



# **MAHARASHTRA JEEVAN PRADHIKARAN**

( Government of Maharashtra Undertaking )

## **SCHEDULE OF RATES 2021-22**

( Electrical & Mechanical Works )

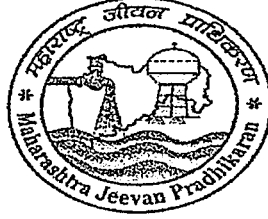
**Effective From 15/06/2021**

**Applicable for All Regions**





**MAHARASHTRA JEEVAN PRADHIKARAN**  
(Government Of Maharashtra Undertaking)



**SCHEDULE OF RATES**

**FOR YEAR 2021-22**

**( Effective from 15/6/2021)**

**APPLICABLE IN  
ALL REGIONS OF MAHARASHTRA**

**ELECTRICAL AND MECHANICAL WORKS**

**Sd/-  
Member Secretary**

**MAHARASHTRA JEEVAN PRADHIKARAN**

**MAHARASHTRA JEEVAN PRADHIKARAN**  
**ELECTRICAL / MECHANICAL / AUTOMATION CSR 2021-22**

**C O N T E N T S**

Section No.	Name of Section	Page Nos.	
		From	To
	Notes	(ii)	(iii)
1	PM Pumps	01	08
2	SP Solar Pumps	09	09
3	VA Valve Actuators	10	10
4	PW Pipe Work and Vessels	11	13
5	LF Lifting Equipments	14	16
6	SS H.T. Sub-station Equipments	17	17
7	TR Transformer and Voltage Stabilizer	18	24
8	LT L.T. Panel	25	25
9	CP Capacitor	26	26
10	LG LT Switchgear and Protection	27	29
11	HG HT Switchgear and Protection	30	32
12	CB LT Cable	33	36
13	HT HT Cable	37	38
14	MO LT Motors	39	41
15	MO HT Motors	42	43
16	TL Tools	44	45
17	EC Electro Chlorination System	46	48
	GC Fully Automatic Gas Chlorination System		
18	WM Water Meter	49	67
19	SA SCADA & Automation	68	82
20	LB Removing ,Dismantling, Assembling & Re-erection	83	83
21	Cable Selection Chart & HP V/s Current	84	85
22	Recommended Height of Pump House	86	86

# MAHARASHTRA JEEVAN PRADHIKARAN

## MJP ELECT. / MECH. CSR 2021-22

### NOTES

1. The rates in this CSR are applicable for Electrical & Mechanical Works in Maharashtra Jeevan Pradhikaran.
2. The rates in this schedule are exclusive of GST. Add 12 % GST on overall estimate.
3. The rates in the schedule are inclusive of routine tests at manufacturer's works, packing, forwarding, loading, transportation including head load carting upto 0.5 km., unloading, storing and insurance and overhead charges wherever applicable.
4. The rates in this schedule do not include charges payable to MSEDCL for power supply.
5. Following increase on rates in this CSR is admissible on account of the following-

Admissible increase on Rates for	Supply Part	Erection Part
a) Notified hilly and inaccessible area / tribal area as detailed in Civil CSR of MJP for respective regions (except Matheran)	2%	20%
b) For additional lead for head load carting above 0.5 km (except Matheran)	2%	10%
c) Matheran and its pumping stations	5%	20%
d) Test and Inspections	As per MJP	Circular
i) Manufacturer's inspecting agency's charges for routine and performance test of pump, motor, transformer and other equipments at manufacturer's works to be witnessed by M.J.P	0.16% OR	minimum Rs.3,000/-
ii) Inspection charges of third party agency approved by MJP for any or all test at manufacturer's work.	0.16% OR	minimum Rs.3,000/-

6. The rates of items not included in this schedule shall be adopted as follows –
  - i) The rates if included in CSR of civil works of MJP.
  - ii) If not included in the Civil CSR of MJP, the rates as per CSR of Electrical wing of Public Works Department of Govt. of Maharashtra.

- iii) If not included in both (i) and (ii) above the rates as per CSR of MIDC (E & M).
- iv) If not included in both (i), (ii) and (iii) above, the same shall be worked out on the basis of budgetary offer / price lists of manufacturers as given below.

	For Equipments manufactured out of Maharashtra	For Equipments manufactured in Maharashtra
1) Budgetary offer / price list		
2) Add for Goods and Service Tax (GST)	As rate applicable	As rate applicable
3) Add for packing, forwarding, transit insurance, loading, unloading, transportation, insurance upto completion of work	5%	5%

7. Rate of valves shall be as per Civil CSR of MJP and makes of valves shall be as per Elect. / Mech. approved list of MJP.
8. Erection rate mentioned in this CSR shall not be applicable for left over works for which separate analysis covering actual expenses shall be prepared.

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 1 - PM [PUMPS]</b>				
<b>PM1</b>	Providing, erecting and giving test of submersible pump set conforming to IS 8034 and motor conforming to IS 9283, with water proof winding. Pump shall be suitable for various delivery head and discharge with stainless steel shaft. Motor suitable for working on 415 V $\pm$ 10%, 3 Ph, 50 Hz A.C. Supply, with cable guard, thrust carbon/fiber bearing to withstand entire hydraulic thrust. The pump set shall be suitable for direct coupling, with suitable suction strainer. Pump should have suitable discharge out let as per manufacturer's design. Antithrust stream lined non return valve shall be provided with the pump. 3 m submersible copper conductor cable in single / double run and 2 pairs of suitable size erection clamp 10 mm thick shall be provided with each pump.				
<b>PM 1-1</b>	<b>Submersible Pump set 100 mm dia (with Polypropylene / Noryl Impeller) up to 20 stages</b>				
PM 1-1-1	1.5 HP	Each	17908	3890	21798
PM 1-1-2	2.0 HP	Each	18571	3890	22461
PM 1-1-3	3.0 HP	Each	20938	3890	24828
PM 1-1-4	4.0 HP	Each	21955	3890	25845
PM 1-1-5	5.0 HP	Each	28352	3890	32242
<b>Note 1</b>	Supply rate should be increased per stage for pump with more than 20 stages	Each	230	0	230
<b>PM 1-2</b>	<b>Submersible Pump 150 mm dia (with Bronze / Stainless steel (CF8M) Impeller) up to 8 stages</b>				
PM 1-2-1	1.5 HP	Each	24022	3890	27912
PM 1-2-2	2.0 HP	Each	25285	3890	29175
PM 1-2-3	3.0 HP	Each	27157	3890	31047
PM 1-2-4	4.0 HP	Each	28135	3890	32025
PM 1-2-5	5.0 HP	Each	29584	3890	33474
PM 1-2-6	6.0 HP	Each	32433	5066	37499
PM 1-2-7	7.5 HP	Each	33895	5066	38961
<b>Note 2</b>	Supply rate should be increased per stage for pump with more than 8 stages	Each	690	0	690
<b>PM 1-2</b>	<b>Submersible Pump 150 mm dia (with Bronze / Stainless steel(CF8M) Impeller) up to 12 stages</b>				
PM 1-2-8	8.0 HP	Deleted			

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
PM 1-2-9	9.0 HP	Deleted			
PM 1-2-10	10.0 HP	Each	41392	5634	47026
PM 1-2-11	11.0 HP	Deleted			
PM 1-2-12	12.5 HP	Each	44998	6515	51513
PM 1-2-13	15.0 HP	Each	47586	6515	54101
<b>Note 3</b>	Supply rate should be increased per stage for pump with more than 12 stages	Each	690	0	690
<b>PM 1-2</b>	<b>Submersible Pump 150 mm dia (with Bronze / Stainless steel(CF8M) Impeller) up to 15 stages</b>				
PM 1-2-14	17.5 HP	Each	52300	7397	59697
PM 1-2-15	20.0 HP	Each	61416	7397	68813
PM 1-2-16	22.5 HP	Each	75806	7397	83203
<b>Note 4</b>	Supply rate should be increased per stage for pump with more than 15 stages for Borewell only.	Each	690	0	690
	For other use 200 mm dia pump shall be preferred over 150 mm dia with more than 15 stage pump.				
	For 150 mm dia energy efficient pumps add as below				
	a. upto 8 stages 3% of supply rates				
	b. upto 12 stages 4% of supply rates				
	c. upto 15 stages 5% of supply rates				
<b>PM 1-3</b>	<b>Submersible Pump 200 mm dia (with Bronze / Stainless steel (CF8M) Impeller) up to 5 stages of category A &amp; B</b>				
PM 1-3-1	7.5 HP	Each	33233	5066	38299
PM 1-3-2	10.0 HP	Each	38727	5634	44361
PM 1-3-3	12.5 HP	Each	42341	6515	48856
<b>Note 5</b>	Supply rate should be increased per stage for pump with more than 5 stages	Each	2185	0	2185
<b>PM 1-3</b>	<b>Submersible Pump 200 mm dia (with Bronze /Stainless steel (CF8M) Impeller) up to 8 stages of category A &amp; B</b>				
PM 1-3-4	15.0 HP	Each	58456	7397	65853
PM 1-3-5	17.5 HP	Each	61938	7397	69335
PM 1-3-6	20.0 HP	Each	68506	7397	75903
PM 1-3-7	22.5 HP	Each	76937	7397	84334
PM 1-3-8	25.0 HP	Each	77001	7397	84398
PM 1-3-9	27.5 HP	Each	89689	7397	97086

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
Note 6	Supply rate should be increased per stage for pump with more than 8 stages	Each	2185	0	2185
PM 1-4	Submersible Pump 250 mm dia (with Bronze / Stainless steel(CF8M) Impeller) up to 8 stages of category A & B				
PM 1-4-1	15.0 HP	Each	60460	7397	67857
PM 1-4-2	20.0 HP	Each	64601	7397	71998
PM 1-4-3	22.5 HP	Each	82714	7397	90111
PM 1-4-4	25.0 HP	Each	86550	7397	93947
PM 1-4-5	30.0 HP	Each	88127	7402	95529
PM 1-5	Submersible monoblock Pump set (with Bronze / Stainless steel(CF8M) Impeller) Horizontal / Vertical - up to 3 stages				
	(Motor with water lubricated bearing to accept entire hydraulic thrust)				
PM 1-5-1	3.0 HP	Each	15547	3890	19437
PM 1-5-2	5.0 HP	Each	17288	4477	21765
PM 1-5-3	7.5 HP	Each	31530	5066	36596
PM 1-5-4	10 HP	Each	37810	5066	42876
PM 1-5-5	12.5 HP	Each	38467	5066	43533
PM 1-5-6	15.0 HP	Each	49665	5066	54731
PM 1-5-7	17.5 HP	Each	51712	5066	56778
PM 1-5-8	20.0 HP	Each	53760	5066	58826
Note 7	Erection rates for submersible pump set are considering drop pipe length up to 15 m. The erection rates shall be increased for additional length of drop pipe by 50% of the rate of erection of respective dia of GI pipe for more than 15 m drop pipe. Refer Civil CSR for the rates of erection of GI pipes.				
Note 8	For turbid water use of submersible pump shall be avoided, however for emergency situation mechanical seal of TCTC construction shall be provided with the motor and adequate screen to prevent floating material shall also be provided for which Rs. 8250/- shall be added in additional to supply rate.	Each	8250	0	8250



Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>PM 2</b>	<b>Centrifugal Monoblock Pump set</b>				
	Providing, erecting and giving test of Centrifugal Monoblock pump set conforming to IS 9079 operating at 2900 RPM with CI impeller, priming funnel, cock, suitable flanges at suction and delivery side. Pump shall have common shaft for pump and motor. Motor shall be suitable for working on 415 V $\pm$ 10%, 3 Ph, 50 Hz A.C. Supply. Motor shall be TEFC type. Pump set shall be suitable for working at various discharge and head requirements. Pump shall be erected on Provided C.C. foundation block with suitable foundation bolts grouted in C.C. foundation block.				
<b>PM 2-1</b>	<b>Centrifugal Monoblock Pump set (Single Stage)</b>				
PM 2-1-1	2.0 HP	Each	13157	2735	15892
PM 2-1-2	3.0 HP	Each	15949	2735	18684
PM 2-1-3	5.0 HP	Each	19496	3595	23091
PM 2-1-4	7.5 HP	Each	23752	3595	27347
PM 2-1-5	10.0 HP	Each	31463	3595	35058
PM 2-1-6	12.5 HP	Each	38346	4477	42823
PM 2-1-7	15.0 HP	Each	41850	4477	46327
PM 2-1-8	20.0 HP	Each	60336	4477	64813
PM 2-1-9	25.0 HP	Each	79364	4477	83841
PM 2-1-10	30.0 HP	Each	98264	4477	102741
<b>PM 2 -2</b>	<b>Centrifugal Monoblock Pump set (Two Stage)</b>				
PM 2-2-1	5.0 HP	Each	22093	3595	25688
PM 2-2-2	7.5 HP	Each	26839	3595	30434
PM 2-2-3	10.0 HP	Each	35580	3595	39175
PM 2-2-4	12.5 HP	Each	43922	4477	48399
PM 2-2-5	15.0 HP	Each	52246	4477	56723
PM 2-2-6	20.0 HP	Each	58250	4477	62727
<b>PM 3</b>	<b>Centrifugal Coupled Pump set</b>				
	C.S.R. for centrifugal coupled set is not prepared due to wide variation in rates per horse power as per duty conditions and type of material. The rates required shall be worked out on basis of quotations, offers from manufacturers, distributors, dealers in individual case.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>PM 4</b>	<b>Centrifugal Coupled Pump set -- Erection charges</b>				
	Erecting and giving test of centrifugal coupled pump set with foot mounted motor excluding base plate coupling and foundation bolts, etc. on provided concrete foundation / RSJ with accurate levelling with shims and proper alignment.				
PM 4-1	15 to 30 HP	Each		5129	5129
PM 4-2	31 to 50 HP	Each		6138	6138
PM 4-3	51 to 100 HP	Each		7314	7314
PM 4-4	101 to 150 HP	Each		8764	8764
PM 4-5	151 to 200 HP	Each		10214	10214
PM 4-6	201 to 250 HP	Each		11684	11684
PM 4-7	251 to 300 HP	Each		14015	14015
PM 4-8	More than 300 HP	HP		65	65
<b>PM 5</b>	<b>Vacuum Pump set (Monoblock)</b>				
	Providing, erecting Kirloskar make or other approved make Mono block Vacuum pump set with base plate excluding C.C. foundation / cross channels / RSJ frame and foundation bolts etc complete.				
PM 5-1	1 HP, single Ph (Type kV 20)	Each	21429	2735	24164
PM 5-2	3 HP, three Ph (Type kV 30)	Each	40180	2735	42915
<b>PM 6</b>	<b>Vacuum Pump set (Coupled)</b>				
	Providing, erecting Coupled Vacuum pump set with horizontal foot mounted TEFC squirrel cage motor working on three phase 50 Hz, 415 Volts +/- 10% with base plate including cost of flexible couplings, coupling guard etc complete.				
PM 6-1	5 HP (Type DV 40)	Each	82312	3953	86265
PM 6-2	10 HP (Type DV 50)	Each	102067	3953	106020
<b>Note 9</b>	Cost of starters, cable, switches, suitable GI Pipe with coupling and specials, valves etc shall be added as per CSR.				
<b>PM 7</b>	<b>V.T. Pumps, Water / Oil lubricated</b>				
	C.S.R. for Vertical Turbine Pump set is not prepared due to wide variation in rates per horse power as per duty conditions, number of stages, column pipe size and length required and type of material. The rates required shall be worked out on basis of quotations, offers from manufacturer, distributors, dealers in individual case.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>PM 8</b>	<b>V.T. Pump erection charges (For column length up to 6 m)</b>				
	Erecting, commissioning and giving test of Vertical Turbine Pump (Water Lubricated) including bowl assembly and discharge head etc on provided channel / RSJ / RCC beam including erecting on provided sole plate with blue matching.				
PM 8-1	Up to 30 HP	Each		6369	6369
PM 8-2	31 HP to 100 HP	Each		9497	9497
PM 8-3	101 HP to 200 HP	Each		13133	13133
PM 8-4	201 HP to 300 HP	Each		17525	17525
PM 8-5	above 300 HP	HP		65	65
<b>Note 10</b>	For column length more than 6m additional rate per column joint				
	100 mm dia column pipe	Joint		192	192
	150 mm dia column pipe	Joint		361	361
	200 mm dia column pipe	Joint		402	402
	300 mm dia column pipe	Joint		549	549
	350 mm dia column pipe	Joint		717	717
	400 mm dia column pipe	Joint		885	885
	450 mm dia column pipe	Joint		1095	1095
	500 mm dia column pipe	Joint		1180	1180
	600 mm dia column pipe and above	Joint		1411	1411
<b>Note 11</b>	Add 5 % for erection of oil lubricated pumps				
<b>Note 12</b>	Generally self water lubricated VT pumps shall be preferred. In exceptional cases, oil lubricated VT pumps shall be selected with prior approval from Superintending Engineer (Mech).				
<b>Note 13</b>	Above rates shall not be applicable where supply part is over and erection part is left. In such cases erection and testing charges shall be worked out separately.				
<b>PM 9</b>	<b>Sewage Pump</b>				
	Supplying Non-clog Submersible Pump suitable for sewage/ Liquid waste application with standard MOC & duty points as below				
	<b>Head upto 10 Mtrs</b>				
PM 9-1-1	1 HP (Up to 9000 LPH)	Each	63525	5129	68654
PM 9-1-2	2 HP (Up to 12000 LPH)	Each	63984	5129	69113

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
PM 9-1-3	3 HP (Up to 18000 LPH)	Each	85701	5129	90830
PM 9-1-4	5 HP (Up to 35000 LPH)	Each	99330	5129	104459
PM 9-1-5	7.5 HP (Up to 72000 LPH)	Each	103950	5129	109079
PM 9-1-6	10 HP (Up to 90000 LPH)	Each	147840	5129	152969
PM 9-1-7	15 HP (Up to 132000 LPH)	Each	179025	5129	184154
PM 9-1-8	20 HP (Up to 192000 LPH)	Each	254100	5129	259229
PM 9-1-9	25 HP (Up to 228000 LPH)	Each	306075	5129	311204
PM 9-1-10	30 HP (Up to 240000 LPH)	Each	367290	5129	372419
PM 9-1-11	35 HP (Up to 276000 LPH)	Each	444675	6725	451400
<b>PM 9-2</b>	<b>Head upto 20 Mtrs</b>				
PM 9-2-1	7.5 HP (Up to 36000 LPH)	Each	99619	5129	104748
PM 9-2-2	10 HP (Up to 48000 LPH)	Each	132825	5129	137954
PM 9-2-3	15 HP (Up to 60000 LPH)	Each	179025	5129	184154
PM 9-2-4	20 HP (Up to 90000 LPH)	Each	254100	5129	259229
PM 9-2-5	25 HP (Up to 120000 LPH)	Each	306075	5129	311204
PM 9-2-6	30 HP (Up to 168000 LPH)	Each	351393	5129	356522
PM 9-2-7	35 HP (Up to 216000 LPH)	Each	401808	6725	408533
<b>PM 9-3</b>	<b>Head upto 30 Mtrs</b>				
PM 9-3-1	10 HP (Up to 18000 LPH)	Each	135135	5129	140264
PM 9-3-2	15 HP (Up to 27000 LPH)	Each	189787	5129	194916
PM 9-3-3	20 HP (Up to 36000 LPH)	Each	217878	5129	223007
PM 9-3-4	25 HP (Up to 54000 LPH)	Each	306075	5129	311204
PM 9-3-5	30 HP (Up to 78000 LPH)	Each	351393	6725	358118
PM 9-3-6	35 HP (Up to 120000 LPH)	Each	383324	6725	390049
<b>PM 10</b>	<b>Sewage Pump, Erection charges</b>				
	Erection and giving test and trial for directly coupled sewage pump set on provided foundation.				
PM 10-1	Up to 30 HP	Each		5129	5129
PM 10-2	31 HP to 100 HP	Each		6725	6725
PM 10-3	101 HP to 200 HP	Each		9497	9497
PM 10-4	201 HP to 300 HP	Each		12839	12839
PM 10-5	Above 300 HP	HP		65	65
<b>Note 14</b>	Add 25 % to above rates in case of submersible sewage pump set including guide rail etc or extended shaft of sewage pump.				
<b>Note 15</b>	Erection of pumpset ( Above 100 HP ) must be done in presence & guidance of manufacturers representative.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>PM 11</b>	<b>Pressure gauges</b>				
	Providing, erecting Pressure gauge of required range complete with syphon tube, isolating cock suitable for 12 mm dia G.I. Pipe. Pressure gauge shall be installed as directed, with tapping on rising main.				
PM 11-1	Pressure gauge (100 mm dia)	Each	794	75	869
PM 11-2	Pressure gauge (150 mm dia)	Each	913	75	988
	<b>Glycerine Filled Pressure gauge Bourdon's type as IS 3624:1987</b>				
	Mounting - direct bottom, stainless steel body, toughened glass window				
PM 11-3	Pressure gauge 100 mm dia (black & red marking)	Each	1265	75	1340
PM 11-4	Pressure gauge 150 mm dia	Each	1870	75	1945
<b>PM 12</b>	<b>Vacuum / Combination gauge</b>				
	Providing, erecting Vacuum Gauge / Combination gauge of required range complete with syphon tube, isolating cock suitable for 12 mm dia G.I. Pipe. Vacuum / Combination gauge shall be installed as directed, with tapping on main lines.				
PM 12-1	Vacuum / Combination gauge - 100 mm dia	Each	923	75	998
PM 12-2	Vacuum / Combination gauge - 150 mm dia	Each	1044	75	1119
<b>PM 13</b>	<b>Foot Valve</b>				
	Providing, erecting C.I. foot valve having single leather flap and gunmetal seating. Valve shall be fixed on suction side of pump as per requirement including jointing material and hardware.				
	<b>Screwed Type</b>				
PM 13-1	50 mm	Each	451	140	591
PM 13-2	65 mm	Each	600	140	740
PM 13-3	80 mm	Each	768	140	908
PM 13-4	100 mm	Each	1182	268	1450
PM 13-5	125 mm	Each	1819	268	2087
PM 13-6	150 mm	Each	2645	268	2913
	<b>Flanged Type</b>				
PM 13-7	50 mm	Each	1217	505	1722
PM 13-8	65 mm	Each	1433	505	1938
PM 13-9	80 mm	Each	1630	505	2135
PM 13-10	100 mm	Each	2238	656	2894
PM 13-11	125 mm	Each	3740	656	4396
PM 13-12	150 mm	Each	5457	656	6113



Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.				
	SECTION 2 - SP								
	[ SOLAR PUMPS ]								
SP	Designing,Supplying,Installing,Testing and commissioning of SPV water pumping system with required accessories as per following: 1.Solar panel with stand 2.Controller 3.Protection 4.Battery based back up 5.Sufficient size & Length of cable and with comprehensive contract for 5 years.								
1	Solar pumps - SPV DC type	As per PWD CSR							
1.1	1 HP ( 900 Wp ) Surface pump								
1.2	2 HP ( 1500 Wp ) Surface pump								
1.3	3 HP ( 3000 Wp ) Surface pump								
1.4	1 HP ( 675 Wp ) Sub. pump								
1.5	2 HP ( 1800 Wp ) Sub. pump								
1.6	2.3 HP ( 2400 Wp ) Sub. pump								
1.7	3 HP ( 3000 Wp ) Sub. pump								
1.8	4 HP ( 4200 Wp ) Sub. pump								
1.9	4.8 HP ( 5600 Wp ) Sub. pump								
2	Solar pumps - SPV AC type								
2.1	1 HP ( 900 Wp ) Surface pump								
2.2	1 HP ( 900 Wp ) Sub. pump								
2.3	1.5 HP ( 1500 Wp ) Sub. pump								
2.4	2 HP ( 1800 Wp ) Sub. pump								
2.5	2.5 HP ( 2400 Wp ) Sub. pump								
2.6	3 HP ( 3000 Wp ) Sub. pump								
2.7	4 HP ( 4200 Wp ) Sub. pump								
2.8	5 HP ( 5600 Wp ) Sub. pump								

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 3- VA</b>				
	<b>[ VALVE ACTUATOR ]</b>				
<b>VA</b>	Providing, erecting Electric Valve Actuator for non rising spindle type sluice valve of PN 1 & PN 1.6 rating, totally enclosed, weather-proof and dust proof construction with IP-67, protection class suitable for installation in any position without lubrication, leakage or other operational difficulty with special grease filled gear box and hand wheel for emergency manual operation which will automatically dis-engage on restoration of power to motor and with 10 watt single phase space heater and continuous local mechanical position indicator and individually replaceable counter gear assembly and with two torque and four limit switches with S.S. flap and operated with gear driven cams and of rating 250 Volt, 5 Amp, AC/DC, torque switch dial and with TEFC squirrel cage induction motor working on 440 Volts +/- 10%, 3 phase, 50 Hz AC of intermittent duty rating S-2, insulation class "F" and temp rise restricted to class "B" with IP - 67 protection class suitable for DOL starting and with three thermostat and 30% over load margin. The torque rating of reduction gear box shall be atleast 1.5 times max. torque required for opening and closing of valve with integral starter for ON				
VA 1-1	50 mm dia	Each	65387	3479	68866
VA 1-2	65 mm dia	Each	65387	3479	68866
VA 1-3	80 mm dia	Each	66308	3479	69787
VA 1-4	100 mm dia	Each	69531	3479	73010
VA 1-5	125 mm dia	Each	72533	3479	76012
VA 1-6	150 mm dia	Each	74136	3479	77615
VA 1-7	200 mm dia	Each	77174	3479	80653
VA 1-8	250 mm dia	Each	82240	3479	85719
VA 1-9	300 mm dia	Each	87906	3479	91385
VA 1-10	350 mm dia	Each	90298	3479	93777
VA 1-11	400 mm dia	Each	92690	3479	96169
VA 1-12	450 mm dia	Each	96716	3479	100195
VA 1-13	500 mm dia	Each	105508	3479	108987
VA 1-14	600 mm dia	Each	118696	3479	122175
VA 1-15	700 mm dia	Each	123656	3479	127135
VA 1-16	750 mm dia	Each	126048	3479	129527
VA 1-17	800 mm dia	Each	129323	3479	132802
VA 1-18	900 mm dia	Each	140521	3479	144000
VA 1-19	1000 mm dia	Each	148701	3479	152180

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 4 - PW</b>				
	<b>[ PIPE WORK AND VESSELS ]</b>				
<b>PW 1</b>	<b>G.I. Bend "B" Class</b>				
	Supplying and erecting "B" class G.I. Bend in position with necessary material				
PW 1-1	15 mm dia	Each	48	26	74
PW 1-2	25 mm dia	Each	70	26	96
PW 1-3	40 mm dia	Each	91	26	117
PW 1-4	50 mm dia	Each	140	38	178
PW 1-5	65 mm dia	Each	204	38	242
PW 1-6	75 mm dia	Each	329	38	367
PW 1-7	100 mm dia	Each	657	57	714
<b>PW 2</b>	<b>G.I. Tee "B" Class</b>				
	Supplying and erecting "B" class G.I. Tee in position with necessary material				
PW 2-1	15 mm dia	Each	29	26	55
PW 2-2	25 mm dia	Each	62	26	88
PW 2-3	40 mm dia	Each	125	26	151
PW 2-4	50 mm dia	Each	198	38	236
PW 2-5	65 mm dia	Each	368	38	406
PW 2-6	75 mm dia	Each	526	38	564
PW 2-7	100 mm dia	Each	861	57	918
PW 2-8	150 mm dia	Each	937	57	994
<b>PW 3</b>	<b>G.I. Coupling / Nipple "B" Class</b>				
	Supplying and erecting "B" class G.I. Coupling / Nipple in position with necessary material				
PW 3-1	15 mm dia	Each	18	8	26
PW 3-2	25 mm dia	Each	36	8	44
PW 3-3	40 mm dia	Each	65	19	84
PW 3-4	50 mm dia	Each	111	19	130
PW 3-5	65 mm dia	Each	181	19	200
PW 3-6	75 mm dia	Each	271	19	290
PW 3-7	100 mm dia	Each	440	26	466
PW 3-8	150 mm dia	Each	538	26	564
<b>PW 4</b>	<b>G.I. Union (Heavy Duty)</b>				
	Supplying and erecting Heavy Duty G.I. Union in position with necessary material				
PW4-1	15 mm dia	Each	50	8	58
PW 4-2	25 mm dia	Each	91	8	99
PW 4-3	40 mm dia	Each	176	19	195
PW 4-4	50 mm dia	Each	271	19	290

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>PW 5</b>	<b>G.I. Elbow (Heavy Duty)</b>				
	Supplying and erecting Heavy Duty G.I. Elbow in position with necessary material				
PW 5-1	15 mm dia	Each	16	13	29
PW 5-2	25 mm dia	Each	48	19	67
PW 5-3	40 mm dia	Each	101	19	120
PW 5-4	50 mm dia	Each	156	19	175
<b>PW 6</b>	<b>Dismantling Joints</b>				
	Providing, erecting and commissioning M.S. Dismantling joint as per requirement and Department's approved drawing and specifications, including machining and rubber rings and suitable for 16 kg/cm <sup>2</sup> working pressure with required flanges of suitable size with nut bolts etc complete. The joint should have through long bolts so that during normal working pressure there should be no sliding movement of sliding flanges. L.O.F. ( length over flange ) should not be less than 75% of dia.				
New Item	100 mm dia Joint	Joint	5775	837	6612
New Item	150 mm dia Joint	Joint	8925	837	9762
PW 6-1	200 mm dia Joint	Joint	9056	837	9893
PW 6-2	250 mm dia Joint	Joint	12558	1072	13630
PW 6-3	300 mm dia Joint	Joint	15215	1126	16341
PW 6-4	350 mm dia Joint	Joint	20769	1475	22244
PW 6-5	400 mm dia Joint	Joint	27773	1835	29608
PW 6-6	450 mm dia Joint	Joint	33654	2267	35921
PW 6-7	500 mm dia Joint	Joint	40814	2476	43290
PW 6-8	600 mm dia Joint	Joint	50232	2947	53179
PW 6-9	700 mm dia Joint	Joint	65930	3195	69125
PW 6-10	750 mm dia Joint	Joint	78005	3503	81508
<b>PW 7</b>	<b>Surge/ Air Vessels</b>				
	Providing, fabricating, erecting, testing and commissioning as per IS 2825 (code for unfired pressure vessels) Surge vessel / Air Vessel fabricated in boiler quality plate conforming to grade I of IS 2002 with radiography testing on provided foundation including epoxy painting.				
PW 7-1	Boiler quality Plate	Kg	270	0	270
<b>PW 8</b>	<b>Pressure Vessels</b>				
	Providing, fabricating, erecting, testing and commissioning pressure vessel fabricated in M.S. plate on provided foundation including epoxy paint.				
PW 8-1	M.S. Plate	Kg	195	0	195





Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 5 - LF</b>				
	<b>[ LIFTING EQUIPMENT ]</b>				
<b>LF 1</b>	<b>Chain Pulley Block</b>				
	Providing, erecting triple spur gear type Chain Pulley Block suitable for capacity as below with 6 m lift complete with load chain and hand chain suitable for above lift, tested to 50% over load as per IS 3832 carrying ISI mark.				
LF 1-1	1 Tonne Capacity	Each	11604	226	11830
LF 1-2	2 Tonne Capacity	Each	16295	280	16575
LF 1-3	3 Tonne Capacity	Each	22906	420	23326
LF 1-4	5 Tonne Capacity	Each	30030	600	30630
<b>LF 2</b>	<b>Travelling Trolley</b>				
	Providing, erecting Travelling Trolley of capacity as below with 6 m lift, tested to 50% over load				
LF 2 -1	1 Tonne Capacity	Each	9117	170	9287
LF 2 -2	2 Tonne Capacity	Each	11429	226	11655
LF 2 -3	3 Tonne Capacity	Each	15372	280	15652
LF 2 -4	5 Tonne Capacity	Each	21840	380	22220
<b>Note 1</b>	Add for Additional 1 m load chain for Chain pulley block as under				
	For 1 Tonne	Mtr	503	0	503
	For 2 Tonne	Mtr	963	0	963
	For 3 Tonne	Mtr	998	0	998
	For 5 Tonne	Mtr	1203	0	1203
<b>Note 2</b>	Add for Additional handling chain for Chain pulley block & Travelling Trolley				
	For 1 Tonne	Mtr	290	0	290
	For 2 Tonne	Mtr	290	0	290
	For 3 Tonne	Mtr	483	0	483
	For 5 Tonne	Mtr	483	0	483

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>LF 3</b>	<b>Hand Operated Circular or Rectangular Travelling Crane (Single Girder)</b>				
	Providing , erecting and commissioning Single Girder Hand Operated Circular / Rectangular Travelling Crane with 6 m lift complete with chain pulley block ISI marked and travelling trolley both tested for 50 % overload including arrangement for longitudinal travel / circular travel and cross travel with wheel, hand chain, etc complete.				
<b>LF 3-1</b>	<b>3 Tonne Capacity</b>				
LF 3 -1-1	Up to 5 m span	Each	161739	18446	180185
LF 3 -1-2	Above 5 m upto 6 m span	Each	174933	19201	194134
LF 3 -1-3	Above 6 m upto 8 m span	Each	204585	20950	225535
LF 3 -1-4	Above 8 m upto 10 m span	Each	239464	21499	260963
<b>LF 3-2</b>	<b>5 Tonne Capacity</b>				
LF 3 -2-1	Up to 5 m span	Each	207467	18446	225913
LF 3 -2-2	Above 5 m upto 6 m span	Each	222633	19201	241834
LF 3 -2-3	Above 6 m upto 8 m span	Each	257051	20950	278001
LF 3 -2-4	Above 8 m upto 10 m span	Each	311272	22926	334198
<b>Note 4</b>	The rates are exclusive of corbel / rail / square bar and track girders for supporting rails.				
<b>LF 4</b>	<b>Electric Operated Circular or Rectangular Travelling Crane (Single Girder)</b>				
	Providing, erecting and commissioning single girder Electrically Operated Rectangular Over head Travelling Crane with 6 m lift complete with wire rope hoist, class II duty, all three motions electrically operated by suitable rating motor IP 54, control panel and down pendant control block.				
	<b>3 Tonne Capacity</b>				
	<b>Upto 6 mt span</b>	Each	504000	15251	519251
	Above 6 m upto 8 m span	Each	535500	20067	555567
	Above 8 m upto 10 m span	Each	577500	24826	602326
<b>LF 4-1</b>	<b>5 Tonne Capacity</b>				
	<b>Upto 6 mt span</b>	Each	686526	15251	701777
LF 4-1-1	Above 6 m upto 8 m span	Each	736673	21336	758009
LF 4-1-2	Above 8 m upto 10 m span	Each	783690	26396	810086

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>LF 4-2</b>	<b>7.5 Tonne Capacity</b>				
	<b>Upto 6 mt span</b>	Each	837609	22212	859821
LF 4-2-1	Above 6 m upto 8 m span	Each	895360	26396	921756
LF 4-2-2	Above 8 m upto 10 m span	Each	953124	29175	982299
<b>LF 4-3</b>	<b>10 Tonne Capacity</b>				
<b>New Item</b>	<b>Upto 6 mt span</b>	Each	922654	24825	947479
LF 4-3-1	Above 6 m upto 8 m span	Each	985531	29175	1014706
LF 4-3-2	Above 8m upto 10 m span	Each	1048438	31955	1080393
<b>Note 5</b>	The rates are exclusive of corbel / rail / square bar and track girders for supporting rails.				
<b>Note 6</b>	For D.S.L. (Down Shop Lead) system for above crane Add Rs. 2500/- per m length of longitudinal travel.	Mtr	2383		2383
<b>LF 5</b>	<b>Square Bar / Rail</b>				
	Providing, erecting and fixing square bar of EN 8 as rail for over head crane on provided track, girder / continuous corbel beam, including supporting plate and "J" bolts.				
LF 5 -1	50 X 50 mm ( EN 8 )	Mtr	1693	29	1722
LF 5 -2	40 X 40 mm ( EN 8 )	Mtr	1079	29	1108

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	SECTION 6 - SS	As per PWD CSR			
	[ H.T. SUB STATION EQUIPMENTS ]				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 7 - TR</b>				
	<b>[ TRANSFORMER AND VOLTAGE STABILIZER ]</b>				
<b>TR-1</b>	<b>Power Transformer (With Off Load Tap Changer)</b>				
	Providing, erecting and commissioning out door type copper wound transformer as per IS 1189 (Part I) : 2014 Level II continuously rated for 3 Ph, 50 Hz, at full load and temp. rise not exceeding 45° C by thermometer in oil and 50°C by the resistance in winding after continuous run resistance in winding after continuous run at full load rating, the transformer should have oil immersed winding having vector group DY 11, HT side connected in Delta and LT side connected in Star with neutral brought out connected to provided separate earthing. The transformer shall have power terminal arrangement, bushings / cable end box on HT side and cable end box on LT side. 2 Nos. channels with stoppers shall be provided and fixed on the provided plinth for mounting the transformer. The transformer should have following standard fittings. Transformer shall be of latest manufacturing standards as per amended IS specifications and the Load & No Load losses shall be as per IS.				
	1) Oil conservator with filling hole with cap and plain oil level gauge.				
	2) Silica gel dehydrating breather charged with Silica Gel.				
	3) Oil drain valve.				
	4) Oil filter valve.				
	5) Lifting eyes / hooks.				
	6) Two earthing terminals.				
	7) Diagram and rating plate				
	8) Air Vent.				
	9) Explosion Vent.				
	10) 100 mm dia thermometer with thermometer pocket				
	11) Four bi directional plain roller.				



Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>Power Transformer 11000 / 433 Volt</b>				
	With off load Tap Changer -12.5% to +2.5% in steps of 2.5%				
TR 1-1	63 kVA	Each	As per PWD CSR		
TR 1-2	100 kVA	Each			
TR 1-3	160 kVA	Each			
TR 1-4	200 kVA	Each			
TR 1-5	250 kVA	Each			
TR 1-6	315 kVA	Each			
TR 1-7	500 kVA	Each			
TR 1-8	630 kVA	Each			
TR 1-9	800 kVA	Each	1336458	14894	1351352
<b>TR 2</b>	<b>Power Transformer 22000 / 433 Volt and other specification as per TR-1</b>	As per PWD CSR			
	With off load Tap Changer -12.5% to +2.5% in steps of 2.5%				
TR 2-1	63 kVA				
TR 2-2	100 kVA				
TR 2-3	160 kVA				
TR 2-4	200 kVA				
TR 2-5	250 kVA				
TR 2-6	315 kVA				
TR 2-7	500 kVA				
TR 2-8	630 kVA				
TR 2-9	800 kVA	Each	1439116	20840	1459956
<b>TR 3</b>	<b>Power Transformer 33000 / 433 Volt and other Specification as per TR-1</b>				
	With off load Tap Changer -12.5% to +2.5% in steps of 2.5%				
TR 3-1	63 kVA	Each	311980	12509	324489
TR 3-2	100 kVA	Each	374376	12509	386885

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
TR 3-3	160 kVA	Each	482152	12509	494661
TR 3-4	200 kVA	Each	680684	12509	693193
TR 3-5	250 kVA	Each	794131	12509	806640
TR 3-6	315 kVA	Each	952957	12509	965466
TR 3-7	400 kVA	Each	1021025	12509	1033534
TR 3-8	500 kVA	Each	1077749	20840	1098589
TR 3-9	630 kVA	Each	1418091	20840	1438931
TR 3-10	800 kVA	Each	1559900	20840	1580740
TR-4	Power Transformer (With On Load Tap Changer)				
	Providing, erecting and commissioning out door type copper wound transformer as per IS 1180 (Part I) : 2014 Level II continuously rated for 3 Ph, 50 Hz, at full load and temp. rise not exceeding 45° C by thermometer in oil and 50°C by the resistance in winding after continuous run resistance in winding after continuous run at full load rating, the transformer should have oil immersed winding having vector group DY 11, HT side connected in Delta and LT side connected in Star with neutral brought out connected to provided separate earthing. The transformer shall have power terminal arrangement, bushings / cable end box on HT side and cable end box on LT side. 2 Nos. channels with stoppers shall be provided and fixed on the provided plinth for mounting the transformer. The transformer should have following standard fittings. Transformer shall be of latest manufacturing standards as per amended IS specifications and the Load & No Load losses shall be as per IS.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	1) Oil conservator with filling hole with cap and plain oil level gauge. 2) Silica gel dehydrating breather charged with Silica Gel. 3) Oil drain valve. 4) Oil filter valve. 5) Lifting eyes / hooks. 6) Two earthing terminals. 7) Diagram and rating plate. 8) Air Vent. 9) Explosion Vent. 10) 100 mm dia thermometer with thermometer pocket 11) Four bi directional plain roller. 12) Bucholtz relay. 13) Resistance Temp. detector. 14) Marshalling box. 15) Automatic Voltage Regulator (AVR). 16) Remote Tap Changing Controller (RTCC).				
	<b>Transformer 11000 / 433 Volt</b>				
	With On Load Tap Changer -15% to +5% in steps of 1.25% with RTCC, AVR and marshalling box, and other specification as per TR-1				
TR 4-1	800 kVA	Each	1789534	20840	1810374
TR 4-2	1000 kVA	Each	1876125	20840	1896965
TR 4-3	1250 kVA	Each	2078168	20840	2099008
TR 4-4	1600 kVA	Each	2586166	20840	2607006
TR 4-5	2000 kVA	Each	2799755	20840	2820595
<b>TR 5</b>	<b>Transformer 22000 / 433 Volt</b>				
	With On Load Tap Changer -15% to +5% in steps of 1.25% with RTCC, AVR and marshalling box, and other specification as per TR-4				
TR 5-1	800 kVA	Each	1763294	20840	1784134
TR 5-2	1000 kVA	Each	1873500	20840	1894340
TR 5-3	1250 kVA	Each	2038809	20840	2059649
TR 5-4	1600 kVA	Each	2534736	20840	2555576
TR 5-5	2000 kVA	Each	2755148	20840	2775988
<b>TR 6</b>	<b>Transformer 33000 / 433 Volt</b>				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	With On Load Tap Changer -15% to +5% in steps of 1.25% with RTCC, AVR and marshalling box, and other specifications as per TR-4				
TR 6-1	800 kVA	Each	1876125	20840	1896965
TR 6-2	1000 kVA	Each	1991579	20840	2012419
TR 6-3	1250 kVA	Each	2164759	20840	2185599
TR 6-4	1600 kVA	Each	2701620	20840	2722460
TR 6-5	2000 kVA	Each	2944072	20840	2964912
	<b>H.T. TRANSFORMER</b>				
<b>TR 7</b>	<b>Transformer 11000 / 3300 Volt</b>				
	With On Load Tap Changer -15% to +5% in steps of 1.25% with RTCC, AVR and marshalling box, and other specification as per TR-4				
TR 7-1	1000 kVA	Each	1453746	20840	1474586
TR 7-2	1250 kVA	Each	1683612	20840	1704452
TR 7-3	1600 kVA	Each	1845139	20840	1865979
TR 7-4	2000 kVA	Each	2329721	20840	2350561
TR 7-5	2500 kVA	Each	2634137	20840	2654977
TR 7-6	3000 kVA	Each	2764602	20840	2785442
<b>TR 8</b>	<b>Transformer 22000 / 3300 Volt</b>				
	With On Load Tap Changer -15% to +5% in steps of 1.25% with RTCC, AVR and marshalling box, and other specification as per TR 4				
TR 8-1	1000 kVA	Each	1569122	20840	1589962
TR 8-2	1250 kVA	Each	1810526	20840	1831366
TR 8-3	1600 kVA	Each	1979509	20840	2000349
TR 8-4	2000 kVA	Each	2395930	20840	2416770
TR 8-5	2500 kVA	Each	2776139	20840	2796979
TR 8-6	3000 kVA	Each	3186526	20840	3207366
<b>TR 9</b>	<b>Transformer 33000 / 3300 Volt</b>				
	With On Load Tap Changer -15% to +5% in steps of 1.25% with RTCC, AVR and marshalling box, and other specification as per TR-4				
TR 9-1	1000 kVA	Each	1629473	20840	1650313

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
TR 9-2	1250 kVA	Each	1882947	20840	1903787
TR 9-3	1600 kVA	Each	2051929	20840	2072769
TR 9-4	2000 kVA	Each	2474385	20840	2495225
TR 9-5	2500 kVA	Each	2830456	20840	2851296
TR 9-6	3000 kVA	Each	3258946	20840	3279786
<b>TR 10</b>	<b>Servo Controlled Automatic Voltage Stabilizer</b>				
	Providing, erecting Servo Controlled Automatic Voltage stabilizer suitable for out put voltage of 415 Volt +/-1%, 3 Ph, 50 Hz, with copper wound transformer (air/oil cooled) as mentioned below. The stabilizer shall function satisfactorily even if incoming supply is unbalanced between phases within range of 10%. The stabilizer should be constructed in cubical box, with bi-directional wheels for easy handling, necessary monitors and user's controls on front panel such as indication, alarm, volt meter and selector switch for measuring input and out put voltage, Auto/Manual selector switch, Raise/Low push buttons etc. Suitable capacity termination strips and bus bars for incoming and out going cable should be provided. All three phases shall be independently monitored and corrected. with Over Voltage / Under Voltage Single Phasing, Cut off contactor with electronic output sensing unit				
<b>TR 10-1</b>	<b>Servo Controlled Automatic Voltage Stabilizer (Out put 415 +/-1%)</b>				
<b>TR 10-1</b>	<b>Input 220 to 460 Volt</b>				
TR 10-1-1	3 kVA Air cooled	Each	58413	280	58693
TR 10-1-2	5 kVA Air cooled	Each	67635	364	67999
TR 10-1-3	7.5 kVA Air cooled	Each	76236	557	76793
TR 10-1-4	10 kVA Air cooled	Each	99835	837	100672
TR 10-1-5	12.5 kVA Air cooled	Each	109738	1114	110852
TR 10-1-6	15 kVA Air cooled	Each	119639	1114	120753
TR 10-1-7	20 kVA Air cooled	Each	130307	1390	131697
TR 10-1-8	25 kVA Air cooled	Each	143411	1669	145080
TR 10-1-9	30 kVA Air cooled	Each	174388	1947	176335



Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
TR 10-1-10	40 kVA Air cooled	Each	191355	2224	193579
TR 10-1-11	50 kVA Oil cooled	Each	258672	2224	260896
TR 10-1-12	60 kVA Oil cooled	Each	313609	2224	315833
TR 10-1-13	75 kVA Oil cooled	Each	327932	2224	330156
TR 10-1-14	100 kVA Oil cooled	Each	369525	3057	372582
TR 10-1-15	125 kVA Oil cooled	Each	459022	3617	462639
<b>TR 10-2</b>	<b>Servo Controlled Automatic Voltage Stabilizer (Out put 415 +/-1%)</b>				
	<b>Input 280 to 460 Volt</b>				
TR 10-2-1	3 kVA Air cooled	Each	49712	280	49992
TR 10-2-2	5 kVA Air cooled	Each	60006	557	60563
TR 10-2-3	7.5 kVA Air cooled	Each	64571	557	65128
TR 10-2-4	10 kVA Air cooled	Each	68905	837	69742
TR 10-2-5	12.5 kVA Air cooled	Each	83143	1114	84257
TR 10-2-6	15 kVA Air cooled	Each	92953	1114	94067
TR 10-2-7	20 kVA Air cooled	Each	106350	1390	107740
TR 10-2-8	25 kVA Air cooled	Each	115572	1669	117241
TR 10-2-9	30 kVA Air cooled	Each	130425	1769	132194
TR 10-2-10	40 kVA Air cooled	Each	153452	2224	155676
TR 10-2-11	50 kVA Air cooled	Each	170737	2224	172961
TR 10-2-12	60 kVA Air cooled	Each	194771	2224	196995
TR 10-2-13	60 kVA Oil cooled	Each	232940	2224	235164
TR 10-2-14	75 kVA Oil cooled	Each	241564	2224	243788
TR 10-2-15	100 kVA Oil cooled	Each	289868	3057	292925
TR 10-2-16	125 kVA Oil cooled	Each	333539	3617	337156
TR 10-2-17	150 kVA Oil cooled	Each	343429	3893	347322
TR 10-2-18	175 kVA Oil cooled	Each	394433	3893	398326
TR 10-2-19	200 kVA Oil cooled	Each	430751	5006	435757
<b>Note 1</b>	For oil cooled stabilizer, the supply cost is excluding cost of transformer oil.				



Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 9 - CP</b>				
	<b>[ CAPACITOR ]</b>				
<b>CP 1</b>	<b>All Polypropylene Capacitors ( APP )</b>				
	Supplying and erecting bank of All Polypropylene capacitors with the standard capacities of 1, 2, 3, 5, 7, 12.5, 15, 20 and 25 KVAR units of power factor correction for operation on 3 phase, 50 Hz, 400 V+/- 10% with externally discharging resistances, earthing terminals and built on angle iron or channel iron frame work and provided with terminal cover box complete erected and tested.	KVAR	314	29	343
<b>CP 2</b>	<b>Metalized polypropylene Capacitors (MPP)</b>				
	Supplying and erecting bank of Metalized polypropylene Capacitors with the standard capacities of 1, 2, 3, 5, 7, 12.5, 15, 20 and 25 KVAR units of power factor correction for operation on 3 phase, 50 Hz, 400 V+/- 10% with externally discharging resistances, earthing terminals and built on angle iron on channel iron frame work and provided with terminal cover box complete erected and tested.	KVAR	289	29	318
<b>CP 3</b>	<b>H.T. Capacitors</b>				
	Supplying and erecting bank of All Polypropylene capacitors with the standard capacities of 75,84,116,133 and 167 KVAR units of power factor correction for operation on 3 phase, 50 Hz, 3300 V+/- 6% with externally discharging resistances, earthing terminals and built on angle iron on channel iron frame work and provided with terminal cover box, H.T. bushing bus bar and HRC fuses etc complete erected and tested.	KVAR	522	75	597

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 10 - LG</b>				
	<b>[L.T. SWITCHGEAR AND PROTECTION]</b>				
<b>LG 1</b>	<b>D.O.L. Starter</b>				
	Supplying and erecting DOL starter to operate squirrel cage induction motor working on 380-440 Volt, 3 phase, 50 Hz with no volt coil and over load element with necessary material and connected to supply, etc complete. Starter with original sheet steel encloser.				
LG 1-1	Up to 7.5 HP	Each	1765	93	1858
LG 1-2	Up to 10 HP	Each	2876	198	3074
<b>LG 2</b>	<b>Assembled D.O.L. Starter</b>				
	Supplying and erecting assembled DOL starter in provided cubical panel, with ON-OFF push buttons, no volt coil, over load element and required power and control wiring complete.				
LG 2-1	Up to 7.5 HP	Each	1669	114	1783
LG 2-2	Up to 10 HP	Each	2162	224	2386
<b>LG 3</b>	<b>F.A.S.D. Starter</b>				
	Supplying and erecting Fully Automatic Star Delta starter to operate squirrel cage induction motor working on 380- 440 Volt, 3 phase, 50 Hz with no volt coil, over load element, and ON - OFF push buttons, with necessary material and connected to supply, etc complete. Starter with original sheet steel encloser.				
LG 3-1	> 7.5 HP & Up to 12.5 HP	Each	6949	201	7150
LG 3-2	> 12.5 HP & Up to 20 HP	Each	8495	201	8696
LG 3-3	> 20 HP & Up to 25 HP	Each	9882	224	10106
LG 3-4	> 25 HP & Up to 35 HP	Each	22794	224	23018
<b>Note 1</b>	Contactor rating should be same for STAR, LINE and DELTA Connection.				
<b>LG 4</b>	<b>F.A.S.D. Starter ( Assembled )</b>				
	Supplying and erecting, assembled Fully Automatic Star Delta starter, in a provided cubical panel to operate squirrel cage induction motor working on 380- 440 Volt, 3 phase, 50 Hz with no volt coil, over load relay and ON-OFF push buttons, with necessary material and connected to supply, etc complete.				
LG 4-1	> 7.5 HP & Up to 12.5 HP	Each	6849	224	7073

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
LG 4-2	> 12.5 HP & Up to 20 HP	Each	8297	224	8521
LG 4-3	> 20 HP & Up to 30 HP	Each	16099	252	16351
LG 4-4	> 30 HP & Up to 35 HP	Each	22709	252	22961
Note 2	Contactor rating should be same for STAR, LINE and DELTA Connection.				
LG 5	<b>Auto transformer Starter with air break contactor ( Locally Fabricated )</b>				
	Providing erecting and giving test and trial of Fully Automatic, Auto Transformer Starter with Air Break Contactor, assembled locally with contactors of approved make in 14 SWG sheet steel fabricated, floor mounted type cubical panel, suitable for operation on 380 - 440 Volts, 3 Phase, 50 Hz, fitted with accessories as below. The incoming and outgoing cable end boxes shall be on either sides of main panel. The cable entries from auto transformer shall be totally enclosed in sheet metal. The starter shall have screened louvers on both sides.				
	1) Oil immersed copper wound auto transformer with 50%,65%, and 80% tapping including first fill of oil.				
	2) All Air Break Contactors of AC 3 duty of suitable rating as mentioned.				
	3) Bimetallic overload relay.				
	4) Timer ON and OFF delay.				
	5) Master timer.				
	6) Ammeter with CTs and selector switch.				
	7) No Volt release.				
	8) Motor 'ON', 'OFF' and 'TRIP' indication lamp.				
	9) Motor Protection Relay, solid state with protection CTs.				
	10) Thermostat with 1 NO + 1 NC for Oil temperature.				
	11) Door interlock switch with 1 NO + 1 NC.				
	12) Control fuse.				
	Starter for Motor HP / Contactor Rating " Main/ Start/ Run".				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>Cubical Panel Size</b>				
	<b>1.25 m height X 0.75 m width X 0.45 m deep.</b>				
LG 5-1	40 HP (110 / 40 / 40)	Each	71466	3057	74523
LG 5-2	60 HP (200 / 70 / 70)	Each	100053	3057	103110
LG 5-3	80 HP (200 / 110 / 110)	Each	121493	3057	124550
LG 5-4	100 HP (200 / 110 / 110)	Each	157320	3057	160377
LG 5-5	120 HP (300 / 150 / 150)	Each	200106	3057	203163
	<b>Cubical Panel Size</b>				
	<b>1.5 m height X 0.9 m width X 0.5 m deep.</b>				
LG 5-6	150 HP (300/150/150)	Each	203390	6115	209505
LG 5-7	180 HP (400/170/170)	Each	233415	6115	239530
LG 5-8	200 HP (400/200/200)	Each	254285	6115	260400
LG 5-9	220 HP (400/200/200)	Each	319145	6115	325260
LG 5-10	250 HP ( 400/300/300)	Each	330125	9169	339294
LG 5-11	270 HP (630/300/300)	Each	342217	9169	351386
LG 5-12	300 HP (630/300/300)	Each	355510	9169	364679
<b>LG 6</b>	<b>FCMA / HFSR Electrical Soft starter</b>				
	Providing erecting and giving test and trial of FCMA fully Automatic, Starter with DOL Soft Starter complete with main Contactor, VAF meter , PLC and HMI , push buttons and indications,FCMA module with bypass contactor and its control circuitry etc complete.				
LG 6-13	100 HP (200)	Each	169340	3057	172397
LG 6-14	120 HP (300)	Each	188692	3057	191749
LG 6-15	150 HP (300)	Each	213808	6115	219923
LG 6-16	180 HP (400)	Each	235419	6115	241534
LG 6-17	200 HP (400)	Each	252875	6115	258990
LG 6-18	220 HP (400)	Each	278863	6115	284978
LG 6-19	250 HP (400)	Each	298999	9169	308168
LG 6-20	270 HP (630)	Each	317093	9169	326262
LG 6-21	300 HP (630)	Each	371034	9169	380203
<b>LG 7</b>	<b>Electronic Motor Protection Relay (for LT motors)</b>				
	Providing, installing in panel EMPR for protection like overload, phase failure, locked rotor, phase reversal with trip indication and adjustable over current function, DIN rail mounted.	Each	8388	2524	10912

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 11 - HG</b>				
	<b>[H.T. SWITCHGEAR &amp; PROTECTION]</b>				
<b>HG 1</b>	Providing and erecting Vacuum Circuit Breaker out door type excluding cost of CT, PT and control relay panel.				
	<b>Vacuum Circuit Breaker (Out door type)</b>				
HG 1-1	11 kV system 630 Amp 25 kA	Each	172673	15280	187953
HG 1-2	22 kV system 630 Amp 25 kA	Each	177853	15280	193133
HG 1-3	33 kV system 630 Amp 25 kA	Each	183189	15280	198469
HG 1-4	11 kV system 1250 Amp 25 kA	Each	185955	15280	201235
HG 1-5	22 kV system 1250 Amp 25 kA	Each	191534	15280	206814
HG 1-6	33 kV system 1250 Amp 25 kA	Each	197280	15280	212560
<b>HG 2</b>	Providing and erecting Vacuum Circuit Breaker panel Indoor type including CT of required ratio for metering and protection including 3 O/C and E/F relay and high speed trip relay.				
<b>HG 2</b>	<b>Vacuum Circuit Breaker (Indoor type)</b>				
HG 2-1	3.3 kV system 630 Amp 25 kA	Each	334110	15280	349390
HG 2-2	6.6 kV system 630 Amp 25 kA	Each	334110	15280	349390
HG 2-3	11 kV system 630 Amp 25 kA	Each	334110	15280	349390
HG 2-4	22 kV system 630 Amp 25 kA	Each	581953	15280	597233
HG 2-5	33 kV system 630 Amp 25 kA	Each	581953	15280	597233
HG 2-6	3.3 kV system 1250 Amp 25 kA	Each	346043	15280	361323
HG 2-7	6.6 kV system 1250 Amp 25 kA	Each	346043	15280	361323
HG 2-8	11 kV system 1250 Amp 25 kA	Each	346043	15280	361323
HG 2-9	22 kV system 1250 Amp 25 kA	Each	711020	15280	726300
HG 2-10	33 kV system 1250 Amp 25 kA	Each	711020	15280	726300
<b>HG 3</b>	Providing and erecting draw out type Vacuum Contactor Panel Indoor type including CT of required ratio for metering and motor protection relay with High speed trip relay.				
<b>HG 3</b>	<b>Vacuum Contactor Panel (Indoor Type)</b>				
HG 3-1	3.3 kV system ( 25 kA)	Each	311071	15280	326351
HG 3-2	6.6 kV system ( 25 kA)	Each	357801	15280	373081
<b>HG 4</b>	Providing and erecting Resin Cast Indoor single phase double core CT of required ratio and VA burden for metering and protection purpose.				
<b>HG 4</b>	<b>Resin Cast Indoor Single Phase, Double Core CT of required ratio</b>				
HG 4-1	C.T. for 3.3/ 6.6 / 11 kV 15 VA Class 1/10-P-10	Each	9657	1390	11047
HG 4-2	C.T. for 22 /33 kV 15 VA Class 1/10-P-10	Each	15715	1390	17105

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>HG 5</b>	Providing and erecting Resin Cast Indoor single phase Single core PT of required ratio and VA burden for metering purpose.				
	Indoor Type Single Core PT of 100 VA capacity				
HG 5-1	(11 kV / $\sqrt{3}$ ) / (110 Volt / $\sqrt{3}$ )	Each	9657	1390	11047
HG 5-2	(22 kV / $\sqrt{3}$ ) / (110 Volt / $\sqrt{3}$ )	Each	14395	1390	15785
HG 5-3	(33 kV / $\sqrt{3}$ ) / (110 Volt / $\sqrt{3}$ )	Each	15487	1390	16877
<b>HG 6</b>	<b>Protection and auxiliary relays</b>				
	Providing and erecting following type protection and auxiliary relay as required for Vacuum Circuit Breaker Panel / control relay panel.				
HG 6-1	<b>Motor Protection Relays ( CT Operated)</b> Providing, installing numerical motor protection relay for motors controlled through circuit breaker / with vacuum cotactor, providing instantaneous 3 ph overcurrent , unbalance and single phasing ,earth fault and seperate built in stalling proction similar to ABB make type REM 601 or similar				
	REM 601	Each	59878	1466	61344
HG 6-2	<b>Over Current and Earth Fault Relay ( C T Operated )</b>				
	Providing, installing triple pole over current and earthfault relay , 3 O/C and 1 E / F with high set over current setting , -50% to -200% of 5 Amp . Earth fault setting , 10% to 40 % of 5 Amp				
	REJ 601	Each	19924	837	20761
HG 6-3	<b>High Speed Trip Relay / Master Trip Relay</b>				
	Providing, installing in panel single element high speed trip relay with mechanical flag and hand reset contacts similar to GE / ABB				
	VAJH 13 / MVAJ053 / PQ8nCH2JS	Each	3985	75	4060
HG 6-4	<b>Combiflex / Electromagnetic Realy ( Voltage operated )</b> Voltage operated auxillary relay without indicator with self reset / hand reset contacts, plug in combiflex mounting similar ABB model RXP8n / RXPQ8n / VAJH 22A / VAJH 23 B	Each	4123	305	4428



Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>HG 6-5</b>	<b>Auxiliary Relay for Transformer Protection</b>				
HG 6-5-1	Providing, installing in panel voltage operated auxiliary relay with flag, 2 NO + 2 NC, self reset contacts similar to GE / ABB				
	MVAA 11 / CV2 D 2 J	Each	3072	75	3147
HG 6-5-2	Providing, installing in panel voltage operated auxiliary relay with flag, 2 NO + 2 NC, hand reset contacts similar to GE / ABB				
	MVAA 31/ AVA33 / CV2D2J	Each	5313	75	5388
<b>HG 6-6</b>	<b>Power Factor Controller Relay</b>				
HG 6-6-1	Providing, installing static power factor controller relay with minimum 8 capacitor stages with micro processor based capacitor switching with display of power factor	Each	<b>Deleted</b>		
HG 6-6-2	14 stages	Each			
<b>HG 6-7</b>	<b>Digital Timer</b>				
	Providing, installing static digital timer with time delay on pick-up.	Each	1568	75	1643
<b>HG 6-8</b>	<b>Automatic Semaphore Indicator</b>				
	Providing, installing Automatic Semaphore indicator DC / AC operated for automatic indication of the position of Circuit Breakers				
	VAM 21	Each	3295	75	3370
<b>HG 6-9 ( New)</b>	CTMM 501-510 static motor protection relay similar to Alstom make for motors controlled through circuit breaker,	Each	36750	837	37587
<b>HG 6-10 ( New)</b>	CTMM 401-410 static motor protection relay similar to Alstom make for motors controlled by fused contactors,	Each	36750	837	37587
<b>HG 6-11 ( New)</b>	Over Current and/or Earth Fault Relay in panel single pole non directional IDMT O/C or E/F self powered relay, flush mounted, conforming to IS 3231				
a	CDG 11, without High set/ MC 11A	Each	26250	837	27087
b	CDG 21, with High set/ MC 11A	Each	27510	837	28347
<b>HG 6-12 ( New)</b>	Triple pole non directional IDMT, 2 O/C and 1 E/F self powered relay, flush mounted, conforming to IS 3231				
a	CDG 31, without High set	Each	34125	837	34962
b	CDG 61 with high set	Each	35700	837	36537
<b>HG 6-15 ( New)</b>	Numerical communicable nondirectional overcurrent and earth fault T/R Differential relay,	Each	157500	1674	159174
<b>HG 6-16 ( New)</b>	Under voltage and over voltage relay .	Each	15750	837	16587

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 12 - CB</b>				
	<b>[ L.T. CABLE ]</b>				
<b>CB 1</b>	<b>3 core PVC insulated, PVC sheathed copper conductor flat submersible cable</b>	<b>As per PWD CSR</b>			
	Supplying and erecting, Flat flexible submersible cable with, Copper Conductor, PVC insulated, and PVC sheathed.				
CB 1-1	3 core 1.5 sq mm				
CB 1-2	3 core 2.5 sq mm				
CB 1-3	3 core 4 sq mm				
CB 1-4	3 core 6 sq mm				
CB 1-5	3 core 10 sq mm	Mtr	341	16	357
CB 1-6	3 core 16 sq mm	Mtr	520	29	549
CB 1-7	3 core 25 sq mm	Mtr	844	29	873
CB 1-8	3 core 35 sq mm	Mtr	1200	29	1229
<b>CB 2</b>	<b>Aluminium conductor single core, XLPE /PVC insulated &amp; armoured cable</b>				
	Supplying and erecting, XLPE / PVC insulated, armoured cable 1100 V grade with ISI mark single core, stranded aluminium conductor with 6 mm thick 25 mm width M.S. spacer with G.I. Earth wire 6 sq mm, complete erected on wall / on pole with 25 X 3 mm M.S. clamps or in provided trench in an approved manner.				
CB 2-1	Single core 300 sq mm	Mtr	489	57	546
CB 2-2	Single core 400 sq mm	Mtr	624	57	681
CB 2-3	Single core 500 sq mm	Mtr	777	57	834
CB 2-4	Single core 630 sq mm	Mtr	1003	57	1060
CB 2-5	Single core 800 sq mm	Mtr	1236	87	1323
CB 2-6	Single core 1000 sq mm	Mtr	1518	87	1605
<b>CB 3</b>	<b>Aluminium conductor Twin core, XLPE / PVC insulated &amp; armoured cable</b>	<b>As Per PWD CSR</b>			
	Supplying and erecting XLPE / PVC insulated, armoured cable 1100 V grade with ISI mark Twin core, solid / stranded aluminium conductor with 6 mm thick 25 mm width M.S. spacer with G.I. Earth wire 6 sq mm, complete erected on wall / on pole with 25 X 3 mm M.S. clamps or in provided trench				
CB 3-1	Two core 2.5 sq mm				
CB 3-2	Two core 4 sq mm				
CB 3-3	Two core 6 sq mm				
CB 3-4	Two core 10 sq mm				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>CB 4</b>	<b>Aluminium conductor Three core, XLPE / PVC insulated &amp; armoured cable</b>				
	Supplying and erecting XLPE / PVC insulated, armoured cable 1100 V grade with ISI mark Three core, solid / stranded aluminium conductor with 6 mm thick 25 mm width M.S. spacer with G.I. Earth wire 6 sq mm, complete erected on wall / on pole with 25 X 3 mm M.S. clamps or in provided trench in an approved manner.				
CB 4-1	3 Core 2.5 sq mm				
CB 4-2	3 Core 4 sq mm				
CB 4-3	3 Core 6 sq mm				
CB 4-4	3 Core 10 sq mm				
CB 4-5	3 Core 16 sq mm				
CB 4-6	3 Core 25 sq mm				
CB 4-7	3 Core 35 sq mm				
CB 4-8	3 Core 50 sq mm				
CB 4-9	3 Core 70 sq mm	Mtr	411	31	442
CB 4-10	3 Core 95 sq mm	Mtr	521	31	552
CB 4-11	3 Core 120 sq mm	Mtr	628	57	685
CB 4-12	3 Core 150 sq mm	Mtr	750	57	807
CB 4-13	3 Core 185 sq mm	Mtr	882	57	939
CB 4-14	3 Core 240 sq mm	Mtr	1182	57	1239
CB 4-15	3 Core 300 sq mm	Mtr	1390	57	1447
<b>CB 5</b>	<b>Aluminium conductor 3.5 Core, XLPE / PVC insulated &amp; armoured cable</b>				
	Supplying and erecting, XLPE / PVC insulated, armoured cable 1100 V grade with ISI mark Three and half core, stranded aluminium conductor with 6 mm thick 25 mm width M.S. spacer with G.I. Earth wire 6 sq mm, complete erected on wall / on pole with 25 X 3 mm M.S. clamps or in provided trench in an approved manner.				
CB 5-1	3.5 Core 25 sq mm				
CB 5-2	3.5 Core 35 sq mm				
CB 5-3	3.5 Core 50 sq mm				
CB 5-4	3.5 Core 70 sq mm				
CB 5-5	3.5 Core 95 sq mm				
CB 5-6	3.5 Core 120 sq mm				
CB 5-7	3.5 Core 150 sq mm				
CB 5-8	3.5 Core 185 sq mm				
CB 5-9	3.5 Core 240 sq mm				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
CB 5-10	3.5 Core 300 sq mm				
CB 5-11	3.5 Core 400 sq mm				
<b>CB 6</b>	<b>Aluminium conductor 4 Core, XLPE / PVC insulated &amp; armoured cable</b>				
	Supplying and erecting, XLPE / PVC insulated, armoured cable 1100 V grade with ISI mark Four core, solid / stranded aluminium conductor with 6 mm thick 25 mm width M.S. spacer with G.I. Earth wire 6 sq mm, complete erected on wall / on pole with 25 X 3 mm M.S. clamps or in provided trench in an approved manner.				
CB 6-1	4 Core 4 sq mm	Mtr	104	19	123
CB 6-2	4 Core 6 sq mm	Mtr	118	19	137
CB 6-3	4 Core 10 sq mm	Mtr	151	19	170
CB 6-4	4 Core 16 sq mm	Mtr	168	19	187
<b>CB 7</b>	<b>Copper conductor PVC insulated, armoured control cable</b>				
<b>CB 7-1</b>	Supplying and erecting armoured control cable with ISI mark stranded / solid copper conductor 1.1 kV grade complete erected on wall / panel or in provided trench in an approved manner.				
	<b>1.5 sq mm Copper conductor PVC insulated, armoured control cable</b>				
CB 7-1-1	2 core 1.5 sq mm	Mtr	90	7	97
CB 7-1-2	3 core 1.5 sq mm	Mtr	108	7	115
CB 7-1-3	4 core 1.5 sq mm	Mtr	130	7	137
CB 7-1-4	5 core 1.5 sq mm	Mtr	152	7	159
CB 7-1-5	6 core 1.5 sq mm	Mtr	175	7	182
CB 7-1-6	7 core 1.5 sq mm	Mtr	193	7	200
CB 7-1-7	8 core 1.5 sq mm	Mtr	219	7	226
CB 7-1-8	9 core 1.5 sq mm	Mtr	230	7	237
CB 7-1-9	10 core 1.5 sq mm	Mtr	279	7	286
CB 7-1-10	12 core 1.5 sq mm	Mtr	371	7	378
CB 7-1-11	14 core 1.5 sq mm	Mtr	423	7	430
<b>CB 7-2</b>	<b>2.5 sq mm Copper conductor PVC insulated, armoured control cable</b>				
CB 7-2-1	2 core 2.5 sq mm	Mtr	116	7	123
CB 7-2-2	3 core 2.5 sq mm	Mtr	146	7	153
CB 7-2-3	4 core 2.5 sq mm	Mtr	183	7	190

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
CB 7-2-4	5 core 2.5 sq mm	Mtr	219	7	226
CB 7-2-5	6 core 2.5 sq mm	Mtr	253	7	260
CB 7-2-6	7 core 2.5 sq mm	Mtr	286	7	293
CB 7-2-7	8 core 2.5 sq mm	Mtr	319	7	326
CB 7-2-8	9 core 2.5 sq mm	Mtr	322	7	329
CB 7-2-9	10 core 2.5 sq mm	Mtr	376	7	383
CB 7-2-10	12 core 2.5 sq mm	Mtr	452	7	459
CB 7-2-11	14 core 2.5 sq mm	Mtr	521	7	528
<b>CB 8</b>	<b>Copper conductor PVC insulated, Un-armoured control cable</b>				
	Supplying and erecting Un-armoured control cable with ISI mark stranded / solid copper conductor 1.1 kV grade complete erected on wall / panel or in provided trench in an approved manner.				
CB 8-1-1	2 core 1.5 sq mm	Mtr	55	7	62
CB 8-1-2	3 core 1.5 sq mm	Mtr	72	7	79
CB 8-1-3	4 core 1.5 sq mm	Mtr	87	7	94
CB 8-1-4	5 core 1.5 sq mm	Mtr	107	7	114
CB 8-1-5	6 core 1.5 sq mm	Mtr	128	7	135
CB 8-1-6	7 core 1.5 sq mm	Mtr	140	7	147
CB 8-1-7	8 core 1.5 sq mm	Mtr	158	7	165
CB 8-1-8	9 core 1.5 sq mm	Mtr	178	7	185
CB 8-1-9	10 core 1.5 sq mm	Mtr	194	7	201
CB 8-1 -10	12 core 1.5 sq mm	Mtr	260	7	267
CB 8-1 -11	14 core 1.5 sq mm	Mtr	298	7	305
<b>CB 8-2</b>	<b>2.5 sq mm Copper conductor PVC Un-armoured control cable</b>				
CB 8-2-1	2 core 2.5 sq mm	Mtr	76	7	83
CB 8-2-2	3 core 2.5 sq mm	Mtr	104	7	111
CB 8-2-3	4 core 2.5 sq mm	Mtr	130	7	137
CB 8-2-4	5 core 2.5 sq mm	Mtr	155	7	162
CB 8-2-5	6 core 2.5 sq mm	Mtr	185	7	192
CB 8-2-6	7 core 2.5 sq mm	Mtr	214	7	221
CB 8-2-7	8 core 2.5 sq mm	Mtr	237	7	244
CB 8-2-8	9 core 2.5 sq mm	Mtr	267	7	274
CB 8-2-9	10 core 2.5 sq mm	Mtr	302	7	309
CB 8-2 10	12 core 2.5 sq mm	Mtr	400	7	407
CB 8-2 11	14 core 2.5 sq mm	Mtr	462	7	469

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 13 - CB</b>				
	<b>[ H.T. CABLE ]</b>				
<b>CB 9</b>	<b>Aluminium conductor XLPE / PVC insulated, armoured Cable</b>				
	Supplying and erecting Aluminium conductor, XLPE / PVC - 3.3 kV, armoured cable complete erected in provided trench or on provided trays in an approved manner as per direction of Engineer In Charge				
	<b>3.3 kV- XLPE / PVC</b>				
CB 9-1	3 Core 25 sq mm	Mtr	520	31	551
CB 9-2	3 Core 35 sq mm	Mtr	541	31	572
CB 9-3	3 Core 50 sq mm	Mtr	618	31	649
CB 9-4	3 Core 70 sq mm	Mtr	723	31	754
CB 9-5	3 Core 95 sq mm	Mtr	896	57	953
CB 9-6	3 Core 120 sq mm	Mtr	1009	57	1066
CB 9-7	3 Core 150 sq mm	Mtr	1188	57	1245
CB 9-8	3 Core 185 sq mm	Mtr	1329	57	1386
CB 9-9	3 Core 240 sq mm	Mtr	1647	57	1704
CB 9-10	3 Core 300 sq mm	Mtr	1927	89	2016
CB 9-11	3 Core 400 sq mm	Mtr	2397	89	2486
<b>CB 10</b>	Supplying and erecting Aluminium conductor, XLPE / PVC - 6.6 kV, armoured cable complete erected in approved trench or on trays as per direction of Engineer In Charge				
<b>CB 10</b>	<b>6.6 kV -- XLPE / PVC</b>				
CB 10-1	3 Core 35 sq mm	Mtr	585	31	616
CB 10-2	3 Core 50 sq mm	Mtr	661	31	692
CB 10-3	3 Core 70 sq mm	Mtr	787	31	818
CB 10-4	3 Core 95 sq mm	Mtr	930	31	961
CB 10-5	3 Core 120 sq mm	Mtr	1073	57	1130
CB 10-6	3 Core 150 sq mm	Mtr	1198	57	1255
CB 10-7	3 Core 185 sq mm	Mtr	1394	57	1451
CB 10-8	3 Core 240 sq mm	Mtr	1673	57	1730
CB 10-9	3 Core 300 sq mm	Mtr	1946	89	2035
CB 10-10	3 Core 400 sq mm	Mtr	2445	89	2534

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	Providing and erecting IN-DOOR type termination kit, for 3.3 kV / 6.6 kV / 11 kV / 22kV / 33 kV XLPE Screened 3 core cable				
<b>CB 11</b>	<b>INDOOR TERMINATION KIT for 3.3 kV / 6.6 kV XLPE 3 Core cable.</b>				
CB 11-1	25-50 sq.mm	Deleted			
CB 11-2	70-120 sq.mm	Each	4066	2779	6845
CB 11-3	150-185 sq.mm	Each	4606	2779	7385
CB 11-4	240-400 sq.mm	Each	5132	2779	7911
<b>CB 12</b>	<b>OUT DOOR TERMINATION KIT for 3.3 / 6.6 kV XLPE 3 Core cable.</b>				
CB 12-1	25-50 sq.mm	Deleted			
CB 12-2	70-120 sq.mm	Each	6239	2779	9018
CB 12-3	150-185 sq.mm	Each	6726	2779	9505
CB 12-4	240-400 sq.mm	Each	8462	2779	11241
<b>CB 13</b>	<b>STRAIGHT THROUGH JOINT for 3.3 / 6.6 kV XLPE 3 Core cable.</b>				
CB 13-1	25-50 sq.mm	Deleted			
CB 13-2	70-120 sq.mm	Each	15407	2779	18186
CB 13-3	150-185 sq.mm	Each	19599	2779	22378
CB 13-4	240-400 sq.mm	Each	21435	2779	24214
<b>CB 14</b>	<b>INDOOR TERMINATION KIT for 11 kV XLPE Screened 3 core cable.</b>				
CB 14-1	25-50 sq.mm	Each	5304	2779	8083
CB 14-2	70-120 sq.mm	Each	6422	2779	9201
CB 14-3	150-225 sq.mm	Each	7689	2779	10468
CB 14-4	240-400 sq.mm	Each	8660	2779	11439
<b>CB 15</b>	<b>CABLE DUCT RCC M-150</b>				
	Providing and laying RCC ( M-150) cable duct of				
CB 15-1	Cable duct 2 tier-750W X 750 D	Mtr	1444	0	1444
CB 15-2	Cable duct 3 tier-750W X 1000 D	Mtr	1696	0	1696
CB 15-3	Cable duct 2x3 tier-1000W X 1000D	Mtr	2107	0	2107

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 14 - MO</b>				
	<b>[ L.T.MOTORS ]</b>				
<b>MO 1</b>	<b>Foot Mounted Motors SPDP 1000 RPM</b>				
	Providing, erecting and giving test and trial of Foot Mounted SPDP motor 1000 RPM, squirrel cage induction motor, conforming to IS 325 having continuous rating suitable for operation at 415 Volts +/-10%, 3 Phase, 50 Hz +/-3% with "F" class insulation temperature rise limited to class "B" insulation.				
MO 1-1	45 kW ( 60 HP )	Each	233033	4169	237202
MO 1-2	55 kW ( 75 HP )	Each	270926	4169	275095
MO 1-3	75 kW ( 100 HP )	Each	322154	5562	327716
MO 1-4	90 kW ( 120 HP )	Each	410506	5562	416068
MO 1-5	110 kW ( 150 HP )	Each	524811	8336	533147
MO 1-6	125 kW ( 170 HP )	Each	592347	8336	600683
MO 1-7	135 kW ( 180 HP )	Each	626885	8336	635221
MO 1-8	150 kW ( 200 HP )	Each	667044	8336	675380
MO 1-9	160 kW ( 215 HP )	Each	723035	8336	731371
MO 1-10	180 kW ( 240 HP )	Each	814904	11117	826021
MO 1-11	187 kW ( 250 HP )	Each	827923	11117	839040
MO 1-12	200 kW ( 270 HP )	Each	849770	11117	860887
MO 1-13	225 kW ( 300 HP )	Each	970419	11117	981536
<b>MO 2</b>	<b>Foot Mounted Motor TEFC 1500 RPM</b>				
	Providing, erecting and giving test and trial of Foot Mounted TEFC motor 1500 RPM, squirrel cage induction motor, conforming to IS 12615:2011 of efficiency class IE3 premium having continuous rating suitable for operation at 415 Volts +/-10%, 3 Phase, 50 Hz +/-3% with "F" class insulation.				
MO 2-1	1.1 kW ( 1.5 HP )	Each	11203	280	11483
MO 2-2	1.5 kW ( 2 HP )	Each	12134	280	12414
MO 2-3	2.2 kW ( 3 HP )	Each	16146	280	16426
MO 2-4	3.7 kW ( 5 HP )	Each	20751	420	21171
MO 2-5	5.5 kW ( 7 HP )	Each	28559	694	29253



Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
MO 2-6	7.5 kW ( 10 HP )	Each	33422	694	34116
MO 2-7	9.3 kW ( 12 HP )	Each	51943	1390	53333
MO 2-8	11 kW ( 15 HP )	Each	54588	1390	55978
MO 2-9	15 kW ( 20 HP )	Each	67788	1390	69178
MO 2-10	18.5 kW ( 25 HP )	Each	83560	2779	86339
MO 2-11	22 kW ( 30 HP )	Each	99332	2779	102111
MO 2-12	30 kW ( 40 HP )	Each	134263	2779	137042
MO 2-13	37 kW ( 50 HP )	Each	173911	4174	178085
MO 2-14	45 kW ( 60 HP )	Each	210367	4174	214541
MO 2-15	55 kW ( 75 HP )	Each	286797	4174	290971
MO 2-16	75 kW ( 100 HP )	Each	367251	5562	372813
MO 2-17	90 kW ( 120 HP )	Each	451658	5562	457220
MO 2-18	110 kW ( 150 HP )	Each	547050	8336	555386
MO 2-19	132 kW ( 160 HP )	Each	623175	8336	631511
MO 2-20	135 kW ( 180 HP )	Each	640999	8336	649335
MO 2-21	160 kW ( 215 HP )	Each	810731	8336	819067
MO 2-22	180 kW ( 240 HP )	Each	876356	11117	887473
MO 2-23	200 kW ( 270 HP )	Each	912975	11117	924092
MO 2-24	225 kW ( 300 HP )	Each	1127070	11117	1138187
<b>MO 3</b>	<b>Vertical Hollow Shaft Motor</b>				
	Providing, erecting and testing vertical hollow shaft motor 1500 RPM, squirrel cage induction motor, conforming to IS 12615, class IE3 premium, having continuous rating suitable for operation at 415 Volts +/-10%, 3 Phase, 50 Hz +/-5% with "F" class insulation temperature rise limited to class "B" insulation.				
MO 3-1	18.5 kW ( 25 HP )	Each	127902	2779	130681
MO 3-2	22 kW ( 30 HP )	Each	141501	2779	144280
MO 3-3	30 kW ( 40 HP )	Each	154446	2779	157225
MO 3-4	37 kW ( 50 HP )	Each	178018	4174	182192
MO 3-5	45 kW ( 60 HP )	Each	227532	4174	231706
MO 3-6	55 kW ( 75 HP )	Each	289356	4174	293530

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
MO 3-7	67 kW ( 90 HP )	Each	383278	5562	388840
MO 3-8	75 kW ( 100 HP )	Each	386784	5562	392346
MO 3-9	90 kW ( 120 HP )	Each	400229	5562	405791
MO 3-10	110 kW ( 150 HP )	Each	477389	8336	485725
MO 3-11	125 kW ( 170 HP )	Each	488372	8336	496708
MO 3-12	135 kW ( 180 HP )	Each	563654	8336	571990
MO 3-13	150 kW ( 200 HP )	Each	661258	8336	669594
MO 3-14	160 kW ( 215 HP )	Each	712627	8336	720963
MO 3-15	180 kW ( 240 HP )	Each	740262	11117	751379
MO 3-16	187 kW ( 250 HP )	Each	749296	11117	760413
MO 3-17	200 kW ( 270 HP )	Each	791810	11117	802927
MO 3-18	225 kW ( 300 HP )	Each	825643	11117	836760
<b>MO 4</b>	<b>Vertical Solid Shaft Motor TEFC - 1500 RPM</b>				
<b>Note 1</b>	Add 5 % on the rate of Horizontal foot mounted ( TEFC ) motor for vertical flange mounted solid shaft motor				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 15 - MO</b>				
	<b>[ H.T.MOTORS ]</b>				
<b>MO 5</b>	<b>3.3 kV Foot Mounted Motor TEFC 1000 RPM</b>				
	Providing, erecting and giving test and trial of Foot Mounted TEFC motor 1000 RPM, squirrel cage induction motor, conforming to IS 12615:2011 having continuous rating suitable for operation at 3300 Volts +/-10%, 3 Phase, 50 Hz +/-3% with "F" class insulation temperature rise limited to class "B" insulation. Motor shall be fitted with suitable space heater and six nos. RTD.				
MO 5-1	225 kW ( 300 HP )	Each	760681	11117	771798
MO 5-2	250 kW ( 335 HP )	Each	863266	13890	877156
MO 5-3	280 kW ( 375 HP )	Each	1023314	16669	1039983
MO 5-4	340 kW ( 456 HP )	Each	1078370	16669	1095039
MO 5-5	390 kW ( 523 HP )	Each	1136759	19451	1156210
MO 5-6	440 kW ( 590 HP )	Each	1208774	19451	1228225
MO 5-7	510 kW ( 684 HP )	Each	1381999	19451	1401450
MO 5-8	580 kW ( 777 HP )	Each	1492940	22230	1515170
MO 5-9	660 kW ( 885 HP )	Each	1676273	22230	1698503
<b>MO 6</b>	<b>3.3 kV Foot Mounted Motor TEFC 1500 RPM</b>				
MO 6-1	225 kW ( 300 HP )	Each	680651	11117	691768
MO 6-2	250 kW ( 335 HP )	Each	772366	13890	786256
MO 6-3	280 kW ( 375 HP )	Each	915306	16669	931975
MO 6-4	330 kW ( 442 HP )	Each	956997	16669	973666
MO 6-5	370 kW ( 495 HP )	Each	1099937	19448	1119385
MO 6-6	425 kW ( 569 HP )	Each	1141626	19448	1161074
MO 6-7	510 kW ( 683 HP )	Each	1244860	19448	1264308
MO 6-8	660 kW ( 885 HP )	Each	1514859	22230	1537089

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>MO 7</b>	<b>3.3 kV Vertical Flange Mounted Motor TEFC 1000 RPM</b>				
MO 7-1	225 kW ( 300 HP )	Each	801012	11117	812129
MO 7-2	250 kW ( 335 HP )	Each	909145	13890	923035
MO 7-3	280 kW ( 375 HP )	Each	1077514	16669	1094183
MO 7-4	340 kW ( 456 HP )	Each	1131700	16669	1148369
MO 7-5	390 kW ( 523 HP )	Each	1191260	19451	1210711
MO 7-6	440 kW ( 590 HP )	Each	1264713	19451	1284164
MO 7-7	510 kW ( 684 HP )	Each	1431477	19451	1450928
MO 7-8	580 kW ( 777 HP )	Each	1544637	22230	1566867
MO 7-9	660 kW ( 885 HP )	Each	1730844	22230	1753074
<b>MO 8</b>	<b>3.3 kV Vertical Flange Mounted Motor TEFC 1500 RPM</b>				
MO 8-1	225 kW ( 300 HP )	Each	711659	11117	722776
MO 8-2	250 kW ( 335 HP )	Each	807606	13890	821496
MO 8-3	280 kW ( 375 HP )	Each	903553	16669	920222
MO 8-4	330 kW ( 442 HP )	Each	1000675	16669	1017344
MO 8-5	370 kW ( 495 HP )	Each	1131700	19448	1151148
MO 8-6	425 kW ( 569 HP )	Each	1173393	19448	1192841
MO 8-7	510 kW ( 683 HP )	Each	1276625	19448	1296073
MO 8-8	660 kW ( 885 HP )	Each	1536696	22230	1558926
<b>Note 2</b>	For all types of motors above 200 HP the cost is inclusive of 2 space heater and for all types of HT motor the cost is inclusive of 2 Nos. space heater and 6 Nos. RTD. Necessary provision for control wiring and suitable contactor shall be made in the estimate of LT panel board.				
<b>Note 3</b>	For any special purpose if RTD and space heater are required in addition, add following extra charges				
	a) Space heater (240 Volts) for set of two	L.S.	6038	0	6038
	b) RTD for six Nos.	L.S.	7500	0	7500
<b>Note 4</b>	All motors shall be of BEE mark				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 16 - TL</b>				
	<b>[ TOOLS ]</b>				
TL 1	D.E. Open Jaw fix spanner 12 piece set - 6 -32 mm	Set	749	0	749
TL 2	Bi-hexagon Ring spanner 12 piece set - 6-32mm	Set	1303	0	1303
TL 3	Ball pen hammer with handle 800 gm	Each	337	0	337
TL 4	Combination side cutting plier 200 mm KDPE coated	Each	247	0	247
TL 5	Adjustable wrench chrome vanadium 250 mm - 30 mm	Each	321	0	321
TL 6	Pipe wrench stillson pattern carbon steel 450 mm - 60 mm	Each	631	0	631
TL 7	Pipe wrench stillson pattern carbon steel 600 mm - 76 mm	Each	1130	0	1130
TL 8	Screw driver Engineering pattern 6 X 300 mm	Each	108	0	108
TL 9	Screw driver Engineering pattern 8 X 200 mm	Each	94	0	94
TL 10	Screw driver Engineering pattern 5 X 200 mm	Each	68	0	68
TL 11	Screw driver Engineering pattern 5 X 300 mm	Each	70	0	70
TL 12	Screw driver with green neon bulb line tester 3.6 X 60 mm	Each	68	0	68
TL 13	Hack saw frame 300 mm size with heavy duty blade	Each	76	0	76
TL 14	Tool box fabricated from MS sheet of 18 SWG of size 50 X 30 X 30 cm with locking arrangement	Each	1202	0	1202
TL 15	Cold chisels chrome vanadium hexagonal 19/14 - 200 mm	Each	166	0	166
TL 16	Chain pipe wrench IS 54123 -- 210 - 4"	Each	4469	0	4469
TL 17	Chain pipe wrench IS 54123 -- 210 - 6"	Each	6560	0	6560
TL 18	25 mm dia heavy duty 1.2 m long crow bar	Each	227	0	227
TL 19	12 mm size 2 NT capacity wire rope 3 m long with dog bolt 2 Nos.	Each	301	0	301
TL 20	50 mm size G.I. "B" class pipe 1.5 m long with coupling on both side, for use as lever	Each	270	0	270
TL 21	Central punch Chrome Vanadium steel 175 mm	Each	70	0	70
TL 22	Triangular file 300 mm size of "Standard" make	Each	376	0	376

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
TL 24	Bearing puller three legs -- 8"	Each	398	0	398
TL 25	Bearing puller three legs -- 10"	Each	520	0	520
TL 26	Bearing puller three legs -- 12"	Each	631	0	631
TL 27	Hydraulic flip flop crimping tool suitable for 6 to 500 sq mm size cable lugs (Usha-Ismail or similar make)	Each	37231	0	37231
TL 28	Hand operated crimping tool with set of dies ranging from 6 to 185 sq mm cable lug, in pairs of hand ratches	Each	10512	0	10512
TL 29	Insulator tester ( Megger ) cranking type having metal body of range 100 Volts 1000 Ohms.	Each	4835	0	4835
TL 30	Earth Tester- 4 terminals of range 0-10-100-1000-10000 Ohms	Each	7436	0	7436
TL 31	Tong Tester ( Clip on meter ) of range 0-10-30-100-1000 Amps and 0-300-600 Volts	Each	3649	0	3649
TL 32	Engineer's precision steel level of size 300 mm	Each	450	0	450
TL 33	Precision stainless steel rules 500 mm	Each	301	0	301
TL 34	Allen Head Wrench Crome Vanadium 10 piece - 6-10mm	Set	365	0	365
TL 35	Tubler box spanner set with Tommy bar 8 piece- 6-22mm	Set	903	0	903
TL 36	Diagonal cutting pliers 150 mm PVC coated	Each	217	0	217
TL 37	Long nose pliers carbon steel 200 mm PVC coated	Each	208	0	208
TL 38	Water pump pliers chrome vanadium 259 mm - 40 mm	Each	304	0	304

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 17 - EC &amp; GC</b>				
	<b>A - EC- ELECTRO CHLORINATION SYSTEM</b>				
EC	Providing, erecting, commissioning & giving test & trial for a period of one month including one year free maintenance after commissioning of Electro chlorinator capable of generating chlorine from common salt by electrolysis using electrodes in form of sodium hypo chlorite solution containing 6-8 gms/lit of available chlorine in batch or continuous process and capable of providing 8 hrs storage of hypochlorite in case of power failure & comprise of following				
	Electrolytic cell consisting dimensionally stable electrodes made from Gr I Titanium sheet with multi metal Oxide coating.				
	Electolyzer tank made from PVC -FRP or Acrylic.				
	Power pack consisting of transformer rectifier for generating suitable DC current from AC supply along with the control switch for dosing pumps, etc through MCB's contacts, relays and				
	Control panel for the electro chlorinator consisting of DC voltage and current display income phase status unit on-off switches fuses				
	Dosing tank of suitable capacity made from PVC/FRP.				
	Dosing pumps of special quality (1W+1S) suitable to handle hypo chlorite solution.				
	Entire chlorine solution pipeline shall be of PVC				
	Chlorine test kit suitable to measure residual chlorine up to 5ppm.				
EC 17-1	25 gms / hr	Each	192348	19573	211921
EC 17-2	50 gms / hr	Each	284959	28994	313953
EC 17-3	100 gms / hr	Each	504614	51343	555957
EC 17-4	150 gms / hr	Each	563982	57382	621364
EC 17-5	250 gms / hr	Each	676778	68861	745639
EC 17-6	350 gms / hr	Each	795511	80940	876451
EC 17-7	500 gms / hr	Each	1009230	102684	1111914
EC 17-8	750 gms / hr	Each	1280250	130258	1410508
EC 17-9	1000 gms / hr	Each	1555401	158253	1713654
EC 17-10	1500 gms / hr	Each	1959093	199323	2158416
EC 17-11	2000 gms / hr	Each	2202497	224088	2426585

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>B - GC - [ AUTOMATIC GAS CHLORINATION SYSTEM ]</b>				
GC	Providing, Erecting commissioning & giving test and trial including one year supervision of the system in day shift (General shift) and one year free maintenance of fully automatic gas chlorination system confirmation to all applicable NEC and Compressed Gas Associations recommendations and comprising of following				
	Automatic Vacuum operated Chlorinator unit of capacity as mentioned below with Actuator rotameter, injector, vacuum tubing special PVC Piping for Chlorine solution & suitable booster pumps(1W+1S) with GI piping valves, fittings etc.				
	Automatic Switchover type vacuum regulators(2 nos.) installed on tonners with suitable mounting & showing tonner status indication as standby, empty & in use.				
	Auto Control Panel of suitable capacity ,wall mounted industrial type with voltmeter, ammeter, starter MCB indicating lamps having automatic operation.				
	Microprocessor based Multi functional controller with digital & graphical display.				
	Online residual Chlorine Analyser without need of reagent utilizing unique, internally buffered sensor.				
	Gas leak & temperature detection two channel measuring system designed for gas and temperature monitoring in up to two rooms with necessary wiring & battery backup cum voltage stabilizer system of suitable capacity with batteries.				
	Preventing maintenance kit for injector, Rotameter & Vacuum regulator.				
GC 17-1	4 kg / hr ( 200PPD )	Each	1504456	228239	1732695
GC 17-2	10 kg / hr (500 PPD)	Each	1574617	230636	1805253



Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>C . GAS CHLORINATION SYSTEM ( Manual )</b>				
	<p>Providing,Erecting,commissioning and giving test and trial of gas chlorination system confirmation to all applicable compressed Gas Association recommendations and comprising of following :</p> <p>Vacuum operated chlorinator unit of capacity as mentioned below :</p> <p>Two set of Rota meter assembly and control valve assembly,two sets of Remote injector assembly(1W + 1SB),10 RMT of vacuum tubing ,10 meters of uPVC piping for chlorine solution &amp; suitable booster pumps (1W + 1SB) with 10 meters water inlet piping ,valves,fittings etc</p> <p>Automatic switchover type vacuum regulators(2 nos) or with vacuum operated switchover system.</p> <p>Control panel of suitable capacity wall mounted industrial type with voltmeter,ammeter,starter.MCB indicating lamps.</p> <p>Preventive maintenance kit for injector,Rotameter &amp; vacuum regulator including erection.</p>				
GC 17-3	4 kg / hr ( 200PPD )	Each	304502	46181	350683
GC 17-4	10 kg / hr (500 PPD)	Each	388580	46181	434761
	Note: The autochlorination system shall be provided for water Treatment Plants of capacity 10 MLD and above.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 18 - WM</b>				
<b>WM 1</b>	<b>Mechanical Type Meters.</b>				
<b>A)</b>	<b>Domestic Meters</b>				
<b>a)</b>	<b>I S I mark as per IS 779/1994</b>				
	Providing, installing and giving satisfactory field testing of Domestic water meter, horizontal inferential multijet type with magnetic drive and dry dial suitable for ambient 50° C Temperature duly sealed against tampering complete with couplings at both ends and conforming to class B as per IS 779/1994 (VI Revision) with ISI mark along with manufacturer's test certificate and guarantee certificate, including cost of all materials and labour.				
1	15 mm dia	Each	1007	192	1199
2	20 mm dia	Each	1878	192	2070
3	25 mm dia	Each	2661	192	2853
4	40 mm dia	Each	5828	192	6020
	For Comprehensive Maintenance & Repairs of above water meters in water supply scheme, Following % shall be added on Supply rate.				
	1 First year	Free			
	2 Second year	4%			
	3 Third year	5%			
	4 Fourth year	6%			
	5 Fifth year	7%			
<b>b)</b>	<b>Multijet meters</b>				
	Providing, installing and giving satisfactory field testing of Domestic water meter, horizontal inferential multijet type with magnetic drive and dry dial suitable for ambient 50° C Temperature duly sealed against tampering complete with couplings at both ends and conforming to class B as per ISO 4064 along with manufacturer's test certificate and guarantee certificate, including cost of all materials and labour etc with OIML / MID certification for Abroad and FCRI for India including 36 months guarantee etc complete				
1	15 mm dia	Each	1776	192	1968

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
2	20 mm dia	Each	2201	192	2393
3	25 mm dia	Each	3850	192	4042
4	40 mm dia	Each	7325	192	7517
c)	<b>AMR Meters</b>				
	Providing, installing and giving satisfactory field testing of domestic multijet mechanical AMR water meters horizontal inferencial with magnetic drive and dry dial suitable for ambient 50°C temperature duly sealed against tampering complete with coupling at both ends and conforming to ISO 4064 with GSM / radio frequency ( RF ) for communication to server via transreceiver alongwith Hand held Device and PC software etc complete with OIML.MID certification for Abroad meter and FCRI for India including 36 months guarantee etc complete.				
1	15 mm dia	Each	6158	729	6887
2	20 mm dia	Each	6775	834	7609
3	25 mm dia	Each	10579	1030	11609
4	40 mm dia	Each	14423	1406	15829
B)	<b>Bulk Meters.</b>				
	Providing, installing and giving satisfactory field testing of flanged ends Bulk water meter of following type and as mentioned below with FGI-250 cast iron body, class "B" conforming to IS : 2373, to read in metric system, alongwith manufacturer's test and guarantee certificate including cost of all materials and labour with ISI mark etc complete.				
a)	<b>Removable mechanism type as per IS2373</b>				
1	200 mm dia	Each	19898	2314	22212
2	250 mm dia	Each	38222	3049	41271
3	300 mm dia	Each	50511	3953	54464

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
b)	<b>Removable mechanism type Bulk water meter as per ISO 4064</b>				
	Providing, installing and giving satisfactory field testing of bulk water meter, horizontal inferential multijet type with magnetic drive and dry dial suitable for ambient 50° C Temperature duly sealed against tampering complete with flanges at both ends and conforming to class B as per ISO 4064 along with manufacturer's test certificate and guarantee certificate, including cost of all materials and labour etc with OIML MID certification for Abroad meter and FCRI for India including 36 months guarantee etc complete.				
1	50 mm dia	Each	13099	402	13501
2	80 mm dia	Each	14553	979	15532
3	100 mm dia	Each	16009	1388	17397
4	150 mm dia	Each	20331	2166	22497
5	200 mm dia	Each	26791	2314	29105
6	250 mm dia	Each	60703	3049	63752
7	300 mm dia	Each	102238	3953	106191
<b>NOTE</b>	1) The domestic and bulk water meter shall be suitable for water, minimum, maximum and transitional flow conforming to IS 779-(1994-6th edition), I S 2373 or ISO-4064 as applicable and shall be installed so as to have laminar flow with pipe running full.				
	2) Pressure rating (maximum working pressure 16 Kg. sqcm) suitable for forward and reverse				
	3) Strainers (also called as filters or dirt boxes) are recommended for installation upstream of the water meter at a length not less than 12D - D is diameter of pipe)				
	4) For tapers, non-return valves, specials, pumps the meter shall be installed at a distance of not less than 15 D (D is diameter of pipe) downstream i.e. in the direction of flow.				
	5) The cost of cutting existing pipe, welding flanges, excavation, construction of chamber is not included in above rates.				
	6) Cost of Strainer (Filter/dirt box ) is not included in above rates.				
	7) Guarantee period shall be 36 months.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
c)	C.I. Strainer "T" (Basket) Type with flanged ends				
	Providing, and fixing C.I.Strainer for water meters including cost of all material and labour.of "T" (Basket) Type with flanged ends and with stainless steel or brass mesh with openings of 2.5. mm to 3 mm and suitable for operating pressure of 16 Kg./cm2 and test pressure of 24 Kg./cm2				
1	50 mm dia	Each	3219	402	3621
2	80 mm dia	Each	4652	979	5631
3	100 mm dia	Each	6644	1388	8032
4	150 mm dia	Each	12179	2166	14345
5	200 mm dia	Each	18365	2314	20679
6	250 mm dia	Each	24486	3049	27535
7	300 mm dia	Each	47014	3953	50967
NOTE	1) The cost of cutting existing pipe, welding flanges excavation, construction of chamber is not included in above rates.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>WM 2</b>	<b>Ultrasonic / Electromagnetic Water Meter</b>				
<b>A)</b>	<b>AMR Domestic Meters</b>				
	Providing, installing and giving satisfactory field testing of domestic battery operated AMR water meters with no measurement of air along with manufacturing test certificate and guarantee certificate with battery life of minimum 10 years with GSM / RF technology for communication to server with PC software including 36 months guarantee, etc. complete.				
	<b>General Specifications</b>				
	1. Meter should be battery operated with no moving parts, low pressure loss, dry type as per ISO 4064/OIML R49 MID approved alongwith Endurance certificate from FCRI.				
	2. Display : 9 digits LCD				
	3. Enclosure : Protection class IP 68				
	4. Temperature : Ambient 50 deg.C				
	5. Pressure : PN-16				
	6. Power Supply : 3.6 lithium battery with minimum life of 10 years				
	7. Memory built-in and should have storage for atleast 12 months with daily / monthly accumulated totalised data with time and date should be available. It should be able to access memory of the meter through serial communication				
	8. End connections : Screwed upto 40 mm				
	9. Installation : should be able to install in any orientation				
1	15 mm dia	Each	8878	841	9719
2	20 mm dia	Each	9683	918	10601
3	25 mm dia	Each	11291	1070	12361
4	40 mm dia	Each	16117	1525	17642

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>B)</b>	<b>AMR Bulk Meters</b>				
	Providing, installing testing and commissioning of in line battery operated ultrasonic bulk type water meters ISO 4064 with built in data logger and GSM/GPRS modem for transfer of data communication to remote central computer as per working on following conditions and specifications. The meter shall be suitable for 50°C and provided with IP 68 protection class with complete immersion of water. The meter shall have battery life of min. 10 years should be able to detect the reverse flow volume and tampering. The accuracy of the meter shall be +/- 1 % of measured value including 36 months guarantee etc complete. ( With Simcard and its charges, valid for 36 months)				
1	50 mm dia	Each	24198	2207	26405
2	80 mm dia	Each	28099	2561	30660
3	100 mm dia	Each	32816	2992	35808
4	150 mm dia	Each	46017	4193	50210
5	200 mm dia	Each	69769	6358	76127
6	250 mm dia	Each	133796	12190	145986
7	300 mm dia	Each	185312	12190	197502
<b>C)</b>	<b>Ultrasonic Flow meters</b>				
	Providing, installing and giving satisfactory test & trial of Ultrasonic Flow meter of ISO working on 85 -260 V AC, 50 HZ electric power supply of following type working on time of flight principle suitable for satisfactory continuous operation in all seasons & with following accessories, working conditions, specifications & duly tested as specified below :				
1	<b>Ultrasonic Clamp-on portable type Flow Meter (Single Channel)</b>				
	Providing, installing and giving satisfactory test & trial of ultrasonic clamp on portable type flow meter working on conditions & specifications, calibration, inspection, testing, training, guarantees and manufacturers test certificate/ declaration copy along with accessories as mentioned above along with accessories like	Each	271004	0	271004
	a) Magnetic Clamps-1 Pair &				
	b) Suitable carrying case-1 No.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
2	<b>Ultrasonic Clamp-on Fixed type Flow Meter (Single Channel)</b>				
	Providing, installing and giving satisfactory test & trial of ultrasonic clamp on Fixed type flow meter working on conditions & specifications, calibration, inspection, testing, training, guarantee and manufacturers test certificate/ declaration copy along with accessories as mentioned in a (1) to (16) below.	Each	235463	0	235463
3	<b>Ultrasonic Insertion Fixed type Flow Meter (Single Channel)</b>				
	Providing, installing and giving satisfactory test & trial of ultrasonic Insertion Fixed type flow meter working on conditions & specifications, calibration, inspection, testing, training, guarantee and manufacturers test certificate/ declaration copy along with accessories as mentioned in a (1) to (16) below & with inbuilt assembly to fix the insertion type transducer on the pipeline.	Each	241500	0	241500
A)	<b>Mandatory Accessories:</b>				
	1) Integrated signal converter transmitter enclosed in die cast aluminum case / any anticorrosive material confirming to IP-68 - 1				
	2) Pair of transducers (Sensors) confirming to IP-68 with junction boxes - 1 No.				
	3)Stainless steel straps for mounting clamp on type sensors - 2 Nos.				
	4) Grease count plant, 100 ml : Bottle - 5 Nos.				
	5) Signal & power cables for each transducer - 50 Mtrs length/each (insertion type flow meter) & 10 mtrs length /each (portable type flow meter)				
	6) a) for fixed type flow meter-UPS working on 230 V AC, 50 Hz power supply suitable for 12 hrs continuous operation.-1 No. (only required for category C)				
	b) Built in portable type battery back up for minimum 5 Hrs continuous operation with spare battery and separate battery charger working on 230 V AC, 50 Hz power supply for charging battery- 1 No. (only required for category A)				
	c) Aluminium / anticorrosive carrying case for flow meter and all accessories (only required for category C-1)				



Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	7)Data storage capacity with built in or separate for date, time, actual flow rate, totaliser & error messages if any with storage capacity of 120 days and at 5 minutes interval data logging along with local indication and necessary cables and software to download data to laptop -1 No				
	8) Proper earthing shall be provided for protection against high voltage surge (only required for category B,C)				
	9) Suitable over voltage protection unit for protection of instrument from higher voltage (upto 275 V-300 V AC)				
	10) M.S. sensor protection boxes with suitable size for above ground lines where construction of chamber is not possible. (only required for category C-2)				
	12) Magnetic clamp for metallic pipe lines and Nylon / SS strips, chain arrangement for clamp on sensors suitable for pipe diameters 50 mm to 3000 mm (only required for category C-1)				
	11) Battery powered ultrasonic thickness gauge along with charger, test sample, coupling agent and carrying case suitable measuring thickness of 1 mm to 100 mm (only required for category C)				
	12) 5 meter steel measurement tape with level bottle.				
	13) Communication facility through GSM(without simcard ( for category C )				
	14) Guarantee period shall be 36 months.				
<b>B)</b>	<b>Optional Accessories:</b>				
	1) Fixing flow meter transmitter to internal walls of buildings in a suitably designed panel cabinet with proper locking arrangement with glass window on front door for seeing the readings of flow transmitter and data logger without opening of the panel cabinet. It should house complete ancillaries and including the provision for connection of electrical power supply from nearby apparatus. The panel cabinet shall be prewired and with suitable gland entries.	Each	5843	0	5843
	2) Wireless communication device to communicate between central computer & flow transmitter installed at remote site with GSM based system				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	3) DA Scheduler software for CSV file storage and data acquisition				
	4) Cables for pressure, flow & totalized details from transmitter to field gate system (10 Mtrs with each GSM / GPRS system)				
	5) OPC Software to be installed in central PC for SCADA interface as may be necessary				
	7) Customized page with Java Applets XML-Data import software for online MIMIC				
	8) Sensor/Transmitter cable of following specification:				
	3 x 0.38 mm <sup>2</sup> PVC cable with common branded copper shield 7mm dia and individually shielded cores-with empty pipe detection 9 EPD	Mtr	174	0	174
	4 x 0.38 mm <sup>2</sup> PVC cable with common branded copper shield 7 mm dia and individually shielded cores.				
	Conductor resistance : $\leq 50$ Ohm/Km				
<b>C)</b>	<b>Working Condition &amp; Specifications</b>				
	a) Water Temp : 10° to 50° C				
	b) Water Quality: Raw water, turbid in nature. Potable chlorinated water				
	c) Operating pressure: 10-15 Kg./cm <sup>2</sup>				
	d) Pipeline MOC : CI, DI, MS with /without mortar lined, Non-metallic pipes.				
	e) Pipe diameter : > 1000 mm -4000 mm				
	f) Flow -Up to 300 Mld				
	g) Pipe condition: Pipe shall be running full.				
	h) Ultrasonic flow meters shall be designed, manufactured to international standards with accuracy of +/-2% of actual flow. The supplier should have full ISO -9000 series accreditation & facility for fully traceable calibration flow rig as per international standard				
	i) Functional details: Freely programmable.				
	j) Measurement - Volumetric flow rate, totalized flow.				
	k) Flow direction- Forward & Reverse.				
	l) Display- LCD display with suitable lines, digits, segments, markers, for identification of current output. The digit shall be clear, bold & can be read from 1 Mtr distance.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	m) Output - for current 4 mA - 20 mA HART (active/passive) for measuring flow in pipeline. Frequency output shall be 1 Khz, Open collector, passive.				
	n) Status output-open collector.				
	o) Meter shall be suitable for remote facility.				
	p) Power supply-85-260 V AC(45-65 Hz)/20-55 V AC (45-65 Hz)/16-62 V DC.				
	q) Galvanic isolation- input & output galvanically isolated from power supply from the sensor and from each other				
	r) Instruments must carry "CE" mark.				
	s) Functionality verification check should be possible inline using recommended software tools.				
	t) Future upgradation to field bus foundation. Profibus should be possible with minimal changes.				
<b>D)</b>	<b>Calibration, Testing &amp; Inspection</b>				
	The total supply quantity shall be inspected and tested as below. The flowmeter shall be calibrated at manufacturers place as per international standard given above. Manufacturer having NABL lab accreditation ,the calibration testing shall be witnessed by Third party approved by MJP .The manufacturer not having NABL lab accreditation shall be tested at FCRI/CWPRS/IDEMI etc. for which third party inspection is not required.				
	1. For Domestic water meter- 1%				
	2. For Bulk water meter- 10%				
<b>E)</b>	<b>Manufacturer's Guarantee, Certificate &amp; training</b>				
	The flow meter shall be supplied with manufacturer's test certificate as per international standards given above. calibration certificates. 36 months guarantee for the trouble free performance and given adequate training for handling flow meter and installation in field so that trainees can carryout the job independently.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>F)</b>	<b>O &amp; M towards flow meter &amp; accessories</b>				
	The O & M shall be decided based on "planned preventive maintenance" Program (PPM) to be finalized with suppliers with following service included (but not limited) for 36 months beyond standard warranty. However for project cases user must discuss with supplier for lumpsum O & M cost for the overall project.				
	Planned Preventive Maintenance (PPM):				
	a) Regular visit to the flow meters (once in 2 months to check the healthiness of instruments)				
	b) Repairs/ replacement of components/spare parts as may be necessary during the flow meter inspection.				
	c) Free replacement of the spare parts and consumables as necessary.				
	d) Emergency visit to site within 48 hours for attending any major trouble shooting and break downs.				
	e) Technical training/ trouble shooting training to the user by the supplier.				
	f) Providing complete technical details on instrument with necessary manuals				
<b>G)</b>	<b>General Terms &amp; Conditions</b>				
	a) General Specifications with accessories (except required for each type of meter specified) working conditions, mandatory accessories, calibration, inspection testing manufacturers test certificates, installation and commissioning, guarantee and training shall be common for all flow meters as mentioned above. The optional accessories mentioned above to be considered as per project and site requirements.				
	b) The above prices include local inland transportation from manufacturer's godown /custom's godown upto sites anywhere in Maharashtra.				
	c) The above prices include necessary packing & forwarding charges as applicable for each project.				
	d) The above prices are inclusive of Marine & inland insurance of flow meters up to site storage.				
	e) Meter shall be procured with prior permission from concerned Superintending Engineer / Chief Engineer.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	f) Planning for installation for meter shall be done during execution of pipe work. Straight pipe length of 5 D or more on up stream side and 2 D or more on down stream side of meter is necessary (D is diameter of flow meter) The meter shall be installed so as to have a laminar flow with pipe running full				
<b>WM 3</b>	<b>Full-Bore Electromagnetic Flow Meter:</b>				
	Supply, install and commission Electromagnetic Flow Meter (EMF) As Per ISO 4064, for Raw/Pure water with accuracy $\pm 0.5\%$ of measured value & protection as per given specifications for size 100 mm-1000mm including sensor, transmitter surge arrester, cable GI duct if suitable size for 25 mtrs built in GSM ( with Simcard and its charges, valid for 36 months) including the pipe cutting, leveling and installation of flow meter in the pipelines with necessary tool tackles, cranes including 36 months guarantee etc complete, as may be required at site & based on technical specifications.				
1	100 mm Nominal Diameter Flowmeter	Each	115132	4306	119438
2	150 mm Nominal Diameter Flowmeter	Each	123516	5234	128750
3	200 mm Nominal Diameter Flowmeter	Each	146908	5541	152449
4	250 mm Nominal Diameter Flowmeter	Each	162041	6434	168475
5	300 mm Nominal Diameter Flowmeter	Each	185346	7875	193221
6	350 mm Nominal Diameter Flowmeter	Each	257370	9863	267233
7	400 mm Nominal Diameter Flowmeter	Each	292115	11371	303486
8	450 mm Nominal Diameter Flowmeter	Each	312107	13015	325122
9	500 mm Nominal Diameter Flowmeter	Each	364629	13620	378249
10	550 mm Nominal Diameter Flowmeter	Each	403770	14838	418608
11	600 mm Nominal Diameter Flowmeter	Each	420533	15363	435896
12	700 mm Nominal Diameter Flowmeter	Each	451832	16335	468167
13	750 mm Nominal Diameter Flowmeter	Each	484144	17322	501466
14	800 mm Nominal Diameter Flowmeter	Each	542955	19175	562130

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
15	900 mm Nominal Diameter Flowmeter	Each	618667	21529	640196
16	1000 mm Nominal Diameter Flowmeter	Each	662681	25112	687793
A)	<b>Mandatory Accessories:</b>				
	1) The sensor should be as per IP-68 protection & with flanges of PN 10 rating from CS-1 No.				
	2) The sensor coil housing shall be IP-68. This protected against external magnetic field.				
	3) The transmitter shall have one current 4 m A-20 mA output.				
	4) The current output shall be galvanically / optically isolated. transients without damage. It shall be fitted with switched mode power supply capability 85-260 V & 45-65 Hz to cope up with power transient without damage				
	5) Signal & power cables shall be of 50 Mtrs length/each.				
	6) Conduit pipe ( PVC Plumbing schedule 4 ) 25 mm diameter with suitable rating of cable with digging, laying & concealed the duct - 25 mtrs/each				
	7) UPS working on 230 V AC, 50 Hz power supply suitable for 12 hrs continuous operation-1 No.				
	8) Data storage capacity with built in or separate for date time, actual flow rate, totaliser & error messages if any with storage capacity of 120 days -1 No.				
	9) Proper earthing shall be provided for protection against high voltage surge.				
	10) Suitable over voltage protection unit for protection of instrument from higher voltage (upto 275 V-300 V AC)				
	11) Fixing flow meter transmitter to internal walls of buildings in a suitably designed panel cabinet with proper locking arrangement with glass window on front door for seeing the readings of flow transmitter and data logger without opening of the panel cabinet. electrical power supply from near by apparatus. The panel cabinet shall be It should house complete ancillaries and including the provision for connection of prewired and with suitable gland entries.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
B)	<b>Optional Accessories:</b>				
	2) Providing and supplying DI/CI/MS in-line adapters with mechanical joints & concentric tapers with flanges along with suitable gasket of SBR, complete with mild steel nut bolts coated or otherwise protected from rusting and suitable for DI pipes as may be necessary for the following line size x flow meter sizes. Applicable only for Electromagnetic Flow meters.				
	3) Wireless communication device to communicate between central computer & flow transmitter installed at remote site with GSM based system				
	4) DA Scheduler software for CSV file storage and data acquisition				
	5) OPC Software to be installed in central PC for SCADA interface as may be necessary				
	7) Sensor/Transmitter cable of following specification:				
	3 X 0.38 mm <sup>2</sup> PVC cable with common, braided copper shield (-7mm dia) and individually shielded cores- with empty pipe detection 9 EPD): 4X0.38 mm <sup>2</sup> PVC cable with common, braided copper shield (-7 mm dia) and individually shielded cores-conductor resistance: $\leq 50$ Ohm/Km-Capacitance: core/shield: $\leq 420$ pF/m.-permanent operating temperature: 20.....+80 Deg C	Mtr	180	0	180
	8) Coil cable of following specifications :				
	3 X 0.75 mm <sup>2</sup> PVC cable with common, braided copper shield (-7mm dia) Conductor resistance : $\leq 37$ Ohm/Km-Capacitance: core/core, shield grounded : $\leq 120$ pF/m.-permanent operating temperature:-20+/-80 Deg C	Mtr	163	0	163
C)	<b>Working Condition &amp; Specifications</b>				
	a) Water Temp : 10 Deg to 50 Deg				
	b) Water Quality: Raw water, turbid in nature. Potable chlorinated water				
	c) Operating pressure: 0-30 Kg./cm <sup>2</sup>				
	d) Pipeline MOC:CI,DI,MS with /without mortar lined, Non-metallic pipes.HS & PSC				
	e) Pipe condition: pipe shall be running full.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	f) Full-Bore Bi-directional Electromagnetic Flow meters shall be designed, manufactured & calibrated to international standards with accuracy of +/-0.5% of reading.				
	g) The supplier should have full ISO-9000 series accreditation & full traceable calibration methods to either of the two primary standard means of testing i.e. mass (ISO 4185) or volume (ISO 6817)				
	h) Each meter shall be wet calibrated at the place of manufacturing with 3 point calibration at sufficient flow rates. The testing facility shall be duly accredited in accordance to ISO 17025				
	i) The sensor shall be of standard length as per ISO 13359				
	j) The sensor shall have built in stainless steel Grounding Electrode & Empty pipe Detection. Any ground probes, rings, flanges or straps will be strictly not acceptable.				
	k) The liner material shall be either Certified Hard Rubber (HR) with Drinking water Approval or Polyurethane (PU) & teflon.				
	l) The sensor & transmitter shall be capable of working in tropical environment.				
	m) The Meter body shall be flanged or with custom connector as per the requirement. Wafer designs will not be acceptable.				
	n) The housing of flow meter shall be Die cast Aluminum/painted steel with suitable anti-corrosive paint.				
	o) The flow meter shall be suitable for both submergence as well as burial installation & shall withstand all necessary natural shocks.				
	p) The transmitter & sensor shall not have any EMI interferences in the actual flow meter reading.				
	q) The transmitter shall be wall-mounted type with a 2-line display for the indication of Actual Flow rate & Totalized value. The material enclosure shall be sufficient to guarantee 5 year operation life.				



Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	r) The transmitter shall be capable of fully programmed with push button/using HART communicator. It shall have a set-up menu so that all relevant parameters may be user-set from the self-prompting driven menu. The repeatability shall be 0.1% of reading or better, minimum+/-0.5mm/s				
	s) The transmitter shall have one scalable pulse output. One current (HART) output. The current output shall be galvanically isolated. It shall be fitted with switched mode power supply capability 85-260 V & 45-65 Hz to cope with power transients without damage.				
	t) The totalizer value shall be protected by EEPROM during power outage, and utilizes an overflow counter.				
	u) The flow meter shall be provided with remote display suitable without any signal booster / amplifier for distance upto 150 Mtrs. for online MIMIC				
<b>D)</b>	<b>Calibration, Testing &amp; Inspection</b>				
	10 % of the total supply quantity shall be inspected and tested as below. The flowmeter shall be calibrated at manufacturers place as per international standard given above. Manufacturer having NABL lab accreditation, the calibration testing shall be witnessed by Third party approved by MJP. The manufacturer not having NABL lab accreditation shall be tested at FCRI / CWPRS / IDEMI etc. for which third party inspection is not required.				
<b>E)</b>	<b>Manufacturer's Guarantee, Certificate &amp; training</b>				
	The flow meters shall be supplied with manufacturer's test certificate as per international standards given above. calibration certificates. 36 months guarantee for the trouble free performance and given adequate training for handling flow meter and installation in field so that trainees can carryout the job independently.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
<b>F)</b>	<b>O &amp; M towards flow meter &amp; accessories</b>				
	The O & M shall be decided based on "planned preventive maintenance" Program (PPM) to be finalized with suppliers with following service included (but not limited) for 36 months beyond standard warranty. However for project cases user must discuss with supplier for lumpsum O & M cost for the overall project.				
	Planned Preventive Maintenance (PPM):				
	a) Regular visit to the flow meters (once in 2 month to check the healthiness of instruments)				
	b) Repairs/ replacement of components/spare parts as may be necessary during the flow meter inspection.				
	c) Free replacement of the spare parts and consumables as necessary.				
	d) Emergency visit to site within 48 hours for attending any major trouble shooting and break downs.				
	e) Technical training/ trouble shooting training to the user by the supplier.				
	f) Providing complete technical details on instrument with necessary manuals				
<b>G)</b>	<b>General Terms &amp; Conditions</b>				
	a) General Specifications with accessories (except required for each type of meter specified) working conditions, mandatory accessories, calibration, inspection testing manufacturers test certificates, installation and commissioning, guarantee and training shall be common for all flow meters as mentioned above. The optional accessories mentioned above to be considered as per project and site requirements.				
	b) The above prices include local inland transportation from manufacturer's godown /custom's godown upto sites anywhere in Maharashtra.				
	d) The above prices are inclusive of Marine & inland insurance of flow meters up to site storage				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	e) Planning for installation for meter shall be done during execution of pipe work. Straight pipe length of 5 D or more on up stream side and 2 D or more on down stream side of meter is necessary (D is diameter of flow meter) The meters shall be installed so as to have a laminar flow with pipe running full				
	<b>Note : While preparing the estimate of water meter / flowmeter ( Other than WM 1 A a ) , 7% of amount of supply rate of water meter / flowmeter shall be added for comprehensive maintenance of water meter for 36 months after the guarantee period .</b>				
<b>WM 4</b>	<b>Battery Operated electromagnetic flow meter</b>				
	Providing, erecting, testing and commissioning of battery operated electromagnetic flow meter built in GSM ( with Simcard charges for 36 months validity ) of various diameters as per the following specifications including 36 months guarantee etc complete.				
<b>A)</b>	<b>General Specifications</b>				
	<b>Sensor</b>				
	1) Sensor size (dia.) : DN 25 mm to 1200 mm				
	2) Process temperature : Ambient -1... +50°C				
	3) Type : In line full bore Electromagnetic				
	6) Process Connection : Flanged AS per IS				
	7) Weather Protection class : IP 68				
	8) Liner : Neoprene or equivalent				
	9) Housing : corrosion resistant, non corrosive sensor can be buried.				
	10) Application : Water application and distribution network				
	11) Electrode : Stainless steel 316				
	12) Grounding electrode : Stainless steel 316				
	13) Flanges : Carbon steel				
	14) Operating Pressure : PN 16/232 psi				
	15) Cable : factory fitted 20 mtrs long				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>Transmitter</b>				
	1) Type : Microprocessor based, with configurable parameter				
	2) Power supply : Inbuilt battery via internal D cell (3.6 V)				
	3) Input : From flow sensor				
	4) Output : pulse outputs				
	5) Display : Display with 8 digits for main information. Index, menu and status symbols for dedicated information. Resolution totalized information can be displayed with 1,2 or 3 decimals or automatic adjustment (default).				
	6) Display unit : Flow unit				
	7) Weather protection class : IP 68				
	8) Accuracy : +/- 0.5%				
	9) RS 232 / RS 485Serial interface				
	10) Diagnostic : Continuous self test including coil current to drive the magnetic field signal input circuit, data calculation, handling and storing alarm statistics and logging for fault analyzing electrode impedance to check actual media contact, flow simulation to check pulse and communication signal chain for correct scaling number of sensor measurements (excitations)				
1	100 mm line size	Each	115634	13456	129090
2	150 mm line size	Each	124053	14435	138488
3	200 mm line size	Each	147548	17168	164716
4	250 mm line size	Each	162746	18936	181682
5	300 mm line size	Each	186151	21660	207811
6	350 mm line size	Each	258489	30077	288566
7	400 mm line size	Each	293385	34137	327522
8	450 mm line size	Each	313464	36474	349938
9	500 mm line size	Each	366216	42611	408827
<b>NOTE 1</b>	<b>Battery operated electromagnetic flow meter shall be considered for estimation and installation with prior approval from the Superintending Engineer (Mech.).</b>				
<b>NOTE 2</b>	<b>All erection of water meters must be done in presence &amp; guidance of manufacturers representative.</b>				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	<b>SECTION 19 - SA</b>				
	<b>[ SCADA &amp; AUTOMATION ]</b>				
<b>SA 1</b>	<b>Raw Water Pump house</b>				
<b>1.1</b>	<b>Ultrasonic level transmitter</b>				
<b>New Item</b>	Designing, Supplying, Installing, commissioning & testing of <b>Ultrasonic Raddar type level transmitter</b> CE marked with following technical parameters at Raw Water Pump House and Interfacing with PLC panel including mounting arrangement.	Each	56700	4746	61446
	Output-4-20 mA				
	Power supply - 24V DC ext.				
	Display - 4" LED				
	Range- 11 to ...20... mtrs				
	Accuracy - +/- 0.25% of Full Scale or better				
	Enclosure- IP 67				
	Mounting - On PLC panel				
<b>1.1</b>	<b>Ultrasonic level transmitter</b>				
	Designing, Supplying, Installing, commissioning & testing of <b>Ultrasonic Raddar type level transmitter</b> CE marked with following technical parameters at Raw Water Pump House and Interfacing with PLC panel including mounting arrangement.	Each	60307	4746	65053
	Output-4-20 mA				
	Power supply - 24V DC ext.				
	Display - 4" LED				
	Range- 21 to ...30... mtrs				
	Accuracy - +/- 0.25% of Full Scale or better				
	Enclosure- IP 67				
	Mounting - On PLC panel				
<b>1.2</b>	<b>Pressure Transmitter</b>	Each	32366	2215	34581
	Designing, Supplying, Installing, commissioning & testing of <b>pressure transmitter</b> CE markd with following technical parameters at Raw Water Pump House and Interfacing with PLC panel including mounting arrangement.				
	Output 4-20 mA				
	Power supply - 24V DC ext.				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	Display - 4" LED				
	Accuracy - +/- 0.1 % of full scale or better				
	Enclosure- IP 67				
<b>1.3</b>	<b>Power Analyser</b>	Each	29189	2089	31278
	Designing, Supplying, Installing, commissioning & testing of Power Analyser interfacing to PLC Panel with modbus communication port , as per IEC 62053 and in the prescribed format including mounting arrangement.				
<b>1.4</b>	<b>PLC Panel</b>				
	Designing, Supplying, Installing, commissioning & testing of PLC Panel. Including PLC with CPU & Power supply unit, power supply cables interfacing cards, interfacing cables, wireless modules with 25% extra quantity of all accessories.	Each	30690	1582	32272
<b>1.5</b>	<b>PLC based control monitoring and communication software</b>				
	Designing, Supplying, Installing, commissioning & testing of PLC based control monitoring and communication software as per IEC 61131 at Raw water Jackwell / Sump suitable for monitoring and control of Raw water Pumps, Pressure Transmitters, Level Transmitter, Flow Transmitter complete.	Each	42556	6327	48883
<b>1.6</b>	<b>Power Cable</b>				
	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of 2 C x 1.5 sq.mm as per IS 694 twisted shielded copper armoured conductor on wall in GI tray or in ground suitable for supplied D. C. Voltage.	As per MJP CSR			
<b>1.7</b>	<b>Communication Cable</b>				
	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of CAT 6 as per ISO/IEC-11801 std.cable for networking on wall in GI tray or on ground etc.	As per PWD CSR			
<b>1.8</b>	<b>Signal Cable</b>				
<b>1.8.1</b>	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of 2 Pair x 1 sq.mm as per IS 694 copper Shielded twisted, multistranded armoured cable on wall in GI tray or on ground.	Mtr	160	11	171
<b>1.8.2</b>	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of 3 Pairs x 1 sq.mm. as per IS 694 copper Shielded, twisted, multistranded armoured cable on wall in GI tray or on ground.	Mtr	204	13	217

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
1.8.3	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of <b>4.5 Pairs x 1.0 sq.mm</b> as per IS 694 copper shielded, twisted, multi stranded armoured cable on wall in GI tray or on ground.	Mtr	300	20	320
1.8.4	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of <b>8 Pairs x 1.0 sq.mm</b> as per IS 694 copper shielded, twisted, multi stranded armoured cable on wall in GI tray or on ground.	Mtr	526	48	574
1.9	<b>Surveillance System</b>				
	Designing, supplying, installing, commissioning & testing of CCTV IR water proof camera suitable for upto 100ft. with IR Dome camera, control key board, DVR, Hard Disk, cables, UPT transreceivers etc. complete.	Each	23905	1899	25804
SA 2	<b>Water Treatment Plant</b>				
	<b>Aeration Fountain</b>				
2.1	<b>Open channel type ultrasonic flowmeter with FIT</b>	Each	48437	3163	51600
	Design, Supply, Installation, Testing & calibration of open channel type ultrasonic flow Transmitter CE marked with following technical parameters at Raw Water channel and Interfacing with PLC panel including mounting arrangement.				
	Range- 0 - 5 mtrs				
	Output-4-20 mA				
	Power supply - 24V DC ext.				
	Display - 4" LED				
	Accuracy - +/- 0.25% of Full Scale or better				
	Enclosure- IP 68				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
2.2	<b>PH analyser</b>				
	Design, Supply, Installation, Testing of <b>pH analyser</b> as per IUPAC( International Union for Pure & Applied Chemistry)at A.F. and Interfacing with PLC panel including mounting arrangement. Range : 0 -14 , pH Accuracy : Better than 0.1% of full scale , Supply Voltage : 24V dc, Output : 4-20 mA As per IEC 61000-6-2 & IEC 61000-6-3	Each	92470	6327	98797
2.3	<b>Turbidity Analyser</b>				
2.3.1	Design, Supply, Installation, commissioning, testing of <b>Turbidity Analyser</b> as per ISO 7027 scattering light method at A.F. and Interfacing with PLC panel. Turbidity analyser shall comprises of 3 components i.e. sensors,signal distributor and transmitter with indicator. with 2 Outputs, 1 to PLC & another to Local Display with mounting arrangement.	Each	215460	23405	238865
	Overall Range : 0 - 2000 NTU				
	Accuracy : +/- 0.02 NTU				
	Supply Voltage : 230 V ac				
	Output : 4-20 mA				
2.3.2	<b>Alum / PAC Dosing</b>				
	Design, Supply, Installing commissioning and testing <b>PLC compatible</b> Alum/PAC Mixing, Dosing and monitoring system for Dosing at raw water channel by applying suitable mechanism to control the available turbidity in desired limit. This system includes level switches for tank.	Each	202145	14234	216379
2.4	<b>Level transmitter</b>				
	Designing,Supplying, installing, commissioning & testing of <b>Ultrasonic level transmitter CE marked at each filter bed</b> with following technical parameters Interfacing with PLC panel including mounting arrangement.	Each	46236	3163	49399
	Range- 0 - 5 mtrs				
	Output-4-20 mA				
	Power supply - 24V DC ext.				
	Display - 4" LED				
	Accuracy - +/- 0.25% of Full Scale or better				
	Enclosure- IP 65				



Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
2.5	<b>Power Analyser</b>				
	Designing, Supplying, Installing, commissioning & testing of <b>Power Analyser</b> interfacing to PLC Panel with modbus communicatuion port, <u>as per IEC 62053</u> and in the prescribed format including mounting arrangement.	Each	29189	2089	31278
2.6	<b>PLC Panel with HMI for Filter Bed</b>				
	Designing, Supplying, Installing, commissioning & testing of <b>PLC Panel with HMI</b> including PLC with CPU & Power supply unit, power supply cable, Interfacing cards, interfacing cables, wireless modules with 25 % extra quantity of all accessories.	Each	30690	1582	32272
2.7	<b>Master PLC Panel</b>				
A	Design, Supply, Installing, Commissioning & Testing of <b>Master PLC control monitoring and communication panel</b> as per IEC 61131 at Pure Water Sump suitable for monitoring and control of pure water Pumps. Pressure Transmitters, Level Transmitter, PH Transmitter, Turbidity Transmitter ,for all pumps installed. <b>Without Filter Control</b>	Each	48459	1582	50041
B	Design, Supply, Installing, Commissioning & Testing of <b>Master PLC control monitoring and communication panel</b> as per IEC 61131 at Pure Water Sump suitable for monitoring and control of pure water Pumps. Pressure Transmitters, Level Transmitter, PH Transmitter, Turbidity Transmitter ,for all pumps installed. <b>With Filter Control</b>	Each	58151	1582	59733

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
2.8	Control Cable				
2.8.1	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of 2 C x 1.5 sq.mm as per IS 694 twisted shielded copper armoured conductor on wall in GI tray or in ground suitable for supplied DC Voltage		As per MJP CSR		
2.8.2	Communication Cable				
	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of CAT 6 as per ISO/IEC-11801 std.cable for networking on wall in GI tray or on ground etc.		As Per PWD CSR		
2.9	Signal Cable				
2.9.1	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of 2 pair x 1.0 sq.mm. as per IS 694 copper shielded, twisted, multistranded armoured cable on wall in GI tray or on ground.		As per MJP CSR SA 1.8.1		
2.9.2	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of 3 pair x 1.0 sq.mm. as per IS 694 copper shielded, twisted, multistranded armoured cable on wall in GI tray or on ground.		As per MJP CSR SA 1.8.2		
2.9.3	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of 4.5 pair x 1.0 sq.mm. as per IS 694 copper shielded, twisted, multistranded armoured cable on wall in GI tray or on ground.		As per MJP CSR SA 1.8.3		
2.9.4	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of 8 pair x 1.0 sq.mm. as per IS 694 copper shielded, twisted, multistranded armoured cable on wall in GI tray or on ground.		As per MJP CSR SA 1.8.4		
3	Blower				
3.1	Pressure Transmitter for Blower				
	Designing, Supplying, Installing, commissioning & testing of pressure transmitter CE markd with following technical parameters at Blower delivery and Interfacing with PLC panel.		As per MJP CSR SA 1.1.2		

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
3.2	Ultrasonic Level Transmitter for Wash Water Tank				
	Designing, Supplying, Installing, commissioning & testing of Ultrasonic level transmitter CE marked with following technical parameters and Interfacing with PLC panel including Mounting accessories.	Each	46236	3163	49399
	Range- 0 - 5 mtrs				
	Output-4-20 mA				
	Power supply - 24V DC ext.				
	Display - 4" LED				
	Accuracy - +/- 0.25% of Full Scale or better				
	Enclosure- IP 65				
3.3	Priming arrangement				
	Desidning,supplying,installing,commissioning & testing with complete priming arrangements for centrifugal pumps as applicable & as required shall be done with interface with PLC panels & further to SCADA system.	Each	79436	12399	91835
3.4	Surveillance system				
	Desiging,supplying,installing,commissioning & testing of CCTV IR water proof camera suitable for upto 100ft.with IR Dome camera,control key board,DVR,Hard Disk,cables,UPT transreceivers etc.complete.	Each	23905	1899	25804
SA 3	Flash Mixer & Clariflocculator				
	Designing,Supplying,Installing,commissioning & testing with operation, controlling & Monitoring of Flash Mixer and Clarifloccutor mechanism interfaced with Master PLC of WTP	Each	23529	1582	25111

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
SA 4	Valves with actuator				
	Design, Supply, Installation, Testing of <b>Motor Actuated Valve / Gate</b> at all required sizes and places of filter beds, Clarifier Drains, blowers and Interfacing with PLC panel, Supply Voltage : 415 V ac, Manual Operation : Hand wheel Position Indication : 01 Nos. Limit Switch for open, close Overload Protection : Torque Overload Limit Switch		As Per MJP MECH CSR		
SA 5	Pure Water Pump house				
5.1	Ultrasonic level transmitter				
	Designing, Supplying, Installing, commissioning & testing of <b>Ultrasonic level transmitter</b> CE marked with following technical parameters at pure Water Pump House and Interfacing with PLC panel including Mounting accessories.	Each	46236	3163	49399
	Range- 0 - 5 mtrs				
	Output-4-20 mA				
	Power supply - 24V DC ext.				
	Display - 4" LED				
	Accuracy - +/- 0.25% of Full Scale or better				
	Temp.- With Inbuilt temp compensation				
	Enclosure- IP 65 weatherproof				
	Mounting - Top/above FSL of Tank				
5.2	Pressure Transmitter				
	Designing, Supplying, Installing, commissioning & testing of <b>pressure transmitter</b> CE marked with following technical parameters at Raw Water Pump House and Interfacing with PLC panel including Mounting arrangement.	Each	32366	2215	34581
	Output 4-20 mA				
	Power supply - 24V DC ext.				
	Display - 4" LED				
	Accuracy - +/- 0.1 % of full scale or better				
	Enclosure- IP 67				
5.3	pH analyser				

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
	Design, Supply, Installation, Testing of pH Analyser as per IUPAC ( International Union for Pure & Applied Chemistry)at A.F. and Interfacing with PLC panel including Mounting arrangement. Range : 0 -14 , pH Accuracy : Better than 0.5% of full scale , Supply Voltage : 24V dc, Output : 4-20 mA As per IEC 61000-6-2 & IEC 61000-6-3	Each	92470	6327	98797
5.4	<b>Turbidity meter / analyser</b>				
	Design, Supply, Installation, Commissioning & Testing of Turbidity Analyser as per ISO 7027 scattering light method at A.F. and Interfacing with PLC panel. Turbidity Analyser shall comprises of 3 components i.e. sensors,signal distributor and transmitter with indicator with 2 outputs, 1 to PLC & another to local display including Mounting arrangement. Overall Range : 0 - 100 NTU Accuracy : +/- 0.02 NTU Supply Voltage : 230 V ac Output : 4-20 mA	Each	179678	12652	192330
5.5	<b>Residual chlorine analyser</b>				
	Design, Supply, Installation,Testing of <b>Residual chlorine analyser / meter</b> must have automatic sensor cleaning facility at pure water sump and Interfacing with PLC panel. Residual Chlorine meter shall comprises of 3 components i.e. sensors,flow through assembly and transmitter with indicator and gives 2 outputs one to Local display & other to PLC including Mounting arrangement. Overall Range : 0 - 8 mg/l (ppm) Accuracy : 2% of full scale Supply Voltage : 230 V ac Output : 4-20 mA Membrane free sensor of 2 gold plated electrodes for long term stability and reference electrode (ag/Agcl) <b>must be</b> provided to avoid maintenance. IP 65 Nema 4 housing protection class requird.	Each	242187	15815	258002
5.6	<b>Power Analyzer</b>				
	Designing, Supplying, Installing, commissioning & testing of <b>Power Analyzer interfacing to PLC Panel with Modbus Communication Port, as per IEC 62053</b> and in the prescribed format including Mounting arrangement.		29189	2089	31278

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
5.7	<b>PLC Panel</b>				
	Designing, Supplying, Installing, commissioning & testing of <b>PLC Panel</b> including PLC with CPU & Power supply unit, power supply cable, Interfacing cards, interfacing cables, wireless modules with 25 % extra quantity of all accessories.	Each	30690	1582	32272
5.8	<b>PLC based control monitoring and communication software</b>				
	Design, Supply, Installing,Testing, PLC based <b>control monitoring and communication panel</b> as per IEC 61131 at Pure Water Sump suitable for monitoring and control of pure water Pumps. Pressure Transmitters, Level Transmitter, PH Transmitter, Turbidity Transmitter,residual chlorine analyser ,for all pumps installed.	Each	42556	6327	48883
5.9	<b>Surveillance system</b>				
	Designing,supplying,installing,commissioning & testing of CCTV IR water proof camera suitable for upto 100ft.with IR Dome camera,control key board,DVR,Hard Disk,cables,UPT transreceivers etc.complete.	Each	23905	1899	25804
SA 6	<b>SCADA Software</b>				
6.1	Supply, Installation, Commissioning, Testing, Terminating & Interfacing Software Design to PLC and commissioning of <b>SCADA software with required hard tags plus 25% extra and with unlimited soft Tags &amp; life time licence Development version</b>	Each	227861	25303	253164
6.2	Developing/programming charges to install the software as per logic defined by the dept.	Each	133745	18978	152723
6.3	Supply, Installation, Testing, Terminating & <b>Interfacing Centralised Historian Server grade Historian PC with Window 7 or latest window operating system &amp; Historian software development cost etc. complete</b>	Each	70587	4746	75333
6.4	Supply, Installation, Testing, Terminating & Interfacing <b>Secondary Computer Station</b> Secondary computer station etc.	Each	55614	4113	59727

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
6.5	Supply, Installation, Testing, Intgeration & Commissioning of 46" LCD monitor at Conf. Room for display of total water system (Online)	Each	73663	5694	79357
SA7	MBR / GSR / ESR				
	Providing, installing, testing and commissioning of following equipments with satisfactory test and trial etc.as per detailed specification attached				
7.1	Ultrasonic level transmitter	Each	46236	3163	49399
	Medium- Water				
	Range- 0 - 5 mtrs				
	Output-4-20 mA				
	Power supply - 24V DC ext.				
	Display - Large LED				
	Accuracy - +/- 0.25% of Full Scale or better				
	Enclosure- IP 65				
7.2	PLC Panel suitable for Wireless communication				
	Designing, supplying, Installing commissioning & testing of following equipments with satisfactory test and trial of PLC Panel control, monitoring and communication system along with PLC Panel at Central monitoring system.	Each	143548	11071	154619

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
7.3	Solar Panel with Battery				
	Designing, Supplying, installing commissioning & testing of photovoltaic solar panel with its charger, MS Stand for mounting solar panel so as to have maximum exposure of sunlight for desired location and maintenance free battery with 3 days battery backup.	Each	14765	1139	15904
SA 8 (I)	ESR Management Systems (RMS)				
	( For Inlet / outlet)				
	Designing, Supplying, Installing, Commissioning & testing of <b>Flow Control Valve</b> for inlet with flow measuring, flow controlling, pressure monitoring & web based with cable, PLC etc. complete				
SA8-1	80 mm Dia	Each	112989	12652	125641
SA8-2	100 mm Dia	Each	121967	12652	134619
SA8-3	150 mm Dia	Each	160669	12652	173321
SA8-4	200 mm Dia	Each	205269	12652	217921
SA8-5	250 mm Dia	Each	277340	12652	289992
SA8-6	300 mm Dia	Each	328729	12652	341381
SA8-7	350 mm Dia	Each	421104	12652	433756
SA8-8	400 mm Dia	Each	551998	12652	564650
SA8-9	450 mm Dia	Each	591266	12652	603918
SA8-10	500 mm Dia	Each	776053	12652	788705
SA8-11	600 mm Dia	Each	1116377	12652	1129029
SA 8 (II)	( Pressure Reducing valve )				
	Designing, Supplying, Installing, Commissioning & testing of Pilot operated hydraulically controlled Pressure reducing Valve for ESR/MBR outlet or distribution with pressure controlling / limiting application which maintains a constant downstream pressure regardless of fluctuations in inlet pressure or flow with fixed set points inclusive of all the accessories like pressure gauge etc. complete as per given specifications				
a	80 mm	Each	54158	12652	66810



Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
b	100 mm	Each	58682	12652	71334
c	150 mm	Each	105362	12652	118014
d	200 mm	Each	160345	12652	172997
e	250 mm	Each	246484	12652	259136
f	300 mm	Each	335116	12652	347768
g	350 mm	Each	408971	12652	421623
h	400 mm	Each	600164	12652	612816
i	450 mm	Each	740453	12652	753105
j	500 mm	Each	976870	12652	989522
k	600 mm	Each	1335397	12652	1348049
<b>SA 8 (III)</b>	<b>( Flow cum Altitude Control valve )</b>				
	Designing, Supplying, Installing, Commissioning & testing of Pilot operated hydraulically controlled Flow Limiting cum Altitude Control Valve for ESR/MBR Inlet with level controlling and flow limiting application which Maintains a constant downstream rate of flow regardless of fluctuations in inlet pressure or flow. Also, closes on high reservoir level (FSL). Opens when reservoir level drops with fixed set points inclusive of all accessories like integral Float Arrangement, pressure gauge etc. complete..as per specs				
a	80 mm	Each	101522	12652	114174
b	100 mm	Each	115158	12652	127810
c	150 mm	Each	162131	12652	174783
d	200 mm	Each	215164	12652	227816
e	250 mm	Each	284865	12652	297517
f	300 mm	Each	387901	12652	400553
g	350 mm	Each	571285	12652	583937
h	400 mm	Each	740350	12652	753002
i	450 mm	Each	976614	12652	989266

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
j	500 mm	Each	1364714	12652	1377366
k	600 mm	Each	1575849	12652	1588501
SA 8 (IV)	( Solonoid operated On / Off Valve with timer Controller ) 80 mm to 600 mm				
	Solonoid Operated On/Off Valve with Timer Controller - Designing, Supplying, Installing, Commissioning & testing of Solonoid operated hydraulically controlled On/Off Valve with Timer Controller for ESR outlet with time based On-Off application which performs Opening and Closing operations on pre -set timings. The valve should offer minimum restriction while allowing the flow inclusive of all the accesories like inbuilt timer controller, batteries etc. complete... as per given specifications				
a	80 mm	Each	80517	12652	93169
b	100 mm	Each	87593	12652	100245
c	150 mm	Each	134331	12652	146983
d	200 mm	Each	189010	12652	201662
e	250 mm	Each	275149	12652	287801
f	300 mm	Each	363781	12652	376433
g	350 mm	Each	441634	12652	454286
h	400 mm	Each	628829	12652	641481
i	450 mm	Each	832696	12652	845348
j	500 mm	Each	1005535	12652	1018187
k	600 mm	Each	1374582	12652	1387234

Section & Code No.	Description	Unit	Supply Rate Rs	Erection Rate Rs	Total Amt Rs.
SA11	Comprehensive O & M				
	Operation and Maintenance Charges of the whole water supply scheme on SCADA and generation of daily report of water quality parameters and electrical parameters with specific consumption in kWh/ml . The report shall be mailed daily to the head quarters for monitoring purpose.				
1	During First year		Free		
2	During Second year		3% of total cost		
3	During Third year		5% of total cost		
4	During Fourth year		7% of total cost		
5	During Fifth year		7% of total cost		
6	During Sixth year		7% of total cost		
NOTE -	The makes other than approved list shall be got approved from The Superintending Engineer (Mech.)				

Code No	Description	For Removing	For Dismantling	For Assembling	For Re-erection
	<b>SECTION 20 - LB Labour Charges</b>				
<b>Note</b>	The rates in this schedule are stated as percentage of rate for erection given in Section 1, 7, 14, 15 and Section of Civil CSR as applicable.				
<b>LB 1</b>	Labour charges for removing, disassembling, assembling and re-erection of pumps				
LB 1-1	Submersible pump set	80%	10%	20%	90%
LB 1-2	Monoblock pump motor set	25%	10%	20%	30%
LB 1-3	Rotating assembly of H.S. casing pump	-	20%	30%	-
LB 1-4	Coupled pump (without motor ) Not applicable for HS casing Pump	10%	15%	30%	30%
LB 1-5	Vacuum pump ( Monoblock )	25%	10%	20%	30%
LB 1-6	Vacuum pump (Coupled with out motor )	10%	15%	30%	30%
LB 1-7-a	Vertical Turbine pump (upto 6 stage)( Without motor)	60%	15%	30%	90%
LB 1-7-b	Vertical Turbine pump (above 6 stages & upto 12 stages)( Without motor)	70%	25%	35%	90%
LB 1-8	Conventional sewage pump ( Without motor)	65%	65%	50%	50%
LB 1-9	Submersible sewage pump	20%	40%	40%	10%
<b>LB 2</b>	<b>Motor</b>	20%	15%	20%	25%
<b>LB 3</b>	<b>Transformer</b>				
LB 3-1	Up to 315 kVA capacity	70%	20%	35%	90%
LB 3-2	Above 315 to 750 kVA	80%	20%	35%	90%
<b>LB 4</b>	<b>Valves</b>				
LB 4	Sluice Valve , Non return valve , butter fly valve and air valve	40%	50%	50%	60%
<b>Note</b>	1) Above rates are exclusive of transportation charges of equipments				
	2) Rates of re-erection are inclusive of jointing materials but excluding cost of fasteners				
	3) For removing and re-erection of transformer by using crane, rates mentioned above are not applicable				

CABLE SECTION CHART							
Sr. No.	Conductor Size in Sq.mm.	Aluminium Conductor PVC insulated cable				Plain Copper Conductor PVC insulated flexible cable	
		(Maximum) in Ground		(Minimum) in Duct		Current Carrying Capacity in Amp	
no.	no.	Single Core	Multi Core	Single Core	Multi Core	Single Core	Multi Core
1	1.5	18	16	16	14	15	14
2	2.5	25	21	21	18	20	19
3	4	32	28	27	23	27	26
4	6	40	35	34	30	46	42
5	10	55	46	45	39	46	42
6	16	70	60	58	50	62	57
7	25	90	76	76	63	80	71
8	35	110	98	92	77	102	91
9	50	135	110	115	95	138	120
10	70	160	135	140	115	214	165
11	95	190	165	170	140	254	200
12	120	210	185	190	155	300	225
13	150	240	210	210	175	340	-
14	185	275	235	240	200	390	-
15	240	320	275	275	235	460	-
16	300	355	305	305	260	-	-
17	400	385	335	345	290	-	-

#### HP Vs Current

Approximate full load current for submersible pump motor, 3 phase, 50 cycles, 415-425 V.

HP	AMP
5.0	7.5
7.5	11.0
10.0	14.9
12.5	18.9
15.0	22.5
17.5	25.2
20.0	28.4

HP	AMP
25.0	35.6
30.0	42.3
35.0	50.4
40.0	62.1
50.0	67.5
55.0	73.8

XLPE Cable Selection Chart							
Sr. No.	Conductor Size in	Current Carrying Capacity in AMP				Approximate Wt. of Cable Kg/Mtr.	Approximate Wt. of Cable Kg/Mtr.
		Single Core		3 Core			
		In Ground	In Air	In Ground	In Air		
1	25	-	-	93	100	-	-
2	35	115	140	110	120	3.470	59
3	50	135	170	130	145	3.830	62
4	70	135	210	150	180	4.330	66
5	95	200	255	190	220	4.940	70
6	120	225	295	215	255	5.580	75
7	150	255	335	240	285	6.180	78
8	185	285	385	270	330	6.820	82
9	350	330	455	315	385	8.040	89
10	300	375	520	355	440	9.080	94
11	400	425	610	405	510	10.240	101
12	500	480	700	455	590	12.170	108
13	630	550	830	-	-	-	-
14	800	650	950	-	-	-	-
15	1000	690	1080	-	-	-	-
<p><b>Note</b> Standard current carrying capacities are mentioned in the table for fixed basic assumptions, however for actual field conditions necessary de-rating factor should be applied for ambient temperature method of laying, etc.</p> <p>Std. weight and overall dimensions are given in the table and the same should be considered for designing width and size of trench / duct / cable tray for PVC and XLPE cables.</p>							

## Recommended Height of the Pump House

### A) For V.T. Pumps

#### i) Single floor pump house

Sr. No.	HP of Pump	Pump Floor to corbel top	Corbel top to roof slab bottom	Pump floor to bottom of roof slab Total	Lifting Equipments
1	Upto 50 HP	-	-	5.5 m	Monorail
2	From 51 HP to 150 HP	5 m	1.5 m	6.5 m	HOT
3	From 151 HP to 300 HP	5.5 m	1.5 m	7 m	HOT
4	From 301 HP to 500 HP	5.5 m	2 m	7.5 m	EOT
5	501 HP and above	5.5 m	2.5 m	8 m	EOT

#### ii) Double floor pump house

Generally double floor arrangement shall be provided for the delivery pipes of ;diameter 350 mm or above

The height of pump house shall be as below

Pump floor to Panel floor	2.5 m
Panel floor to Corbel	5 m
Corbel to bottom of roof slab	2.5 m

### B) For Centrifugal and Submersible Pumps

Sr. No.	HP of Pump	Pump Floor to corbel top	Corbel top to roof slab bottom	Pump floor to bottom of roof slab Total	Lifting Equipments
1	Upto 150 HP	-	-	4 m	Monorail
2	From 151 HP to 300 HP	3.5 m	1.5 m	5 m	HOT
3	301 HP and above	4 m	2.5 m	6.5 m	EOT



**Nature's Most Precious Resources**

**Water & Energy**

**SAVE Water & Energy**

**SAVE Nature**

