

Contract for: **Wastewater Treatment Facility**

Between: **English River Enterprises Property
Management LP**

And: **Wright Construction Western Inc.**

Project: **7603-002-00**

Contract Date: **January 15, 2021**

Volume: **6 of 6**

APPENDIX E1

Network Architecture



SHOP DRAWING REVIEW FORM

Name of Contract: English River Property Management- WWTF

Job No.: 5401-002-00

Supplier: SUEZ

Description: Network Architecture

Tag Numbers:

SHOP DRAWING REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility as detailed in the contract documents.

<input type="checkbox"/>	Reviewed	Submission No. <u>1</u>
<input type="checkbox"/>	Reviewed as noted	Job No. <u>7603-002-00</u>
<input checked="" type="checkbox"/>	Revise & Resubmit	Date <u>August 25, 2020</u>

Dwg. reviewed by Richard O.

MPE ENGINEERING LTD.

Engineer's Notes:

- Please see comments within

Attachments: 506752-WTS-EL-T02-8513-DN-001

8 7 6 5 4 3 2 1

COMMUNICATION		CABLE TYPE	RECOMMENDED MANUFACTURER PART #	LEGEND	
				BY SUEZ WTS	BY CONTRACTOR
ETHERNET		CATEGORY 5E UNSHIELDED TWISTED-PAIR	BELDEN 1583A	— E —	— — — E —

MAIN CONTROL PANEL, CP-01

INSIGHT COMMUNICATION PANEL

TO PLANT NETWORK

MEMBRANE BLOWER VFD, 20-B-201-A

MEMBRANE BLOWER VFD, 20-B-201-B

MEMBRANE BLOWER VFD, 20-B-201-C

PROCESS BLOWER VFD, 16-B-501-A

PROCESS BLOWER VFD, 16-B-501-B

WAS BLOWER VFD, 16-B-801

PROCESS PUMP VFD, 20-P-301-1

PROCESS PUMP VFD, 20-P-301-2

RAS/WAS/DRAIN PUMP VFD, 20-P-401-A

RAS/WAS/DRAIN PUMP VFD, 20-P-401-B

TRAIN 1 REMOTE I/O PANEL, CP-11

TRAIN 2 REMOTE I/O PANEL, CP-12

1794-AENTR RACK 1

1794-AENTR RACK 2

1794-AENTR RACK 3

1794-AENTR RACK 4

5069-L340ER

1783-NATR

GFCI

PANELVIEW PLUS 7, 15"

RS4000

2X ETHERNET CONFIGURED IN RING

8) SAME MODEL N-TRON SWITCH

SUPPLIED WITH MCC BY CONTRACTOR

PLANT WILL HAVE VPN-SECURED INTERNET CONNECTION. SUEZ CAN BE GIVEN ACCESS.

NOTES

1. DASHED LINES DENOTES WIRING BY OTHERS/GENERAL CONTRACTOR.

2. NETWORK COMMUNICATION CABLES SHOULD BE INSTALLED IN SEPARATE CONDUIT FROM POWER, CONTROL AND INSTRUMENTATION CIRCUITS.

3. DEFAULT NETWORK PARAMETERS WILL BE USED UNLESS OTHERWISE SPECIFIED BY THE CONTRACTOR/SYSTEM INTEGRATOR.

4. SUEZ EXPECTS THE CUSTOMER PLANT ETHERNET NETWORK TO HAVE VPN-SECURED HIGH SPEED INTERNET CONNECTION FOR INSIGHT & PLC SUPPORT FROM SUEZ, ALTERNATIVELY, A VPN ROUTER CAN BE PROVIDED WITH THIS FUNCTIONALITY. IF THE VPN-SECURED HIGH SPEED INTERNET CONNECTION IS SUPPLIED BY CUSTOMER SET THE GATEWAY ADDRESS TO IP ADDRESS SUPPLIED BY CUSTOMER FOR ETHERNET CARD (1), HMI (3) & INSIGHT BLACKBOX COMPUTER (5), OTHERWISE SET THE GATEWAY ADDRESS FOR ABOVE DEVICES TO IP ADDRESS DEFINED FOR THE RS4000 INTERNET VPN GATEWAY (4).

5. PROGRAMMING PORT MOUNTED ON ENCLOSURE DOOR. USE IP ADDRESS 192.168.169.200 TO CONNECT TO PLC. IF THE IP ADDRESSES ARE ASSIGNED BY SYSTEM INTEGRATOR, SYSTEM INTEGRATOR TO RESERVE ONE IP ADDRESS FOR PROGRAMMING LAPTOP.

6. INSIGHT COMMUNICATION PANEL TO BE INSTALLED BY SUEZ FSR AT TIME OF COMMISSIONING. IF OTHER ANTENNAE ARE REQUIRED SUEZ FSR TO INSTALL EXTERNAL ANTENNAE, ROUTE CABLES VIA STRAIN RELIEF SUPPLIED AT BOTTOM OF PANEL & CONNECT TO DELL EDGE GATEWAY AND/OR RS4000.

7.

8.

DLR SUPERVISOR ASSIGNMENT			
REF.	PLC COMPONENTS	PRECEDENCE #	DESCRIPTION
1	5069-L340ER, CP-01	254	ACTIVE RING SUPERVISOR
20	1783-NATR	255	ACTIVE RING SUPERVISOR

NETWORK: ETHERNET - HMI AND SCADA		
BAUD RATE: 10/100 Mbps SUBNET MASK: 255.255.255.0 GATEWAY: (SEE NOTE 4) (SEE NOTE 3)		
REF.	IP ADDRESS	DESCRIPTION
1	192.168.169.10	5069-L340ER, 4MB, CP-01
2	192.168.169.11	N-TRON 716FX2-ST, MANAGED ETHERNET SWITCH, MAIN CONTROL PANEL, CP-01
3	192.168.169.20	AB PANELVIEW PLUS 7, 15" HMI, CP-01
4	192.168.169.9	RS4000 INTERNET VPN GATEWAY (OPTIONAL), INSIGHT COMMUNICATION PANEL
5	192.168.169.60	INSIGHT BLACKBOX COMPUTER, DELL EDGE GATEWAY 3002, INSIGHT COMMUNICATION PANEL.
6	N/A	PROGRAMMING PORT, RJ45 + 120VAC, CP-01
7	192.168.169.21	1783-NATR, NETWORK ADDRESS TRANSLATION ROUTER

NETWORK: ETHERNET - IO		
BAUD RATE: 10/100 Mbps SUBNET MASK: 255.255.255.0 GATEWAY: 192.168.175.1 (SEE NOTE 3)		
REF.	IP ADDRESS	DESCRIPTION
20	192.168.175.10	1783-NATR, NETWORK ADDRESS TRANSLATION ROUTER
21	192.168.175.30	1794-AENTR, RACK 1, CP-01, MAIN CONTROL PANEL
22	192.168.175.31	1794-AENTR, RACK 2, CP-01, MAIN CONTROL PANEL
23	192.168.175.32	1794-AENTR, RACK 3, CP-11, TRAIN 1 RIO PANEL
24	192.168.175.33	1794-AENTR, RACK 4, CP-12, TRAIN 2 RIO PANEL
25	192.168.175.41	MEMBRANE BLOWER VFD, 20-B-201-A
26	192.168.175.42	MEMBRANE BLOWER VFD, 20-B-201-B
27	192.168.175.43	MEMBRANE BLOWER VFD, 20-B-201-C
28	192.168.175.44	PROCESS BLOWER VFD, 16-B-501-A
29	192.168.175.45	PROCESS BLOWER VFD, 16-B-501-B
30	192.168.175.46	WAS BLOWER VFD, 16-B-801
31	192.168.175.47	PROCESS PUMP VFD, 20-P-301-1
32	192.168.175.48	PROCESS PUMP VFD, 20-P-301-2
33	192.168.175.49	RAS/WAS/DRAIN PUMP VFD, 20-P-401-A
34	192.168.175.50	RAS/WAS/DRAIN PUMP VFD, 20-P-401-B

PLC COMPONENT	
MODULE	DESCRIPTION
PROCESSOR	5069-L340ER, 4MB PROCESSOR
HMI	PANEL VIEW PLUS 7, 15", 2711P-T15C22D9P
FLEX IO-DI	1794-IB16, 24VDC, 16-CH, DISCRETE INPUT
FLEX IO-DO	1794-OB16, 24VDC, 16-CH, DISCRETE OUTPUT
FLEX IO-AI	1794-IF8, 8-CH, ANALOG INPUT
FLEX IO-AO	1794-OE4, 4-CH, ANALOG OUTPUT

SUEZ WTS CONTROLLED DOCUMENT

ENGLISH RIVER PROPERTY MANAGEMENT WASTEWATER TREATMENT FACILITY

NETWORK ARCHITECTURE DIAGRAM

506752-WTS-EL-T02-8513-DN-001

REVISION A

PROJECT NO. 506752

PART/MATERIAL NO. -

SCALE NONE

SIZE D

SHEET 01 OF 01

LAST SAVED: Monday, August 10, 2020 5:46:09 PM

APPENDIX E2

Single Line Diagram

SHOP DRAWING REVIEW FORM

Name of Contract: English River Property Management WWTF

Job No.: 5401-002-00

Supplier: SUEZ

Description: Single Line Diagram

Tag Numbers: _____

SHOP DRAWING REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility as detailed in the contract documents.

<input type="checkbox"/>	Reviewed	Submission No. <u>1</u>
<input checked="" type="checkbox"/>	Reviewed as noted	Job No. <u>7603-002-00</u>
<input type="checkbox"/>	Revise & Resubmit	Date <u>August 25, 2020</u>

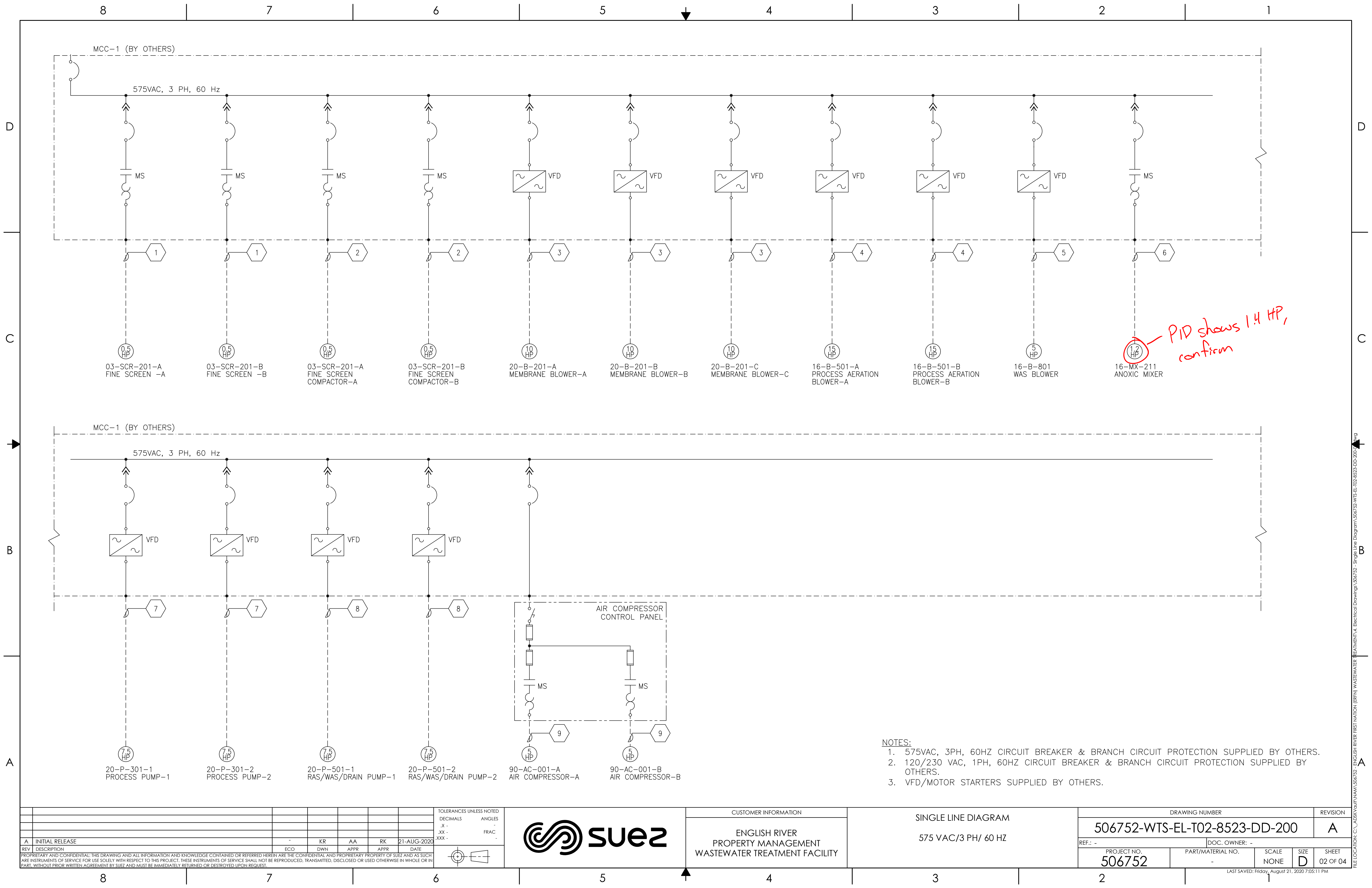
Dwg. reviewed by Richard O.
MPE ENGINEERING LTD.

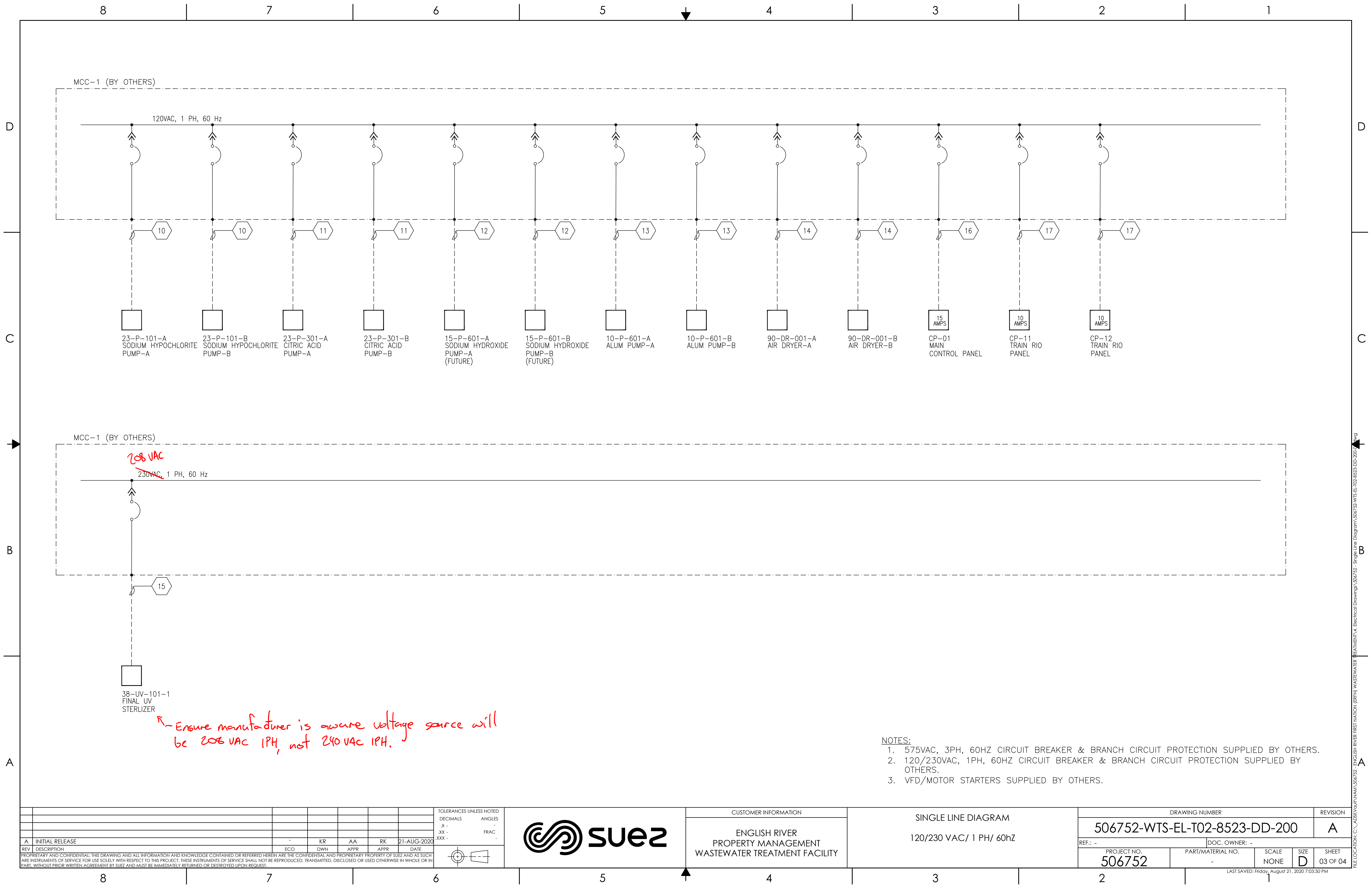
Engineer's Notes:

- Please see comments within

Attachments: 506752-WTS-EL-T02-8523-DD-200

D	8	7	6	5	4	3	2	1	D						
	LINE/CONNECTION DESCRIPTION	LINE STYLE/ SYMBOL	SYMBOL DESCRIPTION	SYMBOL ANSI	SYMBOL IEC	SYMBOL DESCRIPTION	SYMBOL ANSI	SYMBOL IEC		SYMBOL DESCRIPTION	SYMBOL ANSI	SYMBOL IEC			
	PANEL AND EQUIPMENT WIRING		CIRCUIT BREAKER WITH THERMAL OVERCURRENT TRIP			CIRCUIT BREAKER WITH THERMAL OVERCURRENT TRIP				CIRCUIT BREAKER WITH THERMAL OVERCURRENT TRIP					
	FIELD INTERCONNECTING WIRING BY OTHERS		HEATER LOAD			FUSE				CIRCUIT BREAKER WITH MAGNETIC OVERCURRENT TRIP					
	ELECTRICAL ASSEMBLY BOUNDARY					① SUPPLEMENTARY PROTECTOR ② CIRCUIT BREAKER	①	②							
	CROSSING OF CONDUCTORS (NOT CONNECTED)		ELECTRODIALYSIS STACK			OVERLOAD				FUSED DISCONNECT SWITCH ① IEC: ON-LOAD ISOLATING					
	INTERLOCK		TRANSFORMER			CONTACTOR									
	JUNCTION OF CODUCTORS		CURRENT TRANSFORMER			OPERATING COIL				MAGNETIC STARTER WITH OVERLOAD DEVICE					
	UPWARD POWER FLOW		POTENTIAL TRANSFORMER			AC/DC POWER SUPPLY, RECTIFIER, DC DRIVE									
	CIRCUIT NUMBER		TRANSFORMER WITH MULTIPLE WINDINGS			VARIABLE FREQUENCY DRIVE, UNINTERRUPTIBLE POWER SUPPLY				SELF-PROTECTED MAGNETIC MOTOR CONTROLLER					
CONTINUATION ARROW		3-PHASE, DELTA			KEY INTERLOCK										
C	B	A	CIRCUIT BREAK		3-PHASE, WYE, UNGROUNDED			REFLECTED WAVE TRAP							
			IEC 2-WIRE CIRCUIT		3-PHASE, WYE, GROUNDED NEUTRAL			TERMINAL BLOCK							
			IEC 3-WIRE CIRCUIT		INDUCTOR, REACTOR			RECEPTACLE, FEMALE CONNECTOR							
A	IEC 4-WIRE CIRCUIT		CAPACITOR			PLUG, MALE CONNECTOR									
	—		EARTH GROUND			SEPARABLE CONNECTOR									
						CUSTOMER INFORMATION		SINGLE LINE DIAGRAM		DRAWING NUMBER		REVISION			
						ENGLISH RIVER PROPERTY MANAGEMENT WASTEWATER TREATMENT FACILITY		SYMBOL LEGEND		506752-WTS-EL-T02-8523-DD-200		A			
										REF.: -		DOC. OWNER: -			
										PROJECT NO. 506752		PART/MATERIAL NO. -	SCALE NONE	SIZE D	SHEET 01 OF 04
														LAST SAVED: Monday, August 10, 2020 5:59:55 PM	






8						7						6						5						4						3						2						1					
CIRCUIT INFORMATION																		INSTALLATION INFORMATION																													
NO	TYPE	QTY	MCC LOAD DESCRIPTION			VOLTAGE	LOAD	FLA	OVERCURRENT PROTECTION			CONTROLLER OR TRANSFORMER			TERM TEMP	AMB TEMP	WIRING	CONDUIT			LENGTH	NOTES																									
1	BRN	2	FINE SCREEN			575/3/60	0.5 HP	0.9 A																																							
2	BRN	2	FINE SCREEN COMPACTOR			575/3/60	0.5 HP	0.9 A																																							
3	BRN	3	MEMBRANE BLOWER			575/3/60	10 HP	11 A																																							
4	BRN	2	PROCESS AERATION BLOWER			575/3/60	15 HP	17 A																																							
5	BRN	1	WAS BLOWER			575/3/60	5 HP	6.1 A																																							
6	BRN	1	ANOXIC MIXER			575/3/60	1.2 HP	2.4 A																																							
7	BRN	2	PROCESS PUMP			575/3/60	7.5 HP	9 A																																							
8	BRN	2	RAS/WAS/DRAIN PUMP			575/3/60	7.5 HP	9 A																																							
9	BRN	2	AIR COMPRESSOR			575/3/60	5.0 HP	6.1 A																																							
10	BRN	2	SODIUM HYPOCHLORITE CHEMICAL DOSING SYSTEM			120/1/60	–	–																																							
11	BRN	2	CITRIC ACID CHEMICAL DOSING SYSTEM			120/1/60	–	–																																							
12	BRN	2	SODIUM HYDROXIDE CHEMICAL DOSING SYSTEM (FUTURE)			120/1/60	–	–																																							
13	BRN	2	ALUM PUMP			120/1/60	–	–																																							
14	BRN	2	AIR DRYER			120/1/60	–	–																																							
15	BRN	1	FINAL UV STERLIZER			230/1/60	–	–																																							
16	BRN	1	MAIN CONTROL PANEL, CP–01			120/1/60	–	15 A																																							
17	BRN	2	TRAIN RIO PANEL			120/1/60	–	10 A																																							

APPENDIX E3


IO List


		CUSTOMER INFORMATION					I/O LIST					CUSTOMER DOCUMENT NUMBER							
SUEZ DOCUMENT NUMBER: 506752-WTS-EL-T02-8533-LI-001							PROPRIETARY AND CONFIDENTIAL: THIS DOCUMENT AND ALL INFORMATION AND KNOWLEDGE CONTAINED OR REFERRED HERIN ARE THE CONFIDENTIAL AND PROPRIETARY PROPOERTY OF SUEZ AND AS SUCH ARE INSTRUMENTS OF SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT. THESE INSTRUMENTS OF SERVICE SHALL NOT BE REPRODUCED, TRANSMITTED, DISCLOSED OR USED OTHERWISE, IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN AGREEMENT BY SUEZ AND MUST BE IMMEDIATELY RETURNED OR DESTROYED UPON REQUEST.												
CONTRACT	ISSUER	DISCIPLINE	PRODUCT	PHASE	TYPE	CHRONO							A	ISSUED FOR APPROVAL		KR	AA	RK	21.08.2020
506752	WTS	EL	T02	8533	LI	001							REV	DESCRIPTION		CREATED BY	CHECKED BY	APPROVED BY	DATE (DD-MMM-YY)
ROW NO.	REV	P&ID	DEVICE TAG	DESCRIPTION	SIGNAL TAG	I/O TYPE	PANEL TAG	5069-L340ER	RACK	SLOT	CHANNEL	ADDRESS	IO MODULE PART NUMBER	IO ENERGIZED ACTION	POWER SUPPLY	SIGNAL TYPE	NOTES / REMARKS		
1	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-A	FINE SCREEN "A" RUNNING	03-SCR-201-A	DI	CP-01	5069-L340ER	1	00	00	I:1:00.00	1794-IB16	RUNNING	AUTO STATUS - HA:DI				
2	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-A	FINE SCREEN "A" FAULT	03-SCR-201-A	DI	CP-01	5069-L340ER	1	00	01	I:1:00.01	1794-IB16	ALARM					
3	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-A	FINE SCREEN "A" E-STOP	03-SCR-201-A	DI	CP-01	5069-L340ER	1	00	02	I:1:00.02	1794-IB16						
4	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-B	FINE SCREEN "B" RUNNING	03-SCR-201-B	DI	CP-01	5069-L340ER	1	00	03	I:1:00.03	1794-IB16	RUNNING	AUTO STATUS-HA:DI				
5	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-B	FINE SCREEN "B" FAULT	03-SCR-201-B	DI	CP-01	5069-L340ER	1	00	04	I:1:00.04	1794-IB16	ALARM					
6	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-B	FINE SCREEN "B" E-STOP	03-SCR-201-B	DI	CP-01	5069-L340ER	1	00	05	I:1:00.05	1794-IB16						
7	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-A	FINE SCREEN COMPACTOR "A" RUNNING	03-SCR-201-A	DI	CP-01	5069-L340ER	1	00	06	I:1:00.06	1794-IB16	RUNNING	AUTO STATUS - HA:DI				
8	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-A	FINE SCREEN COMPACTOR "A" FAULT	03-SCR-201-A	DI	CP-01	5069-L340ER	1	00	07	I:1:00.07	1794-IB16	ALARM					
9	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-A	FINE SCREEN COMPACTOR "A" E-STOP	03-SCR-201-A	DI	CP-01	5069-L340ER	1	00	08	I:1:00.08	1794-IB16						
10	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-B	FINE SCREEN COMPACTOR "B" RUNNING	03-SCR-201-B	DI	CP-01	5069-L340ER	1	00	09	I:1:00.09	1794-IB16	RUNNING	AUTO STATUS HA:DI				
11	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-B	FINE SCREEN COMPACTOR "B" FAULT	03-SCR-201-B	DI	CP-01	5069-L340ER	1	00	10	I:1:00.10	1794-IB16	ALARM					
12	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-B	FINE SCREEN COMPACTOR "B" E-STOP	03-SCR-201-B	DI	CP-01	5069-L340ER	1	00	11	I:1:00.11	1794-IB16						
13	A	506752-WTS-PR-T02-8521-DS-101	03-LSH-101-1	FINE SCREEN "A" LEVEL HIGH	03-LAH-101-1	DI	CP-01	5069-L340ER	1	00	12	I:1:00.12	1794-IB16	ALARM	ADD: RFS 2900 - RAW H2O SAMPLER - FAULT ALARM - YA:DI				
14	A	506752-WTS-PR-T02-8521-DS-101	03-LSH-101-2	FINE SCREEN "B" LEVEL HIGH	03-LAH-101-2	DI	CP-01	5069-L340ER	1	00	13	I:1:00.13	1794-IB16	ALARM					
15	A		SURGE SUPRESSOR	SURGE SUPRESSOR FAULT		DI	CP-01	5069-L340ER	1	00	14	I:1:00.14	1794-IB16						
16	A		AC POWER	NORMAL POWER ON		DI	CP-01	5069-L340ER	1	00	15	I:1:00.15	1794-IB16						
17	A	506752-WTS-PR-T02-8521-DS-102	20-B-201-A	MEMBRANE BLOWER "A" E-STOP	20-B-201-A	DI	CP-01	5069-L340ER	1	01	00	I:1:01.00	1794-IB16						
18	A	506752-WTS-PR-T02-8521-DS-102	20-FSL-201-A	MEMBRANE BLOWER "A" FLOW LOW	20-FAL-201-A	DI	CP-01	5069-L340ER	1	01	01	I:1:01.01	1794-IB16	ALARM	24VDC	24 VDC			
19	A	506752-WTS-PR-T02-8521-DS-102	20-B-201-B	MEMBRANE BLOWER "B" E-STOP	20-B-201-B	DI	CP-01	5069-L340ER	1	01	02	I:1:01.02	1794-IB16						
20	A	506752-WTS-PR-T02-8521-DS-102	20-FSL-201-B	MEMBRANE BLOWER "B" FLOW LOW	20-FAL-201-B	DI	CP-01	5069-L340ER	1	01	03	I:1:01.03	1794-IB16	ALARM	24VDC	24 VDC			
21	A	506752-WTS-PR-T02-8521-DS-102	20-B-201-C	MEMBRANE BLOWER "C" E-STOP	20-B-201-C	DI	CP-01	5069-L340ER	1	01	04	I:1:01.04	1794-IB16						
22	A	506752-WTS-PR-T02-8521-DS-102	20-FSL-201-C	MEMBRANE BLOWER "C" FLOW LOW	20-FAL-201-C	DI	CP-01	5069-L340ER	1	01	05	I:1:01.05	1794-IB16	ALARM	24VDC	24 VDC			
23	A	506752-WTS-PR-T02-8521-DS-103	16-B-501-A	PROCESS BLOWER "A" E-STOP	16-B-501-A	DI	CP-01	5069-L340ER	1	01	06	I:1:01.06	1794-IB16						
24	A	506752-WTS-PR-T02-8521-DS-103	16-FSL-501-A	PROCESS BLOWER "A" FLOW LOW	16-FAL-501-A	DI	CP-01	5069-L340ER	1	01	07	I:1:01.07	1794-IB16	ALARM	24VDC	24 VDC			
25	A	506752-WTS-PR-T02-8521-DS-103	16-B-501-B	PROCESS BLOWER "B" E-STOP	16-B-501-B	DI	CP-01	5069-L340ER	1	01	08	I:1:01.08	1794-IB16						


ALSO INCLUDE ALL EXPECTED ETHERNET CONTROLS STATUS I-E


6. HIGH TEMP - DI

1. RUN COMMAND - DO
2. SPEED CONTROL - AO
3. AUTO STATUS - DI
4. RUN STATUS - DI
5. FAULT ALARM - DI


			CUSTOMER INFORMATION				I/O LIST										CUSTOMER DOCUMENT NUMBER																	
			ENGLISH RIVER PROPERTY MANAGEMENT WASTEWATER TREATMENT FACILITY																															
SUEZ DOCUMENT NUMBER: 506752-WTS-EL-T02-8533-LI-001													PROPRIETARY AND CONFIDENTIAL: THIS DOCUMENT AND ALL INFORMATION AND KNOWLEDGE CONTAINED OR REFERRED HERIN ARE THE CONFIDENTIAL AND PROPRIETARY PROPOERTY OF SUEZ AND AS SUCH ARE INSTRUMENTS OF SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT. THESE INSTRUMENTS OF SERVICE SHALL NOT BE REPRODUCED, TRANSMITTED, DISCLOSED OR USED OTHERWISE, IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN AGREEMENT BY SUEZ AND MUST BE IMMEDIATELY RETURNED OR DESTROYED UPON REQUEST.																					
CONTRACT		ISSUER	DISCIPLINE	PRODUCT	PHASE		TYPE		CHRONO		A												ISSUED FOR APPROVAL				KR	AA		RK	21.08.2020			
506752		WTS	EL	T02	8533		LI		001		REV												DESCRIPTION				CREATED BY	CHECKED BY	APPROVED BY	DATE (DD-MMM-YY)				
ROW NO.	REV	SEE BLOWER COMMENT & ID FROM PREVIOUS PAGE		DEVICE TAG	DESCRIPTION			SIGNAL TAG	I/O TYPE	PANEL TAG	5069-L340ER	RACK	SLOT	CHANNEL	ADDRESS	IO MODULE PART NUMBER	IO ENERGIZED ACTION	POWER SUPPLY	SIGNAL TYPE	NOTES / REMARKS														
26	A			16-FSL-501-B	PROCESS BLOWER "B" FLOW LOW			16-FAL-501-B	DI	CP-01	5069-L340ER	1	01	09	I:1:01.09	1794-IB16	ALARM	24VDC	24 VDC															
27	A			16-B-801	WAS BLOWER E-STOP			16-B-801	DI	CP-01	5069-L340ER	1	01	10	I:1:01.10	1794-IB16																		
28	A			16-FSL-801	WAS BLOWER FLOW LOW			16-FAL-801	DI	CP-01	5069-L340ER	1	01	11	I:1:01.11	1794-IB16	ALARM	24VDC	24 VDC															
29	A			20-FV-641	TREATED EFFLUENT FROM UV TO BACKPULSE TANK VALVE OPEN FEEDBACK			20-ZAO-641	DI	CP-01	5069-L340ER	1	01	12	I:1:01.12	1794-IB16	OPEN	24VDC	24 VDC															
30	A			20-FV-641	TREATED EFFLUENT FROM UV TO BACKPULSE TANK VALVE CLOSE FEEDBACK			20-ZAC-641	DI	CP-01	5069-L340ER	1	01	13	I:1:01.13	1794-IB16	CLOSED	24VDC	24 VDC															
31	A			SPARE	SPARE				DI	CP-01	5069-L340ER	1	01	14	I:1:01.14	1794-IB16																		
32	A			SPARE	SPARE				DI	CP-01	5069-L340ER	1	01	15	I:1:01.15	1794-IB16																		
33	A			20-P-301-1	PROCESS PUMP "1" E-STOP			20-P-301-1	DI	CP-01	5069-L340ER	2	00	00	I:2:00.00	1794-IB16	}- ETHERNET CONTROLS?																	
34	A			20-P-301-2	PROCESS PUMP "2" E-STOP			20-P-301-2	DI	CP-01	5069-L340ER	2	00	01	I:2:00.01	1794-IB16																		
35	A			16-MX-211	ANOXIC MIXER RUNNING			16-MX-211	DI	CP-01	5069-L340ER	2	00	02	I:2:00.02	1794-IB16	RUNNING																	
36	A			16-MX-211	ANOXIC MIXER LEAK			16-MX-211	DI	CP-01	5069-L340ER	2	00	03	I:2:00.03	1794-IB16	ALARM																	
37	A			16-MX-211	ANOXIC MIXER REMOTE (AUTO)			16-MX-211	DI	CP-01	5069-L340ER	2	00	04	I:2:00.04	1794-IB16	← FAULT ALARM! FOR MIXER?																	
38	A			16-LSH-703	TWAS STORAGE TANK LEVEL HIGH			16-LAH-703	DI	CP-01	5069-L340ER	2	00	05	I:2:00.05	1794-IB16		ALARM	24VDC	24 VDC														
39	A			16-LSL-703	TWAS STORAGE TANK LEVEL LOW			16-LAL-703	DI	CP-01	5069-L340ER	2	00	06	I:2:00.06	1794-IB16	ALARM	24VDC	24 VDC															
40	A			38-UV-101-1	UV STERLIZER RUNNING			38-UV-101-1	DI	CP-01	5069-L340ER	2	00	07	I:2:00.07	1794-IB16	RUNNING																	
41	A			38-UV-101-1	UV STERLIZER FAULT			38-UV-101-1	DI	CP-01	5069-L340ER	2	00	08	I:2:00.08	1794-IB16	ALARM																	
42	A			SPARE	SPARE				DI	CP-01	5069-L340ER	2	00	09	I:2:00.09	1794-IB16	RUNNING																	
43	A			SPARE	SPARE				DI	CP-01	5069-L340ER	2	00	10	I:2:00.10	1794-IB16																		
44	A			SPARE	SPARE				DI	CP-01	5069-L340ER	2	00	11	I:2:00.11	1794-IB16																		
45	A			SPARE	SPARE				DI	CP-01	5069-L340ER	2	00	12	I:2:00.12	1794-IB16																		
46	A			SPARE	SPARE				DI	CP-01	5069-L340ER	2	00	13	I:2:00.13	1794-IB16																		
47	A			SPARE	SPARE				DI	CP-01	5069-L340ER	2	00	14	I:2:00.14	1794-IB16																		
48	A			SPARE	SPARE				DI	CP-01	5069-L340ER	2	00	15	I:2:00.15	1794-IB16																		
49	A			23-P-101-A	SODIUM HYPOCHLORITE PUMP "A" RUNNING			23-P-101-A	DI	CP-01	5069-L340ER	2	01	00	I:2:01.00	1794-IB16	RUNNING																	
50	A			23-P-101-B	SODIUM HYPOCHLORITE PUMP "B" RUNNING			23-P-101-B	DI	CP-01	5069-L340ER	2	01	01	I:2:01.01	1794-IB16	RUNNING																	


		CUSTOMER INFORMATION					I/O LIST										CUSTOMER DOCUMENT NUMBER											
		ENGLISH RIVER PROPERTY MANAGEMENT WASTEWATER TREATMENT FACILITY																										
SUEZ DOCUMENT NUMBER: 506752-WTS-EL-T02-8533-LI-001																	PROPRIETARY AND CONFIDENTIAL: THIS DOCUMENT AND ALL INFORMATION AND KNOWLEDGE CONTAINED OR REFERRED HERIN ARE THE CONFIDENTIAL AND PROPRIETARY PROPOERTY OF SUEZ AND AS SUCH ARE INSTRUMENTS OF SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT. THESE INSTRUMENTS OF SERVICE SHALL NOT BE REPRODUCED, TRANSMITTED, DISCLOSED OR USED OTHERWISE, IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN AGREEMENT BY SUEZ AND MUST BE IMMEDIATELY RETURNED OR DESTROYED UPON REQUEST.											
CONTRACT		ISSUER	DISCIPLINE	PRODUCT	PHASE	TYPE	CHRONO	A		ISSUED FOR APPROVAL				KR	AA	RK							21.08.2020					
506752		WTS	EL	T02	8533	LI	001	REV		DESCRIPTION				CREATED BY	CHECKED BY	APPROVED BY							DATE (DD-MMM-YY)					
ROW NO.	REV	P&ID	DEVICE TAG	DESCRIPTION			SIGNAL TAG	I/O TYPE	PANEL TAG	5069-L340ER	RACK	SLOT	CHANNEL	ADDRESS	IO MODULE PART NUMBER	IO ENERGIZED ACTION	POWER SUPPLY	SIGNAL TYPE	NOTES / REMARKS									
51	A	506752-WTS-PR-T02-8521-DS-110	23-P-301-A	CITRIC ACID PUMP "A" RUNNING			23-P-301-A	DI	CP-01	5069-L340ER	2	01	02	I:2:01.02	1794-IB16	RUNNING												
52	A	506752-WTS-PR-T02-8521-DS-110	23-P-301-B	CITRIC ACID PUMP "B" RUNNING			23-P-301-B	DI	CP-01	5069-L340ER	2	01	03	I:2:01.03	1794-IB16	RUNNING												
53	A	506752-WTS-PR-T02-8521-DS-110	15-P-601-A	FUTURE SODIUM HYDROXIDE PUMP "A" RUNNING			15-P-601-A	DI	CP-01	5069-L340ER	2	01	04	I:2:01.04	1794-IB16	RUNNING												
54	A	506752-WTS-PR-T02-8521-DS-110	15-P-601-B	FUTURE SODIUM HYDROXIDE PUMP "B" RUNNING			15-P-601-B	DI	CP-01	5069-L340ER	2	01	05	I:2:01.05	1794-IB16	RUNNING												
55	A	506752-WTS-PR-T02-8521-DS-110	10-P-601-A	ALUM PUMP "A" RUNNING			10-P-601-A	DI	CP-01	5069-L340ER	2	01	06	I:2:01.06	1794-IB16	RUNNING												
56	A	506752-WTS-PR-T02-8521-DS-110	10-P-601-B	ALUM PUMP "B" RUNNING			10-P-601-B	DI	CP-01	5069-L340ER	2	01	07	I:2:01.07	1794-IB16	RUNNING												
57	A	506752-WTS-PR-T02-8521-DS-111	90-AC-001-A	AIR COMPRESSOR "A" RUNNING			90-AC-001-A	DI	CP-01	5069-L340ER	2	01	08	I:2:01.08	1794-IB16	RUNNING												
58	A	506752-WTS-PR-T02-8521-DS-111	90-AC-001-A	AIR COMPRESSOR "A" FAULT			90-AC-001-A	DI	CP-01	5069-L340ER	2	01	09	I:2:01.09	1794-IB16	ALARM												
59	A	506752-WTS-PR-T02-8521-DS-111	90-AC-001-A	AIR COMPRESSOR "A" REMOTE (AUTO)			90-AC-001-A	DI	CP-01	5069-L340ER	2	01	10	I:2:01.10	1794-IB16													
60	A	506752-WTS-PR-T02-8521-DS-111	90-AC-001-B	AIR COMPRESSOR "B" RUNNING			90-AC-001-B	DI	CP-01	5069-L340ER	2	01	11	I:2:01.11	1794-IB16	RUNNING												
61	A	506752-WTS-PR-T02-8521-DS-111	90-AC-001-B	AIR COMPRESSOR "B" FAULT			90-AC-001-B	DI	CP-01	5069-L340ER	2	01	12	I:2:01.12	1794-IB16	ALARM												
62	A	506752-WTS-PR-T02-8521-DS-111	90-AC-001-B	AIR COMPRESSOR "B" REMOTE (AUTO)			90-AC-001-B	DI	CP-01	5069-L340ER	2	01	13	I:2:01.13	1794-IB16													
63	A	506752-WTS-PR-T02-8521-DS-111	90-PSLL-002	AIR COMPRESSOR LOW LOW			90-PALL-002	DI	CP-01	5069-L340ER	2	01	14	I:2:01.14	1794-IB16	ALARM	24VDC	24 VDC										
64	A	506752-WTS-PR-T02-8521-DS-111	90-PSL-003	AIR COMPRESSOR LOW			90-PAL-003	DI	CP-01	5069-L340ER	2	01	15	I:2:01.15	1794-IB16	ALARM	24VDC	24 VDC										
65	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-A	FINE SCREEN "A" RUN COMMAND			03-SCR-201-A	DO	CP-01	5069-L340ER	1	02	00	O:1:02.00	1794-OB16		24VDC	RELAY										
66	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-B	FINE SCREEN "B" RUN COMMAND			03-SCR-201-B	DO	CP-01	5069-L340ER	1	02	01	O:1:02.01	1794-OB16		24VDC	RELAY										
67	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-A	FINE SCREEN COMPACTOR "A" RUN COMMAND			03-SCR-201-A	DO	CP-01	5069-L340ER	1	02	02	O:1:02.02	1794-OB16		24VDC	RELAY										
68	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-B	FINE SCREEN COMPACTOR "B" RUN COMMAND			03-SCR-201-B	DO	CP-01	5069-L340ER	1	02	03	O:1:02.03	1794-OB16		24VDC	RELAY										
69	A	506752-WTS-PR-T02-8521-DS-101	03-FV-201-A	FINE SCREEN "A" INLET VALVE OPEN COMMAND			03-FV-201-A	DO	CP-01	5069-L340ER	1	02	04	O:1:02.04	1794-OB16	OPEN	24VDC											
70	A	506752-WTS-PR-T02-8521-DS-101	03-FV-102-A	FINE SCREEN "A" BYPASS VALVE OPEN COMMAND			03-FV-102-A	DO	CP-01	5069-L340ER	1	02	05	O:1:02.05	1794-OB16	OPEN	24VDC											
71	A	506752-WTS-PR-T02-8521-DS-101	03-FV-201-B	FINE SCREEN "B" INLET VALVE OPEN COMMAND			03-FV-201-B	DO	CP-01	5069-L340ER	1	02	06	O:1:02.06	1794-OB16	OPEN	24VDC											
72	A	506752-WTS-PR-T02-8521-DS-101	03-FV-102-B	FINE SCREEN "B" BYPASS VALVE OPEN COMMAND			03-FV-102-B	DO	CP-01	5069-L340ER	1	02	07	O:1:02.07	1794-OB16	OPEN	24VDC											
73	A		SPARE	SPARE				DO	CP-01	5069-L340ER	1	02	08	O:1:02.08	1794-OB16													
74	A		SPARE	SPARE				DO	CP-01	5069-L340ER	1	02	09	O:1:02.09	1794-OB16													
75	A		SPARE	SPARE				DO	CP-01	5069-L340ER	1	02	10	O:1:02.10	1794-OB16													

		CUSTOMER INFORMATION ENGLISH RIVER PROPERTY MANAGEMENT WASTEWATER TREATMENT FACILITY					I/O LIST							CUSTOMER DOCUMENT NUMBER						
SUEZ DOCUMENT NUMBER: 506752-WTS-EL-T02-8533-LI-001													PROPRIETARY AND CONFIDENTIAL: THIS DOCUMENT AND ALL INFORMATION AND KNOWLEDGE CONTAINED OR REFERRED HERIN ARE THE CONFIDENTIAL AND PROPRIETARY PROPOERTY OF SUEZ AND AS SUCH ARE INSTRUMENTS OF SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT. THESE INSTRUMENTS OF SERVICE SHALL NOT BE REPRODUCED, TRANSMITTED, DISCLOSED OR USED OTHERWISE, IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN AGREEMENT BY SUEZ AND MUST BE IMMEDIATELY RETURNED OR DESTROYED UPON REQUEST.							
CONTRACT	ISSUER	DISCIPLINE	PRODUCT	PHASE	TYPE	CHRONO	A	ISSUED FOR APPROVAL			KR	AA							RK	21.08.2020
506752	WTS	EL	T02	8533	LI	001	REV	DESCRIPTION			CREATED BY	CHECKED BY							APPROVED BY	DATE (DD-MMM-YY)
ROW NO.	REV	P&ID	DEVICE TAG	DESCRIPTION		SIGNAL TAG	I/O TYPE	PANEL TAG	5069-L340ER	RACK	SLOT	CHANNEL	ADDRESS	IO MODULE PART NUMBER	IO ENERGIZED ACTION	POWER SUPPLY	SIGNAL TYPE	NOTES / REMARKS		
76	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	02	11	O:1:02.11	1794-OB16						
77	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	02	12	O:1:02.12	1794-OB16						
78	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	02	13	O:1:02.13	1794-OB16						
79	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	02	14	O:1:02.14	1794-OB16						
80	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	02	15	O:1:02.15	1794-OB16						
81	A	506752-WTS-PR-T02-8521-DS-107	23-FV-161	BACKPULSE TANK FILL VALVE OPEN COMMAND		23-FV-161	DO	CP-01	5069-L340ER	1	03	00	O:1:03.00	1794-OB16	OPEN	24VDC				
82	A	506752-WTS-PR-T02-8521-DS-107	20-FV-641	TREATED EFFLUENT FROM UV TO BACKPULSE TANK VALVE OPEN COMMAND		20-FV-641	DO	CP-01	5069-L340ER	1	03	01	O:1:03.01	1794-OB16	OPEN	24VDC				
83	A	506752-WTS-PR-T02-8521-DS-108_1	20-FV-807	RAS DRAIN TO ANOXIC ZONE VALVE OPEN COMMAND		20-FV-807	DO	CP-01	5069-L340ER	1	03	02	O:1:03.02	1794-OB16	OPEN	24VDC				
84	A	506752-WTS-PR-T02-8521-DS-108_1	20-FV-701	WAS TO SLUDGE HANDLING VALVE OPEN COMMAND		20-FV-701	DO	CP-01	5069-L340ER	1	03	03	O:1:03.03	1794-OB16	OPEN	24VDC				
85	A	506752-WTS-PR-T02-8521-DS-109	38-UV-101-1	UV STERLIZER START COMMAND		38-UV-101-1	DO	CP-01	5069-L340ER	1	03	04	O:1:03.04	1794-OB16	OPEN	24VDC				
86	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	03	05	O:1:03.05	1794-OB16						
87	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	03	06	O:1:03.06	1794-OB16						
88	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	03	07	O:1:03.07	1794-OB16						
89	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	03	08	O:1:03.08	1794-OB16						
90	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	03	09	O:1:03.09	1794-OB16						
91	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	03	10	O:1:03.10	1794-OB16						
92	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	03	11	O:1:03.11	1794-OB16						
93	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	03	12	O:1:03.12	1794-OB16						
94	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	03	13	O:1:03.13	1794-OB16						
95	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	03	14	O:1:03.14	1794-OB16						
96	A		SPARE	SPARE			DO	CP-01	5069-L340ER	1	03	15	O:1:03.15	1794-OB16						
97	A	506752-WTS-PR-T02-8521-DS-110	23-P-101-A	SODIUM HYPOCHLORITE PUMP "A" RUN COMMAND		23-P-101-A	DO	CP-01	5069-L340ER	2	02	00	O:2:02.00	1794-OB16		24VDC	RELAY			
98	A	506752-WTS-PR-T02-8521-DS-110	23-P-101-B	SODIUM HYPOCHLORITE PUMP "B" RUN COMMAND		23-P-101-B	DO	CP-01	5069-L340ER	2	02	01	O:2:02.01	1794-OB16		24VDC	RELAY			
99	A	506752-WTS-PR-T02-8521-DS-110	23-P-301-A	CITRIC ACID PUMP "A" RUN COMMAND		23-P-301-A	DO	CP-01	5069-L340ER	2	02	02	O:2:02.02	1794-OB16		24VDC	RELAY			
100	A	506752-WTS-PR-T02-8521-DS-110	23-P-301-B	CITRIC ACID PUMP "B" RUN COMMAND		23-P-301-B	DO	CP-01	5069-L340ER	2	02	03	O:2:02.03	1794-OB16		24VDC	RELAY			

		CUSTOMER INFORMATION					I/O LIST							CUSTOMER DOCUMENT NUMBER											
		ENGLISH RIVER PROPERTY MANAGEMENT WASTEWATER TREATMENT FACILITY																							
SUEZ DOCUMENT NUMBER: 506752-WTS-EL-T02-8533-LI-001												PROPRIETARY AND CONFIDENTIAL: THIS DOCUMENT AND ALL INFORMATION AND KNOWLEDGE CONTAINED OR REFERRED HERIN ARE THE CONFIDENTIAL AND PROPRIETARY PROPOERTY OF SUEZ AND AS SUCH ARE INSTRUMENTS OF SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT. THESE INSTRUMENTS OF SERVICE SHALL NOT BE REPRODUCED, TRANSMITTED, DISCLOSED OR USED OTHERWISE, IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN AGREEMENT BY SUEZ AND MUST BE IMMEDIATELY RETURNED OR DESTROYED UPON REQUEST.													
CONTRACT	ISSUER	DISCIPLINE	PRODUCT	PHASE	TYPE	CHRONO	A	ISSUED FOR APPROVAL														KR	AA	RK	21.08.2020
506752	WTS	EL	T02	8533	LI	001	REV	DESCRIPTION														CREATED BY	CHECKED BY	APPROVED BY	DATE (DD-MMM-YY)
ROW NO.	REV	P&ID	DEVICE TAG	DESCRIPTION		SIGNAL TAG	I/O TYPE	PANEL TAG	5069-L340ER	RACK	SLOT	CHANNEL	ADDRESS	IO MODULE PART NUMBER	IO ENERGIZED ACTION	POWER SUPPLY	SIGNAL TYPE	NOTES / REMARKS							
101	A	506752-WTS-PR-T02-8521-DS-110	15-P-601-A	FUTURE SODIUM HYDROXIDE PUMP "A" RUN COMMAND		15-P-601-A	DO	CP-01	5069-L340ER	2	02	04	O:2:02.04	1794-OB16		24VDC	RELAY								
102	A	506752-WTS-PR-T02-8521-DS-110	15-P-601-B	FUTURE SODIUM HYDROXIDE PUMP "B" RUN COMMAND		15-P-601-B	DO	CP-01	5069-L340ER	2	02	05	O:2:02.05	1794-OB16		24VDC	RELAY								
103	A	506752-WTS-PR-T02-8521-DS-110	10-P-601-A	ALUM PUMP "A" RUN COMMAND		10-P-601-A	DO	CP-01	5069-L340ER	2	02	06	O:2:02.06	1794-OB16		24VDC	RELAY								
104	A	506752-WTS-PR-T02-8521-DS-110	10-P-601-B	ALUM PUMP "B" RUN COMMAND		10-P-601-B	DO	CP-01	5069-L340ER	2	02	07	O:2:02.07	1794-OB16		24VDC	RELAY								
105	A	506752-WTS-PR-T02-8521-DS-111	90-AC-001-A	AIR COMPRESSOR "A" ENABLE		90-AC-001-A	DO	CP-01	5069-L340ER	2	02	08	O:2:02.08	1794-OB16		24VDC	RELAY								
106	A	506752-WTS-PR-T02-8521-DS-111	90-AC-001-B	AIR COMPRESSOR "B" ENABLE		90-AC-001-B	DO	CP-01	5069-L340ER	2	02	09	O:2:02.09	1794-OB16		24VDC	RELAY								
107	A	506752-WTS-PR-T02-8521-DS-104	16-MX-211	ANOXIC MIXER RUN COMMAND		16-MX-211	DO	CP-01	5069-L340ER	2	02	10	O:2:02.10	1794-OB16		24VDC	RELAY								
108	A		SPARE	SPARE			DO	CP-01	5069-L340ER	2	02	11	O:2:02.11	1794-OB16											
109	A		SPARE	SPARE			DO	CP-01	5069-L340ER	2	02	12	O:2:02.12	1794-OB16											
110	A		SPARE	SPARE			DO	CP-01	5069-L340ER	2	02	13	O:2:02.13	1794-OB16											
111	A		SPARE	SPARE			DO	CP-01	5069-L340ER	2	02	14	O:2:02.14	1794-OB16											
112	A		SPARE	SPARE			DO	CP-01	5069-L340ER	2	02	15	O:2:02.15	1794-OB16											
113	A	506752-WTS-PR-T02-8521-DS-101	XX-FIT-XXX	RAW MUNICIPAL WASTEWATER FLOW TRANSMITTER		XX-FIT-XXX	AI	CP-01	5069-L340ER	1	04	00	I:1:04.00	1794-IE8			4-20 mA								
114	A	506752-WTS-PR-T02-8521-DS-107	20-LIT-603	BACKPULSE TANK LEVEL TRANSMITTER		20-LI-603	AI	CP-01	5069-L340ER	1	04	01	I:1:04.01	1794-IE8		LOOP-POWERED	4-20 mA								
115	A	506752-WTS-PR-T02-8521-DS-107	20-TT-001	BACKPULSE TANK TEMPEARTURE TRANSMITTER		20-TI-001	AI	CP-01	5069-L340ER	1	04	02	I:1:04.02	1794-IE8		LOOP-POWERED	4-20 mA								
116	A		SPARE	SPARE			AI	CP-01	5069-L340ER	1	04	03	I:1:04.03	1794-IE8											
117	A		SPARE	SPARE			AI	CP-01	5069-L340ER	1	04	04	I:1:04.04	1794-IE8											
118	A		SPARE	SPARE			AI	CP-01	5069-L340ER	1	04	05	I:1:04.05	1794-IE8											
119	A		SPARE	SPARE			AI	CP-01	5069-L340ER	1	04	06	I:1:04.06	1794-IE8											
120	A		SPARE	SPARE			AI	CP-01	5069-L340ER	1	04	07	I:1:04.07	1794-IE8											
121	A	506752-WTS-PR-T02-8521-DS-108_1	20-FIT-401	WAS TO SLUDGE HANDLING FLOW TRANSMITTER		20-FIT-401	AI	CP-01	5069-L340ER	1	05	00	I:1:05.00	1794-IE8		120VAC	4-20 mA								
122	A	506752-WTS-PR-T02-8521-DS-108_2	16-LIT-701	WAS STORAGE TANK LEVEL TRANSMITTER		16-LIT-701	AI	CP-01	5069-L340ER	1	05	01	I:1:05.01	1794-IE8		LOOP-POWERED	4-20 mA								
123	A	506752-WTS-PR-T02-8521-DS-109	38-UV-101-1	UV STERLIZER INTENSITY		38-UV-101-1	AI	CP-01	5069-L340ER	1	05	02	I:1:05.02	1794-IE8		24VDC	4-20 mA								
124	A	506752-WTS-PR-T02-8521-DS-109	38-FIT-101	UV STERLIZER FLOW TRANSMITTER		38-FIT-101	AI	CP-01	5069-L340ER	1	05	03	I:1:05.03	1794-IE8		120VAC	4-20 mA								
125	A		SPARE	SPARE			AI	CP-01	5069-L340ER	1	05	04	I:1:05.04	1794-IE8											

also provide - FT: DI

		CUSTOMER INFORMATION					I/O LIST							CUSTOMER DOCUMENT NUMBER															
		ENGLISH RIVER PROPERTY MANAGEMENT WASTEWATER TREATMENT FACILITY																											
SUEZ DOCUMENT NUMBER: 506752-WTS-EL-T02-8533-LI-001							PROPRIETARY AND CONFIDENTIAL: THIS DOCUMENT AND ALL INFORMATION AND KNOWLEDGE CONTAINED OR REFERRED HERIN ARE THE CONFIDENTIAL AND PROPRIETARY PROPOERTY OF SUEZ AND AS SUCH ARE INSTRUMENTS OF SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT. THESE INSTRUMENTS OF SERVICE SHALL NOT BE REPRODUCED, TRANSMITTED, DISCLOSED OR USED OTHERWISE, IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN AGREEMENT BY SUEZ AND MUST BE IMMEDIATELY RETURNED OR DESTROYED UPON REQUEST.																						
CONTRACT		ISSUER	DISCIPLINE	PRODUCT	PHASE	TYPE														CHRONO	A	ISSUED FOR APPROVAL				KR	AA	RK	21.08.2020
506752		WTS	EL	T02	8533	LI														001	REV	DESCRIPTION				CREATED BY	CHECKED BY	APPROVED BY	DATE (DD-MMM-YY)
ROW NO.	REV	P&ID		DEVICE TAG	DESCRIPTION		SIGNAL TAG	I/O TYPE	PANEL TAG	5069-L340ER	RACK	SLOT	CHANNEL	ADDRESS	IO MODULE PART NUMBER	IO ENERGIZED ACTION	POWER SUPPLY	SIGNAL TYPE	NOTES / REMARKS										
126	A			SPARE	SPARE			AI	CP-01	5069-L340ER	1	05	05	I:1:05.05	1794-IE8														
127	A			SPARE	SPARE			AI	CP-01	5069-L340ER	1	05	06	I:1:05.06	1794-IE8														
128	A			SPARE	SPARE			AI	CP-01	5069-L340ER	1	05	07	I:1:05.07	1794-IE8														
129	A	506752-WTS-PR-T02-8521-DS-110		23-P-101-A	SODIUM HYPOCHLORITE PUMP "A" SPEED CONTROL		23-P-101-A	AO	CP-01	5069-L340ER	1	06	00	O:1:06.00	1794-OE4														
130	A	506752-WTS-PR-T02-8521-DS-110		23-P-101-B	SODIUM HYPOCHLORITE PUMP "B" SPEED CONTROL		23-P-101-B	AO	CP-01	5069-L340ER	1	06	01	O:1:06.01	1794-OE4														
131	A	506752-WTS-PR-T02-8521-DS-110		23-P-301-A	CITRIC ACID PUMP "A" SPEED CONTROL		23-P-301-A	AO	CP-01	5069-L340ER	1	06	02	O:1:06.02	1794-OE4														
132	A	506752-WTS-PR-T02-8521-DS-110		23-P-301-B	CITRIC ACID PUMP "B" SPEED CONTROL		23-P-301-B	AO	CP-01	5069-L340ER	1	06	03	O:1:06.03	1794-OE4														
133	A	506752-WTS-PR-T02-8521-DS-110		15-P-601-A	FUTURE SODIUM HYDROXIDE PUMP "A" SPEED CONTROL		15-P-601-A	AO	CP-01	5069-L340ER	1	07	00	O:1:07.00	1794-OE4														
134	A	506752-WTS-PR-T02-8521-DS-110		15-P-601-B	FUTURE SODIUM HYDROXIDE PUMP "B" SPEED CONTROL		15-P-601-B	AO	CP-01	5069-L340ER	1	07	01	O:1:07.01	1794-OE4														
135	A	506752-WTS-PR-T02-8521-DS-110		10-P-601-A	ALUM PUMP "A" SPEED CONTROL		10-P-601-A	AO	CP-01	5069-L340ER	1	07	02	O:1:07.02	1794-OE4														
136	A	506752-WTS-PR-T02-8521-DS-110		10-P-601-B	ALUM PUMP "B" SPEED CONTROL		10-P-601-B	AO	CP-01	5069-L340ER	1	07	03	O:1:07.03	1794-OE4														
137	A			SPARE	SPARE			AO	CP-01	5069-L340ER	2	03	00	O:2:03.00	1794-OE4														
138	A			SPARE	SPARE			AO	CP-01	5069-L340ER	2	03	01	O:2:03.01	1794-OE4														
139	A			SPARE	SPARE			AO	CP-01	5069-L340ER	2	03	02	O:2:03.02	1794-OE4														
140	A			SPARE	SPARE			AO	CP-01	5069-L340ER	2	03	03	O:2:03.03	1794-OE4														
Notes:																													
1.																													
2.																													
3.																													
4.																													
5.																													

			CUSTOMER INFORMATION				I/O LIST						CUSTOMER DOCUMENT NUMBER																	
			ENGLISH RIVER PROPERTY MANAGEMENT WASTEWATER TREATMENT FACILITY																											
SUEZ DOCUMENT NUMBER: 506752-WTS-EL-T02-8533-LI-001										PROPRIETARY AND CONFIDENTIAL: THIS DOCUMENT AND ALL INFORMATION AND KNOWLEDGE CONTAINED OR REFERRED HERIN ARE THE CONFIDENTIAL AND PROPRIETARY PROPOERTY OF SUEZ AND AS SUCH ARE INSTRUMENTS OF SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT. THESE INSTRUMENTS OF SERVICE SHALL NOT BE REPRODUCED, TRANSMITTED, DISCLOSED OR USED OTHERWISE, IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN AGREEMENT BY SUEZ AND MUST BE IMMEDIATELY RETURNED OR DESTROYED UPON REQUEST.																				
CONTRACT		ISSUER	DISCIPLINE	PRODUCT	PHASE	TYPE	CHRONO		A											ISSUED FOR APPROVAL				KR	AA	RK	21.08.2020			
506752		WTS	EL	T02	8533	LI	001		REV											DESCRIPTION				CREATED BY	CHECKED BY	APPROVED BY	DATE (DD-MMM-YY)			
ROW NO.	REV	P&ID		DEVICE TAG		DESCRIPTION		SIGNAL TAG		I/O TYPE	PANEL TAG	PLC NUMBER	RACK	SLOT	CHANNEL	ADDRESS	IO MODULE PART NUMBER	IO ENERGIZED ACTION	POWER SUPPLY	SIGNAL TYPE	NOTES / REMARKS									
1	A	506752-WTS-PR-T02-8521-DS-104		16-LSHH-401-X		BIOREACTOR TANK LEVEL HIGH HIGH		16-LAHH-401-X		DI	CP-1X		3	00	00	I:3:00.00	1794-IB16	ALARM												
2	A	506752-WTS-PR-T02-8521-DS-105		20-FV-205-X		MEMBRANE AERATION VALVE OPEN FEEDBACK		20-ZAO-205-X		DI	CP-1X		3	00	01	I:3:00.01	1794-IB16	OPEN												
3	A	506752-WTS-PR-T02-8521-DS-105		20-FV-205-X		MEMBRANE AERATION VALVE CLOSE FEEDBACK		20-ZAC-205-X		DI	CP-1X		3	00	02	I:3:00.02	1794-IB16	CLOSED												
4	A	506752-WTS-PR-T02-8521-DS-105		20-FV-501-X		MEMBRANE TANK TO RAS PUMPS VALVE OPEN FEEDBACK		20-ZAO-501-X		DI	CP-1X		3	00	03	I:3:00.03	1794-IB16	OPEN												
5	A	506752-WTS-PR-T02-8521-DS-105		20-FV-501-X		MEMBRANE TANK TO RAS PUMPS VALVE CLOSE FEEDBACK		20-ZAC-501-X		DI	CP-1X		3	00	04	I:3:00.04	1794-IB16	CLOSED												
6	A	506752-WTS-PR-T02-8521-DS-105		20-LSHH-201-X		MEMBRANE TANK LEVEL HIGH HIGH		20-LAHH-201-X		DI	CP-1X		3	00	05	I:3:00.05	1794-IB16	ALARM												
7	A	506752-WTS-PR-T02-8521-DS-105		20-LSLL-201-X		MEMBRANE TANK LEVEL LOW LOW		20-LALL-201-X		DI	CP-1X		3	00	06	I:3:00.06	1794-IB16	ALARM												
8	A	506752-WTS-PR-T02-8521-DS-106		20-FV-302-X		PERMEATE HEADER ISOLATION VALVE OPEN FEEDBACK		20-ZAO-302-X		DI	CP-1X		3	00	07	I:3:00.07	1794-IB16	OPEN												
9	A	506752-WTS-PR-T02-8521-DS-106		20-FV-302-X		PERMEATE HEADER ISOLATION VALVE CLOSE FEEDBACK		20-ZAC-302-X		DI	CP-1X		3	00	08	I:3:00.08	1794-IB16	CLOSED												
10	A	506752-WTS-PR-T02-8521-DS-108_1		20-P-501-1		RAS/WAS/DRAIN PUMP "1" E-STOP		20-P-501-1		DI	CP-1X		3	00	09	I:3:00.09	1794-IB16													
11	A	506752-WTS-PR-T02-8521-DS-108_1		20-P-501-2		RAS/WAS/DRAIN PUMP "2" E-STOP		20-P-501-2		DI	CP-1X		3	00	10	I:3:00.10	1794-IB16													
12	A	506752-WTS-PR-T02-8521-DS-105		20-FV-209-X		MIXED LIQUOR FROM BIO REACTOR VALVE OPEN FEEDBACK		20-ZAO-209-X		DI	CP-1X		3	00	11	I:3:00.11	1794-IB16													
13	A	506752-WTS-PR-T02-8521-DS-105		20-FV-209-X		MIXED LIQUOR FROM BIO REACTOR VALVE CLOSE FEEDBACK		20-ZAC-209-X		DI	CP-1X		3	00	12	I:3:00.12	1794-IB16													
14	A			SURGE SUPRESSOR		SURGE SUPRESSOR FAULT				DI	CP-1X		3	00	13	I:3:00.13	1794-IB16													
15	A			AC POWER		NORMAL POWER ON				DI	CP-1X		3	00	14	I:3:00.14	1794-IB16													
16	A			SYSTEM STOP		SYSTEM STOP PUSH BUTTON				DI	CP-1X		3	00	15	I:3:00.15	1794-IB16													
17	A	506752-WTS-PR-T02-8521-DS-106		20-FV-609-X		BACKPULSE TANK PERMEATE VALVE OPEN FEEDBACK		20-ZAO-609-1		DI	CP-1X		3	01	00	I:3:01.00	1794-IB16													
18	A	506752-WTS-PR-T02-8521-DS-106		20-FV-609-X		BACKPULSE TANK PERMEATE VALVE CLOSE FEEDBACK		20-ZAC-609-1		DI	CP-1X		3	01	01	I:3:01.01	1794-IB16													
19	A			SPARE		SPARE				DI	CP-1X		3	01	02	I:3:01.02	1794-IB16													
20	A			SPARE		SPARE				DI	CP-1X		3	01	03	I:3:01.03	1794-IB16													
21	A			SPARE		SPARE				DI	CP-1X		3	01	04	I:3:01.04	1794-IB16													
22	A			SPARE		SPARE				DI	CP-1X		3	01	05	I:3:01.05	1794-IB16													
23	A			SPARE		SPARE				DI	CP-1X		3	01	06	I:3:01.06	1794-IB16													
24	A			SPARE		SPARE				DI	CP-1X		3	01	07	I:3:01.07	1794-IB16													
25	A			SPARE		SPARE				DI	CP-1X		3	01	08	I:3:01.08	1794-IB16													
26	A			SPARE		SPARE				DI	CP-1X		3	01	09	I:3:01.09	1794-IB16													
27	A			SPARE		SPARE				DI	CP-1X		3	01	10	I:3:01.10	1794-IB16													

28	A		SPARE	SPARE		DI	CP-1X		3	01	11	I:3:01.11	1794-IB16				
29	A		SPARE	SPARE		DI	CP-1X		3	01	12	I:3:01.12	1794-IB16				
30	A		SPARE	SPARE		DI	CP-1X		3	01	13	I:3:01.13	1794-IB16				
31	A		SPARE	SPARE		DI	CP-1X		3	01	14	I:3:01.14	1794-IB16				
32	A		SPARE	SPARE		DI	CP-1X		3	01	15	I:3:01.15	1794-IB16				
33	A	506752-WTS-PR-T02-8521-DS-105	20-FV-802-X	EJECTOR VALVE OPEN COMMAND	20-FV-802-X	DO	CP-1X		3	02	00	O:3:02.00	1794-OB16	OPEN			
34	A	506752-WTS-PR-T02-8521-DS-105	20-FV-205-X	MEMBRANE AERATION VALVE OPEN COMMAND	20-FV-205-X	DO	CP-1X		3	02	01	O:3:02.01	1794-OB16	OPEN			
35	A	506752-WTS-PR-T02-8521-DS-105	20-FV-501-X	MEMBRANE TANK TO RAS PUMPS VALVE OPEN COMMAND	20-FV-501-X	DO	CP-1X		3	02	02	O:3:02.02	1794-OB16	OPEN			
36	A	506752-WTS-PR-T02-8521-DS-106	20-FV-302-X	PERMEATE HEADER ISOLATION VALVE OPEN COMMAND	20-FV-302-X	DO	CP-1X		3	02	03	O:3:02.03	1794-OB16	OPEN			
37	A	506752-WTS-PR-T02-8521-DS-106	23-FV-102-X	SODIUM HYPOCHLORITE SOLUTION INJECTION VALVE OPEN COMMAND	23-FV-102-X	DO	CP-1X		3	02	04	O:3:02.04	1794-OB16	OPEN			
38	A	506752-WTS-PR-T02-8521-DS-106	23-FV-302-X	CITRIC ACID SOLUTION INJECTION VALVE OPEN COMMAND	23-FV-302-X	DO	CP-1X		3	02	05	O:3:02.05	1794-OB16	OPEN			
39	A	506752-WTS-PR-T02-8521-DS-106	20-FV-320-X	PERMEATE TURBIDITY SAMPLE VALVE OPEN COMMAND	20-FV-320-X	DO	CP-1X		3	02	06	O:3:02.06	1794-OB16	OPEN			
40	A	506752-WTS-PR-T02-8521-DS-105	20-FV-209-X	MIXED LIQUOR FROM BIO REACTOR VALVE OPEN COMMAND	20-FV-209-X	DO	CP-1X		3	02	07	O:3:02.07	1794-OB16	OPEN			
41	A	506752-WTS-PR-T02-8521-DS-107	20-FV-609-X	BACKPULSE TANK PERMEATE VALVE OPEN COMMAND	20-FV-609-1	DO	CP-1X		3	02	08	O:3:02.08	1794-OB16	OPEN			
42	A		SPARE	SPARE		DO	CP-1X		3	01	09	O:3:01.09	1794-OB16				
43	A		SPARE	SPARE		DO	CP-1X		3	02	10	O:3:02.10	1794-OB16				
44	A		SPARE	SPARE		DO	CP-1X		3	02	11	O:3:02.11	1794-OB16				
45	A		SPARE	SPARE		DO	CP-1X		3	02	12	O:3:02.12	1794-OB16				
46	A		SPARE	SPARE		DO	CP-1X		3	02	13	O:3:02.13	1794-OB16				
47	A		SPARE	SPARE		DO	CP-1X		3	02	14	O:3:02.14	1794-OB16				
48	A		SPARE	SPARE		DO	CP-1X		3	02	15	O:3:02.15	1794-OB16				
49	A	506752-WTS-PR-T02-8521-DS-104	16-AIT-405-X	BIOREACTOR TANK DO ANALYZER	16-AE-405-X	AI	CP-1X		3	03	00	I:3:03.00	1794-IE8		120VAC	4-20 mA	
50	A	506752-WTS-PR-T02-8521-DS-104	16-AIT-405-X	BIOREACTOR TANK pH ANALYZER	16-AE-402-X	AI	CP-1X		3	03	01	I:3:03.01	1794-IE8		120VAC	4-20 mA	
51	A	506752-WTS-PR-T02-8521-DS-104	16-LIT-403-X	BIOREACTOR TANK LEVEL TRNAMSITTER	16-LI-403-X	AI	CP-1X		3	03	02	I:3:03.02	1794-IE8		LOOP-POWERED	4-20 mA	
52	A	506752-WTS-PR-T02-8521-DS-105	20-LIT-203-X	MEMBRANE TANK LEVEL TRANSMITTER	20-LI-203-X	AI	CP-1X		3	03	03	I:3:03.03	1794-IE8		LOOP-POWERED	4-20 mA	
53	A	506752-WTS-PR-T02-8521-DS-105	20-PIT-301-X	PERMEATE HEADER PRESSURE TRANSMITTER	20-PI-301-X	AI	CP-1X		3	03	04	I:3:03.04	1794-IE8		LOOP-POWERED	4-20 mA	
54	A		SPARE	SPARE		AI	CP-1X		3	03	05	I:3:03.05	1794-IE8				
55	A		SPARE	SPARE		AI	CP-1X		3	03	06	I:3:03.06	1794-IE8				
56	A		SPARE	SPARE		AI	CP-1X		3	03	07	I:3:03.07	1794-IE8				
57	A	506752-WTS-PR-T02-8521-DS-106	20-AIT-320-X	PERMEATE TURBIDITY ANALYZER	20-AE-320-X	AI	CP-1X		3	04	00	I:3:04.00	1794-IE8		120VAC	4-20 mA	
58	A	506752-WTS-PR-T02-8521-DS-106	20-FIT-307-X	PERMEATE DISCHARGE FLOW TRANSMITTER	20-FI-307-X	AI	CP-1X		3	04	01	I:3:04.01	1794-IE8		120VAC	4-20 mA	
59	A	506752-WTS-PR-T02-8521-DS-108_1	20-FI-507-1	RAS/WAS/DRAIN PUMP "1" FLOW TRNAMSITTER	20-FI-507-1	AI	CP-1X		3	04	02	I:3:04.02	1794-IE8		120VAC	4-20 mA	
60	A	506752-WTS-PR-T02-8521-DS-108_1	20-FI-507-2	RAS/WAS/DRAIN PUMP "2" FLOW TRNAMSITTER	20-FI-507-2	AI	CP-1X		3	04	03	I:3:04.03	1794-IE8		120VAC	4-20 mA	
61	A		SPARE	SPARE		AI	CP-1X		3	04	04	I:3:04.04	1794-IE8				

PSID
SHOWS TWO
"DO's" ?
- OPEN
- PARTIAL
OPEN

SHOULD NOT
IT BE ON
10% FOR
FAULT STATE

PSID SHOWS
407. CORRECT
ONE OR THE
OTHER.

ALSO FOR THESE, YOU
SHOW VO FOR EACH
TANK. WHILE OTHER
VO IS SHOWN ONLY WITH SUFFIX "-X" ?

62	A		SPARE	SPARE		AI	CP-1X		3	04	05	I:3:04.05	1794-IE8				
63	A		SPARE	SPARE		AI	CP-1X		3	04	06	I:3:04.06	1794-IE8				
64	A		SPARE	SPARE		AI	CP-1X		3	04	07	I:3:04.07	1794-IE8				
Notes:																	
1. WHERE "X" DENOTES FOR TRAIN 1 & 2.																	
2.																	
3.																	
4.																	
5.																	

APPENDIX E4

Load List

SHOP DRAWING REVIEW FORM

Name of Contract: English River Property Management- WWTF

Job No.: 5401-002-00

Supplier: SUEZ

Description: Electrical Load List

Tag Numbers: _____

SHOP DRAWING REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility as detailed in the contract documents.

<input type="checkbox"/>	Reviewed	Submission No. <u>1</u>
<input type="checkbox"/>	Reviewed as noted	Job No. <u>7603-002-00</u>
<input checked="" type="checkbox"/>	Revise & Resubmit	Date <u>August 25, 2020</u>

Dwg. reviewed by Richard O. / Ivan K.
MPE ENGINEERING LTD.

Engineer's Notes:

- Please see comments within

Attachments: 506752-WTS-EL-T02-8513-LI-001



CUSTOMER INFORMATION
ENGLISH RIVER PROPERTY MANAGEMENT
WASTEWATER TREATMENT FACILITY

ELECTRICAL LOAD LIST

CUSTOMER DOCUMENT NUMBER

SUEZ DOCUMENT NUMBER: 506752-WTS-EL-T02-8513-LI-001

CONTRACT
506752

ISSUER
WTS

DISCIPLINE
EL

PRODUCT
T02

PHASE
8513

TYPE
LI

CHRONO
001

PROPRIETARY AND CONFIDENTIAL: THIS DOCUMENT AND ALL INFORMATION AND KNOWLEDGE CONTAINED OR REFERRED HERIN ARE THE CONFIDENTIAL AND PROPRIETARY PROPERTY OF SUEZ AND AS SUCH ARE INSTRUMENTS OF SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT. THESE INSTRUMENTS OF SERVICE SHALL NOT BE REPRODUCED, TRANSMITTED, DISCLOSED OR USED OTHERWISE, IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN AGREEMENT BY SUEZ AND MUST BE IMMEDIATELY RETURNED OR DESTROYED UPON REQUEST.

A
REV

INITIAL RELEASE
DESCRIPTION

KR
CREATED BY

AA
CHECKED BY

RK
APPROVED BY

21-Aug-20
DATE (DD-MMM-YY)

ROW NO.	REV	P&ID	EQUIPMENT TAG NUMBER(S)	EQUIPMENT NAME	SKID NAME / LOOSE SHIP	EQUIPMENT SCOPE	TOTAL CONNECTED	TOTAL DUTY	LOAD FACTOR (%)	VOLTAGE (V)	PHASE (Φ)	LOAD RATING	UNITS (HP, kVA, kW)	CURRENT (A)	CONTROLLER TYPE	CONTROLLER SCOPE	GENERATOR POWER REQUIRED	ESTIMATED POWER FACTOR	UTILITY CONNECTED LOAD (kVA)	GENERATOR CONNECTED LOAD (kVA)	NOTES / REMARKS
1	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-A	FINE SCREEN	LOOSE SHIP	BY SUEZ	1	1	85	575 VAC	3	0.5	HP	0.9	FVNR	BY CLIENT	NO YES	0.486	0.44	0.44	
2	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-B	FINE SCREEN	LOOSE SHIP	BY SUEZ	1	0	85	575 VAC	3	0.5	HP	0.9	FVNR	BY CLIENT	NO	0.486	0	0	
3	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-A	FINE SCREEN COMPACTOR	LOOSE SHIP	BY SUEZ	1	1	85	575 VAC	3	0.5	HP	0.9	FVNR	BY CLIENT	NO YES	0.486	0.44	0.44	
4	A	506752-WTS-PR-T02-8521-DS-101	03-SCR-201-B	FINE SCREEN COMPACTOR	LOOSE SHIP	BY SUEZ	1	0	85	575 VAC	3	0.5	HP	0.9	FVNR	BY CLIENT	NO	0.486	0	0	
5	A	506752-WTS-PR-T02-8521-DS-102	20-B-201-A	MEMBRANE BLOWER	BLOWER PACKAGE	BY SUEZ	1	1	85	575 VAC	9	10	HP	11	VFD, CT	BY CLIENT	NO YES	0.95	10.41	10.41	
6	A	506752-WTS-PR-T02-8521-DS-102	20-B-201-B	MEMBRANE BLOWER	BLOWER PACKAGE	BY SUEZ	1	1	85	575 VAC	3	10	HP	11	VFD, CT	BY CLIENT	NO	0.95	10.41	0	
7	A	506752-WTS-PR-T02-8521-DS-102	20-B-201-C	MEMBRANE BLOWER	BLOWER PACKAGE	BY SUEZ	1	0	85	575 VAC	3	10	HP	11	VFD, CT	BY CLIENT	NO	0.95	0	0	
8	A	506752-WTS-PR-T02-8521-DS-103	16-B-501-A	PROCESS BLOWER	BLOWER PACKAGE	BY SUEZ	1	1	85	575 VAC	3	15	HP	17	VFD, CT	BY CLIENT	NO YES	0.95	16.08	16.08	
9	A	506752-WTS-PR-T02-8521-DS-103	16-B-501-B	PROCESS BLOWER	BLOWER PACKAGE	BY SUEZ	1	0	85	575 VAC	3	15	HP	17	VFD, CT	BY CLIENT	NO	0.95	0	0	
10	A	506752-WTS-PR-T02-8521-DS-103	16-B-801	WAS BLOWER	BLOWER PACKAGE	BY SUEZ	1	1	85	575 VAC	3	5	HP	6.1	VFD, CT	BY CLIENT	NO YES	0.95	5.77	5.77	
11	A	506752-WTS-PR-T02-8521-DS-104	16-MX-211	ANOXIC MIXER	LOOSE SHIP	BY SUEZ	1	1	85	575 VAC	3	1.2	HP	2.4	FVNR	BY CLIENT	NO YES	0.695	1.66	1.66	
12	A	506752-WTS-PR-T02-8521-DS-106	20-P-301-1	PROCESS PUMP	PROCESS PUMP SKID	BY SUEZ	1	1	85	575 VAC	3	7.5	HP	9	VFD, CT	BY CLIENT	NO YES	0.95	8.52	8.52	
13	A	506752-WTS-PR-T02-8521-DS-106	20-P-301-2	PROCESS PUMP	PROCESS PUMP SKID	BY SUEZ	1	1	85	575 VAC	3	7.5	HP	9	VFD, CT	BY CLIENT	NO	0.95	8.52	0	
14	A	506752-WTS-PR-T02-8521-DS-108	20-P-501-1	RAS/WAS/DRAIN PUMP	LOOSE SHIP	BY SUEZ	1	1	85	575 VAC	3	7.5	HP	9	VFD, CT	BY CLIENT	NO YES	0.95	8.52	8.52	
15	A	506752-WTS-PR-T02-8521-DS-108	20-P-501-2	RAS/WAS/DRAIN PUMP	LOOSE SHIP	BY SUEZ	1	1	85	575 VAC	3	7.5	HP	9	VFD, CT	BY CLIENT	NO	0.95	8.52	0	
16	A	506752-WTS-PR-T02-8521-DS-111	90-AC-001-A	AIR COMPRESSOR	LOOSE SHIP	BY SUEZ	1	1	85	575 VAC	3	5	HP	6.1	FVNR	BY VENDOR	NO YES	0.687	4.17	4.17	
17	A	506752-WTS-PR-T02-8521-DS-111	90-AC-001-B	AIR COMPRESSOR	LOOSE SHIP	BY SUEZ	1	0	85	575 VAC	3	5	HP	6.1	FVNR	BY VENDOR	NO	0.687	0	0	
18	A	506752-WTS-PR-T02-8521-DS-109	38-UV-101-1	UV SYSTEM	LOOSE SHIP	BY SUEZ	1	1	70	230 VAC	1	TBD	HP	TBD	FDR	BY CLIENT	NO YES	TBD	TBD	0	
19	A	506752-WTS-PR-T02-8521-DS-110	23-P-101-A	SODIUM HYPOCHLORITE PUMP	SODIUM HYPOCHLORITE SKID	BY SUEZ	1	1	70	110 VAC	1	TBD	HP	TBD	FDR	BY CLIENT	NO YES	TBD	TBD	0	
20	A	506752-WTS-PR-T02-8521-DS-110	23-P-101-B	SODIUM HYPOCHLORITE PUMP	SODIUM HYPOCHLORITE SKID	BY SUEZ	1	1	70	110 VAC	1	TBD	HP	TBD	FDR	BY CLIENT	NO	TBD	TBD	0	
21	A	506752-WTS-PR-T02-8521-DS-110	23-P-301-A	CITRIC ACID PUMP	CITRIC ACID SKID	BY SUEZ	1	1	70	110 VAC	1	TBD	HP	TBD	FDR	BY CLIENT	NO YES	TBD	TBD	0	
22	A	506752-WTS-PR-T02-8521-DS-110	23-P-301-B	CITRIC ACID PUMP	CITRIC ACID SKID	BY SUEZ	1	1	70	110 VAC	1	TBD	HP	TBD	FDR	BY CLIENT	NO	TBD	TBD	0	
23	A	506752-WTS-PR-T02-8521-DS-110	15-P-601-A	FUTURE SODIUM HYDROXIDE PUMP	SODIUM HYDROXIDE SKID	BY SUEZ	1	1	70	110 VAC	1	TBD	HP	TBD	FDR	BY CLIENT	NO YES	TBD	TBD	0	
24	A	506752-WTS-PR-T02-8521-DS-110	15-P-601-A	FUTURE SODIUM HYDROXIDE PUMP	SODIUM HYDROXIDE SKID	BY SUEZ	1	1	70	110 VAC	1	TBD	HP	TBD	FDR	BY CLIENT	NO	TBD	TBD	0	
25	A	506752-WTS-PR-T02-8521-DS-110	10-P-601-A	ALUM PUMP	ALUM SKID	BY SUEZ	1	1	70	110 VAC	1	TBD	HP	TBD	FVNR	BY CLIENT	NO YES	TBD	TBD	0	
26	A	506752-WTS-PR-T02-8521-DS-110	10-P-601-B	ALUM PUMP	ALUM SKID	BY SUEZ	1	1	70	110 VAC	1	TBD	HP	TBD	FDR	BY CLIENT	NO	TBD	TBD	0	
27	A	506752-WTS-PR-T02-8521-DS-111	90-DR-001-A	AIR DRYER	LOOSE SHIP	BY SUEZ	1	1	70	110 VAC	1	TBD	HP	TBD	FDR	BY CLIENT	NO YES	TBD	TBD	0	
28	A	506752-WTS-PR-T02-8521-DS-111	90-DR-001-B	AIR DRYER	LOOSE SHIP	BY SUEZ	1	0	70	110 VAC	1	TBD	HP	TBD	FDR	BY CLIENT	NO	TBD	TBD	0	
29	A	-	CP-01	MAIN CONTROL PANEL	-	BY SUEZ	1	1	70	110 VAC	1	3	KW	27.27	FDR	BY SUEZ	NO	1	2.1	0	
30	A	-	CP-11	REMOTE IO PANEL	-	BY SUEZ	1	1	70	110 VAC	1	3	KW	27.27	FDR	BY SUEZ	NO	1	2.1	0	REMOTE SKID?
31	A	-	CP-12	REMOTE IO PANEL	-	BY SUEZ	1	1	70	110 VAC	1	3	KW	27.27	FDR	BY SUEZ	NO	1	2.1	0	" "

LEGEND	
VFD, VT	VARIABLE FREQUENCY DRIVE, VARIABLE TORQUE
VFD, CT	VARIABLE FREQUENCY DRIVE, CONSTANT TORQUE
SS	SOFT STARTER
FVNR	FULL VOLTAGE NON REVERSING
CON	CONTACTOR
FDR	FEEDER BREAKER

Notes:

1.

2.


3.

4.

5.


6.

LOAD SUMMARY TABLE			
VOLTAGE (V)	PHASE (Φ)	UTILITY CONNECTED LOAD (kVA)	GENERATOR CONNECTED LOAD (kVA)
110 VAC	1	6.3	0
208 VAC	3	0	0
230 VAC	1	0	0
230 VAC	3	0	0
380 VAC	3	0	0
460 VAC	3	0	0
575 VAC	3	83.46	0

		CUSTOMER INFORMATION					ELECTRICAL LOAD LIST												CUSTOMER DOCUMENT NUMBER													
		ENGLISH RIVER PROPERTY MANAGEMENT WASTEWATER TREATMENT FACILITY																														
SUEZ DOCUMENT NUMBER: 506752-WTS-EL-T02-8513-LI-001							PROPRIETARY AND CONFIDENTIAL: THIS DOCUMENT AND ALL INFORMATION AND KNOWLEDGE CONTAINED OR REFERRED HERIN ARE THE CONFIDENTIAL AND PROPERITARY PROPOERTY OF SUEZ AND AS SUCH ARE INSTRUMENTS OF SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT. THESE INSTRUMENTS OF SERVICE SHALL NOT BE REPRODUCED, TRANSMITTED, DISCLOSED OR USED OTHERWISE, IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN AGREEMENT BY SUEZ AND MUST BE IMMEDIATELY RETURNED OR DESTROYED UPON REQUEST.																									
CONTRACT		ISSUER	DISCIPLINE	PRODUCT	PHASE	TYPE																			CHRONO	A	INITIAL RELEASE		KR	AA	RK	21-Aug-20
506752		WTS	EL	T02	8513	LI																			001	REV	DESCRIPTION		CREATED BY	CHECKED BY	APPROVED BY	DATE (DD-MMM-YY)
ROW NO.	REV	P&ID		EQUIPMENT TAG NUMBER(S)		EQUIPMENT NAME		SKID NAME / LOOSE SHIP		EQUIPMENT SCOPE	TOTAL CONNECTED	TOTAL DUTY	LOAD FACTOR (%)	VOLTAGE (V)	PHASE (Ø)	LOAD RATING	UNITS (HP, kVA, kW)	CURRENT (A)	CONTROLLER TYPE	CONTROLLER SCOPE	GENERATOR POWER REQUIRED	ESTIMATED POWER FACTOR	UTILITY CONNECTED LOAD (kVA)	GENERATOR CONNECTED LOAD (kVA)	NOTES / REMARKS							
7.																																
8																																
9																																
10																																

APPENDIX F1

Handling & Storage

	SERV-0001 ZeeWeed Membrane Care, Handling, and Storage 500c, 500d, 700b, ZW1000, ZW1500, Zeeblok		SERV-0001	
			P Revision	20-12-17 Date
	Page 1 of 10			

1.0 Purpose

The purpose of this document is to outline the requirements associated with the receipt, unloading and storage of ZeeWeed® membranes and associated assemblies. Information is also included on storing wetted membranes. If, after reading this document, questions exist on proper membrane handling, please contact your Suez Water representative.

Although the ZeeWeed® membranes are designed for maximum durability in water filtering applications, membranes are susceptible to irreversible damage if mishandled. Any concerns regarding membrane handling and potential damage should be addressed with Suez Water staff directly before any activities are undertaken at site that may cause an increased potential for membrane damage to occur. It should also be confirmed in advance that suitable Builders All Risk Insurance coverage is in place or other insurance coverage as deemed necessary by the project contract.



The installer in charge of the site is responsible for taking all reasonable precaution to prevent damage during installation and to prevent debris and foreign objects from falling in the membrane tanks after the cassettes are installed.

Safety Risk Assessment Recommendations

Required – Kevlar Gloves, Safety Glasses, Protective Clothing

Keep area around the system clear to minimize risk of slip/trip/fall - Maintain baseline and task specific PPE until completion of task. Fall protection may be required if work around the open tanks during Membrane Installation.



2.0 Applicability and Revisions

This document covers the ZeeWeed® product line, including all ZeeWeed 500, 700, 1000 and 1500 series modules/elements and cassettes/racks. Three important documents to accompany this procedure include:

- I. **Equipment Acceptance Certificate and Checklist** – a document used to confirm the receipt of the goods to the satisfaction of the receiver (for membrane shipments, typically the Installer).
- II. **Membrane Pre-Installation Checklist** – a checklist to be completed by the Installer prior to membrane uncrating and installation.
- III. **ZeeWeed® Uncrating and Installation Procedure** – a procedure specific to each membrane type that details the steps involved in uncrating and installing new membrane

3.0 Definitions

- **Installer** - Organization that is contractually responsible for the project site.
- **ZeeWeed®** - A hollow fiber outside-in and inside-out ultrafiltration membrane.
- **Module**- An assembly to house and contain the membrane fibre. One ZeeWeed® membrane, containing numerous individual fibres grouped together, is called a module. Pictures to the right shows different product modules.
- **Cassette/Rack** – An assembly to house and connect the modules. Cassette/Racks can contain multiple module units.



	SERV-0001 ZeeWeed Membrane Care, Handling, and Storage 500c, 500d, 700b, ZW1000, ZW1500, Zeeblok		SERV-0001	
			P Revision	20-12-17 Date
	Page 3 of 10			

4. Membrane Shipment

During shipping of the ZeeWeed® membranes from the SUEZ manufacturing facility to the intended site, the following conditions must be met:

- Shipment temperatures are to be controlled in the range of 2 - 35°C (35° - 95°F) (Setpoint 20° C or 68°F)
- The shipping crates housing the membrane cassettes or modules should never be exposed to excessive vibration or large bumps. When shipping membrane cassettes or modules by rail or truck, care is to be taken to ensure that air suspension cars or trailers are utilized.
- In most cases membranes will be shipped in populated cassette form (modules are already installed) in cassettes. The ZW1500 and the 700b are exceptions with the modules shipped separately from the racks.
- After the shipping process, installation and glycerine flush, an integrity check will be performed on the membranes to ensure no fibres were compromised during the handling process. To optimize performance, routine and pre-commissioning maintenance may be necessary to ensure the highest quality product prior to commissioning.

5.0 Handling of Factory Shipped SUEZ Water Membranes

5.1 General Information

5.1.2 ZW500, ZW1000 Series, Zeeblok

Cassettes

- Membrane cassettes are shipped in either a plywood or cartonplast packing crate.
- The cassette itself is sealed in a plastic bag to retain moisture and prevent damage to the membranes due to drying.

Modules/Elements

- Individual membrane modules/elements are shipped in a cardboard box within a crate.
- The module itself is sealed in a plastic bag to retain moisture.
- Modules or elements in cardboard boxes should not be stacked more than six high.

5.1.3 ZW1500 and 700 bSeries

Rack/Modules

- Individual membranes modules/elements are shipped in a cardboard box with a crate
- The module itself is sealed in a plastic bag and/or has temporary port caps installed to retain moisture. The rack itself is shipped in a plywood packing crate

5.2 Unloading Membranes

The Installer is responsible for the prompt and proper unloading of all membrane equipment and materials received into his custody.

- Dock level, off-loading facilities are recommended.
- The wooden shipping crates have been designed to be lifted from the bottom using a forklift.

Note that extended forks and an appropriately sized lift are required for the 500d product and the ZW1000 module and cassette crates.



- Damage incurred or observed during equipment off-loading needs to be immediately reported to your Suez Water representative.
- It is recommended that an experienced/qualified forklift truck driver unloads the membranes from the carrier.
- 500d and ZW1000 cassettes are shipped on their sides and will require up righting - follow all procedures carefully to prevent injury
- Shipping crates are not to be stacked!

Safety Risk Assessment Recommendations

Risks	Risk Mitigation
-Risk of being struck by, struck against, caught on the cassette	- area to be cleared of by-standers
-Risk of falling cassette	- cassette to be lifted only to clear obstacles
-Risk of overexertion	- use correct position and posture when lifting sides



5.3 Confirmation of Equipment and Materials

- A cross-check should be performed on the shipment using the packing slip to confirm the delivery of membrane equipment.

Note: membrane crates are not to be opened! Verification should be limited to external examination of crates.

- The equipment delivery will be checked for content and any damage that may have occurred during shipping or the unloading process.
- Any non-conformance shall be immediately reported to your Suez Water representative (in writing). Digital pictures of damage should be provided.
- Refer to section 5.4 for "Confirmation of Handling Indicators"
- Once the equipment shipment has been checked, the document provided by Suez Water (ref. "Equipment Acceptance Certificate and Checklist") is completed and signed by the Site Organization's representatives.
- The Installer shall expeditiously replace all materials and equipment that are lost or damaged while in the custody of the Installer.
- Replacement materials and equipment of a type and quality equal to the original materials and equipment shall be acceptable to Suez WTS and to the Owner.

5.4 Confirmation of Handling Indicators

Suez WTS includes a series of Shipping Indicators to protect the integrity of the membrane cassettes while they are being shipped. In addition to the external indicators inside the crate (affixed to one of the cassette legs).

- The Installer's representative should record the indicator condition of the external indicators.
- At the time of discovery, the Installer must inform the Suez representative of any triggered indicators. (A triggered indicator indicates ideal shipping conditions were not maintained. Both inside and outside indicators should be cross checked. The Suez Water Representative will evaluate membranes prior to installation).

	Freeze Indicator	Heat Indicator
Indicator Location:	External	External
When to Check:	At time of receipt	At time of receipt
Indicator Location:	Internal	Internal
When to Check:	During installation	During installation

	SERV-0001 ZeeWeed Membrane Care, Handling, and Storage 500c, 500d, 700b, ZW1000, ZW1500, Zeeblok		SERV-0001	
			P Revision	20-12-17 Date
	Page 6 of 10			

- During membrane installation, the Suez WTS Representative onsite will also inspect and record the status of all indicators.



Outside indicators

Note: Duplicate indicators are inside crate affixed to the cassette. These indicators are for GE FSR use.



6.0 Storage of Membranes

The Installer shall provide all facilities and services required for the storage, maintenance, protection and security of the equipment and materials delivered by Suez WTS.

The following conditions should be followed:

- Equipment and materials shall be stored in assigned lay-down areas.
- Stored equipment and materials shall be adequately supported and protected to prevent damage.
- Equipment shall be moved into the permanent building or onto its permanent foundation as soon as construction will permit.
- Stored materials and equipment shall not be allowed to contact the ground. In warehouses that do not have dry concrete or suspended floors, materials and equipment shall be stored on platforms or shoring.
- Indoor storage furnished by the Installer shall consist of suitable construction trailers or portable enclosures and shall be weather-tight, well ventilated, and secure against theft and vandalism.
- Access doors shall be adequate to accommodate the movement and handling of materials and equipment to be stored and shall be equipped with secure locks.
- Membrane cassettes/racks will be stored upright on a level surface.
- The membrane cassette crates must remain closed until the Installer begins membrane installation to prevent permanent membrane damage due to drying out.
- if upon removal from storage, mold is discovered on the membrane fibres, carefully repackage and contact Suez for direction



Membranes should be stored in a dark dry area with a storage temperature between 5° - 35° C (40° - 95° F)!

6.1 Storage Conditions – Crated Cassettes or Membranes

The following conditions should be ensured when storing crated cassettes/membranes:

- Stored in a sheltered area protected from freezing, direct sunlight or extreme heat.
- Vacuum sealed bag should remain sealed until membrane installation is being performed.

It is recommended that the product be stored no longer than necessary prior to installation. Coordinate with Suez for appropriate shipment times. Maximum storage duration of a membrane is 12 months from the date of shipment.

6.2 Storage Conditions – Bagged Modules / Elements:

New modules preserved with glycerin solution, bagged and factory sealed, may be stored for up to 12 months. The following conditions should be ensured when storing bagged modules / elements:

- Stored in a sheltered area protected from freezing, direct sunlight, extreme heat and winds that could accelerate drying. The module / element should be kept bagged and sealed at all times.

Disassembly of cassettes/racks to replace modules requires attention and care. Contact Suez for re-assembly procedures, which include step-by-step instructions, bolt torques, and identification of non-reusable hardware.

Safety Risk Assessment Recommendations

Risks	Risk Mitigation
- Risk of being caught on, caught between cassette parts	- use care during inspection, be alert to pinch points
-Risk fall hazard	- ensure any glycerin spills/leaks are cleaned immediately
- Environmental risk – potential development of mold during storage	- don facemask; repackage and contact Suez



	SERV-0001 ZeeWeed Membrane Care, Handling, and Storage 500c, 500d, 700b, ZW1000, ZW1500, Zeeblok		SERV-0001	
			P Revision	20-12-17 Date
	Page 8 of 10			

6.3 Storage Conditions – Wetted Membranes

It is important to note that ZeeWeed® membranes should not be allowed to dry out as membrane properties will be adversely affected. **Drying may result in irreversible damage to the membranes.**

6.3.1 ZW500, ZW1000 Series, ZeeBlok

If the preservative is flushed out or if the module has been in contact with water, the membrane must not be allowed to dry out under any circumstances. The membranes may be left in air for a maximum of forty-five minutes out of direct sunlight and wind. After forty-five minutes, membranes should be immersed in water. Spraying the membranes after this period is not sufficient to prevent drying-out and will not allow a longer period of contact with air. If membranes are **frequently lightly misted** (not sprayed with fire hoses or pressure washers) from the time they have been taken out of the water, they may be left in air for a maximum of 6 hours (5° - 35°C (40° - 95°F)). Since the membranes are maintained wet, there is no need for specific re-wetting procedures. However, if necessary for other reasons (e.g., drinking water compliance, residual of preservatives) the standard procedures for rinsing and disinfection may be used before starting the operation. If it is impractical to immerse or repeatedly spray the membrane, the membrane should be cleaned, preserved in glycerin solution and re-bagged according to membrane preservation procedures. Please refer to the Operations and Maintenance manual supplied with the system for further information. Longer storage durations are to be discussed with Suez WTS on a case by case basis.

6.3.2 700b

The following conditions should be ensured when storing crating or bagged membranes.

- Stored in a sheltered area protected from freezing, direct sunlight, extreme heat and winds that could accelerate drying.
- Vacuum sealed bags or protective caps should remain in place, until membrane installation is being performed.

It is recommended that the product be stored no longer than necessary prior to installation. Coordinate with Suez WTS for appropriate shipment times. New modules preserved with glycerin solution, bagged and factory sealed, may be stored for up to 12 months. After this time, the modules should be wetted with non-hazardous solutions of water (RO-water quality)/glycerin/sodium bisulphite solution (75:25:0.25:wt%) and sealed in plastic again. These solutions will control bacterial growth and dehydration. After this treatment the modules can be stored for a further 2 months before the above process needs to be repeated.

6.3.3 ZW1500 and 700b Series

Short-term Storage (< 1 week)

Membrane fibers must remain wet always and must not be exposed to freezing conditions. Ensure that membrane modules are filled with potable water containing 1-2 mg/L Cl₂ residual.

Long-term Storage (> 1 week)

Membrane fibers must remain wet always and must not be exposed to freezing conditions. Ensure that membrane modules are filled with potable water containing 5-10 mg/L Cl₂ residual. The preservative solution should be checked periodically and replaced once per month


Perform chemical cleaning before storage. Prior to start up ensure that the membrane modules and equipment are sanitized.

Safety Risk Assessment Recommendations

Risks	Risk Mitigation
- chemical handling hazard	<ul style="list-style-type: none"> - use respirator or ensure sufficient ventilation - don protective equipment (chemical resistant apron, neoprene gloves, goggles c/w faceshield)



Suez Water Technologies & Solutions have made every effort to provide current information while preparing this procedure. Suez maintains that depictions of methods and/or techniques and use of specific tools and/or apparatus shown within the situations portrayed are accurate at the time of printing. Suez accepts no liability for any reliance placed on the information contained herein.

	SERV-0001 ZeeWeed Membrane Care, Handling, and Storage 500c, 500d, 700b, ZW1000, ZW1500, Zeeblok		SERV-0001	
			P Revision	20-12-17 Date
	Page 10 of 10			

6.4 Storage Durations – Wetted Cassettes (ZW500, ZW1000 Series, Zeeblok)

When membranes have been installed in a tank, they need to be kept wet at all times. When the protective glycerin solution is removed, the membranes become susceptible to drying.

For storage periods of up to approximately 15 days, simple immersion of the cassettes in water containing sodium hypochlorite (NaOCl) with a maximum residual concentration of 3 mg/L is suitable. Residual should be monitored every week and re-dosing will be required if the residual drops to less than 0.2 mg/L. Recovery cleaning of the membrane prior to storage is strongly recommended. If the membranes have been in service in a MBR application, inspection and debris removal (if necessary) of the membrane prior to storage is also required.

Periodic aeration may also be necessary to prevent anoxic or anaerobic conditions from developing in the tank. Daily testing of the water to ensure that the residual chlorine concentration is within acceptable limits is required; a simple swimming pool chlorine test kit is acceptable. A log is to be maintained recording daily NaOCl concentration and water temperature. Longer storage durations are to be discussed with Suez on a case-by-case basis.

6.5 ZW500, ZW1000 Series, Zeeblok Wetted Membranes – Long Term Removal from Water

If membrane cassettes are to be re-configured or rebuilt for any reason, Suez Field Service Representatives are required to maintain warranty. If short-term storage (<15 days) refer to section 6.4 in this document. If the module is to be out of service for a longer period, the module/cassette must be preserved and stored.

- Perform a recovery cleaning on membrane modules (refer to the appropriate process manual).
- Ensure that no sludge or solids are present on the membranes.



Please contact Suez Customer Service for proper preservation instructions.

In the case that the membranes have spent time in storage, carefully check for any signs of mold on the fibres. Should any mold be present, immediately rebag and follow through with the steps outlined in SERV-0056 Disinfection of Moldy Cassettes/Modules.

Contact your Suez Water Representative for advice on returning a sample for analysis

APPENDIX F2

Uncrating & Installation

1.0 Purpose

The purpose of this document is to outline the steps required to uncrate and install ZeeWeed® 500d and 500d Leapmbr cassettes onsite. Please read this procedure fully before proceeding.

For other specific model replacement instructions, please contact SUEZ WTS for appropriate Uncrating and Installation Instructions.

Safety Risk Assessment Recommendations

Required – Kevlar Gloves, Safety Glasses, Protective Clothing

Keep area around the system clear to minimize risk of slip/trip/fall - Maintain baseline and task specific PPE until completion of task. Fall Protection equipment required.



2.0 Applicability and Revisions

This document covers the ZeeWeed® 500d product line.

Related procedures – SERV-0007 Membrane Pre-Installation Checklist; SERV-0009 ZW Membrane Map and Repair Log.

3.0 Preparation Work

The Membrane Pre-Installation Checklist must be completed before cassettes can be uncrated and installed. Refer to SERV-0007 Membrane Pre-Installation Checklist.

There must be enough potable water in the membrane tank to ensure that upon installation the membrane fibers will be completely covered with water.

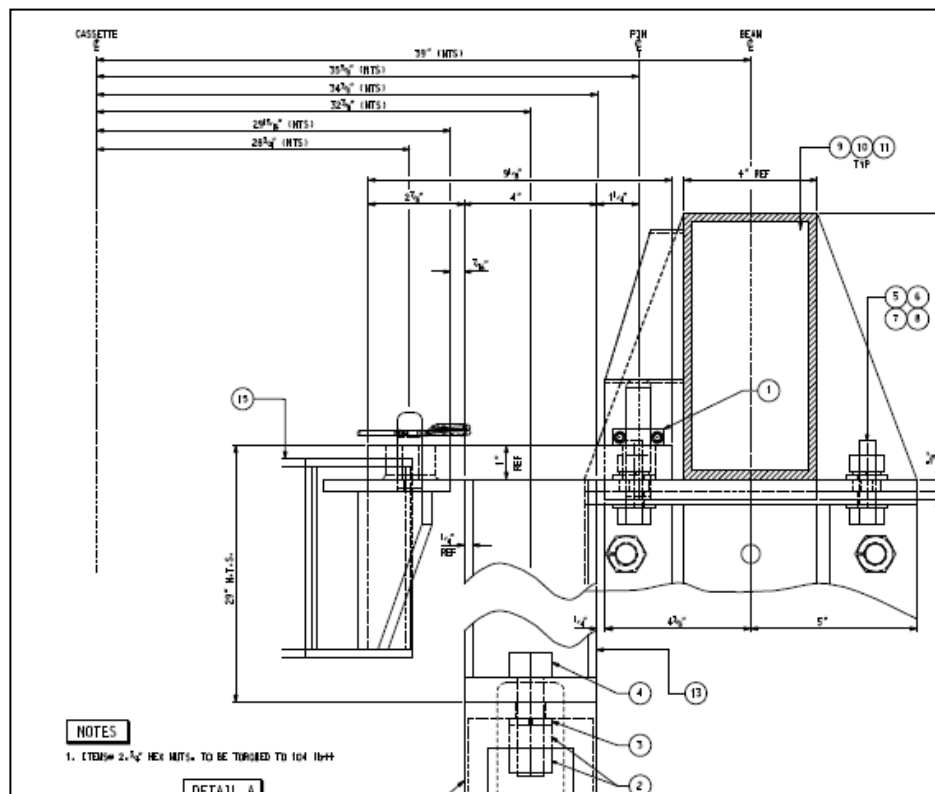


It is also very important to prepare the area where the uncrating and up righting of the cassettes will take place. Ensure that the designated area is free of debris, is large enough to safely move the cassettes and that there is no through traffic. Before cassette installation begins, organize and lay out all of the parts, hardware and components needed in the installation of the cassettes.

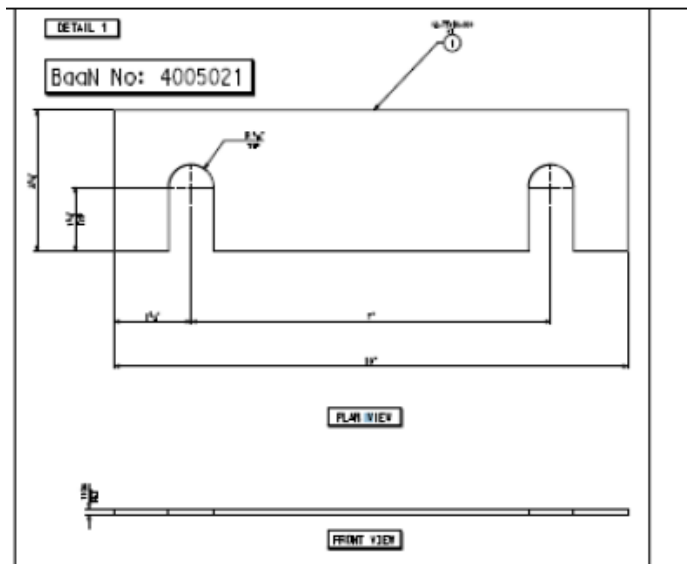


3.1 Cassette Leveling

Earlier versions of ZW500d Cassettes are leveled by means of an adjustable leveling pin at each cassette corner. For later versions, leveling is achieved by leveling the beams and/or brackets. Prior to cassette installation, the beam leveling instructions should have been followed as per the membrane tank general arrangement drawing and, if required, shims would have been installed (see Drawing #2 below). Should fine leveling be required, a $\frac{3}{4}$ " 316 SS flat washer can be used on the pins at each corner to raise the cassette. Please refer to Drawing #1 below for details.

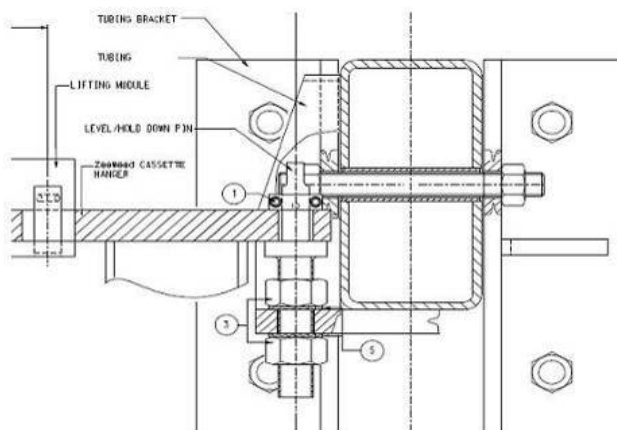


Note: The above is a typical drawing – for Bill of Material and Torque specifications please refer to project specific general arrangement membrane tank drawing



Drawing # 2 – example of shims

If the design has adjustable leveling pins at the cassette corners, the cassette must be individually leveled to a tolerance of $\pm 1/8$ " per cassette within a train. All cassettes across adjoining process trains must be $\pm 1/4$ " level tolerance of one another. Use of a laser level prior to cassette installation is recommended to ensure the required tolerances are achieved. Cassettes that are not properly leveled may exhibit more rapid fouling as air distribution may be affected.



Note: The above is a typical drawing – for Leveling Pin Bill of Material and Torque specifications please refer to project specific general arrangement drawings

 Water Technologies & Solutions	SERV-0003 500d Uncrating and Installation Instructions	SERV-0003	
		AE Revision	05-Jan-2018 Date
		Page 4 of 31	

3.2 Manpower and Time Requirement

The typical installation of a single cassette populated with modules requires two people, approximately 5 hours (from opening of the crate to connection of permeate and aeration spools in the membrane tank).

4.0 Container Sizes

ZW500d cassettes are always shipped with modules installed. The cassette is shipped on its side in a cartonplast crate. (Note that 16M and 20M short cassettes are shipped upright) The cassette itself is sealed in plastic to retain moisture and prevent membrane damage.



500d Crates are not designed to be stacked on top of one another.

Damage, such as punctures, water damage, tripped indicators etc., incurred during equipment off-loading needs to be reported to the Site Superintendent and SUEZ WTS immediately. Refer to SERV-0076 Tripped Temperature Indicator procedure.



Property Chart – ZW500d

16 Module Cassette – WW				
Max. Possible Cassette Shipping Weight (fully populated, in crate)	714	kg	1574	lb
Best-Case Lifting Weight (selected # of empty spaces, no solids, with lifting module)	756	kg	1667	lb
Worst-Case Lifting Weight (fully populated, sludged, with lifting module)	1,464	kg	3228	lb
Dimensions				
Maximum Length	1744	mm	68.7	inch
Maximum Width	738	mm	29.1	inch
Maximum Height (to top of corner post)	2504	mm	98.6	inch
20 Module Cassette – DW				
Max. Possible Cassette Shipping Weight (fully populated, in crate)	892	kg	1966	lb
Best-Case Lifting Weight (selected # of empty spaces, no solids, with lifting module)	930	kg	2051	lb
Worst-Case Lifting Weight (fully populated, sludged, with lifting module)	1,470	kg	3241	lb
Dimensions				
Maximum Length	1744	mm	68.7	inch
Maximum Width	738	mm	29.1	inch
Maximum Height (to top of corner post)	2504	mm	98.6	inch
48 Module Cassette – WW				
Max. Possible Cassette Shipping Weight (fully populated, in crate)	1729	kg	3812	lb
Best-Case Lifting Weight (selected # of empty spaces, no solids, with lifting module)	1959	kg	4320	lb
Worst-Case Lifting Weight (fully populated, sludged, with lifting module)	4064	kg	8962	lb
Dimensions				
Maximum Length	2112	mm	83.1	inch
Maximum Width	1745	mm	68.7	inch
Maximum Height (to top of corner post)	2536	mm	99.8	inch
64 Module Cassette - DW				
Max. Possible Cassette Shipping Weight (fully populated, in crate)	2033	kg	4483	lb
Best-Case Lifting Weight (selected # of empty spaces, no solids, with lifting module)	2375	kg	5237	lb
Worst-Case Lifting Weight (fully populated, sludged, with lifting module)	4380	kg	9659	lb
Dimensions				
Maximum Length	2112	mm	83.1	inch
Maximum Width	1745	mm	68.7	inch
Maximum Height (to top of corner post)	2536	mm	99.8	inch

Please contact your Suez WTS lifecycle team for other specific cassette configuration and information as required.

5.0 Tools Required

- Fork Lift, with extended forks, rated for cassette weight – required to move crate
- Crane/Hoist, slings and Lifting Bracket – required to upright cassette and install cassette in tank
 - Lifting Hoist Requirements
 - 64 element cassettes: 3000 – 4600 kg
 - 48 element cassettes: 2800 – 3800 kg
- Two (2) sheets of 1 inch thick foam (90" x 90")
- Four (4) ¾" lifting safety hoist rings rated for 5000 lbs. Material: 4140 Aircraft Quality Carbon Steel (recommended manufacturer ACTEK, part # 46018) c/w eight ¾" diameter SS flat washers and 4 ¾" dia. SS Hex Nut (included with shipment)
- Four (4) slings
- Four (4) point spreader bar and;
- Two (2) point spreader bar
- Module Interconnecting Strips (MIS) (Drinking Water Applications only)
- MIS Removal Tool (Drinking Water Applications only)
- Module Removal Tool
- NEFAB Tool (if required)/Flat Head Screwdriver – to uncrate the cassette
- Camera – for documenting the condition of the cassette and indicators upon uncrating
- 1 1/8" socket – to attached cassette arms
- PVC Glue and Primer – to install necessary PVC elbows to cassette.
- Anti-Seize – use NSF grade only for drinking water applications (ie White Knight)



Always use trained operators and inspected equipment!

5.1 Parts Required

- Four (4) – 3" x ¾" SS Bolts
- Eight (8) – ¾" SS Nuts
- Four (4) – ¾" SS Nord-Lock Washers
- Four (4) Hanger Arms (two left and two right)
- ZW500d lifting module c/w hitch pins
- Four (4) - ¾" SS double split shaft collars

Suez Water Technologies & Solutions have made every effort to provide current information while preparing this procedure. Suez maintains that depictions of methods and/or techniques and use of specific tools and/or apparatus shown within the situations portrayed are accurate at the time of printing. Suez accepts no liability for any reliance placed on the information contained herein.

6.0 Safety

It is important that before any work begin that the necessary planning and precautions are done to ensure that the membrane installation procedure be safely carried out. It is the responsibility of those installing the membranes to properly prepare.

6.1 Maneuvering the cassette – Forklift and Crane Safety

- Before the crates or cassettes can be moved, ensure that the lifting mechanism (fork lift and crane) are in good operating condition and are rated for the load (see section 5.0).
- While maneuvering the crate or cassette, ensure that no one is in its path or out of sight of the crane/forklift operator.
- Do not stand under the cassette or crate



The forklift and crane operators must be qualified and certified. Forklift and crane operators must have the proper documentation on the person while operating the equipment

Safety Risk Assessment Recommendations

Risks	Risk Mitigation
-Risk of being struck by, struck against, caught on the cassette	- area to be cleared of by-standers
-Risk of falling cassette	- cassette to be lifted only to clear obstacles
- risk of falling into cassette tank	- fall protection equipment required



6.2 Installing Cassette in Tank – Fall Arrest Safety

It is crucial that fall arrest equipment be worn when working overtop the membrane tank. A fall arrest harness must be worn and appropriate tie-off lanyards must be used while installing and/or working on a cassette.

7.0 Sub-Assemblies of Aeration Piping

Some parts of the cassette aeration spool may be assembled together before the cassette is installed. These sub-assemblies are then assembled together after the cassette is installed in the tank. For the specific parts that can be assembled together, look in the spool drawings for the specific project. Pre-assembling reduces the cassette installation time and reduces the amount of work that must be done on the cassettes after they are installed.



Safety Risk Assessment Recommendations

Risks	Risk Mitigation
- Overexertion hazard	- use safe posture or positions



8.0 Uncrating the ZW500d Cassettes

Membranes are to be uncrated with a SUEZ WTS representative present to monitor the process and verify the receiving tanks and piping have been satisfactorily prepared. Failure to do so may affect the membrane warranty.

The cassette will need to be transported to a designated uncrating area using a forklift. Uncrating of the cassettes is to be completed on a dry level surface, out of direct sunlight. Please note that the cassette should not be allowed to freeze. Please refer to SERV-0001 ZeeWeed® Membrane Care, Handling and Storage.

Membranes are not to be uncrated if any of the following activities are taking place in the immediate vicinity:

- Painting;
- Roofing;
- Tinwork;
- Pipe flushing;
- Grinding;
- Welding;
- Sandblasting;
- Drilling;
- All power tools that discharge debris (including carpentry);
- Wiring and terminations;
- Or any other activity that could pose harm to the membranes

Safety Risk Assessment Recommendations

Risks	Risk Mitigation
-Risk of being struck by or caught on by cassette sides	- use two people to uncrate cassette
-Risk of overexertion	- use correct position and posture when lifting sides



The cassettes should be uncrated by removing the top first followed by the sides. Please note that at least two people are required to uncrate the cassette. The following pictures illustrate the order of cassette uncrating.



Ensure the use of two workers to remove box sides!

Should the cassettes be delivered in a plywood crate, the top of the crate is to be removed first followed by one of the sides.



The ends will remain supported by the other side of the cassette. When removing the other side, care must be taken to ensure the remaining ends of the cassette are supported.



The cassette comes packaged in a vacuum sealed bag. Once the cassette is uncrated and provided the cassette will soon be placed into the membrane tank with water, the bag can be carefully removed.



Cut open the bag sealing the cassette at the top and then carefully roll down the bag to the base of the crate.



CAUTION!
Do not cut here!
Fibres can be damaged!!!



Once rolled down, the bag can be cut at the base and discarded.



CAUTION!


There is plastic wrap underneath the bag. The plastic wrap must stay intact for the uprighting of the cassette.

Depending upon the version of your cassette, your cassette may come equipped with yellow shipping braces. If present, these will need to be removed prior to uprighting the cassette.

If applicable, remove yellow shipping braces



In the case that the membranes have spent time in storage, carefully check for any signs of mold on the fibres. Should any mold be present, immediately rebag and follow through with the steps outlined in SERV-0056 Disinfection of Moldy Cassettes and Modules. Contact your SUEZ WTS for advice on returning a sample for analysis.

	SERV-0003 500d Uncrating and Installation Instructions		SERV-0003	
			AE Revision	05-Jan-2018 Date
	Page 12 of 31			

9.0 Movement of Uncrated Cassettes

When the cassette has been removed from the shipping crate, care must be taken to ensure that contact with the membrane fibers is avoided.



CAUTION!

If there is contact with the fibres, the integrity of the membranes may be compromised!

If there is contact with the fibers, the integrity of the membranes may be compromised. Advise SUEZ WTS staff on-site immediately so the fibers can be inspected and repairs can be initiated before cassette is installed.

If fiber damage is not reported to SUEZ WTS staff, it will take a lot of extra time and effort later to remove the cassette and make the repairs.

The cassette is to be lifted by factory supplied lifting points on the top of the cassette using the lifting module. If a lifting module is not available, a spreader bar is required. Do not simply attach ropes to the four hanger brackets and lift on the hanger brackets as the hanger brackets will not withstand the horizontal (inward) loads produced because the ropes are sloping inwards.

Cassettes are designed to be lifted vertically and lowered slowly in a smooth fashion. Do not swing or drop cassettes.

Never tilt or drag an uncrated cassette. Treat the product with care.

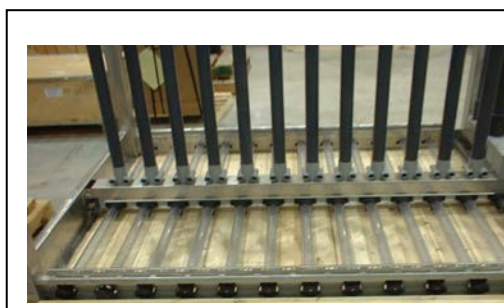
If necessary, the uncrated and up righted cassette can be moved on the wooden skid on which it was shipped, using a forklift.

Extreme caution must be taken to avoid wind, environmental and safety risks that may be present while moving the cassette in this manner.

10.0 Inspecting the ZW500d cassette - Inspection 1

With 48/64M cassette uncrated but still on its side, it is a good time to perform the following inspections of the aeration piping and connections:

- Ensure that aerators are properly in place
- Ensure that the large holes on the aerators are facing down relative to cassette
- Ensure that all saddles are securely clipped to cassette frame
- ensure that the correct number of non-permeating ("dummy") headers are installed and in the correct location
- ensure that saddle plugs are used under the dummy headers
- ensure on the 48/64M cassettes that the main aeration pipe is part of the cassette frame and no inspection is required.



Safety Risk Assessment Recommendations

Risks	Risk Mitigation
-Risk of being caught on, caught between cassette parts	- use care during inspection, be alert to pinch points
-Risk fall hazard	- ensure any glycerin spills/leaks are cleaned immediately



11.0 Installation of 3" union (or other fitting) to cassette's main aeration pipes

All cassettes require that either a PVC union is glued to the 3" PVC aeration pipe(s) or threaded on to the main cassette aeration pipe. It will depend on the product as to which connection type and quantity of PVC union is required. To minimize the amount of time and work required to be done on the cassette after it is installed as well as reduce the risk to the membranes, these parts should be installed prior to the cassette being installed in the tank. The ideal time is when the cassette is still on its side.



Safety Risk Assessment Recommendations

Risks	Risk Mitigation
-Risk of being caught between cassette parts	- use care during inspection, be alert to pinch points
-Risk fall hazard	- ensure any glycerin spills/leaks are cleaned immediately
- Environmental exposure hazard	- avoid breathing PVC glue fumes, work in a well ventilated area



11.0 Up-righting a Cassette

The 48/64 E cassettes and the 16M and 20M tall cassettes are shipped on their side and need to be lifted and rotated to the upright position.



Read this procedure completely before proceeding with the up righting operation!

To promote safety, up righting a cassette must be done in a dedicated staging area. The staging area shall be cordoned off to people who are not directly involved in this activity. Shipping crates shall be brought in the staging area one at a time. The area shall be clear of any material and will provide the safe space required for the removal of the cassette from the wooden skid and up righting – refer to Section 8.0. The area for the up-righting operation shall be at least 7.5 m x 3m (25 feet x 10 feet).

The area shall be clearly marked and isolated such that access of unauthorized personnel shall be prevented. The use of a perimeter fence, rope/chain barriers, pylons or other signaling and blocking means should be considered.



BE ALERT! Cassettes have sharp edges!

Safety Risk Assessment Recommendations for Cassette Uprighting

Risks	Risk Mitigation
-Risk of being struck by, struck against, caught on the cassette	- area to be cleared of by-standers, be aware of sharp edges
-Risk of falling cassette	- cassette to be lifted only to clear obstacles
- risk of falling into cassette tank	- fall protection equipment required
-Risk fall hazard	- ensure any glycerin spills/leaks are cleaned immediately



	SERV-0003 500d Uncrating and Installation Instructions		SERV-0003	
			AE Revision	05-Jan-2018 Date
	Page 16 of 31			

There are two steps to be followed:

Step I: Removal of the Cassette from the wooden skid and;

Step II: Uprighting Procedure

All uncrating material must be removed from staging area before commencing the uprighting activity.

The use of an overhead hoist is recommended, however, if an appropriate overhead hoist is not available then a mobile telescopic boom crane or equivalent lifting device should be used. The hoist/crane shall be rated for at least 5 Ton (10,000 lb) lifting capacity at the jib extension and angle required for the lift. The operation of the hoist/crane shall be performed by a qualified operator and per the local and international safety codes and regulations for lifting operations. If a crane is being used, it shall be located an appropriate distance to prevent collision with the cassette during the lifting and uprighting.



Follow proper safety procedures to prevent injury.

12.0 Step 1: Removal of the Cassette from the Wooden Skid

- Installing the Hoist Rings.

One set of four hoist rings are included with every 10 cassettes (or less) in the shipment. Attach the four lifting hoist rings to the four upper corners of the cassette.

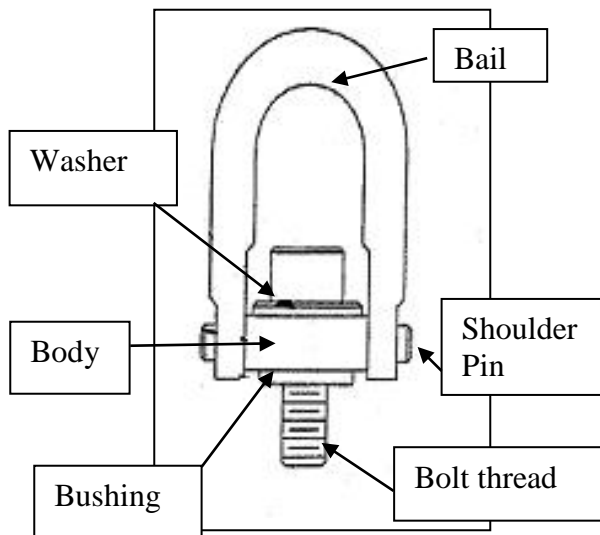
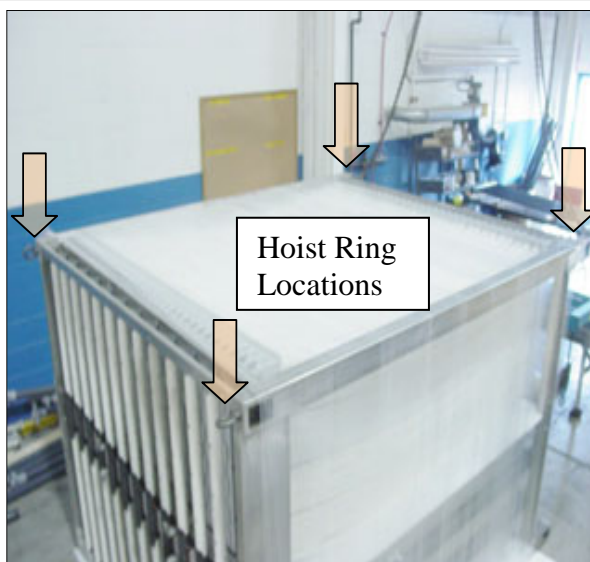
NOTE:



Hoist rings are made of carbon steel - in order to prevent cassette frame stainless steel contamination, it is important to install $\frac{3}{4}$ " stainless steel flat washers on either the top plate along with a stainless steel nut.

Before proceeding with the following up righting procedure, ensure the following:

- The bolt is tightened to the recommended torque – 100 ft/lbs.
- The bushing of the hoist ring is sitting flush against the frame
- The hoist is free to swivel and pivot in every direction
- No signs of wear or cracks on bolt, shoulder pins or bail
- Shoulder pins are secure



A platform ladder should be used to attach and remove the hoist rings to allow freedom of use of both hands.

1. Place 1-inch thick foam sheet on the clear and flat ground where the cassette will be placed for up righting.
2. The use of four-point lift frame and/or spreader bar is highly recommended for the cassette uncrating and up righting, especially where overhead space is limited. Ensure the hoist rings do not touch or pry against any surface of the cassette frame – in particular the vertical corner post, except at the location of attachment.

Where a lift frame or spreader bar is not available an arrangement similar as shown in Picture 1 is recommended. Preferably two slings should be used on each lifting bracket. The sling closest to the cassette should be a short nylon strap, about 4 feet long. This will prevent damage from the crane hooks. The longer cables should be at least twenty feet long. The use of flexible synthetic material (reinforced man-made fibers, etc.), instead of metal chains, is highly recommended to avoid damage to cassette body material.

Minimum angle between horizontal plane and cables should be:

- a) 60° - where spreader bar (lifting frame) is used and:
- b) 75° - for one point lift.



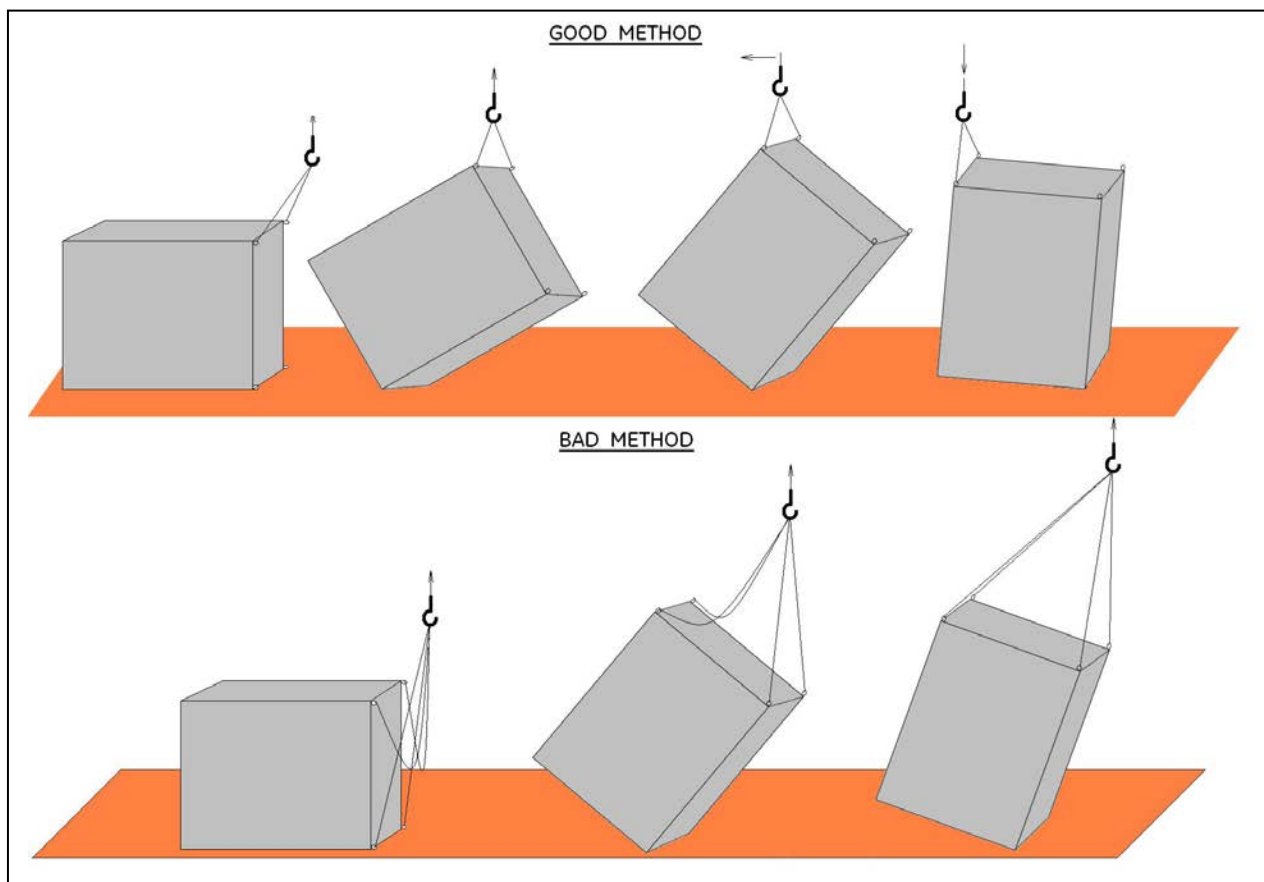
Picture 1

3. Ensure that the surrounding area is clear of people. Slowly commence hoist lifting and gently lift the cassette to the minimum height (not more than 2" or 5 cm) required to remove the cassette of the wooden skid.

4. Slowly and gently transfer the cassette to above the 1-inch foam sheet and gently lower the cassette to the ground. Remove the skid and remains of the vacuum-sealed bag.
5. Clean the area of any spill using rags or other absorbing material. Clean and dry the floor to prevent slip hazards.
6. Disengage the hoist and slings, and remove the two hoist rings attached to bottom side of cassette (that is the side that will be placed on the ground).

13.0 Step II: Up-righting Procedure

1. If a crane is being used, it shall be located an appropriate distance to prevent collision with the cassette during the up-righting in case a “kicking out” occurs. The crane shall be located on the side of the cassette where the cassette moves horizontally during the up-righting.



4. Ensure that the surrounding area is clear of people. Begin slowly lifting the cassette off the ground. It will tilt as you lift, therefore the lifting device must be free to move laterally so it remains over the center of gravity of the cassette.

- 5 Keep the hoist in vertical alignment with the lifting points on the cassette at all times. Failure to do so could result in the cassette “kicking out”. Do not attempt to stop the cassette if it kicks out.
6. If a crane is being used, a signaling person, standing in a safe distance, should be signaling the crane operator. Appropriate signaling/communication means shall be provided. Lift the cassette until it pivots onto its side then begin to lower it until it rests fully on the foam in its vertical position.
- 7 After fully lowering the cassette to the vertical orientation remove the slings and lifting hoist rings. A platform ladder should be used to attach and remove the hoist rings to allow freedom of use of both hands.



Uprighting a cassette using an overhead crane and a two-point spreader bar

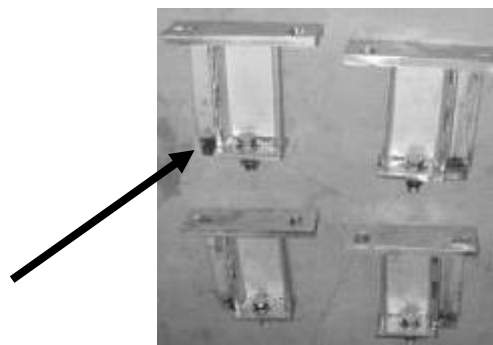
14.0 Installing Cassette Arms

The cassette arms that allow the cassette to be moved using the lifting frame are installed at this point. **Refer to the applicable fabrication drawings provided for details on this assembly.**



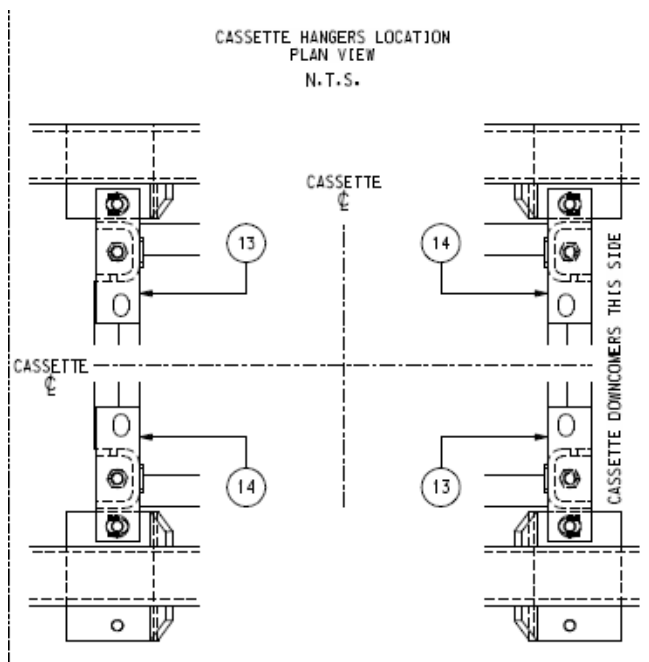
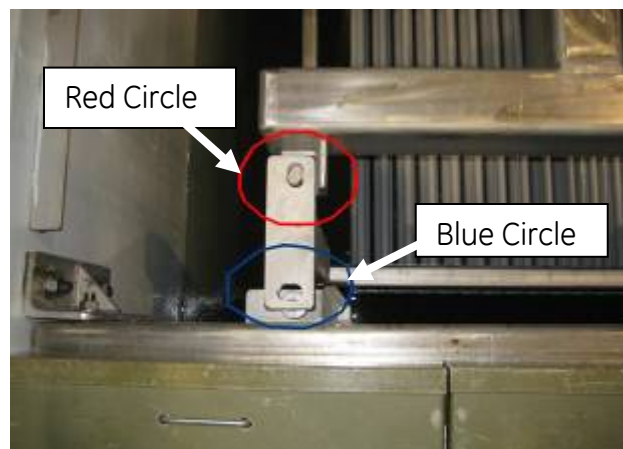
cassette.

There are regular and mirror image version of the arms. Care should be taken to ensure the correct arm is installed on the correct side of the



Note the position of the open end of the hanger arms and the position of the small tab at the bottom. Also note that the hanger arms on the diagonal from each other are identical and hanger arms adjacent to each other are opposite in orientation.

Note there are two different types of slots at the tops of the arms. In the picture below, the slot that faces towards the centre of the cassette is for the 500D lifting arm to attach to. This slot is elongated perpendicular to the cassette support beam, and is offset from centre towards the middle of the cassette (red circle). The other slot, designed to sit on the support beam, is elongated parallel to the beam (blue circle).



Safety Risk Assessment Recommendations for Cassette Arm Installation

Risks	Risk Mitigation
-Risk of being struck by, struck against, caught on the cassette	- area to be cleared of by-standers, be aware of sharp edges
-Risk of falling cassette	- cassette to be lifted only to clear obstacles
- risk of falling into cassette tank	- fall protection equipment required
-Risk fall hazard	- ensure any glycerin spills/leaks are cleaned immediately

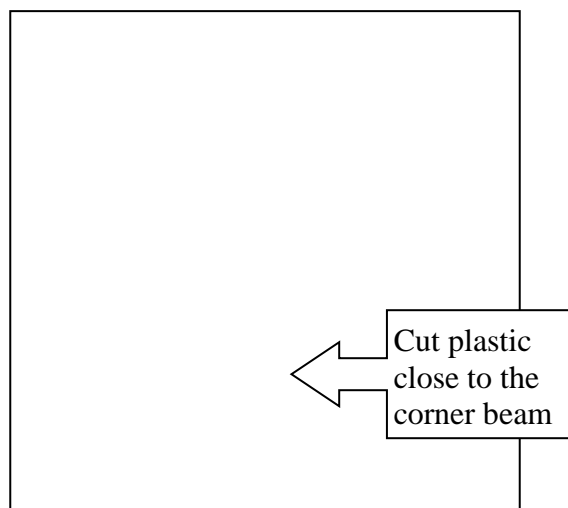


15.0 Removing the Plastic Wrapping

Cassettes are shipped with plastic wrap around the fibres. It must be removed carefully so that the membrane fibres are not cut. To remove the plastic, cut the plastic close to the corner beam as shown in the picture. Discard the plastic following its removal.



CAUTION!!!
Be sure to cut along the corner beam to prevent fibres from being damaged. Do not cut plastic bag along the membrane area.



Safety Risk Assessment Recommendations

Risks	Risk Mitigation
-Risk of being caught on, caught between cassette parts	- use care during inspection, be alert to pinch points
-Risk of contact with knife	- be alert to possible cut hazard



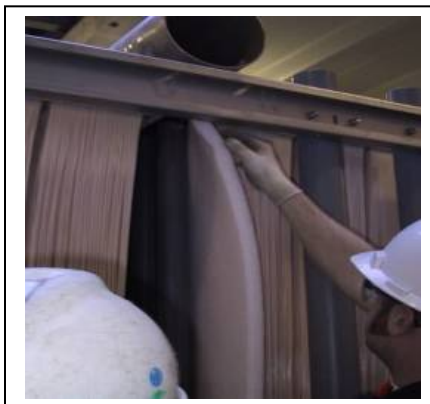
15.0 Removing the Protective Foam

Cassettes are also shipped with protective foam placed against the 2" vertical permeate down pipes on the backside of the cassette. This foam is used to prevent fibres rubbing on the pipes during shipping.

Before removing the foam, visually inspect for any tangled fibres or fibres stuck to the foam. Carefully and slowly, pull the foam out from within the cassette.



Use extreme caution when pulling out the protective foam to ensure no damage to the membranes!



16.0 Inspecting the ZW500d Cassette – Inspection #2

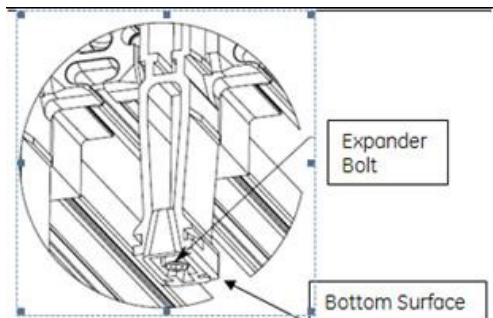
The second inspection consists of the following:

- Before installing the cassette into the membrane tank, it is important to inspect the cassette for loose or missing nuts and bolts. Please refer to 500d Torque Specifications found on the general arrangement drawings.
- ensure there are no rust spots on the cassette frame welds.
- ensure all MIS strips are installed (Drinking Water Applications 20/64M only)
- ensure the module keys are in the locked position (vertical)
- Record the serial numbers of each membrane module on the cassette. When placed into tank, record the membrane location in the tank.
- Should the cassette have aerator end caps, ensure they are properly clipped into the metal frame

For Waste Water Applications, ensure that the top and bottom expander blocks are tight, fully engaged and flush with the bottom surface of the key side outer assembly. Should the blocks need adjustment, follow the below alternating one side then the other side sequence using a 5mm Allen or hex wrench,

Starting with the left outer wedge, tighten all top and bottom key side outer support expanders in an alternate pattern – ie 1st left outer wedge, then 1st right outer wedge. Continue tightening in this alternating pattern until you reach the middle. Try not to overtighten these wedges and use caution that no contact is made with the fibers.

Expander is fully engaged when flush with the bottom surface of the key side outer assembly or maximum torque of 5.0 Nm (3.6 ft-lbs, 44 in-lbs)





On cassettes with aerator end caps, check bottom aerator end caps are clipped into the metal frame of the cassette



For WW Applications, ensure that the top and expander blocks are tight, fully engaged & flush bottom surface of the key side outer assy.

17.0 Installation of the ZW500d Cassettes in the Membrane Tank

After the cassette has been fully inspected, the cassette can be installed in the membrane tank. Please note there must be enough potable water in the membrane tank such that no fibres will be exposed to air once the cassette is installed.

The lifting arm is moved using the crane to overtop of the cassette. The pins at its four corners slide into the hanger arm slotted hole facing the inside of the cassette. Once the pins are through the slotted holes, either a hitch pin must be passed through the lifting bracket pins or depending upon the cassette version, a split ring collar may be used to secure the lifting bracket to the cassette.



Safety Risk Assessment Recommendations for Cassette Installation

Risks	Risk Mitigation
-Risk of being struck by, struck against, caught on the cassette	- area to be cleared of by-standers, be aware of sharp edges
-Risk of falling cassette	- cassette to be lifted only to clear obstacles - ensure crane supports lifting bracket weight independent of hardware
- Confined Space Entry if tank entry required	- confined space entry training and procedures to be followed
- risk of falling into cassette tank	- fall protection equipment required
-Risk fall hazard	- ensure any glycerin spills/leaks are cleaned immediately

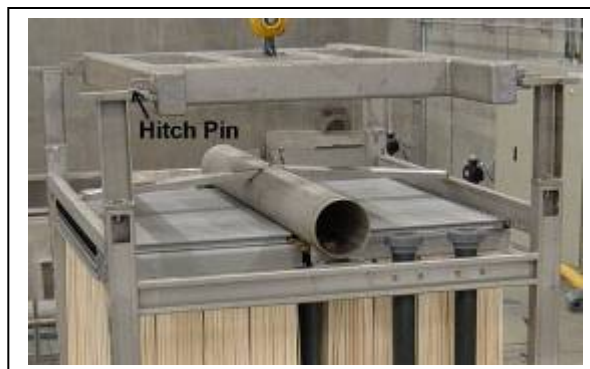


Using the hoist and lifting bracket carefully lift the cassette and install it onto the leveling pins inside the membrane tank. Ensure a constant tension is maintained as any slack on the crane hoist will result in the lifting bracket falling out of the slots.

The hitch pins or split ring collars are not designed to support the weight of the lifting brackets.



During lifting the cassette is to be guided by the cassette stainless steel supports only. Never touch the membranes!!!



18.0 Installation of the Permeate and Air Connections

With the cassette in the tank, the permeate and aeration connections must be completed. See the picture of a cassette before connections have been completed.



Do not to allow any glue or solvent to fall onto the fibres or cassette as irreversible damage will result. Protect fibres and PVC Piping from spills!



Safety Risk Assessment Recommendations for Installation of Permeate/Air Connections

Risks	Risk Mitigation
-Risk of being caught on, caught between cassette parts	- use care during inspection, be alert to pinch points
-Risk fall hazard	- ensure any glycerin spills/leaks are cleaned immediately
- Environmental exposure hazard	- avoid breathing PVC glue fumes, work in a well ventilated area
- Overexertion hazard	- use correct posture and positioning during installation



18.1 Permeate Connection

The permeate piping is connected by installing a coupling which will join the cassette to the rest of the permeate header. The coupling will either be a 4" or 8" size depending on the application. Also depending on the application, the permeate header may come through the tank wall and straight to the cassette header (picture above) or it may be located above the cassettes and have to be piped down from the top of the tank to the cassette header (picture below). Either way, the following steps should be taken in order to minimize the installation time and reduce the amount of work done after membranes are installed in the tank.

1. Just before dropping the cassette onto the leveling pins, mount the coupling to the cassette header and the pipe spool that connects to the other side of the coupling
2. Tighten the coupling so that it can support the weight of the spool piece
3. Lower cassette onto leveling pins
4. Install remaining spool pieces and couplings to connect to main permeate header. Remove the lifting bracket if it gets in the way of the work.



While installing the remaining couplings and spool pieces after cassette is in the tank, make sure that no-one steps on the membrane modules. It is acceptable to step on the cassette header and frame only!!



For systems where the permeate header is installed through the wall of the tank and is aligned with the cassette header, place the coupling on the section of the permeate header sticking through the tank wall, then lower the cassette onto leveling pins, then slide the coupling so that it catches both pipes and tighten.

18.2 Air Connection

Each cassette is provided with 1 x 3" air connections, depending on cassette and aeration type. These air connections provide air to the bottom centre aeration channel that distributes air across the cassette via smaller aeration devices.

- 16M & 20M Cassettes – these cassettes have a 1" x 3" FNPT SS air connection. A 3" union should be attached to connect the cassette to the main air header via an air spool (hose, PVC or SS).
- 48M Sequential Cassette – this cassette type has 2 x 3" PVC pipe air connections that should be connected via 3" union to the main air header via an air spool (hose, PVC or SS)
- 48M LEAPmbr Cassette – this cassette type has 1" x 3" PVC air connection that should be connected via 3" union to the main air header via an air spool (hose, PVC or SS)
- 64M – these cassettes have a 2" x 3" PVC pipe air connections that should be connected via the 2 x 3" union to a 1 x 4" union custom spool piece ordered from the factory. The 1 x 4" connection can then be connected to the main air header via an air spool (hose, PVC or SS).

Always refer to the latest version of the "approved for construction" drawings

Aeration Hose Connection

Follow the following steps for aeration hose connection – note may be Flex Hose Connection or Hard Pipe Connection.

1. Ensure permeate piping completely and all aeration connections at the cassette should be completed before lowering cassette.
2. Lower cassette onto leveling pins and remove lifting bracket if necessary to make room to work.
3. Complete aeration connections to header as per Approved for Construction drawing – connections can vary.



	<div>SERV-0003 500d</div> <div>Uncrating and Installation</div> <div>Instructions</div>		SERV-0003	
			AE Revision	05-Jan-2018 Date
			Page 31 of 31	

19.0 Membrane Installation Documentation

SUEZ WATER FSR is to record all serial numbers and membrane locations. This information is to be recorded in the membrane map form. Please refer to SERV-0009 ZW Membrane Map and Repair Log.

APPENDIX F3

Checklists

COMMISSIONING PLANNING CHECKLIST

Project Name:

Project #:

Customer Organization:

Project Manager:

Customer Contact:

Traveller(s):

Site Address:

ADMINISTRATIVE	Complete?	Date Completed	Incomplete Items & Comments
A1 SDSP (Short Duration Safety Plan) Pre-Mobilization tab has been checked and agreed by SUEZ			
A2 Special Personal Protective Equipment (PPE) requirements			
A3 Site access and hours			
A4 Adequate lighting in day / night			
A5 The crane for ZW membrane installation has been tested and ready for use			
Notes:			

PROCESS	Complete?	Date Completed	Incomplete Items & Comments
B1 Raw water is available			
B2 Does the feed water meet contract specifications? Such as: Turbidity, SDI, Temperature, quality (current water samples/analysis?)			
B3 Is potable water available for testing? How much, flowrate, from where?			
B4 Recirculate permeate or permeate to drain for controls testing?			
B5 Drainage system for testing/commissioning water is completed and ready with enough capacity?			
B6 Is there any environmental permit required for flushing/concentrate flow/RO rinse/testing/commissioning waste water drain?			
B7 Are waste systems ready to accept concentrated waste and spent cleaning solutions? Low and High pH, biocides, etc.			
B8 Membrane preservative disposal plan is clear (If applicable)			
B9 MBR - Seeding plan (if applicable) is available			
B10 MBR - The seeding sludge is coming from a similar plant and does not contain any harmful matter			
B11 MBR - The seeding sludge is enough for seeding based on the commissioning schedule			
B12 MBR - The seeding sludge concentration is good for seeding			
B13 Chemical systems are ready for first fill (sodium hypochlorite, citric acid, sodium hydroxide, sodium bisulfite, antiscalant, HCL, etc.), but please do not fill with chemical until Suez has tested chemical skids with water.			
B14 Criteria to permeate to Clearwell/Distribution, permits required?			
B15 Water sampling and analysis plan is clear			
Notes:			

MECHANICAL	Complete?	Date Completed	Incomplete Items & Comments
C1 UF / MBR - the Prescreen installed and has the proper size			
C2 UF / MBR - Tank coating complete and inspected?			
C3 UF / MBR - Membrane tank dimensions have been confirmed against SUEZ engineering drawings.			
C6 Review Membrane Pre-Installation Checklist.			
C7 Piping and tanks checked for leaks before commissioning begins.			
C8 Raw water pipe flushing plan is agreed			
C9 All other piping and tanks free of debris prior to commissioning			
C10 Rotating equipment (pumps, blowers, etc.) – Alignment completed and report submitted to SUEZ, oil/grease added as indicated in Operation and Maintenance (O&M) manuals, and equipment left uncoupled for commissioning representative to verify rotation.			
C11 Mechanical installation work (not including membrane installation) is completed.			
C12 Review membrane storage, pre-installation checklist and membrane installation procedure. Ensure membranes will be accessible for installation.			

Notes:

ELECTRICAL	Complete?	Date Completed	Incomplete Items & Comments
D1 Main power is available to operate all equipment			
D2 Electrical installation work is completed.			
D3 All rotating equipment has correct rotation			
D4 Network connection between PLC panels and to any required networks is complete			
D5 High speed internet availability to control panel before commissioning begins – For programmer dial in support and Insight if required.			

Notes:

OTHER INFORMATION OF NOTE

Notes:

COMMISSIONING PLANNING MEETING ACKNOWLEDGEMENT (TYPE IN NAMES BELOW):

Commissioning Representative: Date:

Commissioning Support/PM: Date:



PRE-COMMISSIONING CHECKLIST

Project Name: Project #:

Site Location: Project Manager:

Completed By: Date:

GENERAL ITEMS

1.3 Mechanical Installation	Completed?	Comments
1.3.1 Compressed air lines for valves, pumps and other equipment purged to ensure no debris present		
1.3.2 Mechanical construction work (not including membrane installation) is completed		
1.3.3 Equipment (pump and motor bases, tanks, skids, etc.) is anchored and grouted if required		
1.3.4 Pumps are free from stress caused by the piping		
1.3.5 All Rotating equipment oiled and greased as indicated in the Operations and Maintenance (O&M) manuals		
1.3.6 Alignment of all rotating equipment complete (pump, blower, compressor, etc.) with report submitted to Suez		
1.3.7 All rotating equipment has correct rotation		
1.3.8 All rotating equipment has been coupled		
1.3.9 All the equipment is free of damage		
1.3.10 Percentage completion of mechanical installation and how much time remains until commissioning can commence		
1.3.12 Air lines are completed as per P&ID's (if applicable)		
1.3.13 Air lines have hand valves in the low spots to allow water to drain		
1.3.16 Ensure air relief valves are installed at the high points in lines		
1.3.21 Utilities (air, service water, steam, etc.) have been flushed up to the system battery limits.		
1.4 Piping Configuration	Completed?	Comments
1.4.1 Is the system interconnecting piping complete and properly installed as per drawings?		
1.4.2 Piping joints glued properly and flanges torqued to proper specifications		
1.4.3 Has system interconnecting piping passed a hydro or pressure test?		
1.4.4 Are the permeate tanks, transfer systems ready for permeate?		
1.4.5 Piping supports appear to be adequate. Weight of water in the piping will be supported.		
1.5 Electrical and Wiring	Completed?	Comments
1.5.1 Main power is available to operate all equipment		
1.5.2 Are the appropriate power cables/conductors to the cabinets terminated and ready to be energized?		
1.5.3 Aerzen blowers: Discuss wiring considerations with contractor for units with tilting motors. Enough slack should exist for the motor to tilt, and the proper conduit entries should be used in the blower enclosure and connection box on the motor.		
1.5.5 What percentage of devices are terminated in the field?		
1.5.6 What percentage of devices are terminated in the panel?		
1.5.9 Ensure all analog cables are run separately from 120V (or higher) power wires		
1.5.10 Ensure network communication wires between panels (if applicable) are wired i.e.. Devicenet, Controlnet, Ethernet, fiber optics		
1.8 Chemicals	Completed?	Comments
1.8.1 Are the necessary chemicals onsite for commissioning, system sterilization and operation? (i.e. antiscalant, bisulfite, HCl, Caustic, etc.)		

1.9 Permits, Environmental Health & Safety (EHS) requirements, Badging	Completed?	Comments
1.9.1 Are there any Environmental, Health & Safety (EHS) requirements or issues that SUEZ should be aware of? SDSP (Short Duration Safety Plan) has been checked and agreed by Suez?		
1.9.2 Proper water distribution and discharge permits in place (if applicable)		
1.9.3 Water sampling and analysis plan is clear. Equipment is available, and the schedule and responsible party(s) are understood.		
1.9.4 Is site badging required?		
1.9.5 Personal Protective Equipment (PPE) requirements onsite (please list)		
1.9.6 Site access and site hours (working alone)		
1.9.7 Site indoors or outside? Any further protection needed?		
1.9.8 Adequate lighting during day / night		
1.9.9 Have the safety showers been completed and tested?		

ITEMS IDENTIFIED BY TECHNOLOGY

2.1 UF/MBR	Completed?	Comments
2.1.2 Hoist/crane is fully functional for membrane installation (tested and ready). Crane is the correct size to handle lifting a sludged cassette that is fully-loaded with modules. Crane confirmed to reach every cassette slot. Crane confirmed to have enough vertical clearance underneath to fit cassette. Crane cable length is sufficient to reach cassette at the lowest location a cassette will normally be picked up		
2.1.3 Membrane cassette pre-installation checklist and installation procedure has been discussed with contractor		
2.1.4 Blower piping purged with air and free of debris		
2.1.5 Compressed air lines for vacuum ejector are cleaned and ready (if applicable)		
2.1.6 Grating and handrails are installed on tank to ensure a safe working environment during membrane installation and no further modifications are required to the grating or handrails		
2.1.7 Membrane, backpulse, and any other tanks that may be connected to the SUEZ system are cleaned and are free of debris before filling with potable water for membrane installation		
2.1.9 Feed water screen (or strainer) installed and will be operating properly in time for commissioning		
2.1.10 The size of the openings in the feed water screen (or strainer) verified according to Suez standard		
2.1.11 Membranes are properly unloaded and stored onsite. The membranes must be easily accessible and transported to a staging area before installation		
2.1.12 The following parts are available and onsite: <i>For ZW 500 this includes: (confirm with general arrangement, spool drawings, and installation procedure)</i>		
◦ Split collars		
◦ Cassette hanger arms, bolts, nuts and Nord-Lock washers		
◦ Cassette hanger arm braces, bolts, nuts and washers (if applicable)		
◦ PVC elbows, pipes		
◦ Permeate and aeration pipe/hose		
◦ Hose clamps (if applicable)		
◦ Camlock fittings (stainless steel and PVC) (if applicable)		
◦ Straub/Norma/YN coupling connections		
◦ Fiber repair kit		
◦ 4 x lifting rings		
◦ Cassette lifting bracket and four hitch pins for lifting bracket pins (9/64" diameter such as part # 92391A778 from www.mcmaster.com)		
◦ Module removal tool		
◦ Module blank headers		
◦ Module test fittings, pressure decay test kit, repair tank (Optional)		
◦ MIS strip tool (for 64 element modules)		
2.1.13 Potable water available for clean water testing? How much and from where?		
2.1.14 Recirculation loop available for testing, or permeate to drain?		
2.1.16 WASTE WATER: Has a seeding plan been developed?		
2.1.17 WASTE WATER: Where is the seed coming from and is any cross-contamination possible? How will it be screened prior to discharge into the MBR tanks? Bypass/overflow of the screen should not be directed to the MBR. Note: At a minimum, a 2 mm punch-hole or woven-wire screen should be used. Wedge-wire (grooved) screens are not acceptable. Screen type should be confirmed with SUEZ process engineer to confirm it is adequate.		

- 2.1.18 WASTE WATER:** The quantity of seed has been calculated and will be available.
- 2.1.19 WASTE WATER:** The seed concentration is good for seeding
- 2.1.20** With respect to cassette lay down areas, both on the tank and off the tank, check that the surfaces can handle the maximum weight of the cassette. Check for possible point loading issues for all cassettes (in particular 500D and ZeeLung cassettes). Are there plans or restrictions on where a cassette can be lowered.

3 General



MEDIA PRE-INSTALLATION CHECKLIST

Project Name: _____

Project #: _____

To be completed before media installation.

Purpose: To obtain written confirmation from the customer that the necessary tasks have been completed to ensure safe and successful installation of the media.
The following tasks **MUST** be completed, signed off, and this checklist forwarded to the SUEZ project manager for approval before the installation of the media can take place.

1.0 ZW500 ZW1000 Membranes	Date Completed	Customer Initials	Comments
1.1 Mechanical construction work (not including membrane installation requirements) above or near the membrane tanks is completed, and all construction debris with potential to fall into tanks has been removed.			
1.2 Electrical work above or near the membrane tanks is completed.			
1.3 Membrane support I-beams installed in each tank and bolted down as per Suez drawings (if required).			
1.4 Leveling pins and/or beams and/or wall brackets installed and leveled (shim if required). See GA drawing for details.			
1.5 Hoist has been load tested and is fully functional for membrane installation. Hoist is capable of reaching each membrane location.			
1.6 Feed lines thoroughly flushed free of debris (weld and PVC shavings, oils, etc.). Where applicable, feed line strainer or temporary screen is fully functional.			
1.7 Permeate / backpulse header flushed with clean water. (To be completed with help from Suez Commissioning Representative).			
1.8 Blower piping purged with air and free of debris. (To be completed with help from Suez Commissioning Representative).			
1.9 Where membrane integrity testing (MIT) is applicable, air lines have been purged with compressed air and are free of debris. (To be completed with help from Suez Commissioning Representative).			
1.10 Compressed air lines for valves purged to ensure no debris present.			
1.11 Grating and handrails are installed on tank to ensure a safe working environment during membrane installation, and no further modifications are required to the grating or handrails.			
1.12 Mobile working platform installed, operational and safe for use during membrane install (if applicable).			
1.13 Membrane, backpulse and CIP tanks are cleaned and free of debris before filling with potable water for membrane installation.			
1.14 Membrane cassette temperature indicators inspected and found to be intact (located on the side of each cassette crate). Non-conforming indicators to be reported.			
1.15 Membrane tank coating inspected if applicable.			
1.16 Concrete membrane tanks have passed a hydraulic leak test.			
1.17 Provide a clean and clutter-free staging area for membranes and related parts in preparation for installation.			
1.18 Concrete membrane tank dimensions have been confirmed to match Suez drawings.			
1.19 Installation instructions reviewed and tools and parts required are accounted for and ready for use.			

Media pre-installation checklist complete

Customer Representative



























Date

APPENDIX F4
Draft Commissioning Schedule

ID		Task Name	Duration	Start	Finish	Jun '21	3rd Quarter	Jul '21
1		SUEZ TYPICAL PLANT COMMISSIONING	30 days	Tue 6/1/21	Tue 7/6/21			
2		TENTATIVE COMMISSIONING START DATE	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
3		To Be Completed By Client Before Commissioning Starts:	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
4		Mechanical Work	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
5		All Motors Aligned and coupled (provide report to SUEZ)	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
6		All Pumps/Blowers/Compressors Oiled and Greased	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
7		Lifting device ready for membrane loading	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
8		All "client" feed channels cleaned out	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
9		All "client" piping tested for leaks	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
10		All piping has been pressure tested and adequately supported	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
11		All tanks clean	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
12		Potable water available for chemical flush in chemical tanks	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
13		Tanks filled with clean water	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
14		Feed screen fully operational	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
15		Electrical Work	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
16		Electricians continuity checks complete (provide report to SUEZ)	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
17		Power for MCC/PLC is ready to turn on	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
18		Communication cables terminated- SUEZ PLC and other panels	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
19		Other	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
20		Safety Equipment onsite (Fall Arrest, Confined Entry)	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
21		Personnel and Equipment available to perform required lab work	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
22		Chemicals Available (cleaning and process)	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
23		Membranes easily accessible when required for installation	0 days	Tue 6/1/21	Tue 6/1/21	6/1		
24		Planning with SUEZ	0 days	Tue 6/1/21	Tue 6/1/21	6/1		

Project: English River WWTP_Commi Date: Wed 7/22/20	Task		Rolled Up Milestone		Inactive Task		Manual Summary Rollup		Progress	
	Split		Rolled Up Progress		Inactive Milestone		Manual Summary		Deadline	
	Milestone		External Tasks		Inactive Milestone		Start-only			
	Summary		Project Summary		Inactive Summary		Finish-only			
	Rolled Up Task		External Milestone		Manual Task		External Tasks			
	Rolled Up Split		External Milestone		Duration-only		External Milestone			

ID		Task Name	Duration	Start	Finish		Jun '21	3rd Quarter	Jul '21
49		Valves	0.8 days	Fri 6/11/21	Sat 6/12/21				
50		Stroke all valves from computer interface	4 hrs	Fri 6/11/21	Fri 6/11/21				
51		Set limit switches (If applicable)	2 hrs	Fri 6/11/21	Fri 6/11/21				
52		Adjust Open/Close Timing	2 hrs	Fri 6/11/21	Sat 6/12/21				
53		SYSTEM FLUSHING AND MEMBRANE INSTALLATION	3.6 days	Sat 6/12/21	Wed 6/16/21				
54		Feed System Thoroughly Flushed (by others)	0 days	Sat 6/12/21	Sat 6/12/21				
55		Blower Startup	0.4 days	Sat 6/12/21	Sat 6/12/21				
56		Run Blowers Flushing out Air Lines	2 hrs	Sat 6/12/21	Sat 6/12/21				
57		Run blowers and verify operation curves	2 hrs	Sat 6/12/21	Sat 6/12/21				
58		Prep Backpulse Tank	0 days	Sat 6/12/21	Sat 6/12/21				
59		Ensure Backpulse Tank is Cleaned (by others)	0 days	Sat 6/12/21	Sat 6/12/21				
60		Fill Backpulse Tank with potable water (by others)	0 days	Sat 6/12/21	Sat 6/12/21				
61		Pump Start Up	1 day	Sat 6/12/21	Mon 6/14/21				
62		Run all Pumps from HMI	4 hrs	Sat 6/12/21	Sat 6/12/21				
63		Run all pumps and verify curves	4 hrs	Sat 6/12/21	Mon 6/14/21				
64		Manually Backpulse - Flushing Permeate Header	2 hrs	Mon 6/14/21	Mon 6/14/21				
65		Chemical Injection	1 day	Mon 6/14/21	Tue 6/15/21				
66		Fill tanks with water (by others)	0 hrs	Mon 6/14/21	Mon 6/14/21				
67		Run pumps using water	4 hrs	Mon 6/14/21	Mon 6/14/21				
68		Calibrate Dosage with water	6 hrs	Mon 6/14/21	Tue 6/15/21				
69		Membrane Installation	1.2 days	Tue 6/15/21	Wed 6/16/21				
70		Complete Membrane Pre-Installation Checklist (with contractor)	0 days	Tue 6/15/21	Tue 6/15/21				
71		Membrane Construction & Installation	1.2 days	Tue 6/15/21	Wed 6/16/21				
72		Fill Membrane Tank with Potable Water	0 hrs	Tue 6/15/21	Tue 6/15/21				

Project: English River WWTP_Commi Date: Wed 7/22/20	Task		Rolled Up Milestone		Inactive Task		Manual Summary Rollup		Progress	
	Split		Rolled Up Progress		Inactive Milestone		Manual Summary		Deadline	
	Milestone		External Tasks		Inactive Milestone		Start-only			
	Summary		Project Summary		Inactive Summary		Finish-only			
	Rolled Up Task		External Milestone		Manual Task		External Tasks			
	Rolled Up Split		External Milestone		Duration-only		External Milestone			

English River WWTP_Commissioning Schedule_Draft

ID		Task Name	Duration	Start	Finish	Jun '21		3rd Quarter	Jul '21
73		Organize plan for cassette unloading & lifting	2 hrs	Tue 6/15/21	Tue 6/15/21				
74		Install Cassettes/ Bubble Testing	1 day	Tue 6/15/21	Wed 6/16/21				
75		MEMBRANE TRAIN COMMISSIONING	11.2 days	Wed 6/16/21	Tue 6/29/21				
76		Trains 1 & 2	11.2 days	Wed 6/16/21	Tue 6/29/21				
77		Manual Operation	0.8 days	Wed 6/16/21	Thu 6/17/21				
78		Check all tank level setpoints (including weir heights)	1 hr	Wed 6/16/21	Wed 6/16/21				
79		Run Blower - Check Aeration Pattern	2 hrs	Wed 6/16/21	Wed 6/16/21				
80		Run Recirc/Reject Pumps	1 hr	Thu 6/17/21	Thu 6/17/21				
81		Permeate starting at low flow	2 hrs	Thu 6/17/21	Thu 6/17/21				
82		Backpulse starting at low flow	2 hrs	Thu 6/17/21	Thu 6/17/21				
83		Auto Operation Testing	10.4 days	Thu 6/17/21	Tue 6/29/21				
84		Verify Correct Setpoints - Change if necessary	4 hrs	Thu 6/17/21	Thu 6/17/21				
85		Run ZW in Auto	6 hrs	Thu 6/17/21	Fri 6/18/21				
86		Roughly Tune PID loops	4 hrs	Fri 6/18/21	Fri 6/18/21				
87		Test all Modes of Operation (Production, BP, MC, RC)- Check	4 days	Fri 6/18/21	Wed 6/23/21				
88		Test all alarms and alerts- Check CLSC	5 days	Wed 6/23/21	Tue 6/29/21				
89		PROCESS STARTUP WASTE WATER	3.2 days	Tue 6/29/21	Sat 7/3/21				
90		Seed plant with well screened seed (By others)	0 days	Tue 6/29/21	Tue 6/29/21				
91		Calibrate all Instruments (ie: pH, Cl, etc)	1 day	Tue 6/29/21	Wed 6/30/21				
92		Connect Chemicals to Chemical Pumps	2 hrs	Wed 6/30/21	Thu 7/1/21				
93		Fine Tune PID Loops, plant controls, Process Verification	2 days	Thu 7/1/21	Sat 7/3/21				
94		OPERATOR TRAINING	2 days	Sat 7/3/21	Tue 7/6/21				
95		Operator Training	2 days	Sat 7/3/21	Tue 7/6/21				

Project: English River WWTP_Commi
Date: Wed 7/22/20

Task

Split

Milestone

Summary

Rolled Up Task

Rolled Up Split

Rolled Up Milestone

Rolled Up Progress

External Tasks

Project Summary

External Milestone

External Milestone

Inactive Task

Inactive Milestone

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Progress

Deadline