

Appendix 7-1 General Information of Existing Pump Station(I/4)

Information and check Items		1.G.Ballola	2.G.Al-Arab	3.Kubania	4.S.Abu Rish	5.S.El-Kelh	6.V.El Kubania	7.El-Sharunia	8.El-Owenia	9.Bakulous	11.El Kalabia
1.Number of Pump Sets		2	1	1	2	2	2	2	2	1(Present)	2
2.Commencement and Rehabilitation of the Pump Station											
(1)Commencement of the Pump Station(Year)		1948	1948	1951	1957	1952	1981	-	-	-	-
(2)Major Rehabilitation or Replacement(Year)		1979(E-W)	1987(E-W)	1981(E-W)	1979(E-W)	No repl.	1995(From Gharb, Aswan Baharia)	-	-	-	1987(E-W) 1991(Float.→Fixed.)
3.Manufacturer's Name of the Pump and Mover											
(1)Pump(Country)		No.1 Sulzer(Switz.) No.2 X2	Sulzer(Switz.)	KSB(Ger.)	Gras(Aus.) X2	Andritz(Aus.)X2	WunderX2(Switz. & Egy.)	Sigma Olombuc(Czecho.)X2	Sigma Olombuc(Czecho.)X2	KSB(Ger.)X2	Sigma Olombuc(Czecho.)X2
(2)Mover(Country)		No.1 3BX(U.S.S.R.) No.2 Reliance(U.S.A)	Reliance(U.S.A)	3BX(U.S.S.R))	Reloy Somer(Fran.)X2	Bohn & Kahler Kiel(Ger.)X2	Reloy Somer(Fran.)X2	Bodabest(Hung.)X2	Bodabest(Hung.)X2	Detroit(U.S.A.)	G.E.(U.S.A.)X2
4.Prime Mover		Motor Drive	Motor Drive	Motor Drive	Motor Drive	Engine Drive	Motor Drive	Motor Drive	Motor Drive	Engine Drive	Motor Drive
(1)Type		No.1 A094-6T No.2 P	P	A02-82-T	LSP355M6X2	KR18FX2	LSP355M6X2	-	-	[Power take-off] 2:1 reduction with clutch	-
(2)Out put		No.1 75KW No.2 100KW	100KW	40KW	110KWx2	150HPx2	110KWx2	90KWx2	90KWx2	252HP	100KWx2
(3)Voltage		380V	380V	380V	380V	-	380V	380V	380V	-	380V
(4)Ampere		No.1 139A No.2 185A	185A	75A	234Ax2	-	234Ax2	-	-	-	193Ax2
(5)No. of Poles(Synchronous)		6P(1,000rpm)	6P(1,000rpm)	8P(750rpm)	10P(600rpm)	-	10P(600rpm)	6P(1,000rpm)	6P(1,000rpm)	-	8P(750rpm)
(6)Frequency		50Hz	50Hz	50Hz	50Hz	-	50Hz	50Hz	50Hz	-	50Hz
(7)Year of Manufacturing		1962	-	1966	1970	1952	-	-	1968	1965	-
(8)Present Workability		x	0	x	0	x	Δ	x	x	Δ	0
(9)Appearance		Finished coat 0 Rust Δ	x x	x x	Δ Δ	x x	Δ Δ	x x	x x	x x	Δ Δ
(10)Bearing		Noise 0 Vibration 0 Temperature 0 oil leak 0	0 0 0 0	Δ x 0 0	0 0 0 0	- - - x	0 0 0 Δ	x x - Δ	Δ x Δ Δ	Δ 0 0 0	0 x 0 0
(11)Rotor & Fan		Noise 0 Vibration x Wind Pressure 0	0 0 0	Δ 0 0	0 0 0	- - -	Δ x 0	x x 0	Δ x 0	Δ x 0	0 x 0
(12)Others		Rust Δ oil leak 0 Water leak - Wear Δ	x 0 - x	x 0 - x	Δ 0 - 0	x x - x	Δ Δ 0 x	x Δ - x	x Δ Δ x	x 0 - x	Δ 0 - Δ
5.Prime Pump											Heavy Cavitation
(1)Discharge Capacity(Initial Stage)		350lit/s	350lit/s	250lit/s	764lit/s	750lit/s	500lit/s	467lit/s	357lit/s	750lit/s	500lit/s
(2)Total Head		13m	13m	13m	10m	10m	10m	13.5m	13.5m	13m	10.5m
(3)Revolutions		985rpm	985rpm	735rpm	590rpm	600rpm	590rpm	980rpm	980rpm	800rpm	730rpm
(4)Year of Manufacturing		1948	1948	1951	1957	1957	-	-	-	1951	-
(5)Present Workability		x	0	x	0	x	Δ	x	x	Δ	0
(6)Appearance of casing		Finished coat x Rust x	x x	x x	0 Δ	x x	x x	x x	x x	Δ Δ	Δ Δ

Table General Information of Existing Pump Station(2/4)

Information and check items		1.G.Ballola	2.G.Al-Arab	3.Kubania	4.S.Abu Rish	5.S.El-Kelh	6.W.El Kubania	7.El-Sharunia	8.El-Owenia	9.Bakulous	11.El Kalabla
(7) Appearance of installation	Bolts tightness	0	0	0	Δ	0	0	0	Δ	0	0
	Vibration	Δ	0	0	0	-	Δ	x	x(bad)	0	0
	Noise (Hydraulic)	0	0	Δ	0	-	Δ	x	x	0	Δ
(8) Bearing	Noise	Δ	0	x	0	-	x	x	x	0	x
	Vibration	Δ	0	0	0	-	x	x	x	x	0
	Temperature	0	0	0	0	-	0	-	0	0	0
	Oil leak	x	x	0	Δ	x	Δ	x	x	x	Δ
(9) Coupling	Bolt tightness	0	0	0	0	0	0	0	0	0	0
	Eccentricity	0	0	Δ	0	-	x	Δ	x	x	Δ
	Wear	Δ	Δ	Δ	0	x	Δ	Δ	x	x	Δ
(10) Stuffing box	Water leak	0	0	x	0	Δ	0	Δ	Δ	0	0
	Temperature	0	0	0	0	-	0	-	0	0	0
(11) Other (Rotar)	Rust	x	x	x	0	x	Δ	x	x	x	x
	Oil leak	Δ	-	Δ	0	x	Δ	Δ	Δ	Δ	x
	Water leak	0	0	Δ	0	Δ	Δ	Δ	Δ	0	0
	Wear	x	x	x	0	x	Δ	Δ	x	x	Δ
	Hand turning	0	0	0	0	-	0	0	-	-	0
6. Transformer											
(1) Capacity		200KVA	160KVA	100KVA	500KVA		300KVA	500KVA	300KVA		500KVA
(2) Primary Voltage - Secondary Voltage		3,300V - 380V	11,000V - 380V	11,000V - 380V	11,000V - 380V		11,000V - 380V	11,000V - 380V	11,000V - 380V		11,000V - 380V
(3) Year of Manufacturing		1975	1972	1978	1977	No Transformer	1979	1983	1976	No Transformer	1986
(4) Present Workability		0	0	Δ	0		0	Δ	Δ		0
(5) Appearance	Oil leak	Δ	Δ	0	Δ		x	Δ	Δ		Δ
	Connection	0	0	0	0		0	0	0		0
	Wear	x	x	0	Δ		Δ	(Electrical Spark)	Δ		Δ
7. Vacuum Pump					Preparing Pump						
(1) Revolutional				2,800rpm	1,450rpm		1,415rpm			2,900rpm	2,860rpm
(2) Present Workability				x	Δ		0			Δ	0
(3) Appearance of casing	Finished coat			Δ	Δ		Δ			Δ	Δ
	Rust			Δ	Δ		Δ			Δ	x
(4) Appearance of installation	Bolts tightness			0	0		0			0	0
	Vibration			x	-		-			-	-
	Noise (Hydraulic)			x	-		-			-	-
(5) Bearing	Noise			x	-		-			-	-
	Vibration			x	-		-			-	-
	Temperature	No Vacuum	No Vacuum	0	-	No Vacuum	-	No Vacuum	No Vacuum	-	-
	Oil leak	Pump	Pump	Δ	x	Pump	0	Pump	Pump	Δ	0
(6) Coupling	Bolt tightness			0	0		0			-	Δ
	Eccentricity			Δ	-		0			-	Δ
	Wear			Δ	Δ		Δ			x	x
(7) Stuffing box	Water leak			Δ	-		0			-	0
	Temperature			0	-		-			-	0
(8) Other	Rust			Δ	Δ		Δ			x	Δ
	Oil leak			Δ	x		0			Δ	0
	Water leak			Δ	-		0			Δ	x
	Wear			Δ	Δ		Δ			x	Δ
(Rotar)	Hand turning			-	-		0			-	-

Table General Information of Existing Pump Station(3/4)

Information and check items		1.G.Ballola	2.G.Al-Arab	3.Kubania	4.S.Abu Rish	5.S.El-Kelh	6.W.El Kubania	7.El-Sharonia	8.El-Owenia	9.Bakulous	11.El Kalabla
20. Motor for the Vacuum Pump											
(1) Out put				4KW	4KW		3KW			1.73KW	7.5KW
(2) Voltage				380V	380V		380V			380V	380V
(3) No. of Poles				2P	4P		4P			2P	2P
(4) Frequency				50Hz	50Hz		50Hz			50Hz	50Hz
(5) Present Workability				Δ	0		0			Δ	0
(6) Appearance	Finished coat			Δ	Δ		Δ			x	Δ
	Rust			Δ	Δ		Δ			Δ	Δ
(7) Bearing	Noise	No Motor	No Motor	x	0	No Motor	-	No Motor	No Motor	-	x
	Vibration	for the	for the	x	0	for the	-	for the	for the	-	x
	Temperature	Vacuum Pump	Vacuum Pump	0	0	Vacuum Pump	-	Vacuum Pump	Vacuum Pump	-	0
	Oil leak			Δ	Δ		0			-	0
(8) Rotar & Fan	Noise			Δ	0		-			-	Δ
	Vibration			Δ	0		-			-	Δ
	Wind pressure			0	0		-			-	0
(9) Others	Rust			Δ	Δ		Δ			Δ	Δ
	Oil leak			Δ	Δ		0			Δ	0
	Water leak			Δ	x		-			Δ	-
	Wear			Δ	Δ		Δ			Δ	Δ
21. Sluice Valve											
(1) Type		Gate	Gate	Gate	Gate	Gate	Gate	Gate	Gate	Gate	Gate
(2) Bore		φ 350mm	φ 350mm	φ 400mm	φ 500mm	φ 500mm	φ 400mm	φ 400mm	φ 500mm	φ 400mm	φ 400mm
(3) Appearance	Finished coat	0	x	x	0	x	x	x	x	x	x
	Rust	0	x	x	0	x	x	x	x	x	x
	Wear	0	x	x	0	x	x	x	x	x	x
	Water leak	x	x	x	0	-	x	Δ	Δ	0	0
22. Check Valve											
(1) Type				Flap	Flap		Flap	Flap	Flap	Swing	Flap
(2) Bore				φ 700mm	φ 1,000mm		φ 700mm	φ 700mm	φ 700mm	φ 400mm	φ 500mm
(3) Appearance	Finished coat	No Flap	No Flap	x	Δ	No Flap	x	x	x	x	x
	Rust	Valve	Valve	x	Δ	Valve	Δ	x	x	x	Δ
	Wear			x	Δ		x	x	x	x	Δ
	Water leak			-	-		-	-	-	0	-
23. Ball joint											
(1) Type		Rubber	Rubber	Flex. hose	Ball joint	Rubber	Rubber	Rubber	Rubber	Rubber	
(2) Bore		φ 500mm	φ 500mm	φ 500mm	φ 600mm	φ 500mm	φ 500mm	φ 500mm	φ 500mm	φ 400mm	
(3) Appearance	Finished coat	x	x	Δ	x	x	x	x	x	x	No Connecting Pipe
	Rust	x	x	x	x	x	x	x	x	x	
	Wear	x	x	x	x	x	x	x	x	x	
	Water leak	0	0	x	x	x	Δ	x	x	x	

Table General Information of Existing Pump Station(4/4)

Information and check items		1.G.Ballola	2.G.Al-Arab	3.Kubania	4.S.Abu Rish	5.S.El-Kelh	6.W.El Kubania	7.El-Sharunia	8.El-Owenia	9.Bakulous	11.El Kalabla
24. Switch Board					Two Pannels						
(1) Entrance Dimension	H	2,200mm	2,000mm	2,000mm	2,200mm		2,000mm	-	2,200mm	1,700mm	2,000mm
	W	940mm	1,330mm	700mm	2,000mm		1,500mm	-	2,000mm	1,500mm	1,500mm
	L	760mm	500mm	700mm	730mm		500mm	-	730mm	500mm	500mm
(2) Rated Voltage		380V	380V	380V	380V		380V	380V	380V	380V	380V
(3) Rated Frequency		50Hz	50Hz	50Hz	50Hz		50Hz	50Hz	50Hz	50Hz	50Hz
(4) Appearance of outside	Rust	Δ	X	Δ	Δ	No Switch Board	X	X	Δ	Δ	Δ
	Wear	Δ	X	X	Δ		X	X	X	X	Δ
	Noise	0	0	0	0		0	0	0	0	0
	Vibration	0	0	0	0		0	Δ	X	0	0
	Tightness	0	0	0	0		0	0	0	0	0
(5) Appearance of interior		0(>100MΩ)	0(>100MΩ)	0(>100MΩ)	0(>100MΩ)		0(>100MΩ)	0(>100MΩ)	0(>100MΩ)	0(>100MΩ)	0(>100MΩ)
(6) Meter	Lighting	0	0	X	Δ		X	X	X	X	X
	Rust	Δ	X	X	Δ		X	X	Δ	Δ	Δ
(6) Meter	Zero setting	0	0	Δ	0		X	X	X	Δ	0
	Workability	0	0	X	0		Δ	Δ	Δ	Δ	0
25. Power Cable											
(1) Appearance	Damage	Δ	X	X	Δ	No Power Cable	0	Δ	X	0	0
	Wear	Δ	X	X	Δ		0	Δ	X	0	0
	Covering	0	0	0	0		0	0	Δ	0	0
	Connection	0	0	0	0		0	0	Δ	0	0
	Insulation	0(>100MΩ)	0(>100MΩ)	0(>100MΩ)	0(>100MΩ)		0(>100MΩ)	0(>100MΩ)	0(>100MΩ)	0(>100MΩ)	0(>100MΩ)
26. Barge											
(1) Appearance of outside	Damage	X	Δ	X	0	X	X	X	X	Δ	No Barge (Fixed Pump Station)
	Rust	X	X	Δ	Δ	X	X	X	X	Δ	
	Wear	X	X	Δ	0	X	X	X	X	Δ	
	Vibration	0	0	Δ	-	-	Δ	Δ	Δ	-	
	Tightness	0	0	Δ	0	-	Δ	Δ	Δ	Δ	
(2) Appearance of interior	Rust	Δ	X	Δ	0	X	X	X	X	Δ	
	Wear	Δ	X	X	0	X	X	X	X	Δ	
	Operation smooth	Δ	Δ	Δ	0	Δ	Δ	Δ	Δ	Δ	
	Lockability	Δ	Δ	Δ	0	Δ	Δ	Δ	Δ	Δ	
	27. Charge Tower										
(1) Nominal Bore		φ1,000mm		φ1,000mm	φ1,500mm	φ1,000mm	φ1,000mm	φ1,000mm	φ1,000mm		φ 800mm
(2) Material		Steel		Steel	Steel	Steel	Steel	Steel	Steel		Steel
(3) Present Workability		Δ	No Tower	X	Δ	Δ	Δ	X	X	No Tower	Δ
(4) Appearance	Finished coat	X		X	X	X	X	X	X		X
	Rust	X		X	X	X	Δ	X	X		Δ
	Wear	X		Δ	Δ	X	Δ	X	X		Δ
28. Discharge Pipe Line											
(1) Nominal Bore		φ 700mm	φ 500mm	φ 700mm	φ1,000mm	φ500-φ700mm	φ 700mm	φ 700mm	φ 700mm	φ 500mm	φ 500mm
(2) Material		Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel
(3) Berried or not		Berried	Not Berried	Berried	Not Berried	Berried	Not Berried	Not Berried	Berried	Berried	Berried
(4) Present Workability		Δ	X	X	Δ	X	Δ	X	X	Δ	0
(5) Appearance	Finished coat	X	X	X	X	X	X	X	X	X	X
	Rust	X	X	X	Δ	X	Δ	X	X	Δ	X
	Wear	X	X	X	Δ	X	Δ	X	X	Δ	Δ

DATE 14th/Dec./95

STATION NAME: Gezirat Ballola

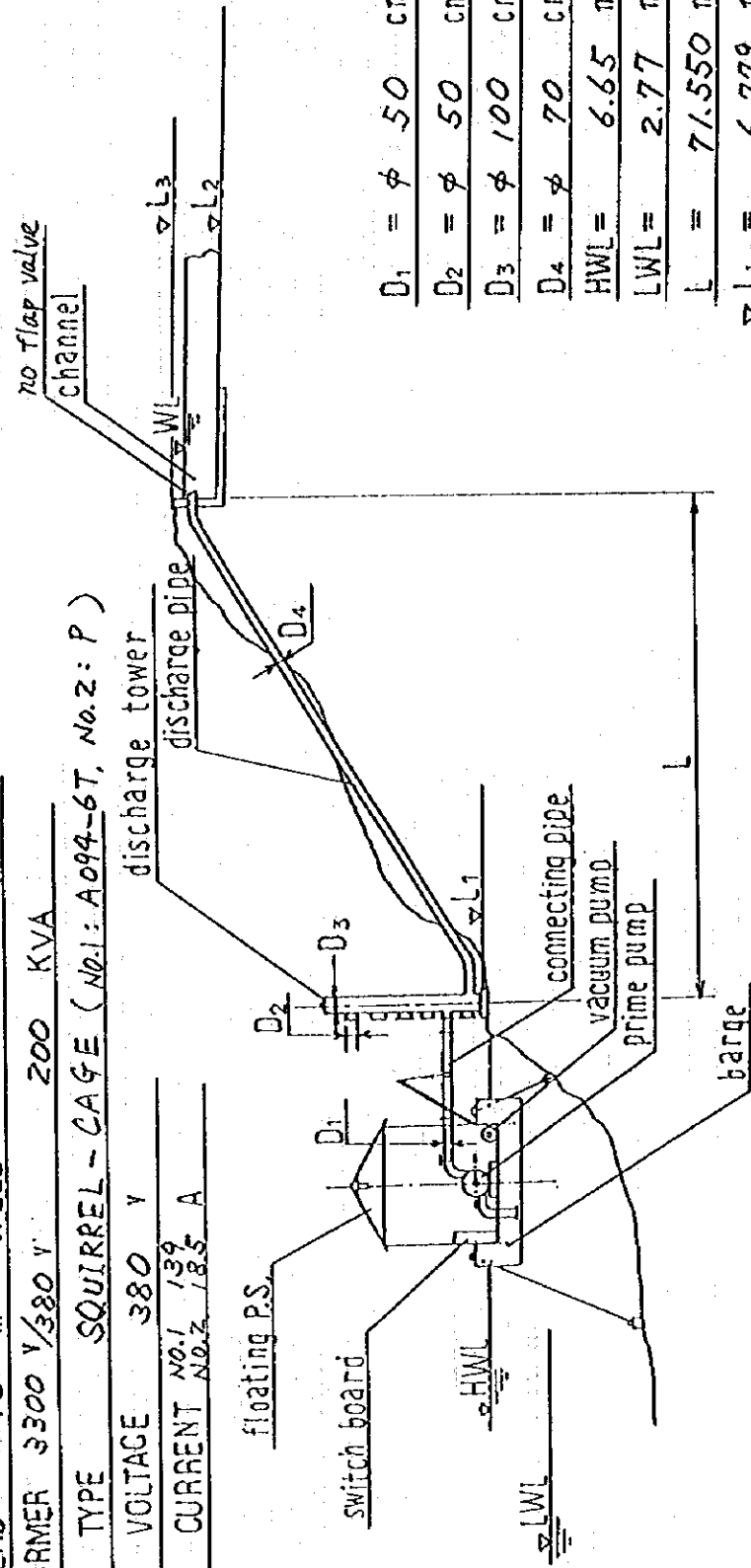
NO. OF UNITS 2 DISCHARGE 350 lit/s
 TOTAL HEAD 13 m SPEED OF ROTATION 985 rpm (SYNCHRONOUS 1000 rpm)

TRANSFORMER 3300 V/380 V 200 KVA

MOTOR TYPE SQUIRREL - CAGE (No. 1: A094-6T, No. 2: P)

VOLTAGE 380 V

CURRENT No. 1 139
No. 2 185 A



$D_1 = \phi$	50	cm
$D_2 = \phi$	50	cm
$D_3 = \phi$	100	cm
$D_4 = \phi$	70	cm
HWL =	6.65	m
LWL =	2.77	m
L =	71.550	m
$\nabla L_1 =$	6.779	m
$\nabla L_2 =$	10.998	m
WL =	—	m
$\nabla L_3 =$	12.508	m

OUT-PUT 75 kW

FLOATING PUMP STATION DATA SHEET

No. 2

STATION NAME: Gezirat Al-Arab

DATE 14th/Dec./95

NO. OF UNITS 1 DISCHARGE 350 lit/s

TOTAL HEAD 13 m SPEED OF ROTATION 985 rpm (SYNCHRONOUS 1000rpm)

TRANSFORMER 11000 V/380V 200 KVA

MOTOR TYPE SQUIRREL-CAGE (P)

VOLTAGE 380 V

CURRENT 185 A

~~discharge tower~~ no tower

no flap valve

channel

floating P.S.

switch board

LWL

HWL

D₁

D₂

D₃

D₄

discharge pipe

~~discharge tower~~

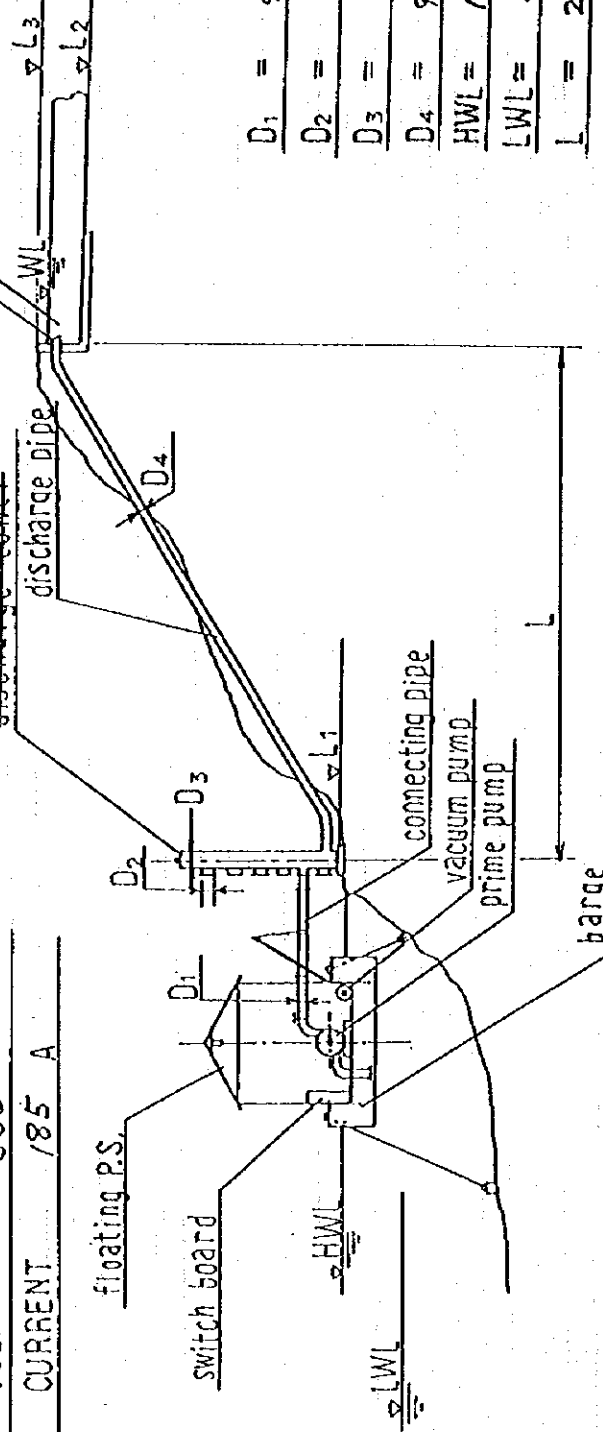
connecting pipe

vacuum pump

prime pump

barge

OUT-PUT 100 KW



D ₁ =	φ 50	cm
D ₂ =	—	cm
D ₃ =	—	cm
D ₄ =	φ 50	cm
HWL =	12.69	m
LWL =	8.90	m
L =	21.700	m
∇ L ₁ =	13.930	m
∇ L ₂ =	17.290	m
WL =	—	m
∇ L ₃ =	18.895	m

FLOATING PUMP STATION DATA SHEET

No.3

DATE 11th/Dec/95

STATION NAME: Kubaria

NO. OF UNITS / DISCHARGE 250 lit/s

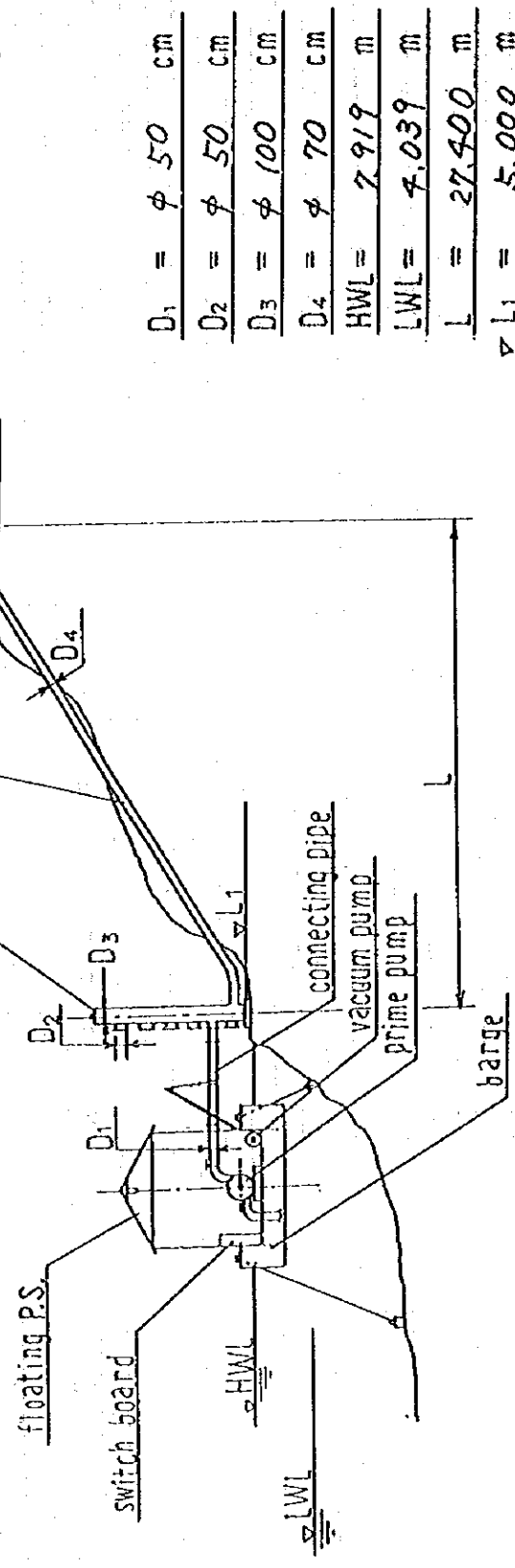
TOTAL HEAD 13 m SPEED OF ROTATION 735 rpm (SYNCHRONOUS 750 rpm)

TRANSFORMER 11000 V/380V 100 KVA

MOTOR TYPE SQUIRREL-CAGE (A02-82-T)

VOLTAGE 380 V

CURRENT 75 A



D ₁ = φ 50	cm
D ₂ = φ 50	cm
D ₃ = φ 100	cm
D ₄ = φ 70	cm
HWL =	2.919 m
LWL =	4.039 m
L =	27.400 m
∇L ₁ =	5.000 m
∇L ₂ =	12.222 m
WL =	- m
∇L ₃ =	14.142 m

OUT-PUT 40 KW

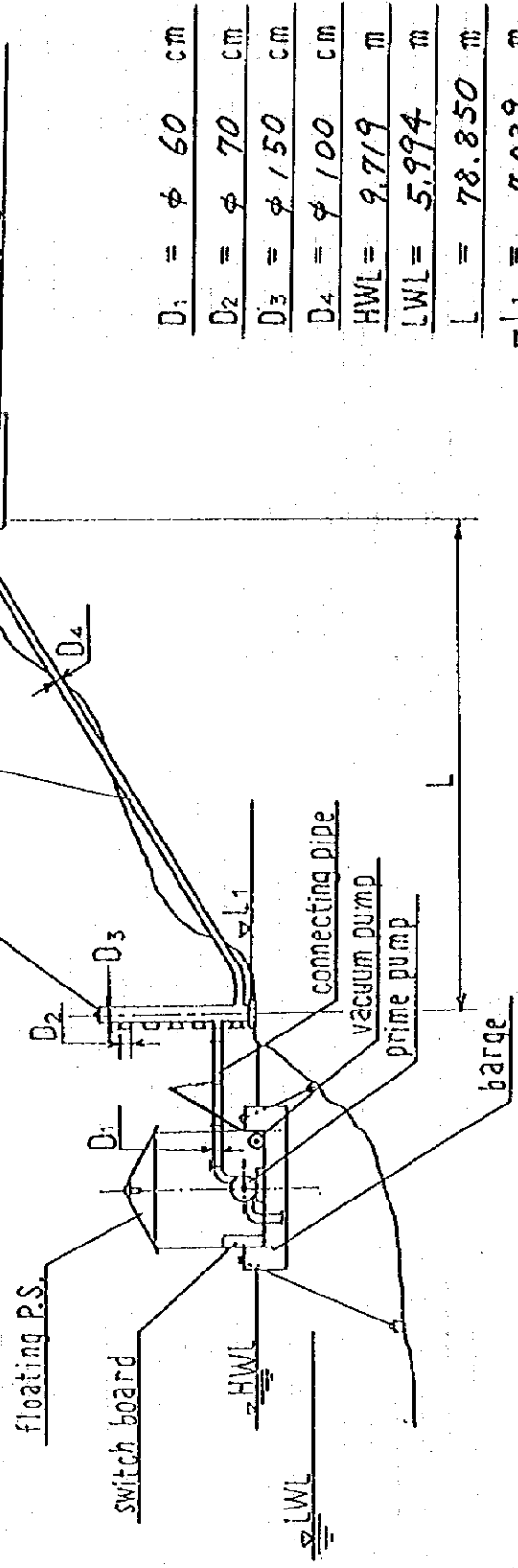
FLOATING PUMP STATION DATA SHEET

No.4

DATE 14th/Dec/95

STATION NAME : Sahel Abu Risk

NO. OF UNITS 2 DISCHARGE 764 lit/s
 TOTAL HEAD 10 m SPEED OF ROTATION 590 rpm (SYNCHRONOUS 600 rpm)
 TRANSFORMER 11000 V/380V 500 KVA
 MOTOR TYPE SQUIRREL CAGE
 VOLTAGE 380 V
 CURRENT 234 A



D ₁ = φ 60	cm
D ₂ = φ 70	cm
D ₃ = φ 150	cm
D ₄ = φ 100	cm
HWL = 9.719	m
LWL = 5.994	m
L = 78.850	m
∇L ₁ = 7.039	m
∇L ₂ = 15.712	m
WL = -	m
∇L ₃ = 17.675	m

OUT-PUT 110 KW

FLOATING PUMP STATION DATA SHEET

No.5

DATE 12th/Dec./95

STATION NAME: Sahel El - Kelh

NO. OF UNITS 2 DISCHARGE 764 lit/s
 TOTAL HEAD 10 m SPEED OF ROTATION 600 rpm

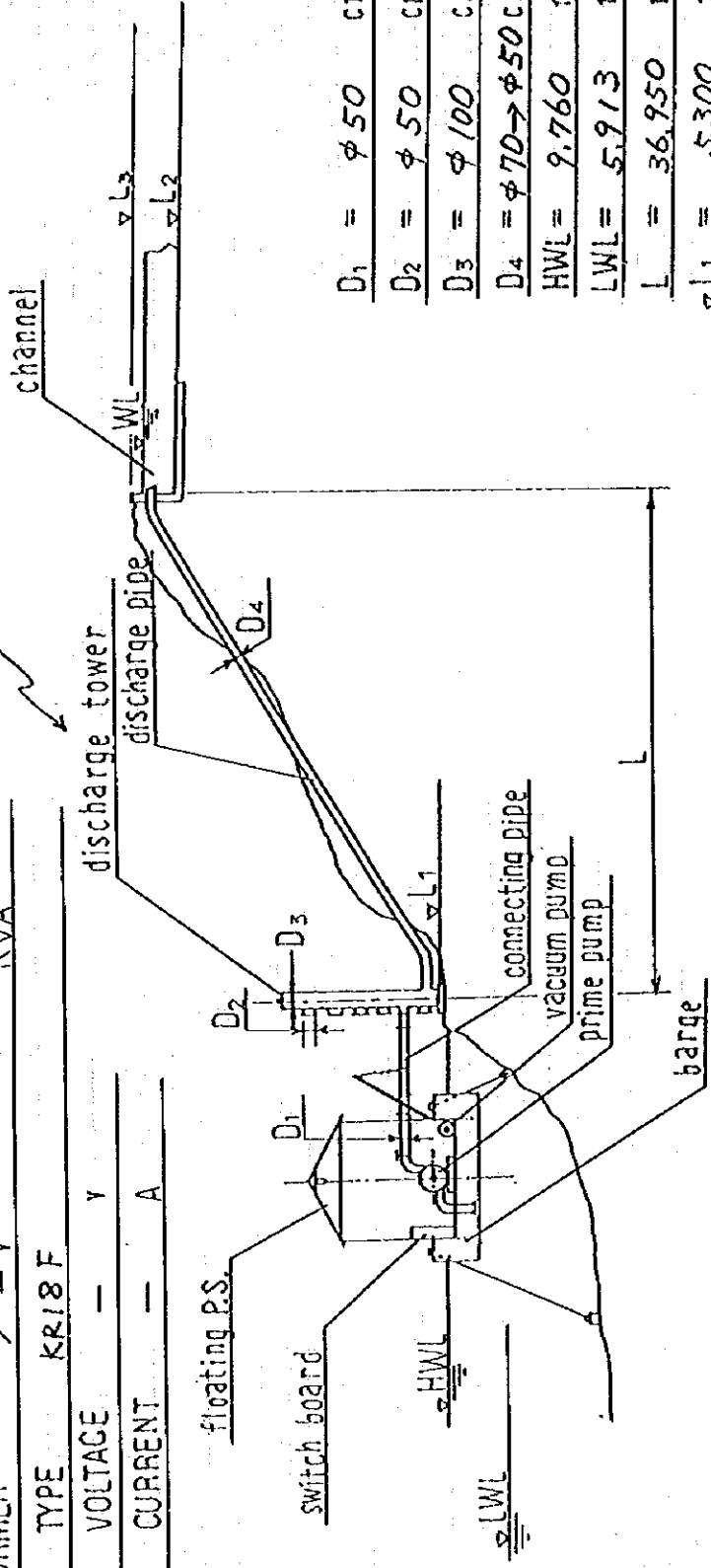
NO TRANSFORMER -- V / -- V -- KVA

PIESEL MOTOR TYPE KR18 F

VOLTAGE -- V

CURRENT -- A

Submerged around lower part



D ₁ =	φ 50	cm
D ₂ =	φ 50	cm
D ₃ =	φ 100	cm
D ₄ =	φ 70 → φ 50	cm
HWL =	9.760	m
LWL =	5.913	m
L =	36.950	m
L ₁ =	5.300	m
L ₂ =	11.013	m
WL =	—	m
L ₃ =	12.630	m

OUTPUT 150 HP

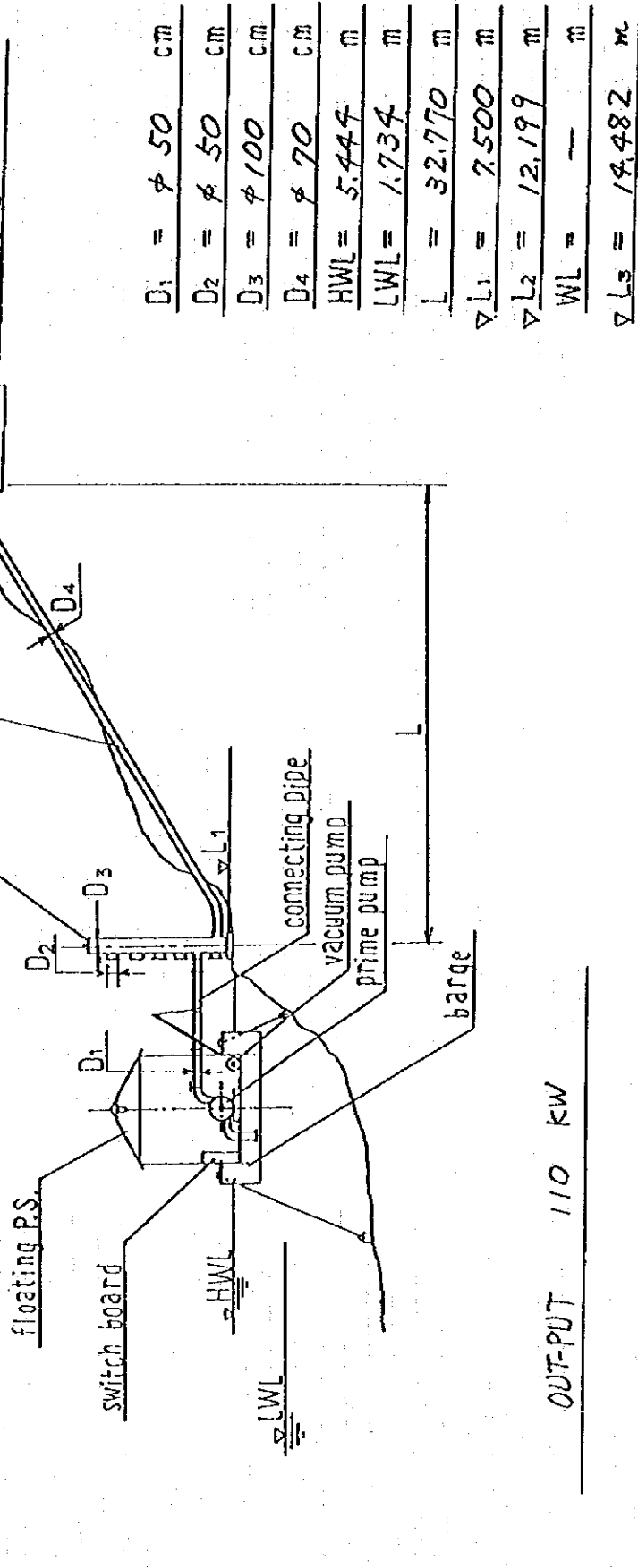
FLOATING PUMP STATION DATA SHEET

No. 6

DATE 11th/Dec./95

STATION NAME: Wadi El Kubania

NO. OF UNITS 2 DISCHARGE 500 lit/s
 TOTAL HEAD 10 m SPEED OF ROTATION 570 rpm (SYNCHRONOUS 600 rpm)
 TRANSFORMER 11000 V / 380 V 300 KVA
 MOTOR TYPE SQUIRREL CAGE (LSP355M6)
 VOLTAGE 380 V
 CURRENT 234 A



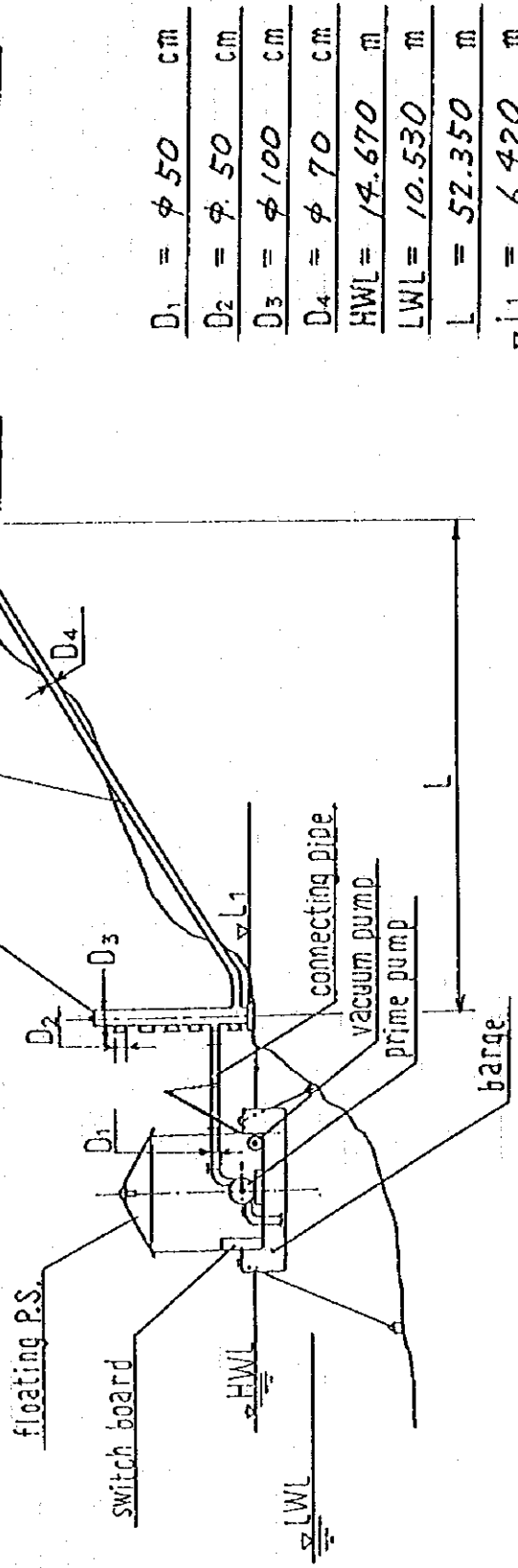
OUTPUT 110 kW

FLOATING PUMP STATION DATA SHEET

DATE 13th/Dec./95

No. 7
STATION NAME: E1 - Shaunika

NO. OF UNITS 2 DISCHARGE 467 lit/s
 TOTAL HEAD 13.5 m SPEED OF ROTATION 980 rpm (SYNCHRONOUS 1000 rpm)
 TRANSFORMER 11000 V/380 V 500 KVA Submerged around lower part channel
 MOTOR TYPE SQUIRREL CAGE
 VOLTAGE 380 V
 CURRENT — A



D ₁ = φ 50	cm
D ₂ = φ 50	cm
D ₃ = φ 100	cm
D ₄ = φ 70	cm
HWL = 14.670	m
LWL = 10.530	m
L = 52.350	m
∇L ₁ = 6.420	m
∇L ₂ = 15.532	m
WL = —	m
∇L ₃ = 17.662	m

OUT-PUT 90 KW

FLOATING PUMP STATION DATA SHEET

No. 8

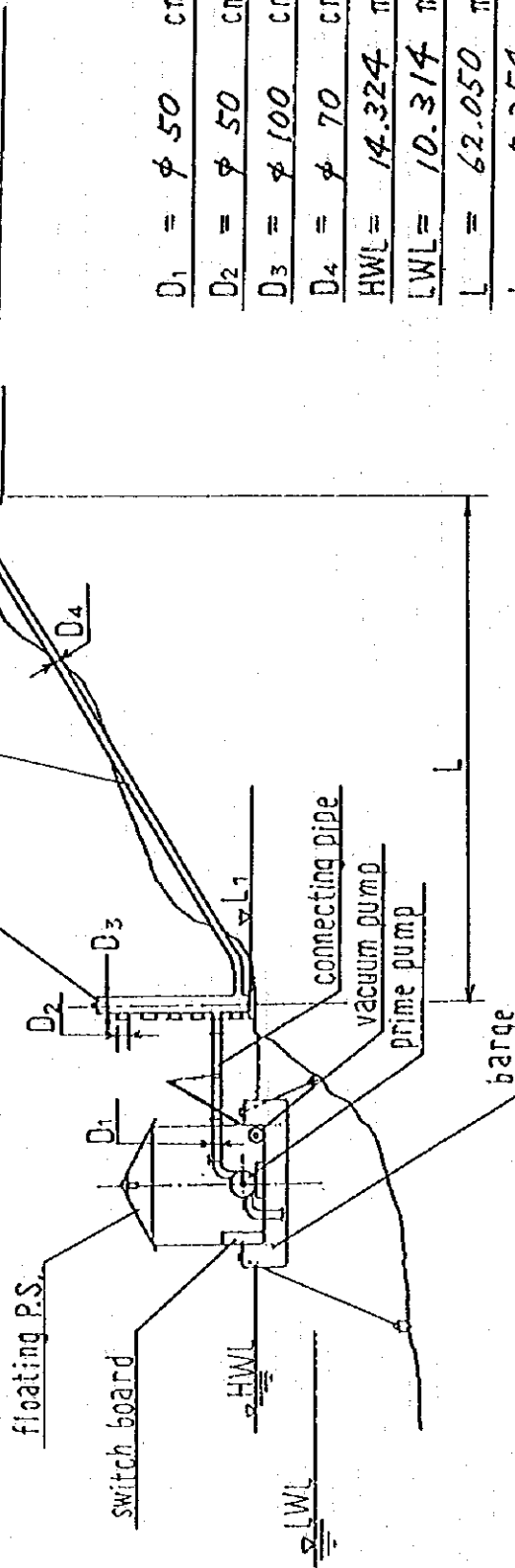
STATION NAME: EI - Oweria

DATE 13th/Dec./95

NO. OF UNITS Z DISCHARGE 357 lit/s
 TOTAL HEAD 13.5 m SPEED OF ROTATION 980 rpm (SYNCHRONOUS 1000 rpm)
 TRANSFORMER 11000 V/380V 300 KVA
 MOTOR TYPE SQUIRREL CAGE
 VOLTAGE 380 V
 CURRENT - A

Submerged around lower part

channel



$D_1 = \phi 50$	cm
$D_2 = \phi 50$	cm
$D_3 = \phi 100$	cm
$D_4 = \phi 70$	cm
HWL =	14.324 m
LWL =	10.314 m
L =	62.050 m
$\nabla L_1 =$	5.354 m
$\nabla L_2 =$	15.020 m
WL =	- m
$\nabla L_3 =$	17.115 m

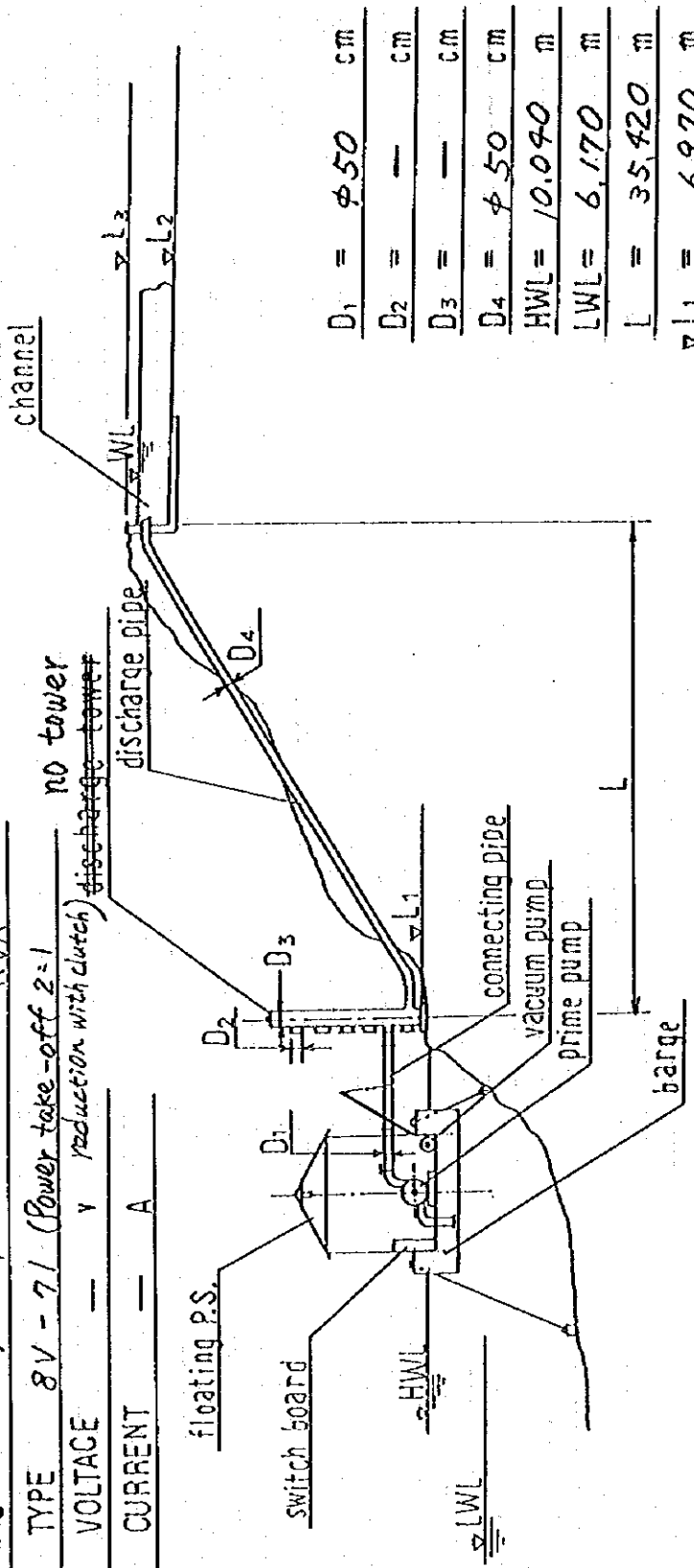
OUT-PUT 90 KW

FLOATING PUMP STATION DATA SHEET

DATE 11th/Dec./95

STATION NAME: Baklous

NO. OF UNITS 1 (2) DISCHARGE 750 lit/s
 TOTAL HEAD 13 m SPEED OF ROTATION 1800rpm
 NO TRANSFORMER - V / - V - KVA
 DIESEL ENGINE TYPE 8V-71 (Power take-off 2:1)
 VOLTAGE - V reduction with clutch ~~discharge tower~~ no tower
 CURRENT - A



D ₁ =	φ 50	cm
D ₂ =	--	cm
D ₃ =	--	cm
D ₄ =	φ 50	cm
HWL =	10.090	m
LWL =	6.170	m
L =	35.420	m
∇L ₁ =	6.970	m
∇L ₂ =	15.469	m
WL =	--	m
∇L ₃ =	17.434	m

OUT-PUT 252 HP

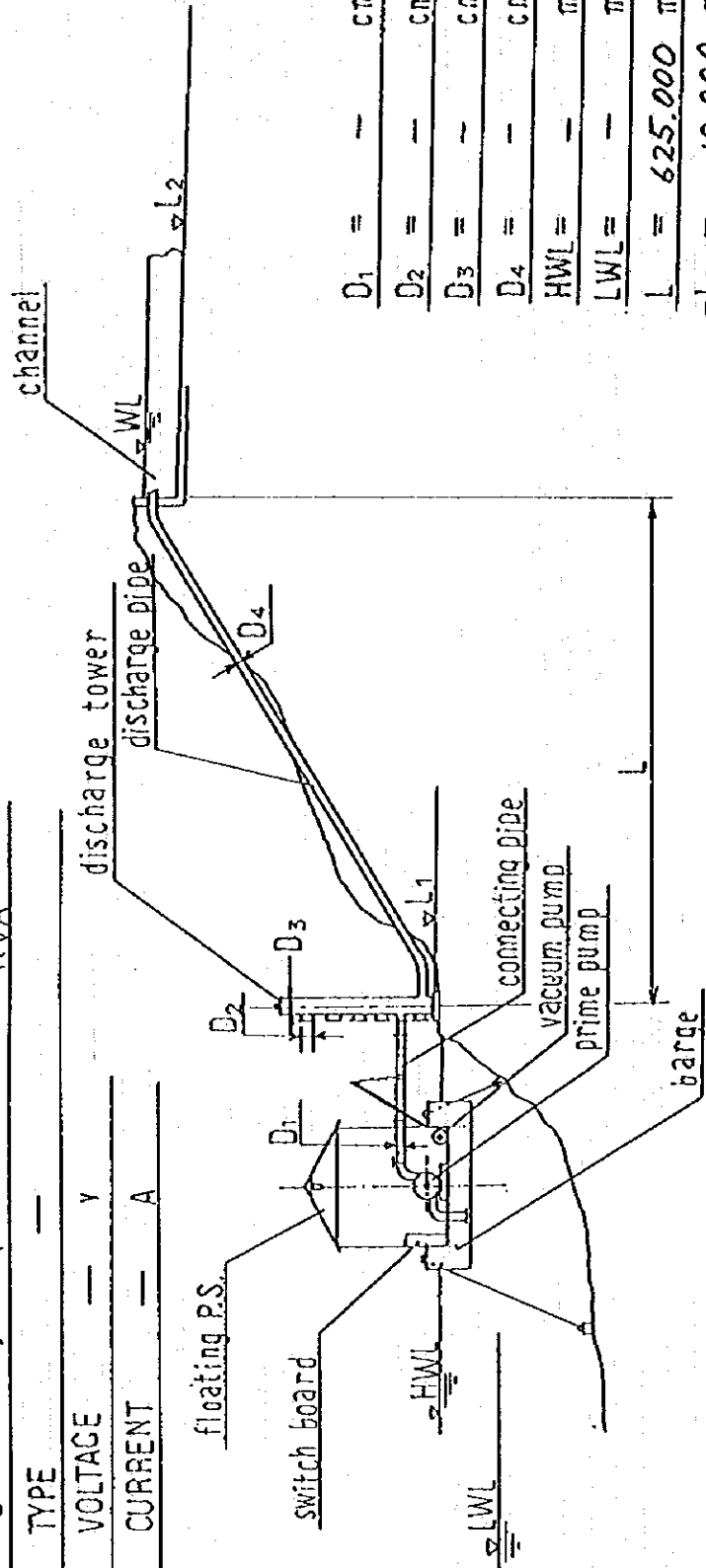
FLOATING PUMP STATION DATA SHEET

No.10

DATE 14th/Dec./95

STATION NAME : Sahel Fares (No facilities)

NO. OF UNITS	—	DISCHARGE	—	lit/s
TOTAL HEAD	—	m	SPEED OF ROTATION	—
TRANSFORMER	—	V / — V	—	KVA
MOTOR TYPE	—			
VOLTAGE	— V			
CURRENT	— A			



D ₁	=	—	cm
D ₂	=	—	cm
D ₃	=	—	cm
D ₄	=	—	cm
HWL	=	—	m
LWL	=	—	m
L	=	625.000	m
∇L ₁	=	10.000	m
∇L ₂	=	—	m
WL	=	—	m

FLOATING PUMP STATION DATA SHEET

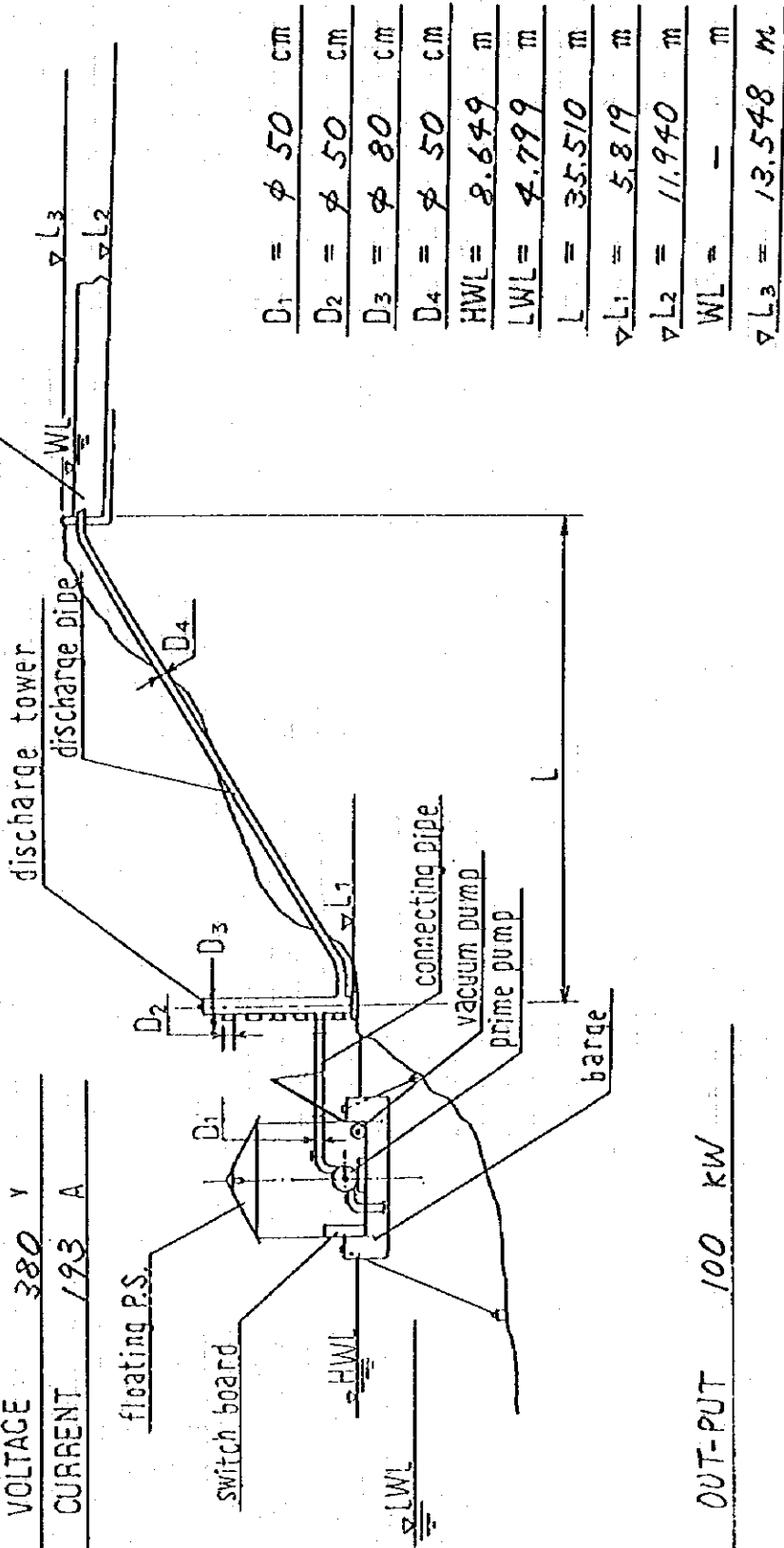
No. 11

DATE 12th/Dec./95

STATION NAME: El Kalabla

NO. OF UNITS 2 DISCHARGE 500 lit/s
 TOTAL HEAD 10.5 m SPEED OF ROTATION 730 rpm (SYNCHRONOUS 750 rpm)
 TRANSFORMER 11000 V / 380V 500 KVA
 MOTOR TYPE SQUIRREL CAGE

VOLTAGE 380 V
 CURRENT 193 A



D ₁ =	φ 50	cm
D ₂ =	φ 50	cm
D ₃ =	φ 80	cm
D ₄ =	φ 50	cm
HWL =	8.649	m
LWL =	4.799	m
L =	35.510	m
∇L ₁ =	5.819	m
∇L ₂ =	11.940	m
WL =	-	m
∇L ₃ =	13.548	m

OUT-PUT 100 kW

FLOATING PUMP STATION DATA SHEET

Manual of inspection and overhaul of pumping plant

(Basic Policy)

This manual mentions about the method of inspection and overhaul of pump plant equipment to maintain them economically and effectively, and also to realize the improvement of reliability of the equipments as a whole system.

(Explanation)

It is necessary to regard the pumping plant as a system and to realize the improvement of reliability and besides to reduce the maintenance costs for the equipments with the inspection and overhaul in accordance with reliable engineering.

One method to solve these problems is to establish the level of keeping a function and to combine the maintenance method like a time-criteria and a condition-criteria in order to keep the level.

For example a deterioration accompanied by operation is basically on the pumps operated continuously, so it is effectively and enough to make a maintenance of a condition-criteria mainly. On the other hand a deterioration accompanied by the lapse of years is basically on the pumps operated discontinuously, so the maintenance of a time-criteria is made mainly.

Though the floating pump station will be operated continuously basically, this manual is instituted considering the factor of discontinuous operation because of frequent electric failure for a time and the unbalanced operation hours for two pumps.

(Definition of terms)

Inspection : Eye inspection, measurement, working test and these records realized in order to find damages, something wrong or judge the quality of a function.

Overhaul : Operations and records of clearing, adjustment, supply of oil and fats, exchange of parts or repair realized in order to prevent damages or to keep or restore the functions in accordance with the judgement for the inspection results.

(Explanation)

Each working extent of inspection and overhaul can not all be separated clearly, but they can be regarded as a string of working, and they have the characteristics on the table below.

	Inspection	Overhaul
Purpose	Confirmation of existence of function loss (trouble or fatigue-deterioration of equipment)	Prevention of trouble or fatigue-deterioration and restoration of function of equipment.
Method	Without disassembly basically. Realized with the measurement using eye-inspection, the sense of hearing, the sense of smell, hammering, touching, working test and simple implement (thermometer, water gauge, ruler etc.)	Without disassembly and exchange. Clearing, painting, supply or exchange of oils and fats, exchange of parts, and adjustment are realized with tools and instruments.

(Definition of terms in the manual of inspection and overhaul)

The contents of inspection items to be shown in the check-sheet of inspection and overhaul are mentioned below, but anyhow if some indications of something wrong of parts or the others are found considering the condition of parts, detailed inspection and overhaul in accordance with proper procedure shall be realized.

X (Exchange) Exchange of parts that deterioration accompanied by the lapse of years progress for the preventive maintenance at the time of periodical overhaul. "X" means exchange like this.

C (Clearing) Filter, float switch, level switch etc. are apt to have some troubles of function with adhering of scale or water dirt, so it shall be removed with disassemble of the proper parts at the time of monthly inspectoion. "C" means clearing like this.

W (Disassemblo) Exchange of deteriorating parts accompanied by the lapse of years after overhaul, inspection of the internal and clearing the part accumulated with impurities by the lapse of years or the part proceeding of corrosion where can't be inspect the internal easily. "W" means disassemble and exchange like this.

E (Eye inspection) Confirmation of existence of something wrong within the limits of being visible with the method below. (including confirmation of indication on the meter attached on the equipment).

Confirmation of existence of something wrong within the limits of being visible at the time of annual inspection or periodical overhaul. "E" means eye inspection like this.

A (Adjustment) Inspection to involve operating a part of equipment in order to keep the function, for example adjusting the Zero point of meter or charging the battery. "A" means adjustment like this.

M (Measurement) Confirmation with quantitative grasp and preparing meters (any other meters except ones on the equipment) for judgement of quality. "M" means measurement like this.

T (Additional tightening) Tightening tie-bolts and nuts in accordance with periodical year or specification established generally. Including tightening the connection of terminal with the required torque to confirm their loosening at the same time.

"T" means additional tightening like this.

H (Sense of touch) Confirmation with the sense of touch for the equipment in operating condition to confirm the existence of abnormal vibration or high temperature of the equipment mainly. "H" means the sense of touch with hand like this.

D (Confirmation of working) Confirmation of existence of something wrong in accordance with the reaction of the equipment by means of moving parts with hand or input the simulated signal, using the meters if necessary. "D" means the confirmation of working like this.

S (Sense of hearing) Judgement of existence of something wrong for the equipment by means of sounds occurring in operating condition.

Prime pump

	Inspection & Overhaul		Periodical inspec.		Operating inspec.	Period, overhaul		Remarks
	Items	Contents of inspec.	Monthly	Annual		5years	10years	
Suction sump	Suction	Clogging with river weed	—	M	—	C	C	
	sump	Water level	E	M	E	M	M	
Casing	Casing	Vibration	H	M	—	M	M	
		Paintaing	—	—	—	E	E	
Shaft & Bearing	Shaft	Centering	—	M	—	M	M	
		Rust	—	E	—	C	C	
		Abration	—	E	—	E	M	
	Flexible coupling	Tightness	—	T	—	T	T	
		Abration	—	E	—	M	M	
	Outer bearing	Temp. Vib.	H	M	H	M	M	
		Abration	—	—	—	—	M	
	Gland packing	Temperature	H	H	H	H	H	
		Sealing water condision	E	E	E	E	E	
		Deterioration	—	—	—	E	X	
Lubri-cation	Outer bearing	Oil quant. (quality)	E	E	E	X	X	
		Oil leak	E	E	E	E	E	
Priming	Priming detector	Working condision	E	C	E	A	X	
		Filling condision	E	—	E	—	—	
Instru-ment	Pressure gauge	Zero point	—	A	—	X	X	
		Pipe	—	E	—	E	E	
Others	General	Noise	S	S	S	S	S	

Prime moter and auxiliaries

	Inspection & Overhaul		Periodical inspec.		Oper- ting inspec.	Period, overhaul		Remarks
	Items	Contents of inspec.	Monthly	Annual		5years	10years	
Prime motor	General	Insulation resistance	—	M	—	M	M	Measuring at pannel
		Vibration	H	M	H	M	M	
		Noise	S	S	S	S	S	
		Input current	E	E	E	E	E	
	Bearing	Temperature	H	H	H	M	M	
		Vibration	H	M	H	M	M	
		Oil & grease q'ty	E	E	E	X	X	
	Internal	Rotor coil	—	—	—	—	W	Every 8years
		Ventilation accessaries	—	—	—	—	W	Every 8years
Vacuum pump	Pump & Motor	Lubricating oil	—	E	—	E	E	
		Vibration	H	H	H	H	H	
		Temp. of bearing	—	H	—	H	H	
		Gland	—	A	—	A	A	
		Max deg. of vac.	E	E	—	E	E	
		Smoothness of rotation	H	H	—	H	H	
		Insulation resistance	—	M	—	M	M	Measuring at pannel
		General	E	E	E	W	W	
	Pipe	Rust, abrasion, painting	—	E	—	E	E	
	Coupling	Centering	—	—	—	A	A	
		Rust of Coupling rubber	—	E	—	M	X	
	Water service tank	Water level	E	E	E	E	E	
		Bowl tap	—	C	—	W	W	
		Water tank	—	C	—	C	C	
	Instru- ment	Pressure gauge (Zero point)	—	A	—	X	X	

Valves, pipes and electric equipment (1/2)

	Inspection & Overhaul		Periodical inspec.		Operating inspec.	Period, overhaul		Remarks
	Items	Contents of inspec.	Monthly	Annual		5years	10years	
Manually operated valve	Valve body	Rust, abrasion, painting	—	E	—	E	E	
	Gland packing	Abrasion	—	A	—	X	X	
	Reduction gear & Spindle	Lab. oil q'ty	—	E	—	X	X	
		Smoothness of rotation	H	H	H	H	H	
Main pipe	pipe	Leak	—	E	—	E	E	
		Rust, abrasion, painting	—	E	—	E	E	
Electric equipment	motor pannel	Appearance of pannel	E	E	—	E	E	
		Door condision	H	H	—	H	H	
		Zero point of meter	E	A	E	A	A	
		Stain of meter	—	E	—	E	A	
		Pilot lamp	E	E	—	E	E	
		Installing condision of wiring	—	E	E	E	E	
		Condision of main circuit conductor	E	E	—	E	E	
		Condision of cable terminal	—	E	—	E	E	
		Connecting point	—	T	—	T	T	
		Insullation resistance	—	M	—	M	M	
		Contact resistance	—	M	—	M	M	
		Working of protective relay	—	M ^(Every 2years)	—	M	M	
		Meter calibration	—	A	—	A	A	
		(Switch)	Transformation, damage, rust, stain fading, slackness	E	E	—	E	E
	Control mechanism		—	D	—	D	D	
	(Power fuse)	Stain of fuse ring Crack of fuse ring Stain of fuse holder insulator Crack of fuse holder insulator fading, transfor- mation, rust and slackness of con- necting point	E	E	—	E	E	

Valves, pipes and electric equipment (2/2)

	Inspection & Overhaul		Periodical inspec.		Operating inspec.	Period, overhaul		Remarks
	Items	Contents of inspec.	Monthly	Annual		5years	10years	
Electric equipment	Electro-static condenser	Appearance (Stain, oil leak, vibration acoustics, overheat transformation)	E	E	-	E	E	
		Contact of panne case	S	S	-	S	S	
		Insullation resistance	E	E	-	E	E	
		Connecting point	-	T	-	T	T	
		tan δ, measuring of capacity	-	M	-	M	N	
		Stain, rust, over-heat, acoustics, something wrong of fuse, earthing conductor, connecting point	-	-	-	M		
		Rust, wiring condision	E	E	-	E		
			-	E	-	E		

Illuminating equipment and overhead crane

	Inspection & Overhaul		Periodical inspec.		Operating inspec.	Period, overhaul		Remarks
	Items	Contents of inspec.	Monthly	Annual		5years	10years	
Illuminating equipment etc.	General	Damage or overheat of switch, illuminating implement and plug socket	E	E	-	E	E	
		slackness of implement to be fixed	-	T	-	T	T	
		Damage of wiring to be costed	E	E	-	E	E	
		Humidity or dust of wiring	-	E	-	E	E	
overhead crane	General	Operating condition	-	E	-	E	E	
	Mechanism	Damage of wire rope	-	E	-	E	E	
		Damage of hook	-	E	-	E	E	
		Condition of monorail	-	E	-	E	E	
		Condition of chain block	-	E	-	E	E	
Winch	General	Working condition	-	E	-	E	E	
	Mechanism	Damage of wire rope	-	E	-	E	E	
		Winding drum	-	E	-	E	E	
Bowl joint	Flexible and expansible part	Working condition for flexibility	-	E	-	E	E	
		Working condition for expansibility	-	E	-	E	E	
		Rubber packing	-	E	-	M	X	
	General	Painting and appearance	-	E	-	E	E	

JICA