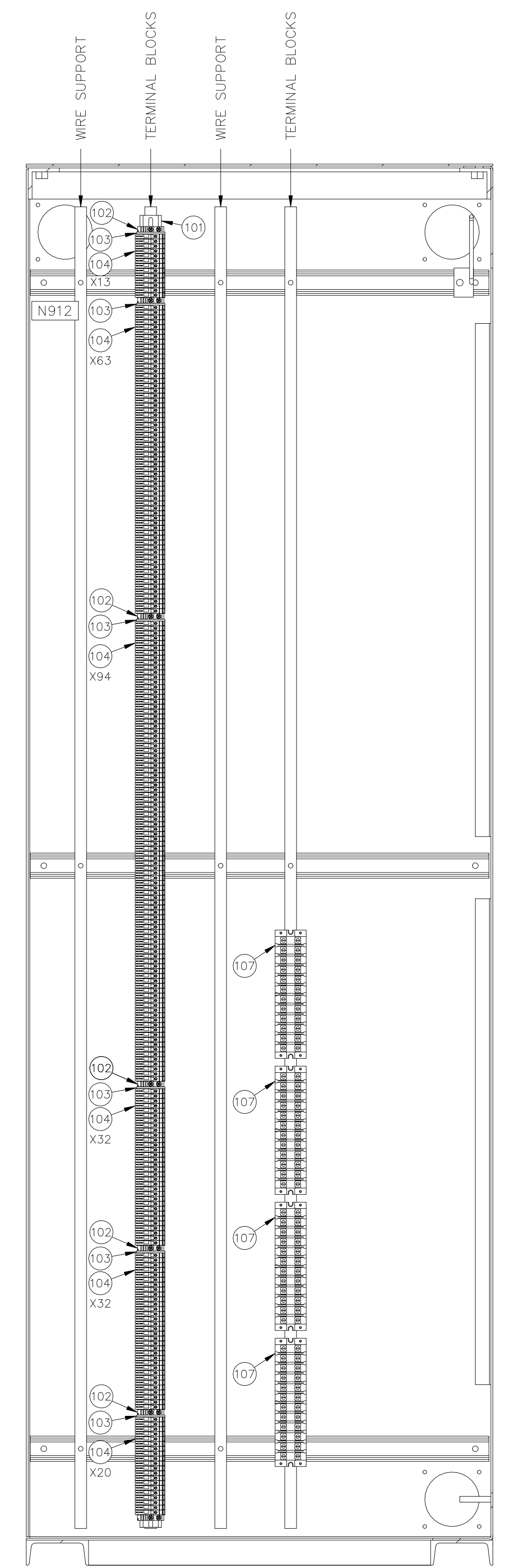
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REF. DWG(S):	dass-el-4508_3.dwg
DRAWING NO.:	DGSS-EL-4508
SHEET 3 of 3	



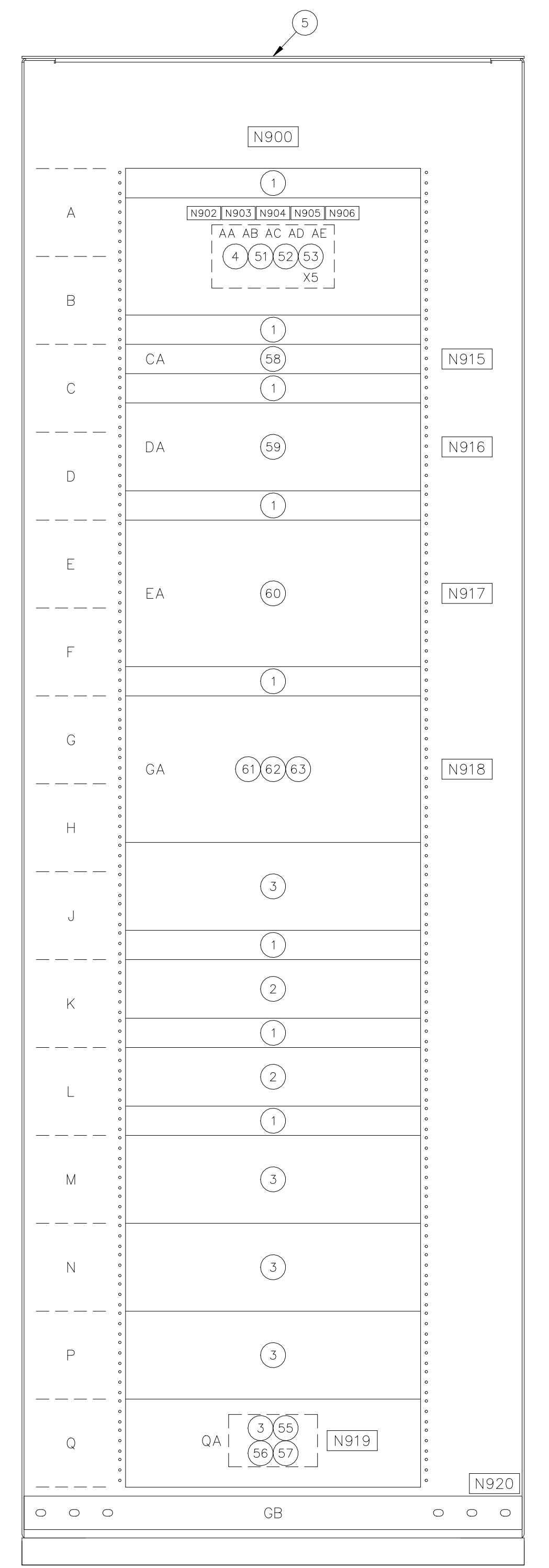
5 PANEL 9 (TOP)
N.T.S.



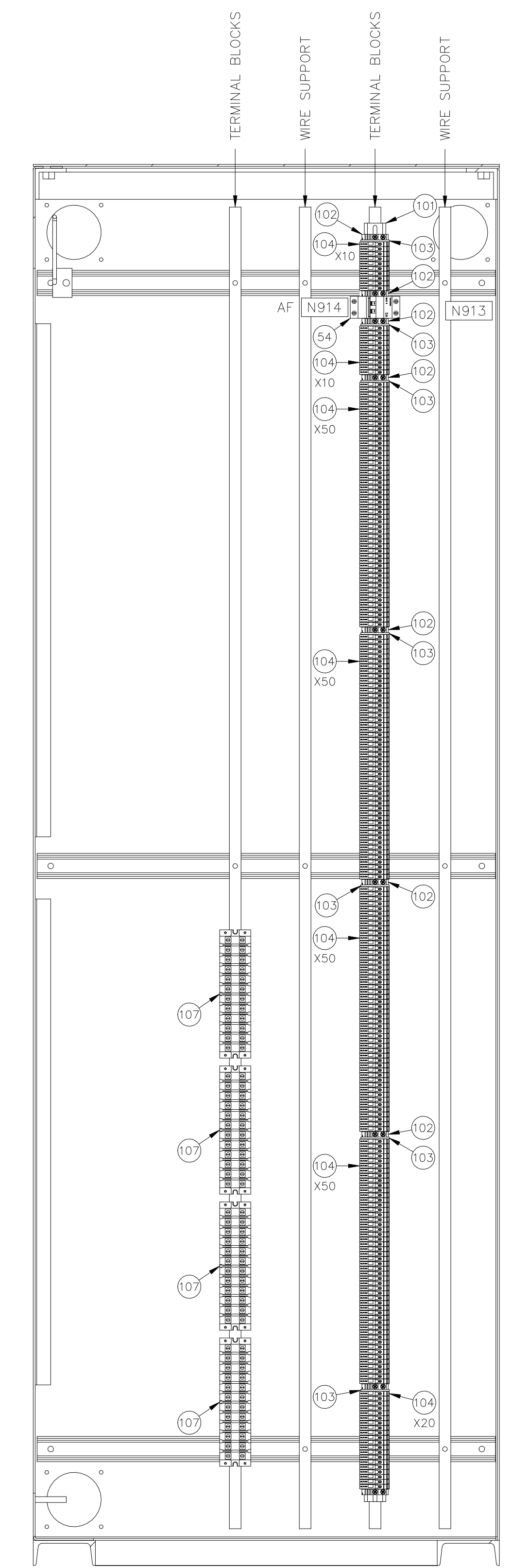
1 PANEL 9 (FRONT)
N.T.S.



2 PANEL 9 (A-SIDE)
N.T.S.



3 PANEL 9 (REAR)
N.T.S.



4 PANEL 9 (B-SIDE)
N.T.S.

NOTES:

1 SEE REFERENCE 6 FOR NAMEPLATES (NXXX)

2 SEE REFERENCE 7 FOR BILL OF MATERIAL.

3 ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS			
JOB #: MEA W.O. EN16-3.2		ENG. STAMP	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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163 East Industrial Way
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	PANEL 9 (FRONT)
2	-	PANEL 9 (A-SIDE)
3	-	PANEL 9 (REAR)
4	-	PANEL 9 (B-SIDE)
5	-	PANEL 9 (TOP)
6	DGSS-EL-4509/2	PANEL 9 NAMEPLATES
7	DGSS-EL-4509/3	PANEL 9 BILL OF MATERIAL

DRAWING NAME: DOUGLAS SUBSTATION
PANEL 9
ELEVATION

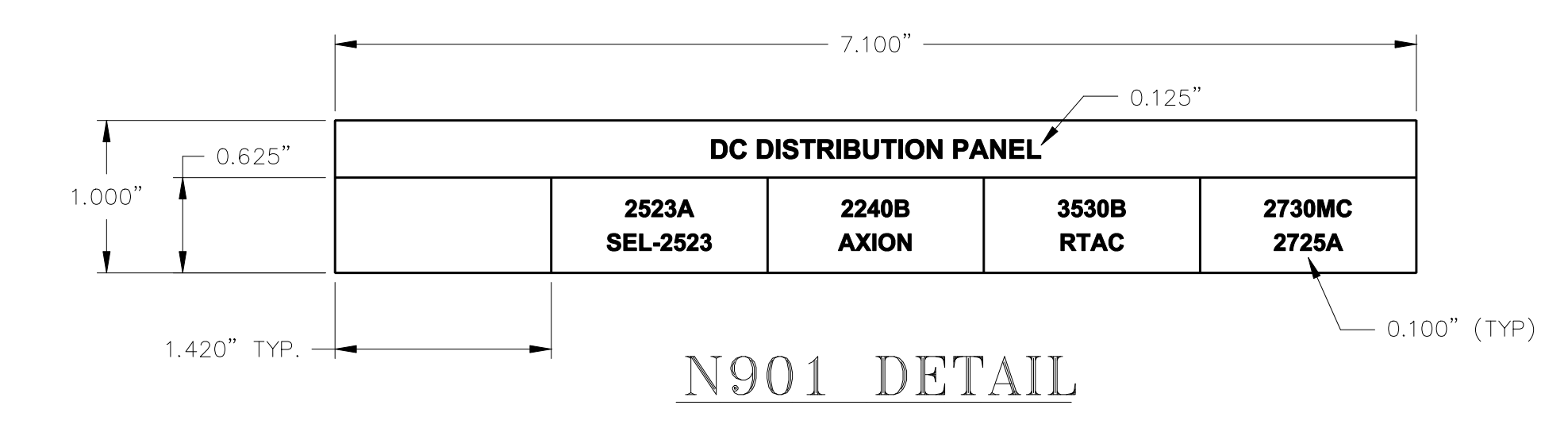
REF. DWG(S):

DRAWING NO.: DGSS-EL-4509

163-4509-1.dwg

SHEET 1 OF 3

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N900	2	PANEL 8	MEA RTAC		1-1/2 x 5	1/4
N901	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N902	2	AA			1/2 x 3/4	1/4
N903	2	AB			1/2 x 3/4	1/4
N904	2	AC			1/2 x 3/4	1/4
N905	2	AD			1/2 x 3/4	1/4
N906	2	AE			1/2 x 3/4	1/4
N907	1	2730MC	ETHERNET SWITCH	SEL-2730M	1 x 3	1/8
N908	1	3530B	RTAC	SEL-3530	1 x 3	1/8
N909	1	2240B	AXION	SEL-2240	1 x 3	1/8
N910	1	2523A	ANNUNCIATOR	SEL-2523	1 x 3	1/8
N911	1	RE25	120 VAC	RECEPTACLE	1 x 3	1/8
N912	1	A			1/2 x 3/4	1/4
N913	1	B			1/2 x 3/4	1/4
N914	1	AF			1/2 x 3/4	1/4
N915	1	CA	2730MC	SEL-2730M	1 X 1-1/2	1/8
N916	1	DA	3530B	SEL-3530	1 X 1-1/2	1/8
N917	1	EA	2240B	SEL-2240	1 X 1-1/2	1/8
N918	1	GA	2523A	SEL-2523	1 X 1-1/2	1/8
N919	1	QA	RE25	RECEPTACLE	1 X 1-1/2	1/8
N920	1	GB	GROUND BUS		1 x 1-1/2	1/8
N921	1	WORK LIGHT			1 x 1-1/2	1/8



- NOTES:
- ① ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
 - ② ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
 - ③ ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
 - ④ ALL TEXT SHALL BE "ARIAL BOLD" FONT.
 - ⑤ EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
 - ⑥ ALL TEXT SHALL BE UPPER CASE.
 - ⑦ ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		JOB #: MEA W.O. EN16-3.2	
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		ENG. STAMP	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

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163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION
PANEL 9
NAMEPLATES

dass-el-4509_2.dwg

DRAWING NO.: DGSS-EL-4509

SHEET 2 OF 3

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
1	EA	8	BLANK FILLER PANEL, METALLIC GREY, 1U	BUD/PA-1101-MG (OAE)	C
2	EA	2	BLANK FILLER PANEL, METALLIC GREY, 2U	BUD/PA-1102-MG (OAE)	C
3	EA	5	BLANK FILLER PANEL, METALLIC GREY, 3U	BUD/PA-1103-MG (OAE)	C
4	EA	1	BLANK FILLER PANEL, METALLIC GREY, 4U	BUD/PA-1104-MG (OAE)	C
5	EA	1	RELAY CABINET WITH DOOR AND COPPER GROUND BUS	TBD	C
6	LOT	1 1 1	LED ENCLOSURE LIGHT LIGHT CABLE ASSEMBLY, 120 VAC	HOFFMAN: HOFFMAN/LEDA1S35 HOFFMAN/LEDA20C	C
7	LOT	1 1 1	LIGHT SWITCH, SINGLE POLE SWITCH BOX COVER	HUBBELL: KELLEMS/HBL12211 (OAE) RACO/239 (OAE) RACO/800C (OAE)	C
8			NOT USED		
9			NOT USED		
10			NOT USED		
11			NOT USED		
12			NOT USED		
13			NOT USED		
14			NOT USED		
15			NOT USED		
16			NOT USED		
17			NOT USED		
18			NOT USED		
19			NOT USED		
20			NOT USED		
21			NOT USED		
22			NOT USED		
23			NOT USED		
24			NOT USED		
25			NOT USED		
26			NOT USED		
27			NOT USED		
28			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
51	EA	5	CIRCUIT BREAKER, 15 AMP	SCHNEIDER ELECTRIC/MG17436	C
52	EA	1	MULTI-POLE BREAKER FRONT MOUNTING KIT	SCHNEIDER ELECTRIC/14210	C
53	EA	1	DIN RAIL WITH SUPPORT	SCHNEIDER ELECTRIC/14211	C
54	EA	1	CIRCUIT BREAKER, 5 AMP	SCHNEIDER ELECTRIC/MG17434	C
55	EA	1	RECEPTACLE, 125V, 20A, DUPLEX, GFI (RE25)	HUBBELL-KELLEMS/GFR5362SGI	C
56	EA	1	COVER PLATE, 1-GANG, STAINLESS STEEL	HUBBELL-KELLEMS/SS26 (OAE)	C
57	EA	1	SINGLE GANG BOX, ALUMINUM	HUBBELL-RACO/5386-0 (OAE)	C
58	EA	1	ETHERNET SWITCH (2730MC)	SCHWEITZER/2730M0ARA1111AAAAX0	C
59	EA	1	REAL TIME AUTOMATION CONTROLLER (3530A)	SCHWEITZER/3530HB0DX211A0XXXXXX	C
60	LOT	1 1 2 2 2 4 1	AXION PLATFORM, SEL-2240 (2240B) AXION CHASSIS, SEL-2242 POWER COUPLER, SEL-2243 (SLOTS: A, B) I/O MODULE, 10 OUTPUTS, SEL-2244 (SLOTS: C, D) I/O MODULE, 16 OUTPUTS, SEL-2244 (SLOTS: E, F) I/O MODULE, 24 INPUTS, SEL-2244 (SLOTS: G, H, I, J) WETTING VOLTAGE JUMPER KIT, 24 JUMPERS, 4-PRONG	SCHWEITZER: SCHWEITZER/2242R1X0 SCHWEITZER/224311X0 SCHWEITZER/22443131X0 SCHWEITZER/22445151X0 SCHWEITZER/22442424X0 SCHWEITZER/915900240	C
61	EA	1	ANNUNCIATOR (2523A)	SCHWEITZER/252301H13A0A0XX	C
62	EA	1	WIRE LEAD TERMINATOR, 50 OHM	SCHWEITZER/915900036	C
63	EA	1	ETHERNET TRANSCEIVER	SCHWEITZER/2890M1X	C
64			NOT USED		
65			NOT USED		
66			NOT USED		
67			NOT USED		
68			NOT USED		
69			NOT USED		
70			NOT USED		
71			NOT USED		
72			NOT USED		
73			NOT USED		
74			NOT USED		
75			NOT USED		
76			NOT USED		
77			NOT USED		
78			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
101	EA	2	MOUNTING RAIL, PR30	ABB/1SNA 173 220 R0500	C
102	EA	16	END STOP, BAM2	ABB/1SNA 206 351 R1600	C
103	EA	13	END SECTION, FEM8	ABB/1SNA 113 373 R2600	C
104	EA	494	TERMINAL, SWITCH BLOCK, TYPE M6/8.SNB	ABB/1SNA 115 688 R2500	C
105	EA	2	TERMINAL MARKERS, VERTICAL, RC810, 1-100	ABB/1SNA 234 060 R0500	C
106	EA	2	TERMINAL MARKERS, VERTICAL, RC810, 101-200	ABB/1SNA 234 061 R2200	C
107	EA	8	TERMINAL BLOCK, 12 POLE, 30 AMP, STANDARD	MARATHON/1512 STD 01C	C
108			NOT USED		
109			NOT USED		
110			NOT USED		
111			NOT USED		
112			NOT USED		
113			NOT USED		
114			NOT USED		
115			NOT USED		
116			NOT USED		
117			NOT USED		
118			NOT USED		
119			NOT USED		
120			NOT USED		
121			NOT USED		
122			NOT USED		
123			NOT USED		
124			NOT USED		
125			NOT USED		
126			NOT USED		
127			NOT USED		
128			NOT USED		
129			NOT USED		
130			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

NOTES:

- 1 BILL OF MATERIAL QUANTITIES ARE ESTIMATED. ACTUAL QUANTITIES SHALL BE VERIFIED BY THE CONTRACTOR.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

ENG. STAMP

Matanuska Electric Association



163 East Industrial Way
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(907) 761-9300
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

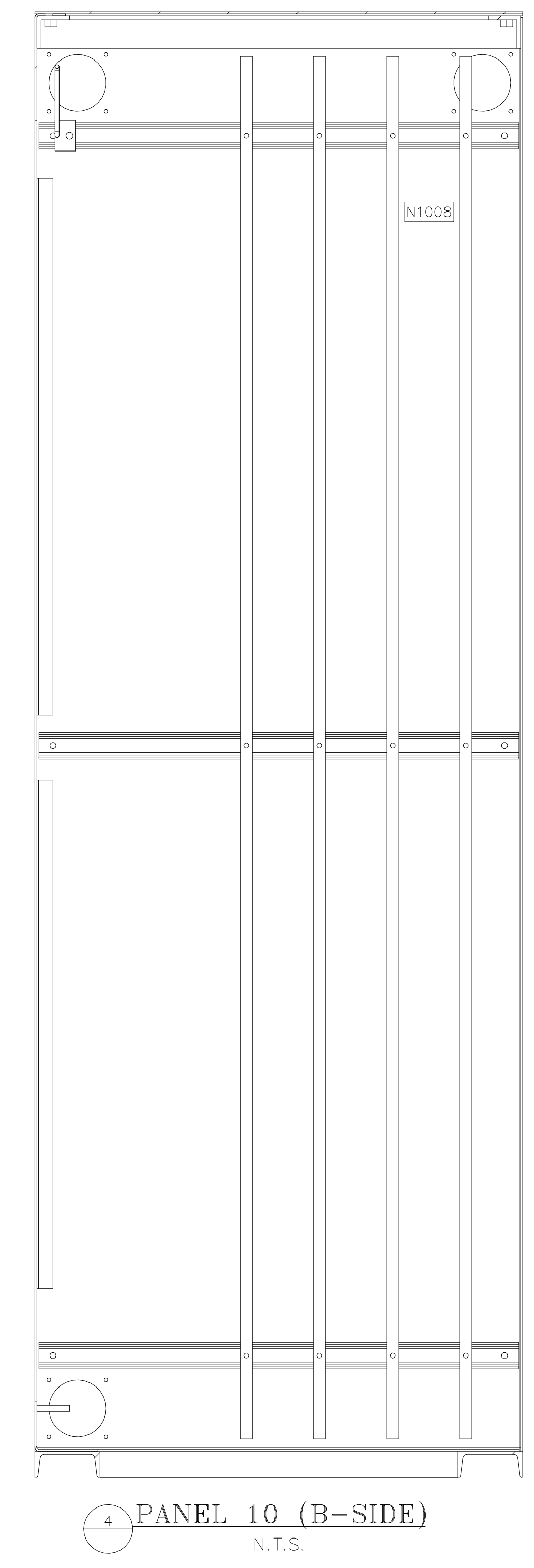
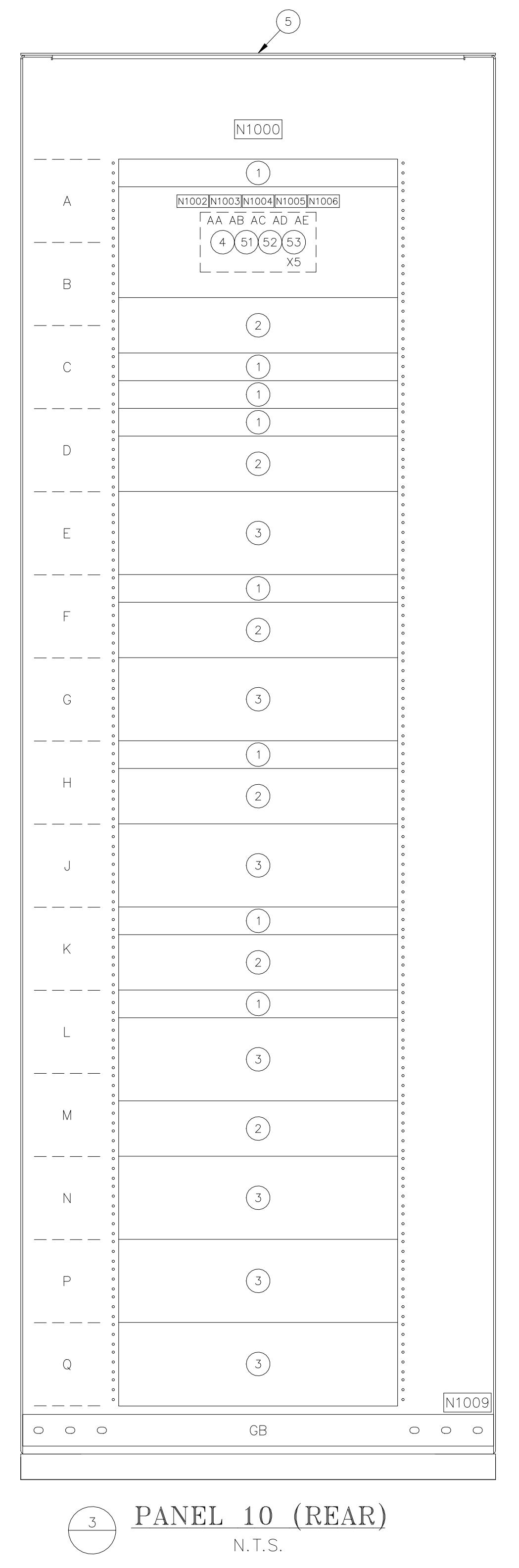
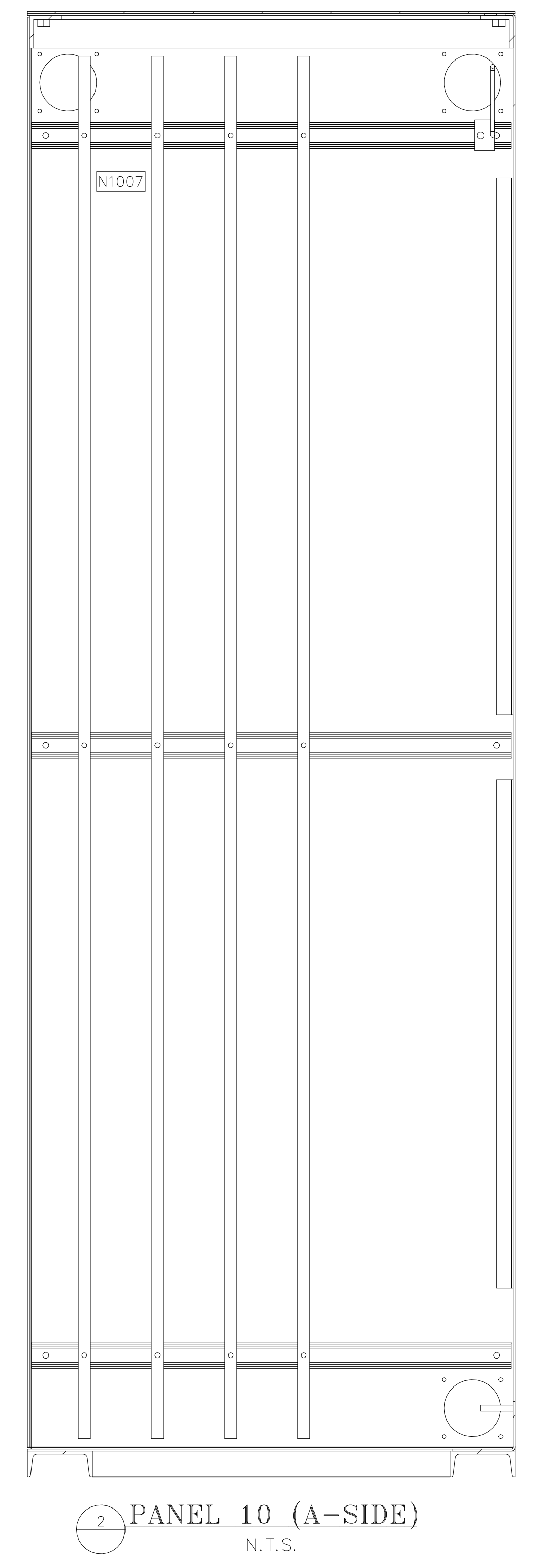
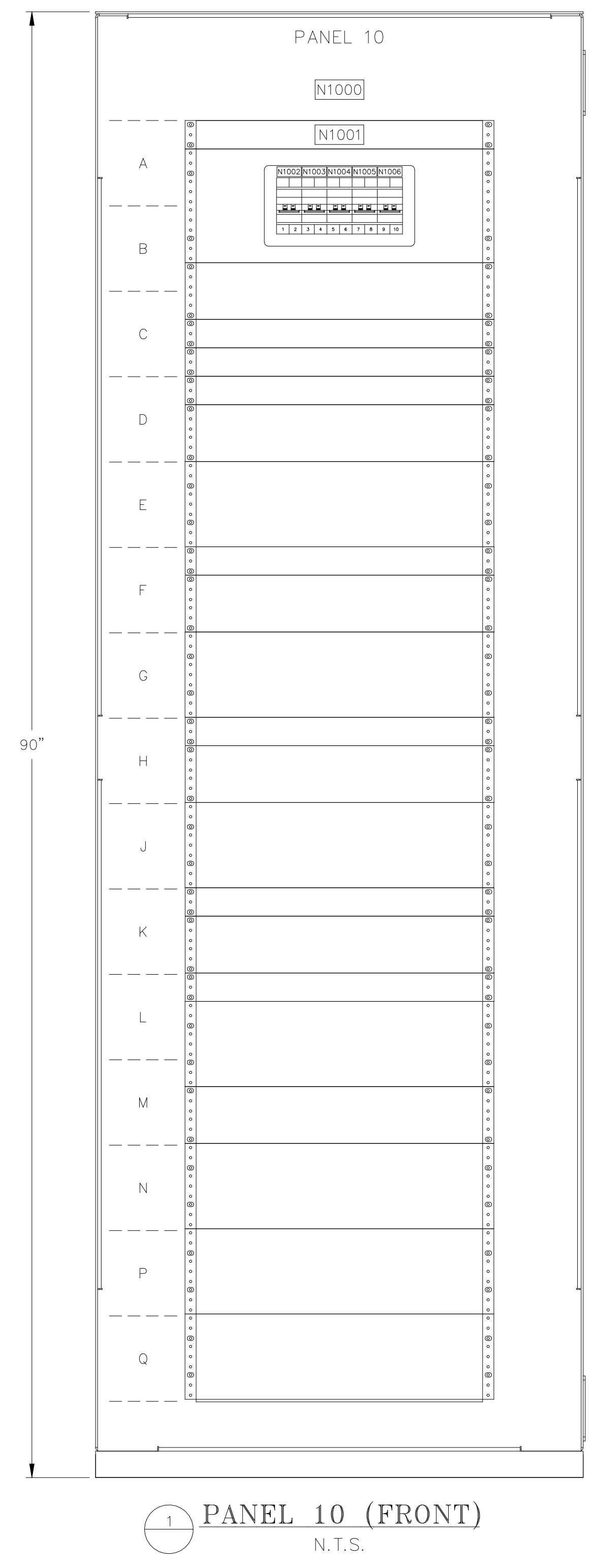
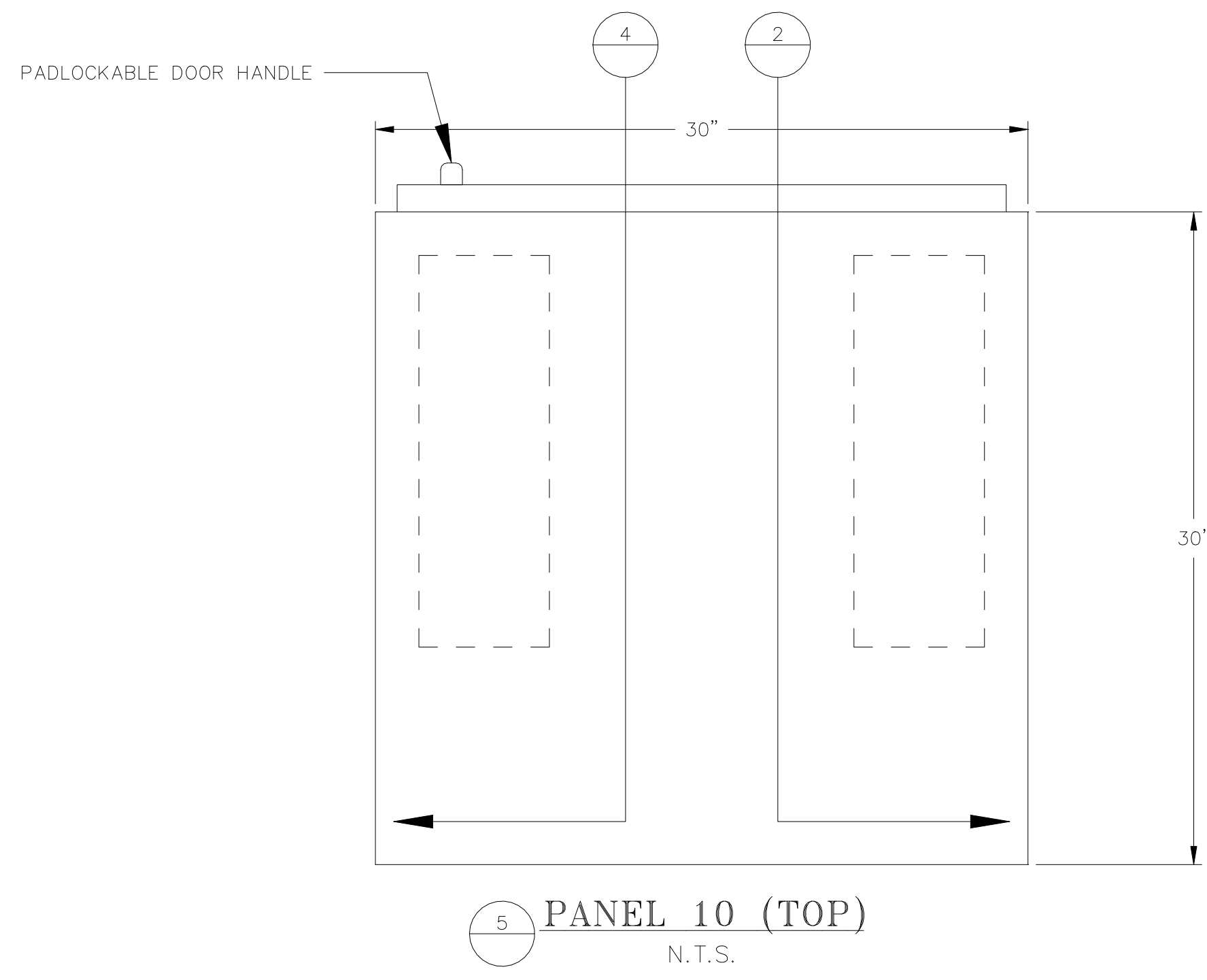
DRAWING NAME:
**DOUGLAS SUBSTATION
PANEL 9
BILL OF MATERIAL**

dass-el-4509_3.dwg

REF. DWG(S):

DRAWING NO.: **DGSS-EL-4509**

SHEET **3** OF **3**



NOTES:

1 SEE REFERENCE 6 FOR NAMEPLATES (NXXX)

2 SEE REFERENCE 7 FOR BILL OF MATERIAL.

3 ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

ENG. STAMP

Matanuska Electric Association

163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
WWW.MEA.COOP

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	PANEL 10 (FRONT)
2	-	PANEL 10 (A-SIDE)
3	-	PANEL 10 (REAR)
4	-	PANEL 10 (B-SIDE)
5	-	PANEL 10 (TOP)
6	DGSS-EL-4510/2	PANEL 10 NAMEPLATES
7	DGSS-EL-4510/3	PANEL 10 BILL OF MATERIAL

DRAWING NAME: DOUGLAS SUBSTATION
PANEL 10
ELEVATION

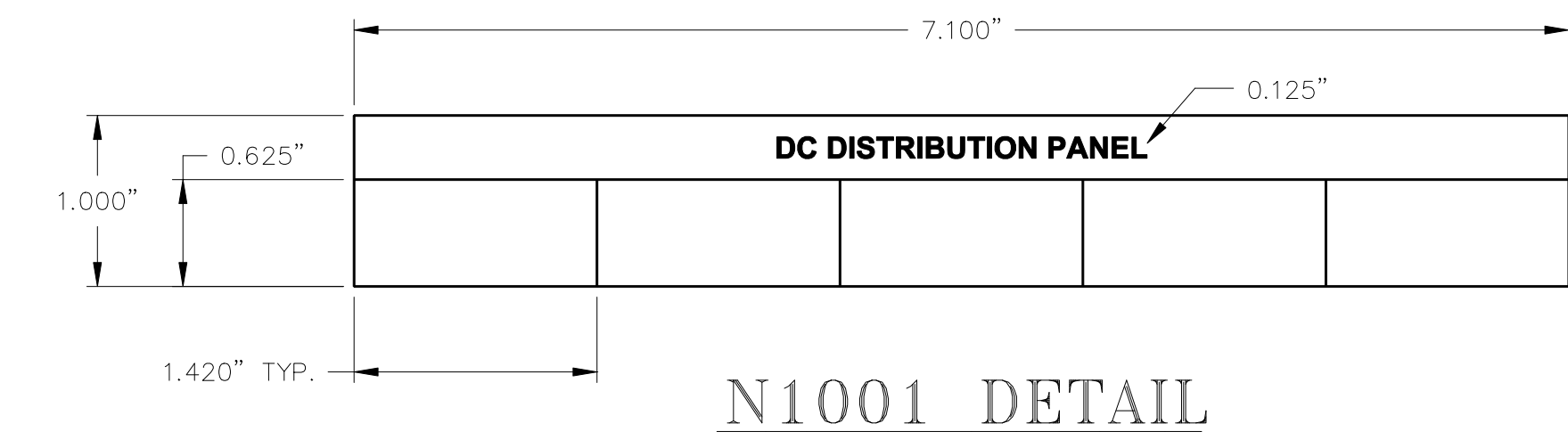
REF. DWG(S):

DRAWING NO.: DGSS-EL-4510

SHEET 1 OF 3

dass-el-4510_1.dwg

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N1000	2	PANEL 10			1-1/2 x 5	1/4
N1001	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N1002	2	AA			1/2 x 3/4	1/4
N1003	2	AB			1/2 x 3/4	1/4
N1004	2	AC			1/2 x 3/4	1/4
N1005	2	AD			1/2 x 3/4	1/4
N1006	2	AE			1/2 x 3/4	1/4
N1007	1	A			1/2 x 3/4	1/4
N1008	1	B			1/2 x 3/4	1/4
N1009	1	GB	GROUND BUS		1 x 1-1/2	1/8
N1010	1	WORK LIGHT			1 x 1-1/2	1/8



- NOTES:
- 1 ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
 - 2 ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
 - 3 ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
 - 4 ALL TEXT SHALL BE "ARIAL BOLD" FONT.
 - 5 EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
 - 6 ALL TEXT SHALL BE UPPER CASE.
 - 7 ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			JOB #: MEA W.O. EN16-3.2	
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS				
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE	
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016	

ENG. STAMP



NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:	DOUGLAS SUBSTATION PANEL 10 NAMEPLATES	
REF. DWG(S):		
DRAWING NO.:	DGSS-EL-4510	SHEET 2 OF 3

dgss-el-4510_2.dwg

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
1	EA	8	BLANK FILLER PANEL, METALLIC GREY, 1U	BUD/PA-1101-MG (OAE)	C
2	EA	6	BLANK FILLER PANEL, METALLIC GREY, 2U	BUD/PA-1102-MG (OAE)	C
3	EA	7	BLANK FILLER PANEL, METALLIC GREY, 3U	BUD/PA-1103-MG (OAE)	C
4	EA	1	BLANK FILLER PANEL, METALLIC GREY, 4U	BUD/PA-1104-MG (OAE)	C
5	EA	1	RELAY CABINET WITH DOOR AND COPPER GROUND BUS	TBD	C
6	LOT	1 1 1	LED ENCLOSURE LIGHT LIGHT CABLE ASSEMBLY, 120 VAC	HOFFMAN; HOFFMAN/LEDA1S35 HOFFMAN/LEDA20C	C
7	LOT	1 1 1	LIGHT SWITCH, SINGLE POLE SWITCH BOX COVER	HUBBELL; KELLEMS/HBL12211 (OAE) RACO/239 (OAE) RACO/800C (OAE)	C
8			NOT USED		
9			NOT USED		
10			NOT USED		
11			NOT USED		
12			NOT USED		
13			NOT USED		
14			NOT USED		
15			NOT USED		
16			NOT USED		
17			NOT USED		
18			NOT USED		
19			NOT USED		
20			NOT USED		
21			NOT USED		
22			NOT USED		
23			NOT USED		
24			NOT USED		
25			NOT USED		
26			NOT USED		
27			NOT USED		
28			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
51	EA	5	CIRCUIT BREAKER, 15 AMP	SCHNEIDER ELECTRIC/MG17436	C
52	EA	1	MULTI-POLE BREAKER FRONT MOUNTING KIT	SCHNEIDER ELECTRIC/14210	C
53	EA	1	DIN RAIL WITH SUPPORT	SCHNEIDER ELECTRIC/14211	C
54			NOT USED		
55			NOT USED		
56			NOT USED		
57			NOT USED		
58			NOT USED		
59			NOT USED		
60			NOT USED		
61			NOT USED		
62			NOT USED		
63			NOT USED		
64			NOT USED		
65			NOT USED		
66			NOT USED		
67			NOT USED		
68			NOT USED		
69			NOT USED		
70			NOT USED		
71			NOT USED		
72			NOT USED		
73			NOT USED		
74			NOT USED		
75			NOT USED		
76			NOT USED		
77			NOT USED		
78			NOT USED		
79			NOT USED		
80			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
101			NOT USED		
102			NOT USED		
103			NOT USED		
104			NOT USED		
105			NOT USED		
106			NOT USED		
107			NOT USED		
108			NOT USED		
109			NOT USED		
110			NOT USED		
111			NOT USED		
112			NOT USED		
113			NOT USED		
114			NOT USED		
115			NOT USED		
116			NOT USED		
117			NOT USED		
118			NOT USED		
119			NOT USED		
120			NOT USED		
121			NOT USED		
122			NOT USED		
123			NOT USED		
124			NOT USED		
125			NOT USED		
126			NOT USED		
127			NOT USED		
128			NOT USED		
129			NOT USED		
130			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

NOTES:

- 1 BILL OF MATERIAL QUANTITIES ARE ESTIMATED. ACTUAL QUANTITIES SHALL BE VERIFIED BY THE CONTRACTOR.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

ENG. STAMP

Matanuska Electric Association

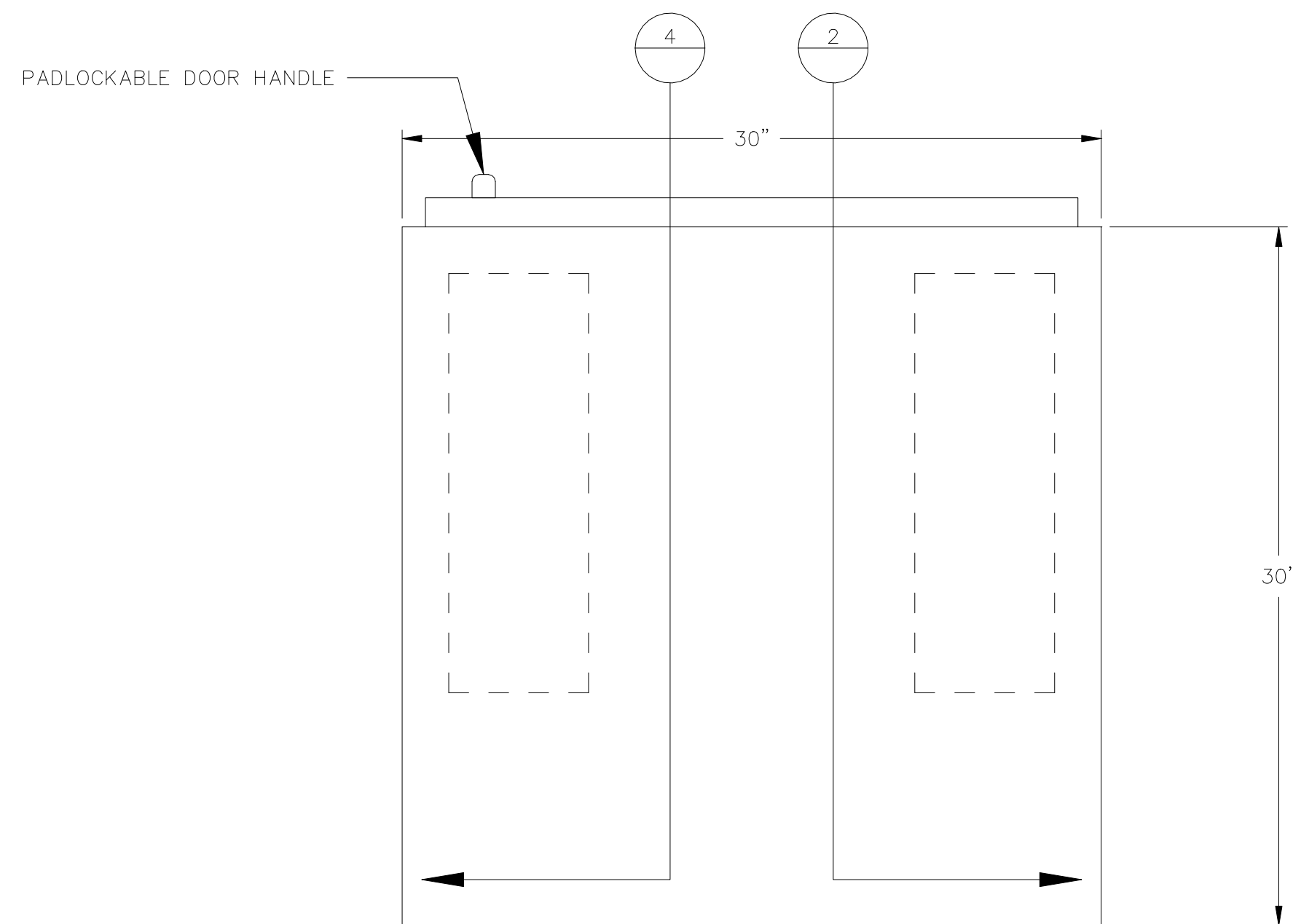


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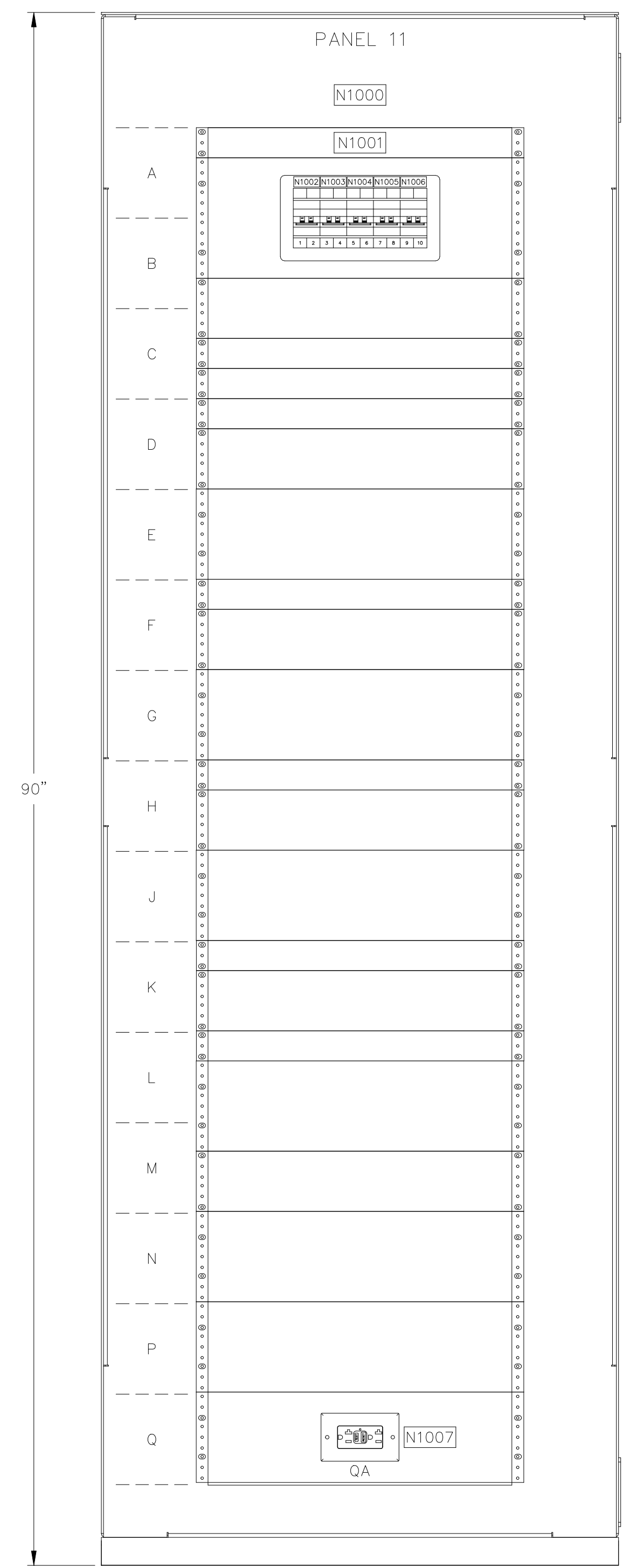
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:		DOUGLAS SUBSTATION PANEL 10 BILL OF MATERIAL
REF. DWG(S):		
DRAWING NO.:		DGSS-EL-4510

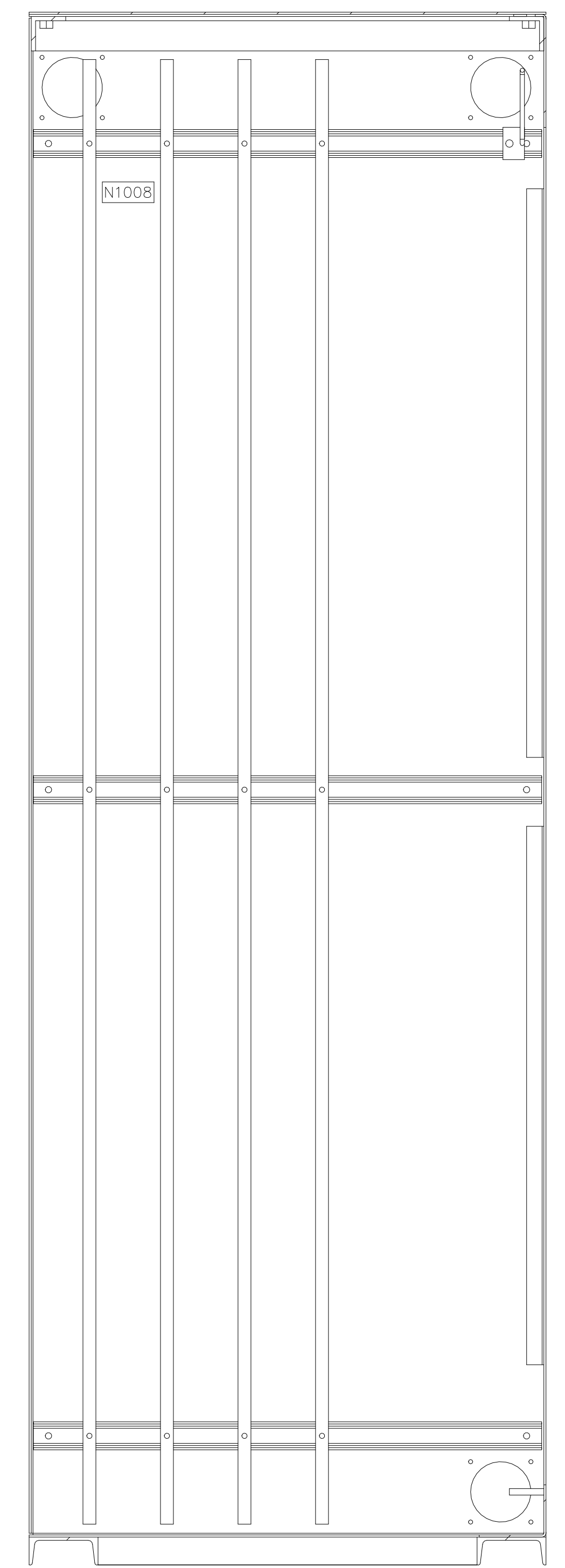
dass-el-4510_3.dwg



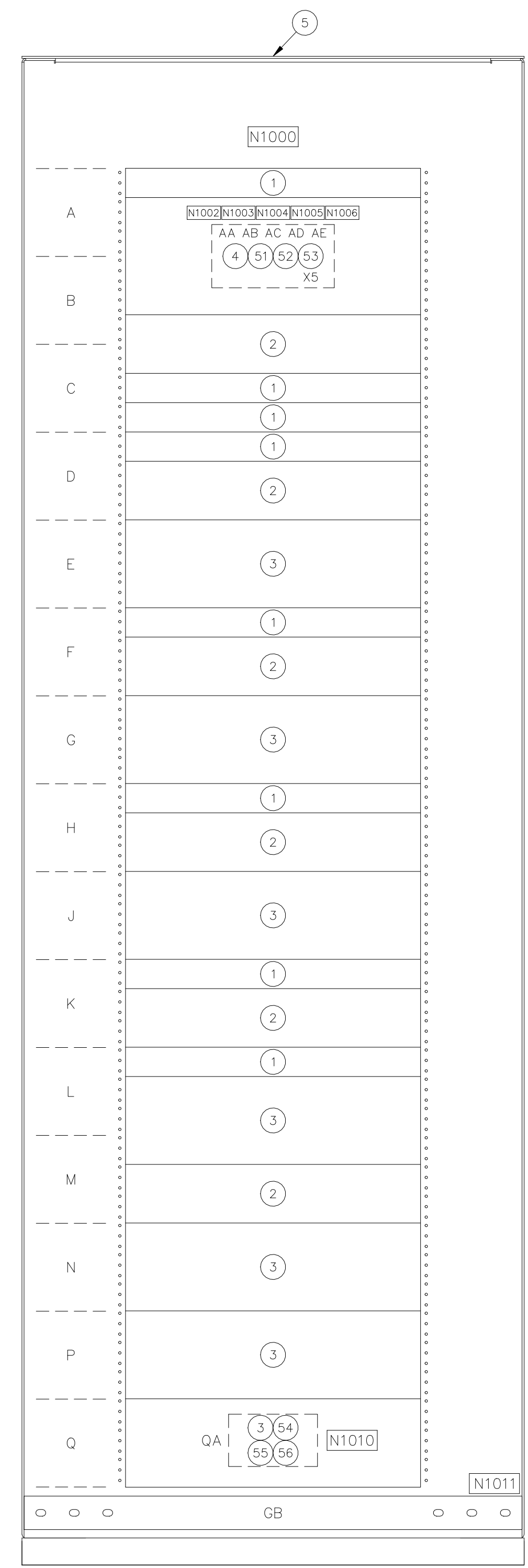
5 PANEL 11 (TOP)
N.T.S.



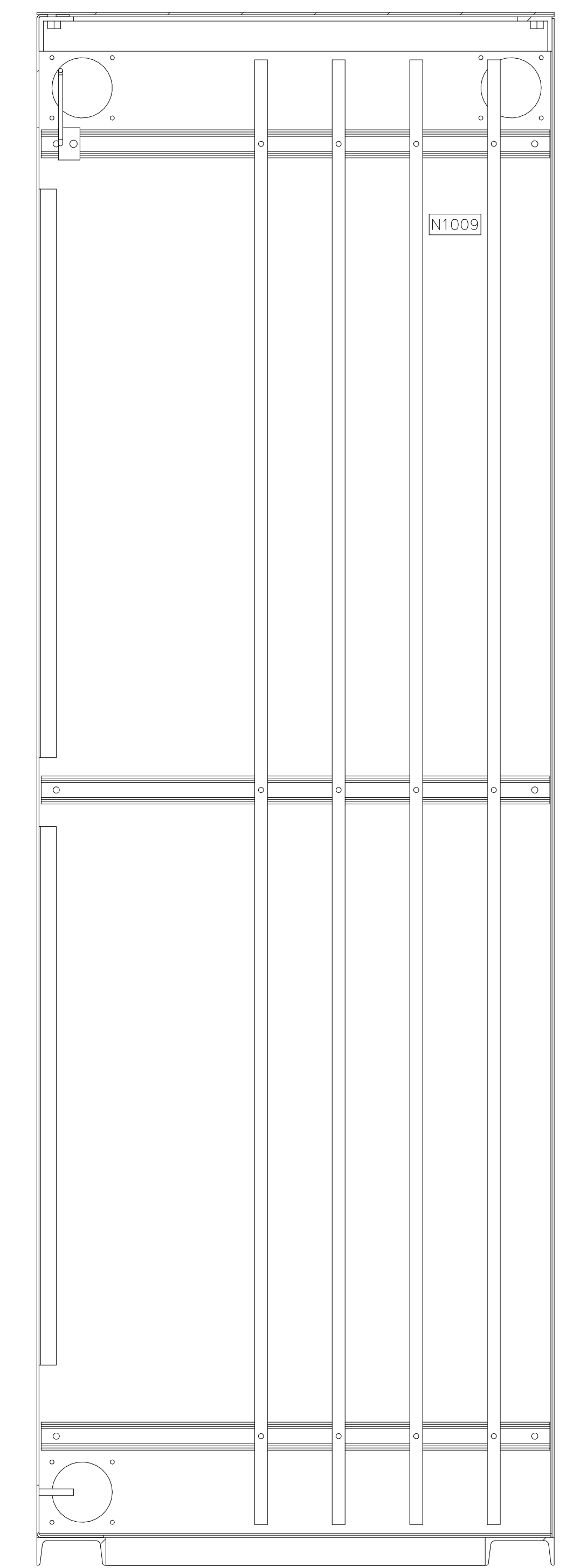
1 PANEL 11 (FRONT)
N.T.S.



2 PANEL 11 (A-SIDE)
N.T.S.



3 PANEL 11 (REAR)
N.T.S.



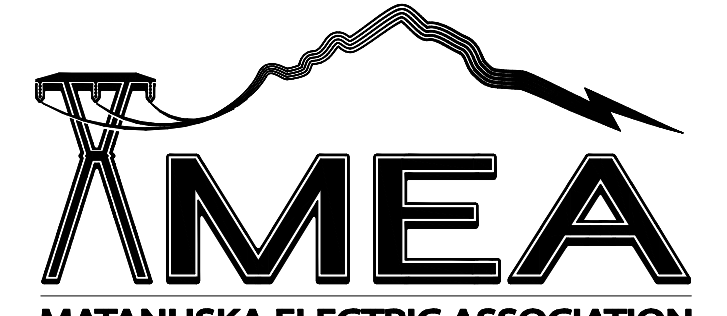
4 PANEL 11 (B-SIDE)
N.T.S.

NOTES:
 ① SEE REFERENCE 6 FOR NAMEPLATES (NXXX)
 ② SEE REFERENCE 7 FOR BILL OF MATERIAL.
 ③ ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

ENG. STAMP

Matanuska Electric Association



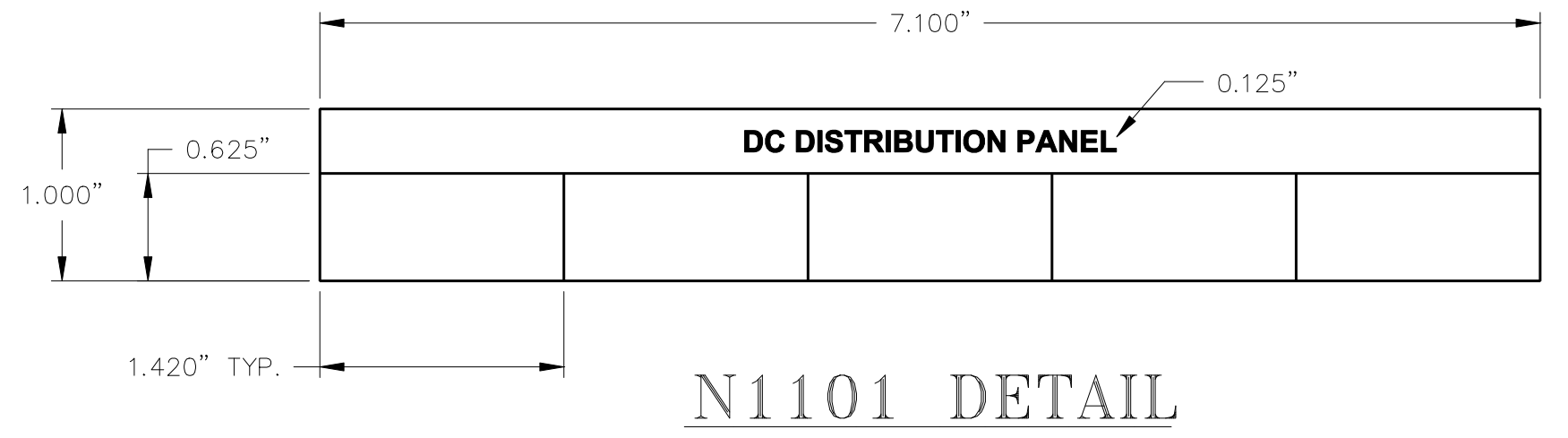
163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
WWW.MEA.COOP

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	-	PANEL 11 (FRONT)
2	-	PANEL 11 (A-SIDE)
3	-	PANEL 11 (REAR)
4	-	PANEL 11 (B-SIDE)
5	-	PANEL 11 (TOP)
6	DGSS-EL-4511/2	PANEL 11 NAMEPLATES
7	DGSS-EL-4511/3	PANEL 11 BILL OF MATERIAL

DRAWING NAME:		DOUGLAS SUBSTATION PANEL 11 ELEVATION
REF. DWG(S):		
DRAWING NO.:		DGSS-EL-4511
		SHEET 1 OF 3

dgss-el-4511_1.dwg

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N1100	2	PANEL 11			1-1/2 x 5	1/4
N1101	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N1102	2	AA			1/2 x 3/4	1/4
N1103	2	AB			1/2 x 3/4	1/4
N1104	2	AC			1/2 x 3/4	1/4
N1105	2	AD			1/2 x 3/4	1/4
N1106	2	AE			1/2 x 3/4	1/4
N1107	1	RE26	120 VAC	RECEPTACLE	1 x 3	1/8
N1108	1	A			1/2 x 3/4	1/4
N1109	1	B			1/2 x 3/4	1/4
N1110	1	QA	RE26	RECEPTACLE	1 X 1-1/2	1/8
N1111	1	GB	GROUND BUS		1 x 1-1/2	1/8
N1112	1	WORK LIGHT			1 x 1-1/2	1/8



- NOTES:
- 1 ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
 - 2 ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
 - 3 ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
 - 4 ALL TEXT SHALL BE "ARIAL BOLD" FONT.
 - 5 EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
 - 6 ALL TEXT SHALL BE UPPER CASE.
 - 7 ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT				DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS	JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE			
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016			

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Matanuska Electric Association

163 East Industrial Way
Palmer, AK 99645
(907) 761-9300
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION PANEL 11 NAMEPLATES		
REF. DWG(S):		
DRAWING NO.: DGSS-EL-4511		
SHEET 2 OF 3		

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
①	EA	8	BLANK FILLER PANEL, METALLIC GREY, 1U	BUD/PA-1101-MG (OAE)	C
②	EA	6	BLANK FILLER PANEL, METALLIC GREY, 2U	BUD/PA-1102-MG (OAE)	C
③	EA	7	BLANK FILLER PANEL, METALLIC GREY, 3U	BUD/PA-1103-MG (OAE)	C
④	EA	1	BLANK FILLER PANEL, METALLIC GREY, 4U	BUD/PA-1104-MG (OAE)	C
⑤	EA	1	RELAY CABINET WITH DOOR AND COPPER GROUND BUS	TBD	C
⑥	LOT	1 1 1	LED ENCLOSURE LIGHT LIGHT CABLE ASSEMBLY, 120 VAC	HOFFMAN: HOFFMAN/LEDA1S35 HOFFMAN/LEDA20C	C
⑦	LOT	1 1 1	LIGHT SWITCH, SINGLE POLE SWITCH BOX COVER	HUBBELL: KELLEMS/HBL12211 (OAE) RACO/239 (OAE) RACO/800C (OAE)	C
⑧			NOT USED		
⑨			NOT USED		
⑩			NOT USED		
⑪			NOT USED		
⑫			NOT USED		
⑬			NOT USED		
⑭			NOT USED		
⑮			NOT USED		
⑯			NOT USED		
⑰			NOT USED		
⑱			NOT USED		
⑲			NOT USED		
⑳			NOT USED		
㉑			NOT USED		
㉒			NOT USED		
㉓			NOT USED		
㉔			NOT USED		
㉕			NOT USED		
㉖			NOT USED		
㉗			NOT USED		
㉘			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
⑤1	EA	5	CIRCUIT BREAKER, 15 AMP	SCHNEIDER ELECTRIC/MG17436	C
⑤2	EA	1	MULTI-POLE BREAKER FRONT MOUNTING KIT	SCHNEIDER ELECTRIC/14210	C
⑤3	EA	1	DIN RAIL WITH SUPPORT	SCHNEIDER ELECTRIC/14211	C
⑤4	EA	1	RECEPTACLE, 125V, 20A, DUPLEX, GFI (RE26)	HUBBELL-KELLEMS/GFR5362SGI	C
⑤5	EA	1	COVER PLATE, 1-GANG, STAINLESS STEEL	HUBBELL-KELLEMS/SS26 (OAE)	C
⑤6	EA	1	SINGLE GANG BOX, ALUMINUM	HUBBELL-RACO/5386-0 (OAE)	C
⑤7			NOT USED		
⑤8			NOT USED		
⑤9			NOT USED		
⑥0			NOT USED		
⑥1			NOT USED		
⑥2			NOT USED		
⑥3			NOT USED		
⑥4			NOT USED		
⑥5			NOT USED		
⑥6			NOT USED		
⑥7			NOT USED		
⑥8			NOT USED		
⑥9			NOT USED		
⑦0			NOT USED		
⑦1			NOT USED		
⑦2			NOT USED		
⑦3			NOT USED		
⑦4			NOT USED		
⑦5			NOT USED		
⑦6			NOT USED		
⑦7			NOT USED		
⑦8			NOT USED		
⑦9			NOT USED		
⑧0			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

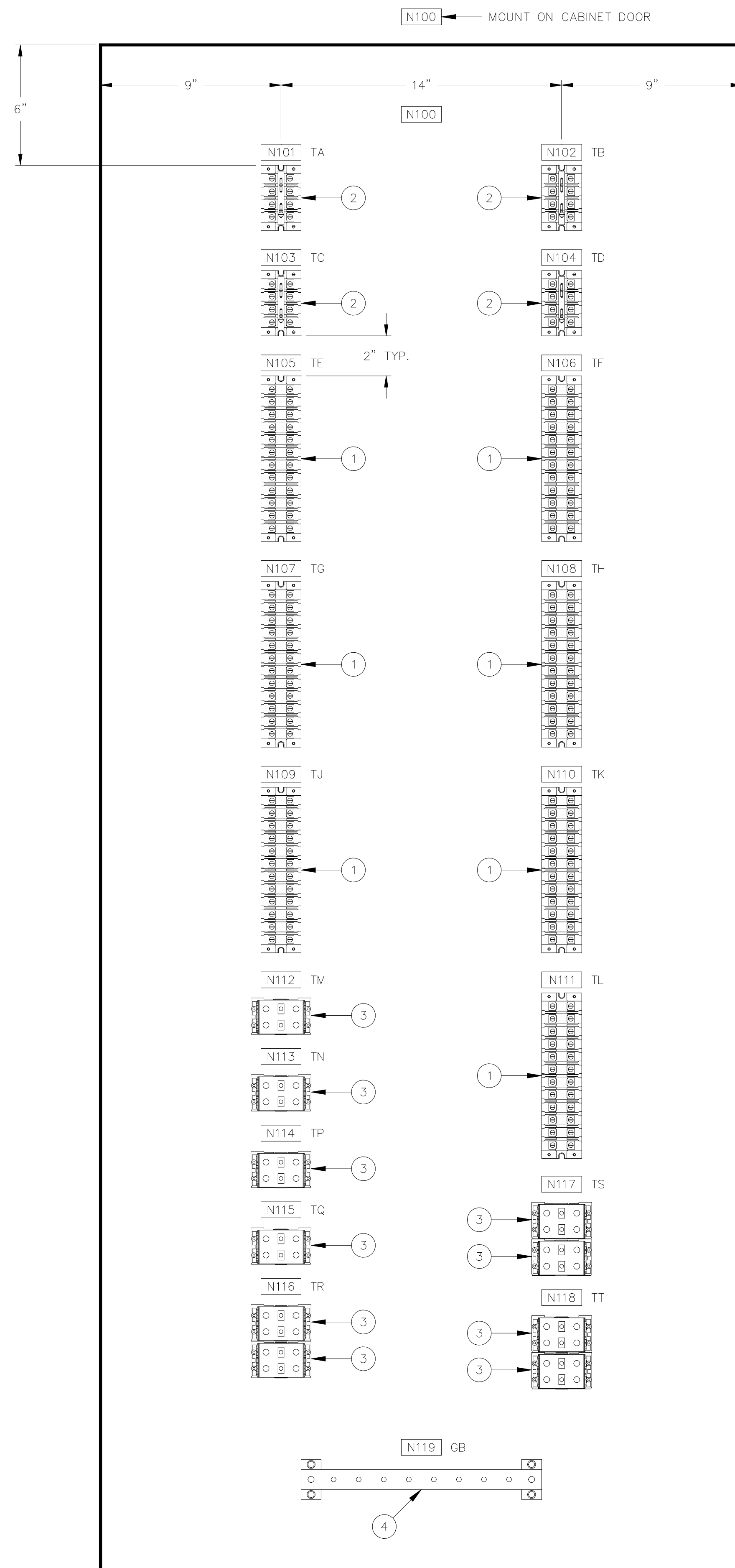
BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
⑩1			NOT USED		
⑩2			NOT USED		
⑩3			NOT USED		
⑩4			NOT USED		
⑩5			NOT USED		
⑩6			NOT USED		
⑩7			NOT USED		
⑩8			NOT USED		
⑩9			NOT USED		
⑪0			NOT USED		
⑪1			NOT USED		
⑪2			NOT USED		
⑪3			NOT USED		
⑪4			NOT USED		
⑪5			NOT USED		
⑪6			NOT USED		
⑪7			NOT USED		
⑪8			NOT USED		
⑪9			NOT USED		
⑫0			NOT USED		
⑫1			NOT USED		
⑫2			NOT USED		
⑫3			NOT USED		
⑫4			NOT USED		
⑫5			NOT USED		
⑫6			NOT USED		
⑫7			NOT USED		
⑫8			NOT USED		
⑫9			NOT USED		
⑬0			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

NOTES:

- ① BILL OF MATERIAL QUANTITIES ARE ESTIMATED. ACTUAL QUANTITIES SHALL BE VERIFIED BY THE CONTRACTOR.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			JOB #: MEA W.O. EN16-3.2		ENG. STAMP	 <p>Matanuska Electric Association 163 East Industrial Way Palmer, AK 99645 (907) 761-9300 WWW.MEA.COOP</p>	NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION	DRAWING NAME:	DOUGLAS SUBSTATION PANEL 11 BILL OF MATERIAL	
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		DWN BY/DATE	REVIEWED BY/DATE	REF. DWG(S):							DRAWING NO.:	DGSS-EL-4511
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE									
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016									



MARSHALLING CABINET 1
N.T.S.
(DOOR NOT SHOWN FOR CLARITY)

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
①	EA	7	TERMINAL BLOCK, 12 POLE, 30 AMP, STANDARD	MARATHON/1512 STD 01C	C
②	EA	4	TERMINAL BLOCK, 4 POLE, 30 AMP, SHORTING	MARATHON/1504 SC 01C WITH CC 1504	C
③	EA	10	POWER SPLICER TERMINAL BLOCK, 2-POLE, WITH COVER	MARATHON/1322572CH	C
④	EA	1	INSULATING GROUND BAR, COPPER	NEWTON INSTRUMENTS/0030590000 (OAE)	C
⑤			NOT USED		
⑥			NOT USED		
⑦			NOT USED		
⑧			NOT USED		
⑨			NOT USED		
⑩			NOT USED		
⑪			NOT USED		
⑫			NOT USED		
⑬			NOT USED		
⑭			NOT USED		
⑮			NOT USED		

C = CONTRACTOR. O = OWNER. NIC = NOT IN CONTRACT.

NOTES:

- ① SEE REFERENCE 1 FOR NAMEPLATES (NXXX)
- ② ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016
		REVIEWED BY/DATE
		TCC/09-19-2016

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Palmer, AK 99645
(907) 761-9300
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-EL-4512/2	MARSHALLING CABINET 1 NAMEPLATES

DRAWING NAME: DOUGLAS SUBSTATION
MARSHALLING CABINET 1
ELEVATION

dgss-el-4512 1.dwg

REF. DWG(S):

DRAWING NO.: DGSS-EL-4512

SHEET 1 OF 2

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N100	2	MARSHALLING CABINET 1			1-1/2 x 5	1/4
N101	1	TA			1/2 x 3/4	1/4
N102	1	TB			1/2 x 3/4	1/4
N103	1	TC			1/2 x 3/4	1/4
N104	1	TD			1/2 x 3/4	1/4
N105	1	TE			1/2 x 3/4	1/4
N106	1	TF			1/2 x 3/4	1/4
N107	1	TG			1/2 x 3/4	1/4
N108	1	TH			1/2 x 3/4	1/4
N109	1	TJ			1/2 x 3/4	1/4
N110	1	TK			1/2 x 3/4	1/4
N111	1	TL			1/2 x 3/4	1/4
N112	1	TM			1/2 x 3/4	1/4
N113	1	TN			1/2 x 3/4	1/4
N114	1	TP			1/2 x 3/4	1/4
N115	1	TQ			1/2 x 3/4	1/4
N116	1	TR			1/2 x 3/4	1/4
N117	1	TS			1/2 x 3/4	1/4
N118	1	TT			1/2 x 3/4	1/4
N119	1	GB	GROUND BUS		1 x 1-1/2	1/8

- NOTES:
- ① ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
 - ② ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
 - ③ ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
 - ④ ALL TEXT SHALL BE "ARIAL BOLD" FONT.
 - ⑤ EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
 - ⑥ ALL TEXT SHALL BE UPPER CASE.
 - ⑦ ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		JOB #: MEA W.O. EN16-3.2	
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS			
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016	TCC/09-19-2016

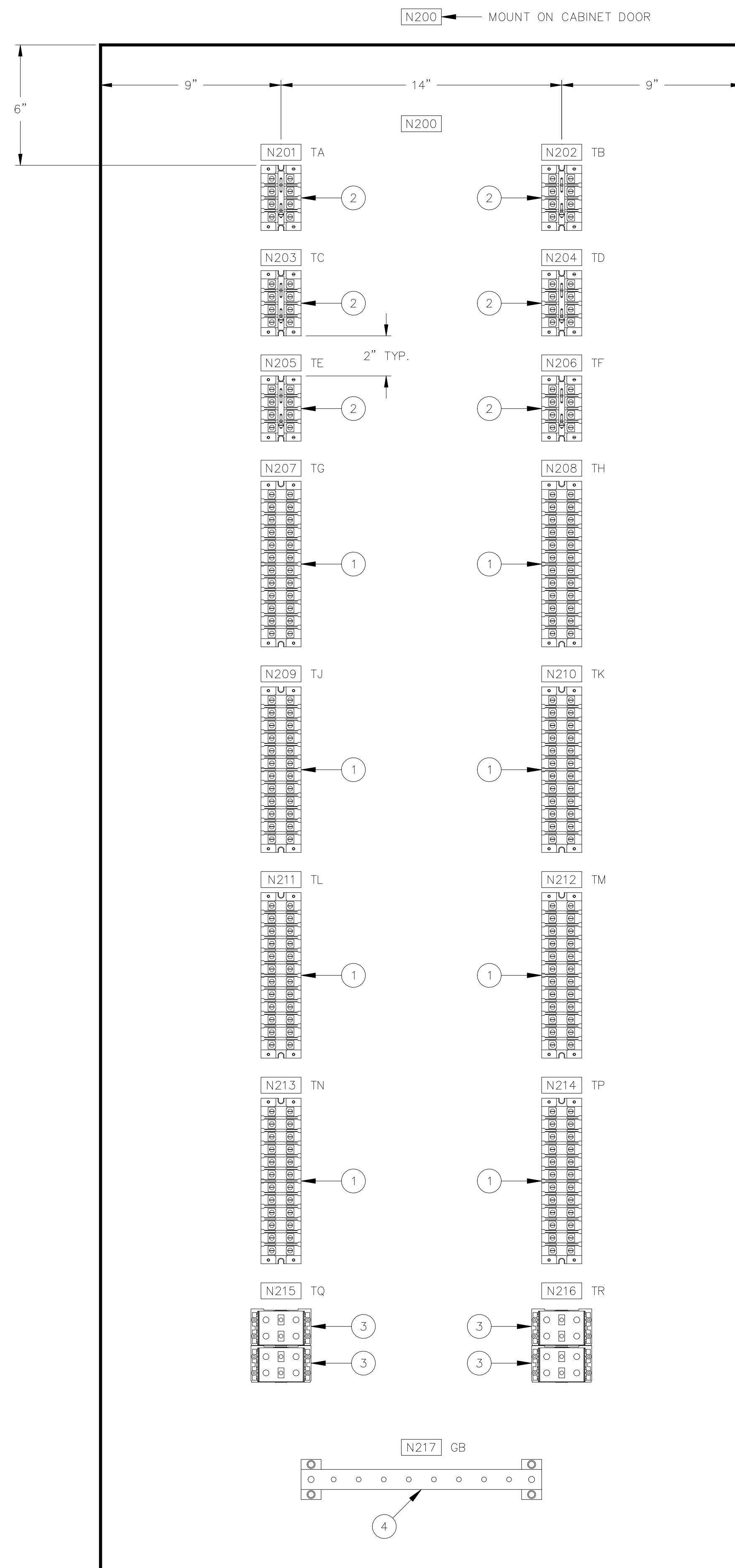
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

<p>DOUGLAS SUBSTATION MARSHALLING CABINET 1 NAMEPLATES</p> <p style="text-align: right; font-size: small;">dgss-el-4512_2.dwg</p>	
REF. DWG(S):	
DRAWING NO.:	DGSS-EL-4512
SHEET:	2 of 2



MARSHALLING CABINET 2
N.T.S.
(DOOR NOT SHOWN FOR CLARITY)

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
①	EA	8	TERMINAL BLOCK, 12 POLE, 30 AMP, STANDARD	MARATHON/1512 STD 01C	C
②	EA	6	TERMINAL BLOCK, 4 POLE, 30 AMP, SHORTING	MARATHON/1504 SC 01C WITH CC 1504	C
③	EA	4	POWER SPLICER TERMINAL BLOCK, 2-POLE, WITH COVER	MARATHON/1322572CH	C
④	EA	1	INSULATING GROUND BAR, COPPER	NEWTON INSTRUMENTS/0030590000 (OAE)	C
⑤			NOT USED		
⑥			NOT USED		
⑦			NOT USED		
⑧			NOT USED		
⑨			NOT USED		
⑩			NOT USED		
⑪			NOT USED		
⑫			NOT USED		
⑬			NOT USED		
⑭			NOT USED		
⑮			NOT USED		

C = CONTRACTOR. O = OWNER. NIC = NOT IN CONTRACT.

NOTES:

- ① SEE REFERENCE 1 FOR NAMEPLATES (NXXX)
- ② ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016
		REVIEWED BY/DATE
		TCC/09-19-2016

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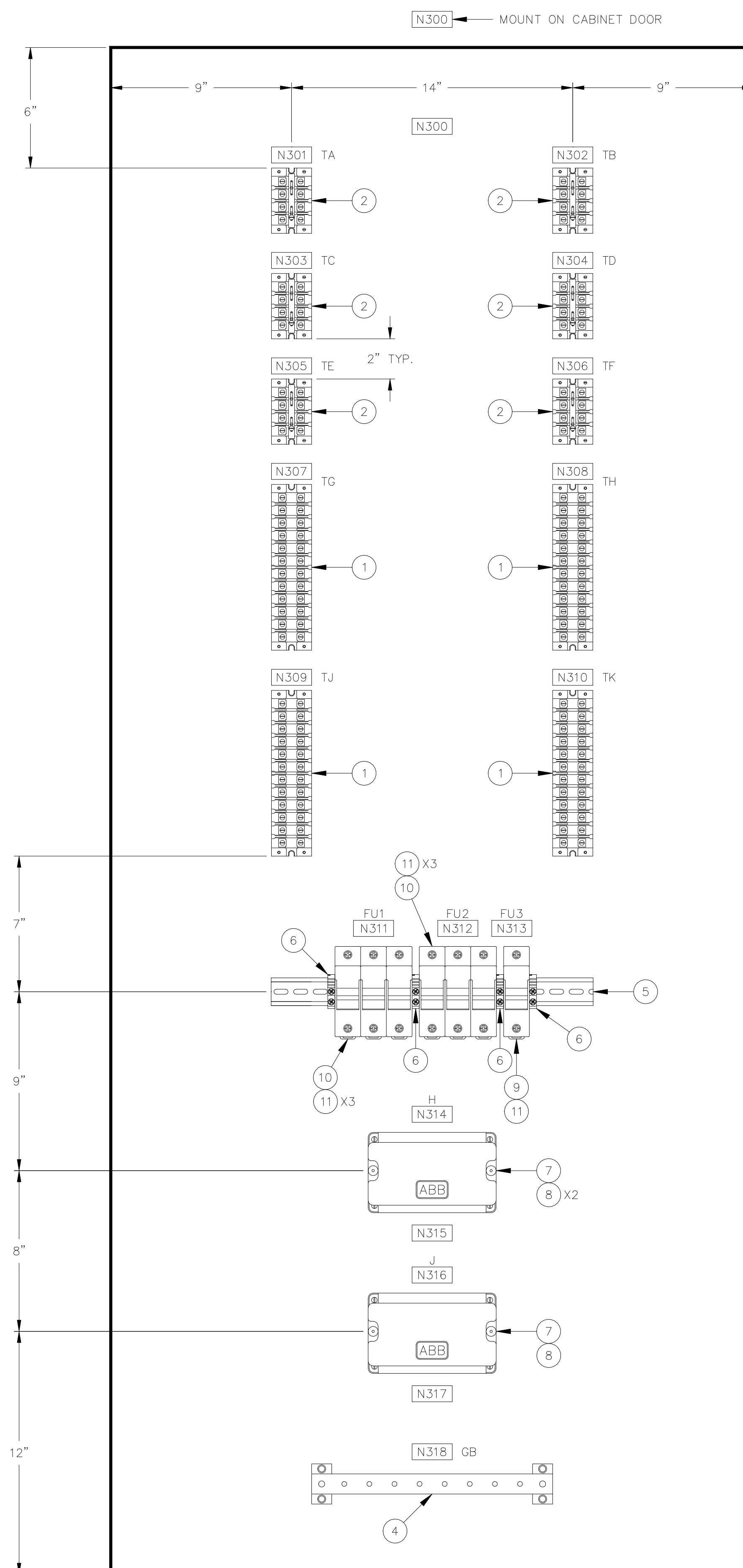
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-EL-4513/2	MARSHALLING CABINET 2 NAMEPLATES

DRAWING NAME:		DOUGLAS SUBSTATION MARSHALLING CABINET 2 ELEVATION
REF. DWG(S):		
DRAWING NO.:		DGSS-EL-4513
		SHEET 1 OF 2



MARSHALLING CABINET 3
N.T.S.
(DOOR NOT SHOWN FOR CLARITY)

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
①	EA	8	TERMINAL BLOCK, 12 POLE, 30 AMP, STANDARD	MARATHON/1512 STD 01C	C
②	EA	6	TERMINAL BLOCK, 4 POLE, 30 AMP, SHORTING	MARATHON/1504 SC 01C WITH CC 1504	C
③	EA	4	POWER SPLICER TERMINAL BLOCK, 2-POLE, WITH COVER	MARATHON/132252CH	C
④	EA	1	INSULATING GROUND BAR, COPPER	NEWTON INSTRUMENTS/0030590000 (0AE)	C
⑤	EA	1	MOUNTING RAIL, PR30	ABB/1SNA 173 220 R0500	C
⑥	EA	5	END STOP, BAM2	ABB/1SNA 206 351 R1600	C
⑦	EA	2	TEST SWITCH, FT-1 STYLE, (10-P)	ABB/CF129A501G01	C
⑧	EA	3	SWITCH HANDLE INTERLOCKING BAR, 3-POSITION	ABB/1164048	C
⑨	EA	1	1 POLE FUSE BLOCK, FINGER SAFE, 30 AMP	MERSEN/US3J1	C
⑩	EA	2	3 POLE FUSE BLOCK, FINGER SAFE, 30 AMP	MERSEN/US3J3	C
⑪	EA	7	TIME DELAY/CLASS J FUSE, 10 AMP	MERSEN/AJT10	C
⑫			NOT USED		
⑬			NOT USED		
⑭			NOT USED		
⑮			NOT USED		

C = CONTRACTOR. O = OWNER. NIC = NOT IN CONTRACT.

NOTES:
① SEE REFERENCE 1 FOR NAMEPLATES (NXXX)
② ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		ENG. STAMP
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE
A	ISSUED FOR BID REVIEW	MSC/09-19-2016
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-EL-4514/2	MARSHALLING CABINET 3 NAMEPLATES

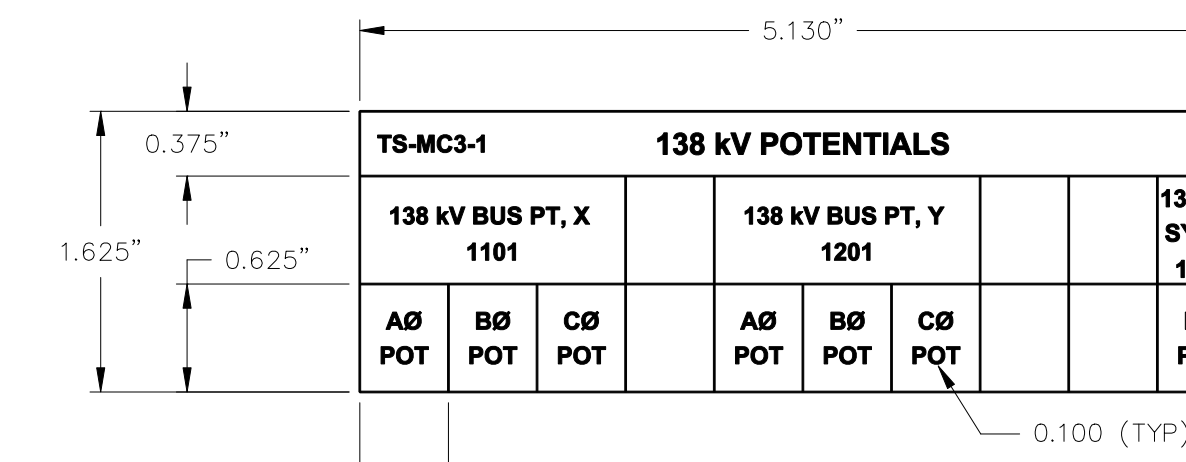
DRAWING NAME: DOUGLAS SUBSTATION MARSHALLING CABINET 3 ELEVATION

REF. DWG(S):

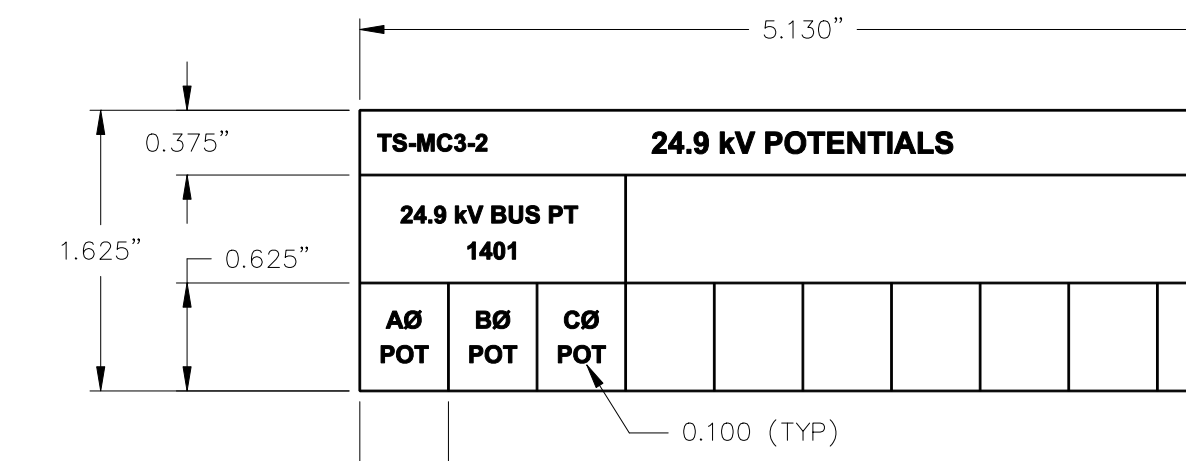
DRAWING NO.: DGSS-EL-4514

SHEET 1 OF 2

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N300	2	MARSHALLING CABINET 2			1-1/2 x 5	1/4
N301	1	TA			1/2 x 3/4	1/4
N302	1	TB			1/2 x 3/4	1/4
N303	1	TC			1/2 x 3/4	1/4
N304	1	TD			1/2 x 3/4	1/4
N305	1	TE			1/2 x 3/4	1/4
N306	1	TF			1/2 x 3/4	1/4
N307	1	TG			1/2 x 3/4	1/4
N308	1	TH			1/2 x 3/4	1/4
N309	1	TJ			1/2 x 3/4	1/4
N310	1	TK			1/2 x 3/4	1/4
N311	1	FU1	138 kV BUS VT	X WDG, 10A FUSE	1 x 2	1/8
N312	1	FU2	138 kV BUS VT	YWDG, 10A FUSE	1 x 2	1/8
N313	1	FU3	138 kV SYNC CVT	B8-N, 10A FUSE	1 x 2	1/8
N314	1	H	TS-MC3-1	138 kV POTENTIALS	1 x 2	1/8
N315	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N316	1	J	TS-MC3-2	24.9 kV POTENTIALS	1 x 2	1/8
N317	1	SEE NAMEPLATE DETAIL ON THIS SHEET				
N318	1	GB	GROUND BUS		1 x 1-1/2	1/8



N316 DETAIL



N318 DETAIL

- NOTES:
- ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
 - ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
 - ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
 - ALL TEXT SHALL BE "ARIAL BOLD" FONT.
 - EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
 - ALL TEXT SHALL BE UPPER CASE.
 - ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
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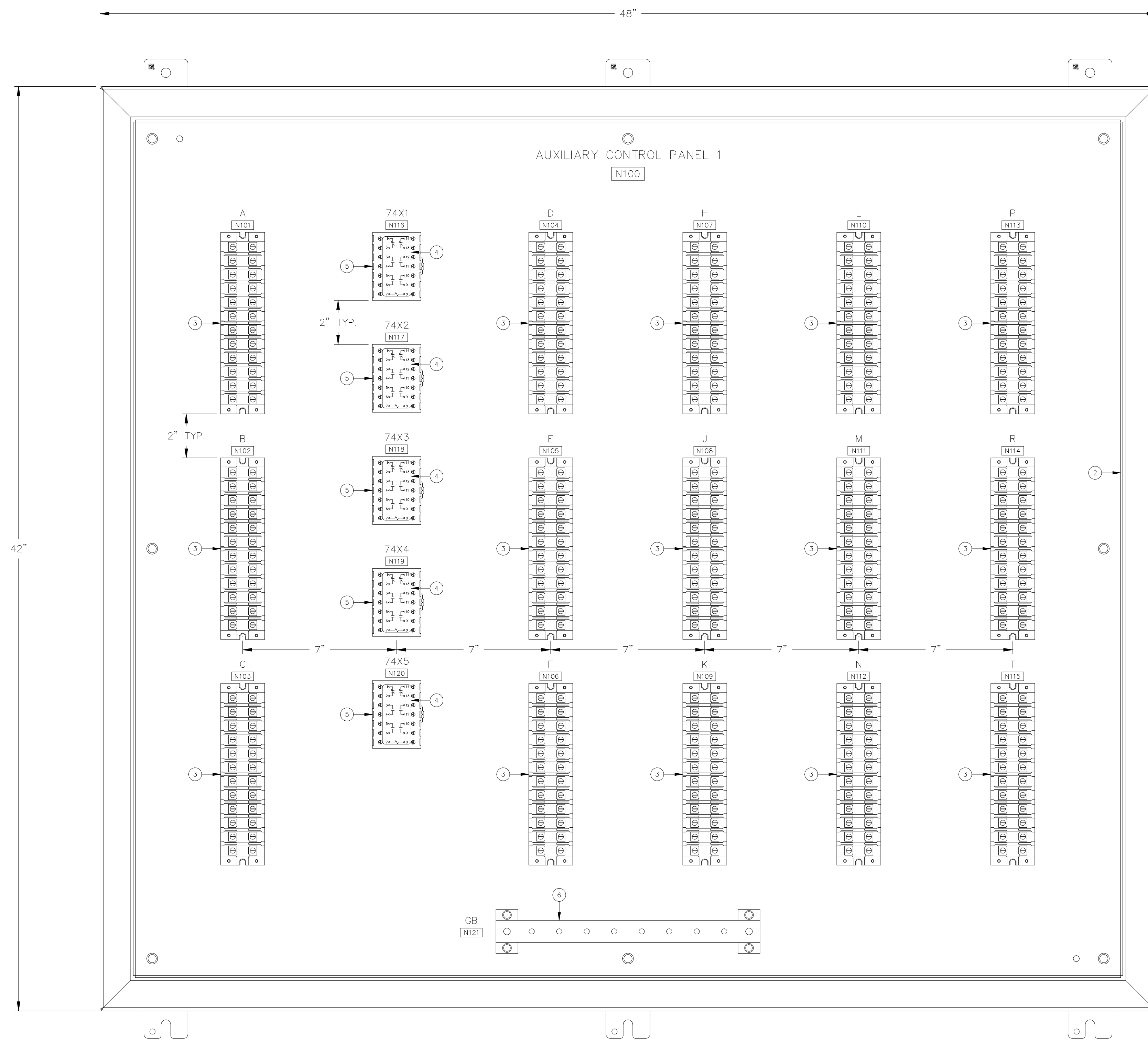
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION MARSHALLING CABINET 3 NAMEPLATES

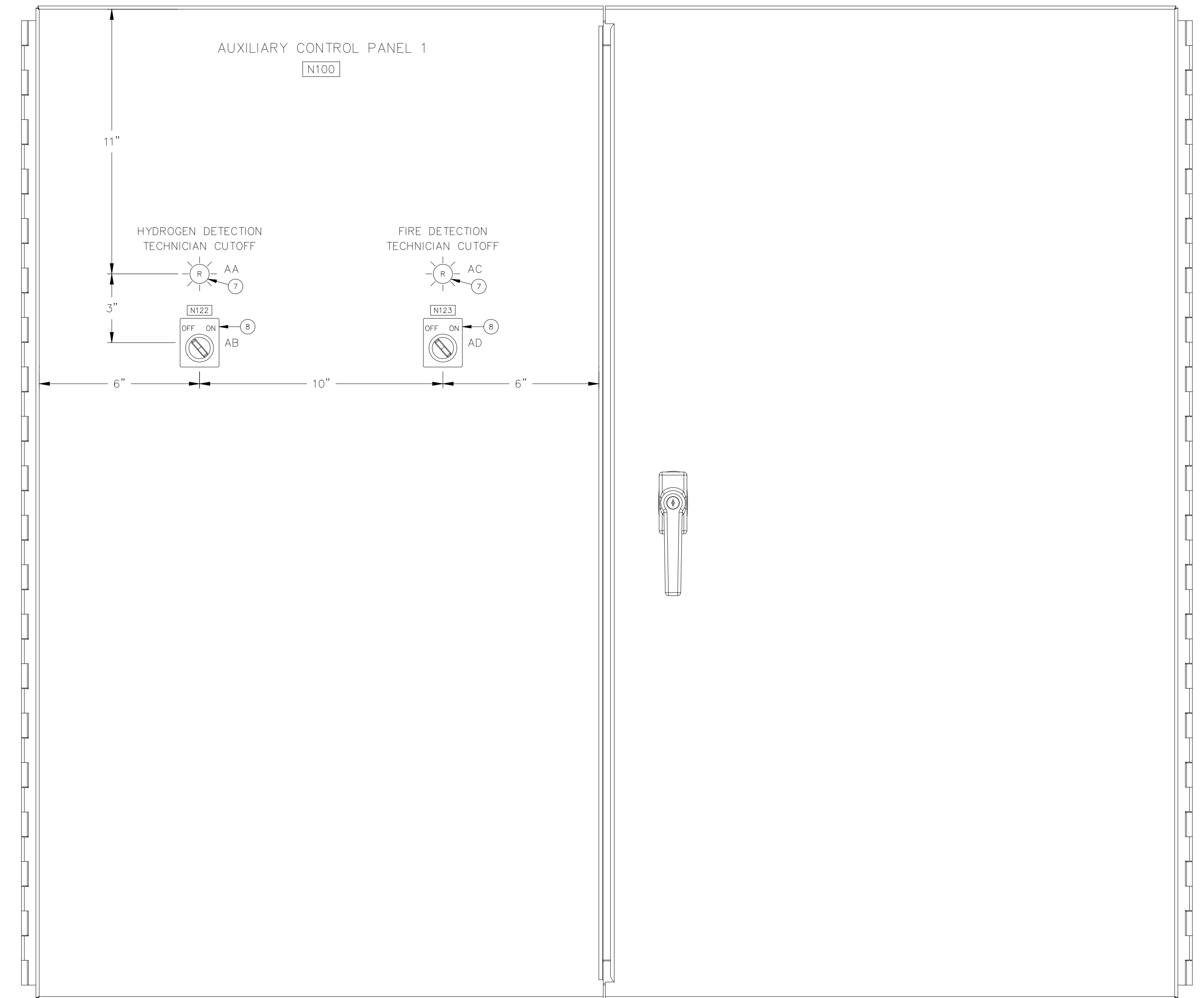
REF. DWG(S):

DRAWING NO.: DGSS-EL-4514

SHEET 2 OF 2



ENCLOSURE FRONT VIEW WITH BACK PANEL
N.T.S.



ENCLOSURE DOOR FRONT
N.T.S.

- NOTES:
- ① FOR NAMEPLATES SEE REFERENCE 1.
 - ② NAMEPLATES N124-N127 MOUNT ON THE BACK OF THE ENCLOSURE DOOR.
 - ③ ALL DIMENSIONS SHOWN IN INCHES.
 - ④ ALL DIMENSIONS ARE TO CENTERLINE UNLESS SHOWN OTHERWISE.

BILL OF MATERIAL					
REF. NO.	UNIT	ESTIMATED QUANTITY	DESCRIPTION	MANUFACTURER/CATALOG NUMBER	FURNISHED BY
①	EA	1	WALL MOUNT ENCLOSURE	HOFFMAN/A424B12WFLP	C
②	EA	1	ENCLOSURE SUB-PANEL	HOFFMAN/A48P42G	C
③	EA	15	TERMINAL BLOCK, 12 POLE, 30 AMP, STANDARD	MARATHON/1512 STD 01C	C
④	EA	5	GENERAL PURPOSE AUX RELAY, 120 VAC COIL (74X1, 74X2, 74X3, 74X4, 74X5)	STRUTHERS-DUNN/219DXBP-120VAC	C
⑤	EA	5	GENERAL PURPOSE AUXILIARY RELAY SOCKET	STRUTHERS-DUNN/33377	C
⑥	EA	1	GROUND BUS, COPPER	NEWTON/0030590000	C
⑦	EA	2	INDICATING LIGHT, ET-16, LED, RED	GE/116B6708G45R73R4	C
⑧	LOT	1 2 2 2	SELECTOR SWITCH SELECTOR SWITCH, 2-POSITION, 30MM CONTACT BLOCKS, 2 N.O + 1 N.C. LEGEND PLATE, ON/OFF	ABB: ABB/G1M25S2-10B ABB/MCBH-21 ABB/GIMP-NPE28-07 POSITION 1: OFF POSITION 2: ON	C
⑨			NOT USED		
⑩			NOT USED		
⑪			NOT USED		
⑫			NOT USED		

C = CONTRACTOR, O = OWNER, NIC = NOT IN CONTRACT.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT		
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		
JOB #: MEA W.O. EN16-3.2		
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	DGSS-EL-4515/2	AUXILIARY CONTROL PANEL 1 NAMEPLATES

DRAWING NAME:		DOUGLAS SUBSTATION AUXILIARY CONTROL PANEL 1 ELEVATION
REF. DWG(S):		
DRAWING NO.:		DGSS-EL-4515

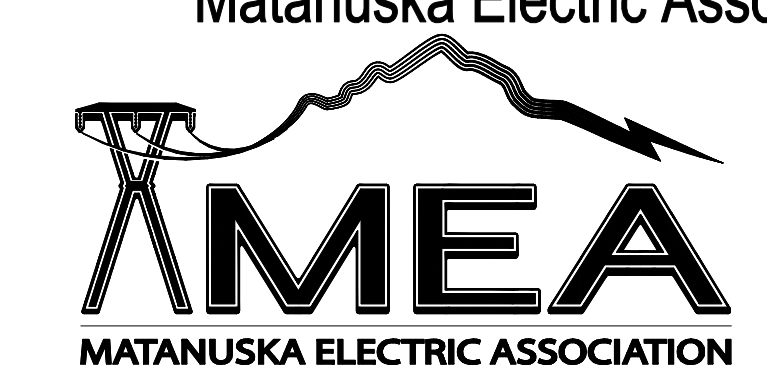
dass-el-4515_1.dwg

NAMEPLATE NUMBER	QTY	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NAMEPLATE SIZE HEIGHT x WIDTH (IN)	TEXT HEIGHT (IN)
N100	2	AUXILIARY CONTROL	PANEL 1		1 x 4	1/4
N101	1	A			1/2 x 3/4	1/4
N102	1	B			1/2 x 3/4	1/4
N103	1	C			1/2 x 3/4	1/4
N104	1	D			1/2 x 3/4	1/4
N105	1	E			1/2 x 3/4	1/4
N106	1	F			1/2 x 3/4	1/4
N107	1	H			1/2 x 3/4	1/4
N108	1	J			1/2 x 3/4	1/4
N109	1	K			1/2 x 3/4	1/4
N110	1	L			1/2 x 3/4	1/4
N111	1	M			1/2 x 3/4	1/4
N112	1	N			1/2 x 3/4	1/4
N113	1	P			1/2 x 3/4	1/4
N114	1	R			1/2 x 3/4	1/4
N115	1	T			1/2 x 3/4	1/4
N116	1	74X1	H2 GAS	1% RELAY	1 x 1-1/2	1/8
N117	1	74X2	H2 GAS	2% RELAY	1 x 1-1/2	1/8
N118	1	74X3	SMOKE DET.	RELAY	1 x 1-1/2	1/8
N119	1	74X4	HEAT DET.	RELAY	1 x 1-1/2	1/8
N120	1	74X5	HVAC STOP	RELAY	1 x 1-1/2	1/8
N121	1	GB	GROUND BUS		1 x 1-1/2	1/8
N122	1	HYDROGEN ALARM	TECHNICIAN CUTOFF		1 x 3	1/8
N123	1	FIRE ALARM	TECHNICIAN CUTOFF		1 x 3	1/8
N124	1	AA	H2 TECH C/O	INDICATION	1 x 1-1/2	1/8
N125	1	AB	CO-HA	H2 TECH C/O	1 x 1-1/2	1/8
N126	1	AC	FIRE TECH C/O	INDICATION	1 x 1-1/2	1/8
N127	1	AD	CO-FA	FIRE TECH C/O	1 x 1-1/2	1/8

- NOTES:
- ① ALL NAMEPLATES SHALL BE 1/16" THICK MINIMUM PLASTIC.
 - ② ALL NAMEPLATES SHALL HAVE EXTERIOR RATED HIGH-TACK ADHESIVE.
 - ③ ALL NAMEPLATES SHALL BE BLACK SURFACE WITH WHITE TEXT.
 - ④ ALL TEXT SHALL BE "ARIAL BOLD" FONT.
 - ⑤ EACH LINE OF TEXT SHALL BE CENTERED ON THE NAMEPLATE.
 - ⑥ ALL TEXT SHALL BE UPPER CASE.
 - ⑦ ALL DIMENSIONS SHOWN IN INCHES.

PROJECT: DOUGLAS CONTROL ENCLOSURE REPLACEMENT			
DESIGNER/PROJECT ENGINEER: TIM CONRAD/EPS		JOB #: MEA W.O. EN16-3.2	
NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME: DOUGLAS SUBSTATION
 AUXILIARY CONTROL PANEL 1
 NAMEPLATES

REF. DWG(S):

DRAWING NO.: DGSS-EL-4515

SHEET 2 OF 2

dass-el-4515_2.dwg