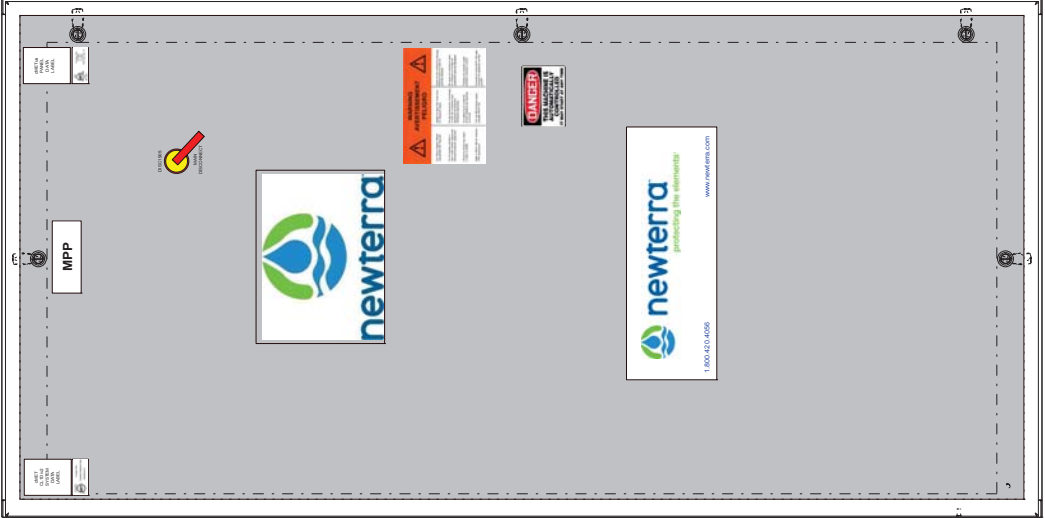
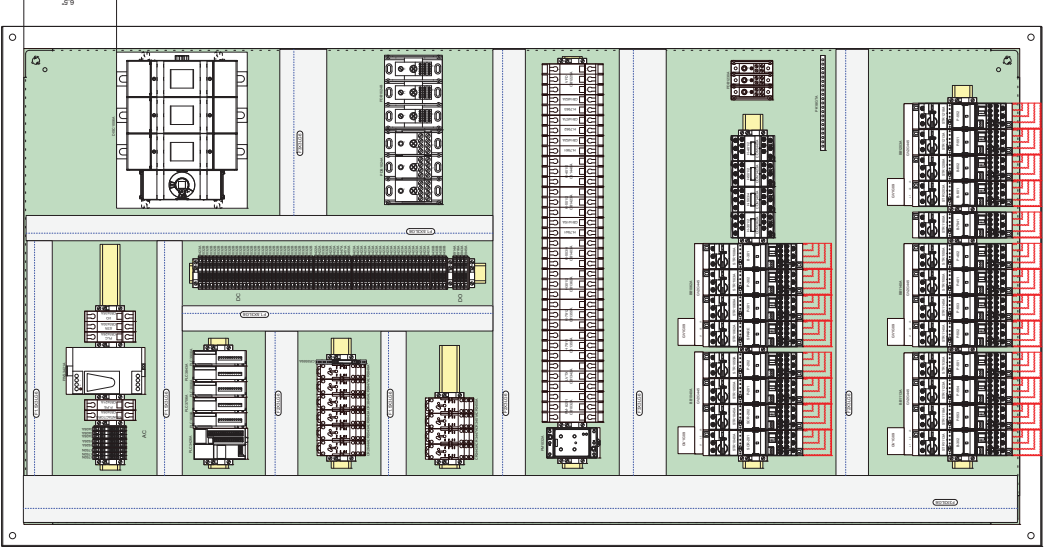




PANEL OUTER DOOR



PANEL INTERIOR

WIRE LEGEND
BLACK: POWER
WHITE: CONTROL
BLUE: +24VDC & IS WIRING
BLU/WH: 0VDC
YELLOW: INTERLOCKS

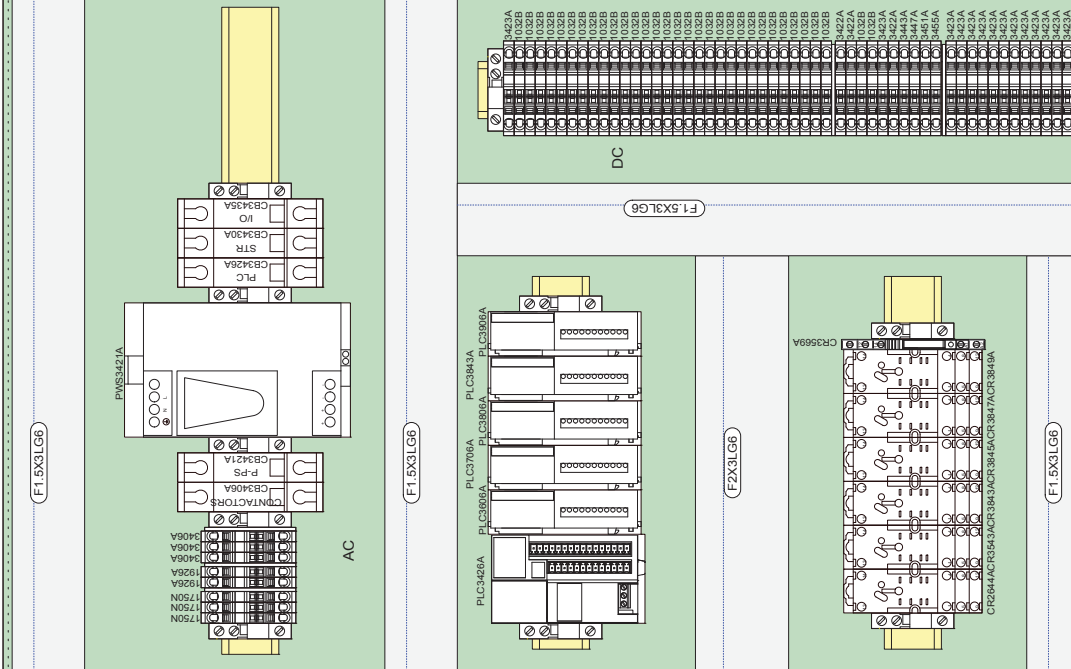
NOTES:

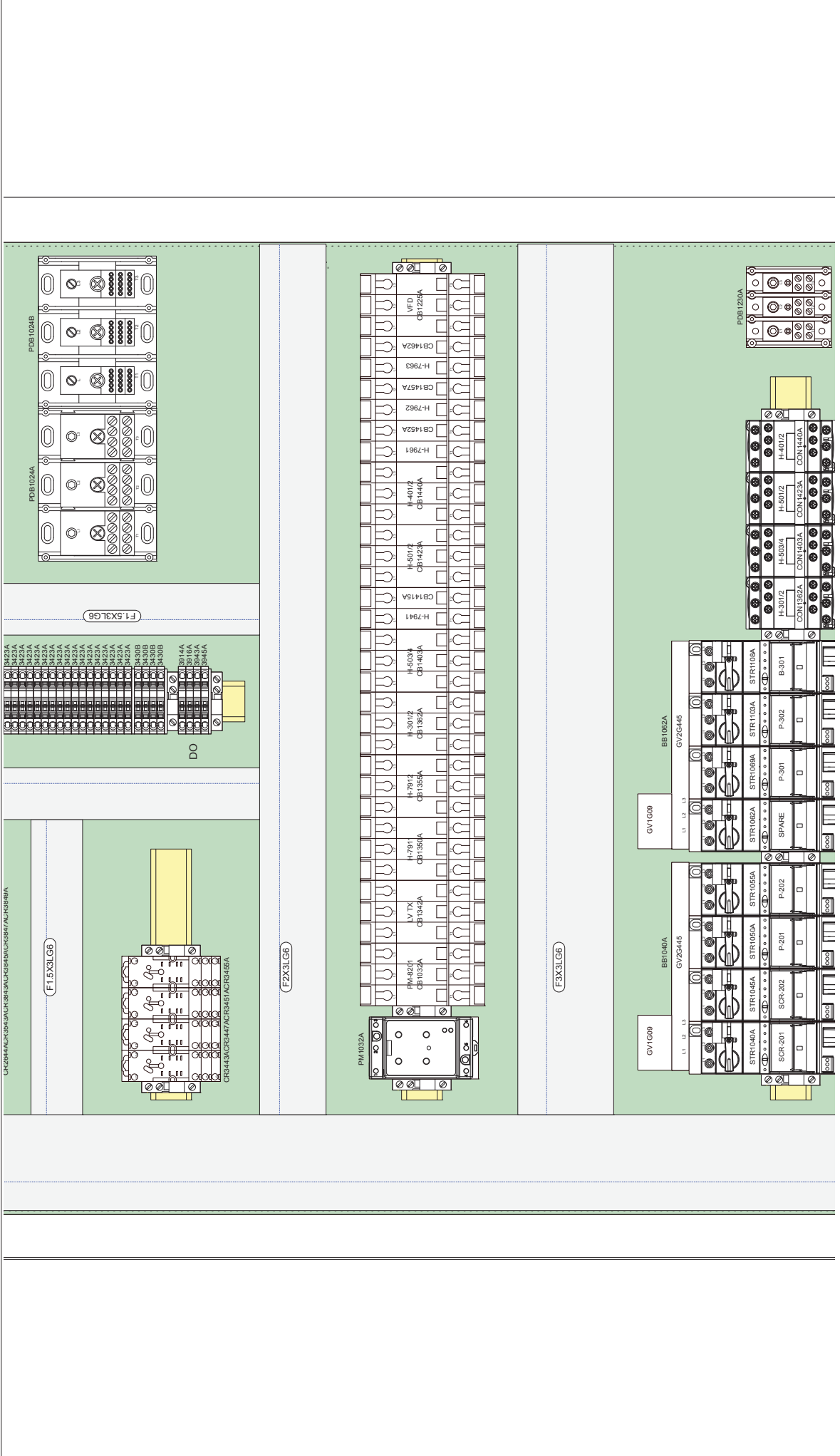


1525 CALIFORNIA AVE
BRANDERSBURG, KY 40303
CANADA: 481.576
PHONE: (615) 458-1576
www.newterra.com

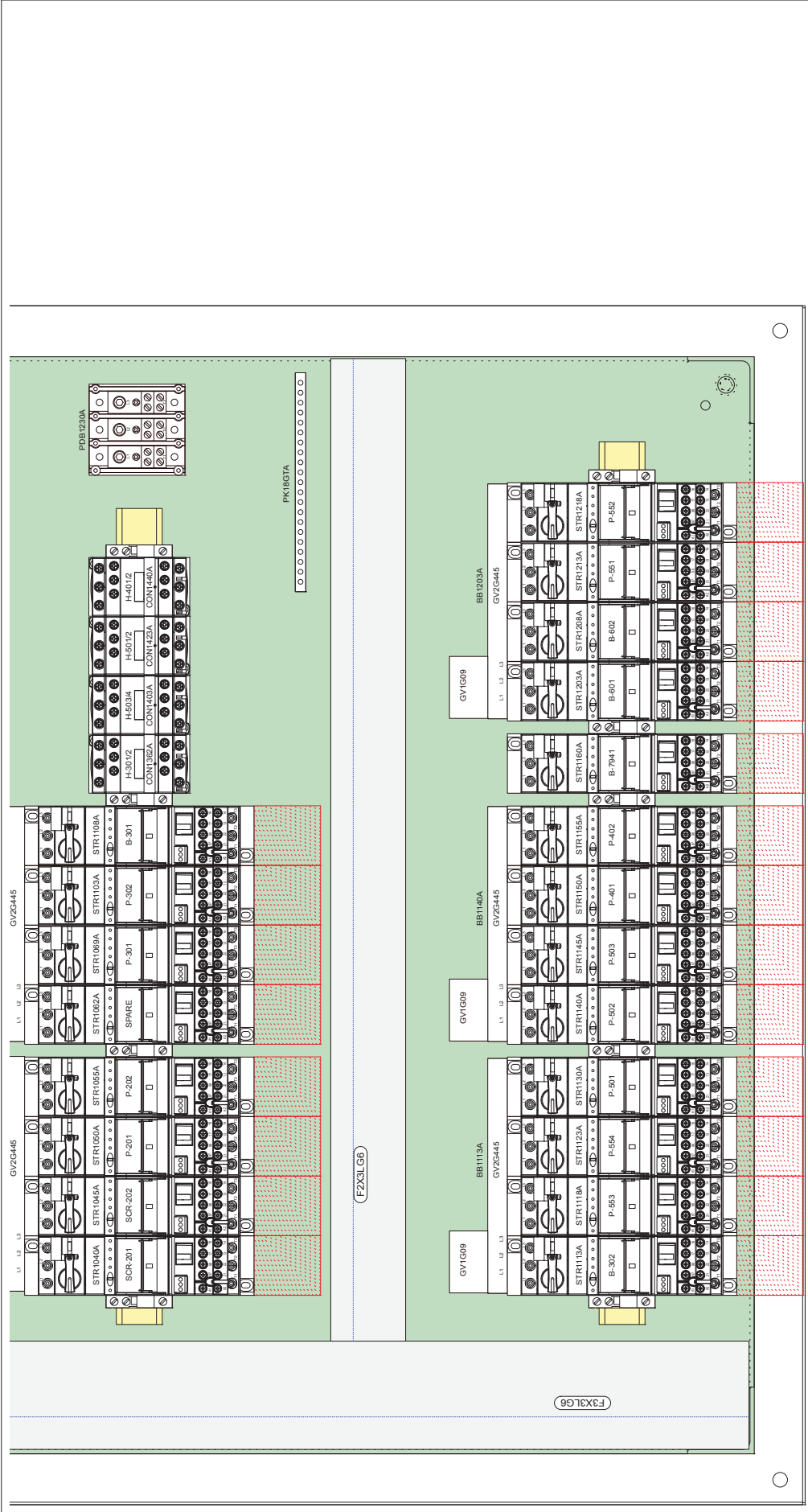
PROJ. NO. 1704432
TITLE AND LOCATION:
MPP PANEL LAYOUT

CUSTOMER:
AGNICO EAGLE
600 MAN AMARUO MINE
DRAWN BY: DMB
DATE: 08/05/17
SHEET: 41
SHEETS: 71
TIME: JAKO DALE INC. C

[illegible]

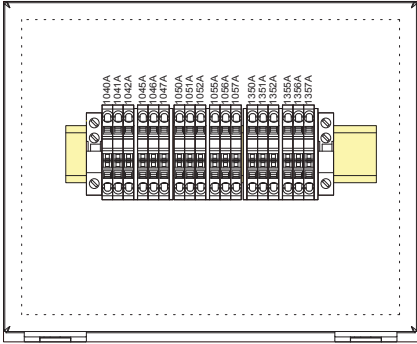


WIRE LEGEND	NOTES:		1.	
	BLACK:	POWER		
	WHITE:	CONTROL		
	BLUE:	NEUTRAL		
THIS INFORMATION IS THE PROPERTY OF newterra inc. AND CANNOT BE REUSED OR REPRODUCED WITHOUT THE WRITTEN CONSENT OF newterra inc.	BLU/WH:	+24VDC & IS WIRING		
	YELLOW:	0VDC		
		INTERLOCKS		
CUSTOMER:		1704432		
TITLE AND LOCATION:		MPP PANEL LAYOUT		
MPP		MIDDLE		
DRAWN BY:		DATE:		SHEET: 71
DMB		08/05/17		45
REVISION		DATE		BY
LEVEL		DATE		BY
A		12/05/17		DMB
A1		23/05/17		DMB
B		31/05/17		DMB
C		14/08/17		DMB
AS BUILT				
FOR PRODUCTION				
FOR REVIEW				
FOR SUBMITTAL				
1525 CALIFORNIA AVE		1525 CALIFORNIA AVE		
SUITE 100		SUITE 100		
CANADA V6V 5V6		CANADA V6V 5V6		
PHONE: (613) 458-1576		PHONE: (613) 458-1576		
www.newterra.com		www.newterra.com		
newterra		newterra		

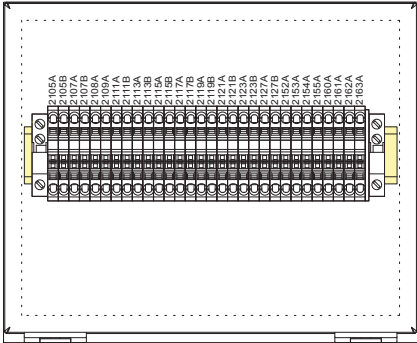


MPP
EN4SD723612GY
PANEL INTERIOR

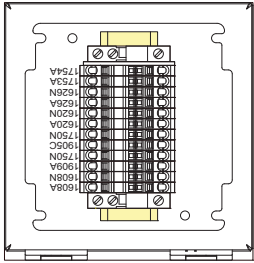
WIRE LEGEND BLACK: POWER RED: 120VAC CONTROL WHITE: 240VAC CONTROL BLUE: 240VDC & IS WIRING BLU/WHIT: 0VDC YELLOW: INTERLOCKS	NOTES:	 newterra www.newterra.com	1325 CALIFORNIA AVE BROOKVILLE, ONTARIO CANADA M1R 3P6 PHONE: (613) 458-1576 www.newterra.com	C	AS BUILT				PROJ. NO. 1704432	CUSTOMER: AGNICO EAGLE 600 MAN AMARUO MINE	
				B	FOR PRODUCTION						
				A1	FOR REVIEW						
				A	FOR SUBMITTAL						
				LEVEL							
					REVISION	DATE	BY				

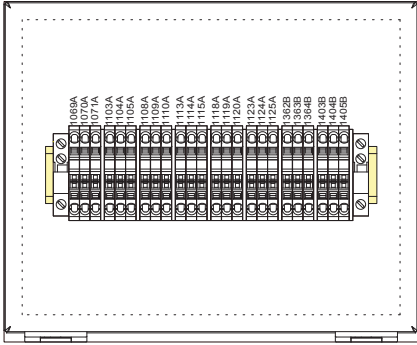


JB-7901-HV
EJ1084

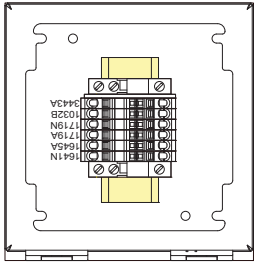


JB-7901-S
EJ1084

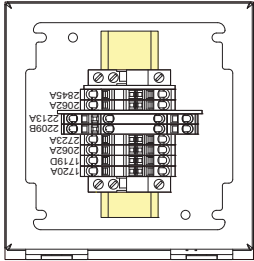




JB-7902-HV
E1064

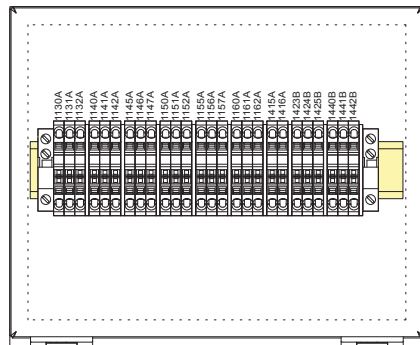
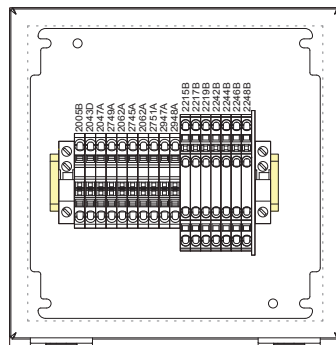
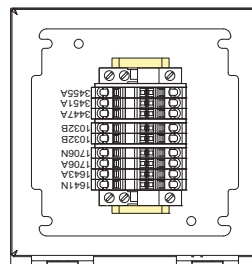


JB-7902-AC
E1064



JB-7902-DC
E1064

newterra	NOTES: 1.	WIRE LEGEND POWER CONTROL NEUTRAL BLUE: +24VDC & IS WIRING 0VDC BLU/WHIT: INTERLOCKS YELLOW:	newterra	1525 CALIFORNIA AVE SUITE 100 CANADA, BC V5V 5V6 PHONE: (604) 458-1576 www.newterra.com		C	AS BUILT	14/05/17	DMB	PROJ. NO.	1704432	CUSTOMER:			
						B	FOR PRODUCTION	31/05/17	DMB	TITLE AND LOCATION:		AGNICO EAGLE			
						A1	FOR REVIEW	23/05/17	DMB	JUNCTION BOX LAYOUTS		600 MAN AMARUO MINE			
						A	FOR SUBMITTAL	12/05/17	DMB	JB-7902'S		DRAWN BY:	DATE:		
						LEVEL	REVISION	DATE	BY			DMB	30/05/17	46	SHEET:
												DMB	71	THIS INFORMATION IS THE PROPERTY OF newterra inc. AND CANNOT BE REUSED OR REPRODUCED WITHOUT THE WRITTEN CONSENT OF newterra inc.	

JB-7904-HV
EJ1084JB-7904-DC
EJ884JB-7904-AC
EJ664

WIRE LEGEND: BLACK: POWER RED: 120VAC CONTROL WHITE: NEUTRAL GREEN: GROUND & IS WIRING BLUE/WH: 0VDC YELLOW: INTERLOCKS	NOTES: 1.		1235 CALIFORNIA AVE BROCKVILLE, ONTARIO CANADA N6V 5Y6 PHONE: (613)485-1876 www.newterra.com					PROJ. NO: 1704432		CUSTOMER: AGNICO EAGLE 600 MAN AMARUQ MINE					
				C	AS BUILT	14/08/17	DMB	TITLE AND LOCATION: JUNCTION BOX LAYOUTS JB-7904'S		DRAWN BY: DMB DATE: 30/05/17 SHEET: 47 SHEETS: 71					
				B	FOR PRODUCTION	31/05/17	DMB								
				A1	FOR REVIEW	23/05/17	DMB								
				A	FOR SUBMITTAL	12/05/17	DMB								
				LEVEL	REVISION	DATE	BY								
						(MM/DD/YY)	(NAME)								

MPP - Bill of Materials

Qty	APES#	Part Number	Description	Manufacturer	Device Designation(s)
1	37557	2QP1	Pad Lockable Quarater Turn Latch	Hammond	MPP
1	18396	460	190-480V, 3PH Power/Phase Monitor	Symcom	PM1032A
25	23745	800886	End Bracket - DIN Rail	Phoenix Contact	TB1, TB5, TB13, TB14, TB15, TB17, TB19, TB20, TB21, TB22, TB23, TB24, TB25, TB26, TB27, TB28, TB31, TB34, TB38, TB39, TB40, TB41, TB42, TB43, TB44
8	19168	0801733	Steel mounting rail, 35x7,5 mm, 1 mm thick; perforated	Phoenix Contact	TS1, TS5, TS6, TS7, TS8, TS9, TS10, TS11
1	23751	2966171	Relay, SPDT, 24VDC Coil	Phoenix Contact	CR3569A
7	23742	3030420	End Plate - 30A Feed Thru	Phoenix Contact	TB16, TB30, TB32, TB33, TB35, TB36, TB37
69	23738	3031377	Terminal, Blue, 28-12AWG, 30A, 600V	Phoenix Contact	AC(3), DC(66)
5	23740	3037151	Terminal, Red, 28-12AWG, 30A, 600V	Phoenix Contact	AC(5)
1	35707	ABL8REM24050	24VDC Power Supply, 120W, 5A	Schneider Electric	PWS3421A
3	12404	AJT250	Fuse GLD AJT250250A 600V Time Delay, Class J	Ferraz Shawmut	DISC1006A(3)
1	24694	Arc Flash	Panel Label - Arc Flash Tri-lingual	Panel	8, 11D
5	27397	C1.5LG6	Wire Duct Cover, 1.5", Grey	Panduit	WD8, WD9, WD10, WD12, WD16
3	27399	C2LG6	Wire Duct Cover, 2", Grey	Panduit	WD7, WD13, WD15
3	27405	C3LG6	Wire Duct Cover, 3", Grey	Panduit	WD1, WD4, WD11
1	38090	EN4SD723612GY	72" x 36" x 12" NEMA4 Steel Enclosure	Hammond	MPP
1	38041	EP7236	72" x 36" Backplate	Hammond	MPP
1	37558	EZPMFHD	Mounting Feet, Zinc, Set of 4	Hammond	MPP
5	27396	F1.5X3LG6	Wire Duct, 1.5"x3", Grey, Narrow Finger	Panduit	WD8, WD9, WD10, WD12, WD16
3	27398	F2X3LG6	Wire Duct, 2"x3", Grey, Narrow Finger	Panduit	WD7, WD13, WD15
3	27404	F3X3LG6	Wire Duct, 3"x3", Grey, Narrow Finger	Panduit	WD1, WD4, WD11
1	27929	GS1AW503	Terminal Lug, 2@#2AWG-600MCM, for use in 400A, 600A, 800A	Schneider Electric	DISC1006A
1	27712	GS2AE2	Shaft for Rotary Thru Door Handle	Schneider Electric	DISC1905
1	27713	GS2AH140	Through Door Rotary Handle	Schneider Electric	DISC1905
1	27928	GS2AP53	Terminal Shroud Kit 400A	Schneider Electric	DISC1006A
1	27927	GS2QU3N	Internal Fusible switch, 400A, Class J	Schneider Electric	DISC1006A
6	17158	GV1G09	Combination Starter, Busbar Top Mount	Schneider Electric	BB1040A, BB1062A, BB1113A, BB1140A, BB1203A, STR1160A
5	22546	GV2G445	Busbar 4 TeSysU Starters, #6AWG 63A MAX	Schneider Electric	BB1040A, BB1062A, BB1113A, BB1140A, BB1203A
4	10254	LC1D18G7	Contactor (TeSys D) Non-Reversing, 18A(AC3) 125A(AC1), 3-Pole (3 NO)	Schneider Electric	CON1362A, CON1403A, CON1423A, CON1440A
15	37367	LU9BN11C	TeSysU Prewired Coil Connection, Front Connection	Schneider Electric	STR1040A, STR1045A, STR1050A, STR1055A, STR1069A, STR1103A, STR1108A, STR1113A, STR118A, STR1123A, STR1130A, STR1140A, STR1145A, STR1203A, STR1208A

NOTES:



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BIRMINGHAM, AL 35202
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B	FOR PRODUCTION	14/08/17	DMB
A1	FOR REVIEW	31/05/17	DMB
A	FOR SUBMITTAL	23/05/17	DMB
LEVEL	REVISION	DATE	BY

CUSTOMER:

1704432	AGNICO EAGLE
MPP BILL OF MATERIAL	600 MAN AMARUO MINE
MODULE 8201 - SHEET 1 OF 2	
DRAWN BY: DMB	DATE: 31/05/17
SHEET: 46	SHEETS: 71

MPP - Bill of Materials

Qty	APES#	Part Number	Description	Manufacturer	Device Designation(s)
21	19289	LUA1C20	Combination Starter, 1NO Ready, 1NO Fault/Aux. Contact Module	Schneider Electric	STR1040A, STR1045A, STR1050A, STR1055A, STR1062A, STR1069A, STR1103A, STR1108A, STR1113A, STR1118A, STR1123A, STR1130A, STR1140A, STR1145A, STR1150A, STR1155A, STR1160A, STR1208A, STR1213A, STR1218A
21	19264	LUB12	Combination Starter, 12A Power Base, 3/7.5/10HP	Schneider Electric	STR1040A, STR1045A, STR1050A, STR1055A, STR1062A, STR1069A, STR1103A, STR1108A, STR1113A, STR1118A, STR1123A, STR1130A, STR1140A, STR1145A, STR1150A, STR1155A, STR1160A, STR1208A, STR1213A, STR1218A
4	19503	LUCA1XBL	Combination Starter, TeSysU Standard Control Unit 0.35-1.4A, 24VDC coil	Schneider Electric	STR1040A, STR1045A, STR1062A, STR1145A
11	21191	LUCA05BL	Combination Starter, TeSysU Standard Control Unit 1.25-5.0A, 24V/60mA DC coil	Schneider Electric	STR1050A, STR1055A, STR1069A, STR1103A, STR1108A, STR1113A, STR1130A, STR1140A, STR1160A, STR1213A, STR1218A
6	22706	LUCA12BL	Combination Starter, TeSysU Standard Control Unit 3-12A, 24V/60mA DC coil	Schneider Electric	STR1118A, STR1123A, STR1150A, STR1155A, STR1203A, STR1208A
4	38092	M9F42215	Breaker, Multi9, 480/277V 15 AMP 2P C Trip Curve, 10k SCCR	Schneider Electric	CB1415A, CB1452A, CB1457A, CB1462A
2	38069	M9F42315	Breaker, Multi9 480/277V 15 AMP 3P C Trip Curve, 10k SCCR	Schneider Electric	CB1032A, CB1342A
5	38070	M9F42320	Breaker, Multi9 480/277V 20 AMP 3P C Trip Curve, 10k SCCR	Schneider Electric	CB1350A, CB1362A, CB1403A, CB1423A, CB1440A
1	38071	M9F42330	Breaker, Multi9 480/277V 30 AMP 3P C Trip Curve, 10k SCCR	Schneider Electric	CB1355A
2	38136	MG24425	Breaker, 240V 1 AMP 1P C	Schneider Electric	CB3406A, CB3426A
1	38137	MG24426	Breaker, 240V 2 AMP 1P C	Schneider Electric	CB3435A
1	38138	MG24427	Breaker, 240V 3 AMP 1P C	Schneider Electric	CB3421A
1	38139	MG24428	Breaker, 240V 4 AMP 1P C	Schneider Electric	CB3430A
2	26722	MPDB67113	Power Block, 175A 1P/12Sec Aluminum, 2/0-#14P/10-14Sec	MERSEN	PDB1024A, PDB1024B
6	26741	MPDB C6667	Power Block, MPDBC6667 safety cover,	MERSEN	PDB1024A(3), PDB1024B(3)
1	36638	NT-CV-12	Panel Label - newterra Decal	Panel	8.11E
1	36639	NT-PS	Panel Label - newterra Slicker	Panel	8.11F
1	36316	OTB1E0DM9LP	OTB RIO Adapter, Ethernet	Schneider Electric	PLC3426A
1	10586	PK18GTA	NO Panelboard Ground Bus	Schneider Electric	GB1
10	22324	RXM2AB1BD	Relay, SQT RXM2AB1BD, Miniature Relay 2PDT 24 VDC	Schneider Electric	CR3443A, CR3447A, CR3451A, CR3455A, CR3541A, CR3543A, CR3843A, CR3845A, CR3847A, CR3849A
10	22326	RXZE2S108M	Relay, SQT RXZE2S108M, Base/Socket for RXM2 2P Relays	Schneider Electric	CR3443A, CR3447A, CR3451A, CR3455A, CR3541A, CR3543A, CR3843A, CR3845A, CR3847A, CR3849A
1	36317	TM2DDI8DT	TM2 8 point DI Expansion Module	Schneider Electric	PLC3806A
2	37596	TM2DDI16DT	TM2 16 point DI Expansion Module	Schneider Electric	PLC3806A, PLC3706A
1	38119	TM2DDO8TT	TM2 8 point DO Expansion Module, Removable Terminal Blocks	Schneider Electric	PLC3843A
1	38209	TM2DRA16RT	TM2 16RO Expansion Module	Schneider Electric	PLC3906A

NOTES:

		1325 CALIFORNIA AVE. BIRMINGHAM, AL 35202 CANADA 607 576 PHONE: (615) 488-1876 www.newterra.com	C	AS BUILT	14/08/17	DMB	PROJ. NO:	1704432	CUSTOMER:
			B	FOR PRODUCTION	31/05/17	DMB	TITLE AND LOCATION:		
A1	FOR REVIEW	23/05/17	DMB	MPP BILL OF MATERIAL			AGNICO EAGLE		
A	FOR SUBMITTAL	12/05/17	DMB	MODULE 8201 - SHEET 2 OF 2			600 MAN AMARUO MINE		
LEVEL	REVISION	DATE	BY	DRAWN BY:			DATE:	SHEET:	SHEETS:
		(8/24/2017)		DMB			31/05/17	49	71

MCP - Bill of Materials

Qty	APES#	Part Number	Description	Manufacturer	Device Designation(s)
1	37557	2QP1	Pad Lockable Quarater Turn Latch	Hammond	MCP
1	26829	8GB_Micro	8GB Micro USB Key	Generic	OIT2008A
1	26511	17-200161	USB TypeA F-F Bulkhead Connector	Conec	USB71A
1	20698	20698	Mounting Bracket, Antenna & Surge Protector		ENET2011A
27	23745	800886	End Bracket - DIN Rail	Phoenix Contact	TB2, TB3, TB4, TB5, TB6, TB10, TB11, TB12, TB13, TB14, TB15, TB16, TB37, TB38, TB39, TB42, TB43, TB44, TB45, TB46, TB47, TB52, TB54, TB57, TB58, TB59, TB65
6	19168	0801733	Steel mounting rail, 35x7,5 mm, 1 mm thick; perforated	Phoenix Contact	TS1, TS2, TS3, TS8, TS9, TS10
17	23751	2966171	Relay, SPDT, 24VDC Coil	Phoenix Contact	CR2507A, CR2509A, CR2511A, CR2517A, CR2519A, CR2521A, CR2548A, CR2550A, CR2552A, CR2554A, CR2607A, CR2609A, CR2611A, CR2613A, CR2615A, CR2617A, CR2619A
14	23742	3030420	End Plate - 30A Feed Thru	Phoenix Contact	TB29, TB31, TB33, TB34, TB49, TB50, TB55, TB56, TB60, TB61, TB62, TB63, TB64, TB66
1	23748	3030747	End Plate - Double Feed Thru	Phoenix Contact	TB48
10	23737	3031384	Terminal, Grey, 28-12AWG, 30A, 600V	Phoenix Contact	AC(6), AO(4)
83	23738	3031377	Terminal, Blue, 28-12AWG, 30A, 600V	Phoenix Contact	AI(44), AO(8), DC(26), DO-P(5)
48	35073	3031432	Terminal, Double, 28-10AWG, 30A, 600V, Blue	Phoenix Contact	DI(48)
15	29545	3036369	Fused Terminal, 28-10AWG, 6.3A, 500V	Phoenix Contact	AI(14), AO
8	23741	3037148	Terminal, Yellow, 28-12AWG, 30A, 600V	Phoenix Contact	TB1(8)
15	23740	3037151	Terminal, Red, 28-12AWG, 30A, 600V	Phoenix Contact	AC(15)
2	35707	ABL8REM24050	24VDC Power Supply, 120W, 5A	Schneider Electric	PWS2004A, PWS2015A
1	24694	Arc Flash	Panel Label - Arc Flash Tri-lingual	Panel	8.11C
2	27402	C1LG6	Wire Duct Cover, 1", Grey	Panduit	WD2, WD11
6	27399	C2LG6	Wire Duct Cover, 2", Grey	Panduit	WD1, WD3, WD8, WD9, WD10, WD12
1	27949	C5E-STPRD-S3	Red Industrial Ethernet Cable, RJ45, 3ft, STP	Canada Computer	CBL5
2	27950	C5E-STPRD-S7	Industrial Ethernet Cable, RJ45, 7ft, STP	Canada Computer	CBL1, CBL3
1	27951	C5E-STPRD-S10	Industrial Ethernet Cable, RJ45, 10ft, STP	Canada Computer	CBL2
1	27953	C5E-STPRD-S25	Industrial Ethernet Cable, RJ45, 25ft, STP	Canada Computer	CBL6
4	12475	D1031Q	4Ch Discrete, Transistor Output, Intrinsically Safe Barrier	GM International	IS2020A, IS2024A, IS2028A, IS2032A
1	24602	E100502	Industrial RJ45 Jack	Belden	ETH71A
1	29140	EC6133D	eWON Cosy 131 LAN/Cell Router, 24VDC Power	eWON	ENET2011A
1	37906	EN4SD483612GY	48" x 36" x 12" NEMA4 Steel Enclosure	Hammond	MCP
1	37907	EP4836	48" x 36" Backplate	Hammond	MCP

NOTES:

		1325 CALIFORNIA AVE. BIRMINGHAM, AL 35202 CANADA K6V 5V6 PHONE: (613)488-1876 www.newterra.com		C	AS BUILT	14/08/17	DWG	PROJ. NO:	1704432	CUSTOMER:	
				B	FOR PRODUCTION	31/05/17	DWG	TITLE AND LOCATION:		AGNICO EAGLE	
				A1	FOR REVIEW	23/05/17	DWG	MCP BILL OF MATERIAL		600 MAN AMARUO MINE	
				A	FOR SUBMITTAL	12/05/17	DWG	MODULE 8202 - SHEET 1 OF 3		DRAWN BY:	DMB
				LEVEL	REVISION	DATE	BY			DATE:	30/05/17
										SHEET:	50
										SHEETS:	71

MCP - Bill of Materials

Qty	APES#	Part Number	Description	Manufacturer	Device Designation(s)
1	37558	EZPMFHD	Mounting Feet, Zinc, Set of 4	Hammond	MCP
2	27400	F1X3LG6	Wire Duct, 1"x3", Grey, Narrow Finger	Panduit	WD2, WD11
6	27398	F2X3LG6	Wire Duct, 2"x3", Grey, Narrow Finger	Panduit	WD1, WD3, WD8, WD9, WD10, WD12
14	20369	GSB1/10	Fuse, GLD, GSB1/10100mA 250V Fast Acting, Miniature 5x20mm	Ferraz Shawmut	AI(14)
1	36555	GSB16/100	Fuse, 160mA 250V Fast Acting, Miniature 5x20mm	Ferraz Shawmut	AO
1	20569	GW195-180-SMA-NIM	Cellular Modem Antenna Cable - 15Ft. N-Male to SMA-Male	Airlink_Communications	ENET2011A
1	36126	HMI DT542	Touchscreen, 10.4" TOUCH SMART DISPLAY	Schneider Electric	OIT2008A
1	36124	HMI G3U	HMI Linux Processor, for use with HMI DT smart displays	Schneider Electric	OIT2008A
1	26892	IS Wiring Inside	Panel Label - IS Wiring Inside	Panel	8.11A
4	38136	MG24425	Breaker, 240V 1 AMP 1P C	Schneider Electric	CB1905C, CB1909A, CB2020A, CB2043A
2	38137	MG24426	Breaker, 240V 2 AMP 1P C	Schneider Electric	CB2057A, CB2062A
5	38138	MG24427	Breaker, 240V 3 AMP 1P C	Schneider Electric	CB1905A, CB2004A, CB2008A, CB2015A, CB2053A
2	38139	MG24428	Breaker, 240V 4 AMP 1P C	Schneider Electric	CB1926A, CB2011A
1	36639	NT-PS	Panel Label - newterra Sticker	Panel	8.11D
1	10586	PK18G7A	NQ Panelboard Ground Bus	Schneider Electric	GB1
1	23504	PSD1001	4Ch Power Supply, 15V - 20mA	GM International	IS2036A
1	11482	QOU1PA	Breaker Lock for 1 pole QOU breakers	Schneider Electric	CB1905B
1	10270	QOU115	Breaker, SQD QOU115 1240V 15A 1P DIN Mount, 10k SCOR	Schneider Electric	CB1905B
5	2324	RXM2AB1BD	Relay, SQT RXM2AB1BD, Miniature Relay 2PDT 24 VDC	Schneider Electric	CR2127A, CR2513A, CR2515A, CR2556A, CR2621A
2	21888	RXM4AB1BD	Relay, SQT RXM4AB1BD, Miniature Relay, 4PDT, 24 VDC, 6A contacts	Schneider Electric	CR2050A, CR2558A
1	21887	RXM4AB1F7	Relay, SQT RXM4AB1F7, Miniature Relay, 4PDT, 120VAC, 6A contacts	Schneider Electric	CR2047A
5	2326	RXZE2S108M	Relay, SQT RXZE2S108M, Base/Socket for RXM2 2P Relays	Schneider Electric	CR2127A, CR2513A, CR2515A, CR2556A, CR2621A
3	21889	RXZE2S114M	Relay, SQT RXZE2S114M, Base/Socket for RXM4 4P Relays	Schneider Electric	CR2047A, CR2050A, CR2558A
1	26891	Substitution of IS	Panel Label - Substitution of IS Components	Panel	8.11B
1	36089	TM3A14G	TM3 4-channel AI Expansion Module	Schneider Electric	PLC2807A
1	36090	TM3A18G	TM3 8-channel AI Expansion Module	Schneider Electric	PLC2707A
1	36543	TM3AQ4G	TM3 4-channel AO Expansion Module	Schneider Electric	PLC2906A
4	36087	TM3DI16G	TM3 16DI Expansion Module	Schneider Electric	PLC2105A, PLC2205A, PLC2305A, PLC2405A
2	36088	TM3DQ16TG	TM3 16DO Expansion Module	Schneider Electric	PLC2507A, PLC2607A
1	36558	TM3XREC1	TME Bus Receiver Module	Schneider Electric	PLC2057A
1	36557	TM3XTRA1	TME Bus Transmitter Module	Schneider Electric	PLC2060A
1	28484	TM251MESE	M251 Controller, Dual Ethernet	Schneider Electric	PLC2053A
1	24550	USB_A-A	6ft. USB MaleA/MaleA	Generic	CBL4

NOTES:

		1325 CALIFORNIA AVE. BIRMINGHAM, AL 35202 CANADA 4 69 576 PHONE: (615) 488-1876 www.newterra.com		C	AS BUILT	14/08/17	DMB	PROJ. NO:	1704432	CUSTOMER:	
				B	FOR PRODUCTION	31/05/17	DMB	TITLE AND LOCATION:		MCP BILL OF MATERIAL	
A1	FOR REVIEW	A	FOR SUBMITTAL	23/05/17	DMB	MODULE 8202 - SHEET 2 OF 3		DATE:	30/05/17	SHEET:	51
LEVEL				DATE	BY			DRAWN BY:	DMB	SHEET:	71
				(60mm x 90mm)							

MCP - Bill of Materials

[illegible]

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1704+32

AND LOCATION:

MCP BILL OF MATERIAL
MODULE 8202 - SHEET 3 OF 3

AGNICO EAGLE

DRAWN BY:	DATE:	SHEET:	SHEETS:
DMB	30/05/17	52	71

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170000 - 180000 GIGAS - C

JB-7901-AC - Bill of Materials

[illegible]

NOTES:



1704432

END LOCATION:
JB-7901-AC BILL OF MATERIAL
MODULE 8203 - SHEET 1 OF 11

AGNICO EAGLE
600 MAN AMARUQ

DRAWN BY:	DATE:	SHEET:	SHEETS:
DMB	30/05/17	53	71

JB-7901-DC - Bill of Materials

[illegible]

NOTES:



C	AS BUILT	14/08/17	DME	PROJ. NO:	1704432	CUSTOMER:	
B	FOR PRODUCTION	31/05/17	DME	TITLE AND LOCATION			
A1	FOR REVIEW	23/05/17	DME	JB-7901-DC BILL OF MATERIAL			
A	FOR SUBMITTAL	12/05/17	DME	MODULE 9203 - SHEET 2 OF 11			
LEVEL	REVISION	DATE	BY				
				DRAWN BY: DMB DATE: 30/05/17 SHEETS: 54 OF 71			
				TITLE: 600 MAN AMARUQ MINE			
				DRAWN BY: J. JAMES/2017 DATE: 7			

THIS INFORMATION IS THE PROPERTY OF newterra llc, AND CANNOT BE REUSED OR REPRODUCED WITHOUT THE WRITTEN CONSENT OF newterra llc.

[illegible]

JB-7901-HV - Bill of Materials

[illegible]

NOTES:

[illegible]

JB-7901-IS - Bill of Materials

[illegible]

NOTES:



1704432

E AND LOCATION:

JB-7901-IS BILL OF MATERIAL

MODULE 8203 - SHEET 4 OF 11

CUSTOMER:

AGNICO EAGLE
600 MAN AMARUQ MINE

DRAWN BY:	DATE:	SHEET:	SHEETS:
DMB	30/05/17	56	71

THIS INFORMATION IS THE PROPERTY OF newterra ltd., AND CANNOT BE REUSED OR REPRODUCED WITHOUT THE WRITTEN CONSENT OF newterra ltd.

17012-10000 ENGINE - C

JB-79010S-AC - Bill of Materials

[illegible]

NOTES:



C	AS BUILT	14/08/17	DMB	PROJ NO: 1704432 TITLE AND LOCATION: JB-79010S-AC BILL OF MATERIAL MODULE 8203 - SHEET 5 OF 11	CUSTOMER: AGNICO EAGLE 600 MAN AMARUO MINE
B	FOR PRODUCTION	31/05/17	DMB		
A1	FOR REVIEW	23/05/17	DMB		
A	FOR SUBMITTAL	12/05/17	DMB		
LEVEL	REVISION	DATE	BY		
				DRAWN BY: DMB DATE: 30/05/17 SHEET: 57 SHEETS: 71	SHEET: 57 OF 71 SHEETS: 71

JB-7902-AC - Bill of Materials

[illegible]

NOTES:



140617	DMB	TITLE AND LOCATION: 1704432 JB-7902-AC BOLL OF MATERIAL MODULO 8203 - SHEET 6 OF 11	CUSTOMER:			
310517	DMB		AGNICO EAGLE			
290517	DMB		600 MAN AMARUO MINE			
120517	DMB		DRAWN BY:	DATE:	SHEET:	SHEETS:
DATE	BY		DMB	30/05/17	58	71

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JB-7902-DC - Bill of Materials

[illegible]

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PROJ. NO:

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RES:

NO.	
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E AND LOCATION:
JB-7902-DC BILL OF MATERIAL
MODULE 8203 - SHEET 7 OF 11

C	AS BUILT
B	FOR PRODUCTION
A1	FOR REVIEW

1325 CALIFORNIA AVE.
BROCKVILLE, ONTARIO
CANADA K6V 5Y6
PHONE: (613) 498-1876



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JB-7902-HV - Bill of Materials

[illegible]

NOTES:

[illegible]

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170019 - JOURNAL OF CLIMATE

JB-7904-DC - Bill of Materials

[illegible]

NOTES:



1325 CALIFORNIA AVE
BROCKVILLE, ONTARIO
CANADA K6V 5Y6
PHONE: (613) 498-1876
www.newterra.com

C	AS BUILT	14/08/17	DMB
B	FOR PRODUCTION	31/05/17	DMB
A1	FOR REVIEW	23/05/17	DMB
A	FOR SUBMITAL	12/05/17	DMB
LEVEL	REVISION	DATE	BY

J. NO: 1704432

EAND LOCATION: JB-7904-DC BILL OF MATERIAL MODULE 8203 - SHEET 10 OF 11

CUSTOMER:

AGNICO EAGLE
600 MAN AMARUQ MINE

DRAWN BY:	DATE:	SHEET:	SHEETS:
DMB	30/05/17	62	71

JB-7904-HV - Bill of Materials

[illegible]

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E AND LOCATION:
JB-7904-HV BILL OF MATERIAL
MODULE 8203 - SHEET 11 OF 11

AGNICO EAGLE
600 MAN AMARUQ N

DRAWN BY:	DATE:	SHEET:	SHEETS:
DMB	30/05/17	63	71

BLD-7901 - Bill of Materials

[illegible]

NOTES:



1704432

END LOCATION:
BLD-7901 BILL OF MATERIAL
MODULE 8901 - SHEET 1 OF 2

AGNICO EAGLE
600 MAN AMARUQ MINE

DRAWN BY:	DATE:	SHEET:	SHEETS:
DMB	30/05/17	64	71

BLD-7901_OUTSIDE - Bill of Materials

[illegible]

NOTES:



1704432

CUSTOMER:

1704432

AGNICO EAGLE
600 MANAMADISON AVE.

MODULE 8901 - SHEET 2 OF 2

DRAWN BY:	DATE:	SHEET
DMB	30/05/17	65

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BLD-7902 - Bill of Materials

[illegible]

NOTES:

	C	AS BUILT		DMS	14/08/17	PROJ. NO. TITLE AND LOCATION: BLD-7902 BILL OF MATERIAL MODULE 8902	CUSTOMER: AGNICO EAGLE 600 MAN AMARUO MINE			
	B	FOR PRODUCTION		DMS	31/05/17					
	A1	FOR REVIEW		DMS	23/05/17					
	A	FOR SUBMITTAL		DMS	12/05/17					
	LEVEL			DATE	BY					
		REVISION		DATE						
							DRAWN BY: DMB	DATE: 30/05/17	SHEETS: 66	TOTAL SHEETS: 71

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BLD-7904 - Bill of Materials

[illegible]

NOTES:

	1325 CALIFORNIA AVE. BROCKVILLE, ONTARIO CANADA K6V 5Y6 PHONE: (613) 486-1876 www.newterra.com	C	AS BUILT		DIMB	PROJ. NO: 1704432 CUSTOMER: AGNICO EAGLE 600 MAN AMARUQ MINE
		B	FOR PRODUCTION		14/08/17	
		A1	FOR REVIEW		31/05/17	
		A	FOR SUBMITTAL		29/05/17	
		LEVEL	REVISION		DATE BY	
					12/05/17	
		DRAWN BY:		SHEET:	SHEETS:	
		DMB		30/05/17	67	71
*THIS IS AN UNCONTROLLED DRAWING. C.						

BLD-7904_OUTSIDE - Bill of Materials

[illegible]

NOTES:



1704432

CUSTOMER:

1704432

AGNICO EAGLE
600 MANITOWAGO AVE.
DULUTH, MN 55812-9700
TEL: 218/825-1000
FAX: 218/825-1001

MODULE 8904 - SHEET 2 OF 2

DRAWN BY:	DATE:	SHEET
DMB	30/05/17	68

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BLD-7905 - Bill of Materials

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NOTES:

 newterra water • air • earth	1325 CALIFORNIA AVE. BROCKVILLE, ONTARIO CANADA K6V 5Y6 PHONE: (613) 458-1676 www.newterra.com		AS BUILT C FOR PRODUCTION B FOR REVIEW A1 FOR SUBMITTAL A LEVEL REVISION		DATE 12/05/17 DATE 12/05/17 DATE 12/05/17 DATE 12/05/17 DATE 12/05/17		DMB DMB DMB DMB DMB DMB DMB		14/08/17 31/05/17 23/05/17 23/05/17 23/05/17 23/05/17 23/05/17		1704432 BLD-7905 BILL OF MATERIAL MODULE 8905		CUSTOMER: AGNICO EAGLE 600 MAN AMIRAUO MINE		DRAWN BY: DMB DATE: 30/05/17 SHEETS: 69 71 (THRU) APPROVED NAME, C	
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BLD-7906 - Bill of Materials

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J. NO: 1704432

END LOCATION:
BLD-7906 BILL OF MATERIAL
MODULE 8906 - SHEET 1 OF 2

AGNICO EAGLE
600 MANITOBA DRIVE, S.W.

DRAWN BY:	DATE:	SHEET:	SHEETS:
DMB	30/05/17	70	71

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BLD-7906 OUTSIDE - Bill of Materials

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AGNICO EAGLE
600 MAN AMARION

MODULE 8906 - SHEET 2 OF 2

DRAWN BY: DMB	DATE: 30/05/17	SHEET 71
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DATE _____ BY _____
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APPENDIX B

Packing Slip

Project Packing List

PMProjNum

1704432

Agnico Eagle - Amaruq Mine WWTP

Shipping Notes:

Tag	Part Number	Part Description	Req Rec PO #	EngMemo Line
0	24612	Container, 40' x 8' x 9'6", Once Use, High Cu	1	---
7901	ea	30,480kg rated, Forklift Pockets, CSC Plate,	1	
	Type: I	ABS/BV/LR Certs. Steel Checkerplate	1704432-0001	1

10	10959	Junction Box, PVC, 6" x 6" x 4"	5	Added by production team
	ea		5	
	Type: I	Junction Box, PVC, 6" x 6" x 4"	1704432-9999	###
10	37975	Junction Box, 6" x 6" x 4", Hammond EJ664	1	Added by production team
	ea	with Back Panel and Hinged Lid, NEMA 4	1	
	Type: I	Junction Box, 6" x 6" x 4", Hammond EJ664	1704432-9999	###
10	P1128	Elbow, 45deg, PVC 40, 4", SxS, 417-040G	1	Added by production team
	ea		1	
	Type: I	Elbow, 45deg, PVC 40, 4", SxS, 417-040G	1704432-9999	####
10	37795	Sealant, MetalSafe, Liquid Rubber, Black 3.7	6	---
-	ea		6	
	Type: P	---	1704432-0134	1
10	37796	Sealant, Polyurethane, Self Leveling, Grey 8	8	---
-	ea		8	
	Type: P	---	1704432-0131	1
10	29551	Insulation, Backer Rod, 7/8" x 15'	10	---
-	ea		10	
	Type: P	---	1704432-0131	2
10	37794	Insulation, Backer Rod, 3/8" x 30'	10	---
-	ea		10	
	Type: P	---	1704432-0131	3
10	22772	Foam, Spray, Tiger Foam, 200BF, Fast Rise	2	---
-	ea		2	
	Type: P	---	1704432-0131	4
10	21768	Chemical, Bacteria, Dry for Start Up, 25lbs p	5	---
-	pail	25 lb per pail (Buy in Pail Quantities)	5	
	Type: I	BI-CHEM CWT Blend CAN product BioRem	1704432-0143	1

10	37797	Tape, Seam, 4" x 50', Paintable	1	---
4	ea		1	
	Type: P	---	1704432-0134	2

Tag	Part Number	Part Description	Req Rec PO #	EngMemo Line
15	27536	Weather Barrier, Blueskin, 9" x 50' Roll	4	---
-	ea		0	
	Type: P	---		0
15	38671	3/4" copper pipe insulation foam 6' long	20	---
-	ea		0	
	Type: P	---		0
15	38672	Insulation, rigid foam sheet, 3", R10, codebo	10	---
-	ea	Blue Styrefoam	0	
	Type: P	---		0
15	10088	Elbow, 90deg, PVC 40, 6", SxS, 406-060G	2	---
-	ea		0	
	Type: I	---	1704432-0170	1
15	16240	Pipe, PVC 40 (Clear), 6"	4	---
-	ft	10ft Length, 40-060CL	0	
	Type: X	---		0
15	P1188	Flexible Coupling, 6" x 6"	4	---
-	ea		0	
	Type: I	---	1704432-0170	2
15	9998	Misc Part, Parts not included in purchasing	6	---
-	ea		0	
	Type: P	Aeration connection pipes 3 - Pre to Air 3 - Air to air		0
15	9998	Misc Part, Parts not included in purchasing	4	---
-	ea		0	
	Type: P	vent stack		0
15	9998	Misc Part, Parts not included in purchasing	2	---
-	ea		0	
	Type: P	MBR Overflow Pipes		0
15	9998	Misc Part, Parts not included in purchasing	1	---
7902	ea		0	
	Type: P	container 7902		0
15	9998	Misc Part, Parts not included in purchasing	1	---
7903	ea		0	
	Type: P	Container 7903		0
15	9998	Misc Part, Parts not included in purchasing	1	---
7904	ea		0	
	Type: P	Container 7904		0

Tag	Part Number	Part Description	Req Rec PO #	EngMemo Line
15	9998	Misc Part, Parts not included in purchasing	1	---
7905	ea		0	
	Type: P	Container 7905		0
100	P1128	Elbow, 45deg, PVC 40, 4", SxS, 417-040G	1	Added by production team
	ea		1	
	Type: I	Elbow, 45deg, PVC 40, 4", SxS, 417-040G	1704432-9999	###
500	10951	Elbow, 45deg, PVC 40, 6", SxS, 417-060G	1	---
-	ea		1	
	Type: I	---	1704432-0089	22
500	M1489	Filter, Silencer, Solberg, FS-230P-300	2	---
B501/2	ea	3"	2	
	Type: P	---	1704432-0091	1
500	36870	Transmitter, pH, Prominent pH Sensor PHER	1	MBR
PH-501	ea	requires probe holder p/n 36871	1	
	Type: P	-	1704432-0071	4
6100	15871	Spill Containment, Single Drum, Eagle 1633	3	---
-	ea		3	
	Type: P	---	1704432-0161	1
6100	19891	Pump, Metering, Misc	1	---
P-610X	ea	See Description for part details	1	
	Type: P	-	1704432-0162	1
		BT4B0708PVT2000UD010A01		
		Flow: 1.88GPH / 7.10L/H		
		Pressure: 102PSI / 07BAR		
		Options Included:		
		- dosing head material PV PVDF		
		- sealmaterial T st.diaphragm w. PTFE seal		
		- execution of dosing head 2 w. Bleed.v. ,		
		w/o. valvespr.		
		- hydraulic-connection 0 standard-connection		
		- execution 0 Hous.RAL5003/hoodRAL2003		
		- Logo 0 w. PM-Logo		
		- type of voltage U universal 100-240 V		
		- cable and plug D 2m USA 115 V		
		- relay function 0 without relay		
		- supplies 1 STDR. FV,IV,TB for PP, PV, NP		
		- control system type 0 without lock		
		- control version A external analog 0-20mA/4-		
		20mA		
		- Remote stop 0 Pause break con., Niv.		
		break		
		- auxiliar frequency 1 external callable		
		frequency		
6100	25823	Pump, Metering, Parts, Multi-function Valve	3	---
p-610x	ea	PVDF, 87PSIG Size 2	3	
	Type: P	740427	1704432-0162	2

Tag	Part Number	Part Description	Req Rec PO #	EngMemo Line
7906	20890	Container, Misc	1	---
7906	ea	See description	1	
	Type: P	53 foot Hi Cube Strong Industrial Steel Used Shipping Container As-is Where-is	1704432-0027	1
7906	24305	Hood, Louver, 21"	1	---
7906	ea	Fits 18" Louver	1	
	Type: I	---	1704432-0049	84
7906	24547	Hood, Fan, 15"	1	---
f7961	ea	Fits 12" Fan	1	
	Type: I	---	1704432-0049	83

APPENDIX C

Testing Checklists/Pre-Commissioning Test Checklist

Pre-Commissioning Checklist – 1704432

Please note that **newterra** has a limited number of Technicians. In order to successfully support your startup, **newterra** requires that the Pre-Commissioning Checklist be returned at least 10 business days prior to mobilizing a Technician to site (subject to Technician availability). **newterra** will not mobilize to site until the Pre-Commissioning Checklist has been executed and returned to service@newterra.com. Or by Fax to: 289.203.1319.

If newterra startup activities are delayed due to lack of site readiness then there may be additional charges associated with overtime and/ or additional days on site.

newterra highly recommends that the system is started by a factory trained startup technician to ensure the long term success of your project. We understand that this may not always be feasible in which case we would require a highly skilled technician capable of troubleshooting both mechanical and electrical aspects of a process treatment system and be familiar with our manual, equipment and capable of training the operator on operating and maintenance requirements of the treatment system.

The purpose of this report is to ensure that the customer is prepared for startup.

Checklist	Customer Initial	newterra Initial
Complete a visual inspection of all units when placed on the pad. **Record any damage to the systems that may have occurred during shipping and provide photos to newterra.		
Verify that system has been installed on a solid, level area		
Verify that system has been installed in accordance with the system layout drawing.		
Verify that the required approvals are in place to allow the system to discharge air and water.		
Verify site power is installed to the control panel and necessary electrical approvals have been completed.		
Verify that all high voltage wiring is completed and wired according to the Field Aid/ project O&M manual.		
Verify that all low voltage wiring is completed and wired according to the Field Aid/ project O&M manual.		
Verify that all process piping has been installed and terminated.		
Verify that all field piping is completed and wells are connected to the operating system.		
Verify that a phone line is installed and activated for alarm autodialer, if required.		
Please read through the packing list (located in the manual) and ensure the correct equipment was delivered.		
There are some items that have shipped loose with your system that will need to be installed prior to start up, these may include exterior components such as stacks, filters and hoods. Sufficient hardware should have been supplied to facilitate installation.		
Some unions in the system may have been loosened for shipment. This is done to prevent damaging susceptible equipment, especially flow meters. All unions in the systems should be checked and tightened.		

Any external equipment such as tanks, well pumps, oxidizers, etc. need to be installed, plumbed and wired prior to start up.		
Some items may have been secured with brackets or tie downs for shipment – ensured these have been removed (eg. reciprocating compressors/ stacked blowers).		
In colder climates, if you do not plan on starting up the system before the winter months, please refer to your O&M manual for instructions on extended shutdowns. It is imperative that the correct measures be taken to prevent freezing water from damaging your system.		
If the system has been winterized, ensure all anti-freeze has been drained and disposed of in accordance with local regulations.		
Email pictures of power connection, site piping connections and installed equipment to service@newterra.com .		

MBR Specific Checks	Customer Initial	newterra Initial
Verify that Ethernet network is installed and activated if required.		
If Ethernet is to be used on site please provide 2 Static IP Addresses _____._____._____._____. _____._____._____._____		
Verify fresh water is available for Wet Test.		
Is waste activated sludge from an operating WWTP available for start-up (Seed Sludge)		
Verify Sufficient amount of sewage is available to start system (Check with newterra to determine actual amounts required).		

RO Specific Checks	Customer Initial	newterra Initial
Ensure all tanks are clean and free of dirt and debris		
Verify that a Fresh Water supply is installed to system.		
Ensure that the necessary chemicals for system operation and cleaning are available for use for starting the installation and commissioning phase.		
Verify the feed water quality		
Verify building process flow and instrumentation matches P&ID drawing. Check off drawing components against actual		
DO NOT LOAD THE MEMBRANES UNTIL DIRECTED as all system inlet piping must be flushed thoroughly before it is connected to the RO system.		

DA Specific Checks	Customer Initial	newterra Initial
GENERAL INSTALLATION		
Stainless Steel nameplate present, visible and contains make and model information in agreement with vendor drawings		
Vessel Saddles Bolted To Structural Steel		
Vessel Properly Insulated for Personnel Protection at a minimum		
Access Platform Properly installed for full access to heater section		
Vessel Manway Gaskets appear to be undamaged		
VESSEL INTERNALS		
Heater Section Tray Assemblies Properly fastened and have been installed per the O & M manual.		
Equalizer connection to storage tank is unobstructed by any shipping materials		
Spray Nozzles appear unobstructed and undamaged by shipping		
PIPING		
Pipes properly insulated for Personnel protection at a minimum		
Relief valve installed and discharge piping run to roof		
Piping systems properly flushed		
Vent Valve is installed and fully open for initial vessel fill		
Steam Control Valve and Muffling plate installed as per drawings		
Low pressure steam trap isolated and discharge piped to flash separator		
Low pressure flash steam lines installed and isolated for initial testing		
Vacuum breaker installed per manufacturer's instructions		
Overflow trap installed with discharge piped to Blowdown Tank		
Condensate control valve installed and isolated for initial testing		
Strainer within condensate control valve station installed and cleaned		
Makeup control valve installed and isolated for initial testing		
Strainer within makeup control valve station installed and cleaned		
Level bridle and gauge glass column installed as per manufacturer's drawings. Vessel isolation valves closed for initial fill.		
Sight glass sections installed with proper washers and do not have any apparent cracks or defects.		
Level switches installed at proper heights relative to the vessel according to the manufacturer's drawings		
Level transmitter properly installed as per instrument installation detail IS-8308		
Pressure transmitter is properly installed as per instrument installation detail IS-8127		
Pressure and temperature Gauges installed with isolation valves as needed.		
Deaerator Steam flow transmitter properly installed as per instrumentation installation detail IS-8308		
Vessel Drain valve installed and fully closed for initial fill		

Chemical feed connection valved and capped. Proper chemical feed is not required at this stage of commissioning		
All remaining spare connections on the storage tank and heater section should be tightly secured with a blind flange.		
CONTROL AND POWER WIRING		
120 volt power is run to Deaerator control panel		
Three Level switches are wired back to Deaerator Control Panel		
Pressure Transmitter is wired back to Deaerator Control Panel		
Level Transmitter is wired back to Deaerator Control Panel		
Steam Pressure Control Valve is wired back to Deaerator Control Panel		
Makeup Water Control Valve is wired back to Deaerator Control Panel		
Deaerator Steam flow transmitter is wired back to existing panel.		

Comments:

Note any deficiencies or damage to the system on arrival.

In the event additional parts are required to be sent for commissioning, please provide a shipping address, contact name and cell number

Provide a list of PPE required or any additional Health and Safety or training requirements that will be required for site access.

Site Address: _____

Onsite Contact Name & Cell Number: _____

Customer Sign-off: _____ Date: _____

 clean water. modular solutions. <i>simple.</i>		Installation Checklist		Initial l/Date
	Has Acceptance Criteria Been Met (Yes/No)	Details		
Misc				
Confirm that all items have been received in accordance with the packing list				
All items are undamaged. Any damages are to be reported to newterra as soon as possible.				
Inspect all exterior of containers and note any damages, Take pictures of any damages and report to the newterra project manager as soon as possible.				
Inspect WW/TP placement location and confirm that it is firm and level. It not report to the newterra project manager as soon as possible. WW/TP needs to be firm and level otherwise the operation of the WW/TP can be compromised.				
Containers may be placed in a on-site storage location until ready for placement. Containers should be placed and installed before freezing temperatures				
Civil				
Placement of container on site. 6 containers. After container placement, inspect for any damages and take pictures. Report damages to newterra project manager.		Lifting - crane equiv required to move container. Fine placement via forklifts or equiv. Firm/Level base for containers See Appendix A of this manual for container layout		
Install Liquid Rubber Container Seal as per attached drawing.				
Electrical				

Installation Checklist			
	Has Acceptance Criteria Been Met (Yes/No)	Details	Initial/Date
 clean water. modular solutions. <i>simple.</i>			
Site power has been connected and verified as per system design criteria			
All internal electrical connections have been terminated			
Confirm Phase Monitor is not in alarm			
Site voltage measured:		L1/L2:	
		L2/L3:	
		L3/L1:	
		L1/GRD:	
		L2/GRD:	
		L3/GRD:	
Check field wiring and piping as per drawings at Appendix A of the O&M Manual			
Check panel for loose wiring, Correct as required			
Check voltage on AC transformer			
Check voltage on DC transformer			
Check I.S. barrier is grounded as per input drawing			
All customer wiring has been completed in accordance with the electrical drawing in Appendix A.			
Mechanical			
Connect all internal piping and hose connections between the containers and external piping hook ups as per P&ID at Appendix A.			

Installation Checklist		
	Has Acceptance Criteria Been Met (Yes/No)	Details
 Inspect the EQ, Pre-Anox, Aeration and Post-Anox Tanks and install anodes. Confirm that the tanks are clean and diffusers & hose connecting are secure.		Initial/Date
Inspect MBR tanks and removing transportation securing straps. Ensuring all hoses and fittings are tight and connected.		
MBR tank - Ensure that the membranes have not moved or shifted in the cassette. Re-secure as necessary. Ensure that the diffusers have not shifted and are secure. Re-secure as necessary.		
Inspect the screens (SCR-201/202) and ensure that the rotating brushes are still aligned. Adjust as necessary.		
Inspect TNK-101/102/103, TNK-201 & TNK-6101/6102 and ensure that they are clean and free of any debris.		
Ensure all unions and fittings are tight, as some are loosened to prevent stress in shipping		
Check alignment of motors, Correct as required		
Check all motor belt tensions, Correct as required		
Check alignment of pulleys for all belt driven blowers		
Install the permeate header to the membrane tank and connect all piping/hoses.		

Installation Checklist		
	Has Acceptance Criteria Been Met (Yes/No)	Details
		Initial/Date
Ensure that the backwash tank (TNK-801) and sludge tank (TNK-901) are clean and free of debris. Clean as necessary.		



Installation Acceptance Sign-Off Form

1704432 - Amaruq Mine WWTP

newterra is pleased to announce that the Installation phase of 1704432, has successfully been completed. In order to move to the Commissioning phase, a visual inspection and walkthrough of the plant will be required, followed by signoff of this document. Installation signoff will be conditional on the completion of items listed in a Punchlist created during this walkthrough.

Installation Signoff		Customer Acceptance	
Name:	_____	Name:	_____
Company:	_____	Company:	_____
Date:	_____	Date:	_____
Signature:	_____	Signature:	_____

Commissioning Checklist			
	Has Acceptance Criteria Been Met (Yes/No)	Details	Initial/Date
			
Ensure availability of on-site emergency eyewash station and personal protection equipment.			
Ensure that all tanks are clean and free of any dirt or debris (this is to prevent obstruction or damage to the piping, pumps, and membranes).			
Ensure that all connections have been provided and joints have been tightened.			
Check the placement of the air diffusers in the equalization tank(s) and aeration tank(s) if incorrectly positioned, proper adjustment has to be performed.			
Verify membrane modules are secure within the membrane tanks and that there is no lateral movement (less than an inch) of the membrane modules			
Verify building process flow and instrumentation matches P&ID drawing. Check off drawing components against actual (preferably with the customer present). Ensure this document is placed in the commissioning binder			

Commissioning Checklist																																																							
	Has Acceptance Criteria Been Met (Yes/No)	Details	Initial/Date																																																				
 Measure and Verify influent characteristics and record.		<table border="1"> <thead> <tr> <th>Parameters</th> <th>Unit</th> <th>Influent*</th> <th>Effluent</th> </tr> </thead> <tbody> <tr> <td>pH</td> <td>s.u.</td> <td>6 - 9</td> <td>6.5 – 8.5</td> </tr> <tr> <td>Fat, Oil, Grease (FOG)</td> <td>mg/L</td> <td>< 30</td> <td>< 5</td> </tr> <tr> <td>Biological Oxygen Demand (BOD)</td> <td>mg/L</td> <td>907.5</td> <td>< 25</td> </tr> <tr> <td>Total Suspended Solids (TSS)</td> <td>mg/L</td> <td>262.5</td> <td>< 25</td> </tr> <tr> <td>Total Kjeldahl Nitrogen (TKN)</td> <td>mgN/L</td> <td>130</td> <td>-</td> </tr> <tr> <td>Unionized Ammonia Nitrogen (NH₃-N)</td> <td>mgN/L</td> <td>-</td> <td>< 1.25</td> </tr> <tr> <td>Nitrate Nitrogen (NO₃-N)</td> <td>mgN/L</td> <td>-</td> <td>< 5</td> </tr> <tr> <td>Total Phosphorus (TP)</td> <td>mgP/L</td> <td>12</td> <td>< 0.5</td> </tr> <tr> <td>Fecal Coliform</td> <td>CFU/100mL</td> <td>-</td> <td>< 200**</td> </tr> <tr> <td>Total Residual Chlorine</td> <td>mg/L</td> <td>-</td> <td>< 0.02</td> </tr> <tr> <td>Alkalinity (assumed)</td> <td>mg/L as CaCO₃</td> <td>471</td> <td>-</td> </tr> <tr> <td>Total Dissolved Solids (TDS)</td> <td>mg/L</td> <td>< 1,200</td> <td>-</td> </tr> </tbody> </table>	Parameters	Unit	Influent*	Effluent	pH	s.u.	6 - 9	6.5 – 8.5	Fat, Oil, Grease (FOG)	mg/L	< 30	< 5	Biological Oxygen Demand (BOD)	mg/L	907.5	< 25	Total Suspended Solids (TSS)	mg/L	262.5	< 25	Total Kjeldahl Nitrogen (TKN)	mgN/L	130	-	Unionized Ammonia Nitrogen (NH ₃ -N)	mgN/L	-	< 1.25	Nitrate Nitrogen (NO ₃ -N)	mgN/L	-	< 5	Total Phosphorus (TP)	mgP/L	12	< 0.5	Fecal Coliform	CFU/100mL	-	< 200**	Total Residual Chlorine	mg/L	-	< 0.02	Alkalinity (assumed)	mg/L as CaCO ₃	471	-	Total Dissolved Solids (TDS)	mg/L	< 1,200	-	
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Total Dissolved Solids (TDS)	mg/L	< 1,200	-																																																				
Confirm that the customers piping and lectrical connections to the WWTP are complete																																																							
Confirm if any grinder pumps are upstream of the WWTP. Advise the newterra project manager as soon as possible.																																																							
Have all rotating equipment oiled and greased as per manufactured recommendations																																																							
Fill system with water and check for leaks (liquid and vapor) by filling the EQ tank first and then process the water thru the system by tank																																																							
Check rotation of all motors that were field wired																																																							
Ensure that proper electrical grounding and lightning protection installed by customer																																																							

Commissioning Checklist			
	Has Acceptance Criteria Been Met (Yes/No)	Details	Initial/Date
 Check voltage + amperage + name plate info against mechanical test record on all motors NOT recorded in FAT. Please include this in the commissioning binder			
Fill out mechanical test record on each motor and check amperage and voltage. Document amperage on the System test records in the operating manual in the Field test load section			
Check overload settings for all motors			
Test position of ball float switches for proper start/stop level as per the P&ID and control narrative in this manual and observed on the HMI.			
Check that PLC Run light is on and no alarm lights are present on the PLC			
Wet test all control inputs and outputs (See Device Verification section in this checklist)			
Test analogue inputs (See Device Verification section in this checklist)			
Wet test all shut down alarms (See Control Narrative at Appendix K in this manual)			
Manually test all permeate stopping alarms(See Control Narrative at Appendix K in this manual)			
Test vacuum and pressure relief valve			
Check the setting of level switches/transmitters			
Check the hydraulic flow through the plant			
Check if all the ancillary equipment and controls of the plant function as per design			
Fill the system with potable water using the inlet and confirm piping & repair any leaks.			
			G-13

Commissioning Checklist			
	Has Acceptance Criteria Been Met (Yes/No)	Details	Initial/Date
			
Confirm heater and fan operation in the screen container.			
Fill TNK-101/102/103 and check for leaks. FIT-101 operations. Confirm operation of all level switches			
Confirm operation of SCR-201/202 and pump P-201/202. Check for leaks and repair as necessary. Confirm operation of FIT-201. Confirm operation of all level switches			
Fill EQ Tank (TNK-501), check for leaks. Confirm tank heater operation. Confirm LT-301 operation via the HMI display for values. Confirm operation of P-301/302			
Confirm B-301/302 operation and Check for - o Buoyancy of air diffusers and if this occurs, empty the tank and fix; - o Air leakages: if this occurs, tighten up the fittings;			
Confirm operation of H-301/302, TSSL-301 and all level switches			
Fill Pre-Anox tank with water (TNK-401) and confirm operation of educators and P-401/402			
Confirm operation of H-401/402, TSL-401 and all level switches			

Commissioning Checklist			
	Has Acceptance Criteria Been Met (Yes/No)	Details	Initial/Date
 Fill Aeration Tanks (TNK-501/502), check for leaks. Confirm tank heater operation. Confirm LT-501/DO-501/PH-501 operation via the HMI display for values. Confirm operation of P-501/502/503. Confirm operation of the sprayer. Confirm operation of B-501/502 and Check for - o Buoyancy of air diffusers and if this occurs, empty the tank and fix; - o Air leakages: if this occurs, tighten up the fittings;			
Confirm operation of H-501/502/503/504, TSL-501/502 and all level switches			
Fill Post Post-Anox Tank (TNK-551) with water and check for leaks. Confirm operation of P-554/555. Confirm operation of educators. Confirm operation of P-551/552			
Fill MBR tanks with water (TNK-601/602) and check for leaks. Confirm level switch operation. Confirm operation of B-601/602, confirm all level switch operation, and Check for			
- o Buoyancy of air diffusers and if this occurs, empty the tank and fix; - o Air leakages: if this occurs, tighten up the fittings;			
Perform electrical and instrumentation (E&I) functional checks and adjustment of level switches.			

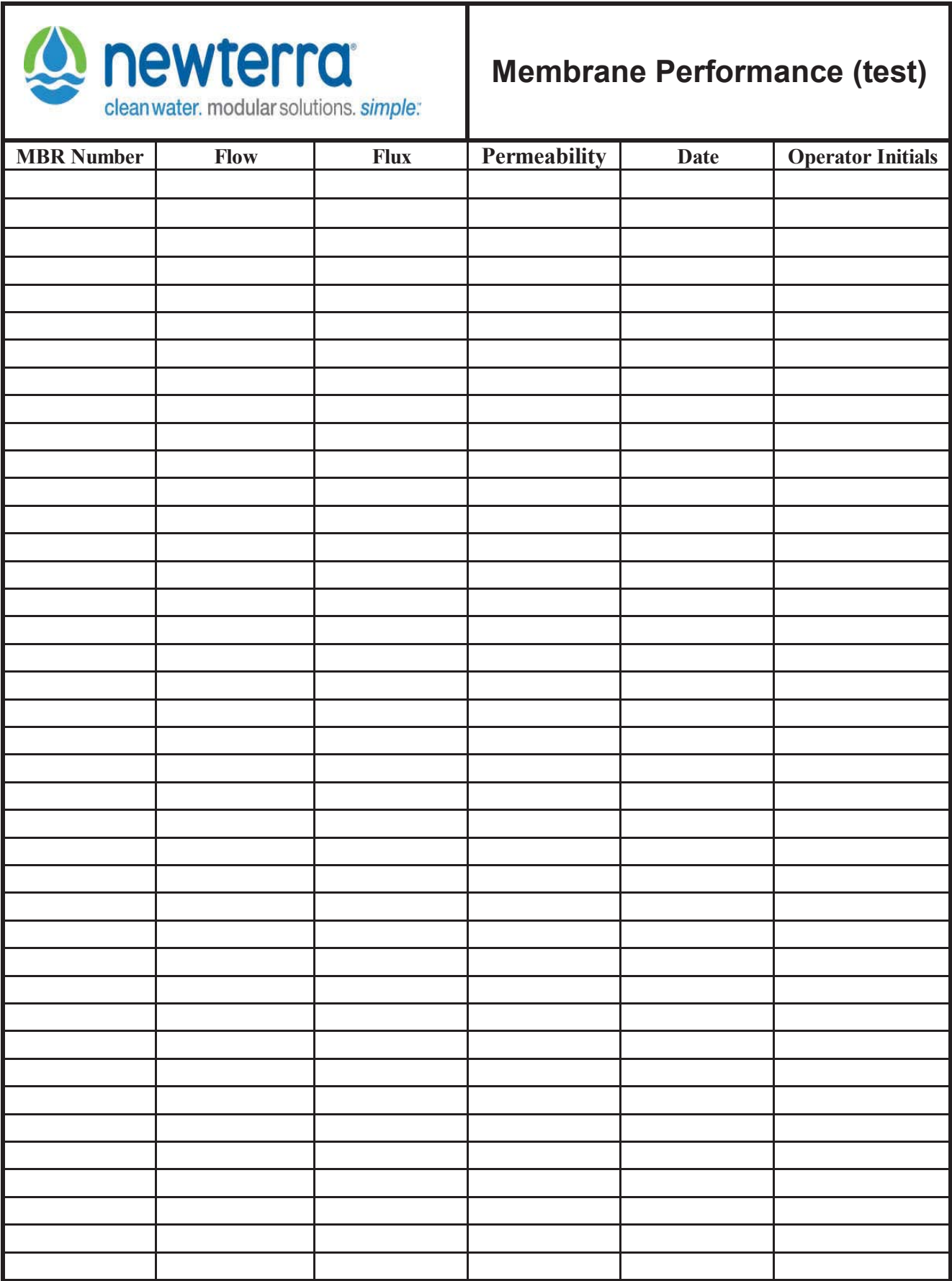
Commissioning Checklist			
	Has Acceptance Criteria Been Met (Yes/No)	Details	Initial/Date
 Turn on the air blower(s) for the equalization tank(s) and blower(s) for aeration tank(s), and check for: - o Buoyancy of air diffusers and if this occurs, empty the tank and fix; - o Air leakages: if this occurs, tighten up the fittings;			
Manually check water temperature and DO (dissolved oxygen): with a hand-held DO meter and adjust air flow to keep it up to 0.5 – 1 mg/L for equalization tank(s) and 2 - 3 mg/L for aeration tank(s); check the DO readings on the touch screen.			
DO Control System: check automatic ON/OFF of Aeration Tank air blowers at low and high settings of DO without the return of aerated water from the membrane tanks to aeration tanks (i.e. turn off transfer pump(s) from aeration tank(s) to membrane tank(s) and turn of recirculation pump(s) from membrane tank(s) to aeration tank(s), if included), and record blower ON/OFF duration.			
Fill membrane Tank, check for leaks. Confirm operation of P-601/701/702/801/6101/6102. Perform manual backwash to confirm operation. Check for - o Buoyancy of air diffusers and if this occurs, empty the tank and fix; - o Air leakages: if this occurs, tighten up the fittings;			C-16

Commissioning Checklist			
	Has Acceptance Criteria Been Met (Yes/No)	Details	Initial/Date
Confirm operation of all container fan and heaters.			
Fill sludge holding tank with water. Confirm diffuser operation and level switch operation. Confirm P-901 operation.			
Introduce seed sludge from customer thru the influent and process. See Section 6 of the manual for the procedure. If seed sludge is unavailable, then use dry bacteria.			

Membrane Inspection (Clean Water)			
	Has Acceptance Criteria Been Met (Yes/No)	Details	Initial/Date
Inspect membrane module that all bolts are secure			
Ensure all hose clamps are secure			
Fill tank until membranes are completely submerged, re-check bubble pattern			
Enable membrane operation from the PLC screen			
Start the transfer pump(s) from the Post Anox tank(s) to the membrane tank(s) and fill the membrane tank(s) with potable water.			
Start the air blowers for the membrane tank(s) and check for an even distribution of air across the membrane filter area and air bubble uniformity above the membrane module/cassette.			
Check hydraulic flow pattern through the membranes and between membrane module/cassette and tank wall.			
Make a clean copy of the Clean Water Testing Sheet presented in Appendix K of this O&M Manual.			
Record all checked parameters in the Clean Water Testing Sheet:			
Pre-prime the permeate pumps according to manufacturer's mfg instructions			
Start the permeate (vacuum) pumps.			

Membrane Inspection (Clean Water)			
	Has Acceptance Criteria Been Met (Yes/No)	Details	Initial/Date
		Record and set the initial vacuum settings on the system to determine correct TMP of the membranes. This step is required based on the Vacuum transmitter located higher than the water level.	
		Record the vacuum (TMP) on the gauge(s) on the permeate line [for clean water could be 0.05 to 0.07 bar (20" to 29" WC)].	
		Record water temperature and DO with a hand-held DO meter.	
		Gradually increase the permeate flow while recording the vacuum (TMP) on the gauges up to the anticipated peak wastewater flow.	
		Ensure membrane module is securely fastened to membrane tank and no movement is detected. Ensure wheels are chocked to prevent membrane module movement during operation	

Full Automatic System Test			
	Has Acceptance Criteria Been Met (Yes/No)	Details	Initial/
		Sludge Obtained From: MLSS:	
Record Membrane Performance after 3 min at the design flow for each membrane cassette with clean water record findings in 'MBR Test Performance' data sheet			
Introduce Waste Activated Sludge (inject slowly through normal waste water inlet, always pre-screen)			
Record Membrane Performance after 3 min at the design flow for each membrane cassette in 'MBR Performance' data sheet			



Influent-Effluent

1 Confirm Influent/Effluent parameters - below are the design parameters.

Parameters	Unit	Influent*	Effluent
pH	s.u.	6 - 9	6.5 – 8.5
Fat, Oil, Grease (FOG)	mg/L	< 30	< 5
Biological Oxygen Demand (BOD)	mg/L	907.5	< 25
Total Suspended Solids (TSS)	mg/L	262.5	< 25
Total Kjeldahl Nitrogen (TKN)	mgN/L	130	-
Unionized Ammonia Nitrogen (NH ₃ -N)	mgN/L	-	< 1.25
Nitrate Nitrogen (NO ₃ -N)	mgN/L	-	< 5
Total Phosphorus (TP)	mgP/L	12	< 0.5
Fecal Coliform	CFU/100mL	-	< 200**
Total Residual Chlorine	mg/L	-	< 0.02
Alkalinity (assumed)	mg/L as CaCO ₃	471	-
Total Dissolved Solids(TDS)	mg/L	< 1,200	-



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clean water. modular solutions. *simple.*

Influent-Effluent

2 Record here the actual influent and effluent values from lab testing

Device Verification Checklist

Device Tag	Device Type	Operation Verified	Notes	Train 1	Train 2
FIT-201	Flow Transmitter				
FIT-202	Flow Transmitter				
SCR-201	rotary brush screen				
SCR-202	rotary brush screen				
LSHH-201	Level Switch				
LSHH-202	Level Switch				
LSHH-101	Level Switch				
LSHH-102	Level Switch				
LSHH-103	Level Switch				
LSHH-203	Level Switch				
LSH-203	Level Switch				
LSL-203	Level Switch				
P-201	Pump				
P-202	Pump				
H-7911	Container heaters				
H-7912	Container heaters				
TSL-7911	Temperature low level				
LSHH-7911	Level Switch				
B-7911 and PDS-7911	Blower				
EQ Tank diffuser Grid	diffusers				
B-302/301 and PSL-301	Blower				
LSHH-301	Level Switch				
LSLL-301	Level Switch				
LT-301	Level Transmitter				
TSLL-301	Temperature sensor				
H-301 and H-302	Tank heater				
P-301/302	Pump				
Pre-Anox Educator					
H-7941 and TSLL-7901	Container heater				
P-401 and P-402					
H-401 and H-402	Tank heaters				
LSHH-401	Level Switch				
LSLL-401	Level Switch				
TSL-401	Temperature Sensor				
B-7941	Blower				
Aeration Tank diffuser grid	diffusers - TNK-501				
H-501/502	Tank heater				
LSLL-501	level switch				
TSL-501	temperature sensor				
LSHH-501	level switch				
LT-501	level transmitter				
DO-501	DO sensor				
PH-501	PH sensor				
P-501	pump				
P-502	pump				
P-503	pump				

Device Tag	Device Type	Operation Verified	Notes	Train 1	Train 2
B-501/502 and PSL-501	blower				
P-6101	Soda Ash/Caustic dosing pump				
P-6102	Alum dosing pump				
Aeration Tank diffuser grid	diffusers - TNK-502				
H-503/504	Tank heater				
LSLL-502	level switch				
TSL-501	temperature sensor				
LSHH-502	level switch				
Educators	Post-Anox Educators TNK-551				
P-553/554	Pumps				
P-551/552	Pumps				
P-6103	MicroC dosing				
B-601 and PSL-601	MBR Blower				
LSHH-601	Level Switch				
LSH-601	Level Switch				
MBR tank diffuser grid	diffusers - TNK-601				
P-701	permeate pump				
VT-701	Vacuum transmitter				
MV-701	Soleniod valve				
FIT-701	flow transmitter				
B-602 and PSL-602	MBR Blower				
LSHH-602	Level Switch				
LSH-602	Level Switch				
MBR tank diffuser grid	diffusers - TNK-602				
P-702	permeate pump				
VT-702	Vacuum transmitter				
MV-702	Motorized valve				
FIT-702	flow transmitter				
SV-801	Backwash valve				
P-801	backwash pump				
LSH-801	Level Switch				
LSL-801	Level Switch				
SV-801	Soleniod valve				
H-7961	container heaters				
H-7962	container heaters				
H-7963	container heaters				
TSL-7961	Temperature sensor				
F-7961	Container fan				
LSHH-7961	Level Switch				
LSHH-7962	Level Switch				
LSHH-901	level switch				
sludge inlet tank diffuser grid	diffusers - TNK-901				



Commissioning Acceptance Sign-Off Form

1704432 - Amaruq Mine WWTP

Newterra is pleased to announce that the Commissioning phase of 1704432 - Amaruq Mine WWTP, has successfully been completed. In order to move to the Training phase, a visual inspection and walkthrough of the plant will be required, followed by signoff of this document. Commissioning signoff will be conditional on the completion of items listed in the Punchlist created during this walkthrough.

Installation Signoff		Customer Acceptance	
Name:	_____	Name:	_____
Company:	_____	Company:	_____
Date:	_____	Date:	_____
Signature:	_____	Signature:	_____

Customer Training Checklist			
 Review the operating manual with the customer explaining the various components of the manual and sources of information. Review the startup and shutdown procedure with operator. Review operation of treatment system and describe the maintenance required for each piece of equipment. Describe operation of panel and panel components. Run through complete logic and alarm sequence with customer Train customer to troubleshoot alarms based on input conditions to the PLC or relays in the panel. Discuss the operating logic with the customer so they understand how the system is configured to work. Have customer/operator sign training sheet Note name of individual and company with whom logic was reviewed:	Has Acceptance Criteria Been Met (Yes/No)	Details	Initial/Date



Training Completion Sign-Off Form

1704432 - Amaruq Mine WWTP

Newterra is pleased to announce that the training of the following operator(s) has been successfully completed:

Installation Signoff

Name: _____
Company: _____
Date: _____
Signature: _____

Customer Acceptance

Name: _____
Company: _____
Date: _____
Signature: _____

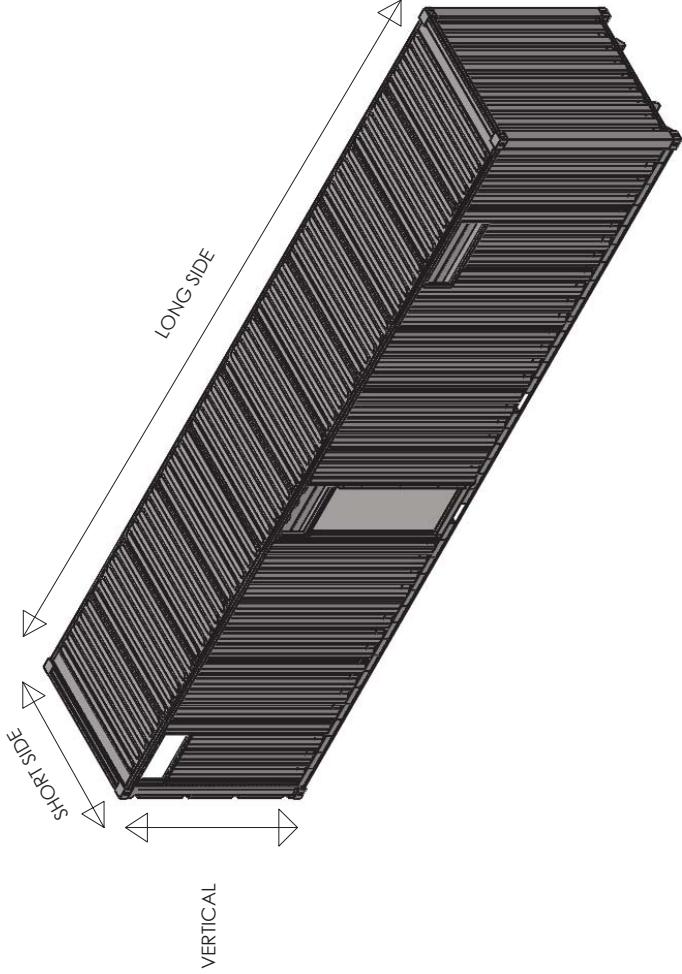
COMPONENT	LONG SIDE (40') QTY.	SHORT SIDE (8') QTY.	VERTICAL (9' 6") QTY.
LIQUID RUBBER (37795)	2 (7.0L)	1 (1.40L)	1 (1.70L)
TAPE (37797)	1 (40')	1 (8')	1 (9' 6")
POLYURETHANE SEALANT (37796)	2 (1.0L)	1 (0.40L)	-
7/8" BACKER ROD (29551)	-	1 (8')	-
3/8" BACKER ROD (37794)	2 (40')	-	1 (9' 6")
SPRAY FOAM (22772)	-	1 (1.33 ft^3)	-

NOTE:

QUANTITIES OF COMPONENTS LISTED ARE FOR A SINGLE SEAL IN THE DIRECTION SPECIFIED.

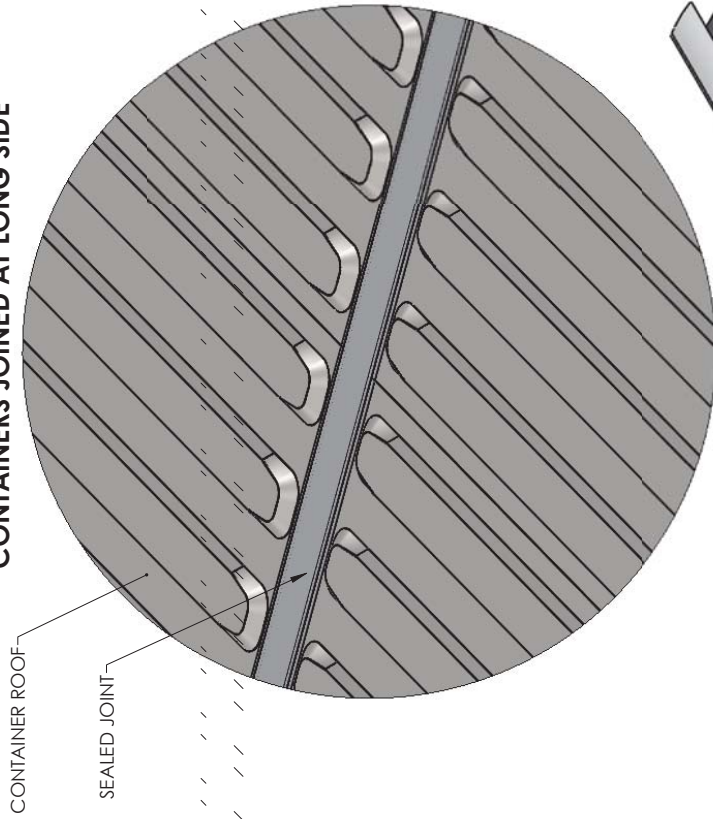
A COMPLETE SEAL OF A MULTI-CONTAINER SYSTEM MAY REQUIRE THE SUMMATION OF MULTIPLE SEALS IN MULTIPLE DIRECTIONS.

THIS TABLE IS TO GIVE ROUGH ESTIMATES ON THE QUANTITIES REQUIRED.



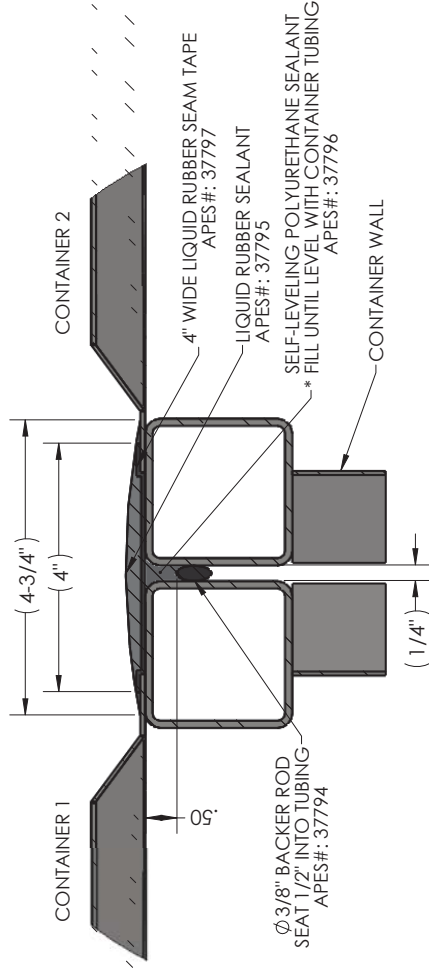
GENERAL TOLERANCES XXX ± 1/8" XX ± 1/16" UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		DWG. NO:		PROJECT NUMBER:	
THIS INFORMATION IS THE PROPERTY OF newterra AND CANNOT BE REUSED OR REPRODUCED WITHOUT WRITTEN CONSENT.		B1 27/02/17 GH FOR PRODUCTION - REVISED SEALING METHOD		TITLE: LIQUID RUBBER CONTAINER SEAL	
		B 11 Nov 2015 OM FOR PRODUCTION		CUSTOMER: newterra	
		A1 26 Aug 2015 OM FOR REVIEW		DATE: 22 July 2015	
		A 22 July 2015 OM FOR REVIEW		DRAWING: OM	
		LEVEL DATE BY REVISION		C-28	
				1 OF 7	

CONTAINERS JOINED AT LONG SIDE



CONTAINER ROOF

SEALED JOINT



SECTION A-A
CONTAINERS JOINED ALONG LONG SIDE
SCALE 1:2



TYPICAL STEPS FOR SEALING LONG SIDE OF CONTAINER JOINTS

1. PUSH BACKER ROD INTO GAP BETWEEN CONTAINER TUBING; 1/2" DOWN.
2. APPLY SELF LEVELING POLYURETHANE SEALANT ON TOP OF BACKER ROD UNTIL LEVEL WITH TUBING.
3. APPLY LIQUID RUBBER TAPE CENTERED OVER GAP, 4" WIDE. ENSURE SMOOTH TIGHT TO SURFACE SEAL.
4. APPLY LIQUID RUBBER SEALANT WITH A MINIMUM CENTERED WIDTH OVER THE GAP OF 4 3/4". ENSURE NONE OF THE TAPE IS VISIBLE AFTER THIS APPLICATION.

GENERAL TOLERANCES .XX ± .00" XXX ± .00" UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		DWG. NO:	PROJECT NUMBER:
THIS INFORMATION IS THE PROPERTY OF newterra AND CANNOT BE REUSED OR REPRODUCED WITHOUT WRITTEN CONSENT.		TITLE: LIQUID RUBBER CONTAINER SEAL	
		CUSTOMER: newterra	
		DATE: 22 July 2015	
		DRAWING: OM	
		BY: REVISION	
		C-36	

Technical drawing showing a cross-section of two containers joined along a short side. The drawing includes dimensions and material specifications for various components.

Containers: CONTAINER 1 and CONTAINER 2.

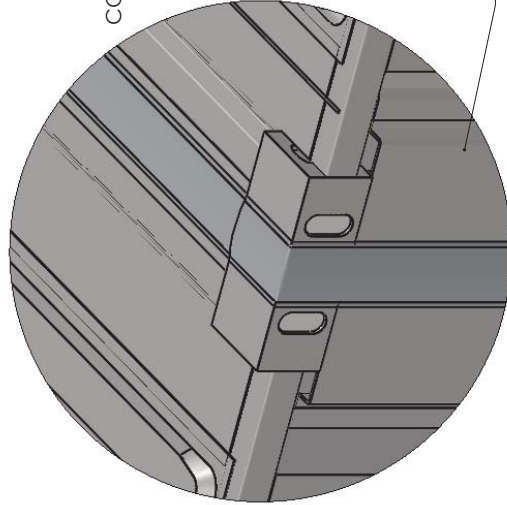
Dimensions:

- Overall width: (4-3/4")
- Joint width: (4")
- Container 1 thickness: 1/2"
- Container 2 thickness: 1/8"
- Backer rod diameter: Ø 7/8"
- Seam tape width: 4"
- Seam tape thickness: 1/2"
- Seam tape angle: L3X3X1/8" ANGLE
- Seam tape material: SELF-LEVELING POLYURETHANE SEALANT APES #: 37796
- Seam tape material: LIQUID RUBBER SEALANT APES #: 37795
- Seam tape material: 4" WIDE LIQUID RUBBER SEAM TAPE APES #: 37797
- Seam tape material: SPRAY FOAM APES #: 22772
- Seam tape material: SEAT 1/2" INTO ANGLE APES #: 29551

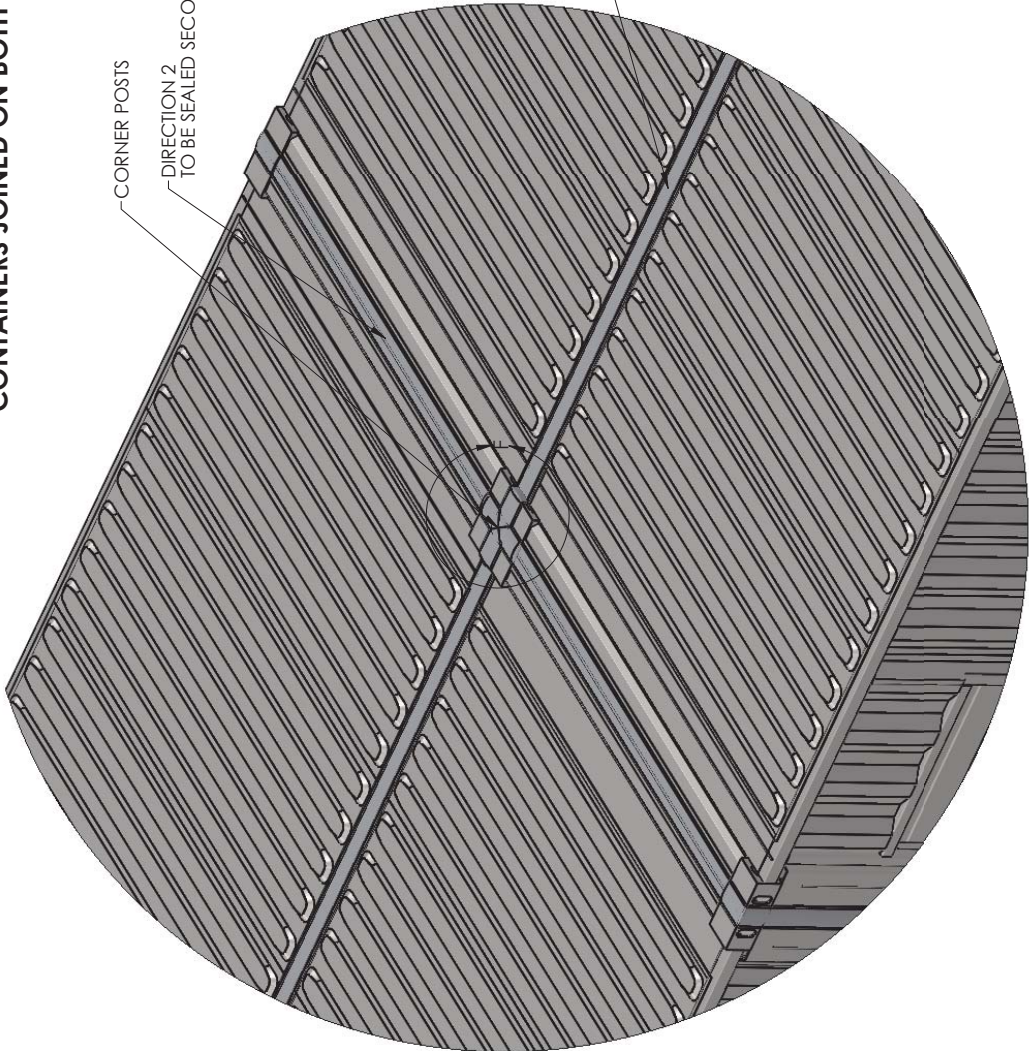
Section B-B: CONTAINERS JOINED ALONG SHORT SIDE - BARN DOOR END TO BARN DOOR END

Scale: 1 : 2.5

1. PERFORM STEPS 1-4 OF TYPICAL SEALING OUTLINED ON PAGE 1 ON TOP OF CONTAINERS.
2. FILL UNDERSIDE AS SHOWN WITH SPRAY FOAM WHEN POLYURETHANE LEVELING SEALANT HAS SET.
3. FOLLOW STEPS 3 & 4 AND ADD SPRAY FOAM TO BARN DOOR END VERTICAL SEALS.

[illegible]

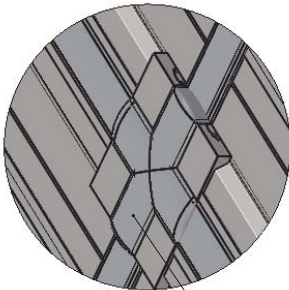
CONTAINERS JOINED ON BOTH LONG AND SHORT SIDES



STEPS FOR SEALING ABOVE CONTAINERS JOINED IN BOTH DIRECTIONS:

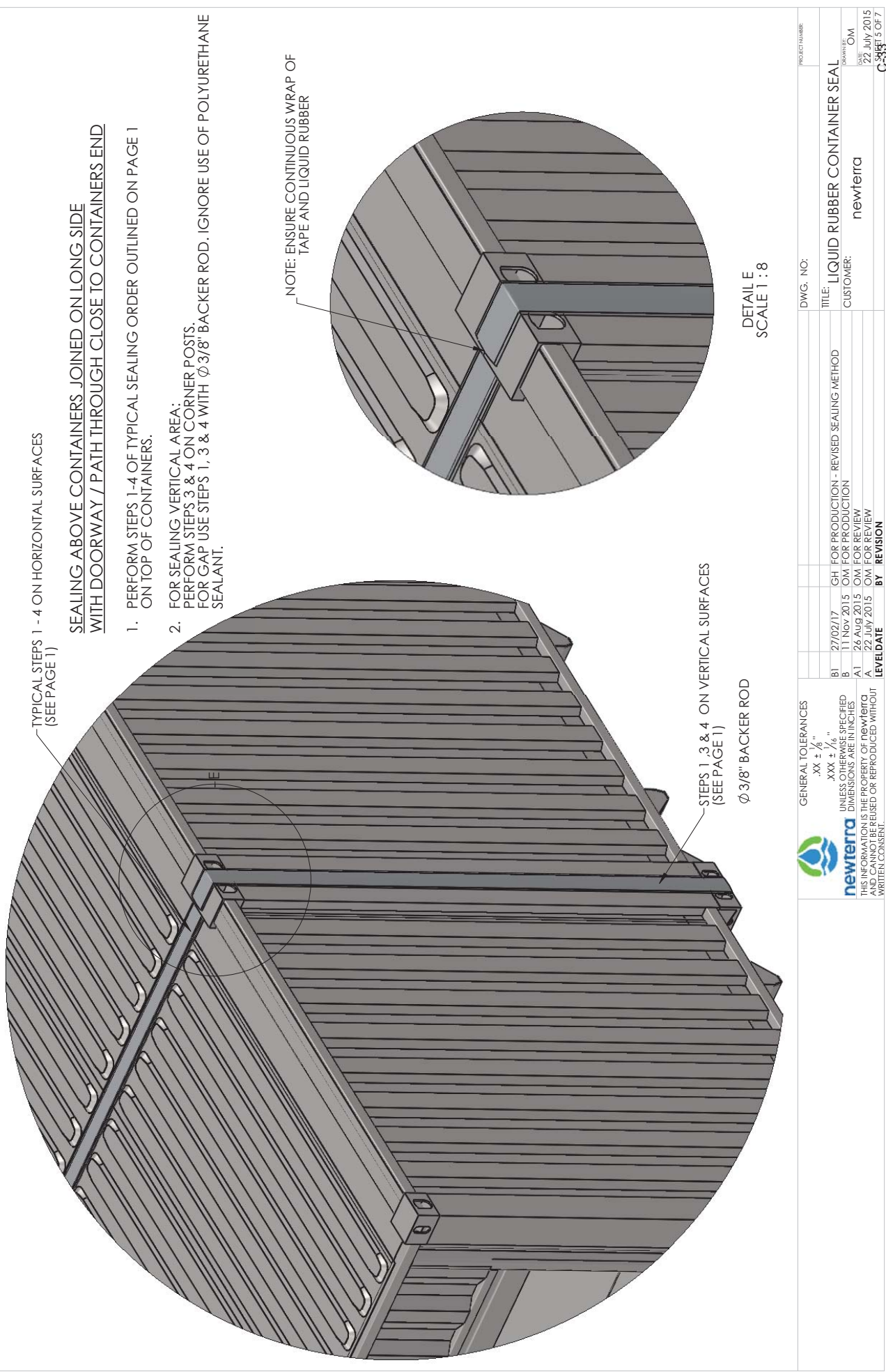
1. CLEAN AND PRIME AREA
2. PERFORM STEPS 1 TO 4 OF TYPICAL SEALING ORDER OUTLINED ON PAGE 1 IN DIRECTION 1 - ALONG LONG SIDE FIRST WITH $\phi 3/8"$ BACKER ROD.
3. PERFORM STEPS 1 TO 4 OF TYPICAL SEALING ORDER OUTLINED ON PAGE 1 IN DIRECTION 2 - ALONG THE SHORT SIDE WITH $\phi 7/8"$ BACKER ROD.
4. PERFORM STEPS 3 & 4 WHEN SEALING CORNER POST JOINTS. (TAPE AND LIQUID RUBBER).

NOTE: WHEN SEALING DIRECTION 1 & 2 CONTINUE WRAP OF TAPE AND RUBBER ACROSS THE CORNER POSTS.



DETAIL F
CORNER POST JOINTS
SCALE 1 : 10

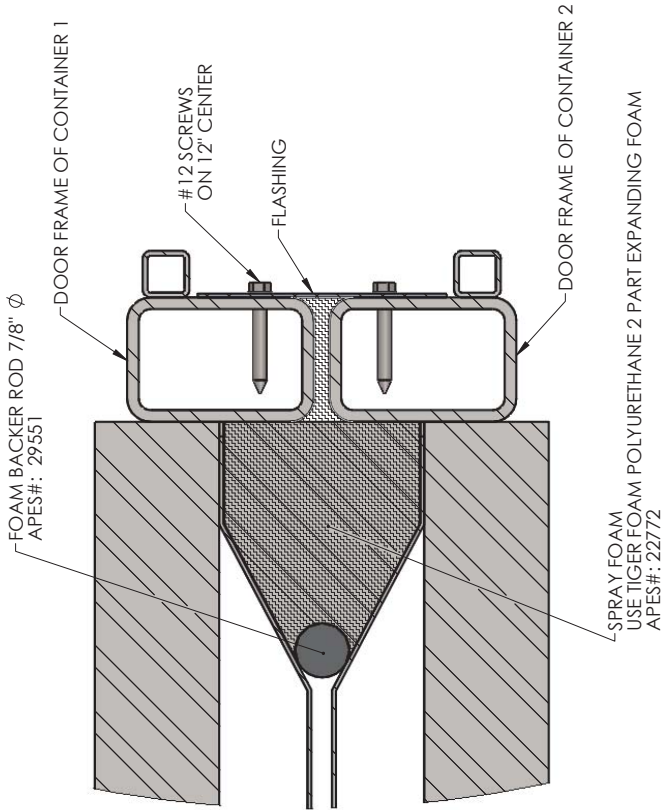
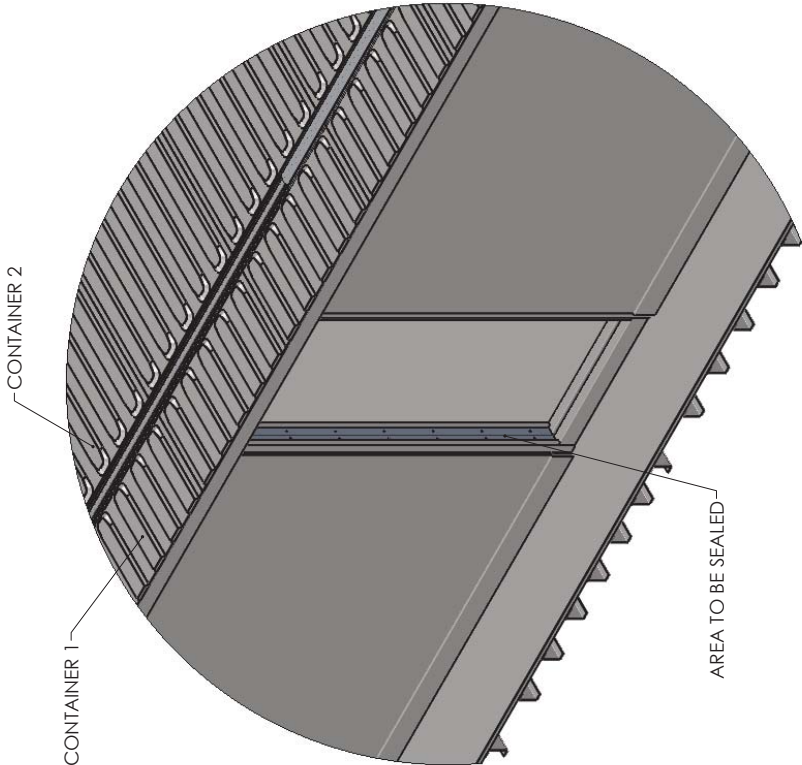
GENERAL TOLERANCES XXX ± 1/16" XX ± 1/8" UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES THIS INFORMATION IS THE PROPERTY OF newterra AND CANNOT BE REUSED OR REPRODUCED WITHOUT WRITTEN CONSENT.		DWG. NO:		PROJECT NUMBER:	
B1	27/02/17	GH	FOR PRODUCTION	REVISED SEALING METHOD	TITLE: LIQUID RUBBER CONTAINER SEAL CUSTOMER: newterra DATE: 22 July 2015 DRAWN: OM BY: 351 C-351 SHEET 4 OF 7
B	11 Nov 2015	OM	FOR PRODUCTION		
A1	26 Aug 2015	OM	FOR REVIEW		
A	22 July 2015	OM	FOR REVIEW		
LEVEL		DATE	BY	REVISION	



GENERAL TOLERANCES
XXX $\pm \frac{1}{8}"$
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
THIS INFORMATION IS THE PROPERTY OF newterra
AND CANNOT BE REUSED OR REPRODUCED WITHOUT
WRITTEN CONSENT.

DWG. NO:		PROJECT NUMBER:
B1	27/02/17	GH FOR PRODUCTION - REVISED SEALING METHOD
B	11 Nov 2015	OM FOR PRODUCTION
A1	26 Aug 2015	OM FOR REVIEW
A	22 July 2015	OM FOR REVIEW
LEVEL/DATE		BY REVISION
TITLE: LIQUID RUBBER CONTAINER SEAL		CUSTOMER: newterra
DRAWN BY: OM		DATE: 22 July 2015
C-33		OF 7

INSIDE SEALING OF WALKWAYS



DETAIL D
DOORWAYS SEALING
SCALE 1:2

GENERAL TOLERANCES
XXX ± 1/16"
UNLESS OTHERWISE SPECIFIED
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DATE	BY	REVISION	LEVEL	DATE	BY	REVISION	LEVEL
27/02/17	GH	FOR PRODUCTION	REVISÉ	27/02/17	GH	FOR PRODUCTION	REVISÉ
11 Nov 2015	OM	FOR PRODUCTION	REVISÉ	11 Nov 2015	OM	FOR PRODUCTION	REVISÉ
26 Aug 2015	OM	FOR REVIEW	REVISÉ	26 Aug 2015	OM	FOR REVIEW	REVISÉ
22 JUN 2015	OM	FOR REVIEW	REVISÉ	22 JUN 2015	OM	FOR REVIEW	REVISÉ
LEVEL				BY REVISION			
PROJECT NUMBER				DWG. NO:			
TITLE: LIQUID RUBBER CONTAINER SEAL				TITLE: LIQUID RUBBER CONTAINER SEAL			
CUSTOMER: newterra				CUSTOMER: newterra			
DATE: 22 July 15				DATE: 22 July 15			
DRAWN: OM				DRAWN: OM			
C-34				C-34			

APPENDIX D

Recommended Spare parts List

1704432 - AGNICO EAGLE MINE - A1

Qty	Category	Spare/ Maintenance	newterra#	Description
1	Electrical	Spare	10270	Breaker, SQD QOU115 1240V 15A 1P DIN Mount, 10k SCCR
1	Electrical	Spare	11482	Breaker Lock for 1 pole QOU breakers
3	Electrical	Spare	12404	Fuse, GLD AJT250250A 600V Time Delay, Class J
1	Electrical	Spare	12475	4Ch Discrete, Transistor Output, Intrinsically Safe Barrier
1	Electrical	Spare	12547	Contactor (TeSys D) Non-Reversing, 9A(AC3) 125A(AC1), 3-Pole (3 NO)
1	Electrical	Spare	17158	Combination Starter, Busbar Top Mount
1	Electrical	Spare	18396	190-480V, 3PH Power/Phase Monitor
4	Electrical	Spare	18642	100W Incandescent, Medium Base, CL1Div2
5	Electrical	Spare	19029	Breaker, SQD QOB115 120V 15A Bolt On, 10k SCCR
1	Electrical	Spare	19264	Combination Starter, 12A Power Base, 3/7.5/10HP
1	Electrical	Spare	19269	Combination Starter, 1NO Ready, 1NO Fault Aux. Contact Module
1	Electrical	Spare	19503	Combination Starter, TeSysU Standard Control Unit 0.35-1.4A, 24VDC coil
5	Electrical	Spare	20369	Fuse, GLD GSB1/10100mA 250V Fast Acting, Miniature 5x20mm
1	Electrical	Spare	21191	Combination Starter, TeSysU Standard Control Unit 1.25-5.0A, 24V/60mA DC coil
1	Electrical	Spare	21887	Relay, SQT RXM4AB1F7, Miniature Relay, 4PDT, 120VAC, 6A contacts
1	Electrical	Spare	21888	Relay, SQT RXM4AB1BD, Miniature Relay, 4PDT, 24 VDC, 6A contacts
1	Electrical	Spare	21889	Relay, SQT RXZE2S114M, Base/Socket for RXM4 4P Relays
2	Electrical	Spare	22324	Relay, SQT RXM2AB1BD, Miniature Relay 2PDT 24 VDC
2	Electrical	Spare	22326	Relay, SQT RXZE2S108M, Base/Socket for RXM2 2P Relays
1	Electrical	Spare	22546	Busbar 4 TeSysU Starters, #6AWG 63A MAX
1	Electrical	Spare	22706	Combination Starter, TeSysU Standard Control Unit 3-12A, 24V/60mA DC coil
1	Electrical	Spare	23504	4Ch Power Supply, 15V - 20mA
4	Electrical	Spare	23751	Relay, SPDT, 24VDC Coil
1	Electrical	Spare	26829	8GB Micro USB Key
1	Electrical	Spare	28484	M251 Controller, Dual Ethernet
1	Electrical	Spare	29140	eWON Cosy 131 LAN/Cell Router, 24VDC Power
2	Electrical	Spare	35707	24VDC Power Supply, 120W, 5A
1	Electrical	Spare	36087	TM3 16DI Expansion Module
1	Electrical	Spare	36088	TM3 16DO Expansion Module
1	Electrical	Spare	36089	TM3 4-channel AI Expansion Module
1	Electrical	Spare	36090	TM3 8-channel AI Expansion Module
1	Electrical	Spare	36126	Touchscreen, 10.4" TOUCH SMART DISPLAY
1	Electrical	Spare	36316	OTB RIO Adapter, Ethernet
1	Electrical	Spare	36317	TM2 8 point DI Expansion Module

Qty	Category	Spare/ Maintenance	newterra#	Description
1	Electrical	Spare	36543	TM3 4-channel AO Expansion Module
1	Electrical	Spare	36555	Fuse, 160mA 250V Fast Acting, Miniature 5x20mm
1	Electrical	Spare	36557	TME Bus Transmitter Module
1	Electrical	Spare	36558	TME Bus Receiver Module
1	Electrical	Spare	37596	TM2 16 point DI Expansion Module
1	Electrical	Spare	37906	48" x 36" x 12" NEMA4 Steel Enclosure
1	Electrical	Spare	38069	Breaker, Multi9 480/277V 15 AMP 3P C Trip Curve, 10k SCCR
1	Electrical	Spare	38070	Breaker, Multi9 480/277V 20 AMP 3P C Trip Curve, 10k SCCR
1	Electrical	Spare	38071	Breaker, Multi9 480/277V 30 AMP 3P C Trip Curve, 10k SCCR
1	Electrical	Spare	38092	Breaker, Multi9, 480/277V 15 AMP 2P C Trip Curve, 10k SCCR
1	Electrical	Spare	38093	Variable Frequency Drive, Danfoss FC202 P1K5, VFD 480V 2HP, 3.4A 3PH, IP55, w/ Line Side Fusible Disc
1	Electrical	Spare	38094	Variable Frequency Drive, Danfoss FC202 P11K, VFD 480V 15HP, 21A 3PH, IP55, w/ Line Side Fusible Disc
2	Electrical	Spare	38136	Breaker, 240V 1 AMP 1P C
2	Electrical	Spare	38137	Breaker, 240V 2 AMP 1P C
2	Electrical	Spare	38138	Breaker, 240V 3 AMP 1P C
2	Electrical	Spare	38139	Breaker, 240V 4 AMP 1P C
2	Electrical	Spare	38204	Wall Pack, 24W LED c/w PhotoEye
1	Electrical	Spare	38209	TM2 16RO Expansion Module
1	Mechanical	Spare	9999	Pump, Metering, Prominent, Rebuild Kit, BT4B0708PVT2000UD010A01, Flow: 1.88GPH / 7.10L/H, Pressure: 102PSI / 07BAR
1	Mechanical	Spare	11518	Blower, Sutorbilt, Model 4L-RHC
1	Mechanical	Maintenance	11529	Filter, Element, Solberg, 30P, Paper element, for newterra PN M1096
1	Mechanical	Spare	11772	Blower, Part, Belt drive, 15hp
1	Mechanical	Maintenance	11792	Filter, Element, Solberg, 230P, Paper element for newterra PN M1489
1	Mechanical	Maintenance	12014	Filter, Element, Solberg, 18P, Paper element, for newterra PN M1406
1	Mechanical	Spare	12026	Motor, Teco, 1hp, 1800rpm, 143T
1	Mechanical	Maintenance	12930	Oil, Blower, Aeon PD blower oil
1	Mechanical	Spare	15185	Motor, Teco, 15hp, 3600rpm, 254T
1	Mechanical	Spare	16196	Gauge, Pressure, 0-15psi, Indumart, P16T2-FG-15
5	Mechanical	Spare	16202	Gauge, Pressure, 0-30psi, Indumart, P16T2-FG-30
4	Mechanical	Spare	19279	Switch, Level, Mech Float, Narrow Angle, N.C., YEL
2	Mechanical	Spare	21552	Switch, Level, Tether Weight
10	Mechanical	Spare	21828	Anode, Magnesium, mounted on wire with washer
1	Mechanical	Spare	23439	Transmitter, Pressure, KPSI 750 series 0-10ft H2O
1	Mechanical	Spare	24163	Heater, Immersion, Caloritech 6KW 460V 3ph
1	Mechanical	Spare	25747	Blower, Cincinnati LM-4, 4.3" X 2.9" Width Alum wheel
1	Mechanical	Spare	27810	Transmitter, Pressure/ Vacuum, IFM efector
1	Mechanical	Spare	28469	Pump, Centrifugal, Price Pumps Type 26 EPR Seal 0542
1	Mechanical	Spare	28617	Pump, Centrifugal, Price Pump 1/4hp 460V 3ph 1800RPM

Qty	Category	Spare/ Maintenance	newterra#	Description
1	Mechanical	Spare	28620	Pump, Centrifugal, Price Pump 2hp 460V 3ph 3600RPM
1	Mechanical	Spare	28712	Flow meter, IFM efector, SM9000, Magnetic flow meter
1	Mechanical	Spare	29263	Pump, Centrifugal, Price Pump 3/4hp 460V 3ph 3600RPM
1	Mechanical	Spare	33737	Switch, Level, Ultrasonic, Flowline, LU10-1405
8	Mechanical	Spare	35983	#10 Stainless Back 3" Trim, 16" Length, 0.5 Black Poly Brush
1	Mechanical	Spare	36395	Pump, Sump, Zoeller N72 Non-Automatic Operation
1	Mechanical	Spare	36870	Transmitter, pH, Prominent pH Sensor PHER 112SE
1	Mechanical	Spare	36973	Pump, Centrifugal, Price, Misc
2	Mechanical	Spare	37662	Valve, Ball, PVC, 2", True-Union, FPM O-rings
1	Mechanical	Spare	38186	Pump, Centrifugal, Price Pump 1hp 460V 3ph 3600RPM
1	Mechanical	Spare	38219	Gear Motor, 230/460V 50/60 3P, 60/50hz 1/4hp
1	Mechanical	Spare	38596	Transmitter, Dissolved Oxygen, Optical, RDO PRO-X, Sensor Cap Replacement Kit, 0088720
1	Mechanical	Spare	M1254	Pump, Progressive Cavity, Moyno, 35601
4	Mechanical	Spare	M1343	Switch, Level, Mech Float, Narrow Angle, N.O., Blue

APPENDIX E

Technical Specs and Brochures for Parts and Equipment

TAG	newterra Part Number	Part Description	Extended Part Description	Page
-	21299	Valve, Relief, Back Pressure, Kunkle, 1", Liquid Service	Set @ 50 PSI, 0019-E01-MG0050	E-8
-	M1096	Filter, Silencer, Solberg, FS-30P-200		E-40
-	M1406	Filter, Silencer, Solberg, FS-18P-150	1	E-40
B-301/2	25404	Blower, Elmo, 2BH7420-0AH267 2.4HP	230/460V 3ph	E-45
B-501/2	11518	Blower, Sutorbilt, Model 4L-RHC	Orientation: Horizontal (Flow Down) Driven Shaft Position: RHC (Right Hand Central) Flow Requirement: 487 scfm Altitude: 100' Inlet Pressure: Outlet Pressure:4.4 Inlet Air Temp: 68 Discharge Air Temp: 126 Noise: RPM: 3352 Horsepower Consumed:13.2 Motor Included with Package Blower calculation sheet and blower curve supplied by Engineering	E-73
B-501/2	15185	Motor, Teco, 15hp, 3600rpm, 254T	208-230/460, 3ph, CSA/UR	E-73
B-501/2	38094	VFD, Danfoss 15HP, 380-480Vac, IP55	p/n: FC202P11KT4E55H2XGX3SXSXXXAXB XCXXXXDX	E-159
B-501/2	M1489	Filter, Silencer, Solberg, FS-230P-300	3"	E-249
B601/2	21232	Blower, Elmo G200 2BH-1510-7HH56-Z	230/460V 3P 6.2 HP	E-251
B-7911	25747	Blower, Cincinnati LM-4, 4.3" X 2.9" Width Alum wheel	Arrangement #4, Direct Drive, bottom discharge c/w	E-283
B7914	22618	Blower, Cincinnati, LM-6, Direct drive	- Cast Aluminum Housing -6.3 x 2.5 STEELWheel - Slip fit inlet - Slip fit discharge - Motor base - 1.5hp, 460V, 3ph, 60Hz, 3600 rpm, TEFC, CCW/TH 769CFM @ 2.25	E-283
DO-501	27325	Transmitter, Dissolved Oxygen, Optical	RDO Pro-x (10m cable)	E-298
F-7961	M1072	Fan, Building, 12", 1/4hp, 1750rpm, 120V, 1ph, TEAO	CSA Approved, S12-E1	E-328

TAG	newterra Part Number	Part Description	Extended Part Description	Page
FM 701 702	28712	Flow meter, IFM efector, SM9000, Magnetic flow meter	G2 connection 0 -300 L/min	E-336
FT-102/2	27200	Flow meter, Endress, Promag 10D50 2"	10D50-4LGA1RA0B4AAM1 Compact head	E-381
H	24384	Heater, Forced Air, Ouellet, 4.8kW, OAC04804BL	460V 1ph	E-521
H-301/302 H-401/402 H-501/502 H-503/504	24163	Heater, Immersion, Caloritech 6KW 460V 3ph	3" Flanged Heater with Moisture Resistant Term Box	E-525
H-7911	38187	Heater, Forced Air, Indeeco, 15KW, 233 Series	480V/3ph. EXP, 1/4HP Fan, w thermostat SIZE 2	E-526
H-7912	38188	Heater, Forced Air, Indeeco, 10KW, 233 Series	480V/3ph. EXP, 1/4HP Fan, w thermostat	E-526
HMI	26421	HMI, HMIGTO5310	10.4" TFT Color Touchscreen, Ethernet, USB, Serial	E-534
LS	19279	Switch, Level, Mech Float, Narrow Angle, N.C., YEL	N/C, Yellow float	E-684
LS	M1343	Switch, Level, Mech Float, Narrow Angle, N.O., Blue	Tilt Float Level Switch w 40' cable	E-684
LS-101/2/3	19279	Switch, Level, Mech Float, Narrow Angle, N.C., YEL	N/C, Yellow float	E-684
LSHH	12351	Switch, Level, Almeg, Vertical, ATB3-48B	1/4NPT	E-687
LSHH-101.102/103 LSHH-301 LSHH-401 LSHH-501 LSHH-502 LSHH-601/602	19279	Switch, Level, Mech Float, Narrow Angle, N.C., YEL	N/C, Yellow float	E-684
LSHH-7901	12351	Switch, Level, Almeg, Vertical, ATB3-48B	1/4NPT	E-687
LSLL-301/401/ 501/502	M1108	Switch, Level, Mech Float, Wide Angle, N.O., Red	13A, SPST, N/O, Red	E-684
LT-301/501	23439	Transmitter, Pressure, KPSI 750 series 0-10ft H2O	Part Number 750S14D4A004.334000.000B10015B	E-688
M-701/702	24353	Valve, Actuated Ball Valve 1.5" Brass 2 way	w/ limit switches PMP electric Actuator 120V OM-1	E-722
MCP	28484	PLC, TM251MESE	M251 Controller 2 Ethernet port	E-739
MCP	29140	Modem/Router, EC6133D	eWON Cosy 131 Ethernet plus with GSM 3G+	E-851

TAG	newterra Part Number	Part Description	Extended Part Description	Page
Membranes	28424	Membrane, Microclear Cassette, MCXL2 - Type M	surface area is 8 m2	E-881
Membranes	36037	MBR, Air Diffuser, FLEXAIR 91 1105 T SERIES		E-900
MPP	18396	Motor Saver, 460 w/Diagnostic 3ph	Finger Safe, DIN Rail Mountable	E-920
P-201/2	38186	Pump, Centrifugal, Price Pump 1hp 460V 3ph 3600RPM	PN: RC200AI-300-26566-100-36-3X6	E-928
P-301/2	29263	Pump, Centrifugal, Price Pump 3/4hp 460V 3ph 3600RPM	PN: RC200AI-250-26566-75-36-3T7	E-928
P-401/2	36973	Pump, Centrifugal, Price, Misc	RC300AI-4.33-26566-500-36-3T7 200GPM @ 60 FEET PRESSURE 3600RPM 5HP TEFC 460v3P	E-928
P-501/2	28620	Pump, Centrifugal, Price Pump 2hp 460V 3ph 3600RPM	PN: RC200AI-388-26566-200-36-3T6	E-928
P503	28617	Pump, Centrifugal, Price Pump 1/4hp 460V 3ph 1800RPM	PN: RC200AI-388-26566-25-18-3T6	E-928
P-551/2	29263	Pump, Centrifugal, Price Pump 3/4hp 460V 3ph 3600RPM	PN: RC200AI-250-26566-75-36-3T7	E-928
P-553/4	28620	Pump, Centrifugal, Price Pump 2hp 460V 3ph 3600RPM	PN: RC200AI-388-26566-200-36-3T6	E-928
P-6101,2,3	21192	Pump, Metering, Prominent, Misc	BT4B0708PVT2000UD010A01 Flow: 1.88GPH / 7.10L/H Pressure: 102PSI / 07BAR	E-947
P-610x	25823	Pump, Metering, Parts, Multi-function Valve	PVDF, 87PSIG Size 2	E-1063
P-701/2	38093	VFD, Danfoss 2HP, 380-480Vac, IP55	p/n: FC202P1K5T4E55H2XGX3SXSXXXXXAXB XCXXXXDX	E-159
P-701/702	12026	Motor, Teco, 1hp, 1800rpm, 143T	208-230/460V, 3ph, CSA/UR	E-1091
P-701/702	M1254	Pump, Progressive Cavity, Moyno, 35601	15gpm@25psi, 1200rpm, NPSH: 2 feet	E-1125
P-801	36395	Pump, Sump, Zoeller N72 Non-Automatic Operation	All Plastic Construction	E-1129
PH-501	27936	Transmitter, pH, Prominent Dulcometer pH or ORP	4-20mA output, 7781499	E-1145
PI-201/2	16202	Gauge, Pressure, 0-30psi, Indumart, P16T2-FG-30	SS, brass internals, Glyc. Filled, bottom mount	E-1249

TAG	newterra Part Number	Part Description	Extended Part Description	Page
PI-301	16196	Gauge, Pressure, 0-15psi, Indumart, P16T2-FG-15	SS, brass internals, Glyc. Filled, bottom mount	E-1249
PI-301/2	16202	Gauge, Pressure, 0-30psi, Indumart, P16T2-FG-30	SS, brass internals, Glyc. Filled, bottom mount	E-1249
PI-401/2	16202	Gauge, Pressure, 0-30psi, Indumart, P16T2-FG-30	SS, brass internals, Glyc. Filled, bottom mount	E-1249
PI-501/2	16202	Gauge, Pressure, 0-30psi, Indumart, P16T2-FG-30	SS, brass internals, Glyc. Filled, bottom mount	E-1249
PI-551/2	16202	Gauge, Pressure, 0-30psi, Indumart, P16T2-FG-30	SS, brass internals, Glyc. Filled, bottom mount	E-1249
PI-553/554 PI-703/704	16203	Gauge, Pressure, 0-60psi, Indumart, P16T2-FG-60	SS, brass internals, Glyc. Filled, bottom mount	E-1249
PI-601/602	30098	Gauge, Pressure, 0-15psi, Indumart, P16K2-FG-15		E-1249
PSL-301	10218	Switch, Pressure, 1823-2	0.5-2" wc, Dwyer, Nema 1	E-1250
PSL501	10547	Switch, Pressure, 1823-40	5-44" wc, Dwyer, Nema 1	E-1250
PSL-601/2	10547	Switch, Pressure, 1823-40	5-44" wc, Dwyer, Nema 1	E-1250
PSL-7911	10218	Switch, Pressure, 1823-2	0.5-2" wc, Dwyer, Nema 1	E-1250
PSL-7911	12877	Meter, Flow, Pitot Tube, 4"	Multi-Point Averaging	E-1254
SCR-201/2	33737	Switch, Level, Ultrasonic, Flowline, LU10-1405	Long Style	E-1257
SCR-201/2	35907	Filter, Rotary screen, Newterra 17" wide SCR-50	0.5mm Wedge Wire	E-1277
SCR-201/2	38219	Gear Motor, 230/460V 50/60 3P, 60/50hz 1/4hp	SK1SI63/H10-56C-63L/4 FRD DIV2 NSD+ 400:1 Nord Gear, 4.3 RPM, CSA CL1 DIV2	E-1278
TNK-101/2	26009	Tank, Closed Top, Cylindrical, 2100 gal, Norwesco - no drain	87dia 89 tall, 1.9sg, Heavy Walled, blue	E-1348
TNK-103	23980	Tank, closed top, cylindrical, ACO CT-450-DT	450 Imp. Gal., 16" lid with locking strap	E-1364
TNK-201	38224	Tank, Open Top, Rectangular, 192 gal	540 US Gal 72x36x48	E-1365
TNK-401/502	38229	Eductor Mixing, ElmrIDGE ME20P	Poly Pro 3/4" inlet	E-1366

TAG	newterra Part Number	Part Description	Extended Part Description	Page
TNK-801	21203	Tank, Open Top, Cylindrical, 60 Imp gal, OT- 60	Aco Tanks With Lid, 22x44 270Liter	E-1368
TNK-901	26009	Tank, Closed Top, Cylindrical, 2100 gal, Norwesco - no drain	87dia 89 tall, 1.9sg, Heavy Walled, blue	E-1348
TSL-301/401/ 501/502	15653	Switch, Temperature, Probe, A19AAF-12C	25-225 deg F, 10 foot Capillary Tube	E-1369
TSLT/TSH	10515	Switch, Temperature Thermostat, CN TF115- 001	40F to 100F / 5C to 40C dial	E-1371
TSLT7911	10515	Switch, Temperature Thermostat, CN TF115- 001	40F to 100F / 5C to 40C dial	E-1371
TSLT-7941	10515	Switch, Temperature Thermostat, CN TF115- 001	40F to 100F / 5C to 40C dial	E-1371
VT-701 702	27810	Transmitter, Pressure/ Vacuum, IFM efector	PG2409 Scale -14.5- 14.5 PSI 4-20mA	E-1375

Valve, Relief, Back Pressure, Kunkle, 1", Liquid Service
Set @ 50 PSI, 0019-E01-MG0050

KUNKLE

ty and Relief Products



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Definitions and Commonly Used Terms

A.S.M.E.

American Society of Mechanical Engineers.

A.P.I.

American Petroleum Institute

PRV

Relief Valve, Safety Valve, Safety Relief Valve.

Back Pressure

The pressure that exists at the outlet of a pressure relief device as a result of the pressure in the discharge system. It is the sum of the superimposed and built-up back pressures.

Built-up Back Pressure

The increase in pressure in the discharge header that develops as a result of flow after the pressure relief device opens.

Blowdown

The difference in pressure between the opening pressure and reclose pressure. May be expressed in percent of set pressure or "psig."

Body/Nozzle/Seat

The stationary seating surface, the inlet.

Cap

The pressure screw cover and/or lever housing. May be screwed, bolted, packed, or plain lever.

Chatter

Abnormal, rapid reciprocating movement of the disc on the seat of a pressure relief valve.

Coefficient of Discharge

The ratio of the measured relieving capacity to the theoretical relieving capacity.

Disc

The moveable seating surface.

Gag

A device attached to a safety or safety relief valve that prevents it from opening at the set pressure.

Guide

That portion of the valve used to guide the disc.

Lift

The distance between the seat and disc seating surfaces when the valve is in the full open position.

MAWP

Maximum allowable working pressure. This data is found on the pressure vessel nameplate and is the maximum pressure at which the lowest set safety valve must be set (stamped).

N.B.

National Board of Boiler and Pressure Vessel Inspectors.

Operating Pressure

The gauge pressure at which a pressure vessel is maintained in normal operation. The operating pressure should not be in excess of 90 percent of the PRV set pressure.

Accumulation

The permitted increase in pressure developed after the valve has opened. Usually expressed in percentage, maximum allowable accumulations are established by applicable codes for operating and fire contingencies.

Pre-open/Warn

An audible or visual discharge at a pressure slightly lower than the set pressure. Warns the operator that the valve is about to operate.

Pressure Relief Device

A device actuated by inlet static pressure and designed to open during an emergency or abnormal condition to prevent a rise of internal fluid pressure in excess of a specified value. The device may also be designed to prevent excessive internal vacuum. The device may be a pressure relief valve, a non-reclosing pressure relief device, or a vacuum relief valve.

psia

Pounds per square inch absolute or absolute pressure. Absolute pressure is equal to gauge pressure plus atmospheric pressure (14.7 psi [1.01 barg] at sea level).

psig

Pounds per square inch gauge or gauge pressure. Differential pressure across the valve, equal to absolute pressure inside the pressure vessel minus atmospheric pressure (14.7 psi [1.01 barg] at sea level).

Relief Valve

A spring-loaded pressure relief valve actuated by the static pressure upstream of the valve. The valve opens normally in proportion to the pressure increase over the opening pressure. A relief valve is used primarily with incompressible fluids (liquids).

Safety Relief Valve

A spring-loaded pressure relief valve that may be used as either a safety or relief valve depending on the application.

Safety Valve

A spring-loaded pressure relief valve actuated by the static pressure upstream of the valve and characterized by rapid opening or pop action. A safety valve is normally used with compressible fluids.

Set Pressure

The gauge pressure at which a safety valve visibly and audibly opens or at which a relief valve discharges a 1" long unbroken stream of liquid.

Spindle/Stem

The rod connecting to the disc.

Stamped Capacity

The rated relieving capacity that appears on the device nameplate. The stamped capacity is based on the set pressure or burst pressure plus the allowable overpressure for compressible fluids and the differential pressure for incompressible fluids.

Superimposed Back Pressure

The static pressure that exists at the outlet of a pressure relief device at the time the device is required to operate. It is the result of pressure in the discharge system coming from other sources and may be constant or variable.

Warn Ring or Regulator Ring

The control ring which surrounds the seat, used to control preopen and blowdown.

Yoke/Bonnet

The portion of a safety/relief valve that surrounds the spring; the spring housing.