

APPENDIX C ELECTRICAL OPERATION DIAGRAM

C.1 WATER SUPPLY FACILITIES

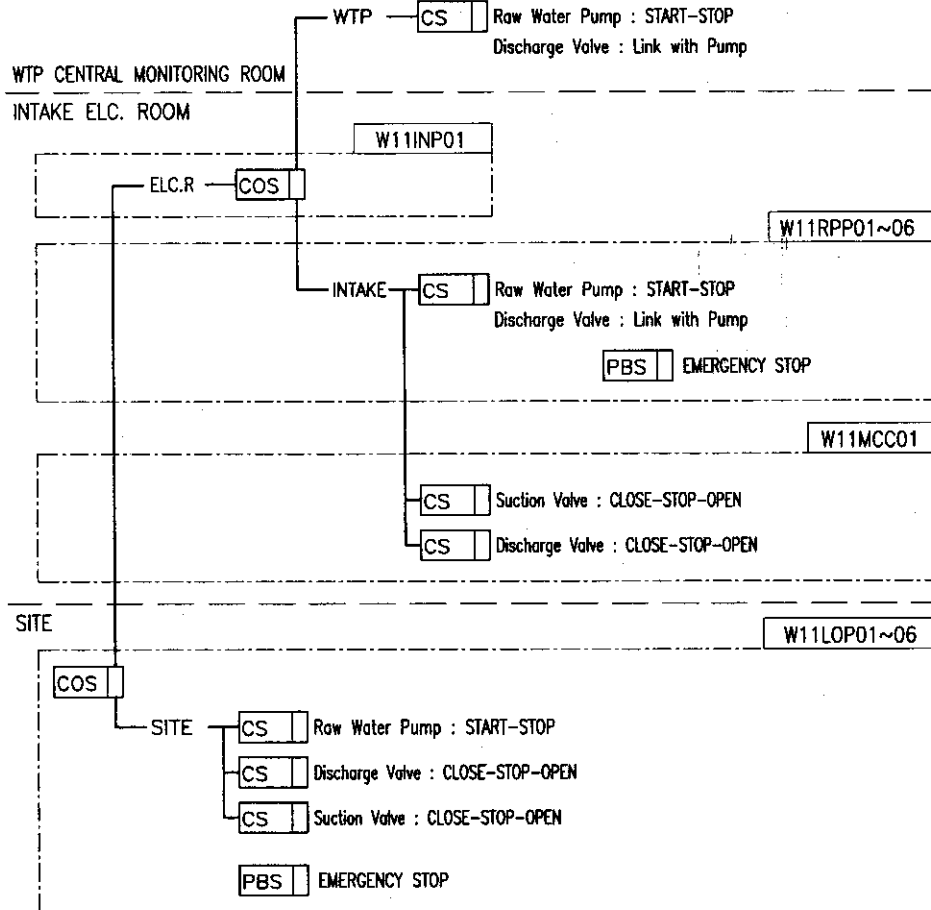
Abbreviation Table

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

Water Supply System for Astana City

Electrical Operation Diagram

FACILITY	1. Intake Pump Station				
LOAD NAME	Raw Water Pump [W11RP11~61]	CAPACITY	280kW	NUMBERS	6(2)
	Suction Valve [W11MV11~61]		0.75kW		6(2)
	Discharge Valve [W11MV12~62]		0.2kW		6(2)



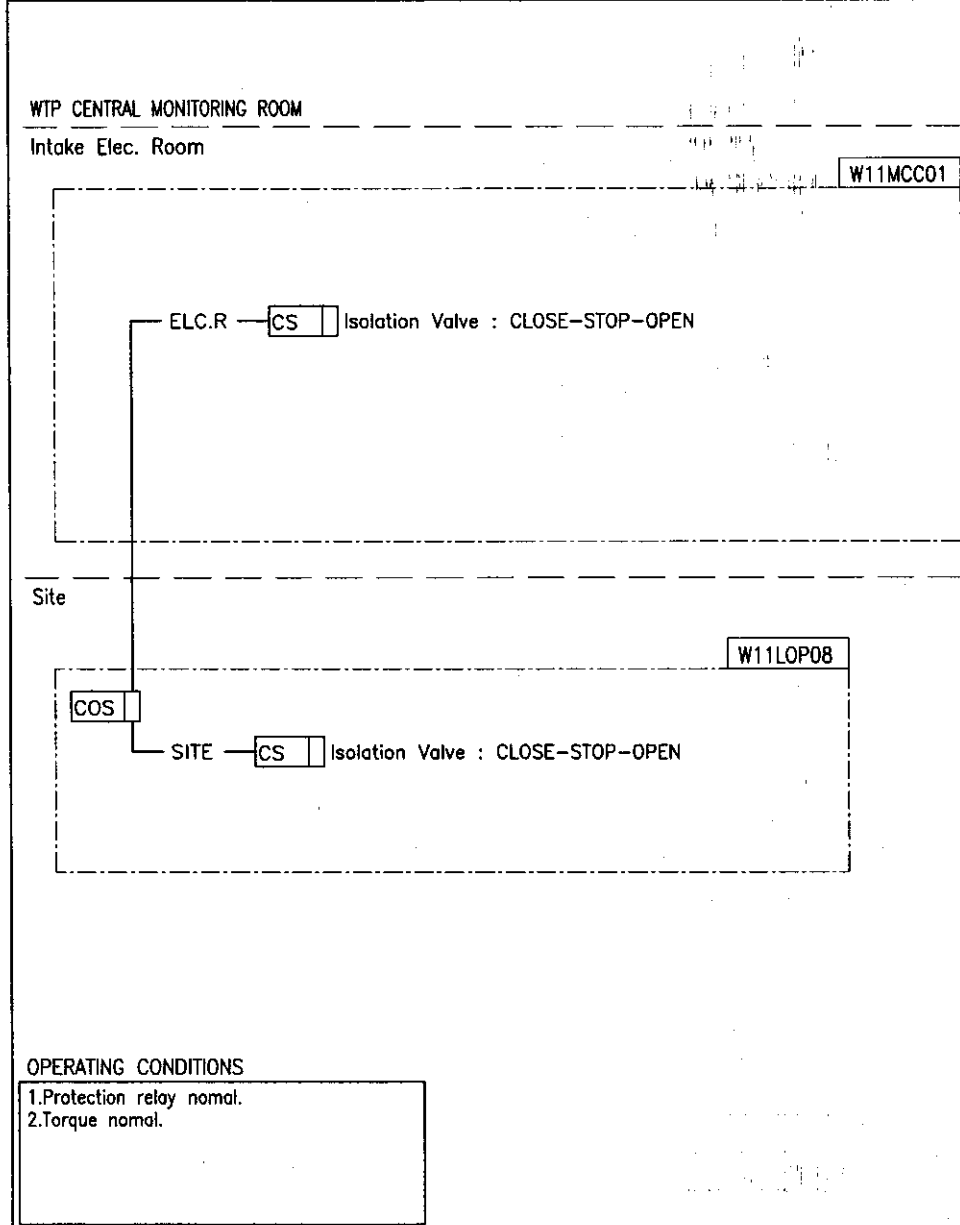
OPERATING CONDITIONS

1. Protection relay normal.
2. Reservoir level in pump well above L.L.
3. Valve is not over torque.
4. Pump is not over load.
5. One of inflow gate is open at the least.

ITEMS	ALARM	Intake Pump Station					WTP			REMARKS	
		SITE LOP	RPP	MCC	INP	MONI.	CENTRAL MONI. MONI.	ROOM PRN.	MINIC		
OPERATING LOCATION [WTP]			○	○			○	○			
OPERATING LOCATION [INTAKE]							○	○			
OPERATING LOCATION [ELC.R]											
OPERATING LOCATION [SITE]			○	○						x6	
Raw Water Pump START		○	○				○	○		○	x6
Raw Water Pump STOP		○	○				○	○		○	x6
Discharge Valve Fully OPEN		○		○			○	○			x6
Discharge Valve Fully CLOSE		○		○			○	○			x6
Suction Valve Fully OPEN		○		○			○	○			x6
Suction Valve Fully CLOSE		○		○			○	○			x6
CS : STOP-START		○	○					○			x6
CS : CLOSE-STOP-OPEN		○		○							x6x2
COS : WTP-INTAKE					○						
COS : SITE-ELC.R		○									
PBS : EMERGENCY STOP			○	○							x6
[Raw Water Pump]											
EARTH FAULT	T	○	○				○	○			x6
OVER LOAD	T	○	○				○	○			x6
TEMPERATURE UP	T	○	○				○	○			x6
[Discharge Valve]											
EARTH FAULT	T	○		○			○	○			x6
OVER LOAD	T	○		○			○	○			x6
OVER TORQUE	T	○		○			○	○			x6
[Suction Valve]											
EARTH FAULT	T	○		○			○	○			x6
OVER LOAD	T	○		○			○	○			x6
OVER TORQUE	T	○		○			○	○			x6
ALARM for PUMP START		○									
PUMP WELL LEVEL L.L.	T		○				○	○			
EMERGENCY STOP	T		○				○	○			x6
INTAKE FLOW RATE DROP							○	○		○	
AMMETER		○	○								x6
RUNNING HOUR METER			○								x6
RAW WATER INTAKE FLOW					○	○	○	○		○	
PUMP WELL LEVEL					○	○	○	○		○	

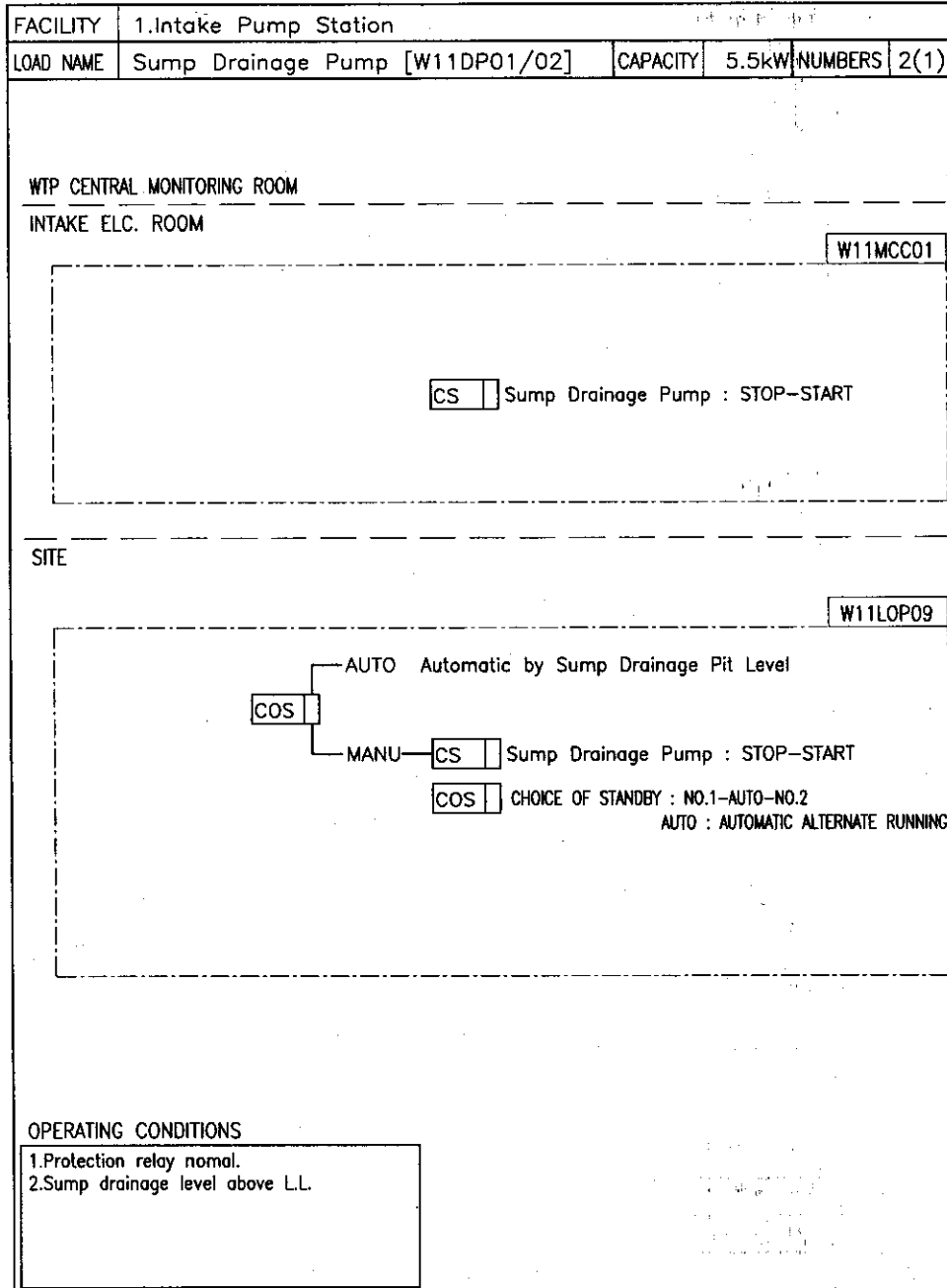
CI-3

FACILITY	1. Intake Pump Station				
LOAD NAME	Isolation Valve [W11MV04/05]	CAPACITY	3.7kW	NUMBERS	2



	ITEMS	ALARM	Intake Pump Station				WTP			REMARKS
			SITE	ELC.ROOM			CENTRAL MONI. ROOM			
				LOP	MCC	INP	MONI.	MONI.	PRN.	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			<input type="radio"/>						x2
	OPERATING LOCATION [SITE]			<input type="radio"/>						x2
	Isolation Valve Fully CLOSE		<input type="radio"/>	<input type="radio"/>			<input type="radio"/>			x2
	Isolation Valve Fully OPEN		<input type="radio"/>	<input type="radio"/>			<input type="radio"/>			x2
OPERATION SWITCH	CS : CLOSE-STOP-OPEN		<input type="radio"/>	<input type="radio"/>						x2
	COS : ELC.R-SITE		<input type="radio"/>							
FAULT INDICATION	EARTH FAULT	T	<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	<input type="radio"/>		x2
	OVER LOAD	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		x2
	OVER TORQUE	T	<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	<input type="radio"/>		x2
INST. INDICATION										

C14



	ITEMS	ALARM	Intake Pump Station			WTP		REMARKS	
			SITE LOP	ELC.ROOM MCC	INP. MONI.	CENTRAL MONI. MONI.	ROOM PRN.		
STATUS INDICATION	Sump Drainage Pump START		○	○			○	x2	
	Sump Drainage Pump STOP		○	○			○	x2	
OPERATION SWITCH	CS : STOP-START		○	○				x2	
	COS : ELC.R-SITE								
	COS : MANU-AUTO		○						
	COS : NO.1-AUTO-NO.2		○						
FAULT INDICATION	EARTH FAULT	T	○	○			○	○	x2
	OVER LOAD	T	○	○			○	○	x2
INST. INDICATION	SUMP DRAINAGE PIT LEVEL H.H.						○	○	
	SUMP DRAINAGE PIT LEVEL L.L.	T	○	○					
INST. INDICATION	RUNNING HOUR METER		○						x2

CI-5

FACILITY	1.Intake Pump Station		
LOAD NAME	Overhead Hoist [W11MHO1~03]	CAPACITY	9.0+0.75kW NUMBERS 3
<p>WTP CENTRAL MONITORING ROOM</p> <hr/> <p>INTAKE ELC. ROOM</p> <p>POWER SUPPLY ONLY</p>			
<p>SITE</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p>Mechanical Standard Equipped</p> <p><input type="checkbox"/> CS Screening Hoist : FORWARD-STOP-REVERSE</p> <p><input type="checkbox"/> CS Screening Hoist : UP-STOP-DOWN</p> </div>			
<p>OPERATING CONDITIONS</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p>1.Protection relay nomal.</p> </div>			

	ITEMS	ALARM	Intake Pump Station				WTP		REMARKS
			SITE	ELC.ROOM			CENTRAL MONI. ROOM		
			LOP	MCC	INP	MONI.	MONI.	PRN.	
STATUS INDICATION									
OPERATION SWITCH	CS :FORWARD-STOP-REVERSE		○						x3
	CS :UP-STOP-DOWN		○						x3
FAULT INDICATION	EARTH FAULT	T		○		○	○		x3
	OVER LOAD	T		○		○	○		x3
INST. INDICATION									

C1-6

FACILITY	1.Intake Pump Station				
LOAD NAME	Air Compressor [W12AC01/02]	CAPACITY	3.7kW	NUMBERS	2(1)
<p>WTP CENTRAL MONITORING ROOM</p> <hr/> <p>INTAKE ELC. ROOM</p> <div style="border: 1px dashed black; padding: 5px; width: fit-content; margin-left: auto;">W13FCP01</div>					
<p>SITE</p> <div style="border: 1px dashed black; padding: 10px; margin-left: 20px;"> <div style="text-align: right; margin-bottom: 10px;">W12LOP01</div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px 5px; margin-right: 5px;">COS</div> <div style="margin-right: 10px;"> <p>AUTO Automatic by Vacuum Tank Level</p> <p>MANU</p> </div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 1px solid black; padding: 2px 5px; margin-bottom: 5px;">CS</div> <div style="border: 1px solid black; padding: 2px 5px;">COS</div> </div> <div style="margin-left: 10px;"> <p>Air Compressor : STOP-START</p> <p>CHOICE OF STANDBY : NO.1-AUTO-NO.2</p> <p style="font-size: small;">AUTO : AUTOMATIC ALTERNATE RUNNING</p> </div> </div> </div>					
<p>OPERATING CONDITIONS</p> <div style="border: 1px solid black; padding: 5px; font-size: small;"> <p>1. Protection relay normal.</p> <p>2. Air tank pressure normal.</p> </div>					

	ITEMS	ALARM	Intake Pump Station				WTP			REMARKS
			SITE		ELC. ROOM		CENTRAL MONI. ROOM			
			LOP	FCP	INP	MONI.	MONI.	PRN.		
STATUS INDICATION	Air Compressor START		○				○			x2
	Air Compressor STOP		○				○			x2
	CS : STOP-START		○							x2
	COS : ELC.R-SITE									
OPERATION SWITCH	COS : MANU-AUTO		○							
	COS : NO.1-AUTO-NO.2		○							
	EARTH FAULT	T	○				○	○		x2
FAULT INDICATION	OVER LOAD	T	○				○	○		x2
	AIR TANK PRESSURE LOW		○				○			
	AIR TANK PRESSURE HIGH	T	○							
INST. INDICATION	RUNNING HOUR METER		○							x2

CI-7

FACILITY	1. Intake Pump Station				
LOAD NAME	Flow Control Valve [W13MV01]	CAPACITY	2.2kW	NUMBERS	1

WTP CENTRAL MONITORING ROOM

CS Flow Control Valve : Target Value Setting Switch

Intake Elec. Room

W11INP01
 CS Flow Control Valve : Opening Degree Adjustment Switch

Site

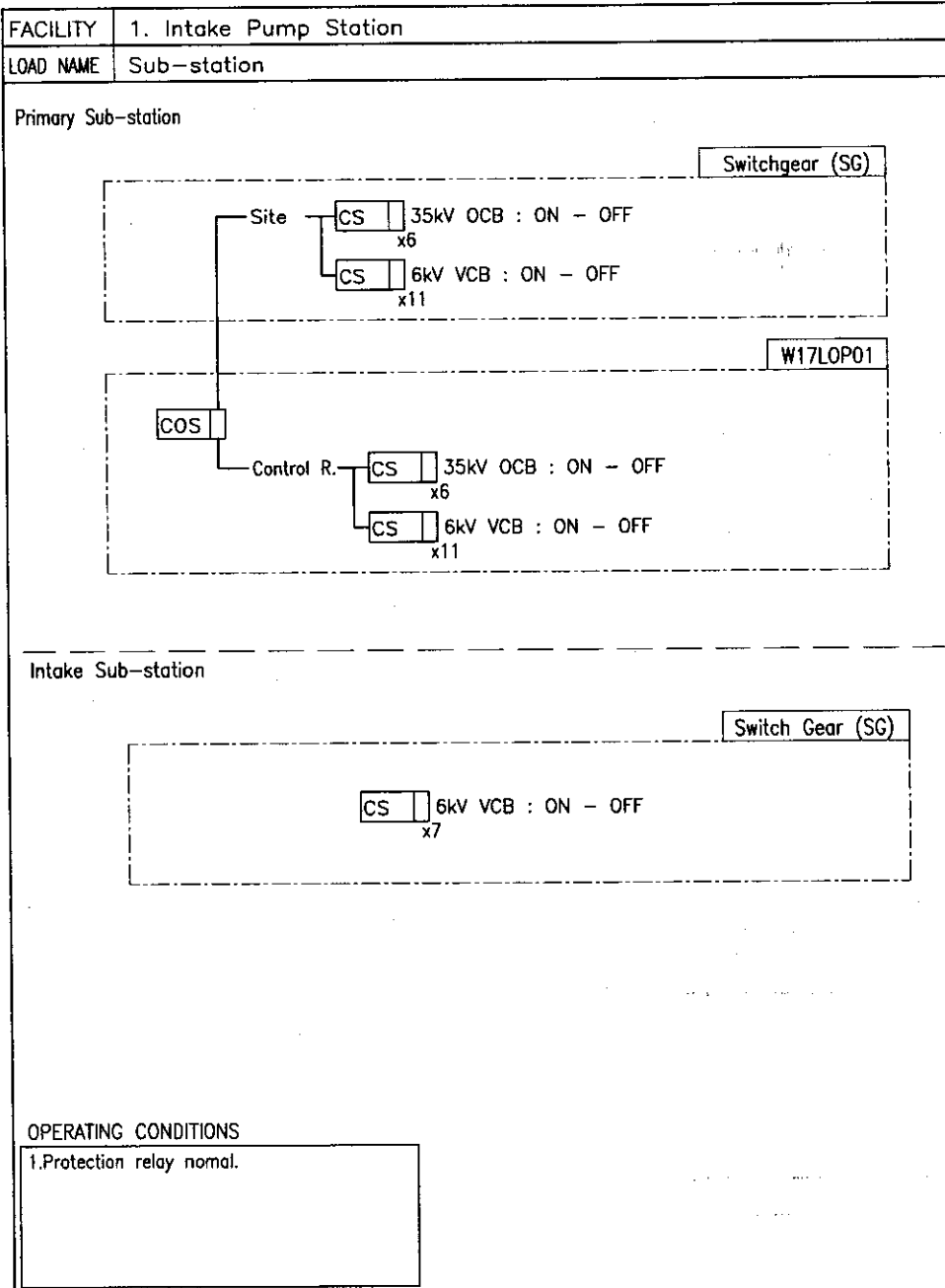
W13FCP01
 CS Flow Control Valve : CLOSE-STOP-OPEN

OPERATING CONDITIONS

1. Protection relay nomal.
2. Torque nomal.

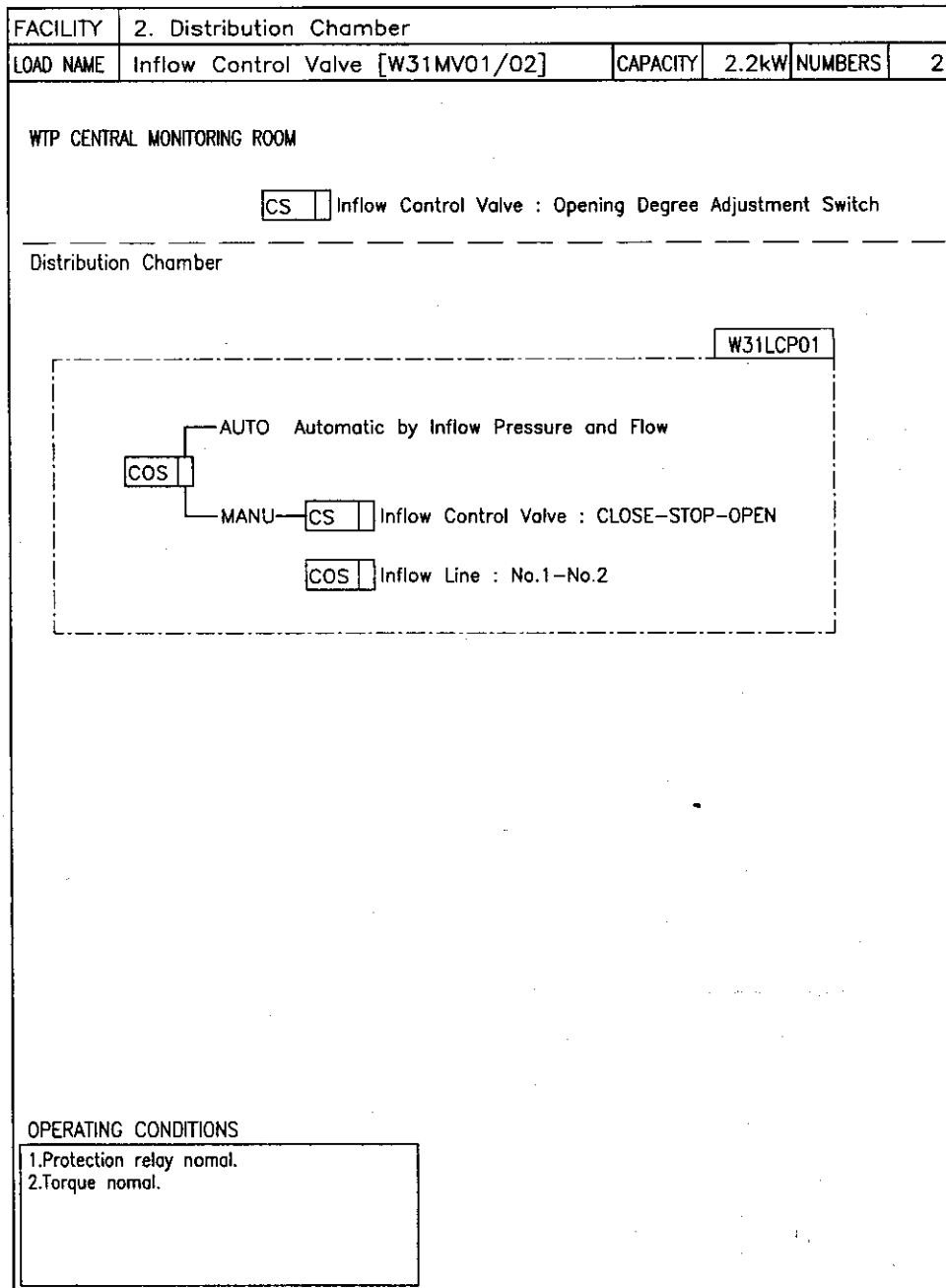
	ITEMS	ALARM	Intake Pump Station				WTP			REMARKS
			SITE FOP	ELC.ROOM			CENTRAL MONI.	MONI. PRN.	ROOM MINIC	
				MCC	INP	MONI.				
STATUS INDICATION	OPERATING LOCATION [ELC.R]									
	OPERATING LOCATION [SITE]									
	Flow Control Valve Fully CLOSE		○				○			
	Flow Control Valve Fully OPEN		○				○			
	Valve Intermediate Position		○				○			
OPERATION SWITCH	CS : CLOSE-STOP-OPEN		○							
	CS : Setting Switch						○			
	CS : Adjustment Switch				○					
	COS : ELC.R-SITE									
FAULT INDICATION	EARTH FAULT	T	○				○	○		
	OVER LOAD	T	○			○	○	○		
	OVER TORQUE	T	○				○	○		
INST. INDICATION	OPENING DEGREE		○		○		○			
	RAW WATER INTAKE FLOW		○							

CI-8



	ITEMS	ALARM	Intake Pump Station				WTP			REMARKS
			Primary		Intake		CENTRAL MONI.	ROOM		
			LOP	SG	SG	MONI.	MONI.	PRN.	MINIC	
STATUS INDICATION	[Primary Sub-station]									
	35kV OCB ON		○	○					x6	
	35kV OCB OFF		○	○					x6	
	6kV VCB ON		○	○					x11	
	6kV VCB OFF		○	○					x11	
OPERATION SWITCH	[Intake Sub-station]									
	6kV VCB ON				○	○	○		x7	
	6kV VCB OFF				○	○	○		x7	
	[Primary Sub-station]									
	CS : ON-OFF		○	○					x17	
	COS : CONTROL.R-SITE		○						x1	
	[Intake Sub-station]									
	CS : ON-OFF				○				x7	
FAULT INDICATION	[Primary Sub-station]									
	EARTH FAULT	T	○	○					x17	
	OVER CURRENT	T	○	○					x17	
	Power Failure		○						x2	
	Control Power Down		○	○					x17	
	[Intake Sub-station]									
	EARTH FAULT	T			○	○	○	○	x7	
	OVER CURRENT	T			○	○	○	○	x7	
Power Failure					○	○	○	x2		
Control Power Down				○	○	○	○	x7		
INST. INDICATION	[Primary Sub-station]									
	AMMETER		○	○					x10	
	VOLTMETER		○	○					x4	
	WATT METER			○					x10	
	WATT HOUR METER			○					x10	
	POWER FACTOR METER		○	○					x2	
	[Intake Sub-station]									
	Receiving AMMETER				○	○	○		x2	
	Receiving VOLTMETER				○	○	○		x2	
	Receiving POWER FACTOR				○	○	○		x2	
	AMMETER				○	○			x4	
	VOLTMETER				○	○			x2	
WATT METER				○				x4		
WATT HOUR METER				○				x4		

CI-9



	ITEMS	ALARM	Water Treatment Plant						REMARKS	
			SITE LCP	ELC.ROOM		CENTRAL MONI.	MONI. PRN.	ROOM MINIC		
STATUS INDICATION	OPERATING MODE [AUTO]							○		
	OPERATING MODE [MANU]							○		
	Inflow Line [No.1]							○		
	Inflow Line [No.2]							○		
	Inflow Control Valve Fully CLOSE		○					○	x2	
	Inflow Control Valve Fully OPEN		○					○	x2	
	Valve Intermediate Position		○					○	x2	
OPERATION SWITCH	CS : CLOSE-STOP-OPEN		○						x2	
	CS : CLOSE-OPEN									
	CS : Adjustment Switch							○		
	COS : AUTO-MANU		○							
	COS : No.1-No.2		○							
FAULT INDICATION	EARTH FAULT	T	○					○	○	x2
	OVER LOAD	T	○					○	○	x2
	OVER TORQUE	T	○					○	○	x2
	Distribution Chamber Level H.H.		○					○	○	
INST. INDICATION	OPENING DEGREE		○					○		x2
	RAW WATER DISTRIBUTION FLOW (New)		○					○	○	
	RAW WATER DISTRIBUTION FLOW (Old)		○					○	○	
	TOTAL INFLUENT FLOW		○					○	○	
	INFLOW PRESSURE		○					○	○	x2
	PROPER INFLOW PRESSURE							○		
RAW WATER INTAKE FLOW							○			

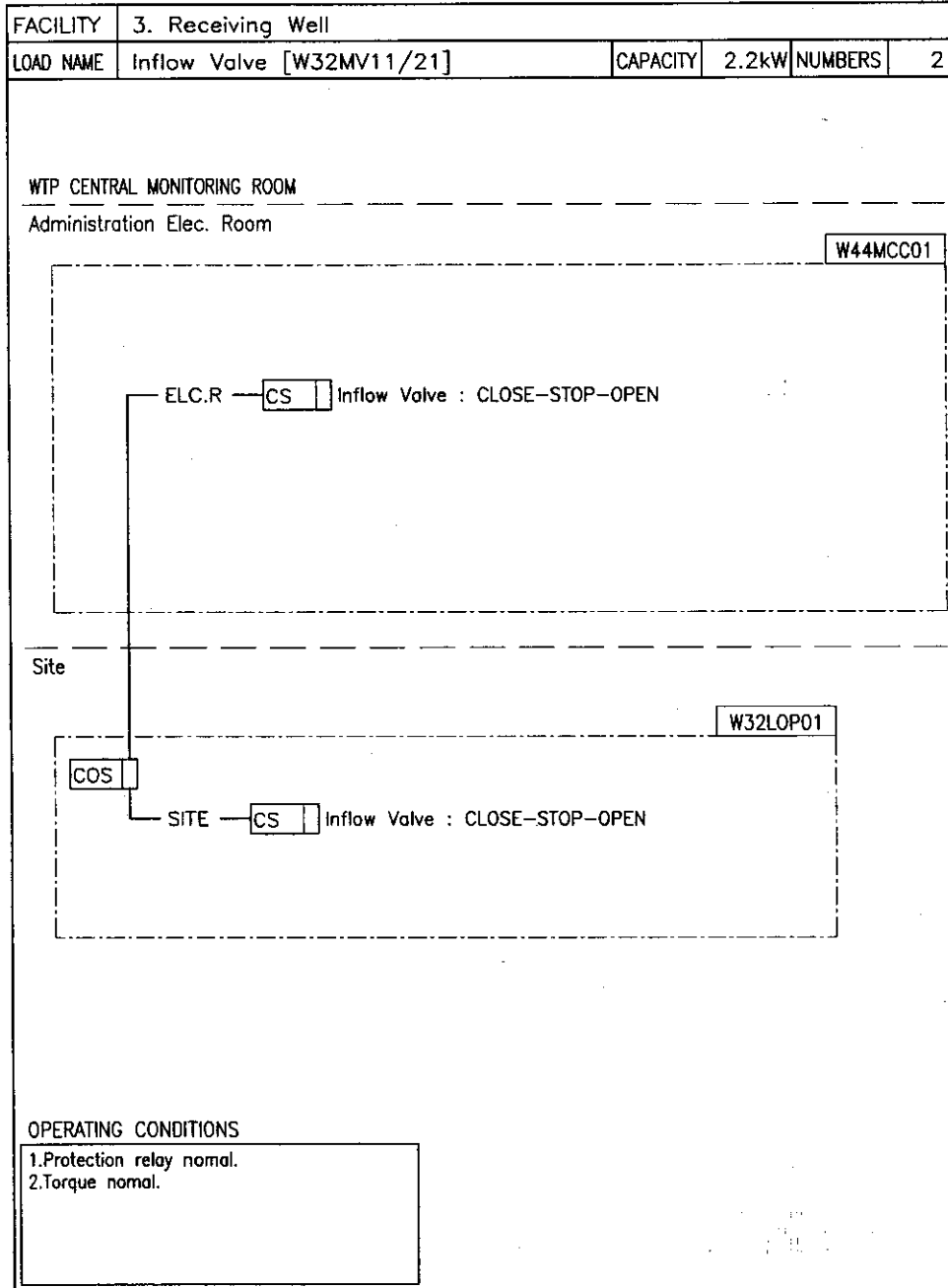
CI-10

FACILITY	2. Distribution Chamber				
LOAD NAME	Distribution Weir [W31MG11~31]	CAPACITY	1.5kW	NUMBERS	3
WTP CENTRAL MONITORING ROOM					

Site					
<div style="text-align: right; margin-bottom: 5px;">W31LCP01</div> <div style="text-align: center; margin-top: 20px;"> <div style="border: 1px solid black; display: inline-block; padding: 2px 5px;">CS</div> Distribution Weir : CLOSE-STOP-OPEN </div>					
OPERATING CONDITIONS 1. Protection relay normal. 2. Torque normal.					

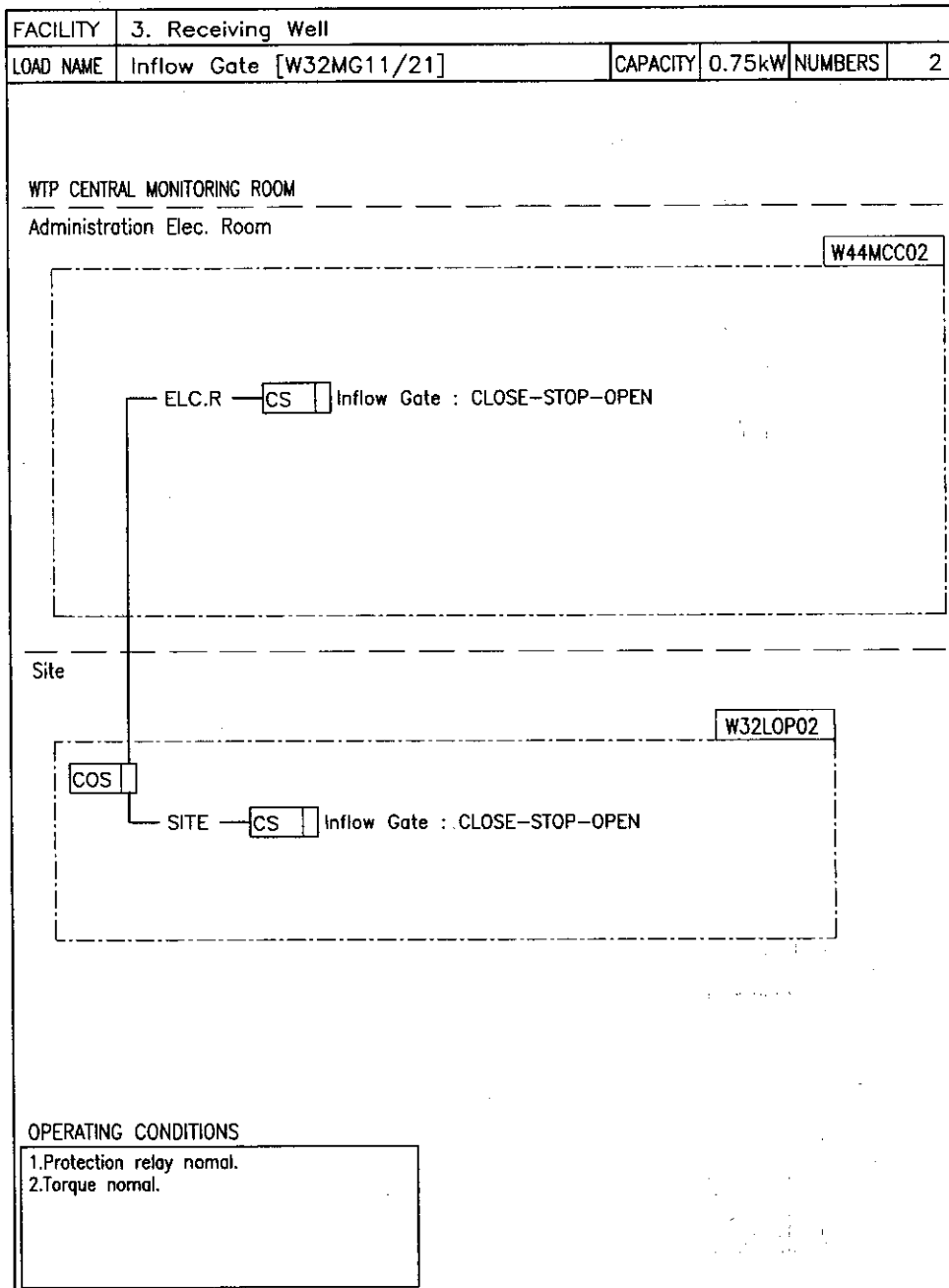
	ITEMS	ALARM	Water Treatment Plant						REMARKS	
			SITE	ELC.ROOM			CENTRAL MONI. ROOM			
				LCP	MCC	INP	MONI.	PRN.		MINIC
STATUS INDICATION	OPERATING LOCATION [ELC.R]									
	OPERATING LOCATION [SITE]									
	Distribution Weir Fully CLOSE		○				○		x3	
	Distribution Weir Fully OPEN		○				○		x3	
	Weir, Intermediate Position		○				○		x3	
OPERATION SWITCH	CS : CLOSE-STOP-OPEN		○						x3	
	CS : CLOSE-OPEN									
	COS : ELC.R-SITE									
FAULT INDICATION	EARTH FAULT	T	○				○	○	x3	
	OVER LOAD	T	○				○	○	x3	
	OVER TORQUE	T	○				○	○	x3	
INST. INDICATION										

CI-11



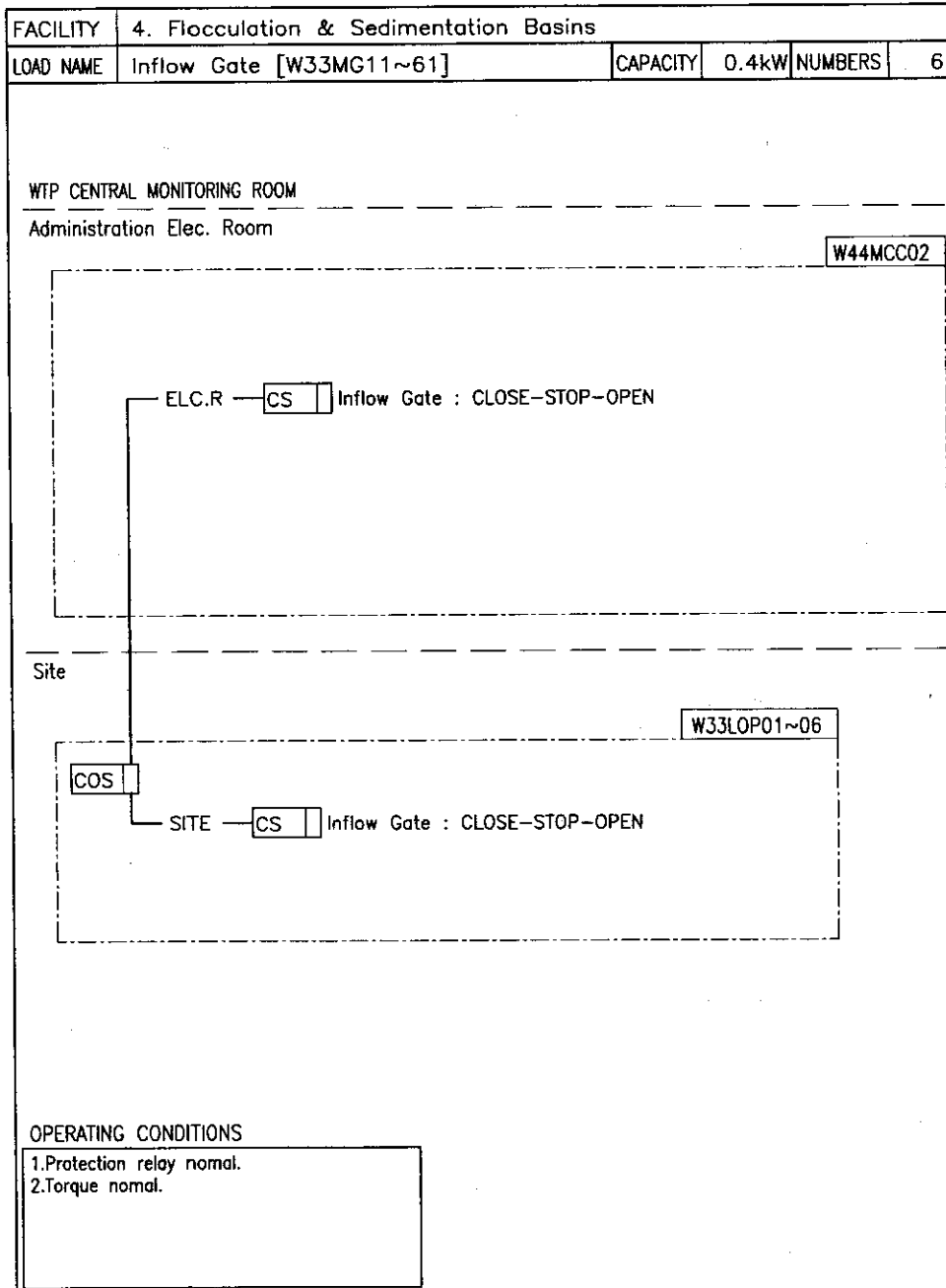
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.	MINIC	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			○					x2
	OPERATING LOCATION [SITE]			○					x2
	Inflow Valve Fully CLOSE		○	○		○			x2
	Inflow Valve Fully OPEN		○	○		○			x2
OPERATION SWITCH	CS : CLOSE-STOP-OPEN		○	○					x2
	COS : ELC.R-SITE		○						
FAULT INDICATION	EARTH FAULT	T	○	○		○	○		x2
	OVER LOAD	T	○	○		○	○		x2
	OVER TORQUE	T	○	○		○	○		x2
INST. INDICATION									

C1-12



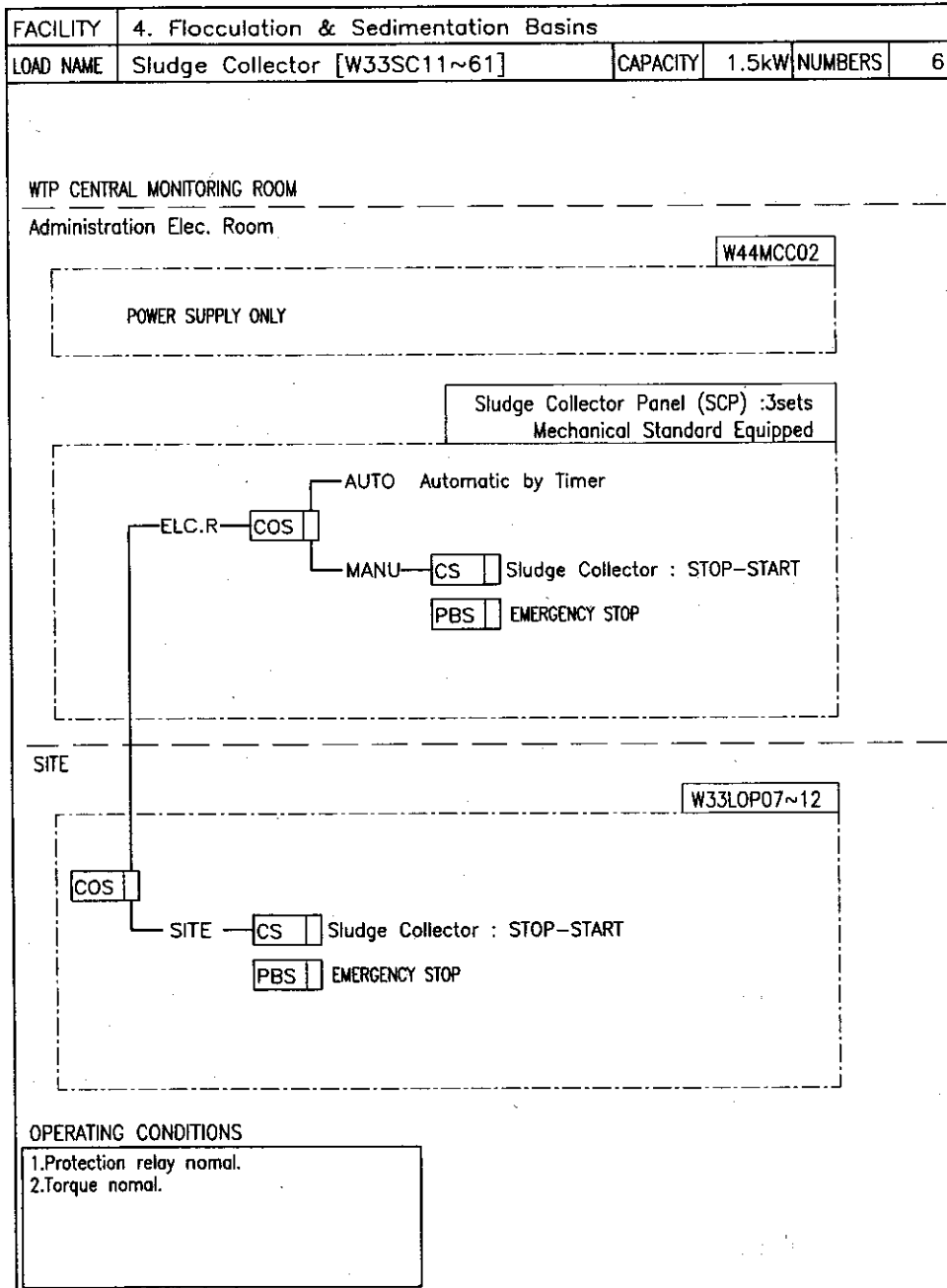
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.	MINIC	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			<input type="radio"/>					x2
	OPERATING LOCATION [SITE]			<input type="radio"/>					x2
	Inflow Gate Fully CLOSE		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			x2
	Inflow Gate Fully OPEN		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			x2
OPERATION SWITCH	CS : CLOSE-STOP-OPEN		<input type="radio"/>	<input type="radio"/>					x2
	COS : ELC.R-SITE		<input type="radio"/>						
FAULT INDICATION	EARTH FAULT	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		x2
	OVER LOAD	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		x2
	OVER TORQUE	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		x2
INST. INDICATION									

CI-13



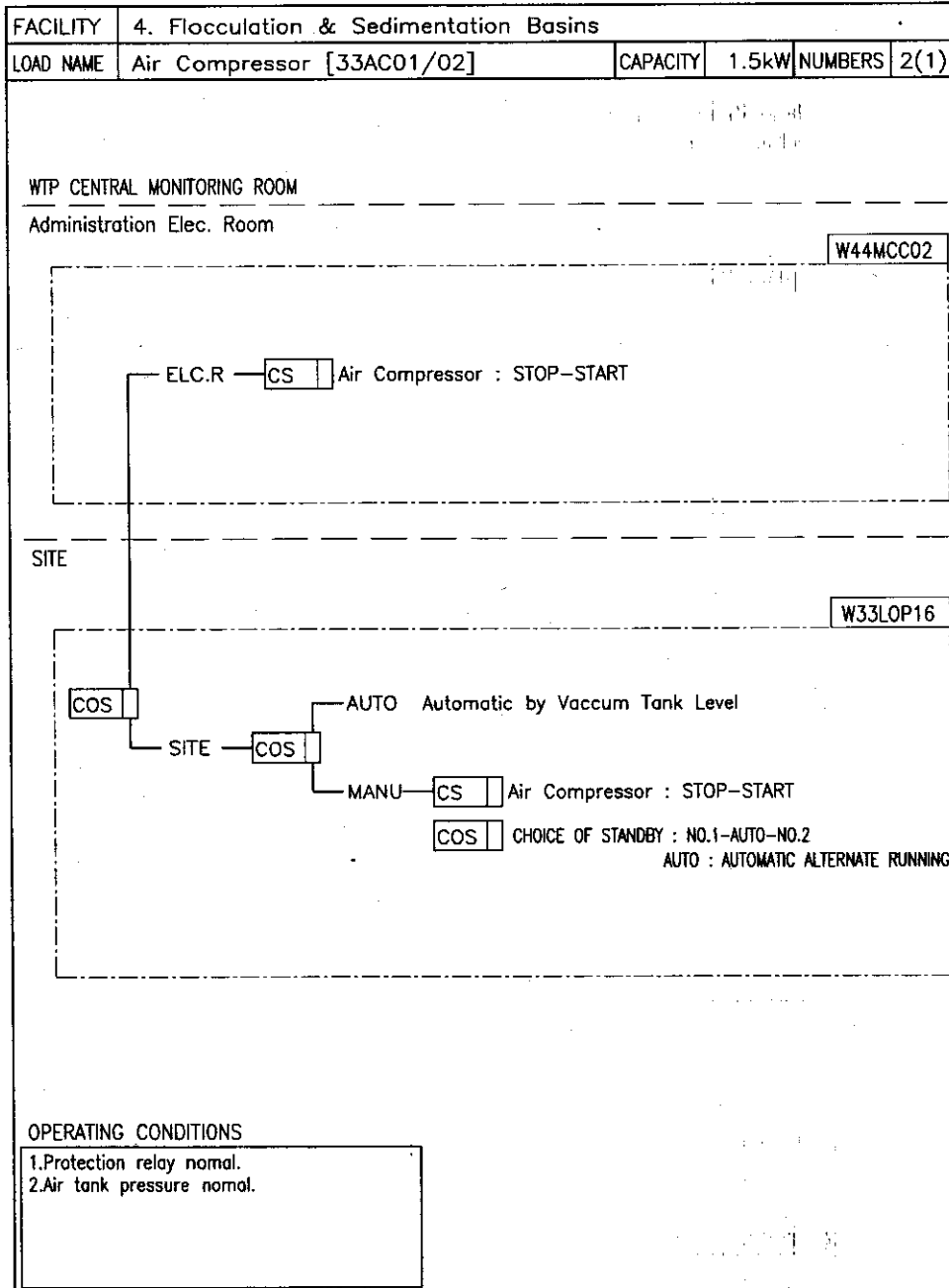
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.	MINIC	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			<input type="radio"/>					x6
	OPERATING LOCATION [SITE]			<input type="radio"/>					x6
	Inflow Gate Fully CLOSE		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			x6
	Inflow Gate Fully OPEN		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			x6
OPERATION SWITCH	CS : CLOSE-STOP-OPEN		<input type="radio"/>	<input type="radio"/>					x6
	COS : ELC.R-SITE		<input type="radio"/>						x6
FAULT INDICATION	EARTH FAULT	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		x6
	OVER LOAD	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		x6
	OVER TORQUE	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		x6
INST. INDICATION									

CI-14



	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM			
				MCC	SCP	MONI.	PRN.	MINIC	
STATUS INDICATION	OPERATING LOCATION [ELC.R]				○				x6
	OPERATING LOCATION [SITE]				○				x6
	Sludge Collector STOP		○	○	○	○			x6
	Sludge Collector START		○	○	○	○			x6
OPERATION SWITCH	CS : STOP-START		○		○				x6
	COS : ELC.R-SITE		○						x6
	COS : MANU-AUTO				○				x6
	PBS : EMERGENCY STOP		○		○				
FAULT INDICATION	EARTH FAULT	T	○	○	○	○	○		x6
	OVER LOAD	T	○	○	○	○	○		x6
	OVER TORQUE	T	○	○	○	○	○		x6
	PBS : EMERGENCY STOP	T	○	○	○	○	○		x6
INST. INDICATION									

CI-15



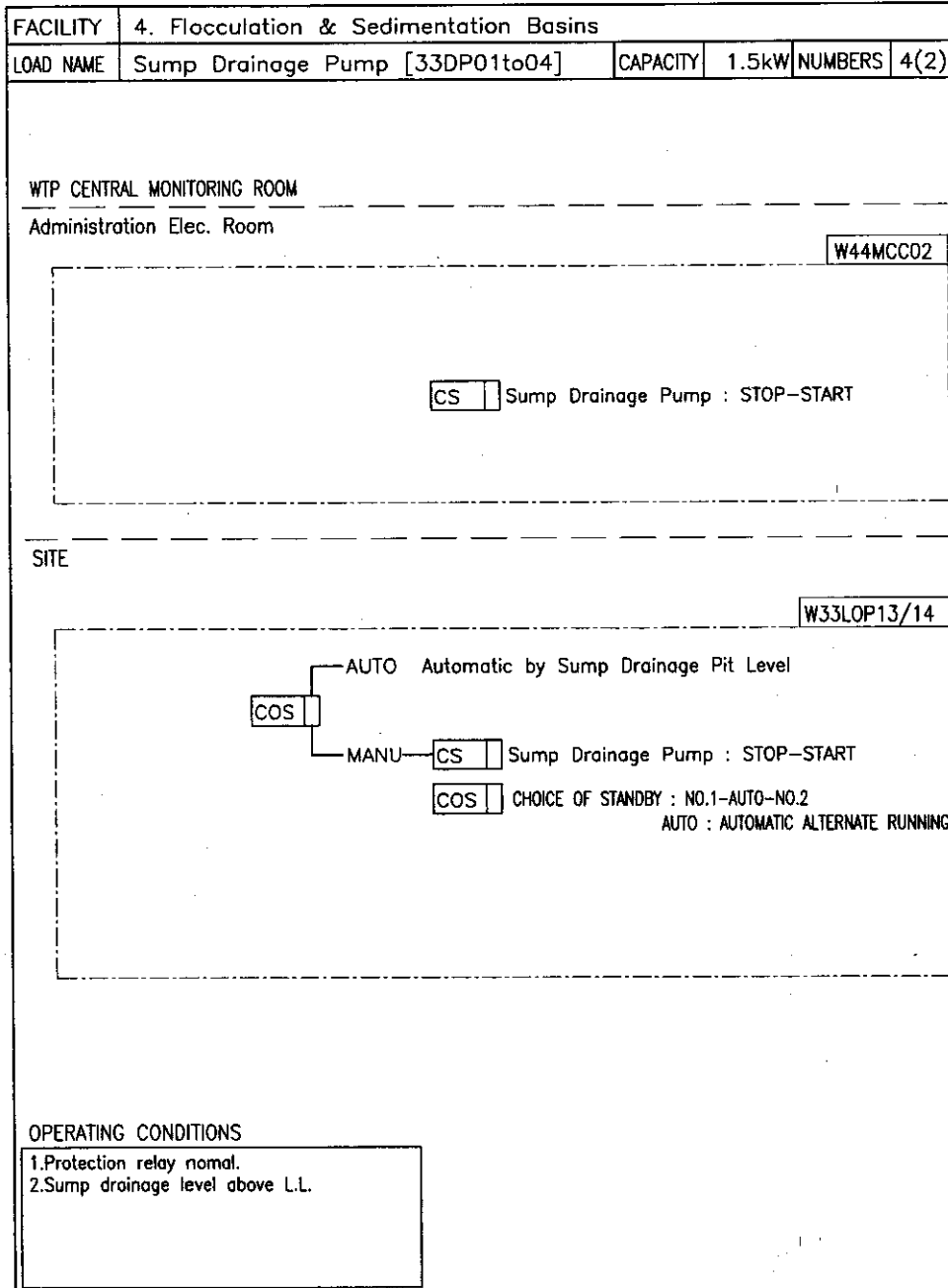
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC. ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.	MINIC	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			○					x2
	OPERATING LOCATION [SITE]			○					x2
	Air Compressor START		○	○		○			x2
	Air Compressor STOP		○	○		○			x2
OPERATION SWITCH	CS : STOP-START		○	○					x2
	COS : ELC.R-SITE		○						
	COS : MANU-AUTO		○						
	COS : NO.1-AUTO-NO.2		○						
FAULT INDICATION	EARTH FAULT	T	○	○		○	○		x2
	OVER LOAD	T	○	○		○	○		x2
	AIR TANK PRESSURE LOW		○			○			
	AIR TANK PRESSURE HIGH	T	○	○					
INST. INDICATION	RUNNING HOUR METER		○						x2

CI-16

FACILITY	4. Flocculation & Sedimentation Basins				
LOAD NAME	De-sludge Valve [W33MV11~64]	CAPACITY	---	NUMBERS	24
<p>WTP CENTRAL MONITORING ROOM</p> <hr style="border-top: 1px dashed black;"/> <p>Administration Elec. Room</p> <p style="text-align: center;">Automatic by Timer</p> <div style="display: flex; justify-content: center; align-items: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; width: 20px; height: 100px; margin-right: 5px;"></div> <div style="text-align: center;"> <p>Site</p> <hr style="border-top: 1px dashed black;"/> <div style="border: 1px dashed black; padding: 5px; width: 80%; margin: 0 auto;"> <p style="text-align: center; border: 1px solid black; display: inline-block;">Mechanical Standard Equipped</p> </div> <p style="margin-top: 10px;">De-sludge Valve (Solenoid Valve) : CLOSE-OPEN</p> </div> </div> <p>OPERATING CONDITIONS</p> <div style="border: 1px solid black; height: 40px; width: 100%; margin-top: 5px;"></div>					

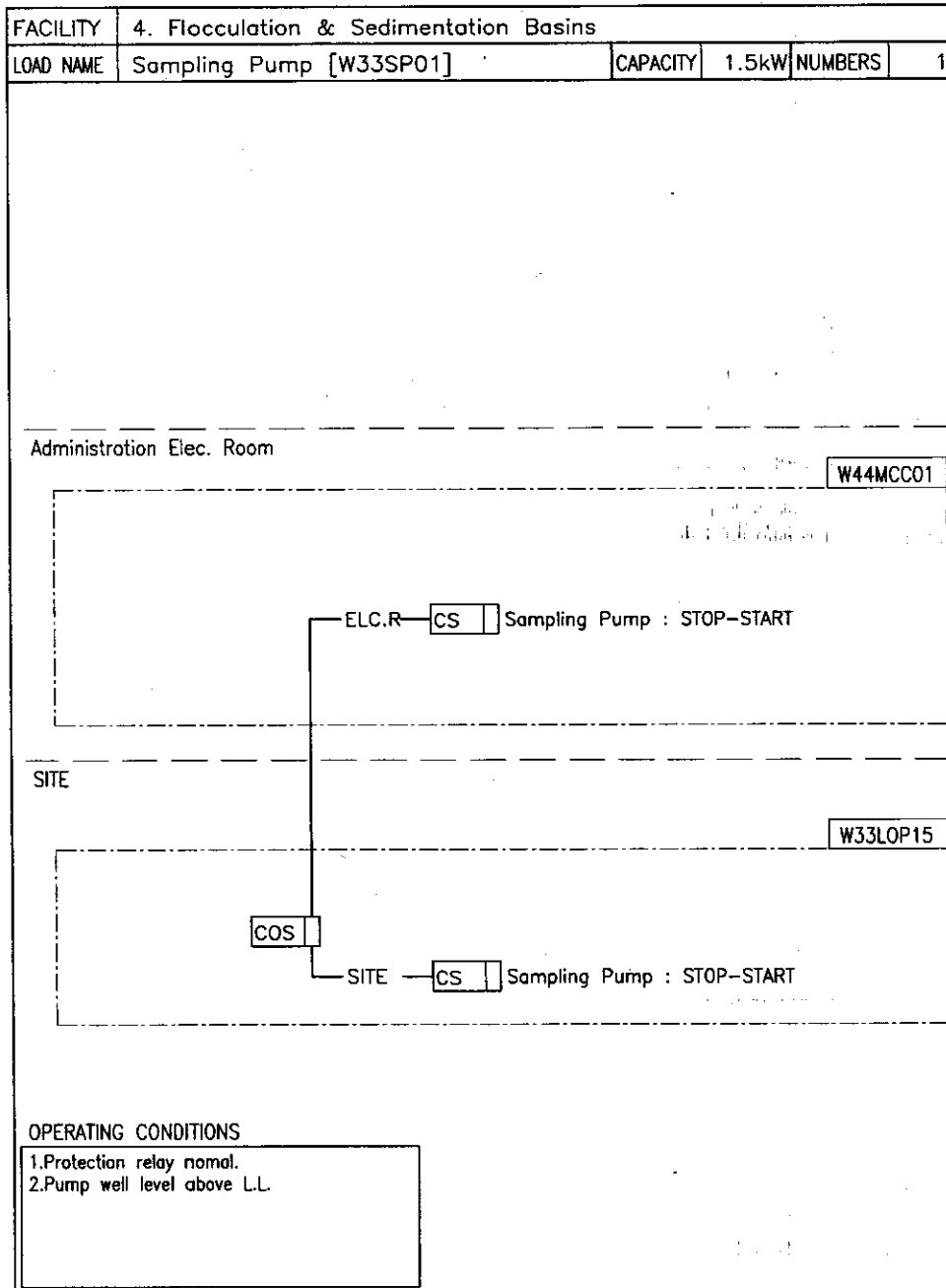
	ITEMS	ALARM	Water Treatment Plant						REMARKS	
			SITE	ELC.ROOM			CENTRAL MONI. ROOM			
				LOP	MCC	INP	MONI.	PRN.		MINIC
STATUS INDICATION	OPERATING LOCATION [ELC.R]									
	OPERATING LOCATION [SITE]									
OPERATION SWITCH	De-sludge Valve CLOSE		○				○		x24	
	De-sludge Valve OPEN		○				○		x24	
FAULT INDICATION	TROUBLE	T	○				○		x6	
INST. INDICATION										

CI-17



	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC. ROOM			CENTRAL MONI. ROOM		
				MCC	INP		MONI.	PRN.	
STATUS INDICATION	Sump Drainage Pump START		○	○			○		x4
	Sump Drainage Pump STOP		○	○			○		x4
	CS : STOP-START		○	○					x4
	COS : ELC.R-SITE								
OPERATION SWITCH	COS : MANU-AUTO		○						x2
	COS : NO.1-AUTO-NO.2		○						x2
	EARTH FAULT	T	○	○			○	○	x4
FAULT INDICATION	OVER LOAD	T	○	○			○	○	x4
	SUMP DRAINAGE PIT LEVEL H.H.						○		x2
	SUMP DRAINAGE PIT LEVEL L.L.	T	○	○					x2
INST. INDICATION	RUNNING HOUR METER		○						x4

CI-18



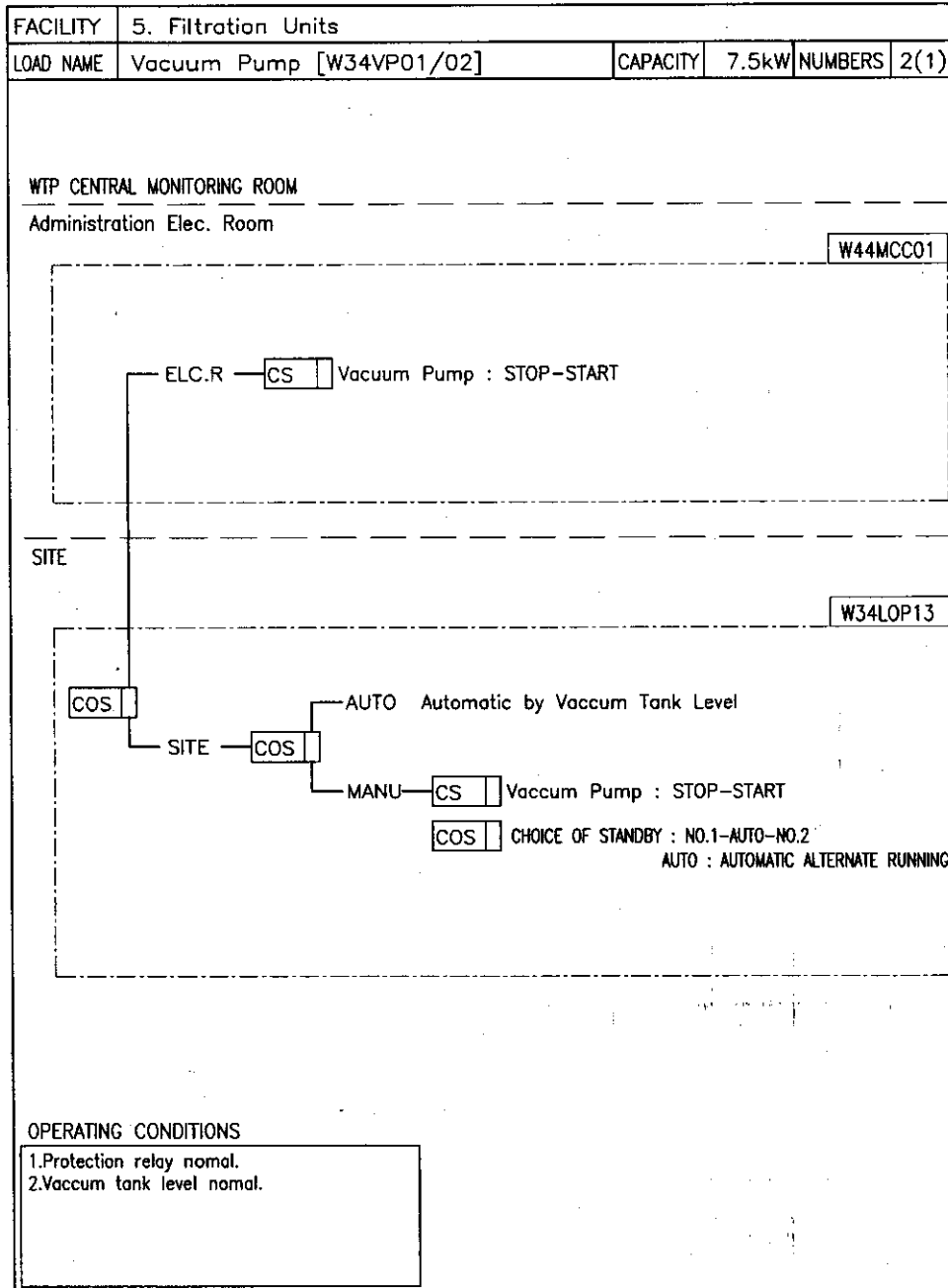
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.	LABO.	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			○					
	OPERATING LOCATION [SITE]			○					
	Sampling Pump START		○	○		○			
	Sampling Pump STOP		○	○		○			
OPERATION SWITCH	CS : STOP-START		○	○					
	COS : ELC.R-SITE		○						
FAULT INDICATION	EARTH FAULT	T	○	○		○	○		
	OVER LOAD	T	○	○		○	○		
	PUMP WELL LEVEL L.L.	T	○	○		○			
INST. INDICATION									

61-10

FACILITY	5. Filtration Units			
LOAD NAME	Inflow Siphon Valve [W34SI011~121]	CAPACITY	Pneumatic	12
	Wash Siphon Valve [W34SI012~122]		Pneumatic	12
	Surface Wash Valve [W34PV011~121]		Pneumatic	12
WTP CENTRAL MONITORING ROOM				
Administration Elec. Room				
Site				
<div style="border: 1px dashed black; padding: 10px;"> <div style="text-align: right; border: 1px solid black; display: inline-block; padding: 2px;">W34LOP01~12</div> <p>AUTO Automatic by Filter Level and Timer</p> <p>COS</p> <p>MANU</p> <ul style="list-style-type: none"> CS Inflow Siphon Valve : CLOSE-OPEN CS Wash Siphon Valve : CLOSE-OPEN CS Surface Wash Valve : CLOSE-OPEN PBS Washing Start Button (Semi-auto) <p>COS Washing Mode COS : Turbidity High-Low</p> </div>				
<p>OPERATING CONDITIONS</p> <p>1. Protection relay normal.</p> <p>2. Other filters are not under washing.</p>				

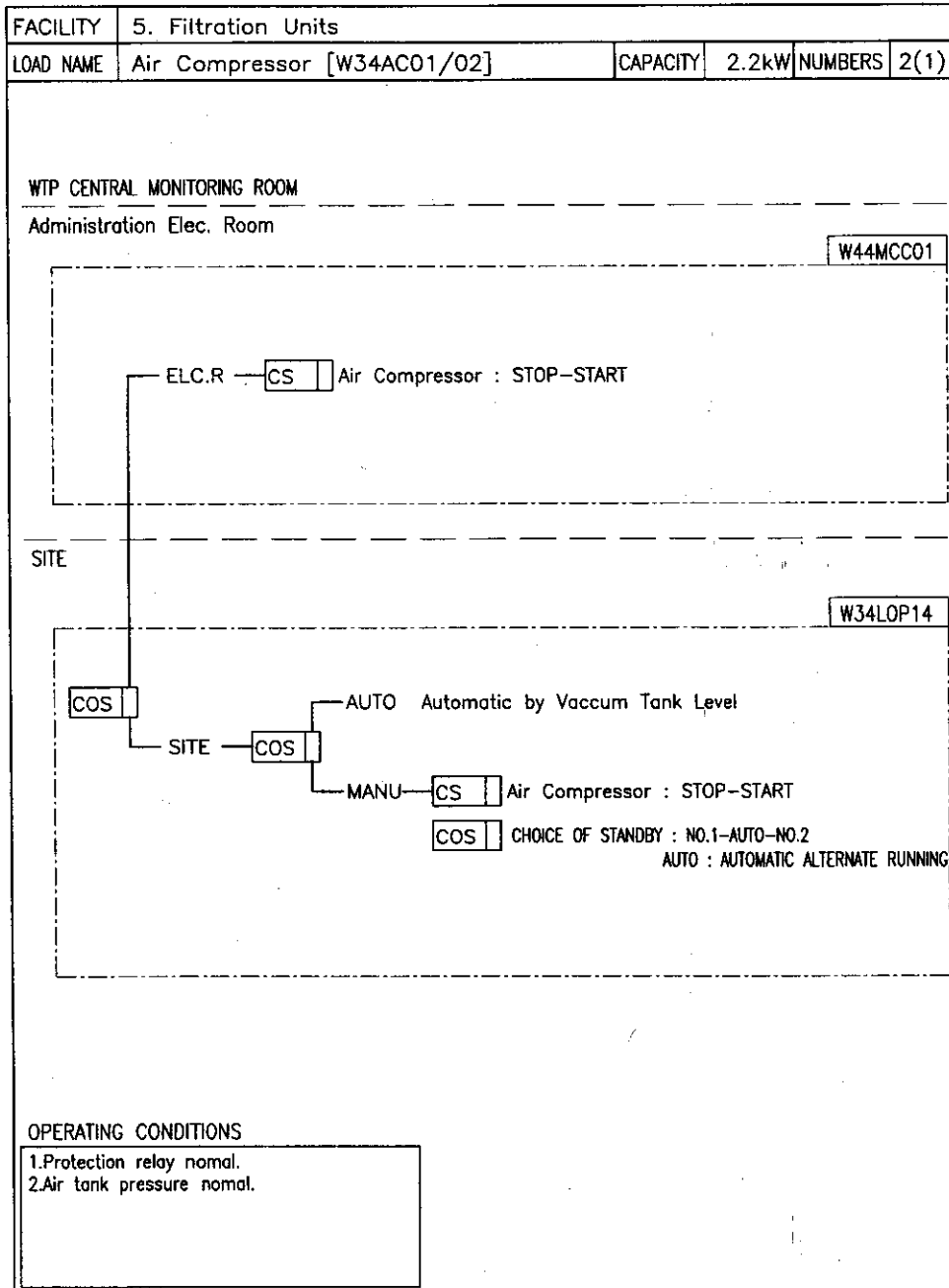
	ITEMS	ALARM	Water Treatment Plant						REMARKS	
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM				
			MCC	INP	MONI.	PRN.	MINIC			
STATUS INDICATION	FILTERING							○	x12	
	WASHING							○	○	x12
	Inflow Siphon Valve CLOSE							○		x12
	Inflow Siphon Valve OPEN							○		x12
	Wash Siphon Valve CLOSE							○		x12
	Wash Siphon Valve OPEN							○		x12
	Surface Wash Valve CLOSE							○		x12
	Surface Wash Valve OPEN							○		x12
	CS : CLOSE-OPEN							○		x12
	COS : AUTO-MANU							○		x12
COS : HIGH-LOW							○		x12	
PBS : Washing Start Button							○		x12	
FAULT INDICATION	Filter Level High							○	○	x12
	Filter Level Emergency High							○	○	x12
	Filter Level Low							○		x12
	Vacuum Unit Failure							○		x12
Compressor Unit Failure							○		x12	
INST. INDICATION	Surfacewash Water Flow							○	○	x2
	In-plant Distribution Water Flow							○	○	

CI-20



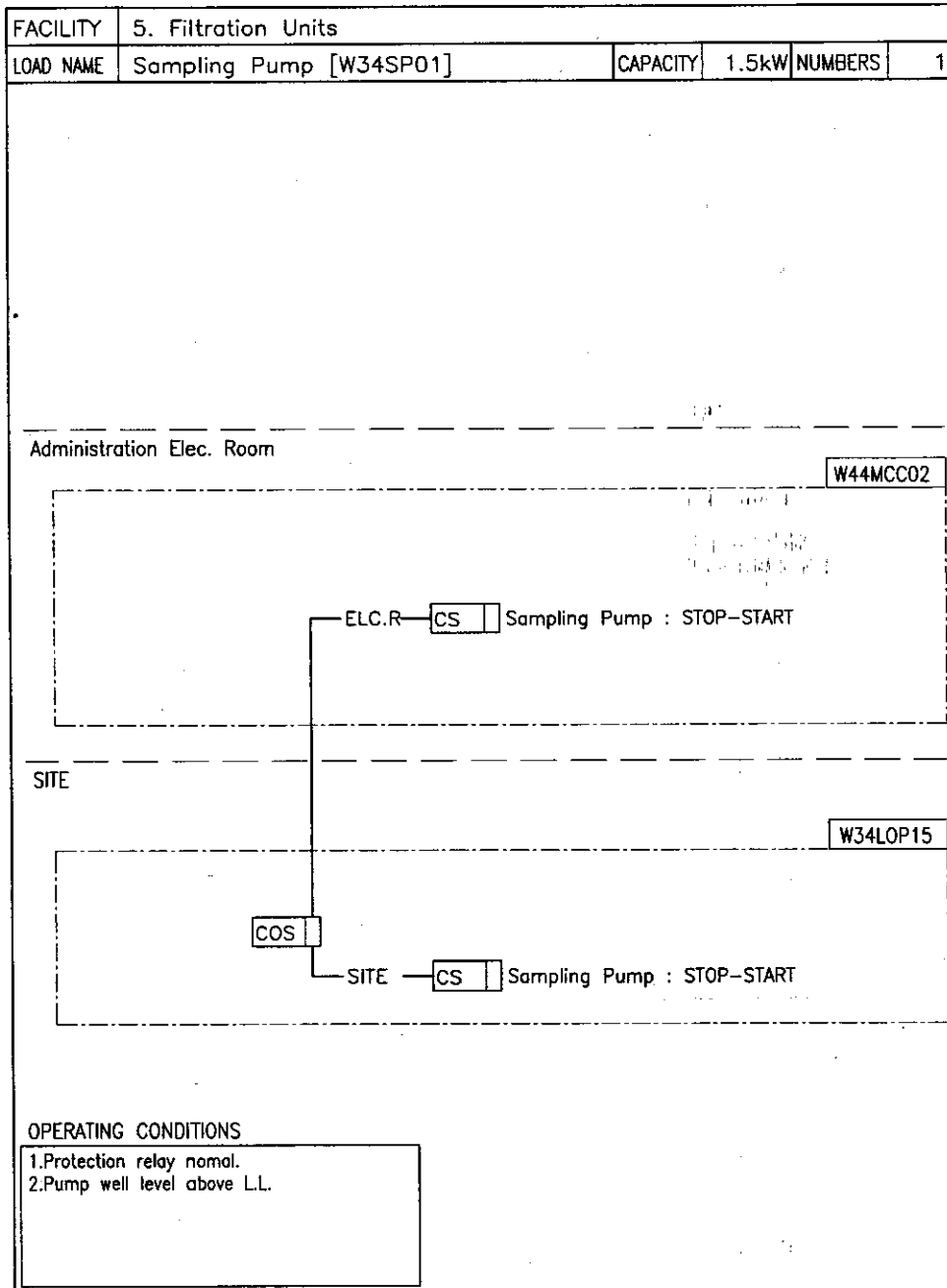
	ITEMS	ALARM	Water Treatment Plant					REMARKS
			SITE LÓP	ELC.ROOM		CENTRAL MONI. ROOM		
				MCC	INP	MONI.	PRN.	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			○				x2
	OPERATING LOCATION [SITE]			○				x2
	Vacuum Pump START		○	○		○		x2
	Vacuum Pump STOP		○	○		○		x2
OPERATION SWITCH	CS : STOP-START		○	○				x2
	COS : ELC.R-SITE		○					
	COS : MANU-AUTO		○					
	COS : NO.1-AUTO-NO.2		○					
FAULT INDICATION	EARTH FAULT	T	○	○		○	○	x2
	OVER LOAD	T	○	○		○	○	x2
	VACUUM TANK LEVEL H.H.					○		
INST. INDICATION	VACUUM TANK LEVEL L.L.	T	○	○				
	AMMETER		○	○				x2
	RUNNING HOUR METER		○					x2

C1-21



	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.		
STATUS INDICATION	OPERATING LOCATION [ELC.R]			<input type="radio"/>					x2
	OPERATING LOCATION [SITE]			<input type="radio"/>					x2
	Air Compressor START		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			x2
	Air Compressor STOP		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			x2
OPERATION SWITCH	CS : STOP-START		<input type="radio"/>	<input type="radio"/>					x2
	COS : ELC.R-SITE		<input type="radio"/>						
	COS : MANU-AUTO		<input type="radio"/>						
	COS : NO.1-AUTO-NO.2		<input type="radio"/>						
FAULT INDICATION	EARTH FAULT	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		x2
	OVER LOAD	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		x2
	AIR TANK PRESSURE LOW		<input type="radio"/>			<input type="radio"/>			
INST. INDICATION	AIR TANK PRESSURE HIGH	T	<input type="radio"/>	<input type="radio"/>					
	RUNNING HOUR METER		<input type="radio"/>						x2

CI-22



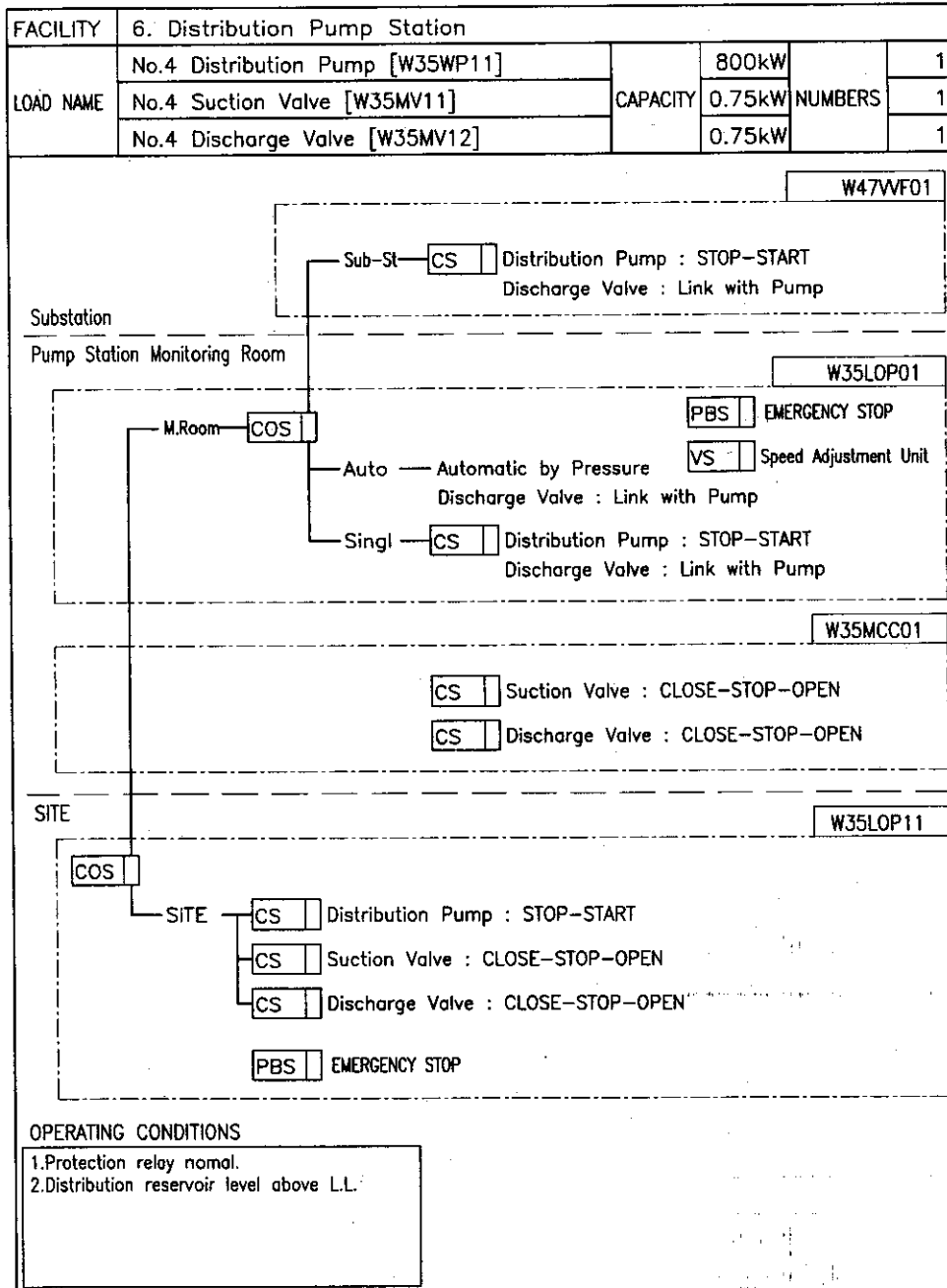
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.	LABO.	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			<input type="radio"/>					
	OPERATING LOCATION [SITE]			<input type="radio"/>					
	Sampling Pump START		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			
	Sampling Pump STOP		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			
OPERATION SWITCH	CS : STOP-START		<input type="radio"/>	<input type="radio"/>					
	COS : ELC.R-SITE		<input type="radio"/>						
FAULT INDICATION	EARTH FAULT	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
	OVER LOAD	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
	PUMP WELL LEVEL L.L.	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			
INST. INDICATION									

CI-23

FACILITY	5. Filtration Units				
LOAD NAME	Overhead Hoist [W34MH01/02]	CAPACITY	9.0+0.75kW	NUMBERS	2
<p>WTP CENTRAL MONITORING ROOM</p> <hr/> <p>Pump Station Elec. Room</p> <p>POWER SUPPLY ONLY</p>					
<p>SITE</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">Mechanical Standard Equipped</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px;">CS</div> Screening Hoist : FORWARD-STOP-REVERSE <div style="border: 1px solid black; padding: 2px;">CS</div> Screening Hoist : UP-STOP-DOWN </div> </div>					
<p>OPERATING CONDITIONS</p> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>1. Protection relay normal.</p> </div>					

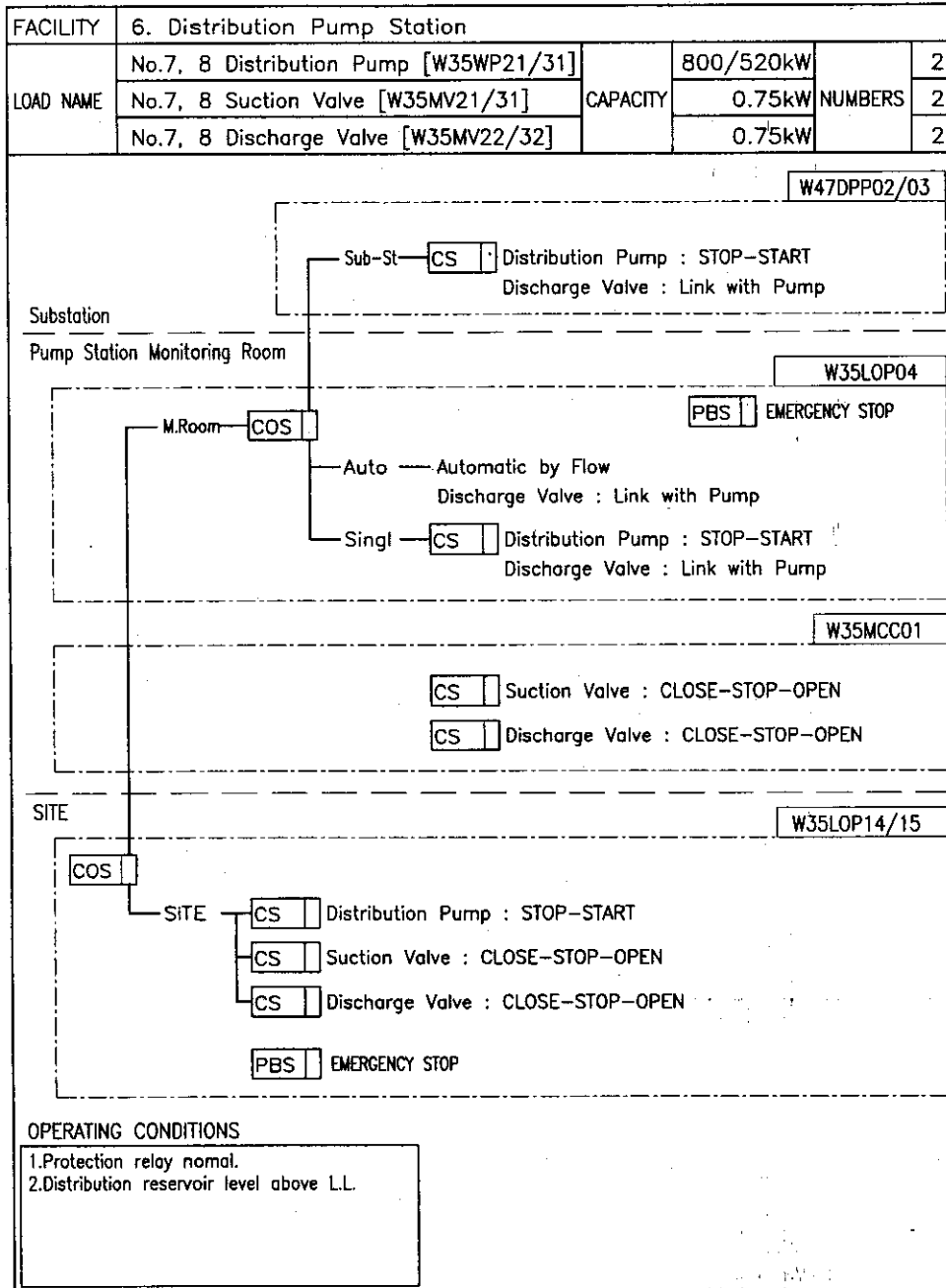
	ITEMS	ALARM	Water Treatment Plant					REMARKS
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM		
				MCC	INP	MONI.	PRN.	
STATUS INDICATION								
OPERATION SWITCH	CS :FORWARD-STOP-REVERSE		○					x2
	CS :UP-STOP-DOWN		○					x2
FAULT INDICATION	EARTH FAULT	T	○	○		○	○	x2
	OVER LOAD	T	○	○		○	○	x2
INST. INDICATION								

CI-24



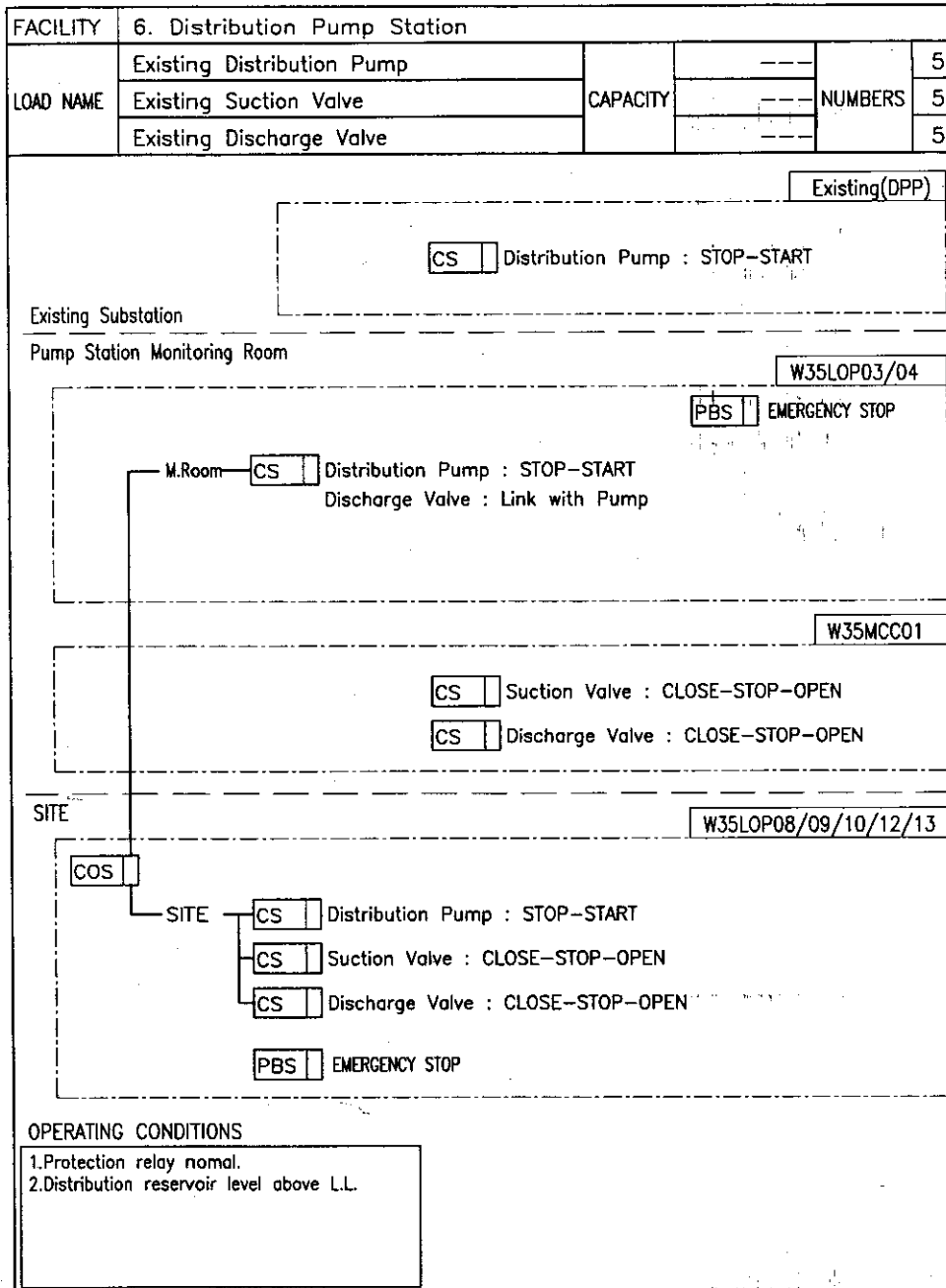
	ITEMS	ALARM	Water Treatment Plant						REMARKS	
			SITE	ELC.ROOM			CENTRAL MONI. ROOM	MONI. ROOM		
			LOP	VF	LOP	INP	MONI.	PRN.	MINIC	
STATUS INDICATION	OPERATING LOCATION [Sub-St.]			<input type="radio"/>	<input type="radio"/>					
	OPERATING LOCATION [M.Room]									
	OPERATING LOCATION [SITE]			<input type="radio"/>	<input type="radio"/>					
	Distribution Pump START		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	
	Distribution Pump STOP		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	
	Discharge Valve Fully OPEN		<input type="radio"/>	<input type="radio"/>	MCC		<input type="radio"/>			
	Discharge Valve Fully CLOSE		<input type="radio"/>	<input type="radio"/>	MCC		<input type="radio"/>			
Suction Valve Fully OPEN		<input type="radio"/>	<input type="radio"/>	MCC		<input type="radio"/>				
Suction Valve Fully CLOSE		<input type="radio"/>	<input type="radio"/>	MCC		<input type="radio"/>				
OPERATION SWITCH	CS : STOP-START		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
	CS : CLOSE-STOP-OPEN		<input type="radio"/>	<input type="radio"/>	MCC					x2
	VS : Speed Adjustment Unit				<input type="radio"/>					
	COS : M.Room-SITE		<input type="radio"/>							
	COS : SubSt.-Auto-Single				<input type="radio"/>					
	PBS : EMERGENCY STOP		<input type="radio"/>		<input type="radio"/>					
FAULT INDICATION	[Distribution Pump]									
	EARTH FAULT	T	<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	<input type="radio"/>		
	OVER LOAD	T	<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	<input type="radio"/>		
	TEMPERATURE UP	T	<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	<input type="radio"/>		
	[Discharge Valve]									
	EARTH FAULT	T	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
	OVER LOAD	T	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
	OVER TORQUE	T	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
	[Suction Valve]									
	EARTH FAULT	T	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
	OVER LOAD	T	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
	OVER TORQUE	T	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
RESERVOIR LEVEL L.L.	T		<input type="radio"/>			<input type="radio"/>	<input type="radio"/>			
EMERGENCY STOP	T		<input type="radio"/>			<input type="radio"/>	<input type="radio"/>			
DISTRIBUTION PRESSURE DROP				<input type="radio"/>		<input type="radio"/>				
INST. INDICATION	AMMETER		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
	RUNNING HOUR METER				<input type="radio"/>					
	DISTRIBUTION RESERVOIR LEVEL					<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
	DISTRIBUTION PRESSURE					<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
	DISTRIBUTION FLOW					<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
	DISTRIBUTION FLOW for TETs-1					<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
DISTRIBUTION FLOW for TETs-2					<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
TOTAL DISTRIBUTION FLOW					<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			

CI-25



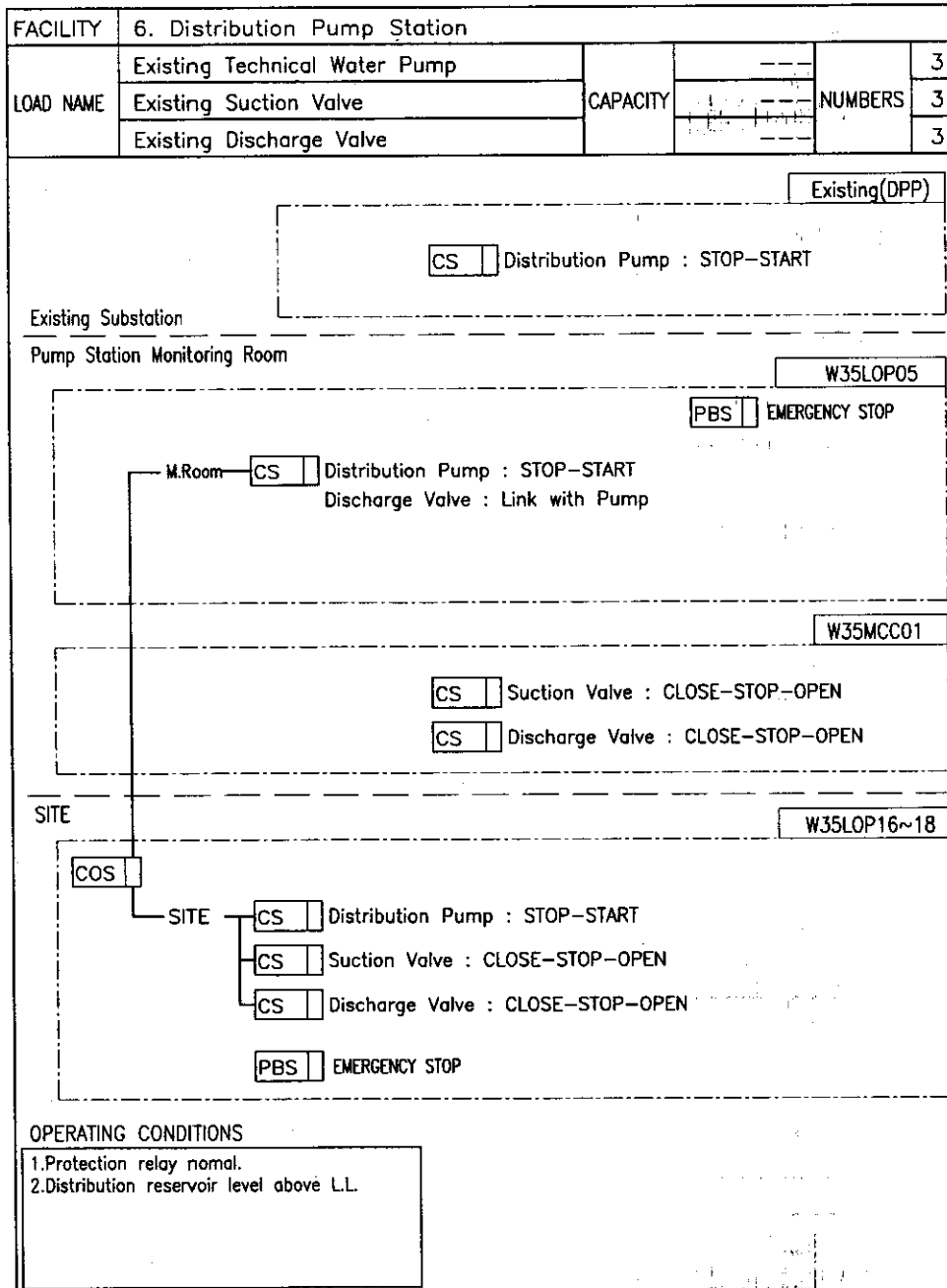
	ITEMS	ALARM	Water Treatment Plant						REMARKS	
			SITE	ELC.ROOM		CENTRAL MONI.	MONI. PRN.	ROOM MINIC		
			LOP	DPP	LOP	INP				
STATUS INDICATION	OPERATING LOCATION [Sub-St.]			○					x2	
	OPERATING LOCATION [M.Room]									
	OPERATING LOCATION [SITE]			○	○				x2	
	Distribution Pump START		○	○	○		○		○	x2
	Distribution Pump STOP		○	○	○		○		○	x2
	Discharge Valve Fully OPEN		○	○	MCC		○			x2
	Discharge Valve Fully CLOSE		○	○	MCC		○			x2
Suction Valve Fully OPEN		○	○	MCC		○			x2	
Suction Valve Fully CLOSE		○	○	MCC		○			x2	
OPERATION SWITCH	CS : STOP-START		○	○	○					x2
	CS : CLOSE-STOP-OPEN		○	○	MCC					x2 x2
	COS : M.Room-SITE		○							x2
	COS : SubSt.-Auto-Single					○				
PBS :EMERGENCY STOP		○			○					x2
FAULT INDICATION	[Distribution Pump]									
	EARTH FAULT	T	○	○			○	○		x2
	OVER LOAD	T	○	○			○	○		x2
	TEMPERATURE UP	T	○	○			○	○		x2
	[Discharge Valve]									
	EARTH FAULT	T	○		○		○	○		x2
	OVER LOAD	T	○		○		○	○		x2
	OVER TORQUE	T	○		○		○	○		x2
	[Suction Valve]									
EARTH FAULT	T	○		○		○	○		x2	
OVER LOAD	T	○		○		○	○		x2	
OVER TORQUE	T	○		○		○	○		x2	
EMERGENCY STOP	T		○				○	○		x2
INST. INDICATION	AMMETER		○	○	○					x2
	RUNNING HOUR METER				○					x2

CI-26



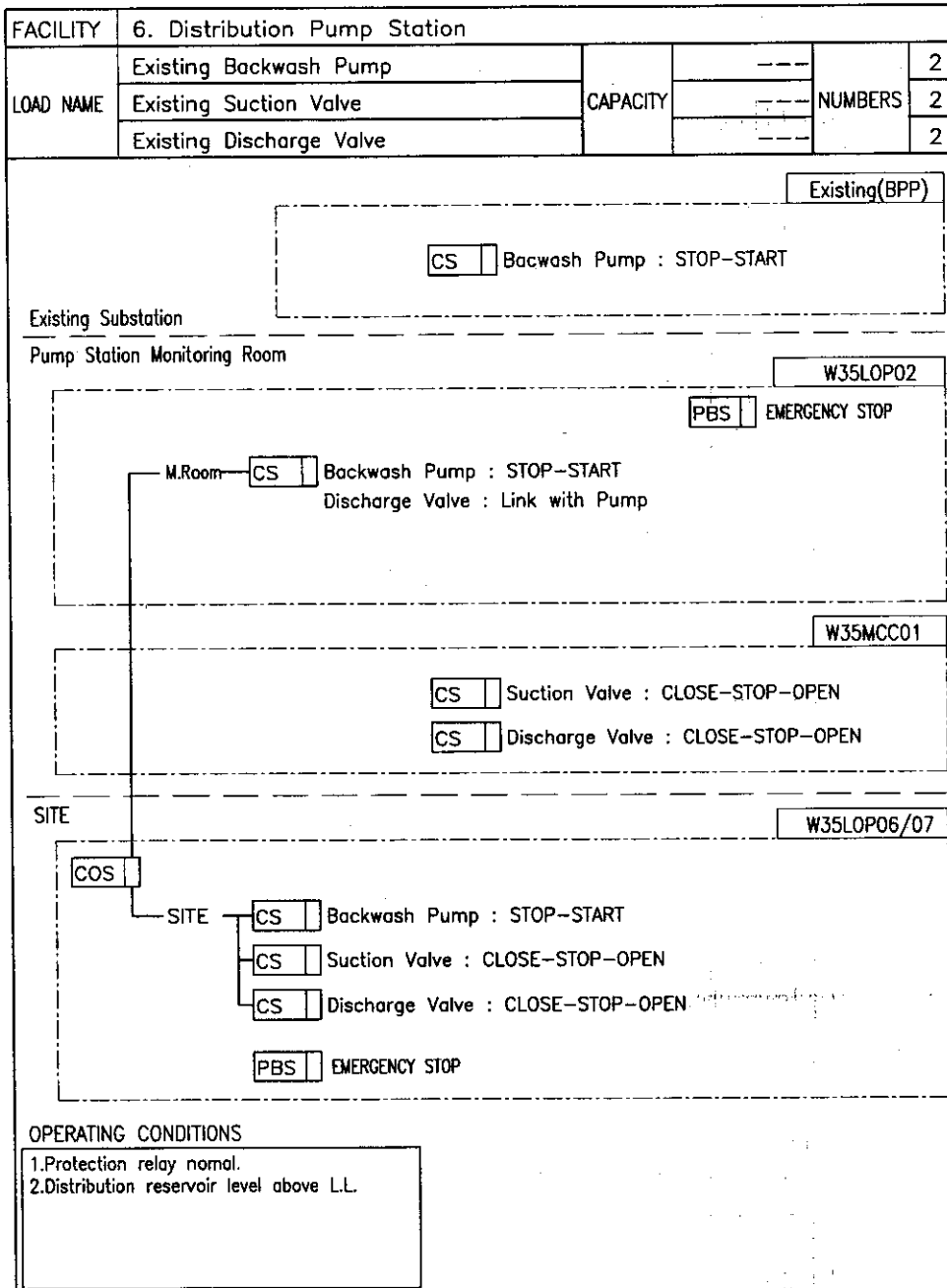
	ITEMS	ALARM	Water Treatment Plant						REMARKS	
			SITE LOP	ELC. ROOM			CENTRAL MONI. ROOM			
				DPP	LOP	INP	MONI.	PRN.		MINIC
STATUS INDICATION	OPERATING LOCATION [Sub-St.]									
	OPERATING LOCATION [M.Room]									
	OPERATING LOCATION [SITE]				○				x5	
	Distribution Pump START		○	○	○		○		○	x5
	Distribution Pump STOP		○	○	○		○		○	x5
	Discharge Valve Fully OPEN		○	○ MCC			○			x5
	Discharge Valve Fully CLOSE		○	○ MCC			○			x5
OPERATION SWITCH	Suction Valve Fully OPEN		○	○ MCC			○			x5
	Suction Valve Fully CLOSE		○	○ MCC			○			x5
	CS : STOP-START		○	○	○					x5
	CS : CLOSE-STOP-OPEN		○	○ MCC						x5 x2
	COS : M.Room-SITE		○							x5
	PBS : EMERGENCY STOP		○		○					x5
	[Distribution Pump]									
FAULT INDICATION	EARTH FAULT	T	○	○			○	○		x5
	OVER LOAD	T	○	○			○	○		x5
	TEMPERATURE UP	T	○	○			○	○		x5
	[Discharge Valve]									
	EARTH FAULT	T	○		○		○	○		x5
	OVER LOAD	T	○		○		○	○		x5
	OVER TORQUE	T	○		○		○	○		x5
	[Suction Valve]									
	EARTH FAULT	T	○		○		○	○		x5
	OVER LOAD	T	○		○		○	○		x5
OVER TORQUE	T	○		○		○	○		x5	
INST. INDICATION	EMERGENCY STOP	T		○			○	○		x5
	AMMETER			○						x5
	RUNNING HOUR METER									x5

CI-27



	ITEMS	ALARM	Water Treatment Plant						REMARKS	
			SITE LOP	ELC. ROOM		CENTRAL MONI. ROOM				
				DPP	LOP	INP	MONI.	PRN.		ROOM MINIC
STATUS INDICATION	OPERATING LOCATION [Sub-St.]									
	OPERATING LOCATION [M.Room]									
	OPERATING LOCATION [SITE]				○				x3	
	Distribution Pump START		○	○	○		○		○	x3
	Distribution Pump STOP		○	○	○		○		○	x3
	Discharge Valve Fully OPEN		○	○	MCC		○			x3
	Discharge Valve Fully CLOSE		○	○	MCC		○			x3
OPERATION SWITCH	Suction Valve Fully OPEN		○	○	MCC		○			x3
	Suction Valve Fully CLOSE		○	○	MCC		○			x3
	CS : STOP-START		○	○	○					x3
	CS : CLOSE-STOP-OPEN		○	○	MCC					x3 x2
	COS : M.Room-SITE		○							x3
	PBS : EMERGENCY STOP		○		○					x3
	FAULT INDICATION	[Distribution Pump]								
EARTH FAULT		T	○	○			○	○		x3
OVER LOAD		T	○	○			○	○		x3
TEMPERATURE UP		T	○	○			○	○		x3
[Discharge Valve]										
EARTH FAULT		T	○		○		○	○		x3
OVER LOAD		T	○		○		○	○		x3
OVER TORQUE		T	○		○		○	○		x3
[Suction Valve]										
EARTH FAULT		T	○		○		○	○		x3
OVER LOAD		T	○		○		○	○		x3
OVER TORQUE		T	○		○		○	○		x3
INST. INDICATION	EMERGENCY STOP	T		○			○	○		x3
	AMMETER		○		○					x3
	RUNNING HOUR METER				○					x3
INST. INDICATION	DISTRIBUTION RESERVOIR LEVEL					○	○		○	
	DISTRIBUTION PRESSURE					○	○		○	
	DISTRIBUTION FLOW 1					○	○		○	
	DISTRIBUTION FLOW 2					○	○		○	
	TOTAL DISTRIBUTION FLOW					○	○		○	

CI-28



	ITEMS	ALARM	Water Treatment Plant						REMARKS	
			SITE LOP	BPP	LOP	INP	CENTRAL MONI. ROOM	MONI. PRN.		ROOM MINIC
STATUS INDICATION	OPERATING LOCATION [Sub-St.]									
	OPERATING LOCATION [M.Room]									
	OPERATING LOCATION [SITE]			○					x2	
	Distribution Pump START		○	○	○		○		○	x2
	Distribution Pump STOP		○	○	○		○		○	x2
	Discharge Valve Fully OPEN		○	○ MCC			○			x2
	Discharge Valve Fully CLOSE		○	○ MCC			○			x2
OPERATION SWITCH	Suction Valve Fully OPEN		○	○ MCC			○			x2
	Suction Valve Fully CLOSE		○	○ MCC			○			x2
	CS : STOP-START		○	○	○					x2
	CS : CLOSE-STOP-OPEN		○	○ MCC						x2 x2
	COS : M.Room-SITE		○							x2
	PBS : EMERGENCY STOP		○		○					x2
	FAULT INDICATION	[Distribution Pump]								
EARTH FAULT		T	○	○			○	○		x2
OVER LOAD		T	○	○			○	○		x2
TEMPERATURE UP		T	○	○			○	○		x2
[Discharge Valve]										
EARTH FAULT		T	○		○		○	○		x2
OVER LOAD		T	○		○		○	○		x2
OVER TORQUE		T	○		○		○	○		x2
[Suction Valve]										
EARTH FAULT		T	○		○		○	○		x2
OVER LOAD	T	○		○		○	○		x2	
OVER TORQUE	T	○		○		○	○		x2	
INST. INDICATION	EMERGENCY STOP	T		○			○	○		
	AMMETER		○		○					x2
	RUNNING HOUR METER				○					x2
	Backwash Indication Lump				○					

CI-29

FACILITY	6. Distribution Pump Station				
LOAD NAME	Sump Drainage Pump [W35DP01/02]	CAPACITY	2.2kW	NUMBERS	2(1)

WTP CENTRAL MONITORING ROOM

Pump Station Elec. Room

W35MCC01

CS

 Sump Drainage Pump : STOP-START

SITE

W35LOP05

AUTO Automatic by Sump Drainage Pit Level

COS

└─

└─

└─

MANU

CS

 Sump Drainage Pump : STOP-START

COS

 CHOICE OF STANDBY : NO.1-AUTO-NO.2

AUTO : AUTOMATIC ALTERNATE RUNNING

OPERATING CONDITIONS

1. Protection relay normal.

2. Sump drainage level above L.L.

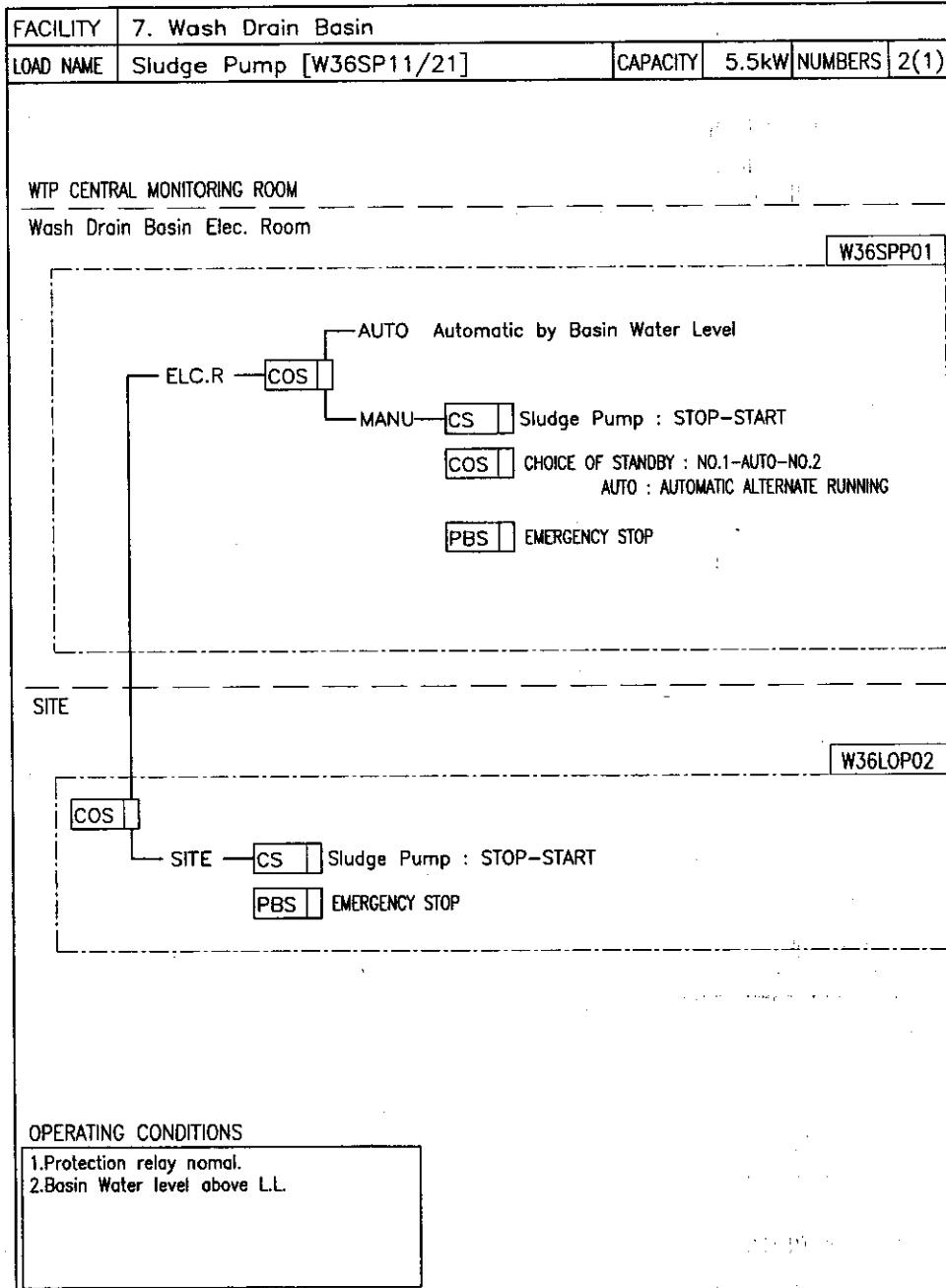
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.		
STATUS INDICATION	Sump Drainage Pump START		○	○			○		x2
	Sump Drainage Pump STOP		○	○			○		x2
OPERATION SWITCH	CS : STOP-START		○	○					x2
	COS : ELC.R-SITE								
	COS : MANU-AUTO		○						
	COS : NO.1-AUTO-NO.2		○						
FAULT INDICATION	EARTH FAULT	T	○	○			○	○	x2
	OVER LOAD	T	○	○			○	○	x2
	SUMP DRAINAGE PIT LEVEL H.H.						○		
INST. INDICATION	SUMP DRAINAGE PIT LEVEL L.L.	T	○	○					
	RUNNING HOUR METER		○						x2

C1-30

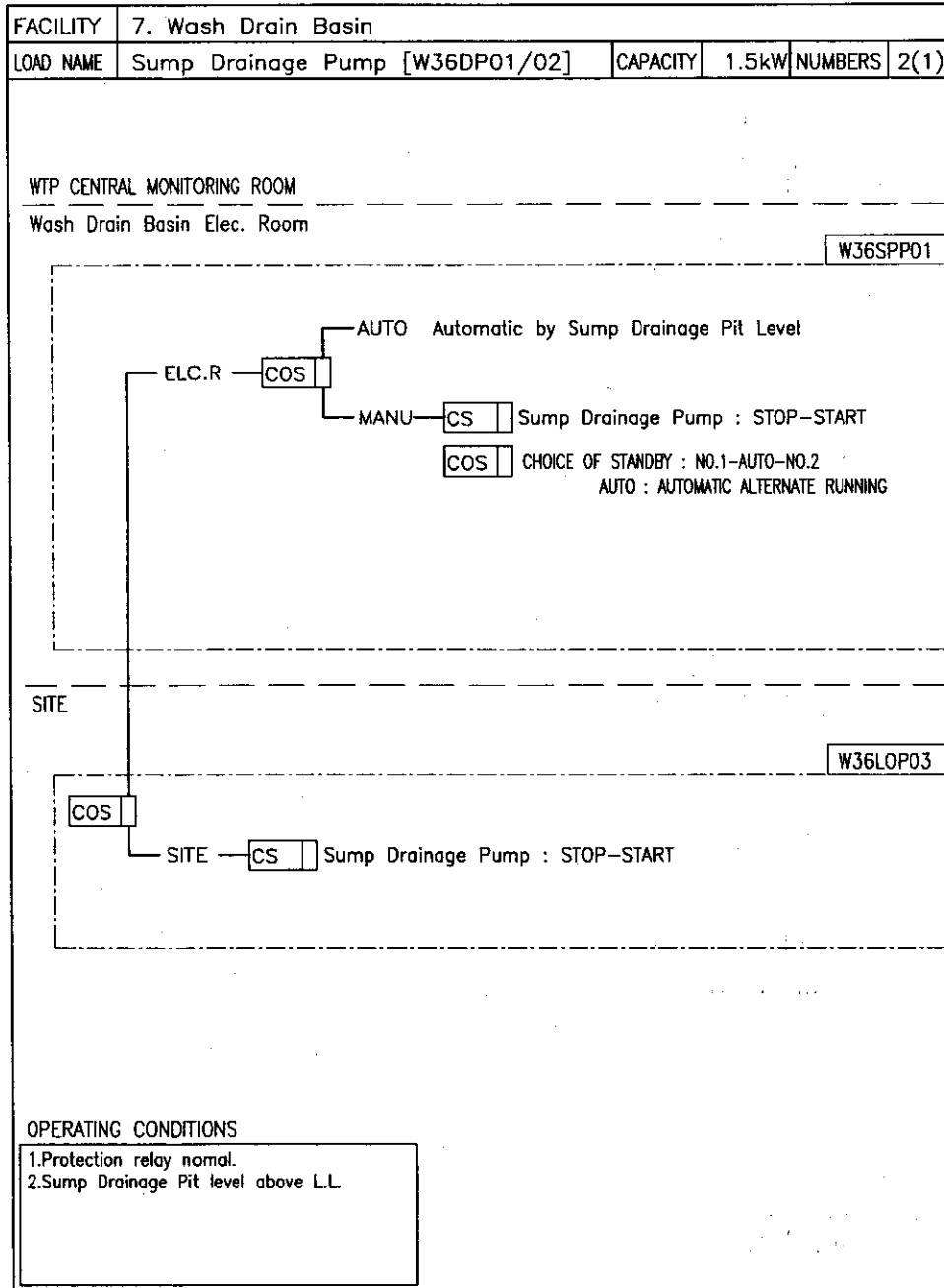
FACILITY	6. Distribution Pump Station													
LOAD NAME	Overhead Crane [W35MC01]	CAPACITY	9+0.75+0.75x2kW	NUMBERS	1									
<p>WTP CENTRAL MONITORING ROOM</p> <hr/> <p>Pump Station Elec. Room</p> <p style="text-align: center;">POWER SUPPLY ONLY</p>														
<p>SITE</p> <div style="border: 1px dashed black; padding: 5px; margin: 10px auto; width: 80%;"> <p style="text-align: center; border: 1px solid black; display: inline-block;">Mechanical Standard Equipped</p> </div> <div style="margin-top: 10px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: center;"><input type="checkbox"/></td> <td style="width: 5%; text-align: center;">CS</td> <td>Overhead Crane : FORWARD-STOP-REVERSE</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">CS</td> <td>Overhead Crane : LEFT-STOP-RIGHT</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">CS</td> <td>Overhead Crane : UP-STOP-DOWN</td> </tr> </table> </div>						<input type="checkbox"/>	CS	Overhead Crane : FORWARD-STOP-REVERSE	<input type="checkbox"/>	CS	Overhead Crane : LEFT-STOP-RIGHT	<input type="checkbox"/>	CS	Overhead Crane : UP-STOP-DOWN
<input type="checkbox"/>	CS	Overhead Crane : FORWARD-STOP-REVERSE												
<input type="checkbox"/>	CS	Overhead Crane : LEFT-STOP-RIGHT												
<input type="checkbox"/>	CS	Overhead Crane : UP-STOP-DOWN												
<p>OPERATING CONDITIONS</p> <div style="border: 1px solid black; padding: 5px;"> <p>1. Protection relay normal.</p> <p>2. Sump drainage level above L.L.</p> </div>														

	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC. ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.		
STATUS INDICATION									
OPERATION SWITCH	CS : FORWARD-STOP-REVERSE		○						
	CS : LEFT-STOP-RIGHT		○						
	CS : UP-STOP-DOWN		○						
FAULT INDICATION	EARTH FAULT	T	○	○			○	○	
	OVER LOAD	T	○	○			○	○	
INST. INDICATION									

CI-31

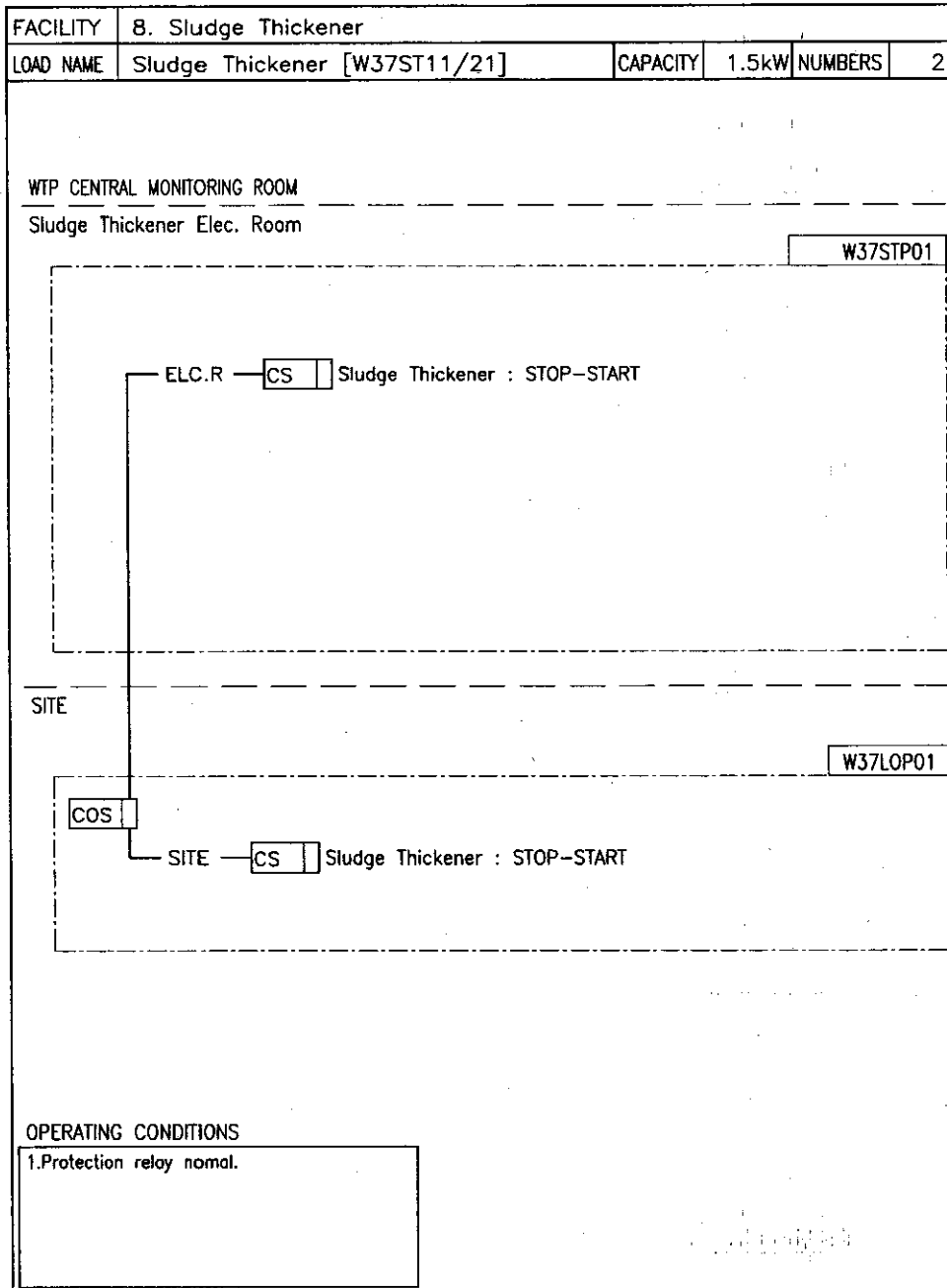


	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE	ELC. ROOM			CENTRAL MONI. ROOM		
				LOP	SPP	INP	MONI.	PRN.	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			○					
	OPERATING LOCATION [SITE]			○					
	Sludge Pump START		○	○		○		○	x2
	Sludge Pump STOP		○	○		○			x2
OPERATION SWITCH	CS : STOP-START		○	○					x2
	COS : ELC.R-SITE		○						
	COS : MANU-AUTO			○					
	COS : NO.1-AUTO-NO.2			○					
	PBS : EMERGENCY STOP		○	○					x2
FAULT INDICATION	EARTH FAULT	T	○	○		○	○		x2
	OVER LOAD	T	○	○		○	○		x2
	BASIN WATER LEVEL L.L.	T	○	○					
INST. INDICATION	EMERGENCY STOP	T	○	○		○	○		x2
	RUNNING HOUR METER			○					x2



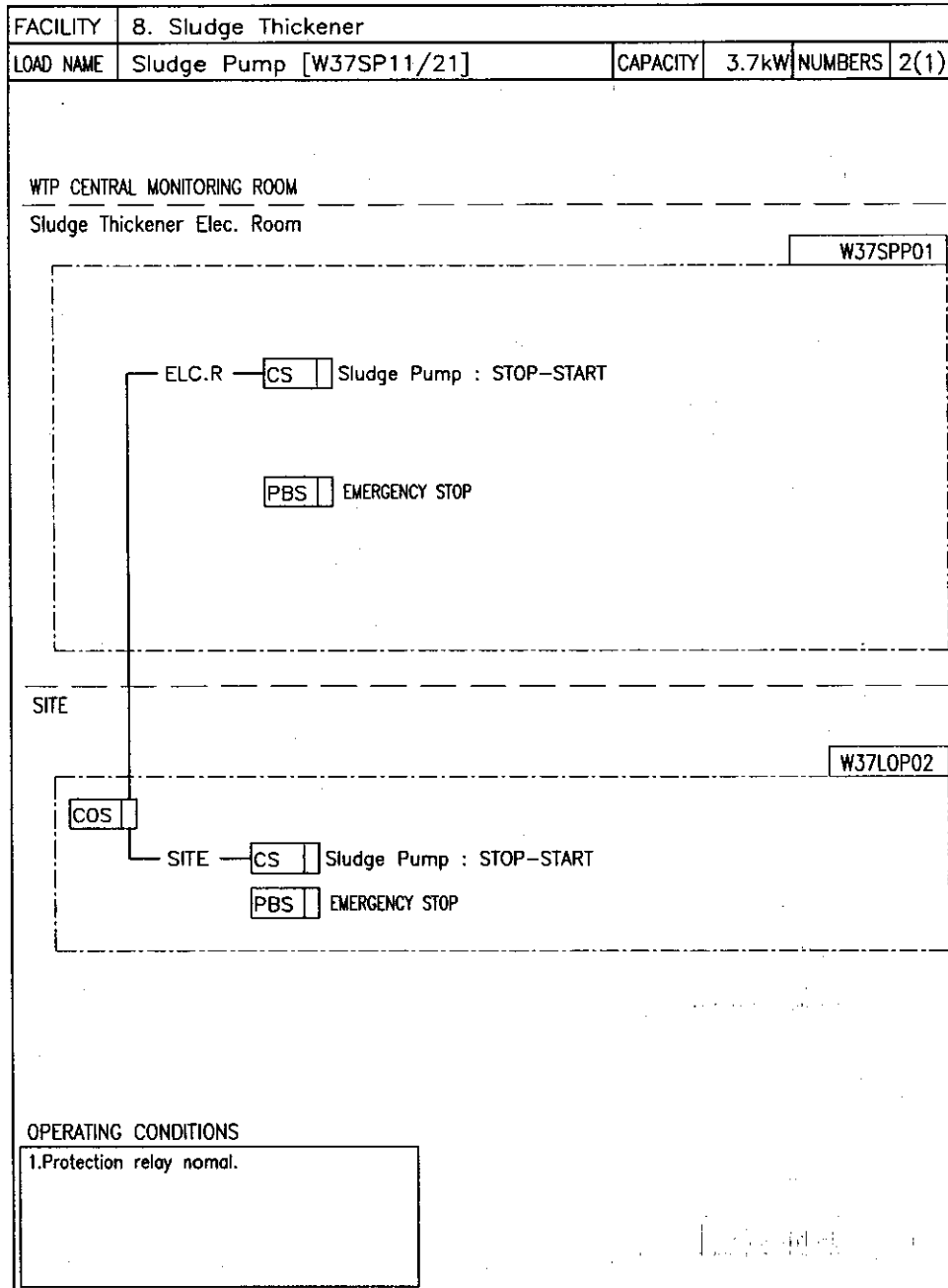
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM			
				SPP	INP	MONI.	PRN.		
STATUS INDICATION	OPERATING LOCATION [ELC.R]			○					
	OPERATING LOCATION [SITE]			○					
	Sump Drainage Pump START		○	○		○			x2
	Sump Drainage Pump STOP		○	○		○			x2
OPERATION SWITCH	CS : STOP-START		○	○					x2
	COS : ELC.R-SITE		○						
	COS : MANU-AUTO			○					
	COS : NO.1-AUTO-NO.2			○					
FAULT INDICATION	EARTH FAULT	T	○	○		○	○		x2
	OVER LOAD	T	○	○		○	○		x2
	SUMP DRAINAGE PIT LEVEL H.H.			○		○			
	SUMP DRAINAGE PIT LEVEL L.L.	T	○	○					
INST. INDICATION	RUNNING HOUR METER			○					x2

CI-34



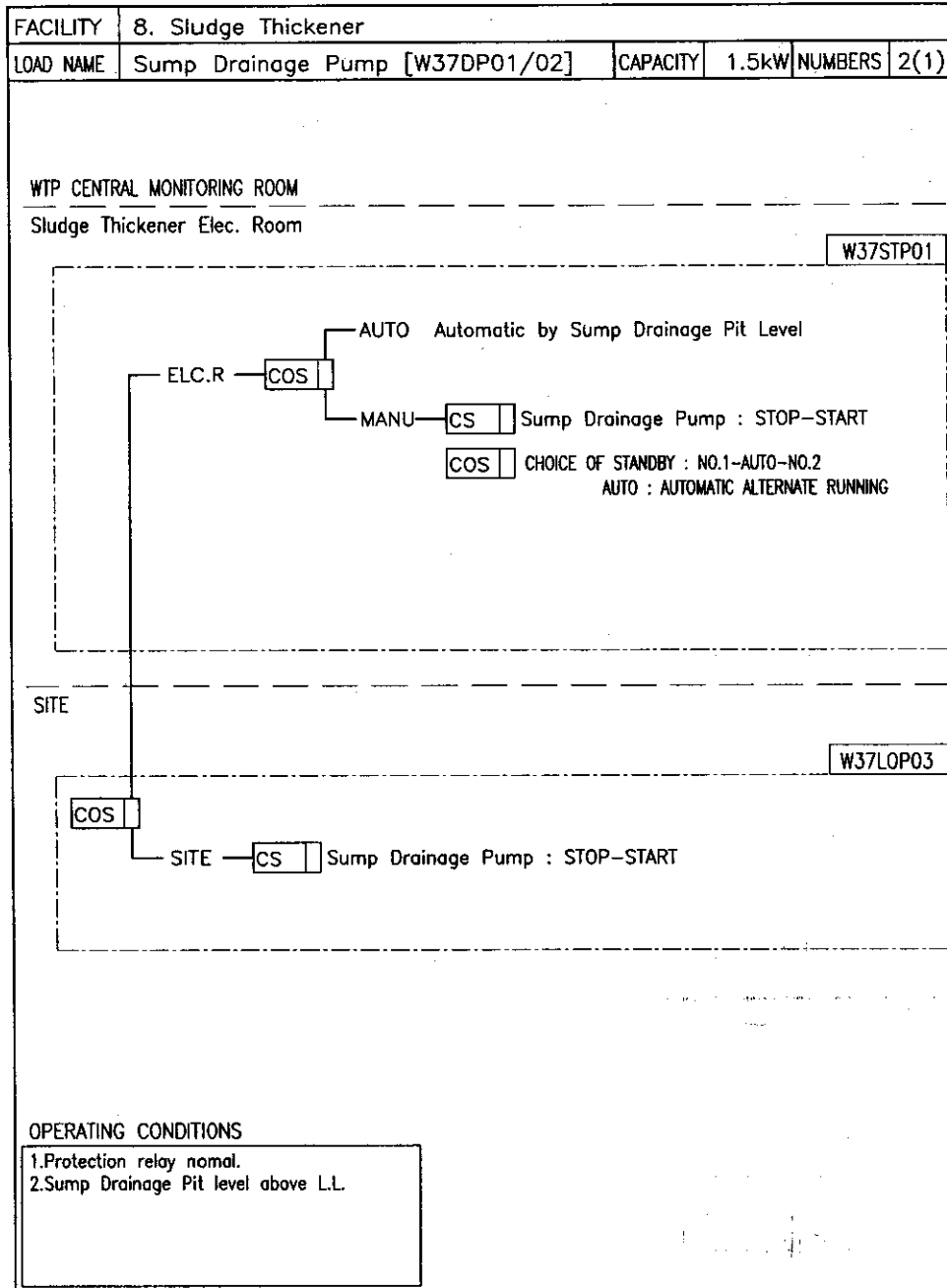
	ITEMS	ALARM	Water Treatment Plant						REMARKS	
			SITE		ELC.ROOM		CENTRAL MONI. ROOM			
			LOP	STP	INP		MONI.	PRN.		MINIC
STATUS INDICATION	OPERATING LOCATION [ELC.R]			○						
	OPERATING LOCATION [SITE]			○						
	Sludge Thickener START		○	○			○		○	x2
	Sludge Thickener STOP		○	○			○			x2
OPERATION SWITCH	CS : STOP-START		○	○						x2
	COS : ELC.R-SITE		○							
FAULT INDICATION	EARTH FAULT	T	○	○			○	○		x2
	OVER LOAD	T	○	○			○	○		x2
	OVER TORQUE	T	○	○			○	○		x2
INST. INDICATION										

CI-35



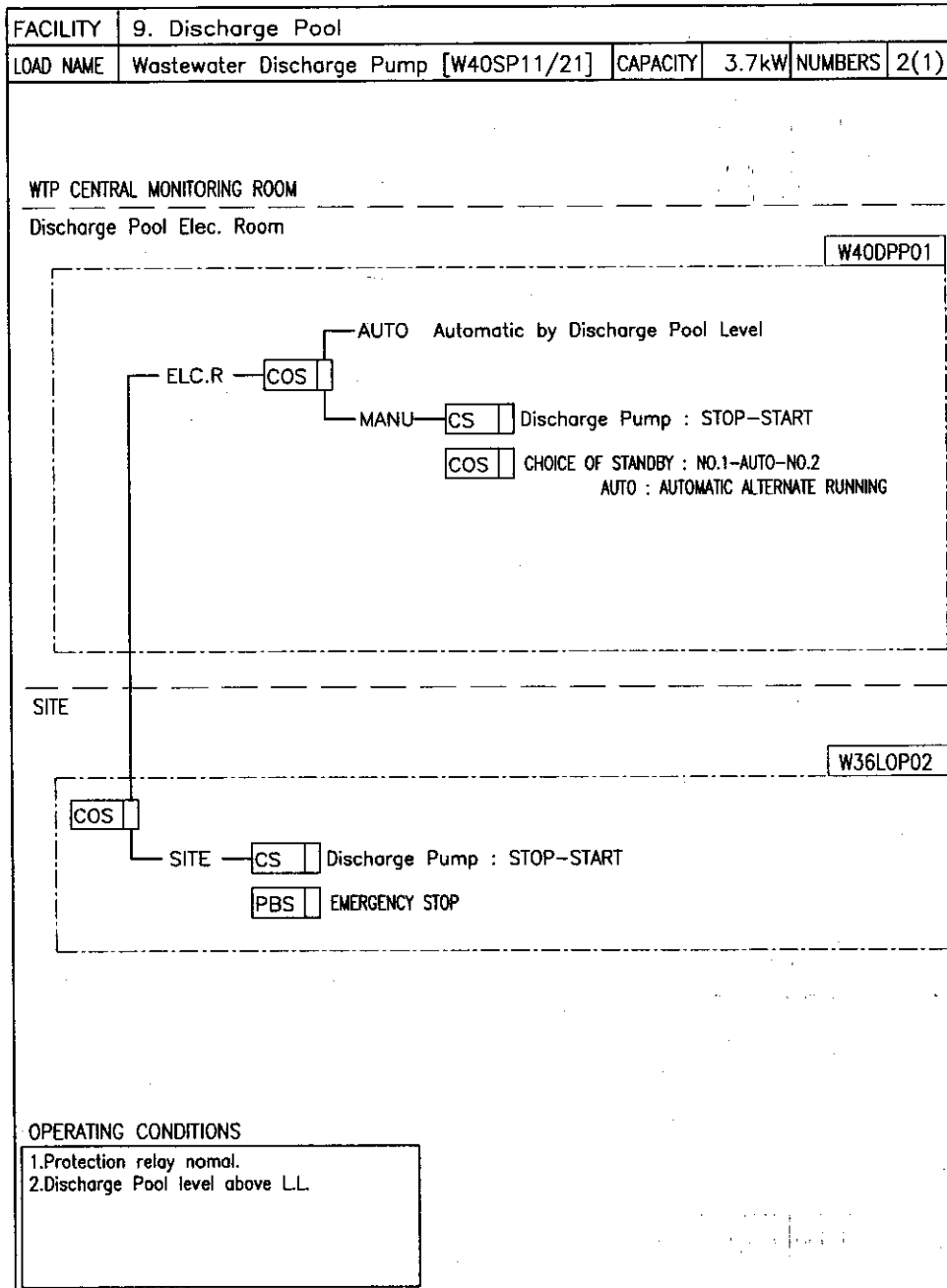
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC.ROOM SPP	ELC.ROOM INP	CENTRAL MONI. MONI.	MONI. ROOM PRN.	MONI. ROOM MINIC	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			○					
	OPERATING LOCATION [SITE]			○					
	Sludge Pump START		○	○		○		○	x2
	Sludge Pump STOP		○	○		○			x2
OPERATION SWITCH	CS : STOP-START		○	○					x2
	COS : ELC.R-SITE		○						
	PBS : EMERGENCY STOP		○	○					x2
FAULT INDICATION	EARTH FAULT	T	○	○		○	○		x2
	OVER LOAD	T	○	○		○	○		x2
INST. INDICATION	EMERGENCY STOP	T	○	○		○	○		x2
	RUNNING HOUR METER			○					x2

C1-36



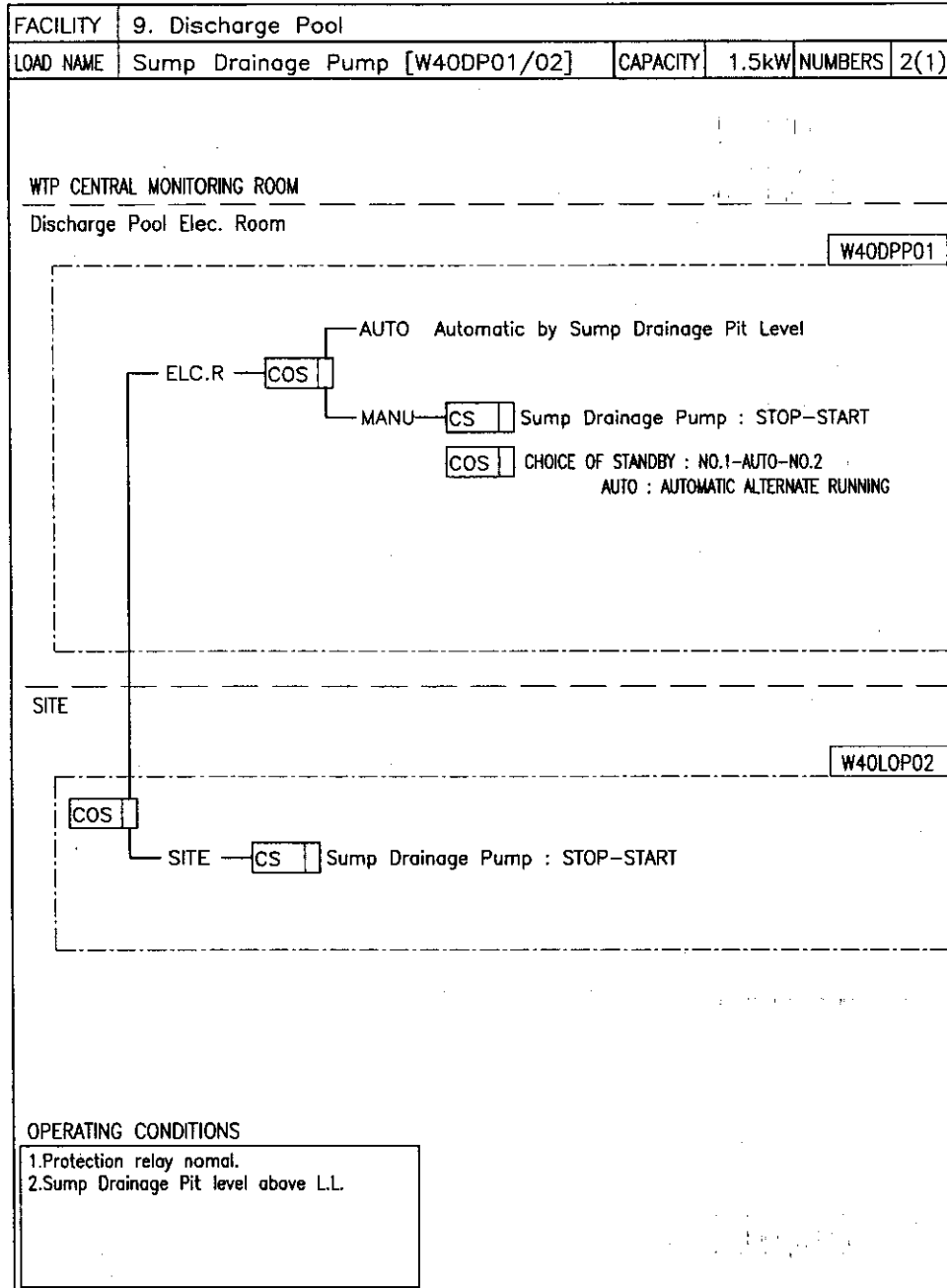
	ITEMS	ALARM	Water Treatment Plant					REMARKS
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM		
				STP	INP	MONI.	PRN.	
STATUS INDICATION	OPERATING LOCATION [ELC.R]							
	OPERATING LOCATION [SITE]							
	Sump Drainage Pump START							x2
	Sump Drainage Pump STOP							x2
OPERATION SWITCH	CS : STOP-START							x2
	COS : ELC.R-SITE							
	COS : MANU-AUTO							
	COS : NO.1-AUTO-NO.2							
FAULT INDICATION	EARTH FAULT	T						x2
	OVER LOAD	T						x2
	SUMP DRAINAGE PIT LEVEL H.H.							
INST. INDICATION	SUMP DRAINAGE PIT LEVEL L.L.	T						
	RUNNING HOUR METER							x2

CI-37



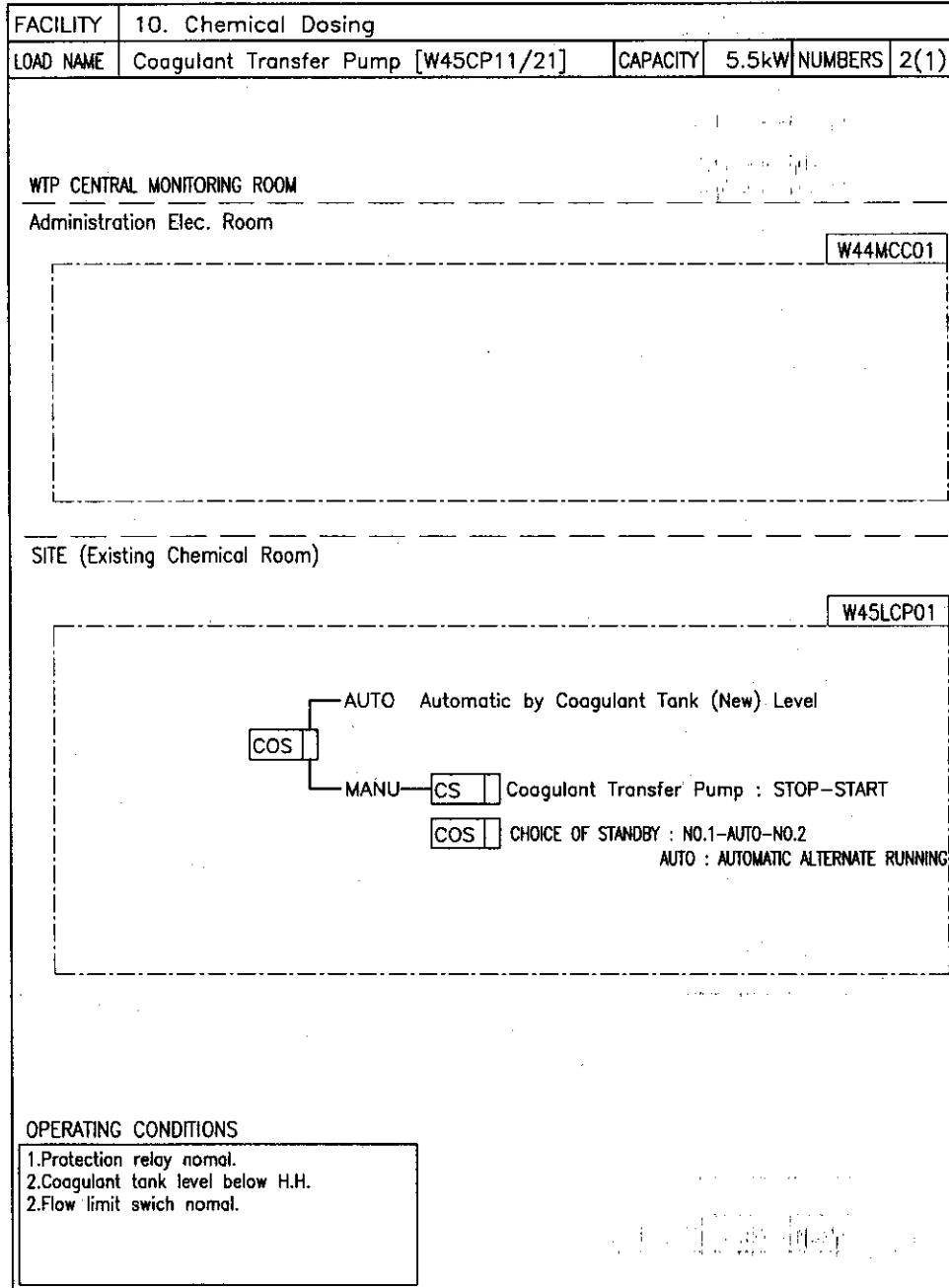
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE	ELC.ROOM		CENTRAL MONI. ROOM			
			LOP	DPP	INP	MONI.	PRN.	MINIC	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			<input type="radio"/>					
	OPERATING LOCATION [SITE]			<input type="radio"/>					
	Discharge Pump START		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	x2
	Discharge Pump STOP		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			x2
OPERATION SWITCH	CS : STOP-START		<input type="radio"/>	<input type="radio"/>					x2
	COS : ELC.R-SITE		<input type="radio"/>						
	COS : MANU-AUTO			<input type="radio"/>					
	COS : NO.1-AUTO-NO.2			<input type="radio"/>					
	PBS : EMERGENCY STOP		<input type="radio"/>						x2
FAULT INDICATION	EARTH FAULT	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		x2
	OVER, LOAD	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		x2
	DISCHARGE POOL LEVEL H.H.					<input type="radio"/>			
	DISCHARGE POOL LEVEL L.L.	T	<input type="radio"/>	<input type="radio"/>					
	EMERGENCY STOP	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		x2
INST. INDICATION	AMMETER		<input type="radio"/>	<input type="radio"/>					x2
	RUNNING HOUR METER			<input type="radio"/>					x2
	Discharge Pool Level				<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	
	Wastewater Discharge Flow				<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	

CI-38



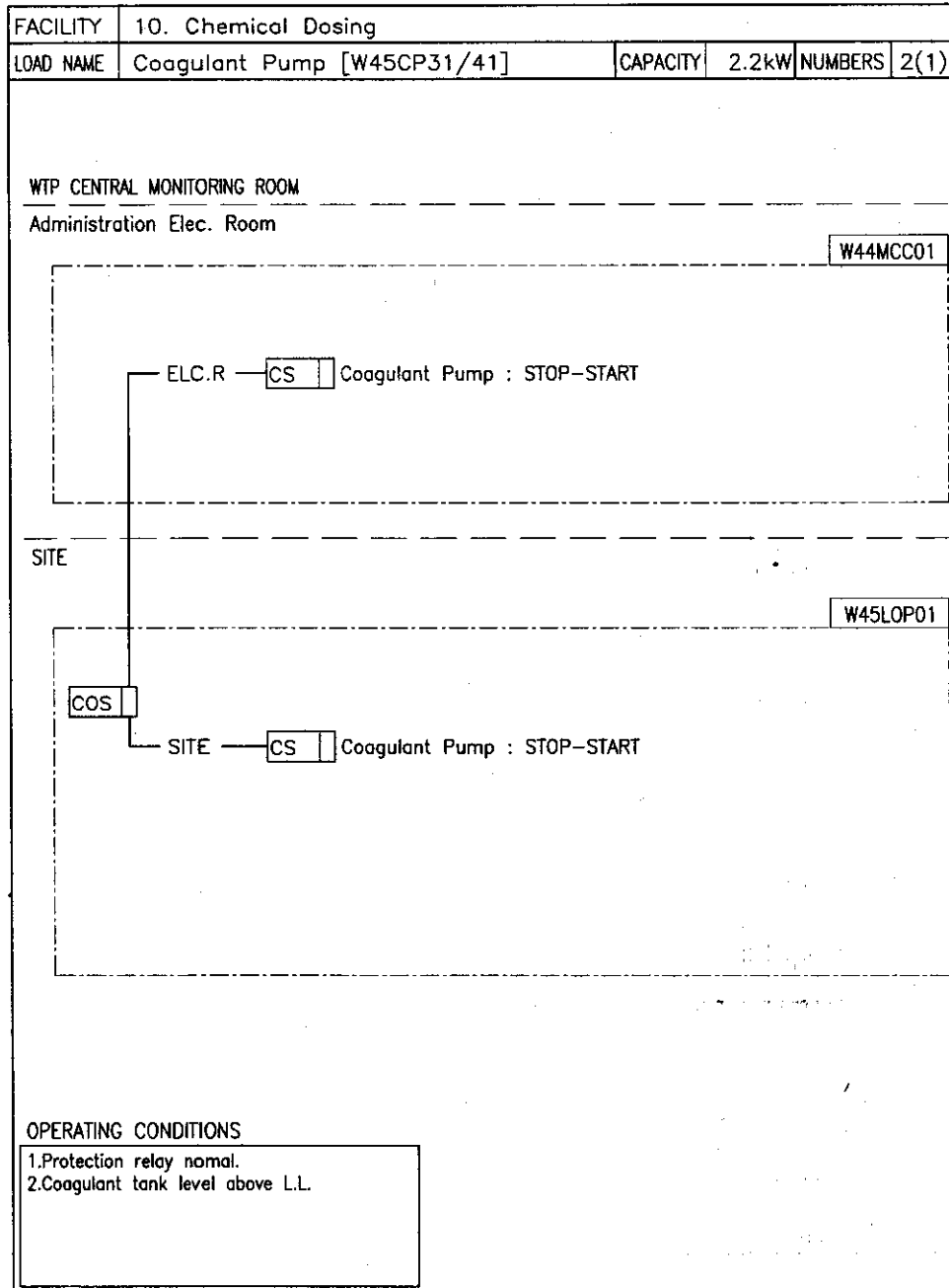
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE		ELC.ROOM		CENTRAL MONI. ROOM		
			LOP	STP	INP	MONI.	PRN.		
STATUS INDICATION	OPERATING LOCATION [ELC.R]			○					
	OPERATING LOCATION [SITE]			○					
	Sump Drainage Pump START		○	○		○			x2
	Sump Drainage Pump STOP		○	○		○			x2
OPERATION SWITCH	CS : STOP-START		○	○					x2
	COS : ELC.R-SITE		○						
	COS : MANU-AUTO			○					
	COS : NO.1-AUTO-NO.2			○					
FAULT INDICATION	EARTH, FAULT	T	○	○		○	○		x2
	OVER LOAD	T	○	○		○	○		x2
	SUMP DRAINAGE PIT LEVEL H.H.			○		○			
INST. INDICATION	SUMP DRAINAGE PIT LEVEL L.L.	T	○	○					
	RUNNING HOUR METER			○					x2

C1-39



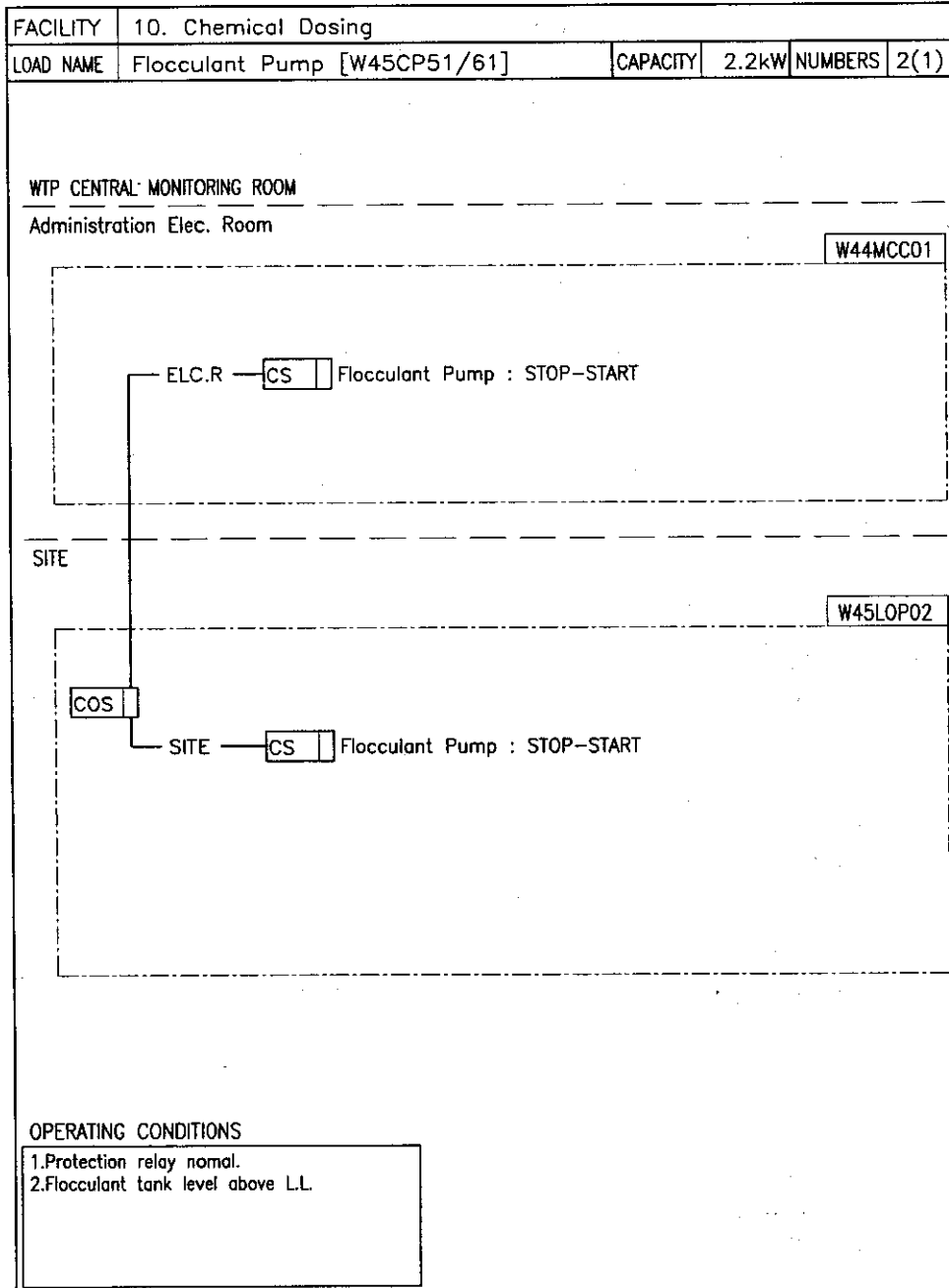
	ITEMS	ALARM	Water Treatment Plant						45LOP01	REMARKS
			SITE LCP	ELC.ROOM		CENTRAL MONI. ROOM				
				MCC	INP	MONI.	PRN.			
STATUS INDICATION	Coagulant Transfer Pump START		○	○					○	x2
	Coagulant Transfer Pump STOP		○	○					○	x2
OPERATION SWITCH	CS : STOP-START		○							x2
	COS : ELC.R-SITE									
	COS : MANU-AUTO		○							
	COS : NO.1-AUTO-NO.2		○							
FAULT INDICATION	EARTH FAULT	T	○	○			○	○		x2
	OVER LOAD	T	○	○			○	○		x2
	COAGULANT TANK LEVEL L.L.		○				○			
	COAGULANT TANK LEVEL H.H.	T	○							
INST. INDICATION										
	RUNNING HOUR METER		○							x2

CI-40



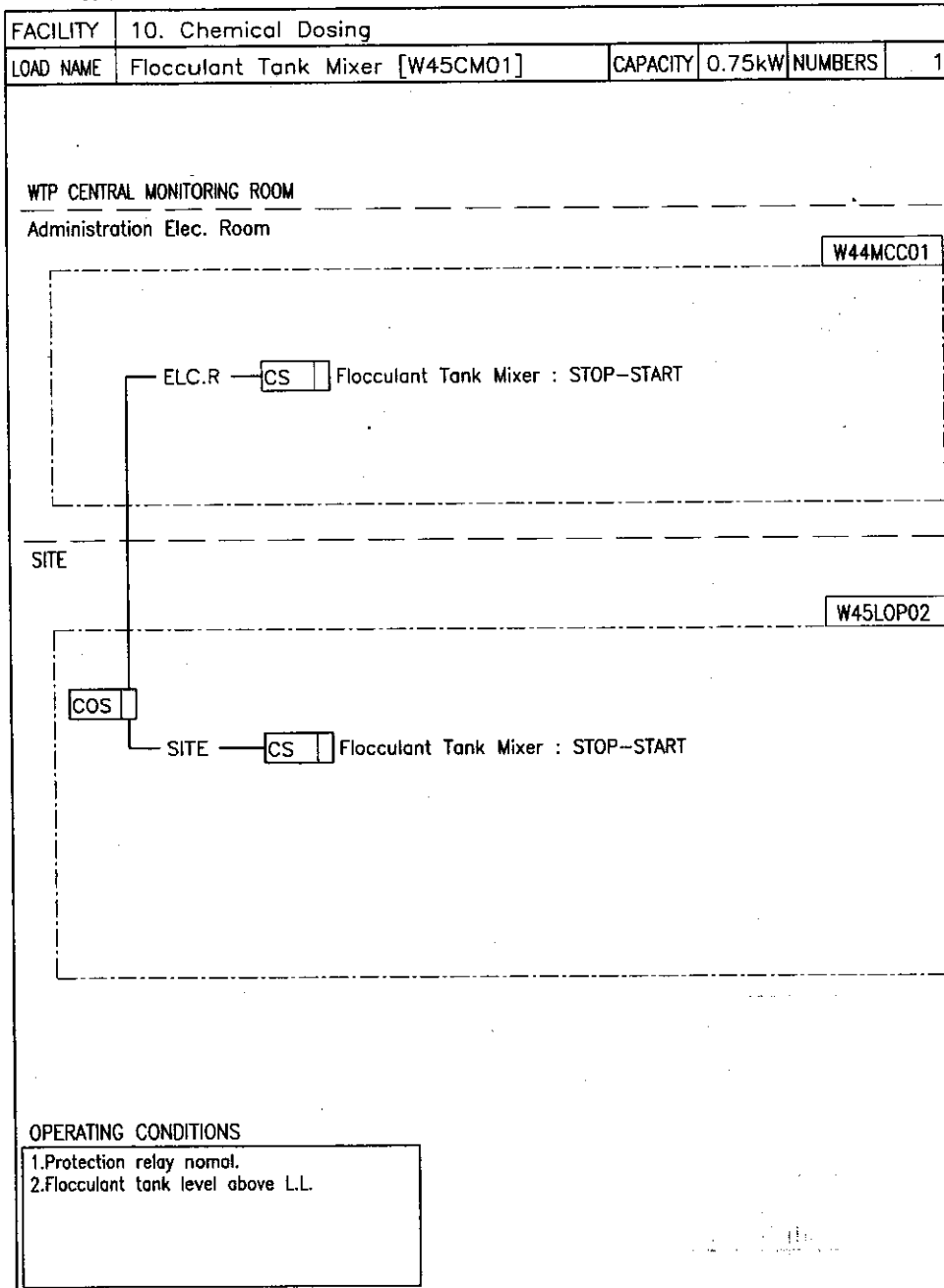
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.	MINIC.	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			<input type="radio"/>					x2
	OPERATING LOCATION [SITE]			<input type="radio"/>					x2
	Coagulant Pump START		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	x2
	Coagulant Pump STOP		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	x2
OPERATION SWITCH	CS : STOP-START		<input type="radio"/>	<input type="radio"/>					x2
	COS : ELC.R-SITE		<input type="radio"/>						
	COS : MANU-AUTO								
	COS : NO.1-AUTO-NO.2								
FAULT INDICATION	EARTH FAULT	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		x2
	OVER LOAD	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		x2
	COAGULANT TANK LEVEL H.H.		<input type="radio"/>			<input type="radio"/>			
	COAGULANT TANK LEVEL L.L.	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			
INST. INDICATION	RUNNING HOUR METER		<input type="radio"/>						x2

CI-41



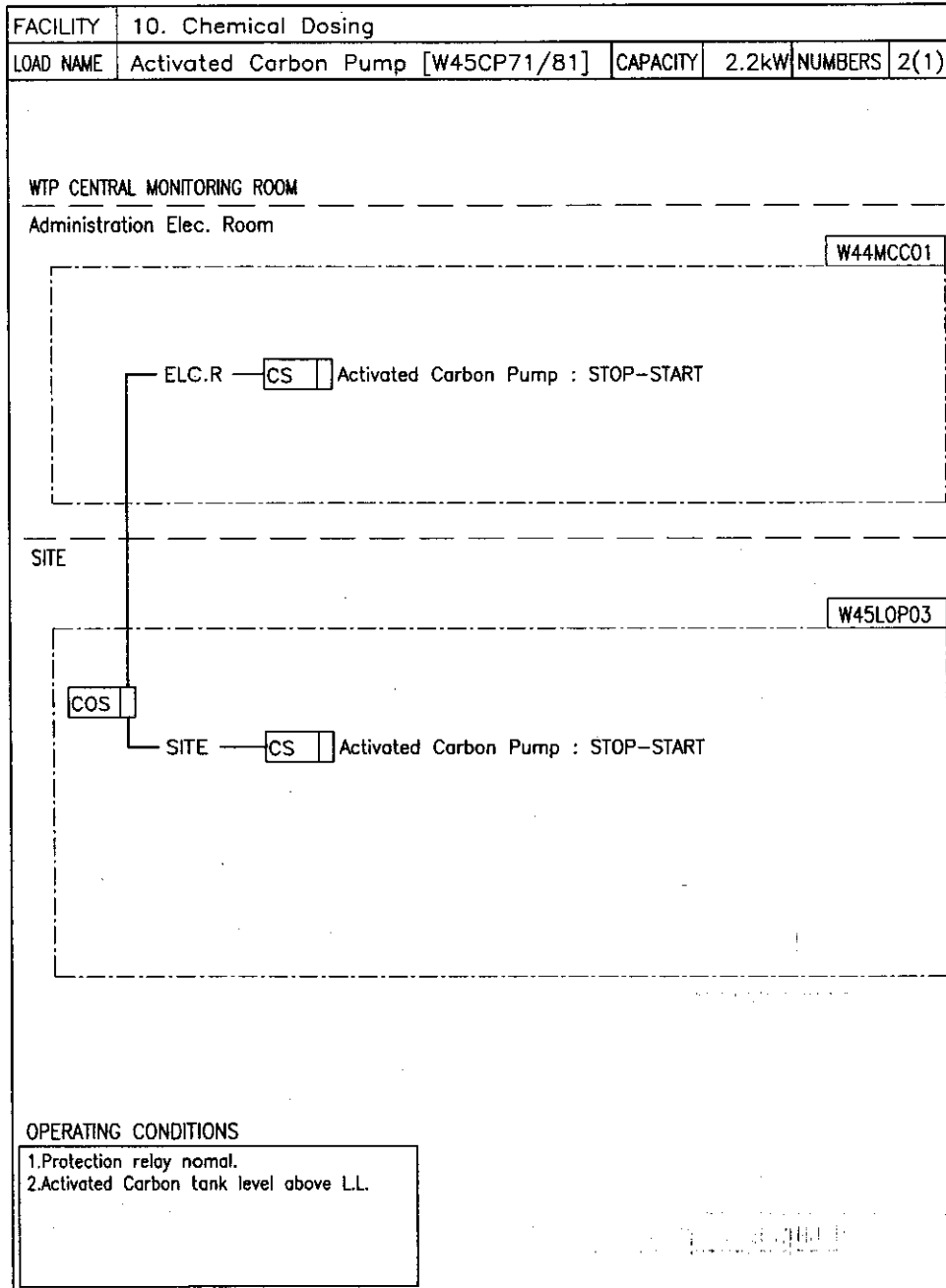
	ITEMS	ALARM	Water Treatment Plant						REMARKS	
			SITE LOP	ELC.ROOM			CENTRAL MONI. ROOM			
				MCC	INP		MONI.	PRN.		MINIC.
STATUS INDICATION	OPERATING LOCATION [ELC.R]			○					x2	
	OPERATING LOCATION [SITE]			○					x2	
	Flocculant Pump START		○	○			○		x2	
	Flocculant Pump STOP		○	○			○		x2	
OPERATION SWITCH	CS : STOP-START		○	○					x2	
	COS : ELC.R-SITE		○							
	COS : MANU-AUTO									
	COS : NO.1-AUTO-NO.2									
FAULT INDICATION	EARTH. FAULT I	T	○	○			○	○	x2	
	OVER LOAD	T	○	○			○	○	x2	
	Flocculant TANK LEVEL H.H.			○			○			
	Flocculant TANK LEVEL L.L.	T	○	○			○			
INST. INDICATION	RUNNING HOUR METER		○						x2	

CI-42



	ITEMS	ALARM	Water Treatment Plant						REMARKS	
			SITE		ELC. ROOM		CENTRAL MONI. ROOM			
			LOP	MCC	INP		MONI.	PRN.		MINIC.
STATUS INDICATION	OPERATING LOCATION [ELC.R]			○						
	OPERATING LOCATION [SITE]			○						
	Flocculant Tank Mixer START		○	○			○			
	Flocculant Tank Mixer STOP		○	○			○			
OPERATION SWITCH	CS : STOP-START		○	○						
	COS : ELC.R-SITE		○							
	COS : MANU-AUTO									
	COS : NO.1-AUTO-NO.2									
FAULT INDICATION	EARTH FAULT	T	○	○			○	○		
	OVER LOAD	T	○	○			○	○		
INST. INDICATION	Flocculant TANK LEVEL L.L.	T	○	○						

C1-43



	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC. ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.	MINIC.	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			○					x2
	OPERATING LOCATION [SITE]			○					x2
	Activated Carbon Pump START		○	○		○		○	x2
	Activated Carbon Pump STOP		○	○		○		○	x2
OPERATION SWITCH	CS : STOP-START		○	○					x2
	COS : ELC.R-SITE		○						
	COS : MANU-AUTO								
	COS : NO.1-AUTO-NO.2								
FAULT INDICATION	EARTH FAULT	T	○	○		○	○		x2
	OVER LOAD	T	○	○		○	○		x2
	Activated Carbon TANK LEVEL H.H		○			○			
	Activated Carbon TANK LEVEL L.L	T	○	○		○			
INST. INDICATION	RUNNING HOUR METER		○						x2

CI-44

FACILITY	10. Chemical Dosing				
LOAD NAME	Coagulant Control Valve [W45MV11]	CAPACITY	0.4kW	NUMBERS	1

CS Dosing Ratio Setting Switch

WTP CENTRAL MONITORING ROOM

Administration Elec. Room

W44MCC01

SITE

W45LOP04

— AUTO Automatic by Coagulant Dosing Flow

— MANU — CS Coagulant Control Valve : CLOSE-STOP-OPEN

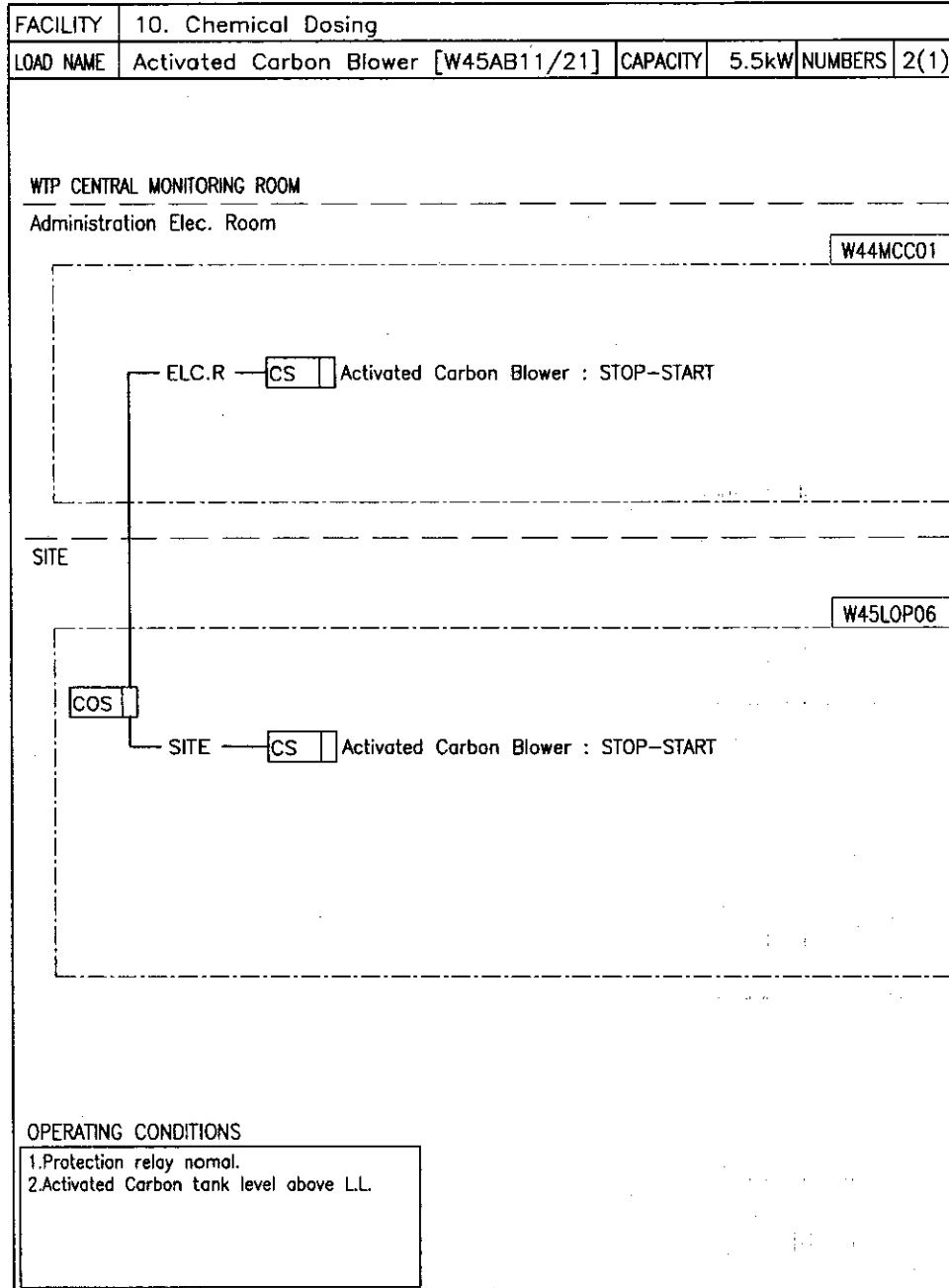
OPERATING CONDITIONS

1. Protection relay normal.

2. Torque normal.

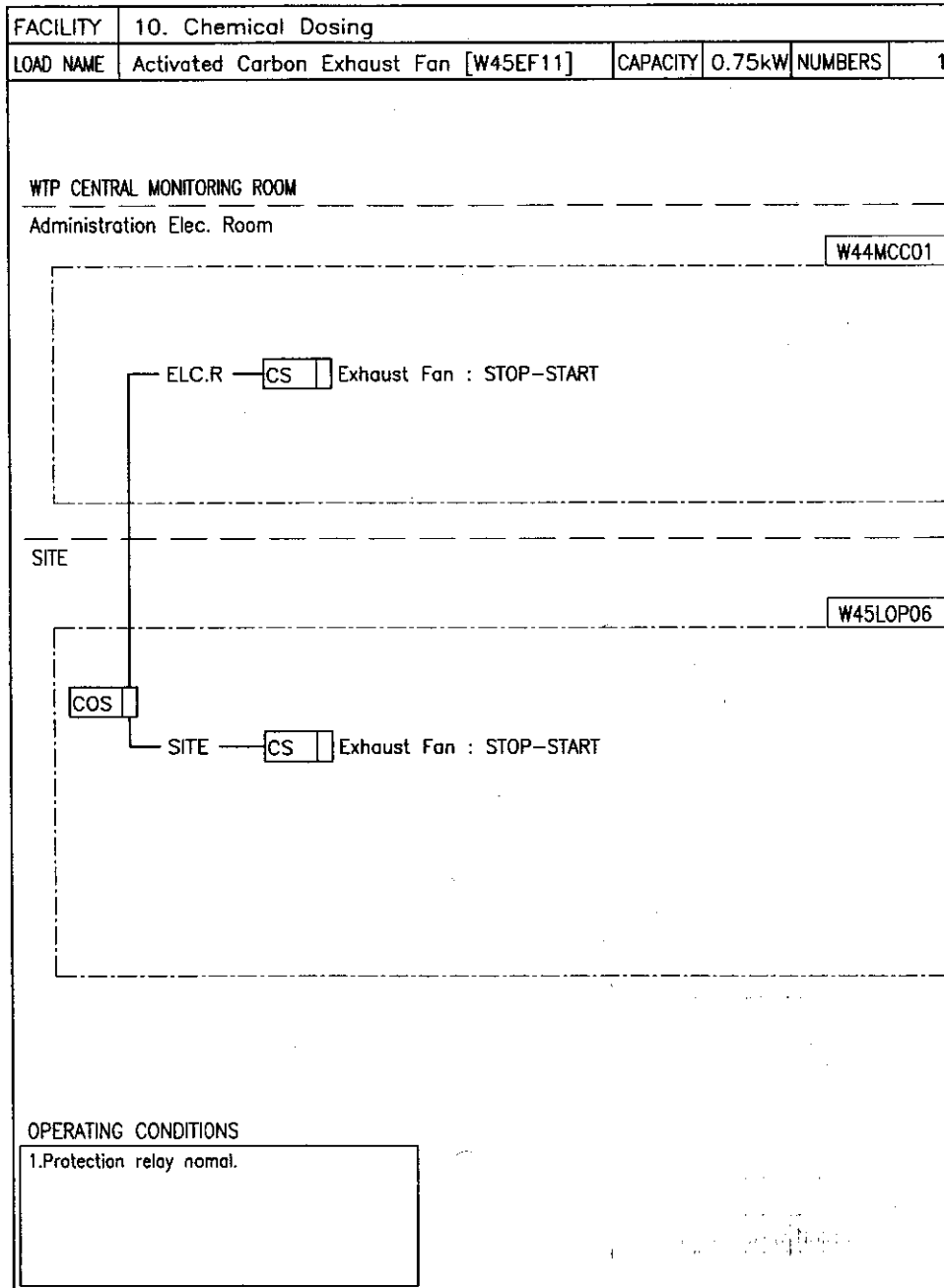
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC. ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.	MINIC.	
STATUS INDICATION	OPERATING MODE [AUTO]							○	
	OPERATING MODE [MANU]							○	
	Control Valve Fully CLOSE		○					○	
	Control Valve Fully OPEN		○					○	
	Valve Intermediate Position		○					○	
	Coagulant Pump START		○						
Coagulant Pump STOP		○							
OPERATION SWITCH	CS : OPEN-STOP-CLOSE		○						
	COS : ELC.R-SITE								
	COS : MANU-AUTO		○						
	Dosing Ratio Setting Switch							○	
FAULT INDICATION	EARTH FAULT	T	○	○				○	○
	OVER LOAD	T	○	○				○	○
	OVER TORQUE	T	○					○	○
INST. INDICATION	OPENING DEGREE		○					○	
	COAGULANT DOSING FLOW		○		○			○	○

C1-45



	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC.ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.	MINIC.	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			○					x2
	OPERATING LOCATION [SITE]			○					x2
	Activated Carbon Blower START		○	○		○			x2
	Activated Carbon Blower STOP		○	○		○			x2
OPERATION SWITCH	CS : STOP-START		○	○					x2
	COS : ELC.R-SITE		○						
	COS : MANU-AUTO								
	COS : NO.1-AUTO-NO.2								
FAULT INDICATION	EARTH FAULT	T	○	○		○	○		x2
	OVER LOAD	T	○	○		○	○		x2
	Activated Carbon Tank LEVEL L.L.	T	○	○					
INST. INDICATION	RUNNING HOUR METER		○						x2

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	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC. ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.	MINIC.	
STATUS INDICATION	OPERATING LOCATION [ELC.R]			<input type="radio"/>					
	OPERATING LOCATION [SITE]			<input type="radio"/>					
	Exhaust Fan START		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			
	Exhaust Fan STOP		<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			
OPERATION SWITCH	CS : STOP-START		<input type="radio"/>	<input type="radio"/>					
	COS : ELC.R-SITE		<input type="radio"/>						
	COS : MANU-AUTO								
	COS : NO.1-AUTO-NO.2								
FAULT INDICATION	EARTH FAULT	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
	OVER LOAD	T	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		
INST. INDICATION									

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FACILITY	10. Chemical Dosing				
LOAD NAME	Overhead Hoist [W45MH01/02]	CAPACITY	1.8+0.4kW	NUMBERS	2
<p>WTP CENTRAL MONITORING ROOM</p> <hr/> <p>Administration Elec. Room</p> <p style="text-align: center;">POWER SUPPLY ONLY</p>					
<p>SITE</p> <div style="border: 1px dashed black; padding: 10px; margin: 10px auto; width: 80%;"> <p style="text-align: center; border: 1px solid black; display: inline-block;">Mechanical Standard Equipped</p> </div> <div style="margin-top: 10px;"> <p><input type="checkbox"/> CS Screening Hoist : FORWARD-STOP-REVERSE</p> <p><input type="checkbox"/> CS Screening Hoist : UP-STOP-DOWN</p> </div>					
<p>OPERATING CONDITIONS</p> <div style="border: 1px solid black; padding: 5px;"> <p>1. Protection relay normal.</p> </div>					

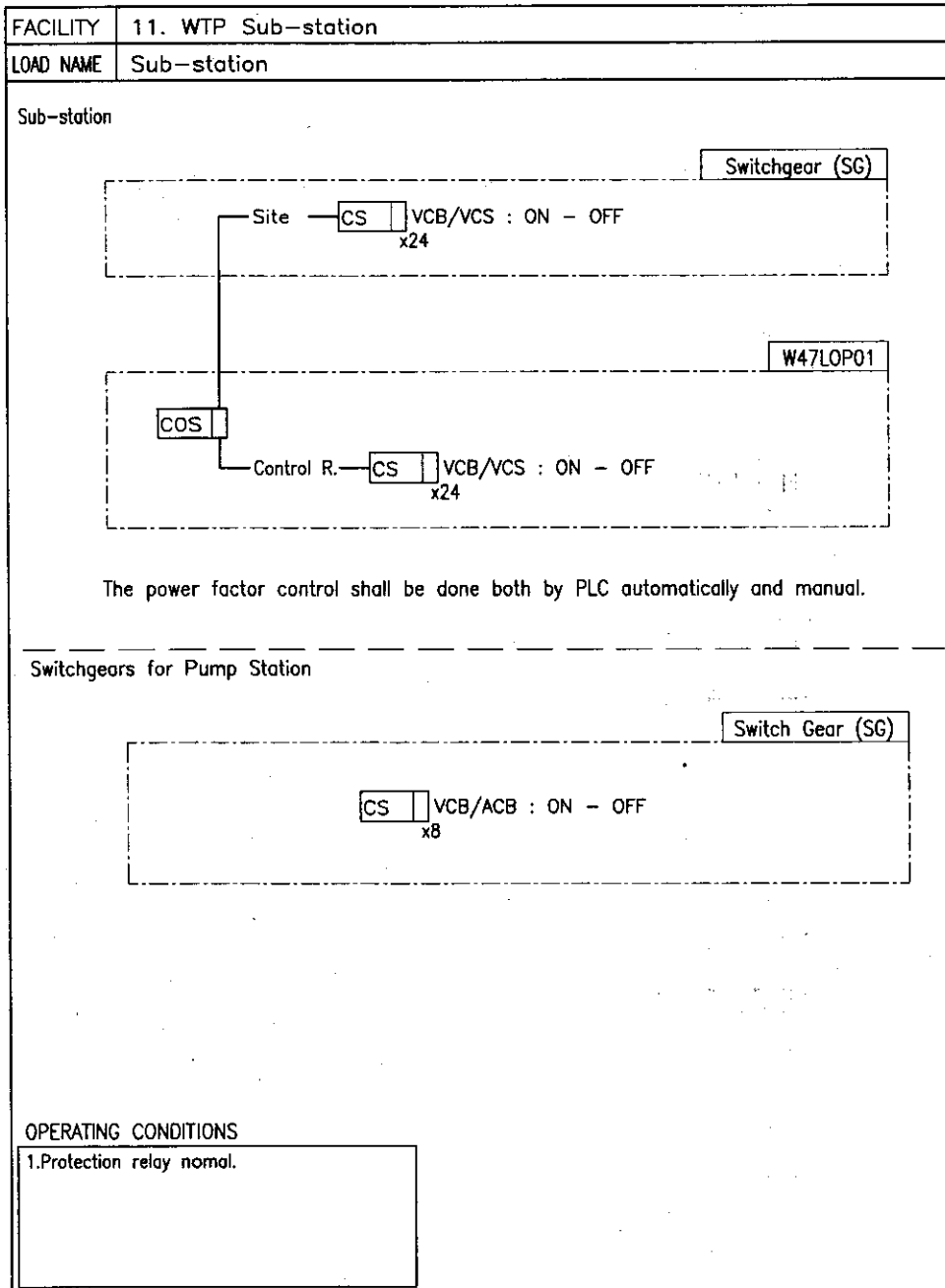
	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE LOP	ELC. ROOM		CENTRAL MONI. ROOM			
				MCC	INP	MONI.	PRN.	MINIC.	
STATUS INDICATION									
OPERATION SWITCH	CS :FORWARD-STOP-REVERSE		○						x2
	CS :UP-STOP-DOWN		○						x2
FAULT INDICATION	EARTH FAULT	T	○	○		○	○		x2
	OVER LOAD	T	○	○		○	○		x2
INST. INDICATION									

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FACILITY	10. Chemical Dosing				
LOAD NAME	Evaporator [W45EV01/02]	CAPACITY	12kW	NUMBERS	2(1)
	Chlorinator [W45CL11~41]		25W		4(2)
	Exhaust Fan [W45EF01/02]		0.4kW		2
<p style="text-align: right;"><input type="checkbox"/> CS <input type="checkbox"/> Dosing Ratio Setting Switch</p> <p>WTP CENTRAL MONITORING ROOM</p> <p>Administration Elec. Room</p> <hr/> <p>SITE</p> <div style="border: 1px dashed black; padding: 5px; margin: 10px 0;"> <p style="text-align: right;">W45CDP01</p> <p>Power Supply Only</p> </div> <div style="border: 1px dashed black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">Mechanical Standard Equipped</p> <div style="border: 1px solid black; width: 50px; height: 20px; margin: 10px auto; display: flex; align-items: center; justify-content: center;"> <input type="checkbox"/> CS </div> </div> <p>OPERATING CONDITIONS</p> <div style="border: 1px solid black; padding: 5px;"> <p>1. Protection relay normal.</p> </div>					

	ITEMS	ALARM	Water Treatment Plant						REMARKS
			SITE	ELC. ROOM		CENTRAL MONI. ROOM			
				LOP	MCC	INP	MONI.	PRN.	
STATUS INDICATION	Chlorinator ON		<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	x4
	Chlorinator OFF		<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	x4
OPERATION SWITCH	Mechanical Standard Equipped								
	CS : STOP-START		<input type="checkbox"/>						x8
	COS : Chlorinator : AUTO-MANU		<input type="checkbox"/>						x2
	Dosing Ratio Setting Switch						<input type="checkbox"/>		
FAULT INDICATION	Mechanical Standard Alarm	T	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	
	Chlorin Gas Leakage		<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
INST. INDICATION	Chlorin Dosing Flow		<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	x2
	Chlorin Cylinder Weight		<input type="checkbox"/>				<input type="checkbox"/>		

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	ITEMS	ALARM	Sub-station				WTP			REMARKS
			Primary		for Pump		CENTRAL	MONI.	ROOM	
			LOP	SG	SG		MONI.	PRN.	MINIC	
STATUS INDICATION	[Sub-station]									
	VCB/VCS ON		○	○		○			x24	
	VCB/VCS OFF		○	○		○			x24	
	[for Pump Station]									
STATUS INDICATION	VCB/ACB ON				○	○			x8	
	VCB/ACB OFF				○	○			x8	
OPERATION SWITCH	[Sub-station]									
	CS : ON-OFF		○	○					x24	
	COS : CONTROL.R-SITE		○						x1	
	[for Pump Station]									
OPERATION SWITCH	CS : ON-OFF				○				x8	
	[Sub-station]									
FAULT INDICATION	EARTH FAULT	T	○	○		○	○		x24	
	OVER CURRENT	T	○	○		○	○		x24	
	Power Failure		○			○	○		x3	
	Control Power Down		○	○		○	○		x24	
	[for Pump Station]									
FAULT INDICATION	EARTH FAULT	T			○	○	○		x8	
	OVER CURRENT	T			○	○	○		x8	
	Control Power Down				○	○	○		x8	
INST. INDICATION	[Sub-station]									
	Receiving AMMETER		○	○		○			x6	
	Receiving VOLTMETER		○	○		○			x6	
	Receiving POWER FACTOR		○	○		○			x3	
	AMMETER		○	○		○			x6	
	VOLTMETER		○	○		○			x2	
	WATT METER		○	○		○			x6	
	WATT HOUR METER		○	○		○			x6	
	[for Pump Station]									
	AMMETER				○				x8	
VOLTMETER				○				x4		

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