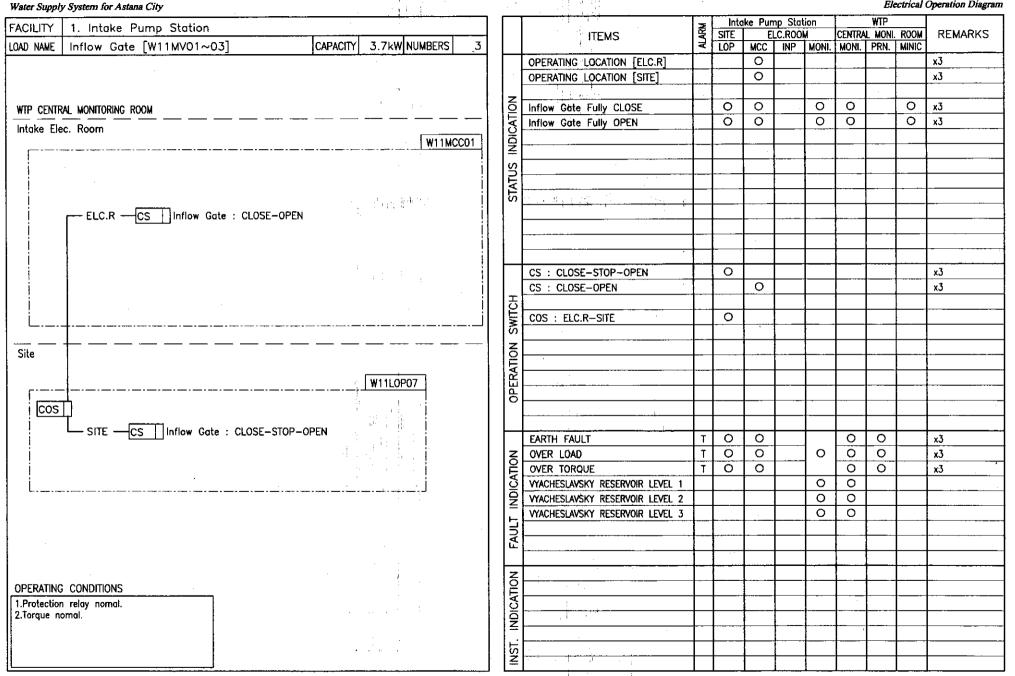
# APPENDIX C ELECTRICAL OPERATION DIAGRAM

# C.1 WATER SUPPLY FACILITIES

# Abbreviation Table

Abbrev	viation Table
CS	Control Switch
COS	Change Over Switch
PBS	Push Button Switch
MCC	Motor Control Center
LOP	Local Operation Panel
LCP	Local Control Panel
INP	Instrumentation Panel
MONI	Monitor
PRN	Printer
RPP	Raw Water Pump Panel
FCP	Flow Control Panel
SCP	Sludge Collector Panel
DPP	Distribution Pump Panel
VVF	VVVF Unit
SG	Switch-gear
INST.	Instrumentation
H.H.	High-high (Emergency High)
L.L.	Low-low (Emergency Low)
T (Alarm)	Trip
WTP	Water Treatment Plant
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C1-2

WTP Intake Pump Station ALARM FACILITY 1. Intake Pump Station CENTRAL MONI, ROOM REMARKS ITEMS SITE FLC.ROOM Raw Water Pump [W11RP11~61] 6(2) MONI. PRN. MINIC 280kW LOP RPP MCC INP MONI. 0 0 0 OPERATING LOCATION [WTP] 0 CAPACITY 0.75kW NUMBERS 6(2) LOAD NAME Suction Valve [W11MV11~61] 0 0 OPERATING LOCATION [INTAKE] 6(2) 0.2kW Discharge Valve [W11MV12~62] NO OPERATING LOCATION [ELC.R] INDICATI 0 0 x6 OPERATING LOCATION [SITE] 3.1 0 0 Row Water Pump START 0 0 0 x6 Discharge Valve : Link with Pump WTP CENTRAL MONITORING ROOM 0 Ó 0 0 x6 0 Row Water Pump STOP STATUS INTAKE ELC. ROOM 0 0 0 0 Discharge Valve Fully OPEN x6 W11INP01 0 0 Ō 0 x6 **Discharge Valve Fully CLOSE** - ELC.R ----COS 0 0 Ο x6 Suction Valve Fully OPEN 0 0 0 Suction Valve Fully CLOSE x6 W11RPP01~06 0 ō x6 0 SWITCH. CS : STOP-START 0 0 x6x2 CS : CLOSE-STOP-OPEN INTAKE----CS Raw Water Pump : START-STOP Discharge Valve : Link with Pump OPERATION 0 COS : WTP-INTAKE PBS EMERGENCY STOP O COS : SITE-ELC.R PBS :EMERGENCY STOP 0 0 x6 W11MCC01 [Raw Water Pump] т Ο 0 0 0 EARTH FAULT x6 Suction Valve : CLOSE-STOP-OPEN -lcs l OVER LOAD Т 0 0  $\circ$ 0 0 x6 Discharge Valve : CLOSE-STOP-OPEN CS 0 0 0 0 TEMPERATURE UP Т x6 [Discharge Valve] EARTH FAULT Т 0 0 0 0 x6 SITE W11L0P01~06 ₫ Т 0 0 0 Ó. 0 OVER LOAD x6 Т 0 0 0 0 x6 OVER TORQUE COS ā [Suction Valve] -SITE Т 0 0 0 0 EARTH FAULT x6 Ο OVER LOAD Т 0 0 Ο 0 CS Discharge Valve : CLOSE-STOP-OPEN x6 ¥ Т 0 0 Ο 0 x6 OVER TORQUE Suction Valve : CLOSE-STOP-OPEN 0 ALARM for PUMP START Т 0 Ο 0 0 PUMP WELL LEVEL L.L. PBS EMERGENCY STOP т 0 0 0 0 x6 EMERGENCY STOP 0 0 0 Ο INTAKE FLOW RATE DROP 0 0 OPERATING CONDITIONS INDICATION AMMETER x6 0 x6 1.Protection relay nomal. RUNNING HOUR METER 2.Reservoir level in pump well above L.L. RAW WATER INTAKE FLOW 0 0 0 0 3.Valve is not over torque. 0 PUMP WELL LEVEL 0 0 Ο 4.Pump is not over load. 5.One of inflow gate is open at the least. INST

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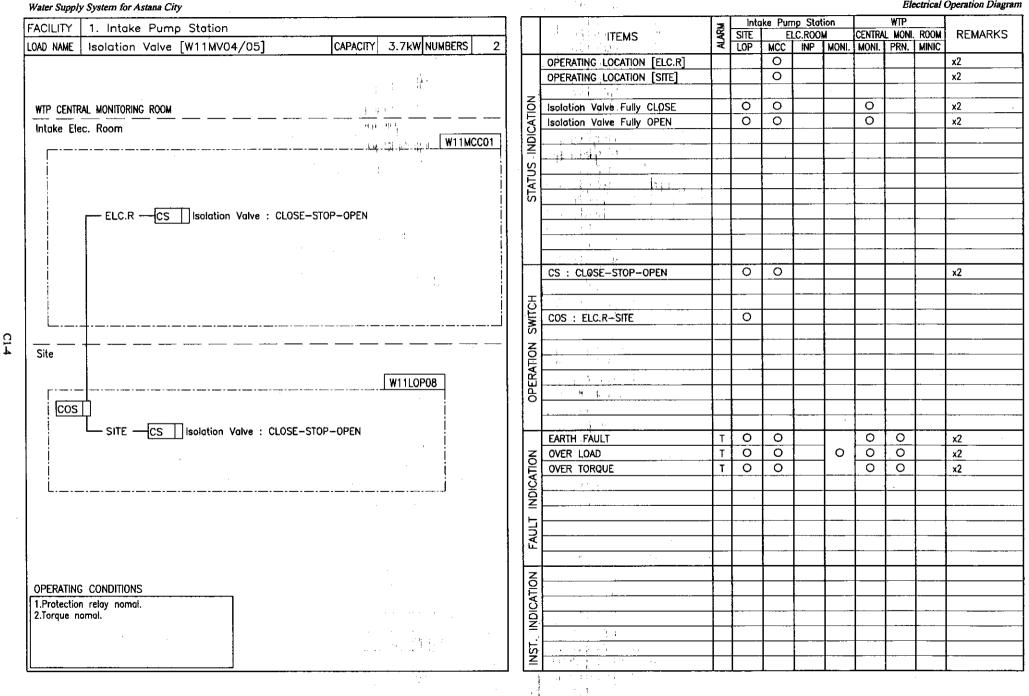
Water Supply System for Astana City

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Electrical Operation Diagram



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Water Supply	System for Astana City											cal Operation
FACILITY	1.Intake Pump Station	i de la de la la		TEMS	Ś	Into	ke Pur	np Stat	ion	OCUTO	WTP	
<u>}</u>	Sump Drainage Pump [W11DP01/02	CAPACITY 5.5kW NUMBERS 2(1)		ITEMS	ALAF	SILE LOP	MCC	np Stati _C.ROON _INP	MONI.	MONI.	L MONI, RO	OM REMA
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WTP CENTR	AL MONITORING ROOM		INDICATION	Sump Drainage Pump START		0	0			0		×2
INTAKE EL			AT	Sump Drainage Pump STOP		0	0			0		x2
		W11MCC01	ă	1. 11. 12. 11								
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	CS Sump	Drainage Pump : STOP-START										
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				CS : STOP→START	+	Ö	0					x2
SITE			품	COS : ELC.R-SITE								
			SWITCH	COS : MANU-AUTO		0						
,		W11L0P09	Š	COS : NO.1-AUTO-NO.2		0						
	AUTO Automatic by S	Sump Drainage Pit Level	Z									
			OPERATION									
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	MANU-CS Sump	Drainage Pump : STOP-START	Ь	;			<b> </b>					<u> </u>
		OF STANDEY : NO.1-AUTO-NO.2		<u>.</u>	-							
		AUTO : AUTOMATIC ALTERNATE RUNNING		EARTH FAULT	┨ <sub>┯</sub>	0	0		<b>[</b>	6	0	x2
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			Z	RUNNING HOUR METER	-	0	<b> </b>	ļ		<u> </u>	<b>↓↓</b> _	x2
	CONDITIONS	the second second	INDICATION						<u> </u>		<u> </u> ·  −	
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## Electrical Operation Diagram

.OAD NAME	Overhead	d Hoist	[W11MH01~03]	CAPACITY 9.0+0.75kW NUMBERS
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INTAKE C	LC. ROOM			
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1		cs	Screening Hoist : UP-STOP-DO	I
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	IG CONDITION on relay nome			

		M	Intoke Pump St			Station C.ROOM		WTP		
	ITEMS	ALARM	SITE	E	LC.ROOI		CENTRA	L MONI.	ROOM	REMARKS
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SWITCH										
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• x · Electrical Operation Diagram Water Supply System for Astana City WTP Intoke Pump Station Intoke Pun SITE V LOP FCP 1.Intake Pump Station FACILITY ELC.ROOM CENTRAL MONI. ROOM REMARKS ITEMS 3.7kW NUMBERS 2(1) CAPACITY LOAD NAME Air Compressor [W12AC01/02] INP MONI. MONI. PRN. INDICATION Air Compressor START 0 0 x2 WTP CENTRAL MONITORING ROOM 0 0 x2 Air Compressor STOP INTAKE ELC. ROOM - p W13FCP01 STATUS 1. 201.00.1.1 0 CS : STOP-START x2 SITE SWITCH COS: : ELC.R-SITE COS : MANU-AUTO 0 W12L0P01 0 COS : NO.1-AUTO-NO.2 OPERATION -AUTO Automatic by Vaccum Tank Level cos MANU--CS Air Compressor : STOP-START COS CHOICE OF STANDBY : NO.1-AUTO-NO.2 EARTH FAULT T 0 Ο 0 x2 AUTO : AUTOMATIC ALTERNATE RUNNING 0 0 Ō x2 OVER LOAD Т INDICATION 0 AIR TANK PRESSURE LOW Ο 0 T AIR TANK PRESSURE HIGH 1 N 1 FAULT x2 INDICATION Ο OPERATING CONDITIONS RUNNING HOUR METER 1.Protection relay nomal. 2.Air tank pressure nomal. INST.

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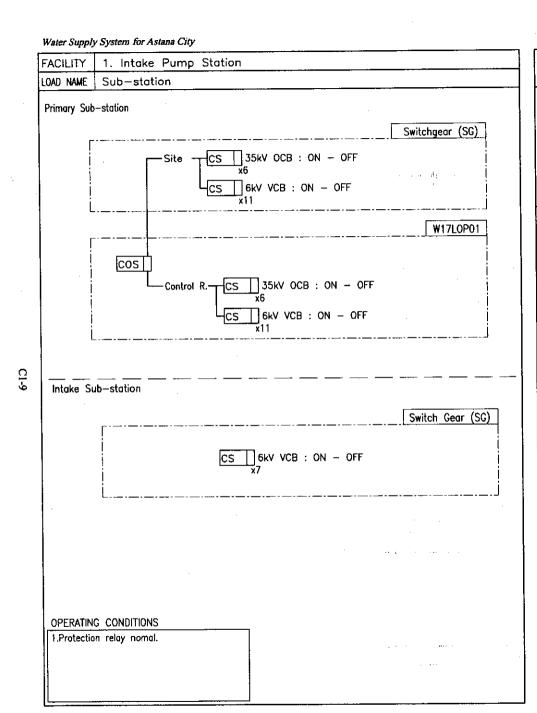
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Electrical Operation Diagram

	Durne Shelfer		2.2kW NUMBERS 1 ITEMS						ſP	1			
FACILITY 1. Intake		<u> </u>			ITEMS	A.	SITE	ELC.R	ÖOM	CE	NTRAL N	ONI. ROOM	REMARKS
LOAD NAME   Flow Con	troi Valve [W13MV01]	CAPACITY	2.2kW NUMBERS 1			R	FOP	MCC IN	P MO	NL MC	ONI. PF	RN. MINIC	
WTP CENTRAL MONITORING	ROOM				OPERATING LOCATION [ELC.R]				_				
THE GENERAL MORITORING	NOOM .				OPERATING LOCATION [SITE]								
	F		:			1							
	CS Flow Control Valve : Tar	get Value Settin	ig Switch	IZ	Flow Control Valve Fully CLOSE		0				0		
			<u> </u>	AT I	Flow Control Valve Fully OPEN		0				0		
Intake Elec. Room				g	Valve Intermediate Position		0			(	0		
				INDICATION		$\vdash$							
				STATUS		1							
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			W11INP01			1					-  -		
				$  \vdash$	CS : CLOSE-STOP-OPEN	+	10		-				<u> </u>
ı İ					CS : Setting Switch	+			+		0		
	CS Flow Control Valve : Ope	ening Degree Ad	justment Switch		CS ; Adjustment Switch	1			5		-*		
i İ				E	CS , Augustment Switch			<u>├</u> ──┼─`					1
Ĺ				SWITCH									1
					L								
				OPERATION	COS : ELC.R-SITE								
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Site				$  \vdash$	EARTH FAULT	ΤT	0	╉───╂──			0	5 - C	1
						$\frac{1}{7}$	0		$\dashv$			5	1
			W13FCP01	<u> </u> ≦	OVER TORQUE	+ <u>+</u>	0		┤`			5	1
				₹	UVER TORQUE	- <sup>1</sup>	١Ť	╉╼╌┠━			<u> </u>		
				INDICATION		+			<u> </u>				<u>.</u>
	CS Flow Control Valve : CLOS	SE-STOP-OPEN				+	-	┼─┼─	_				·
		-		FAULT		┢		+ +					·  ·
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L			J				0		5 -		0		
				Z	OPENING DEGREE			+			-	_	
OPERATING CONDITIONS				INST INDICATION	RAW WATER INTAKE FLOW	+	1 -	+					ł
1.Protection relay nomail 2.Torque nomail						+				+			
2.ronque nomoi.								+		·	<u> </u>	·····	
[]			$\sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} $		- fsi	.		+		-+			
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- 1	■ Intake Pump Station WTP									
	ITEMS	ALARM	Prin	nary		ske	CENTRA		ROOM	REMARKS
	I FEMIS	2	LOP	SG	SG	MONI.	MONI.	PRN.	MINIC	
	[Primary Sub-station]	1								
INDICATION	35kV OCB ON		0	0						x6
ןצ	35kV OCB OFF		0	0						x6
₽	6kV VCB ON		0	0						x11
ا م	6kV VCB OFF		0	0						x11
STATUS	[Intake Sub-station]				_					
히	6kV VCB ON				0	0	0			x7
	6kV VCB OFF	-			0	0	0			x7
	[Primary Sub-station]	+	· · · · · · ·				<u> </u>			
되	CS : ON-OFF		0	0			1			x17
S	COS : CONTROL.R-SITE		õ							x1
g	[Intake Sub-station]	+				<b> </b>				
OPERATION SWITCH	CS : ON-OFF			·	0					x7
빙					ĻŤ					
-	[Primary Sub-station]	+		<u> </u>	<u> </u>					
	EARTH FAULT	T	0	0		1			<u> </u>	x17
	OVER CURRENT	Τ	ŏ	ŏ						x17
No	Power Failure	+	ŏ							x2
Ē		+	0	0		<u> </u>	ł		<u> </u>	x17
ğ	Control Power Down	+	$\vdash$	$\vdash$		<u> </u>	<u> </u>			
FAULT INDICATION	[Intake Sub-station]	Τ	<b> </b>		0	0	6	0	<u> </u>	x7
3	EARTH FAULT	ויר דו	<u> </u>		ŏ	ŏ	Ťŏ	ō		x7
2	OVER CURRENT				$\vdash$	6	0	0		x7 x2
	Power Failure	-	-	<u> </u>	0	0	10	0		x2 x7
	Control Power Down	4-			$\vdash$	<u> </u>	+-∽	<u> </u>		<u></u>
			<u> </u>		<u></u>				<b> </b>	
	[Primary_Sub-station]			-	ļ			<b> </b>		
	AMMETER		0	0	-		<u> </u>			x10
	VOLTMETER		0	0	┣──	<u> </u>		<u> </u>		x4
Z	WATT METER		ļ		<u> </u>					x10
INDICATION	WATT HOUR METER			0	<u> </u>	<b></b>			<b> </b>	x10
Ö	POWER FACTOR METER	4	0	0	<b> </b>		<u> </u>		<u> </u>	x2
g	[Intake Sub-station]	1	<b> </b>	<u> </u>	<b> </b>	<u> </u>	<u> </u>	<b> </b>	<u> </u>	<u> </u>
	Receiving AMMETER		<u> </u>		0	0				×2
ST.	Receiving VOLTMETER	·	L	<b></b>	0	0	0	<b> </b>		x2
Ţ	Receiving POWER FACTOR	4		1	0	0	<u> </u>		ļ	<u>x2</u>
	AMMETER	$\perp$	<b> </b>	ļ	0	0		Į	1	x4
	VOLTMETER				0	0	<u> </u>			x2
ļ	WATT METER				0		<u>                                      </u>		<u> </u>	x4
	WATT HOUR METER		<u> </u>		0		<u> </u>		I	x4
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Electrical Operation Diagram

REMARKS

CENTRAL MONI. ROOM MONI. PRN. MINIC

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Water Sun	bly System for Astana City							
		<del></del>	r			<u></u>		ater Tr
FACILITY				ITEMS	ALARM	SITE	EL	LC.ROO
OAD NAME	Inflow Control Valve [W31MV01/02]	CAPACITY 2.2kw NUMBERS	2		×	LCP	MCC	. INP
				OPERATING MODE [AUTO] OPERATING MODE [MANU]				
WTP CEN	TRAL MONITORING ROOM							
			INDICATION	Inflow Line [No.1]				
	CS Inflow Control Valve : Open	ing Degree Adjustment Switch	ĮĘ	Inflow Line [No.2]				
D'-1-'1		·	—   ğ					
Distribut	ion Chamber					0		i
1			L SD	Inflow Control Valve Fully OPEN	+	0	$\mid$	<u> </u>
		W31LCP01	STATUS	Valve Intermediate Position		0		
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		d Elem					<b> </b>	<u> </u>
	AUTO Automatic by Inflow Pressure ar						· ·	
		i i						
Í	MANU-CS Inflow Control Valve : (	CLOSE-STOP-OPEN		CS : CLOSE-STOP-OPEN	<b>_</b>	0		<b> </b>
				CS : CLOSE-OPEN	<b>_</b>			<u> </u>
	COS Inflow Line : No.1-No.1	2	Ē	CS : Adjustment Switch	–	<u> </u>		
			SWITCH	COS : AUTO-MANU	+	0	┢───┦	
<u> </u>						0		
			OPERATION					
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	-	•			$\frac{1}{T}$	0	<b> </b>	
				EARTH FAULT		0		-
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			<u>S</u>					
			2	Distribution Chamber Level H.H.		0		L
		and the second second second		i see si see si see see see see see see	╞	──	'	
			FAULT			· · · · ·		ŀ
			"		┢	<u> </u>		
				OPENING DEGREE	<u>†</u>	0	<b> </b>	
OPERATI	IG CONDITIONS		INDICATION	RAW WATER DISTRIBUTION FLOW (New	1	0		
1.Protect	on relay nomal.		<u>S</u>	RAW WATER DISTRIBUTION FLOW (OId)		0		
2.Torque	nomal.		. Ž	TOTAL INFLUENT FLOW		0	I	<u> </u>
		· · · · · · · · · · · · · · · · · · ·		INFLOW PRESSURE	+	0	<u> </u>	┣—
			INST.	PROPER INFLOW PRESSURE	+	<u> </u>	<u> </u>	<u> </u>
			1 1=	RAW WATER INTAKE FLOW	1	1	1	1

Water Treatment Plant

ELC.ROOM

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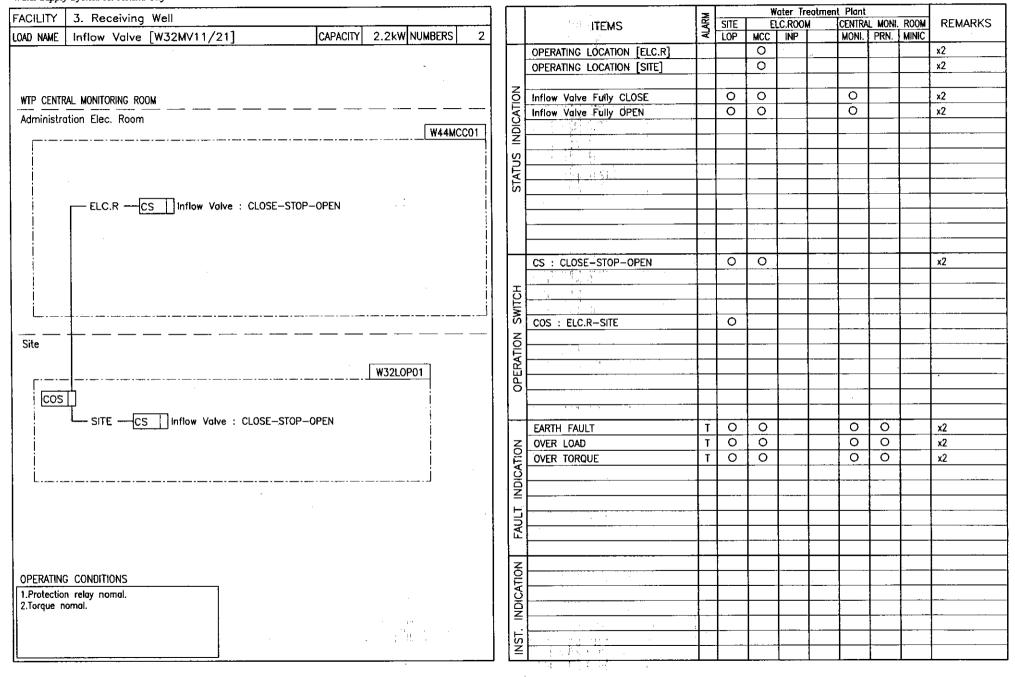
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		1	5	Γ	Y	later Tr	eatmer	nt Plant		]	
ACILITY 2. Distribution Chamber		ITEMS	ĝ	site LCP	Ε	LC.ROO	М	CENTR/	VL MONI.	ROOM	REMARK
AD NAME Distribution Weir [W31MG11~31] CAPACITY 1.5kW NUMBERS	3		₹	LCP	MCC	INP		MONI.	PRN.	MINIC	
VTP CENTRAL MONITORING ROOM		OPERATING LOCATION [ELC.R]						Ţ			
IF CLAINAL MONITORING ROOM	1	OPERATING LOCATION [SITE]									
					1		<b>†</b>				
		Distribution Weir Fully CLOSE		0	1			0			x3
		Distribution Weir Fully OPEN		Ō				Ō			x3
1 - i	<u>`</u>	Weir, Intermediate Position		ō			<u> </u>	ō			x3
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	- SWITCH	COS : ELC.R-SITE				· · ·		+			
		CUS : ELC.R-SHE	<b> </b>		<del> </del>		<u> </u>				
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CS Distribution Weir : CLOSE-STOP-OPEN		· · · · · · · · · · · · · · · · · · ·							l		<u> </u>
		EARTH FAULT	T					0	0		x3
	Z	OVER LOAD	Т	0				0	0		xЗ
		OVER TORQUE	T	0			Ţ	0	0		xЗ
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PERATING CONDITIONS		·	_		<b> </b>		<b> </b>	-	┣──		
1.Protection relay nomal.	NDICATION	· · · · · · · · · · · · · · · · · · ·		1		<u> </u>		<u> </u>	ļ	<b> </b>	
2.Torque normal.							·	Ĺ			
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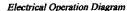
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CI-12

#### Electrical Operation Diagram



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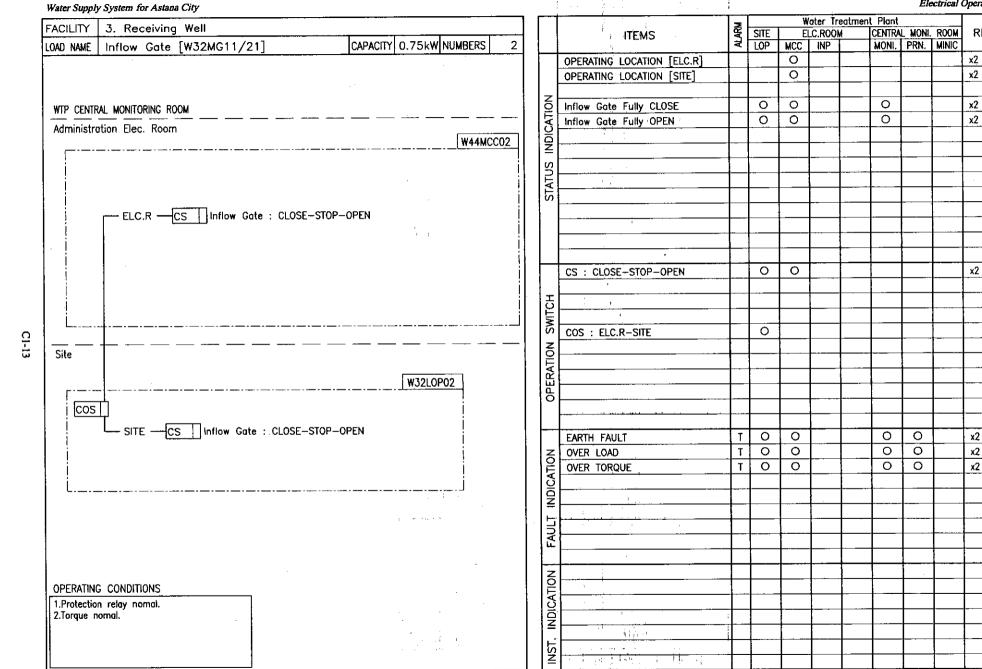
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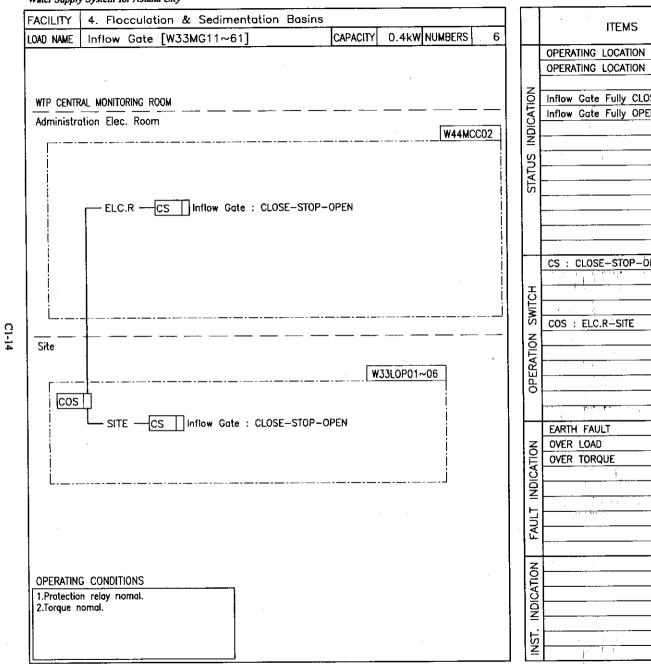
REMARKS



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Water Supply System for Astana City

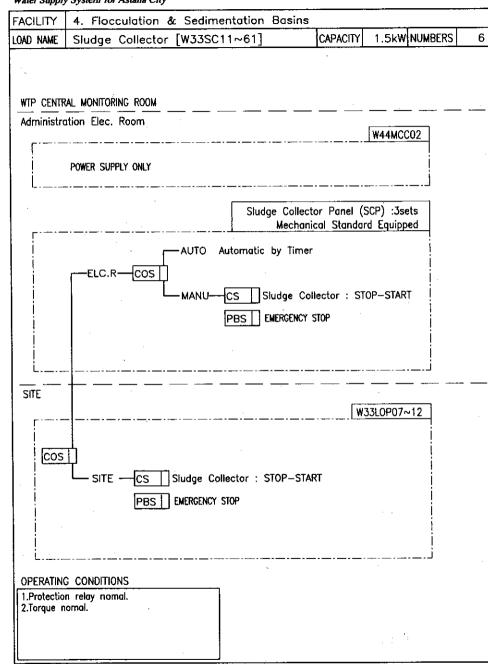


	₩ater Treatment Plant									
	ITEMS	ALARM	SITE LOP	E	C.ROOM	1	CENTRA	l Moni. Prn.	ROOM	REMARKS
			LUP	MCC	INP		MONI.	PKN.	MUNIC	хб
	ATING LOCATION [ELC.R]			0						x6
OPER	ATING LOCATION [SITE]									<u></u>
	Gate Fully CLOSE	<b>-</b> -	0	0			ö			x6
Inflow	v Gate Fully OPEN		0	ŏ			ŏ			x6
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<u> </u>			<u> </u>	$\vdash$						
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		1	<u> </u>				<u> </u>			
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COS	: ELC.R-SITE		ō						[	x6
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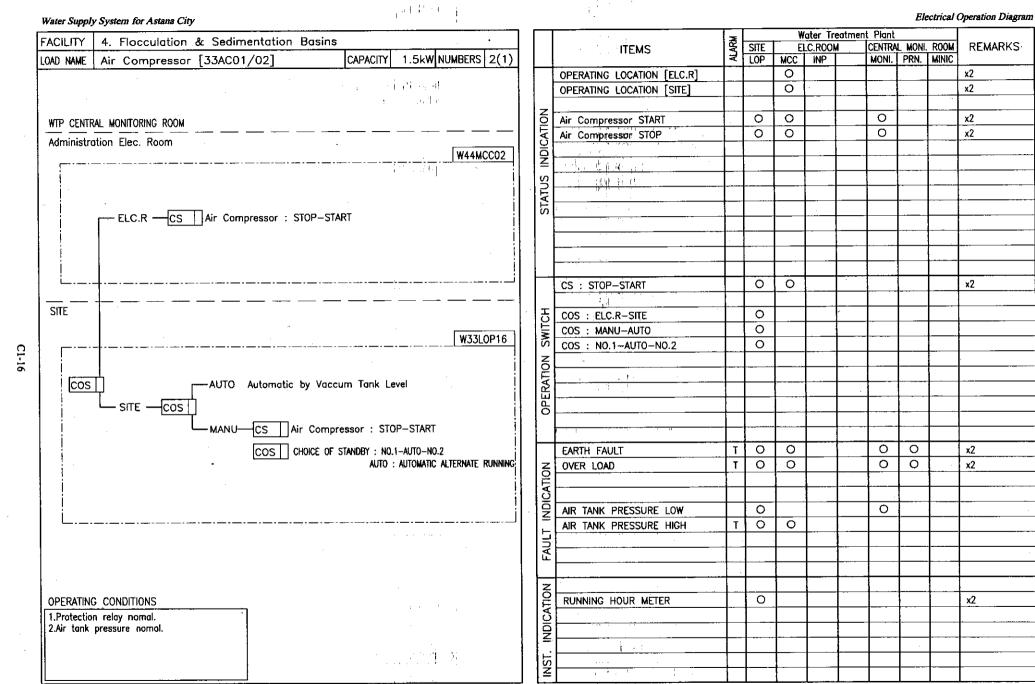
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	ITEMS	ALARM	SITE	Ę	C.ROOI	<u> </u>	CENTRA	L MONI.	ROOM	REMARKS
	·	<u> </u>	LOP	MCC	SCP		MONI.	PRN.	MINIC	
	OPERATING LOCATION [ELC.R]	ļ			0					x6
	OPERATING LOCATION [SITE]	ļ			0					x6
-		<b> </b>								
l⊇	Sludge Collector STOP		0	0	0		0			x6
8	Sludge Collector START:		0	0	0		0			x6
INDICATION										
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STATUS					_					
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		L			<b>_</b>					
	CS : STOP-START		0		0					x6
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문	COS : ELC.R-SITE		0			·				x6
SWITCH	, COS : MANU+AUTO				0					x6
S										
Z,										
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OPERATION	PBS : EMERGENCY STOP		0		0					·
Ĭ										
							<u> </u>			
	EARTH FAULT	T	0	0	0		0	0		хб
Z	OVER LOAD	T	0	0	0		0	0		×6
E	OVER TORQUE	T	0	0	0		0	0		×6
INDICATION							ļ	ļ		
12									L	
	PBS : EMERGENCY STOP	T	0	0	0		0	0		хб
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REMARKS

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Water Supply System for Astana City	1								El	ectrical (	Operation Diagram
FACILITY 4. Flocculation & Sedimentation Basins		$\Box$	ITEMS	ARM	site Lop	W E	LC.ROOM	atment Plo	RAL MON	. ROOM	REMARKS
LOAD NAME De-sludge Valve [W33MV11~64] CAPACITY	NUMBERS 24		OPERATING LOCATION [ELC.R]	A	LÖP	MCC	INP	MON	II. PRN.	MINIC	
			OPERATING LOCATION [SITE]			<u> </u>					
WTP CENTRAL MONITORING ROOM		INDICATION	De-sludge Valve CLOSE		0	L		0			x24
Administration Elec. Room		CAT	De-sludge Valve OPEN		0			0			x24
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			· · · · · · · · · · · · · · · · · · ·								
		STATUS				ļ			_		
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Site	·		l .						_		
		SWITCH				<b>—</b>			_		·
Mechanical Standard Equip	ped	INS								· · · · ·	
				+							
De-sludge Valve (Solenoid Valve) : CLOSE-OPEN	4	OPERATION	· · · · · · · · · · · · · · · · · · ·								
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		INDICATION	· · · · · · · · · · · · · · · · · · ·	+					_		
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OPERATING CONDITIONS	i.	CATI		+		<u> </u>	$+ \cdot +$				
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		<sup>≢</sup>		<u> </u> .	<u> </u>		$\left\{ \begin{array}{c} 1 \\ 1 \end{array} \right\}$			1	
	4. · ·	INST. INDICATION	terreterreterreterreterreterreterreter	+			+ - +		+		· · ·
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			nda 1. – Angel							Electrical	Operation Diagr
ater Supply System for Astana City	m					V	later Tre	atment	Plant	Electrical	
ACILITY 4. Flocculation & Sedimentation Basins			ITEMS	Age 1	site Lop	E	LC.ROOM	C	<b>ENTRA</b>	MONI. ROOM	REMARKS
AD NAME Sump Drainage Pump [33DP01to04] CAPACITY 1.5kW NUMBERS	4(2)			₹	LOP	MCC	INP		MONI.	PRN.	
				1							
							<b>↓</b>				
		z	Sump Drainage Pump START		0	0	<b>!</b>		0		x4
WTP CENTRAL MONITORING ROOM			Sump Drainage Pump STAR		ŏ	ŏ	· ·		ŏ		x4
Administration Elec. Room		ŝĻ	Sump Branage Fump erer	- · · ·	-		· · -				
W44MC		ĭ⊒∣⊤		1							
		sΓ									
		STATUS									
		5									
CS Sump Drainage Pump : STOP-START		-		_						· · ·	
				-							
		⊢		+							
	⊣  نـــــ		CS : STOP-START	+	0	0					x4
· · · · · · · · · · · · · · · · · · ·		F		1							
NTE		रुति	COS : ELC.R-SITE								
W771 0D 41			COS : MANU-AUTO		0						x2
W33L0P1	11 1		COS : NO.1-AUTO-NO.2		0	<b></b> .					x2
AUTO Automatic by Sump Drainage Pit Level		OPERATION			<b> </b>		<b> </b>			· · · ·	
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MANUCS Sump Drainage Pump : STOP-START		ē									
COS CHOICE OF STANDBY : NO.1-AUTO-NO.2											
AUTO : AUTOMATIC ALTERNATE F	UNNING		EARTH FAULT	T	0	0			0	0	x4
		z (	OVER LOAD	Т	0	0			0	0	x4
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		l≚l	SUMP DRAINAGE PIT LEVEL H.H.	+	0	0	<b>  </b>		0		x2 x2
		╘╘┝	SUMP DRAINAGE PIT LEVEL L.L.	- T			<u> </u>				*2
				+	<u> </u>						
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		ΖI	RUNNING HOUR METER		0						x4
PERATING CONDITIONS		INDICATION	······································								
Protection relay nomal.		l₫[									
.Sump droinage level above L.L.		l₽Ŀ	· · · · · · · · · · · · · · · · · · ·	1	<b> </b>						· · · · · ·
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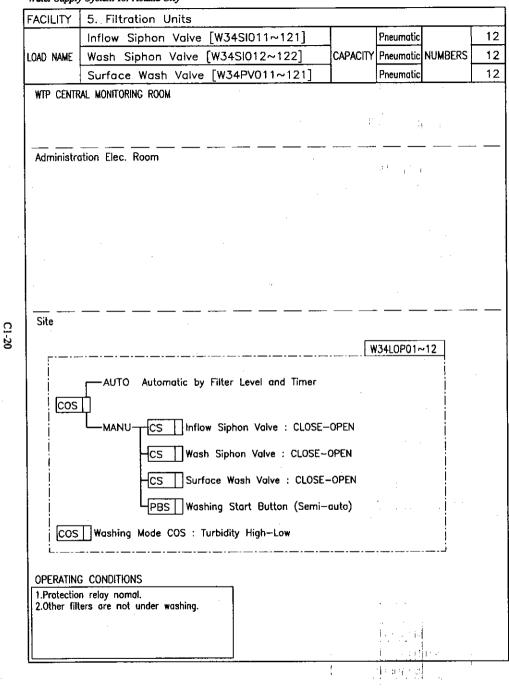
Water Treatment Plant

Water Supply System for Astana City

ITY       4. Flocculation & Sedimentation Basins         VAME       Sampling Pump [W33SP01]       CAPACITY       1.5kW       NUMBERS		ITEMS	182	-							
VAME Sampling Pump [W33SP01] CAPACITY 1.5kW NUMBERS	1		≪	SHE	( EI	C.ROO	<u> </u>	CENTRA	AL MONI	. ROOM	REMARKS
			∣₹	SITE	MCC	INP		MONI.	PRN.	LABO.	· · · · · · · · · · · · · · · · · · ·
		OPERATING LOCATION [ELC.R]			0						
		OPERATING LOCATION [SITE]			0						
			-						†		
		Sampling Pump START	+	0	0			0			
	ΙĔ			0	0			0	<u> </u>	<u>  </u>	
	INDICATION	Sampling Pump STOP					<u> </u>	$\vdash$	<u> </u>		· · · · · · · · · · · · · · · · · · ·
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inistrotion Elec. Room	-		·							<u>†</u>	
W44MCCO		<b>.</b>	+-	<u> </u>							
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	SWITCH	COS : ELC.R-SITE	_	0		· · ·	L		I		
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ELC.R—CS Sampling Pump : STOP-START	10							1			
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	DPFRATION										
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W33LOP1		EARTH FAULT	T	0	0			0	0		
	Z	OVER LOAD	T	0	0			0	0		
		PUMP WELL LEVEL L.L.	T	0	0			0			
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	il lā										
SITE -CS Sampling Pump : STOP-START	_i   ≤	· · · · · · · · · · · · · · · · · · ·			1		···	<u> </u>	1	1	
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RATING CONDITIONS	- I E	<u></u>			· ·	<u> </u>	<b> </b>	I		<b> </b>	
stection relay nomal.	_   [ð	<u>کا</u>								<u> </u>	
mp well level above L.L.		₽					1				
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	1 1 4			1	1	<u>†                                     </u>	1	1	1	- <u> </u>	

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Electrical Operation Diagram

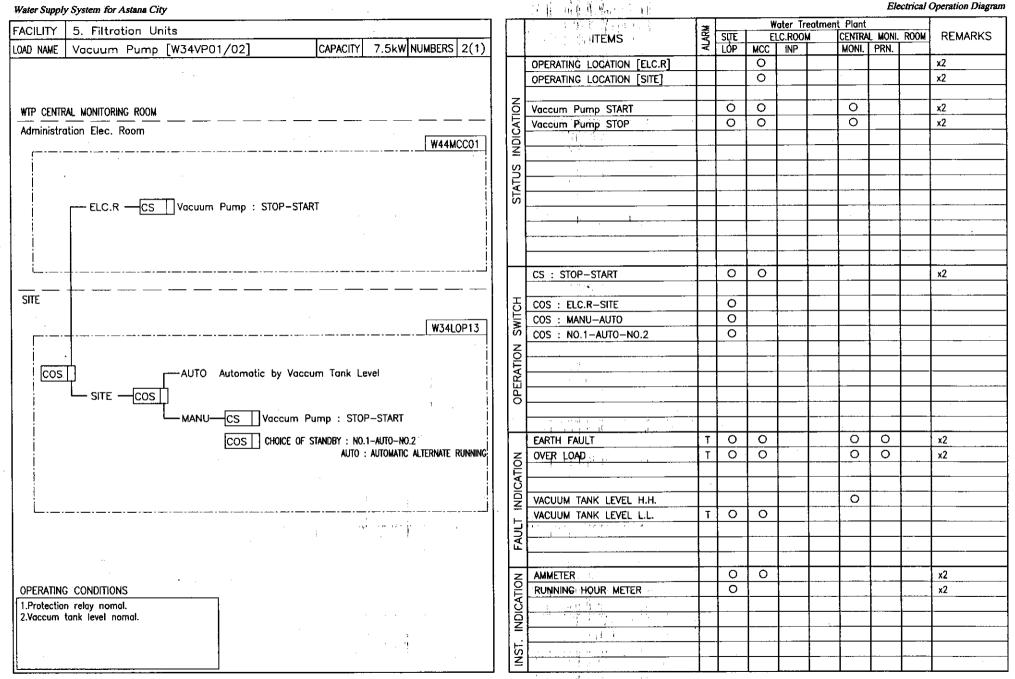


		₽	ALTE				t Plant		DOOH	
	ITEMS	ALARM	site Lop	MCC	LC.ROOI	A	CENTRA	L MONI. PRN.	ROOM	REMARKS
			LUP	MUU	11.48*			T MO.	MINIC	x12
÷	FILTERING	-		···-			ŏ		0	x12
	WASHING						<u> </u>		- ×	X12
z	Inflow Cicken Value CLOSE		0							x12
Ĕ	Inflow Siphon Valve CLOSE Inflow Siphon Valve OPEN		0	<u> </u>						x12 x12
ຽ∣	Wash Siphon Valve CLOSE		0				<u> </u>			x12
STATUS ' INDICATION	Wash Siphon Valve OPEN		0							x12
	Surface Wash Valve CLOSE		0	<u> </u>						x12 x12
Ž		i	0							x12
Σ	Surface Wash Valve OPEN	-								X12
ဖ		-		<b> </b>				· ··	· · · ·	
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				<u> </u>	<b> </b>		<u> </u>			
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	CS : CLOSE-OPEN	┨──	0	<u> </u>						x12
т		-		<b> </b>					· · ·	
OPERATION SWITCH			<u> </u>					<b> </b>	·	40
X	COS : AUTO-MANU	-	0							x12
-	COS : HIGH-LOW		0							x12
₫	· · ·	<u> </u>								
E	PBS : Washing Start Button		0	ļ	·					x12
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6				<u> </u>			<u> </u>			
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		ļ.,_				<b>.</b>		<u> </u>		
-	Filter Level High		0		<b> </b>		<u>-</u>			x12
S	Filter Level Emergency High		0	ļ			0		0	x12
Ē	Filter Level Low	<u> </u>	0	<u> </u>						x12
Š		⊢	<u> </u>	· · · ·	ļ		<u> </u>	<u> </u>	·	
ž	Vacuum Unit Failure	$\vdash$	0	<b> </b>		ļ	<u> </u>			x12
⊢.	Compressor Unit Failure		0	I	ļ	<b> </b>				x12
FAULT INDICATION	· · · · · · · · · · · · · · · · · · ·	_	<b> </b>	<b> </b>	<b> </b>	ļ	<b> </b>	Į	ļ	
Ľ			_		<b> </b>				· · ·	
		<u> </u>	<u>                                     </u>	<b> </b>	$\mathbf{L}$		<u> </u>	<u> </u>	<u> </u>	
INDICATION	Surfacewash Water Flow	1	0		0		0	<b> </b>		x2
Ě		1	<b> </b>		<u> </u>			<b> </b>		
Š	In-plant Distribution Water Flow				0	<b> </b>	0		<b> </b>	1
Z		<u> </u>	<u> </u>		<u> </u>	ļ		ļ	<b> </b>	
		1	<b></b>	ļ	<u> </u>			<b> </b>		· · · · ·
INST.	· · · · · · · · · · · · · · · · · · ·	$\vdash$	1	ļ	<b> </b>	<u> </u>		<u> </u>	<b> </b>	
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#### Electrical Operation Diagram



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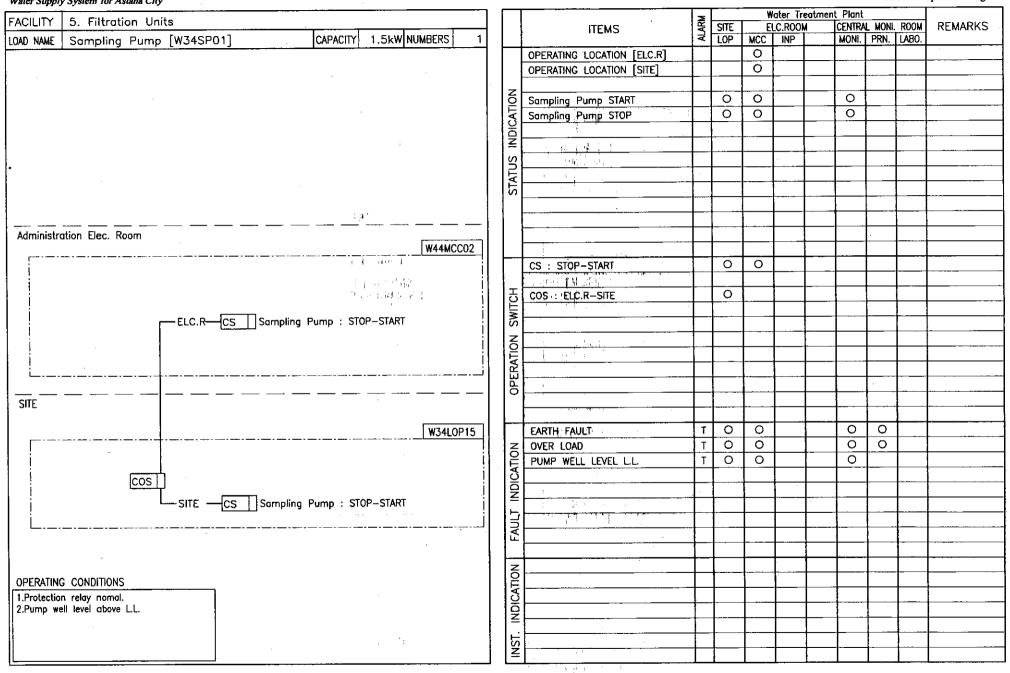
C1-22

5. Filtration Units FACILITY 2.2kW NUMBERS 2(1) Air Compressor [W34AC01/02] CAPACITY LOAD NAME 0 0 INDICATION A WTP CENTRAL MONITORING ROOM Administration Elec. Room W44MCC01 STATUS Air Compressor : STOP-START - ELC.R cs SITE SWITCH . jt C ( W34LOP14 **OPERATION** cos -AUTO Automatic by Vaccum Tank Level Air Compressor : STOP-START MANU--CS COS CHOICE OF STANDBY : NO.1-AUTO-NO.2 AUTO : AUTOMATIC ALTERNATE RUNNING INDICATION FAULT INDICATION OPERATING CONDITIONS 1.Protection relay nomal. 2.Air tank pressure nomal. INST.

	-		W	ater Tr	eatmen	t Plant			
- ITEMS	ALARM	SITE	5	LC.ROOI	v	CENTRA	L MONI.	R00M	REMARKS
	₹	LOP		INP		MONI.	PRN.		
OPERATING LOCATION [ELC.R]			0						x2
OPERATING LOCATION [SITE]			0						×2
Air Compressor START		0	0			0			x2
Air Compressor STOP		0	0			0			x2
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			<u> </u>						·
						<u> </u>			
<u>CS</u> : STOP-START		0	<u> </u>	· ·	<u> </u>				x2
		<b> </b>							
COS : ELC.R-SITE	_	0	L						
COS : MANU-AUTO		0							
COS : NO.1-AUTO-NO.2		0							
				ł					
· · ·									
		1							
						1			
						1			
EARTH FAULT	Ť	0	0			10	l o		x2
OVER LOAD	ΤT	ō	Ō	<u> </u>		Ō	Ō		x2
	-†-	<u> </u>	1		<u> </u>		-		
		1			<u> </u>	+			<u> </u>
AIR TANK PRESSURE LOW	+	0	+			0	<u> </u>		· · ·
AIR TANK PRESSURE HIGH	T	ŏ	0			⊢ <u> </u>		<u> </u>	
AIR TANK PRESSURE HIGH		<u> </u>	<u> </u>			1			
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			<u> </u>	<u> </u>	<b> </b>			<u> </u>	<b> </b>
RUNNING HOUR METER		0							x2
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C1-23

Electrical Operation Diagram



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## Electrical Operation Diagram

FACILITY	5. Filtratio					
load name	Overhead	Hoist	[W34MH01/02]	CAPACITY	9.0+0.75kW NUMBERS	
					. <b>1</b>	
	AL MONITORING					
Pump Sto	ition Elec. Ro					
	POWER SUPP	LT UNLT				
· · .						
	•					
SITE						
				Mechanical St	andard Equipped	
ļ [				i moondinodi ot		
		cs	Screening Hoist : FORWAN			
		CS	Screening Hoist : UP-ST	DP-DOWN		
			·			
	<i>a</i> .					
ODEDATING						
OPERATIN 1.Protectio	n relay nomal.					
	n relay nomal.				· · · · · · · ·	

Weder Treatment Plant           ITEMS         STE         STE         EUC. ROW         CENTRAL WOR, ROW         REMARKS           IOP         MCC         NP         MONI.         PRI.									Ele	ctrical (	Operation Diagram
ITEMS         Example         STE         ELC.ROOM         CENTRAL MONI, ROOM         REMARKS           IDP         MCC         INP         MONI, PRN.         A					W	ater Tre	atmen	t Plant			
NOLESS         Image: State in the sta		ITEMS	AR N	SITE	E	C.ROOM		CENTRA	L MONI.	ROOM	REMARKS
NOTION         Notion<		, HEMO	₹	LOP	MCC	INP		MONI.	PRN.		
NOLYOON         Image: state											
NOLVORU         NOLVORU <t< td=""><td>ŀ</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td></t<>	ŀ									-	
Image: constraint of the second sec	ļ									————	
Image: constraint of the second sec	-1	· · · · · · · · · · · · · · · · · · ·									
CS         FORWARD-STOP-REVERSE         O         I	⊇l										
CS         FORWARD-STOP-REVERSE         O         I	Ł										
CS         FORWARD-STOP-REVERSE         O         I	$\underline{S}$	and the second second second second second second second second second second second second second second second									
CS         FORWARD-STOP-REVERSE         O         I	۶Ŀ				·						
Image: constraint of the second sec	=	<u></u>	<u> </u>								
Image: constraint of the second sec	31				L					<b> </b>	
Image: constraint of the second sec	F				1						
Image: constraint of the second sec	5										
Image: constraint of the second sec											
CS         :UP-STOP-DOWN         O         X2           I		· · · · · · · · · · · · · · · · · · ·									
CS         :UP-STOP-DOWN         O         X2           I			<b> </b>					<b> _</b>		ļi	
CS         :UP-STOP-DOWN         O         X2           I		·									
CS         :UP-STOP-DOWN         O         X2           I											
CS         :UP-STOP-DOWN         O         X2           I		CS FORWARD_STOP_REVERSE		0							x2
HOILOND TO O O V2 EARTH FAULT TO O O O V2 OVER LOAD TO O O O V2 VIENTON O O O V2 VIENTON O O O V2 VIENTON O O O V2 VIENTON O O O V2 VIENTON O O O V2 VIENTON O O O V2 VIENTON O O O V2 VIENTON O O O O V2 VIENTON O O O O V2 VIENTON O O O O V2 VIENTON O O O O V2 VIENTON O O O O V2 VIENTON O O O O O O O O O O O O O O O O O O			-	<u> </u>	···						
NOTE         Image: Second second				$\vdash$							*2
NOTE         Image: Second second	ㅎ		L								
NOLENAR         I </td <td>12</td> <td>( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	12	( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )									
NOLENAR         I </td <td>S</td> <td></td>	S										
EARTH FAULT         T         O         O         O         X2           OVER LOAD         T         O         O         O         X2           Image: Constraint of the state of	7		<u> </u>		1			<u> </u>			
EARTH FAULT         T         O         O         O         X2           OVER LOAD         T         O         O         O         X2           Image: Constraint of the state of	⊡		<u> </u>		<u> </u>				· · ·		
EARTH FAULT         T         O         O         O         X2           OVER LOAD         T         O         O         O         X2           Image: Constraint of the state of	<b>∀</b>		Ļ		<u> </u>	<u> </u>				<u> </u>	
EARTH FAULT         T         O         O         O         X2           OVER LOAD         T         O         O         O         X2           Image: Constraint of the state of	出			L							
EARTH FAULT         T         O         O         O         X2           OVER LOAD         T         O         O         O         X2           Image: Constraint of the state of	Ē								ł.		
OVER LOAD         T         O         O         O         x2           Image: Image	101										
OVER LOAD         T         O         O         O         x2           Image: Image					1			t		1	
OVER LOAD         T         O         O         O         x2           Image: Image	$\vdash$		+-		1-2-						
			-								
INDICATION INDICATION	Z	OVER LOAD	T	0	0	<u> </u>		0	0	ļ	x2
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	<b>≤</b>			1							
	⊢				1	<u> </u>		+		1	<u> </u>
	19		+					-	<u> </u>		
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Vater Supply	y System for Astana City											Lie		Operation D.
ACILITY	6. Distribution Pump Station					M	offe			atmen			DOOL	REMAR
	No.4 Distribution Pump [W35WP11]	800k	W 1	1	ITEMS	Ā	SITE LOP		C.ROOM		MONI.	PRN.	MINIC	REMAR
ain uur		CAPACITY 0.75k		┥┝─┤	OPERATING LOCATION [Sub-St.]			0	0					
OAD NAME	No.4 Suction Valve [W35MV11]			- 3	OPERATING LOCATION [M.Room]									
	No.4 Discharge Valve [W35MV12]	0.75k	(W1	INDICATION	OPERATING LOCATION [SITE]			0	0					
			W47WF01	18										
	L		1 14/10/01	<u> </u>	Distribution Pump START		0	0	0		0		0	
				<u>v</u>	Distribution Pump STOP		Ö	0	0		0		0	
	Sub-St-CS Distributio			I P	Discharge Valve Fully OPEN		0	O MCC			0			
	Discharge	Valve : Link with	Pump	STATUS	Discharge Valve Fully CLOSE		0	O MCC			0			
Substation					Suction Valve Fully OPEN		0	O MCC			0			
Pump Stati	ion Monitoring Room		W751 0001		Suction Valve Fully CLOSE		0	O MCC			0			
······			W35L0P01	•		۱.								
i		PBS	EMERGENCY STOP	ि	CS : STOP-START		0	0	0					
Ì			ipeed Adjustment Unit	SWITCH	CS : CLOSE-STOP-OPEN		· 0	O MCC						x2
ĺ	— Auto — Automatic by Pr				VS : Speed Adjustment Unit				0					
i	Discharge Valve	: Link with Pump		OPERATION	COS : M.Room-SITE		0							
i	Singl	n Pump : STOP-S	TART	ER	COS : SubStAuto-Single				0					
i		Volve : Link with		6	PBS :EMERGENCY STOP		0		0					
Ĺ			· · · · · · · · _		[Distribution Pump]									
			W35MCC01		EARTH FAULT	T	0	0			0	0		
[	+		· _ · · ·		OVER LOAD	T	0	0			0	0		
1	CS Suction	alve : CLOSE-STO	P-OPEN		TEMPERATURE UP	T	0	0			0	0		
ļ					[Discharge Valve]									
ļ	CS Discharge	Valve : CLOSE-S1	TOP-OPEN	Z	EARTH FAULT	T	0		0		0	0		
L	<u>+</u> ·_·_·			i E	OVER LOAD	Ť	0		0		0	0		
SITE				S S	OVER TORQUE	T	0		0		0	0		
			W35L0P11	- Q	[Suction Valve]		_							
cos					EARTH FAULT	T	0		0		0	0.		
000	·T			E H	OVER LOAD	T	0		0		0	0		
	SITE CS Distribution Pump : STOP-S	TART		FAUL	OVER TORQUE	T	0		0		0	0		
ł	CS Suction Valve : CLOSE-STO	P-OPEN												
					RESERVOIR LEVEL L.L.	T		0			0	Ó		
ł	CS Discharge Valve : CLOSE-S	OP-OPEN			EMERGENCY STOP	Τ.		0			0	0		
					DISTRIBUTION PRESSURE DROP			ļ	0		0	ļ		ļ
	PBS EMERGENCY STOP			B	AMMETER		0	0	0			<u> </u>		
L				1 1일	RUNNING HOUR METER	<b>_</b>	L	<b> </b>	0			<u> </u>	L	
OPERATING	G CONDITIONS			₫	DISTRIBUTION RESERVOIR LEVEL		ļ			0	0		0	
	n relay nomal.			Q	DISTRIBUTION PRESSURE		<u> </u>	<b> </b>	ļ	0	0	ļ	0	
2.Distributio	on reservoir level above L.L.				DISTRIBUTION FLOW		ļ	<b> </b>	L	0	0	<u> </u>	0	
	·	· ···		Į Į	DISTRIBUTION FLOW for TETs-1			<b> </b>	ļ	0	0		0	L
	ļ	· · ·		≤	DISTRIBUTION FLOW for TETs-2	1		<u> </u>	<u> </u>	0	0		0	<u> </u>
			e na stalle stalle stalle stalle stalle stalle stalle stalle stalle stalle stalle stalle stalle stalle stalle s		TOTAL DISTRIBUTION FLOW					0	0		0	

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6. Distribution Pump Station FACILITY No.7, 8 Distribution Pump [W35WP21/31] 800/520kW 2 2 No.7, 8 Suction Valve [W35MV21/31] CAPACITY 0.75kW NUMBERS LOAD NAME 2 No.7, 8 Discharge Valve [W35MV22/32] 0.7<sup>5</sup>kW W47DPP02/03 Sub-St-CS Distribution Pump : STOP-START Discharge Valve : Link with Pump Substation Pump Station Monitoring Room W35L0P04 PBS EMERGENCY STOP M.Room COS -Auto ---- Automatic by Flow Discharge Valve : Link with Pump Discharge Valve : Link with Pump W35MCC01 CS Suction Valve : CLOSE-STOP-OPEN CS Discharge Valve : CLOSE-STOP-OPEN SITE W35L0P14/15 cos -SITE -CS Distribution Pump : STOP-START CS Suction Valve : CLOSE-STOP-OPEN Discharge Valve : CLOSE-STOP-OPEN PBS EMERGENCY STOP OPERATING CONDITIONS 1.Protection relay nomal. 2.Distribution reservoir level above L.L. 1.11

Water Treatment Plant SITE ELC.ROOM CENIRAL MUINI, INCOM REMARKS CENTRAL MONI, ROOM **ITEMS** OPERATING LOCATION [Sub-St. x2 INDICATION OPERATING LOCATION [M.Room] 0 0 x2 OPERATING LOCATION [SITE] · · · 0 0 0 Ο 0 x2 Distribution Pump START 0 0 0 0 0 x2 STATUS Distribution Pump STOP 0 6 MCC 0 x2 Discharge Valve Fully OPEN 0 Юмсс Ö x2 Discharge Valve Fully CLOSE 0 Юмсс 0 x2 Suction Valve Fully OPEN Ö 10 MCC 0 x2 Suction Valve Fully CLOSE SWITCH 0 x2 CS : STOP-START 0 0 0 6 MCC x2 x2 CS : CLOSE-STOP-OPEN OPERATION 0 x2 COS : M.Room-SITE 0 COS : SubSt.-Auto-Single 0 0 PBS :EMERGENCY STOP x2 [Distribution Pump] 0 0 Ó Ó x2 EARTH FAULT T 0 0 0 0 x2 OVER LOAD Т 0 0 0 x2 TEMPERATURE UP т 0 [Discharge Valve] Ο Ο Ο Ο x2 EARTH FAULT Т INDICATION 0 OVER LOAD 0 0 0 x2 Т 0 0 0 0 x2 OVER TORQUE T [Suction Nolve] 1.1.1 Ť 0 0 0 Ο x2 EARTH FAULT FAULT 0 0 0 Ο x2 OVER LOAD Т 0 0 0 0 x2 OVER TORQUE Ť - E - E - E 计注意 医骨肉炎 т EMERGENCY STOP 0 Ö 0 x2 0 AMMETER 0 0 x2 INDICATION 0 RUNNING HOUR METER x2 INST.

Electrical Operation Diagram

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Existing(DPP)       O       <	peration Dia
Water Supply System for Astana City       Electrical Operation       FACILITY     6. Distribution Pump Station       ITEMS       Existing Distribution Pump        5     OPERATING LOCATION [Sub-St.]	
FACILITY 6. Distribution Pump Station          Existing Distribution Pump        5         ITEMS       Vater Treatment Plant         Under Distribution Pump        5         INNUMPERS 5       OPERATING LOCATION [Sub-St.]       INTEMES	
FACILITY     6. Distribution     Pump     Central work     ROOM       Existing     Distribution     Pump      5     ITEMS     \$     SITE     ELC.ROOM     CENTRAL WORK     ROOM       LOP     DP     LOP     INP     MONIL     PRN.     MINIC	REMAR
LOAD MANY Existing Sochies Vision Vision CARACITY	
LOAD MANY Frinking Continue Victor CARACITY	
Existing Discharge Valve        5         Existing Discharge Valve        5         Existing Discharge Valve        5         OPERATING LOCATION [M.Room]       0          Distribution Pump : STOP-START       0       0       0         Distribution Pump : STOP-START       0       0       0       0	
Existing Discribution Pump : STOP-START       O       O       O         CS       Distribution Pump : STOP-START       O       O       O	
Existing(DPP)     Distribution Pump START     O     O     O     O       CS     Distribution Pump : STOP-START     Distribution Pump STOP     O     O     O     O	x5
CS     Distribution Pump : STOP-START     O     O     O     O       Distribution Pump : STOP-START     Distribution Pump STOP     O     O     O     O	
CS Distribution Pump : STOP-START	x5
	x5
	<u>x5</u>
	x5
Suction Valve Fully OPEN O Macco O	x5
	x5
PBS EMERGENCY STOP 35 CS : STOP-START 0 0 0 0	x5
	x5 x2
M.Room—CS Distribution Pump : STOP-START	<u>NU NE</u>
Discharge Valve : Link with Pump	x5
	x5
	x5
	x5
	x5
CS Discharge Valve : CLOSE-STOP-OPEN	x5
	x5
C3     Disclidinge volve     C COL     O COL     T     O     O     O       SITE     W35L0P08/09/10/12/13     W35L0P08/09/10/12/13     T     O     O     O     O	x5
SITE W35L0P08/09/10/12/13	
	x5
	x5
SITE CS Distribution Pump : STOP-START	x5
CS Suction Valve : CLOSE-STOP-OPEN	
CS Discharge Valve : CLOSE-STOP-OPEN	-
CS Discharge Valve : CLOSE-STOP-OPEN	x5
PBS EMERGENCY STOP	
	x5 x5
	xJ
1.Protection relay nomal.	
2.Distribution reservoir level above L.L.	
and the second second second second second second second second second second second second second second second	

# Water Supply System for Astana City

Water Supply	System for Astana City										<i>E1</i> ¢	cincal C	Operation Dia
ACILITY	6. Distribution Pump Station				N	OTT		ater Tre				DOOL	REMARI
	Existing Technical Water Pump	3		ITEMS	ALARM	SITE		LOP		CENTRA MONI.			KE MAR
		┥ ┝━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━		OPERATING LOCATION [Sub-St.]									
OAD NAME	Existing Suction Valve		S	OPERATING LOCATION [M.Room]	1								
	Existing Discharge Valve	3	INDICATION	OPERATING LOCATION [SITE]				0					х3
		Existing(DPP)	12		1								
	_··-		1	Distribution Rump START		0	0	0		0		0	x3
				Distribution Pump STOP	1	0	0	0		0		0	x3
	CS Distribu	tion Pump : STOP-START	STATUS	Discharge Volve Fully OPEN		0	O MCC			0			x3
		il	1	Discharge Valve Fully CLOSE			O MCC			Ó			х3
Existing Su	bstation			Suction Volve Fully OPEN		0	O MCC			0	_		хЗ
Pump Stati	on Monitoring Room			Suction Valve Fully CLOSE		0	О МСС			0			хЗ
·													
i		PBS EMERGENCY STOP	동	CS : STOP-START	1	0	Ö	0					х3
			SWITCH	CS : CLOSE+STOP-OPEN		0	O MCC						x3 x2
	M.Room CS Distribution Pump : STOP												
İ	Discharge Valve : Link wit	h Pump	IE	COS :: M.Room-SITE		0							хЗ
			OPERATION										
		i	<u></u>	PBS :EMERGENCY STOP		0		0					хЗ
Ĺ				[Distribution Pump]									
		W35MCC01		EARTH FAULT	Т	0	0			0	0		х3
[				OVER LOAD	T	0	0			0	0		х3
į	CS Suction	Valve : CLOSE-STOP-OPEN		TEMPERATURE UP	T	0	0			0	0		хЗ
į				[Discharge Valve]									
į	CS Dischar	ge Valve : CLOSE-STOP-OPEN	z	EARTH FAULT	T	0		0		0	0		xЗ
Ĺ			읃	OVER LOAD	Т	0		0		0	0		x3
SITE			INDICATION	OVER TORQUE	T	0		0		0	0		x3
		W35LOP16~18	<u></u>	[Suction Volve]									
cos	1			EARTH FAULT	T	0		0		0	0		x3
1 003	Т		13	OVER LOAD	Т	0		0		0	0		x3
ļ	SITE CS Distribution Pump : STOP	-START	FAULT	OVER TORQUE	T	0		0		0	0		хЗ
ļ	-CS Suction Valve : CLOSE-S	IOP-OPEN											
	CS Discharge Valve : CLOSE-	-STOP-OPEN		EMERGENCY STOP	Т		0			0	0		xЗ
1													
-	PBS EMERGENCY STOP		z	AMMETER		0		0		ļ			хЗ
. L			밑	RUNNING HOUR METER				0					х3
OPERATING	CONDITIONS	a d	5	DISTRIBUTION RESERVOIR LEVEL					0	0		0	
1.Protection	n relay nomal.		INDICATIO	DISTRIBUTION PRESSURE					0	0		0	
2.Distributio	on reservoir level above L.L.		=										
		20 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	ST.	DISTRIBUTION FLOW 1					0	0		0	
		- 10-	lŻ	DISTRIBUTION FLOW 2					0	0		0	
1				TOTAL DISTRIBUTION FLOW					0	0	}	0	

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Water Supp	ly System for Astana City		· · · · · ·		<b>_</b>	1111章 1111章 1111章 1111章 1111章 1111章 1111章 1111章 1111章 1111章 1111章 1111章 1111章 1111章 1111章 1111章 1111章 1111章 111						<b>D</b> ( )		ctrical (	Operation
FACILITY	6. Distribution Pump Station					inter an	M	ептс		ater Tri LC.ROOI	eatment	Plant	N MONI.	RUUN	REMA
	Existing Backwash Pump	T		- 2	1	ITEMS	AL	site Lõp	BPP	LOP		MONI.	PRN.	MINIC	
LOAD NAME		CAPACITY		-1		OPERATING LOCATION [Sub-St.]									
LUAU NAME.					H Ig	OPERATING LOCATION [M.Room]									
	Existing Discharge Valve				INDICATION	OPERATING LOCATION [SITE]				0					x2
			Γ	Existing(BPP)	)   ĕ		<u> </u>		ļ						
							1	0	0	0		0			x2
	CS Bacwa	sh Pump :	STOP-START		STATUS	Distribution Pump STOP	<b>_</b>	0	0	0		0		0	×2
			0.01 0.00		<u> </u>   4	Discharge Valve Fully OPEN	+	0	O MCC O MCC			0			x2 x2
Existing S	ubstation				<u>v</u>    i		—	0	O MCC			0	$\left  \right $		x2 x2
	tion Monitoring Room					Suction Valve Fully OPEN	1-	_	O MCC			0			x2
				W35L0P02		Suction Valve Fully CLOSE				····		0			_^2
			PBS	rgency stop				0	0	0					x2
		-	· · ·		SWITCH	CS : CLOSE-STOP-OPEN	-		O MCC						x2 x2
	M.Room-CS Backwash Pump : STOP-	START					1		1		· · ·				í T
	Discharge Valve : Link w	ith Pump			OPERATION	COS : M.Room-SITE		0							x2
		4			i B										
					i B	PBS :EMERGENCY STOP		0		0					×2
L						[Distribution Pump]				L					<b></b>
				W35MCC01		EARTH FAULT	Ţ	0	0			0	0		×2
						OVER LOAD	<u>+</u> -	0	0			<u> </u>	0		x2
	CS Suctio	n Valve : C	CLOSE-STOP-	DPEN		TEMPERATURE UP	1	0	0			0	0		x2
	CS Discho	rae Valve :	CLOSE-STOP	-OPEN	<u>    _</u>	[Discharge Valve]	T	0		0		0	0		x2
	<u></u>				j  [₫	OVER LOAD	┤┼	6		6		0	0		x2 x2
					-	OVER TORQUE		ŏ	+	1 ŏ		0	0	· · ·	×2
SITE				W35L0P06/07	]   Ĕ	[Suction Molve]	+	Ť					1.		
	······································					EARTH FAULT	T	0		0	-	0	0		x2
	T					OVER LOAD	T	0	1	0		0	0		x2
	SITE CS Backwash Pump : STOP-	-START			L I	OVER TORQUE	Т	0		0		0	0		x2
	CS Suction Valve : CLOSE-S	TOP-OPEN													
						1. 白云王如昏视州自己的主动。							$\square$	· · ·	
	CS Discharge Valve : CLOSE	-stop-ope	2N			EMERGENCY STOP	T		0	ļ	<b>_</b>	0	0		<b> </b>
								_	<b></b>	<u> </u>					<u> </u>
	PBS EMERGENCY STOP				i z	AMMETER	-	0			$\left  - \right $		+		x2
		• ••• • • • • • • • • • •				RUNNING HOUR METER			+	0			+		x2
1	IG CONDITIONS			i		Destaurate Idaliantica Lines	+			0	╂		+	<u> </u>	<u> </u>
1.Protecti	on relay normal. ion reservoir level above L.L.					Backwash Indication Lump	+			+			+	+	<u> </u>
									-				+		<u> </u>
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C1-30

### Electrical Operation Diagram

FACILITY 6. Distribution Pump Station			W		Y	Vater Tre	eatment	Plant		00011	DELADIZO
LOAD NAME Sump Drainage Pump [W35DP01/02] CAPACITY 2.2kW NUMBERS 2(1)		ITEMS	ALARM	SITE	L HCC	LC.ROOM		JENTRA MONI.	L MONI.	ROOM	REMARKS
LOAD NAME   SUMP Drainage Pump [WSSDP01702] [CAPACITE 2.2KW NOMOLINS 2(1)	-		H	LOF	MUU						
						-					
WTP CENTRAL MONITORING ROOM	S	Sump Drainage Pump START		0	0			0			x2
	ΤĒ	Sump Drainage Pump STOP		0	0			0			x2
Pump Station Elec. Room W35MCC01	INDICATION										
									-		
	୍ ସ										
	STATUS										
	2										
CS Sump Drainage Pumper: STOP-START	1										
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					<u> </u>	╽					
		j	<u> </u>	_				•			
		CS : STOP-START		0	0						x2
	Ι <sub>Ξ</sub>										
	SWITCH	COS : ELC.R-SITE COS : MANU-AUTO	$\vdash$	0							
W35LOP05	N.S	COS : NO 1-AUTO-NO.2	╞	0	-				· ···		
				Ĕ							· · · · · · · ·
AUTO Automatic by Sump Drainage Pit Level	OPERATION										
cos	₹ I		†								
MANU-CS Sump Drainage Pump : STOP-START	L L										
COS CHOICE OF STANDBY : NO.1-AUTO-NO.2		the Batter State									
AUTO : AUTOMATIC ALTERNATE RUNNING		EARTH FAULT	T	0	0			0	0		x2
	Z	OVER LOAD MEET I IM	T	0	0			0	0		x2
	NDICATION	· · · ·		L					<b> </b>		
i i i i i i i i i i i i i i i i i i i	Š	· · · · · · · · · · · · · · · · · · ·	1		<b> </b>	<u> </u>	┞╴┨		<b> </b>		<b>.</b>
	Ľ2	SUMP DRAINAGE PIT LEVEL H.H.	1_					0	<u> </u>		
	H,	SUMP DRAINAGE PIT LEVEL L.L.	T	0	<u>                                     </u>			· · ·	<b> </b>		· · · · · · · · · · · · · · · · · · ·
	FAULT		<u> </u>	<b> </b> ·		-	+ + +				
	L L L		-	<u> </u>							
		RUNNING HOUR METER	+	0	┼──		$\left  \right $		<del> </del>		x2
	No	KUNNING RUUK METER		<u>۲</u>			$\left  - \right $		· ·		^2
OPERATING CONDITIONS  1.Protection relay nomal.	INDICATION		+		1					-	1
2.Sump drainage level above L.L.			+	<u> </u>	<u> </u>		<u> </u>			1	
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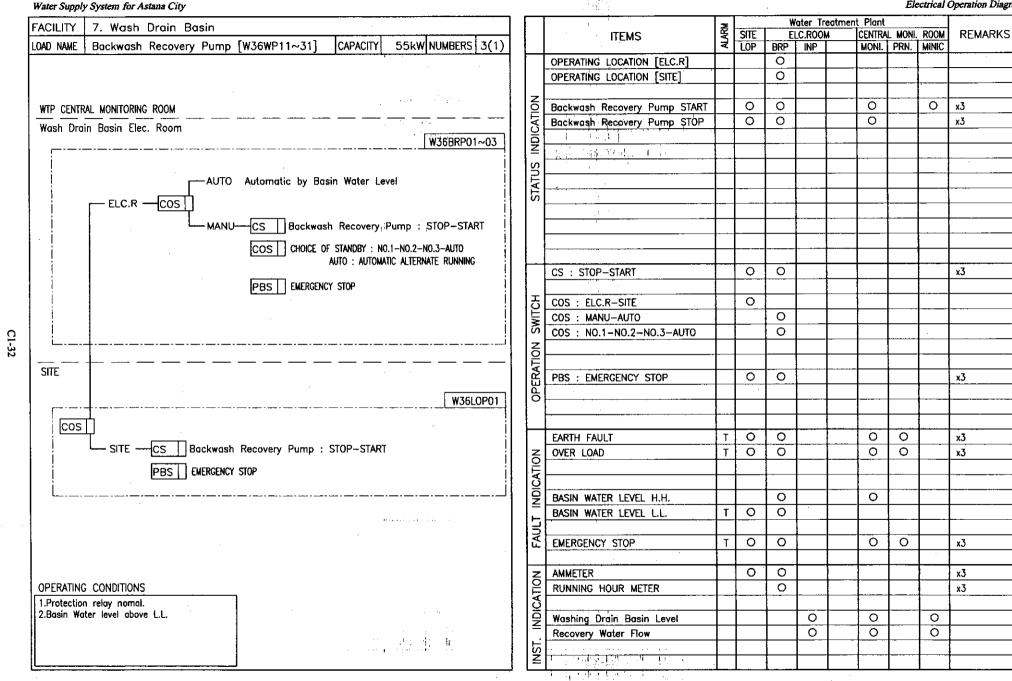
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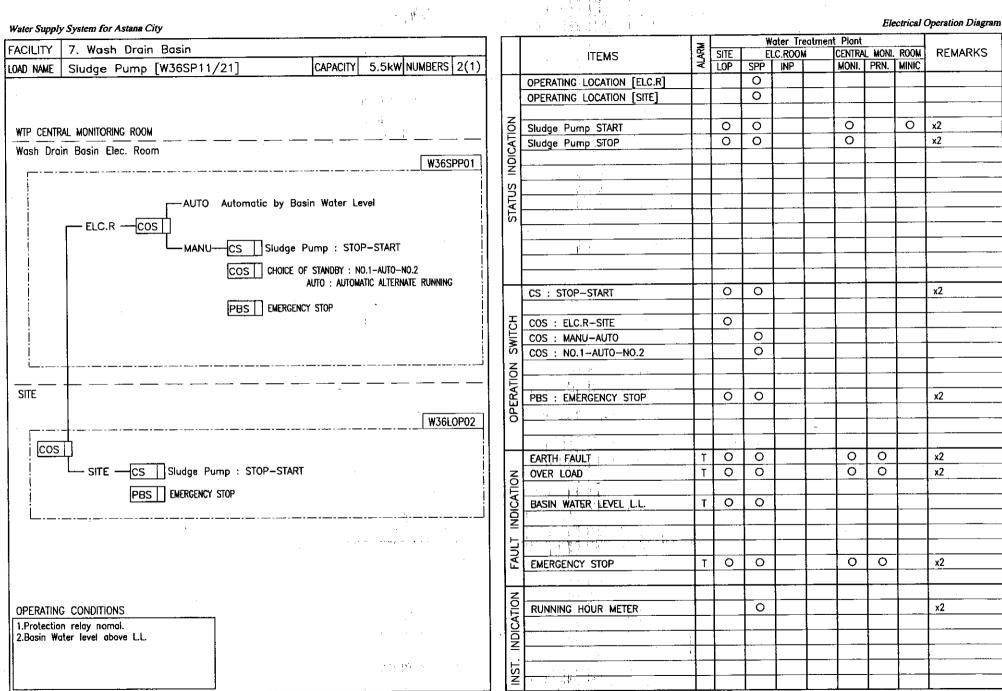
Electrical Operation Diagram

FACILITY	6. Distribution P	· · · · · · · · · · · · · · · · · · ·		<b>_</b>
LOAD NAME	Overhead Crane	[W35MC01]	CAPACITY	9+0.75+0.75x2kW NUMBERS
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F			Mechani	cal Standard Equipped
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	<u>cs</u>	Overhead Crane : LEF		
	cs	Overhead Crane : UP	-stop-down	
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	G CONDITIONS			
1.Protection	n relay nomal. ainage level above L.L.			· · · · ·

1	ITEMS		SITE	E	LC.ROOI	M	CENTRA	L MONI.	ROOM	REMARKS
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.  -	CS :FORWARD-STOP-REVERSE		0			<u> </u>	<u> </u>			
	CS :LEFT-STOP-RIGHT	<b>.</b>	0			·		· · ·		
SWITCH	CS;;UP-STOP-DOWN	_	0		· ·	. —		<u> </u>		
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FAULT INDICATION	OVER LOAD	+	<u> </u>	$\vdash$			10			· · · · · · · · · · · · · · · · · · ·
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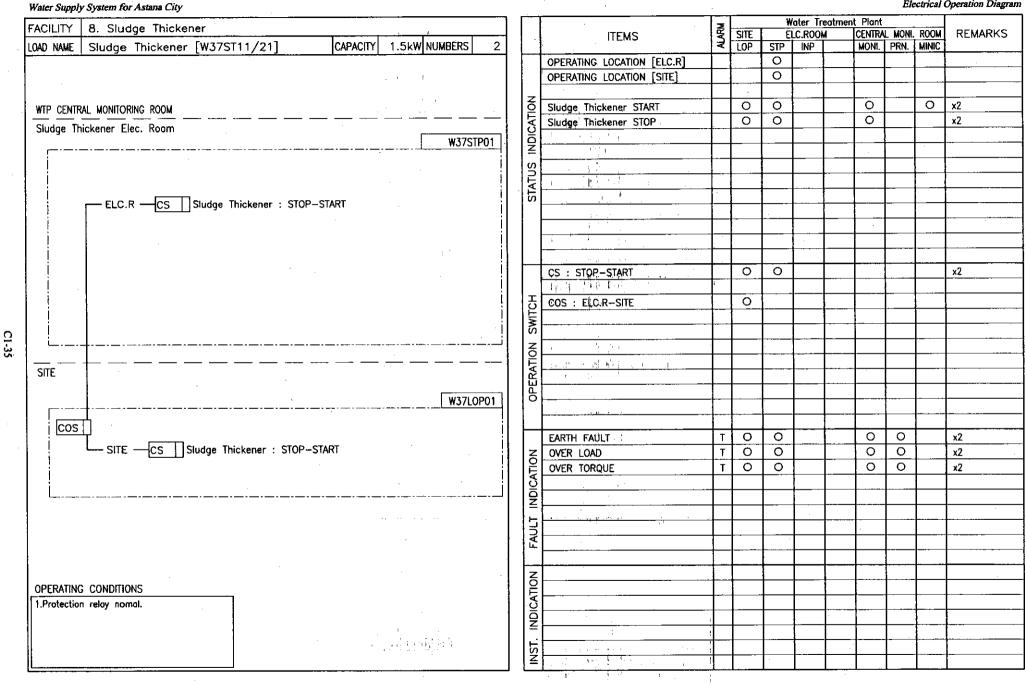
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C1-33

CILITY I / Wash Drain Basin					Water Treatment Plant							
CILITY 7. Wash Drain Basin		ITEMS		₹[	SITE	ELC.ROOM			CENTRA	L MONI.	ROOM	REMARKS
D NAME Sump Drainage Pump [W36DP01/02] CAPACITY 1.5kW NUMBERS 2(1)	<b> </b>	· · · · · · · · · · · · · · · · · · ·		<	LOP		INP		MONI.	PRN.	<u> </u>	
		PERATING LOCATION [EL				0		<u> </u>	<b> </b>		<u> </u>	
· · · · · · · · · · · · · · · · · · ·	OP	PERATING LOCATION [SI	ITE]	_		0		ļ				
								<u> </u>		···· ·		
ITP CENTRAL MONITORING ROOM	<u> </u>	ump Drainage Pump S		_	<u> </u>	0			0			x2
Vash Drain Basin Elec. Room	INDICATION	imp Drainage Pump S	STOP		0	0			0			x2
W36SPP01			<b> </b>	$ \rightarrow$								
	STATUS	۰ 										
AUTO Automatic by Sump Drainage Pit Level								ļ				
	N N	· · ·										
MANU-CS Sump Drainage Pump : STOP-START												
COS CHOICE OF STANDERY : NO.1-AUTO-NO.2												
AUTO : AUTOMATIC ALTERNATE RUNNING								L				
		s : Stop-start	.:		0	0						x2
		<u>, jella (</u>										
		OS : ELC.R-SITE			0							
		DS : MANU-AUTO				0						
	S CO	DS : NO.1-AUTO-NO.2	2			0						
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SITE	OPERATION	i i										
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			. :									
	EA	ARTH FAULT		Т	0	0			0	0		x2
SITE -CS Sump Drainage Pump : STOP-START	z ov	VER LOAD		Т	0	0			0	0		x2
	<u> </u> ∑											
		UMP DRAINAGE PIT LEV	VEL H.H.			0		[	0			
		UMP DRAINAGE PIT LEV		T	0	0	1					
		· · · · · · · · · · · · · · · · · · ·										
	z											
PERATING CONDITIONS	NOL RL	UNNING HOUR METER				0						x2
Protection relay nomal	5							<u> </u>	1			
Sump Drainage Pit level above L.L.	INDICA.						1	1	1	1		
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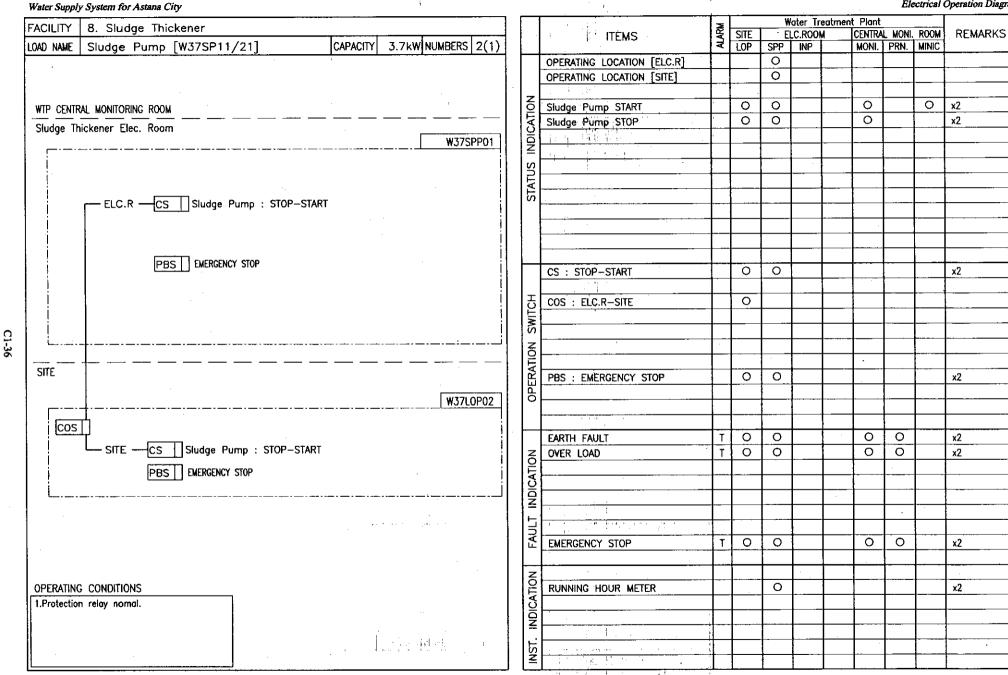
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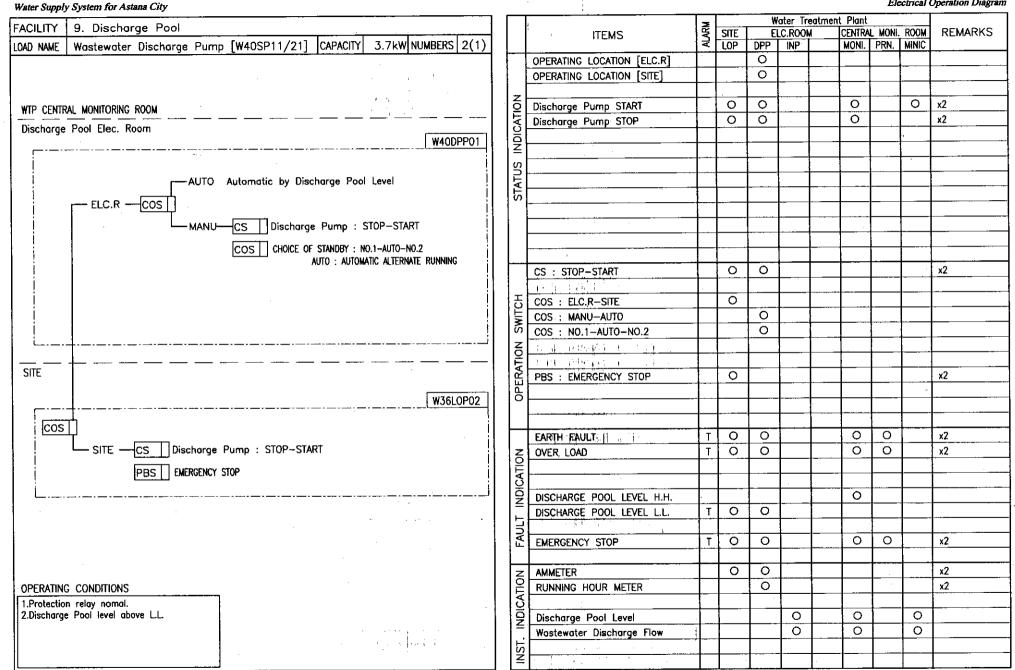
#### Water Supply System for Astana City Water Treatment Plant ALARM 8. Sludge Thickener FACILITY CENTRAL MONI. ROOM REMARKS SITE ELC.ROOM ITEMS LOAD NAME Sump Drainage Pump [W37DP01/02] CAPACITY 1.5kW NUMBERS 2(1) LOP STP INP MONI, PRN. Ο OPERATING LOCATION [ELC.R] Ô OPERATING LOCATION [SITE] INDICATION Sump Drainage Pump START 0 Ô x2 0 WTP CENTRAL MONITORING ROOM 0 0 0 x2 Sump Drainage Pump STOP Sludge Thickener Elec. Room W37STP01 STATUS -AUTO Automatic by Sump Drainage Pit Level - ELC.R -COS MANU-CS Sump Drainage Pump : STOP-START COS CHOICE OF STANDBY : NO.1-AUTO-NO.2 AUTO : AUTOMATIC ALTERNATE RUNNING 0 0 x2 CS : STOP-START SWITCH 0 COS : ELC.R-SITE 0 COS : MANU-AUTO Ö COS : NO.1-AUTO-NO.2 C1-37 OPERATION SITE , W37L0P03 cos 0 0 0 0 x2 EARTH FAULT Т - SITE -CS Sump Drainage Pump : STOP-START O. 0 Т 0 0 x2 OVER LOAD INDICATION 0 SUMP DRAINAGE PIT LEVEL H.H. 0 0 0 SUMP DRAINAGE PIT LEVEL L.L. T FAULT INDICATION RUNNING HOUR METER 0 x2 OPERATING CONDITIONS 1.Protection relay nomal. 2.Sump Drainage Pit level above L.L. INST. . ..

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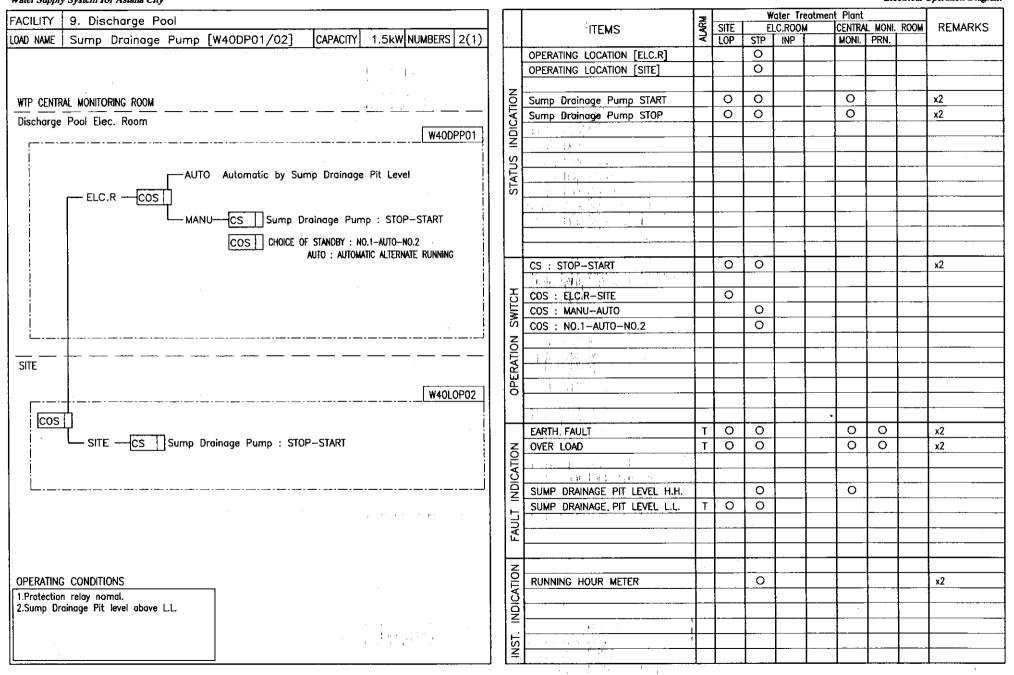
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Electrical Operation Diagram



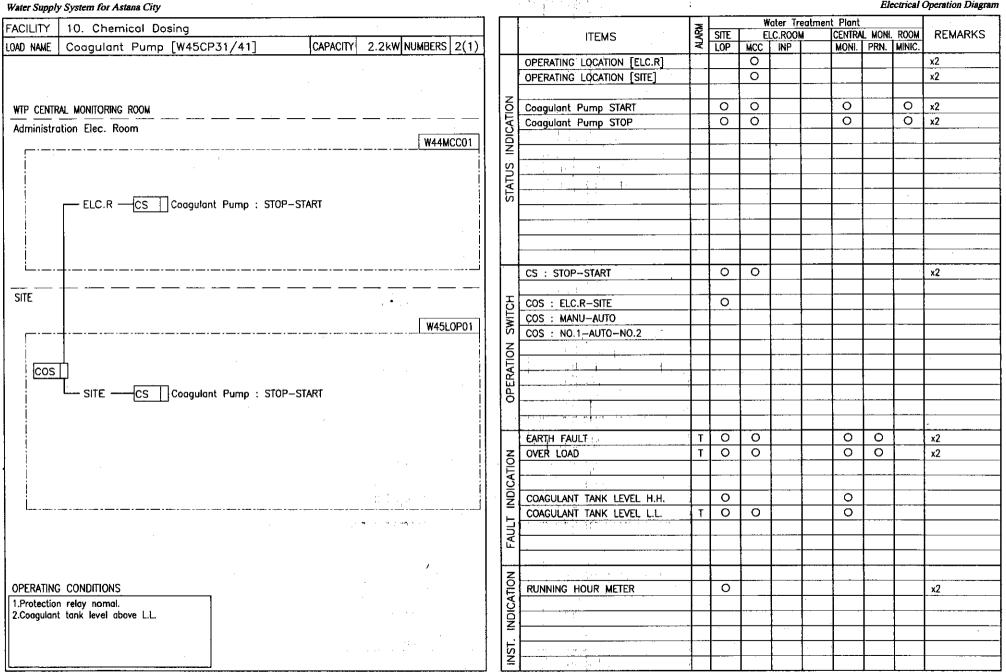
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(1) 月時期 (約) (2) (1) (1)

# Water Sunnly System for Astens City

C1-40

AD NAME       Coogulant       Transfer       Pump       WASCP11/21       CAPACITY       5.5kM (NUMBERS) 2(1)         MIP       CONTRAL       MONITORING ROOM       Image: Contract of the second														
CCLIPT       10. Chemical Dosing       Water Medicate Party       Water Medicate	We have the second second second second second second second second second second second second second second s				Electrical Occurring Dir								n Disers	
Latin To: Drivince round roun		<u> </u>												
MP CDMRM, MONONKO ROQU       Image: Start St				ITEMS	ARM	SITE	E	LC.ROO		CENTRA	L MONI.	ROOM	PO	REMARKS
MP CONTINUE WORKER ROOM       Image: State in the state	0AD NAME   Coagulant Transfer Pump [W45CP1	1/21] CAPACITY 5.5kW NUMBERS 2(1)			₹	LCP	MCC	INP -		MONI.	PRN.		<del>.</del>	
MP CONTINUE WORKER ROOM       Image: State in the state					-									r
GP CENTING CONDITIONS       CONDUCT       Conduct Transfer Pump       Conduct Transfer Pump       CONDUCT		(1 + i) + i + i												
STE       Existing Chemical Room)         W45LCP01         W45		$(1,2)_{ij} = (a_i,a_j) = (1,1)_{ij}$	Z											~?
STE       Existing Chemical Room)         W45LCP01         W45			ĬĔ			<u> </u>	-							
STE       Existing Chemical Room)         W45LCP01         W45	Administration Elec. Room		1Š	Coognait, nonsier runip stor	<u>†</u>	l –	Ť		1					~
STE (£xisting Chemical Room)         Image: Construction of the standard standa			ΙÏ							ŀ				
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SITE (Existing Chemical Room)       W45LCP01         W45LCP01       W45LCP01         AUTO Automatic by Coogulant Tank (New) Level       O         COS       MANU-CS         COS       Coogulant Transfer Pump: STOP-START         COS       COS         COS       COS         MANU-CS       Coogulant Transfer Pump: STOP-START         COS       COS         COS       COS         MANU-CS       Coogulant Transfer Pump: STOP-START         COS       COS         MATO: AUTO-MO.2       O         AUTO: AUTO-MO.2       O         COAGULANT TANK LEVEL, LL       O         COAGULANT TANK LEVEL, H.H., T       O         COAGULANT TANK LEVEL, H.H., T       O         COAGULANT TANK LEVEL, H.H., T       O         COMAGULANT TANK LEVEL, LL       O         COMAGULANT					-				<b> </b>					
Image: Stree (Existing Chemical Room)         Image: Stree (Existing Chemical Room) <td< td=""><td>· · · · · · · · · · · · · · · · · · ·</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>┨</td><td></td><td></td><td></td><td></td><td>×2</td></td<>	· · · · · · · · · · · · · · · · · · ·								┨					×2
W45LCP01         O<	SITE (Existing Chemical Room)		1 <sub>I</sub>			·-		-						
AUTO       Automatic by Coogulant Tank (New) Level         COS       MANU_CS       Coogulant Transfer Pump : STOP-START         COS       CHOCE OF STANDER : NO.1-AUTO-NO.2         AUTO : AUTOMATIC ALTERNATE RUNNICG         PERATING CONDITIONS         Protection reloy nonol.         Loo y limit swich nonol.	(,,,,,,		Ē								┟╴╶╌┠╸			
AUTO       Automatic by Coogulant Tank (New) Level         COS       MANU_CS       Coogulant Transfer Pump : STOP-START         COS       CHOCE OF STANDER : NO.1-AUTO-NO.2         AUTO : AUTOMATIC ALTERNATE RUNNICG         PERATING CONDITIONS         Protection reloy nonol.         Loo y limit swich nonol.			N S		+	_	-	<del> </del>						
MANUCSCoogulant Transfer Pump: STOP-START       I <td< td=""><td></td><td></td><td></td><td>1</td><td></td><td>Ĕ</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td>(</td></td<>				1		Ĕ	1							(
MANUCSCoogulant Transfer Pump : STOP-START       I <t< td=""><td></td><td></td><td> ₽</td><td>·····</td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td>· · · · ·</td></t<>			₽	·····						1				· · · · ·
MANUCSCoogulant Transfer Pump : STOP-START       I <t< td=""><td>AUTO Automatic</td><td>: by Coagulant Tank (New) Level</td><td>RA</td><td>· · · · · · · · · · · · · · · · · · ·</td><td>+</td><td>1</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	AUTO Automatic	: by Coagulant Tank (New) Level	RA	· · · · · · · · · · · · · · · · · · ·	+	1	1							
MANUCSCoogulant Transfer Pump : STOP-START       I <t< td=""><td>cos</td><td></td><td>H۳ H</td><td></td><td><u> </u></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td></t<>	cos		H۳ H		<u> </u>				1					
COS       CHOICE OF STANDBY : NO.1-AUTO-NO.2 AUTO : AUTOMATIC ALTERNATE RUNNING AUTO : AUTOMATIC ALTERNATE RUNNING       I       I       O       O       I		Consulant Transfer Dumo , STOD START	10											
AUTO : AUTOMATIC ALTERNATE RUNNING       T       O       O       X2         I		i i i i i i i i i i i i i i i i i i i												<b></b>
DPERATING CONDITIONS         Protection relay normal.         Line	cos				T	· · · ·			ļ					
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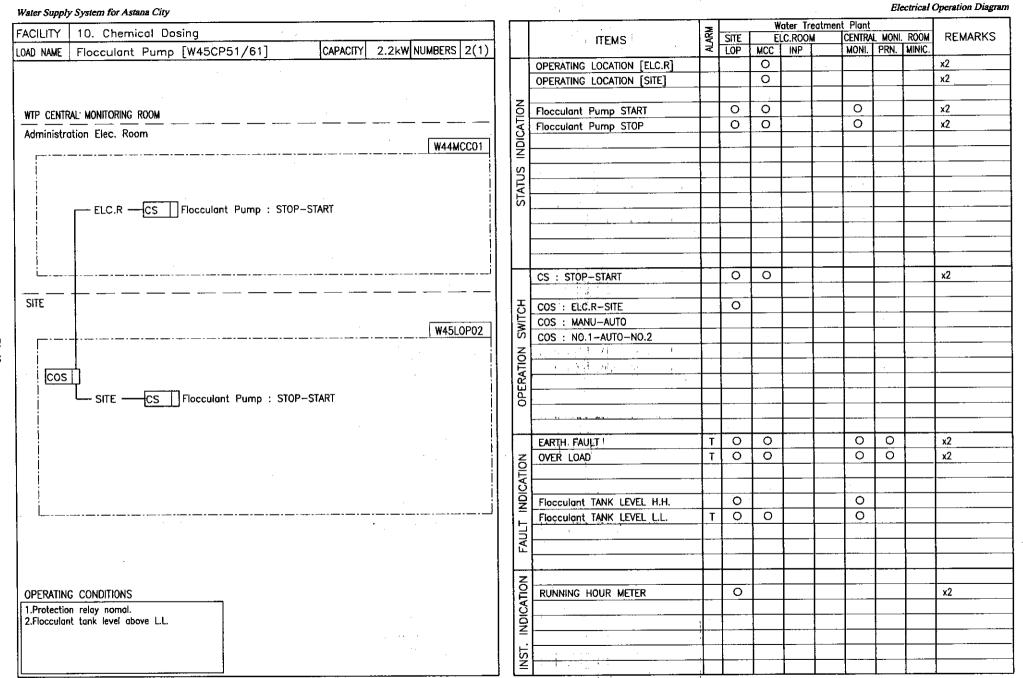
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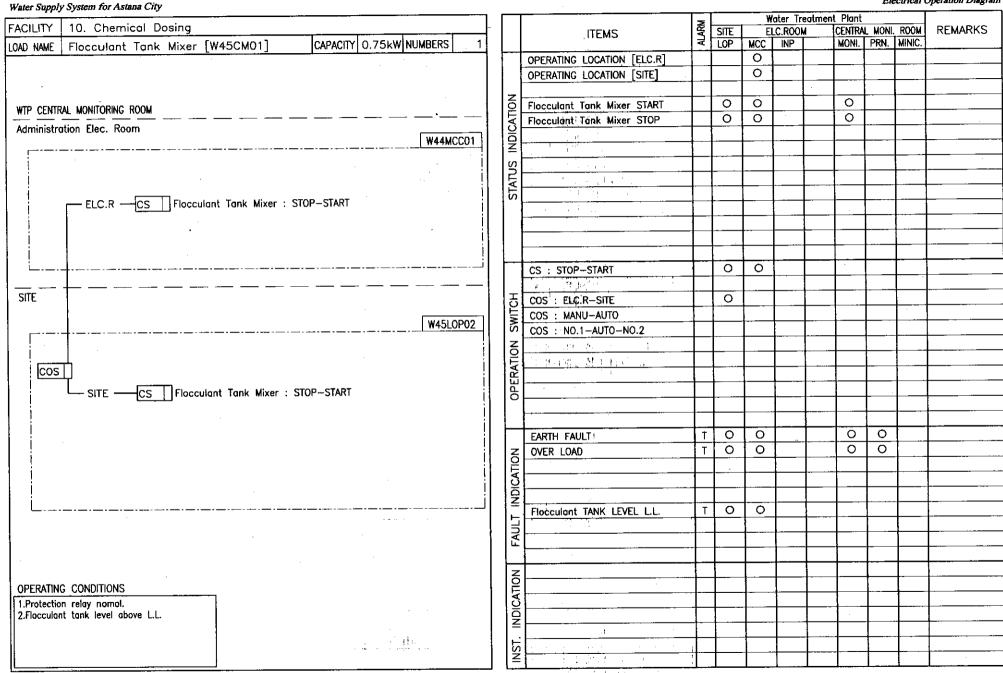
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Electrical Operation Diagram

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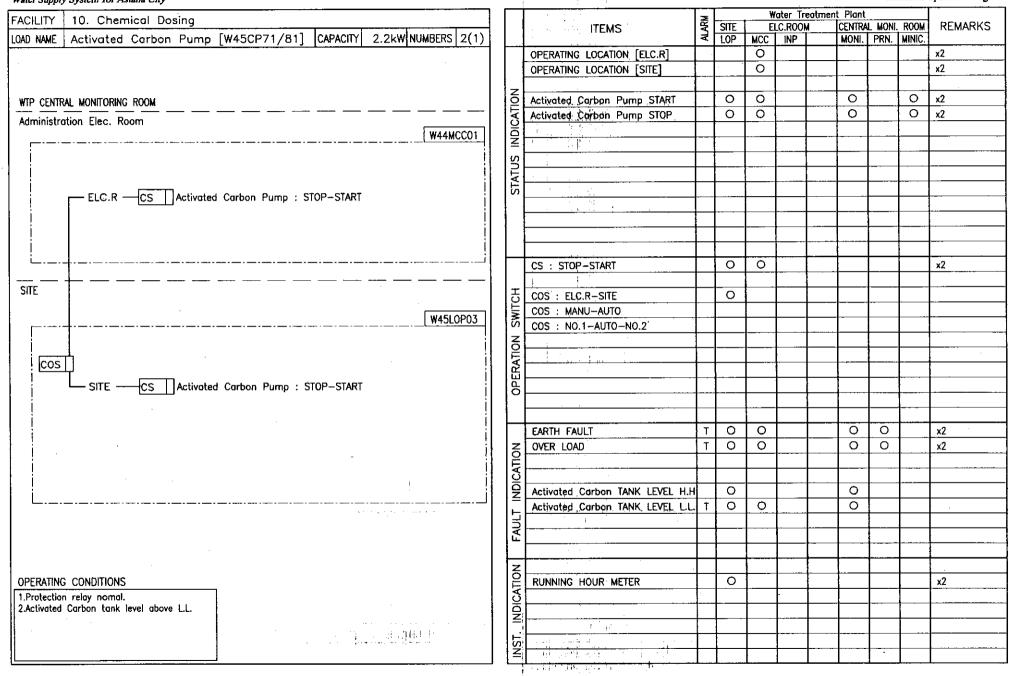


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### Electrical Operation Diagram



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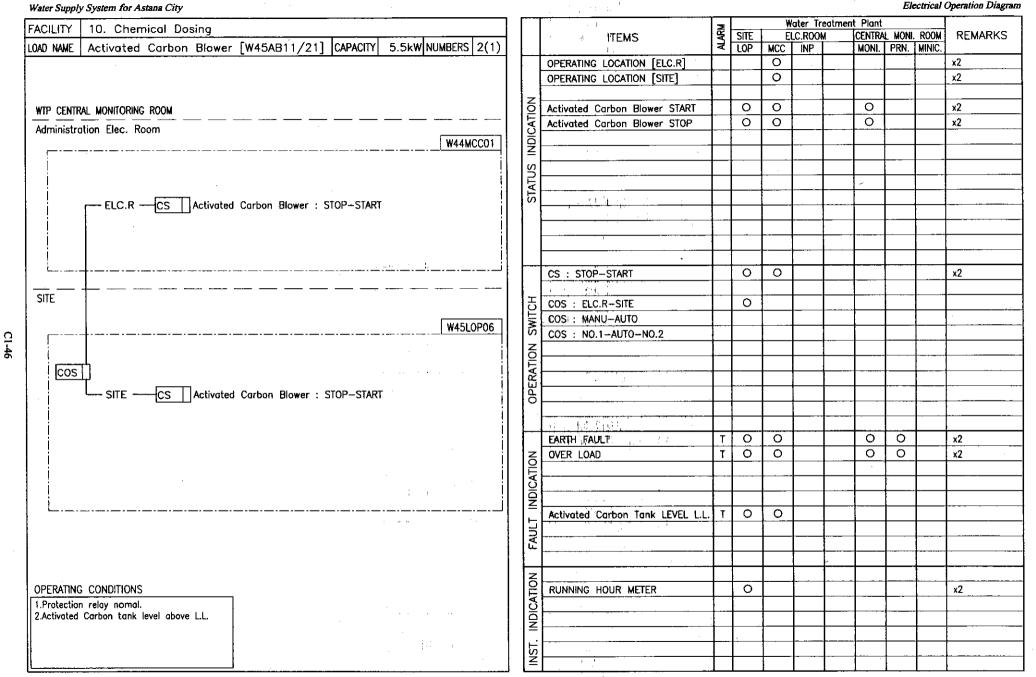
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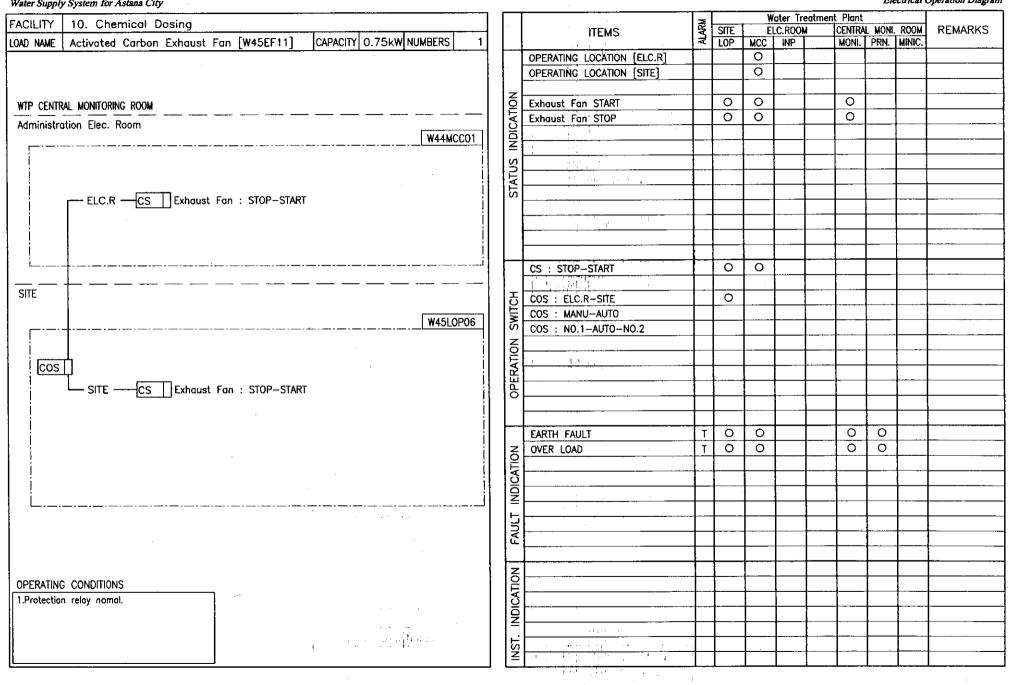
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Electrical Operation Diagram



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Electrical Operation Diagram



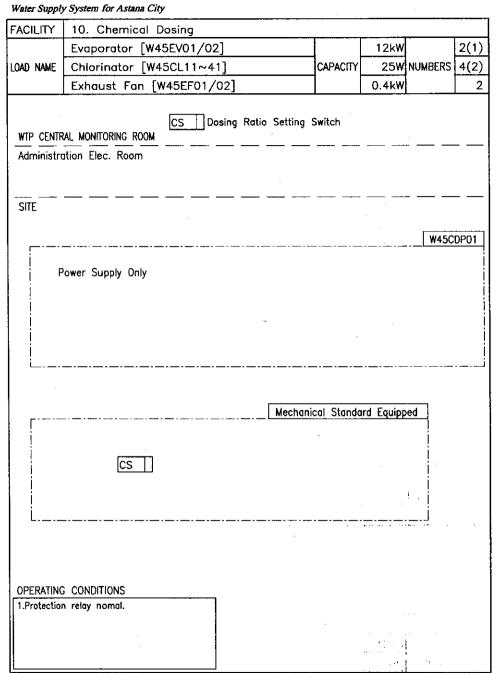
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Electrical Operation Diagram

