



MAHARASHTRA JEEVAN PRADHIKARAN

(Government of Maharashtra Undertaking)

SCHEDULE OF RATES 2019 - 20

(Electrical & Mechanical Works)

Effective from 01 / 06 / 2019

Applicable for All Regions



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FOR YEAR 2019-20

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APPLICABLE IN

ALL REGIONS OF MAHARASHTRA

ELECTRICAL AND MECHANICAL WORKS

sd/-

Member Secretary

Maharashtra Jeevan Pradhikaran

MAHARASHTRA JEEVAN PRADHIKARAN ELECTRICAL & MECHANICAL CSR 2019-20 C O N T E N T S

Section No.	Name of Section	Page Nos.	
		From	To
	Notes	(ii)	(iii)
1	PM Pumps	01	09
2	SP Solar Pumps	10	10
3	VL & VA Glandless Valves & Valve Actuators	11	13
4	PW Pipe Work and Vessels	14	16
5	LF Lifting Equipments	17	19
6	SS H.T. Sub-station Equipments	20	28
7	TR Transformer and Voltage Stabilizer	29	36
8	LT L.T. Panel	37	46
9	CP Capacitor	47	47
10	LG LT Switchgear and Protection	48	51
11	HG HT Switchgear and Protection	52	55
12	CB LT Cable	56	60
13	HT HT Cable	61	68
14	MO LT Motors	69	70
15	MO HT Motors	71	72
16	TL Tools	73	74
17	EC Electro Chlorination System & GC Fully Automatic Gas Chlorination System	75	77
18	WM Water Meter	78	102
19	SA SCADA & Automation	103	119
20	LB Removing ,Dismantling, Assembling & Re-erection	120	120
21	Cable Selection Chart & HP V/s Current	121	122
22	Recommended Height of Pump House	123	123
23	Capacitor Chart	124	124
24	Transformer Losses Chart	125	126

MAHARASHTRA JEEVAN PRADHIKARAN

MJP ELECT. / MECH. CSR 2019-20

NOTES

1. The rates in this CSR are applicable for Electrical and 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 M.S.E.D.Co. Ltd 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.2,000/-
ii) Inspection charges of third party agency approved by MJP for any or all test at manufacturer's work.	0.16% OR	minimum Rs.2,000/-

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.
- 9. While preparing the Estimate, factor for economy of scale shall be used as below -
 - 1) For individual items costing total amount Rs. 10 lakh to 50 lakhs, 5% less shall be adopted on the CSR rate of that individual item.
 - 2) For individual items costing total amount beyond Rs. 50 lakh, 10% less shall be adopted on the CSR rates.

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 1 - PM [PUMPS]				
PM1	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.				
PM 1-1	Submersible Pump set 100 mm dia (with Polypropylene / Noryl Impeller) up to 20 stages				
PM 1-1-1	1.5 HP	Each	15572	3484	19056
PM 1-1-2	2.0 HP	Each	16149	3484	19633
PM 1-1-3	2.5 HP	Each	17892	3484	21376
PM 1-1-4	3.0 HP	Each	18207	3484	21691
PM 1-1-5	4.0 HP	Each	19091	3484	22575
PM 1-1-6	5.0 HP	Each	24654	3484	28138
Note 1	Supply rate should be increased by Rs. 200/-per stage for pump with more than 20 stages				
PM 1-2	Submersible Pump 150 mm dia (with Bronze / Stainless steel (CF8M) Impeller) up to 8 stages				
PM 1-2-1	1.5 HP	Each	20889	3484	24373
PM 1-2-2	2.0 HP	Each	21987	3484	25471
PM 1-2-3	3.0 HP	Each	23615	3484	27099
PM 1-2-4	4.0 HP	Each	24465	3484	27949
PM 1-2-5	5.0 HP	Each	25725	3484	29209
PM 1-2-6	6.0 HP	Each	28203	4538	32741
PM 1-2-7	7.5 HP	Each	29474	4538	34012
Note 2	Supply rate should be increased by Rs. 600/- per stage for pump with more than 8 stages				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
PM 1-2	Submersible Pump 150 mm dia (with Bronze / Stainless steel(CF8M) Impeller) up to 12 stages				
PM 1-2-8	8.0 HP	Each	33551	5047	38598
PM 1-2-9	9.0 HP	Each	33852	5047	38899
PM 1-2-10	10.0 HP	Each	35993	5047	41040
PM 1-2-11	11.0 HP	Each	39180	5047	44227
PM 1-2-12	12.5 HP	Each	39129	5836	44965
PM 1-2-13	15.0 HP	Each	41379	5836	47215
Note 3	Supply rate should be increased by Rs. 600/- per stage for pump with more than 12 stages				
PM 1-2	Submersible Pump 150 mm dia (with Bronze / Stainless steel(CF8M) Impeller) up to 15 stages				
PM 1-2-14	17.5 HP	Each	45478	6626	52104
PM 1-2-15	20.0 HP	Each	53405	6626	60031
PM 1-2-16	22.5 HP	Each	65918	6626	72544
Note 4	Supply rate should be increased by Rs. 600/- per stage for pump with more than 15 stages for Borewell only .				
	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				
PM 1-3	Submersible Pump 200 mm dia (with Bronze / Stainless steel (CF8M) Impeller) up to 5 stages of category A & B				
PM 1-3-1	7.5 HP	Each	28898	4538	33436
PM 1-3-2	10.0 HP	Each	33676	5047	38723
PM 1-3-3	12.5 HP	Each	36818	5836	42654
Note 5	Supply rate should be increased by Rs. 1900/- per stage for pump with more than 5 stages				
PM 1-3	Submersible Pump 200 mm dia (with Bronze /Stainless steel (CF8M) Impeller) up to 8 stages of category A & B				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
PM 1-3-4	15.0 HP	Each	50831	6626	57457
PM 1-3-5	17.5 HP	Each	53859	6626	60485
PM 1-3-6	20.0 HP	Each	59570	6626	66196
PM 1-3-7	22.5 HP	Each	66902	6626	73528
PM 1-3-8	25.0 HP	Each	66957	6626	73583
PM 1-3-9	27.5 HP	Each	77990	6626	84616
Note 6	Supply rate should be increased by Rs. 1900/- per stage for pump with more than 8 stages				
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	52574	6626	59200
PM 1-4-2	20.0 HP	Each	56175	6627	62802
PM 1-4-3	22.5 HP	Each	71925	6628	78553
PM 1-4-4	25.0 HP	Each	75261	6629	81890
PM 1-4-5	30.0 HP	Each	76632	6630	83262
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	13519	3484	17003
PM 1-5-2	5.0 HP	Each	15033	4010	19043
PM 1-5-3	7.5 HP	Each	27417	4538	31955
PM 1-5-4	10 HP	Each	32878	4538	37416
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.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
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. 7500/- shall be added in additional to supply rate.				
PM 2	Centrifugal Monoblock Pump set				
	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.				
PM 2-1	Centrifugal Monoblock Pump set (Single Stage)				
PM 2-1-1	2.0 HP	Each	11441	2450	13891
PM 2-1-2	3.0 HP	Each	13869	2450	16319
PM 2-1-3	5.0 HP	Each	16953	3220	20173
PM 2-1-4	7.5 HP	Each	20654	3220	23874
PM 2-1-5	10.0 HP	Each	27359	3220	30579
PM 2-1-6	12.5 HP	Each	33344	4010	37354
PM 2-1-7	15.0 HP	Each	36391	4010	40401
PM 2-1-8	20.0 HP	Each	52466	4010	56476
PM 2-1-9	25.0 HP	Each	69012	4010	73022
PM 2-1-10	30.0 HP	Each	85447	4010	89457
PM 2 -2	Centrifugal Monoblock Pump set (Two Stage)				
PM 2-2-1	5.0 HP	Each	19211	3220	22431
PM 2-2-2	7.5 HP	Each	23338	3220	26558
PM 2-2-3	10.0 HP	Each	30939	3220	34159
PM 2-2-4	12.5 HP	Each	38193	4010	42203
PM 2-2-5	15.0 HP	Each	45431	4010	49441
PM 2-2-6	20.0 HP	Each	50652	4010	54662

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
PM 3	Centrifugal Coupled Pump set				
	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.				
PM 4	Centrifugal Coupled Pump set -- Erection charges				
	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		4594	4594
PM 4-2	31 to 50 HP	Each		5498	5498
PM 4-3	51 to 100 HP	Each		6551	6551
PM 4-4	101 to 150 HP	Each		7850	7850
PM 4-5	151 to 200 HP	Each		9149	9149
PM 4-6	201 to 250 HP	Each		10466	10466
PM 4-7	251 to 300 HP	Each		12554	12554
PM 4-8	More than 300 HP	HP		58	58
PM 5	Vacuum Pump set (Monoblock)				
	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	20408	2450	22858
PM 5-2	3 HP, three Ph (Type kV 30)	Each	38267	2450	40717

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
PM 6	Vacuum Pump set (Coupled)				
	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	74829	3541	78370
PM 6-2	10 HP (Type DV 50)	Each	92788	3541	96329
Note 9	Cost of starters, cable, switches, suitable GI Pipe with coupling and specials, valves etc shall be added as per CSR.				
PM 7	V.T. Pumps, Water / Oil lubricated				
	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.				
PM 8	V.T. Pump erection charges (For column length up to 6 m)				
	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		5705	5705
PM 8-2	31 HP to 100 HP	Each		8507	8507
PM 8-3	101 HP to 200 HP	Each		11764	11764
PM 8-4	201 HP to 300 HP	Each		15698	15698
PM 8-5	above 300 HP	HP		58	58

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
Note 10	For column length more than 6m additional rate per column joint				
	100 mm dia column pipe	Joint		172	172
	150 mm dia column pipe	Joint		323	323
	200 mm dia column pipe	Joint		360	360
	300 mm dia column pipe	Joint		492	492
	350 mm dia column pipe	Joint		642	642
	400 mm dia column pipe	Joint		793	793
	450 mm dia column pipe	Joint		981	981
	500 mm dia column pipe	Joint		1057	1057
	600 mm dia column pipe and above	Joint		1264	1264
Note 11	Add 5 % for erection of oil lubricated pumps				
Note 12	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).				
Note 13	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.				
PM 9	Sewage Pump				
	Sewage Pumps -Supplying Non-clog Submersible Pump suitable for sewage/ Liquid waste application with standard MOC and given duty points as below				
	Head upto 10 Mtrs				
PM 9-1-1	1 HP (Up to 9000 LPH)	Each	57750	4594	62344
PM 9-1-2	2 HP (Up to 12000 LPH)	Each	58167	4594	62761
PM 9-1-3	3 HP (Up to 18000 LPH)	Each	77910	4594	82504
PM 9-1-4	5 HP (Up to 35000 LPH)	Each	90300	4594	94894
PM 9-1-5	7.5 HP (Up to 72000 LPH)	Each	94500	4594	99094
PM 9-1-6	10 HP (Up to 90000 LPH)	Each	134400	4594	138994
PM 9-1-7	15 HP (Up to 132000 LPH)	Each	162750	4594	167344
PM 9-1-8	20 HP (Up to 192000 LPH)	Each	231000	4594	235594
PM 9-1-9	25 HP (Up to 228000 LPH)	Each	278250	4594	282844
PM 9-1-10	30 HP (Up to 240000 LPH)	Each	333900	4594	338494
PM 9-1-11	35 HP (Up to 276000 LPH)	Each	404250	6024	410274

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
PM 9-2	Head upto 20 Mtrs				
PM 9-2-1	7.5 HP (Up to 36000 LPH)	Each	90563	4594	95157
PM 9-2-2	10 HP (Up to 48000 LPH)	Each	120750	4595	125345
PM 9-2-3	15 HP (Up to 60000 LPH)	Each	162750	4596	167346
PM 9-2-4	20 HP (Up to 90000 LPH)	Each	231000	4597	235597
PM 9-2-5	25 HP (Up to 120000 LPH)	Each	278250	4598	282848
PM 9-2-6	30 HP (Up to 168000 LPH)	Each	319448	4599	324047
PM 9-2-7	35 HP (Up to 216000 LPH)	Each	365280	6024	371304
PM 9-3	Head upto 30 Mtrs				
PM 9-3-1	10 HP (Up to 18000 LPH)	Each	122850	4594	127444
PM 9-3-2	15 HP (Up to 27000 LPH)	Each	172534	4595	177129
PM 9-3-3	20 HP (Up to 36000 LPH)	Each	198071	4596	202667
PM 9-3-4	25 HP (Up to 54000 LPH)	Each	278250	4597	282847
PM 9-3-5	30 HP (Up to 78000 LPH)	Each	319448	4598	324046
PM 9-3-6	35 HP (Up to 120000 LPH)	Each	348476	6024	354500
PM 10	Sewage Pump, Erection charges				
	Erection and giving test and trial for directly coupled sewage pump set on provided foundation.				
PM 10-1	Up to 30 HP	Each		4594	4594
PM 10-2	31 HP to 100 HP	Each		6024	6024
PM 10-3	101 HP to 200 HP	Each		8507	8507
PM 10-4	201 HP to 300 HP	Each		11500	11500
PM 10-5	Above 300 HP	HP		58	58
Note 14	Add 25 % to above rates in case of submersible sewage pump set including guide rail etc or extended shaft of sewage pump.				
Note 15	Erection of pumpset (Above 100 HP) must be done in presence & guidance of manufacturers representative.				
PM 11	Pressure gauges				
	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	690	67	757
PM 11-2	Pressure gauge (150 mm dia)	Each	794	67	861

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	Glycerine Filled Pressure gauge Bourdon's type as IS 3624:1987				
	Mounting - direct bottom, stainless steel body, toughened glass window				
PM 11-3	Pressure gauge 100 mm dia (black & red marking)	Each	1100	67	1167
PM 11-4	Pressure gauge 150 mm dia	Each	1626	67	1693
PM 12	Vacuum / Combination gauge				
	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	803	67	870
PM 12-2	Vacuum / Combination gauge - 150 mm dia	Each	908	67	975
PM 13	Foot Valve				
	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.				
	Screwed Type				
PM 13-1	50 mm	Each	392	125	517
PM 13-2	65 mm	Each	522	125	647
PM 13-3	80 mm	Each	668	125	793
PM 13-4	100 mm	Each	1028	240	1268
PM 13-5	125 mm	Each	1582	240	1822
PM 13-6	150 mm	Each	2300	240	2540
	Flanged Type				
PM 13-7	50 mm	Each	1058	452	1510
PM 13-8	65 mm	Each	1246	452	1698
PM 13-9	80 mm	Each	1417	452	1869
PM 13-10	100 mm	Each	1946	588	2534
PM 13-11	125 mm	Each	3252	588	3840
PM 13-12	150 mm	Each	4745	588	5333

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.
	SECTION 3- VA				
	[VALVES & ACTUATORS]				
	SECTION 3 A- VL [Glandless VALVE]				
VL 1	<u>Glandless CIDF Sluice Valves - PN - 1.0</u> Providing, erecting, testing and commissioning C.I. Glandless Sluice valve suitable for working pressure of 10 kg/cm ² with standard non rising spindle, handwheel, cap etc and manufactured as per IS 2906/14846 and as per detailed specifications.				
VL 1-1	50mm	As per MJP CSR			
VL 1-2	65mm				
VL 1-3	80mm				
VL 1-4	100mm				
VL 1-5	125mm				
VL 1-6	150mm				
VL 1-7	200mm				
VL 1-8	250mm				
VL 1-9	300mm				
VL 1-10	350mm				
VL 1-11	400mm				
VL 1-12	450mm				
VL 1-13	500mm				
VL 1-14	600mm				
VL 2	<u>Glandless CIDF Sluice Valve PN - 1.6</u> Providing, erecting, testing and commissioning C.I. Glandless Sluice valves suitable for working pressure of 16 kg/cm ² with standard non rising spindle, handwheel, cap etc and manufactured as per IS 2906/14846 and as per detailed specifications.				
VL 2-1	50mm	As per MJP CSR			
VL 2-2	65mm				
VL 2-3	80mm				
VL 2-4	100mm				
VL 2-5	125mm				
VL 2-6	150mm				
VL 2-7	200mm				
VL 2-8	250mm				
VL 2-9	300mm				
VL 2-10	350mm				
VL 2-11	400mm				
VL 2-12	450mm				
VL 2-13	500mm				
VL 2-14	600mm				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
VL 3	Glandless DIDF Sluice Valves - PN - 1.0 Providing, erecting, testing and commissioning D.I. Glandless Sluice valves suitable for working pressure of 10 kg/cm2 with standard non rising spindle, handwheel, cap etc and manufactured as per IS 2906/14846. As per detailed specifications.				
VL 3-1	50mm	As per MJP CSR			
VL 3 -2	65mm				
VL 3 -3	80mm				
VL 3 -4	100mm				
VL 3 -5	125mm				
VL 3 -6	150mm				
VL 3 -7	200mm				
VL 3 -8	250mm				
VL 3 -9	300mm				
VL 3 -10	350mm				
VL 3 -11	400mm				
VL 3 -12	450mm				
VL 3 -13	500mm				
VL 3 -14	600mm				
VL 4	Glandless DIDF Sluice Valves - PN - 1.6 Providing,erecting,testing and commissioning D.I. Glandless Sluice valves suitable for working pressure of 16 kg/cm2 with standard non rising spindle, handwheel, cap etc and manufactured as per IS 2906/14846.				
VL 4-1	50mm	As per MJP CSR			
VL 4-2	65mm				
VL 4-3	80mm				
VL 4-4	100mm				
VL 4-5	125mm				
VL 4-6	150mm				
VL 4-7	200mm				
VL 4-8	250mm				
VL 4-9	300mm				
VL 4-10	350mm				
VL 4-11	400mm				
VL 4-12	450mm				
VL 4-13	500mm				
VL 4-14	600mm				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 3 B - VL				
	[VALVE ACTUATOR]				
VA	Providing, erecting electric Valve actuators 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 & OFF operation				
VA -1	Electric Valve Actuator for non rising spindle type sluice valve, PN 1 & PN 1.6 rating For Valve Size				
VA 1-1	50 mm dia	Each	56858	3116	59974
VA 1-2	65 mm dia	Each	56858	3116	59974
VA 1-3	80 mm dia	Each	57659	3116	60775
VA 1-4	100 mm dia	Each	60462	3116	63578
VA 1-5	125 mm dia	Each	63072	3116	66188
VA 1-6	150 mm dia	Each	64466	3116	67582
VA 1-7	200 mm dia	Each	67108	3116	70224
VA 1-8	250 mm dia	Each	71513	3116	74629
VA 1-9	300 mm dia	Each	76440	3116	79556
VA 1-10	350 mm dia	Each	78520	3116	81636
VA 1-11	400 mm dia	Each	80600	3116	83716
VA 1-12	450 mm dia	Each	84101	3116	87217
VA 1-13	500 mm dia	Each	91746	3116	94862
VA 1-14	600 mm dia	Each	103214	3116	106330
VA 1-15	700 mm dia	Each	107527	3116	110643
VA 1-16	750 mm dia	Each	109607	3116	112723
VA 1-17	800 mm dia	Each	112455	3116	115571
VA 1-18	900 mm dia	Each	122192	3116	125308
VA 1-19	1000 mm dia	Each	129305	3116	132421

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 4 - PW				
	[PIPE WORK AND VESSELS]				
PW 1	G.I. Bend "B" Class				
	Supplying and erecting "B" class G.I. Bend in position with necessary material				
PW 1-1	15 mm dia	Each	46	23	69
PW 1-2	25 mm dia	Each	67	23	90
PW 1-3	40 mm dia	Each	87	23	110
PW 1-4	50 mm dia	Each	133	34	167
PW 1-5	65 mm dia	Each	194	34	228
PW 1-6	75 mm dia	Each	313	34	347
PW 1-7	100 mm dia	Each	626	51	677
PW 2	G.I. Tee "B" Class				
	Supplying and erecting "B" class G.I. Tee in position with necessary material				
PW 2-1	15 mm dia	Each	28	23	51
PW 2-2	25 mm dia	Each	59	23	82
PW 2-3	40 mm dia	Each	119	23	142
PW 2-4	50 mm dia	Each	189	34	223
PW 2-5	65 mm dia	Each	350	34	384
PW 2-6	75 mm dia	Each	501	34	535
PW 2-7	100 mm dia	Each	820	51	871
PW 2-8	150 mm dia	Each	892	51	943
PW 3	G.I. Coupling / Nipple "B" Class				
	Supplying and erecting "B" class G.I. Coupling / Nipple in position with necessary material				
PW 3-1	15 mm dia	Each	17	7	24
PW 3-2	25 mm dia	Each	34	7	41
PW 3-3	40 mm dia	Each	62	17	79
PW 3-4	50 mm dia	Each	106	17	123
PW 3-5	65 mm dia	Each	172	17	189
PW 3-6	75 mm dia	Each	258	17	275
PW 3-7	100 mm dia	Each	419	23	442
PW 3-8	150 mm dia	Each	512	23	535
PW 4	G.I. Union (Heavy Duty)				
	Supplying and erecting Heavy Duty G.I. Union in position with necessary material				
PW4-1	15 mm dia	Each	48	7	55
PW 4-2	25 mm dia	Each	87	7	94
PW 4-3	40 mm dia	Each	168	17	185
PW 4-4	50 mm dia	Each	258	17	275
PW 5	G.I. Elbow (Heavy Duty)				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	Supplying and erecting Heavy Duty G.I. Elbow in position with necessary material				
PW 5-1	15 mm dia	Each	16	12	28
PW 5-2	25 mm dia	Each	48	17	65
PW 5-3	40 mm dia	Each	101	17	118
PW 5-4	50 mm dia	Each	156	17	173
PW 6	Dismantling Joints				
	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 ² 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.				
PW 6-1	200 mm dia Joint	Joint	7875	750	8625
PW 6-2	250 mm dia Joint	Joint	10920	960	11880
PW 6-3	300 mm dia Joint	Joint	13230	1009	14239
PW 6-4	350 mm dia Joint	Joint	18060	1321	19381
PW 6-5	400 mm dia Joint	Joint	24150	1644	25794
PW 6-6	450 mm dia Joint	Joint	29264	2031	31295
PW 6-7	500 mm dia Joint	Joint	35490	2218	37708
PW 6-8	600 mm dia Joint	Joint	43680	2640	46320
PW 6-9	700 mm dia Joint	Joint	57330	2862	60192
PW 6-10	750 mm dia Joint	Joint	67830	3138	70968
PW 7	Surge/ Air Vessels				
	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	257	0	257
PW 8	Pressure Vessels				
	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	186	0	186

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 5 - LF				
	[LIFTING EQUIPMENT]				
LF 1	Chain Pulley Block				
	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	10091	202	10293
LF 1-2	2 Tonne Capacity	Each	14170	251	14421
LF 1-3	3 Tonne Capacity	Each	19919	376	20295
LF 2	Travelling Trolley				
	Providing, erecting Travelling Trolley of capacity as below with 6 m lift, tested to 50% over load				
LF 2 -1	1 Tonne Capacity	Each	7928	152	8080
LF 2 -2	2 Tonne Capacity	Each	9938	202	10140
LF 2 -3	3 Tonne Capacity	Each	13367	251	13618
Note 1	Add Rs. 356/- per m for extra handling chain for all capacity geared trolley				
Note 2	Add for Additional 1 m load chain for all capacity chain pulley block				
	For 1 Tonne	Mtr	503	0	503
	For 2 Tonne	Mtr	963	0	963
	For 3 Tonne	Mtr	998	0	998
LF 3	Hand Operated Circular or Rectangular Travelling Crane (Single Girder)				
	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.				
LF 3-1	3 Tonne Capacity				
LF 3 -1-1	Up to 5 m span	Each	140643	16523	157166
LF 3 -1-2	Above 5 m upto 6 m span	Each	152116	17199	169315
LF 3 -1-3	Above 6 m upto 8 m span	Each	177900	18766	196666

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
LF 3-2	5 Tonne Capacity				
LF 3 -2-1	Up to 5 m span	Each	180406	16523	196929
LF 3 -2-2	Above 5 m upto 6 m span	Each	193594	17199	210793
LF 3 -2-3	Above 6 m upto 8 m span	Each	223523	18766	242289
LF 3 -2-4	Above 8 m upto 10 m span	Each	270671	20536	291207
Note 3	The rates are exclusive of corbel / rail / square bar and track girders for supporting rails.				
LF 4	Electric Operated Circular or Rectangular Travelling Crane (Single Girder)				
	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.				
LF 4-1	5 Tonne Capacity				
LF 4-1-1	Above 6 m upto 8 m span	Each	701593	19111	720704
LF 4-1-2	Above 8 m upto 10 m span	Each	746371	23644	770015
LF 4-2	7.5 Tonne Capacity				
LF 4-2-1	Above 6 m upto 8 m span	Each	852724	23644	876368
LF 4-2-2	Above 8 m upto 10 m span	Each	907737	26133	933870
LF 4-3	10 Tonne Capacity				
LF 4-3-1	Above 6 m upto 8 m span	Each	938601	26133	964734
LF 4-3-2	Above 8m upto 10 m span	Each	998512	28623	1027135
Note 4	The rates are exclusive of corbel / rail / square bar and track girders for supporting rails.				
Note 5	For D.S.L. (Down Shop Lead) system for above crane Add Rs. 2500/- per m length of longitudinal travel.	Mtr	2383	0	2383
Note 6	Rate for Additional Load Chain /Handling Chain.				
	Load Chain				
	For 1 Tonne	Mtr	664	0	664
	For 2 Tonne	Mtr	1328	0	1328
	For 3 Tonne	Mtr	2340	0	2340

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 6 - SS				
	[H.T. SUB STATION EQUIPMENTS]				
SS1	RSJ pole				
	Supplying, erecting Rolled Steel Joist (Girder) pole complete erected duly painted with two coats of red oxide paint and one coat of bituminous paint for the length to be embedded in ground and plinth and two coats of aluminium paint for the remaining portion complete with base plate of size 30 X 30 X 0.6 cms welded at the bottom complete erected in provided C.C. foundation and plinth.				
SS 1-1	ISMB 175 - 8.5 mtr Long	As per PWD CSR			
Note 1	Add / subtract Rs. 1170/- per meter for addition or reduction in length				
SS 1-2	ISHB I50 -11 mtr long				
Note 2	Add / subtract Rs. 1660/- per meter for addition or reduction in length				
SS 2	Pole Foundation				
	Providing C.C. foundation including excavation for the poles with 60 X 60 cm and 180 cm deep in 1:3:6 cement concrete (20 to 25 mm stone metal) and 45 X 45 X 45 cm plinth duly plastered and with necessary curing and finishing in an approved manner	As per PWD CSR			
SS 3	GI Stay				
	Supplying, erecting G.I. Stay set for poles, including loop insulators at accessible height complete with anchor plate 300 X 300 X 6 mm, straining screws, G.I. Stay rod 20 mm X 1.8m length and pole clamps erected in provided C.C. foundation.	As per PWD CSR			
SS 3-1	Size 7/10 SWG/ Size7/8 SWG				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
SS 3-2	GI Stay Foundation				
	Providing CC foundation Each including excavation for stay 60 cms x 60 cms x 1.5 mtr. Deep in 1:3:6 cement concrete (20 to 25 mm stone metal) with necessary curing and finishing in an approved manner.	As per PWD CSR			
SS 4	Cross Arm, ISMC 100 (2.4 m long)				
	Supplying erecting 100 X 50 mm with 4.7 mm thick web and 7.5 mm flange channel iron cross arm of suitable length fabricated for H.T. insulator mounting and erected on two pole structure, 2.4m apart provided with two clamps of 50 X 6 mm M.S. flat and 15 mm nuts and bolts for each cross arm, duly painted with one coat of red lead and two coats of silver paint.	As per PWD CSR			
Note 3	Add / subtract Rs. 490/- per m for addition or reduction in length.				
SS 5	Lightening Arrestor				
	Supplying, erecting approved make thyrite type Lightening Arrestor suitable for H.T. supply with necessary ancillary material complete on provided cross arm and connected to overhead line.				
SS 5-1	Suitable for 11 kV Supply, Distribution class	As per PWD CSR			
SS 5-2	Suitable for 22 kV Supply, Distribution class				
SS 5-3	Suitable for 33 kV Supply, Station class	Each	24034	750	24784
SS 6	Disc Insulator				
	Supplying, erecting porcelain Disc Type Insulators with hardware fittings suitable for H.T. overhead line complete erected with nuts and bolts on provided cross arm.				
SS 6-1	Suitable for 11 kV line	As per PWD CSR			
SS 6-2	Suitable for 22 kV line				
SS 6-3	Suitable for 33 kV line				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
SS 7	Pin Insulator				
	Supplying, erecting porcelain Pin Type Insulator with hard ware fittings suitable for H.T. overhead line complete erected with nuts and bolts on provided cross arm.				
SS 7-1	Suitable for 11 kV line	As per PWD CSR			
SS 7-2	Suitable for 22 kV line				
SS 7-3	Suitable for 33 kV line				
SS 8	Air Break Switch Without Earth Switch				
	Supplying, erecting approved make H.T. out door type gang operated air break, triple pole switch of required capacity with 3 post / pin type insulator per phase, mounted in horizontal or vertical position on provided cross arm with adequate length of G.I. pipe for operating handle erected on extended square shaft. The operating handle provided with lock and key at suitable height from ground with necessary clamps.				
SS 8-1	Suitable for 11 kV line				
SS 8-1-1	Rocking / Tilting Type	As per PWD CSR			
SS 8-1-2	Rotating Type	Each	21498	601	22099
SS 8-2	Suitable for 22 kV line				
SS 8-2-1	Rocking / Tilting Type	As per PWD CSR			
SS 8-2-2	Rotating Type	Each	27300	622	27922
SS 8-3	Suitable for 33 kV line				
SS 8-3-1	Rocking / Tilting Type	As per PWD CSR			
SS 8-3-2	Rotating Type	Each	34650	649	35299

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
SS 9	Air Break Switch with Earth Switch				
	Supplying, erecting approved make H.T. out door type gang operated air break, triple pole switch with earth switch of required capacity with 3 post / pin type insulator per phase, mounted in horizontal or vertical position on provided cross arm with adequate length of G.I. pipe for operating handle erected on extended square shaft. The operating handle provided with lock and key at suitable height from ground with necessary clamps.				
SS 9-1	Suitable for 11 kV line				
	Rotating Type	Each	26250	649	26899
SS 9-2	Suitable for 22 kV line				
	Rotating Type	Each	31500	649	32149
SS 9-3	Suitable for 33 kV line				
	Rotating Type	Each	38850	649	39499
SS 10	Drop Out Fuse (Channel mounted)				
	Supplying, erecting approved make outdoor type Drop Out Fuse Channel type with insulator complete with fuse holders fuse barrel with metal fittings, fuse element, with working current up to 50 Amp, capacity complete erected on provided cross arm, each set comprising 3 units.				
SS 10-1	Suitable for 11 kV line	As per PWD CSR			
SS 10-2	Suitable for 22 kV line				
SS 10-3	Suitable for 33 kV line				
SS 11	Horn Gap Fuse (Channel mounted)				
	Supplying, erecting approved make outdoor type Horn Gap Type fuse with insulator, fuse element, with working current up to 50 Amp, capacity complete erected on provided cross arm, each set comprising 3 units.				
SS 11-1	Suitable for 11 kV line	Each	4506	649	5155
SS 11-2	Suitable for 22 kV line	Each	7317	649	7966
SS 11-3	Suitable for 33 kV line	Each	11217	649	11866

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
SS 12	Fuse Barrel	As per PWD CSR			
	Supplying and erecting fuse barrel with metal fittings.				
SS 12-1	Suitable for 11 kV line with metal fitting				
SS 12-1-1	With fiber fitting				
SS 12-2	Suitable for 22 kV line with metal fitting				
SS 12-2-1	With fiber fitting				
SS 13	D.O. Operating Rod	As per PWD CSR			
	Supplying D.O. Operating rod 20 feet long in three sections made from best quality fine wood with SRBP tube and aluminium head PVC coated suitable for 11 / 22 / 33 kV supply with clamps for removing drop out fuses at 6 m height with rain shed porcelain insulator with hand grip including earthing chain 1.5m				
SS 14	Hard Drawn Copper solid wire	As per PWD CSR			
	Supplying and erecting hard drawn copper solid wire complete erected for connections on H.T. side.				
	0 to 6 SWG				
SS 15	Alkathene Pipe 10 mm dia	As per PWD CSR			
	Supplying and erecting extra thick alkathene pipe 10mm dia erected to enclose bare conductor wires.				
SS 16	Out Door CT	As per PWD CSR			
	Providing, erecting and commissioning out door type single phase oil filled current transformer for metering and protection purpose of suitable C.T. ratio and V.A. burden duly erected on provided cross channel.				
SS 16-1	Single Core				
SS 16-1-1	Suitable for 11 kV system	Each	14281	547	14828
SS 16-1-2	Suitable for 22 kV system	Each	19898	547	20445
SS 16-1-3	Suitable for 33 kV system	Each	21035	547	21582
SS 16-2	Double Core	As per PWD CSR			
SS 16-2-1	Suitable for 11 kV system	Each	21375	547	21922
SS 16-2-2	Suitable for 22 kV system	Each	27819	547	28366
SS 16-2-3	Suitable for 33 kV system	Each	27819	547	28366

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
SS 17	Out Door PT				
	Providing, erecting and commissioning out door type single phase oil filled Potential transformer for metering purpose of suitable V.A. burden duly erected on provided cross channel.				
SS 17-1	Single Core				
SS 17-1-1	Suitable for 11 kV system	Each	7763	547	8310
SS 17-1-2	Suitable for 22 kV system	Each	17397	547	17944
SS 17-1-3	Suitable for 33 kV system	Each	18047	547	18594
SS 17-2	Double Core				
SS 17-2-1	Suitable for 11 kV system	Each	12766	547	13313
SS 17-2-2	Suitable for 22 kV system	Each	19414	547	19961
SS 17-2-3	Suitable for 33 kV system	Each	26273	547	26820
SS 18	Miscellaneous items				
SS 18-1	Anticlimbing devices				
	Supplying and erecting anticlimbing devices fabricated from pole clamps with drooping spikes welded to it and erected on pole.	As per PWD CSR			
SS 18-2	Fencing sections				
	Supplying and erecting fencing section having size 2.45 m height from ground level and 1.2 m width by using angle iron size 50 X 50 X 6 mm erected in C.C. foundation 15 X 15 X 40 cm deep. The section of the frame shall be fitted with flat iron support of size 25 X 6 mm on top, bottom and mid way and chain link jali of 3.26 mm dia / 10 SWG G.I. hard wire mesh of 50 X 50 mm to the angle iron at every distance of 30 cms, by angle iron at every distance of 30 cms, by iron studs complete duly painted with one coats of red oxide and two coats of aluminium paint.	As per PWD CSR			

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
Note 4	For sections less than 1200 mm width reduce rate by Rs. 120 /- per 100 mm or part there of reduction in width of 1200 mm.				
SS 18-3	Fencing gate				
	<p>Supplying and erecting double leaf hinged door each 150 cm in width and 185 cm in height using 40 mm dia "B" grade ISI mark G.I. Pipe from all four sides with necessary bends and cross supports of angle iron 45 X 45 X 5 mm with the door leaf covered with chain link jali 50 X 50 mm made from 3.26 mm dia / 10 SWG G.I. wire with necessary flat iron covering all around with necessary number of spikes of size 10 mm dia at top and bottom at 150 mm apart to match the height of fencing. The door shall have latches and side channel of 100 X 50 X 5mm rigidly welded for providing locking arrangement, Godrej/Navtal make medium size lock with duplicate keys, The fencing complete erected and painted with anticorrosive red oxide paint and two coats of prescribed enamel paint / silver paint. The channel iron of size 150 X 75 mm by 2.5 m long shall be provided and erected at both sides of gate.</p>		As per PWD CSR		
SS 18-4	Angle iron corner support				
	<p>Supplying and erecting 50 X 50 X6 mm angle iron corner support 0.5 m way from the fence supports fixed at the middle fencing frame and other side in C.C. foundation 15 X 15 X 40 cm complete duly painted with one coat of red oxide and two coats of aluminium paint.</p>		As per PWD CSR		
SS 18-5	Stone Metal Spreading				
	<p>Providing and spreading stone metal 25 mm size for 100 mm depth above the ground level.</p>		As per PWD CSR		

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
SS 18-6	M.S. Stand for Fire bucket.				
	Providing floor mounted stand for keeping 4 nos. of fire bucket, 1500 mm in length and 900 mm in height made out of 30 X 30 X 4 mm angle iron welded with 4 hooks and duly painted with one coat of red lead and two coats of silver paint.			As per PWD CSR	
SS 18-7	Wall Hook for Fire bucket.				
	Supplying and erecting wall hook 225 mm projection for keeping fire buckets made out of 15 mm dia MS round bar grouted in wall to a depth of minimum 15 cm.			As per PWD CSR	
SS 18-8	G.I. Fire bucket 9 lit				
	Supplying G.I. Fire bucket with round bottom duly painted having at least 9 lit. capacity and filled with dry sand and kept on provided wall hook or stand.			As per PWD CSR	
SS 18-9	First Aid Box				
	Supplying standard first aid box with all standard contents.			As per PWD CSR	
SS 18-10	Pair of Rubber hand Glove 11/22/33 kV				
	Supplying pair of rubber hand gloves suitable for working on 11 / 22 / 33 kV system			As per PWD CSR	
SS 18-11	Instruction Chart				
	Providing printed instruction chart for treating persons suffering from electric shocks, printed in English and Marathi and duly framed with front glass.			As per PWD CSR	

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
SS 18-12	Fire Extinguisher				
	Supplying, erecting D.C.P. type fire extinguisher cartridge type, with G.M. cap 150 gram CO2 gas cartridge powder brackets conforming to IS 2171 - 1985 and having complete erected with necessary clamps made from 50 X 6 mm MS flat with nuts and bolts grouted in wall complete.	As per PWD CSR			
SS 18-12-1	Fire extinguisher with 5 kg cartridge capacity				
SS 18-12-2	Fire extinguisher with 10 kg cartridge capacity				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 7 - TR				
	[TRANSFORMER AND VOLTAGE STABILIZER]				
TR-1	Power Transformer (With Off Load Tap Changer)				
	Providing, erecting and commissioning outdoor type copper wound transformer 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 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 limited to the values given below or as per IS or Norms issued by MSEDCL Ltd whichever are lower at				
	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.
	Power Transformer 11000 / 433 Volt				
	With off load Tap Changer -12.5% to +2.5% in steps of 2.5%				
TR 1-1	63 kVA (no load loss 180 w and load loss 1235 w)	As per PWD CSR			
TR 1-2	100 kVA (no load loss 260 w and load loss 1760 w)				
TR 1-3	160 kVA (no load loss 400 w and load loss 2600 w)				
TR 1-4	200 kVA (no load loss 500 w and load loss 3000 w)				
TR 1-5	250 kVA (no load loss 550 w and load loss 3600 w)				
TR 1-6	315 kVA (no load loss 580 w and load loss 4200 w)				
TR 1-7	500 kVA (no load loss 850 w and load loss 5800 w)				
TR 1-8	630 kVA (no load loss 1000 w and load loss 7000 w)				
TR 1-9	750 kVA (no load loss 1500 w and load loss 8000 w)	Each	1214962	13341	1228303
TR 2	Power Transformer 22000 / 433 Volt and other specification as per TR-1	As per PWD CSR			
	With off load Tap Changer -12.5% to +2.5% in steps of 2.5%				
TR 2-1	63 kVA (no load loss 230w and load loss 1400w)				
TR 2-2	100 kVA (no load loss 300w and load loss 1850w)				
TR 2-3	160 kVA (no load loss 400w and load loss 2600w)				
TR 2-4	200 kVA (no load loss 470w and load loss 3000w)				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
TR 2-5	250 kVA (no load loss 550w and load loss 3600w)				
TR 2-6	315 kVA (no load loss 620w and load loss 4200w)				
TR 2-7	500 kVA (no load loss 900w and load loss 5800w)				
TR 2-8	630 kVA (no load loss 1080w and load loss 7000w)				
TR 2-9	750 kVA (no load loss 1600w and load loss 8000w)	Each	1439116	18667	1457783
TR 3	Power Transformer 33000 / 433 Volt and other Specification as per TR-1				
	With off load Tap Changer -12.5% to +2.5% in steps of 2.5%				
TR 3-1	63 kVA	Each	297124	11205	308329
TR 3-2	100 kVA	Each	356549	11205	367754
TR 3-3	160 kVA	Each	459192	11205	470397
TR 3-4	200 kVA	Each	648270	11205	659475
TR 3-5	250 kVA	Each	756315	11205	767520
TR 3-6	315 kVA	Each	907578	11205	918783
TR 3-7	400 kVA	Each	972405	11205	983610
TR 3-8	500 kVA	Each	1026428	18667	1045095
TR 3-9	630 kVA	Each	1350563	18667	1369230
TR 3-10	750 kVA	Each	1485619	18667	1504286

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
TR-4	Power Transformer (With On Load Tap Changer)				
	<p>Providing, erecting and commissioning out door type copper wound transformer 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 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, bushing / 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. The OLTC should be suitable for minimum 50 operations per day. Transformer shall be of latest manufacturing standards as per amended IS specifications and the Load & No Load losses shall be limited to the values as per IS and Norms issued by MSEDCL Ltd whichever are lower.</p>				

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).				
	Transformer 11000 / 433 Volt				
	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	750 kVA	Each	1626849	18667	1645516
TR 4-2	1000 kVA	Each	1705568	18667	1724235
TR 4-3	1250 kVA	Each	1889244	18667	1907911
TR 4-4	1600 kVA	Each	2351060	18667	2369727
TR 4-5	2000 kVA	Each	2545232	18667	2563899
TR 5	Transformer 22000 / 433 Volt				
	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	750 kVA	Each	1679328	18667	1697995
TR 5-2	1000 kVA	Each	1784286	18667	1802953
TR 5-3	1250 kVA	Each	1941723	18667	1960390
TR 5-4	1600 kVA	Each	2414034	18667	2432701
TR 5-5	2000 kVA	Each	2623950	18667	2642617
TR 6	Transformer 33000 / 433 Volt				
	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				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
TR 6-1	750 kVA	Each	1705568	18667	1724235
TR 6-2	1000 kVA	Each	1810526	18667	1829193
TR 6-3	1250 kVA	Each	1967963	18667	1986630
TR 6-4	1600 kVA	Each	2456018	18667	2474685
TR 6-5	2000 kVA	Each	2676429	18667	2695096
	H.T. TRANSFORMER				
TR 7	Transformer 11000 / 3300 Volt				
	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	1264127	18667	1282794
TR 7-2	1250 kVA	Each	1464010	18667	1482677
TR 7-3	1600 kVA	Each	1604469	18667	1623136
TR 7-4	2000 kVA	Each	2025844	18667	2044511
TR 7-5	2500 kVA	Each	2290554	18667	2309221
TR 7-6	3000 kVA	Each	2404002	18667	2422669
TR 8	Transformer 22000 / 3300 Volt				
	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	1364454	18667	1383121
TR 8-2	1250 kVA	Each	1574370	18667	1593037
TR 8-3	1600 kVA	Each	1721312	18667	1739979
TR 8-4	2000 kVA	Each	2083417	18667	2102084
TR 8-5	2500 kVA	Each	2414034	18667	2432701
TR 8-6	3000 kVA	Each	2770892	18667	2789559
TR 9	Transformer 33000 / 3300 Volt				
	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	1416933	18667	1435600
TR 9-2	1250 kVA	Each	1637345	18667	1656012
TR 9-3	1600 kVA	Each	1784286	18667	1802953
TR 9-4	2000 kVA	Each	2151639	18667	2170306
TR 9-5	2500 kVA	Each	2461266	18667	2479933
TR 9-6	3000 kVA	Each	2833866	18667	2852533

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
TR 10	Servo Controlled Automatic Voltage Stabilizer				
	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. Following protections and indications shall be incorporated				
	Over Voltage / Under Voltage				
	Single Phasing				
	Cut off contactor with electronic output sensing unit				
TR 10-1	Servo Controlled Automatic Voltage Stabilizer (Out put 415 +/-1%)				
	Input 220 to 460 Volt				
TR 10-1-1	3 kVA Air cooled	Each	55631	251	55882
TR 10-1-2	5 kVA Air cooled	Each	64414	326	64740
TR 10-1-3	7.5 kVA Air cooled	Each	72606	499	73105
TR 10-1-4	10 kVA Air cooled	Each	95081	750	95831
TR 10-1-5	12.5 kVA Air cooled	Each	104512	998	105510
TR 10-1-6	15 kVA Air cooled	Each	113942	998	114940
TR 10-1-7	20 kVA Air cooled	Each	124102	1245	125347
TR 10-1-8	25 kVA Air cooled	Each	136582	1495	138077
TR 10-1-9	30 kVA Air cooled	Each	166084	1744	167828
TR 10-1-10	40 kVA Air cooled	Each	182243	1992	184235
TR 10-1-11	50 kVA Oil cooled	Each	246354	1993	248347
TR 10-1-12	60 kVA Oil cooled	Each	298675	1992	300667
TR 10-1-13	75 kVA Oil cooled	Each	312316	1992	314308
TR 10-1-14	100 kVA Oil cooled	Each	351929	2738	354667
TR 10-1-15	125 kVA Oil cooled	Each	437164	3240	440404

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
TR 10-2	Servo Controlled Automatic Voltage Stabilizer (Out put 415 +/-1%)				
	Input 280 to 460 Volt				
TR 10-2-1	3 kVA Air cooled	Each	47345	251	47596
TR 10-2-2	5 kVA Air cooled	Each	57149	499	57648
TR 10-2-3	7.5 kVA Air cooled	Each	61496	499	61995
TR 10-2-4	10 kVA Air cooled	Each	65624	750	66374
TR 10-2-5	12.5 kVA Air cooled	Each	79184	998	80182
TR 10-2-6	15 kVA Air cooled	Each	88527	998	89525
TR 10-2-7	20 kVA Air cooled	Each	101286	1245	102531
TR 10-2-8	25 kVA Air cooled	Each	110069	1495	111564
TR 10-2-9	30 kVA Air cooled	Each	124214	1585	125799
TR 10-2-10	40 kVA Air cooled	Each	146145	1992	148137
TR 10-2-11	50 kVA Air cooled	Each	162607	1993	164600
TR 10-2-12	60 kVA Air cooled	Each	185496	1992	187488
TR 10-2-13	60 kVA Oil cooled	Each	221848	1992	223840
TR 10-2-14	75 kVA Oil cooled	Each	230061	1992	232053
TR 10-2-15	100 kVA Oil cooled	Each	276065	2738	278803
TR 10-2-16	125 kVA Oil cooled	Each	317656	3240	320896
TR 10-2-17	150 kVA Oil cooled	Each	327075	3487	330562
TR 10-2-18	175 kVA Oil cooled	Each	375650	3487	379137
TR 10-2-19	200 kVA Oil cooled	Each	410239	4484	414723
Note 1	For oil cooled stabilizer, the supply cost is excluding cost of transformer oil.				
TR-11	Transformer oil				
	Supplying and topping fresh/ filtered Transformer Oil as per IS 335 and giving test certificate.	As Per PWD CSR			
TR-12-A	Filtration of Transformer oil				
	Filtration of transformer oil at site and giving test certificate for other area than that mentioned at TR-12 (B).	As Per PWD CSR			
TR 12-B	For Metro Area of Pune, Mumbai Metro Region & Nagpur, Nashik, Aurangabad, Amravati Municipal Corporation areas.	As Per PWD CSR			
TR-13	Transportation of oil filtering machine	Rs. 968 for first 10 Km & Rs. 10/- per km for remaining distance			

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 8 - LT				
	[L.T. PANEL]				
LT 1	PANEL FABRICATION				
	M.S. sheet of thickness given below to be used for fabrication of boxes, panel boards, etc including cutting, bending, drilling, welding, cleaning, de-rusting and painting with one coat of red lead paint and two coats of enamel paint.				
LT 1-1	M .S sheet 16 SWG	As per PWD CSR			
LT 1-2	M .S sheet 14 SWG				
LT 2	G.I. Sheet (Ducting of ventilation)				
	G.I. Sheet of thickness given below to be used for fabrication, ducting of ventilation or similar work etc, including cutting, bending, drilling, welding, cleaning, derusting and retouching with cold galvanising method wherever damaged.				
LT 2-1	G.I. Sheet 18 SWG	As per PWD CSR			
LT 2-2	G.I. Sheet 16 SWG				
Note 1	Increase rate by 30% if sheet work for total item in each estimate is less than 1 sq m.				
	16 SWG sheet shall be specified for rear, side and top.				
	14 SWG sheet shall be specified for front and bottom.				
	Rate of G.I. Sheet fabrication may be adopted for panel fabrication also wherever required.				
LT 3	Iron Work for panel board				
	Iron work for panel board or for other purpose complete with bending, cutting, drilling and welding complete erected at position with necessary material duly painted with one coat of red oxide and two coats of enamel paint to match the switchgear or as per the direction of Engineer.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
LT 4	Bus Bar				
	Providing and fixing bus bar of required material in provided cubical panel on internal angle iron frame structure on provided epoxy bus bar insulators or suitable size bus bar strips, suitably designed for desired Amp rating for required length with suitable arrangement for fixing cable termination, etc complete.				
LT 4-1	Aluminium Bus Bar	As per PWD CSR			
LT 4-2	Copper Bus Bar				
Note 2	Add 10% for color coded sleeves for bus bar strip kg rate.				
	Nut bolts holding busbar and cable lugs shall be of brass only.				
	Double bus bar should be adequately bolted.				
	For copper bus bar decrease the cross sectional area by 25% to nearest size available for respective Amp rating				
	Weight of Aluminium is 2700 kg/cum and weight of copper is 8900 kg/cum				
LT 5	Bus Bar Chamber				
	Providing, erecting bus bar chamber triple pole with neutral (With 4 Aluminium bus bar) each of 100 cm length of cross section and rating as below with minimum 3 insulators per bar. Bus bar chamber of given size fabricated from 16 SWG M.S. Sheet and 25 X 25 X 4 mm angle iron frame complete, spray painted with one coat of red oxide and two coats of good quality enamel paint and polish.				
	Chamber size 115 X 40 X 15 cm				
LT 5-1	Each bus bar of size 25 X 5mm-- For 100 Amp	As per PWD CSR			
LT 5-2	Each bus bar of size 40 X 5mm-- For 200 Amp				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	Chamber size 115 X 50 X 30 cm				
LT 5-3	Each bus bar of size 50 X 5mm-- For 300 Amp	As per PWD CSR			
LT 5-4	Each bus bar of size 50 X 10mm-- For 400 Amp				
LT 5-5	Bus bar of size 2 Nos-40 X 10mm-- For 630 Amp				
LT 5-6	Bus bar of size 2 Nos-50 X 10mm-- For 800 Amp				
LT 6	Bus Bar Insulators				
	Providing and fixing epoxy bus bar insulators in provided cubical panel on internal angle frame structure of suitable size as per requirement of aluminium strip being used for panel, with required hardware material.				
LT 6-1	30 X 30 X 30 mm (T X B X H)	As per PWD CSR			
LT 6-2	30 X 40 X 40 mm (T X B X H)				
LT 6-3	40 X 50 X 50 mm (T X B X H)				
LT 6-4	40 X 50 X 60 mm (T X B X H)				
LT 6-5	40 X 50 X 70 mm (T X B X H)				
LT 7	Metal Clad T.P.				
	Supplying and erecting on angle frame, Triple Pole Iron Clad / Metal Clad switch and rewirable fuse 415 / 500 V of suitable rating as below of approved make.				
LT 7-1	16 Amp	As per PWD CSR			
LT 7-2	32 Amp				
LT 7-3	63 Amp				
LT 7-4	100 Amp				
LT 7-5	200 Amp				
LT 7-6	300 Amp				
LT 8	Metal Clad T.P.N.				
	Supplying and erecting on angle frame, Triple Pole Iron Clad / Metal Clad switch with rewirable fuse, 415 / 500 V of suitable rating, with Neutral link, of below rating and of approved make.				
LT 8-1	16 Amp	As per PWD CSR			
LT 8-2	32 Amp				
LT 8-3	63 Amp				
LT 8-4	100 Amp				
LT 8-5	200 Amp				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
LT 9	Metal Clad T.P.N. with HRC fuse				
	Supplying and erecting on angle frame, Triple Pole Iron Clad / Metal Clad switch with H.R.C. Type fuse (of ISI Mark), 415 / 500 V of suitable rating, with Neutral link, of below rating and of approved make.				
LT 9-1	100 Amp	As per PWD CSR			
LT 9-2	200 Amp				
LT 9-3	300 Amp				
LT 9-4	400 Amp				
LT 10	T.P.N. Switch for Panel Mounting				
	Supplying and erecting T.P.N. switch suitable for 415 Volts , 50 Hz with operating mechanism for panel mounting				
LT 10-1	63 Amp	As per PWD CSR			
LT 10-2	100 Amp				
LT 11	T.P.N. Switch Fuse (In sheet steel encloser)				
	Supplying and erecting T.P.N. switch suitable for 415 Volts , 50 Hz with operating mechanism				
LT 11-1	32 Amp	As per PWD CSR			
LT 11-2	63 Amp				
LT 11-3	100 Amp				
LT 12	Switch- Disconnecter Fuse Unit				
	Supplying and erecting T.P.N. Switch - Disconnecter Fuse Unit suitable for 415 Volts, 50 Hz with operating mechanism for panel mounting or sheet metal enclosed, (Without HRC Fuses).				
LT 12-1	125 Amp	As per PWD CSR			
	(In sheet steel encloser)				
LT 12-2	125 Amp				
	(For open execution)				
LT 12-3	200 Amp				
	(In sheet steel encloser)				
LT 12-4	200 Amp				
	(For open execution)				
LT 12-5	315 Amp				
	(In sheet steel encloser)				
LT 12-6	315 Amp				
	(For open execution)				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
LT 13	H.R.C. Fuse Link				
	Supplying erecting HRC Fuse link .				
LT 13-1	HF Type, Current Rating 2/-----/ 40 Amp	As per PWD CSR			
LT 13-2	HF Type, Current Rating 50 Amp				
LT 13-3	HF Type Current Rating 63 Amp				
LT 13-4	HN Type Current Rating 63 Amp				
LT 13-5	HN Type Current Rating 80/100 Amp				
LT 13-6	HN Type 125 Amp				
LT 13-7	HN Type 160 Amp				
LT 13-8	HN Type 200 Amp				
LT 13-9	HN Type 250 Amp				
LT 13-10	HN Type 315 Amp				
LT 14	Rotary change over switch				
	Supplying, erecting front operated rotary change over switch for cubical panel, suitable for 3 Phase, 415 Volt, 50 Hz.				
LT 14-1	63 Amp	As per PWD CSR			
LT 14-2	125 Amp				
LT 14-3	200 Amp				
LT 14-4	250 Amp				
LT 14-5	315 Amp				
LT 14-6	400 Amp				
LT 15	Cut outs (Porcelain Base)				
	Supplying and erecting porcelain base iron clad cut out, 500 Volts, of approved make erected on Polished T.W. block.				
LT 15-1	16 Amp	As per PWD CSR			
LT 15-2	32 Amp				
LT 15-3	63 Amp				
LT 15-4	100 Amp				
LT 15-5	200 Amp				
LT 16	Fuse Bridges (Porcelain Base)				
	Supplying and erecting H.C. Pattern porcelain fuse bridge and fuse link suitable for 500 Volts, of approved make erected on Polished T.W. block.				
LT 16-1	16 Amp	As per PWD CSR			
LT 16-2	32 Amp				
LT 16-3	63 Amp				
LT 16-4	100 Amp				
LT 16-5	200 Amp				
LT 16-6	300 Amp				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
LT 17	Moulded Case Circuit Breakers				
	Providing erecting Moulded Case Circuit Breaker of capacity as below with magnetic thermal release complete erected in provided encloser and connected with provided leads of incoming and out going side with copper PVC leads/ bus in an approved manner.				
LT 17-1	40-60-75-100 Amp (10 kA)	As per PWD CSR			
LT 17-2	125-150 Amp (16 kA)				
LT 17-3	160-175-200-225 Amp (16 kA)				
LT 17-4	175 - 200 Amp (25 kA)				
LT 17-5	225-250 Amp (35 kA)				
LT 17-6	300-350-400 Amp (35 kA)				
LT 17-7	300-350-400 Amp (50 kA)				
LT 17-8	450-500-600-630 Amp (50 kA)				
LT 17-9	700-800 Amp (50 kA)				
Note 3	Add Rs. 1400/- for shunt release coil				
	Add Rs. 1575/- for front operating mechanism				
LT 18	Air Circuit Breaker				
	Providing erecting Air Circuit Breaker manually operated draw out type with magnetic Thermal release, C.T. and auxillary contact and all standard accessories.				
	Manually operated draw out type				
LT 18-1	800 Amp (25 kA)	As per PWD CSR			
LT 18-2	1000 Amp (25 kA)				
LT 18-3	1250 Amp (35 kA)				
LT 18-4	1600 Amp (35 kA)				
LT 18-5	2000 Amp (35 kA)				
LT 18-6	2500 Amp (50 kA)				
LT 18-7	3200 Amp (50 kA)				
LT 18-8	4000 Amp (50 kA)				
Note 4	Add Rs.1400/- for shunt release, Rs. 5185/- for under voltage relay and Rs.2300/- for earth fault relay , if these protections are required as a special case.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
LT 19	Earth Leakage Circuit Breaker				
	Providing, erecting, commissioning Earth leakage circuit breaker (ELCB/ RCCB) of suitable rating as below working on residual current 30 mA sensitivity and max 30 mSec tripping time, test knob facility free trip mechanism operating for rated leakage at nominal 10 V AC and also in both neutral open snapping condition, etc with short circuit with-stand capacity as per literature complying to BS 4293-1983 complete including all material copper leads, lugs, screws etc erected in provided MS box with window etc.				
LT 19-1	16 / 25 Amp 2 pole	As per PWD CSR			
LT 19-2	40 Amp 2 pole				
LT 19-3	63 Amp 2 pole				
LT 19-4	15/25 Amp 4 pole				
LT 19-5	40 Amp 4 pole				
LT 19-6	63 Amp 4 pole				
LT 19-7	80 Amp 4 pole				
LT 19-8	100 Amp 4 pole				
LT 20	Panel Board accessories				
LT 20-1	Marine Plywood				
	Supplying and erecting Marine Plywood 19 mm thick fixed to wall or on provided panel board for fixing Kit-Kat fuses and meter , etc with necessary material .	As per PWD CSR			
LT 20-2	Self Locking Arrangement				
	Supplying and erecting self locking arrangement with duplicate keys duly erected flush with / panel surface of cup-boards.	As per PWD CSR			
LT 20-3	Pilot lamp				
	Supplying and erecting set of three pilot lamps all type indicating lamp with LED colours RED / YELLOW / BLUE, 230 / 250 V on provided box / panel with necessary wiring, material, connections etc.	As per PWD CSR			

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
LT 20-4	Ammeter				
	Providing erecting Ammeter AC 50 Hz 440 Volts of suitable range flush type complete erected in provided MS box and connected to supply by PVC copper wire.				
LT 20-4-1	Ammeter 144 X 144 mm	As per PWD CSR			
LT 20-4-2	Ammeter 96 X 96 mm				
LT 20-5	Voltmeter				
	Providing, erecting Voltmeter AC 50 Hz. 0 to 500 Volts of suitable range flush type complete erected in provided MS box and connected to supply by PVC copper wire.				
LT 20-5-1	Voltmeter 144 X 144mm	As per PWD CSR			
LT 20-5-2	Voltmeter 96 X 96 mm				
LT 20-6	Selector Switch				
	Providing and erecting selector switch RY - YB - BR- for Volt meter, R - Y - B for ammeter suitable for AC supply 500 Volts 50 Hz erected in provided MS box and connected to Voltmeter, Ammeter with PVC copper wire.	As per PWD CSR			
LT 20-7	L.T Current Transformer				
	Providing erecting LT current transformer with wound / bar primary 100/5 Amps to 400/5 Amp ratio with 15 VA burden erected in provided MS box duly secured insulating materials and connected to the meter	As per PWD CSR			
LT 20-8	Power factor meter				
	Providing erecting power factor meter 150 mm dia flush or projection type suitable for 400 Volt 50 Hz, 3 phase 4 wire balanced or unbalanced load to work with appropriately provided CTs 100/5 Amp to 400/5 Amp ratio and other accessories complete erected in provided MS box and connected to the circuit by means of PVC copper leads.	As per PWD CSR			

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
LT 20-9	Hour meter				
	Supplying and erecting Hour meter on provided panel board including the hardware required similar to HM 700 series of L. & T. working on 240 Volts AC synchron / 24 VDC in quartz flush / panel mounting with metallic bracket, etc complete including cost of suitable control wires for connection.		As per PWD CSR		
LT 20-10	kWh meter				
	Supply and erecting kWh meter provided with MD indicator for unbalanced load 3 Phase 4 wire, 50 Hz, 230/440 Volts with incorporated time switch of 30 min integration period and of 50 sec tune required for decoupling suitable to work on provided three numbers of instrument transformer of class "C" accuracy with ratio 100/5 Amp to 400/5 Amps complete with zero adjustment and test certificate from manufacturer, erected on provided MS box or panel connected to CTs and circuit by means of PVC copper wire leads.		As per PWD CSR		
LT 20-11	Push Button				
	Providing erecting shrouded / unshrouded push button actuator L. & T. make TK 3 Type Shrouded push button L&T		As per PWD CSR		
LT 20-12	Toggle Switch				
	Providing erecting selector actuator 2 Position / 3 Position Selector Switch 2/3 Position		As per PWD CSR		
LT 20-13	Key actuator				
	Providing erecting Key actuator Lockable in one position / both position L & T make Key actuator lockable 1/2 position		As per PWD CSR		
LT 20-14	Rubber Matting				
	Supplying rubber mating of thickness as below and of required length and breadth with good insulation property				
LT 20-14-1	Rubber mating 6 mm thick 11 kV		As per PWD CSR		
LT 20-14-2	Rubber mating 12mm thick 22 kV				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
LT 20-15	Caution Board.				
	Providing enameled iron GI Sheet 18 gauge caution board of size 200 X 150 mm as per IS 2551 of 1982 in Marathi and Hindi erected at position.	As per PWD CSR			
LT 20-16	Name Board				
	Providing and fixing wall mounting type Name Board duly painted all details of Pumping machinery, Make. Models, Frame Number, Sr. No, Capacities, Date of installation, Commissioning, facturing Year , Agency's name and agreement No etc. Details on GI Sheet of 18 gauge of required size duly painted with red oxide and enamel paint for displaying the above details . Board shall be provided with suitable size TW bottom on the back side.	As per PWD CSR			
Note 5	For Labour charges for internal wiring of panels including all material Add as below				
	1) Up to 5 HP twin set panel Rs. 1605/- 2) 6 to 10 HP twin set panel Rs. 2140/- 3) 11 to 30 HP twin set panel Rs. 2675/- 4) For connected load more than 60 HP Add Rs. 49/- per HP				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 9 - CP				
	[CAPACITOR]				
CP 1	All Polypropylene Capacitors (APP)				
	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	273	26	299
CP 2	Metalized polypropylene Capacitors (MPP)				
	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	252	26	278
CP 3	H.T. Capacitors				
	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	454	67	521

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 10 - LG				
	[L.T. SWITCHGEAR AND PROTECTION]				
LG 1	D.O.L. Starter				
	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	1535	83	1618
LG 1-2	Up to 10 HP	Each	2501	177	2678
LG 2	Assembled D.O.L. Starter				
	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	1451	102	1553
LG 2-2	Up to 10 HP	Each	1880	201	2081
LG 3	F.A.S.D. Starter				
	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	6043	180	6223
LG 3-2	> 12.5 HP & Up to 20 HP	Each	7387	180	7567
LG 3-3	> 20 HP & Up to 25 HP	Each	8593	201	8794
LG 3-4	> 25 HP & Up to 40 HP	Each	19821	201	20022
Note 1	Contactor rating should be same for STAR, LINE and DELTA Connection.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
LG 4	F.A.S.D. Starter (Assembled)				
	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	5956	201	6157
LG 4-2	> 12.5 HP & Up to 20 HP	Each	7215	201	7416
LG 4-3	> 20 HP & Up to 30 HP	Each	13999	226	14225
LG 4-4	> 30 HP & Up to 40 HP	Each	19747	226	19973
Note 2	Contactor rating should be same for STAR, LINE and DELTA Connection.				
LG 5	Auto transformer Starter with air break contactor (Locally Fabricated)				
	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.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	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".				
	Cubical Panel Size				
	1.25 m height X 0.75 m width X 0.45 m deep.				
LG 5-1	40 HP (110 / 40 / 40)	Each	68063	2738	70801
LG 5-2	60 HP (200 / 70 / 70)	Each	95289	2738	98027
LG 5-3	80 HP (200 / 110 / 110)	Each	115708	2738	118446
LG 5-4	100 HP (200 / 110 / 110)	Each	149829	2738	152567
LG 5-5	120 HP (300 / 150 / 150)	Each	190577	2738	193315
	Cubical Panel Size				
	1.5 m height X 0.9 m width X 0.5 m deep.				
LG 5-6	150 HP (300/150/150)	Each	196622	5477	202099
LG 5-7	180 HP (400/170/170)	Each	233415	5477	238892
LG 5-8	200 HP (400/200/200)	Each	254285	5477	259762
LG 5-9	220 HP (400/200/200)	Each	319145	5477	324622
LG 5-10	250 HP (400/300/300)	Each	330125	8213	338338
LG 5-11	270 HP (630/300/300)	Each	342217	8213	350430
LG 5-12	300 HP (630/300/300)	Each	355510	8213	363723

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
LG 6	FCMA / HFSR Electrical Soft starter				
	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	161276	2738	164014
LG 6-14	120 HP (300)	Each	179707	2738	182445
LG 6-15	150 HP (300)	Each	203627	5477	209104
LG 6-16	180 HP (400)	Each	224209	5477	229686
LG 6-17	200 HP (400)	Each	240833	5477	246310
LG 6-18	220 HP (400)	Each	265584	5477	271061
LG 6-19	250 HP (400)	Each	284761	8213	292974
LG 6-20	270 HP (630)	Each	301993	8213	310206
LG 6-21	300 HP (630)	Each	353366	8213	361579
LG 7	Electronic Motor Protection Relay (for LT motors)				
	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	7988	2261	10249

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 11 - HG				
	[H.T. SWITCHGEAR & PROTECTION]				
HG 1	Providing and erecting Vacuum Circuit Breaker out door type excluding cost of CT, PT and control relay panel.				
	Vacuum Circuit Breaker (Out door type)				
HG 1-1	11 kV system 630 Amp 25 kA	Each	150150	13687	163837
HG 1-2	22 kV system 630 Amp 25 kA	Each	154655	13687	168342
HG 1-3	33 kV system 630 Amp 25 kA	Each	159295	13687	172982
HG 1-4	11 kV system 1250 Amp 25 kA	Each	161700	13687	175387
HG 1-5	22 kV system 1250 Amp 25 kA	Each	166551	13687	180238
HG 1-6	33 kV system 1250 Amp 25 kA	Each	171548	13687	185235
HG 2	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.				
	Vacuum Circuit Breaker (Indoor type)				
HG 2-1	3.3 kV system 630 Amp 25 kA	Each	318200	13687	331887
HG 2-2	6.6 kV system 630 Amp 25 kA	Each	318200	13687	331887
HG 2-3	11 kV system 630 Amp 25 kA	Each	318200	13687	331887
HG 2-4	22 kV system 630 Amp 25 kA	Each	554241	13687	567928
HG 2-5	33 kV system 630 Amp 25 kA	Each	554241	13687	567928
HG 2-6	3.3 kV system 1250 Amp 25 kA	Each	329565	13687	343252
HG 2-7	6.6 kV system 1250 Amp 25 kA	Each	329565	13687	343252
HG 2-8	11 kV system 1250 Amp 25 kA	Each	329565	13687	343252
HG 2-9	22 kV system 1250 Amp 25 kA	Each	677162	13687	690849
HG 2-10	33 kV system 1250 Amp 25 kA	Each	677162	13687	690849
HG 3	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.				
	Vacuum Contactor Panel (Indoor Type)				
HG 3-1	3.3 kV system (25 kA)	Each	345634	13687	359321
HG 3-2	6.6 kV system (25 kA)	Each	397557	13687	411244

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
HG 4	Providing and erecting Resin Cast Indoor single phase double core CT of required ratio and VA burden for metering and protection purpose.				
	Resin Cast Indoor Single Phase, Double Core CT of required ratio				
HG 4-1	C.T. for 3.3/ 6.6 / 11 kV 15 VA Class 1/10-P-10	Each	9657	1245	10902
HG 4-2	C.T. for 22 /33 kV 15 VA Class 1/10-P-10	Each	15715	1245	16960
HG 5	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	1245	10902
HG 5-2	(22 kV / $\sqrt{3}$) / (110 Volt / $\sqrt{3}$)	Each	14395	1245	15640
HG 5-3	(33 kV / $\sqrt{3}$) / (110 Volt / $\sqrt{3}$)	Each	15487	1245	16732
HG 6	Protection and auxiliary relays				
	Providing and erecting following type protection and auxiliary relay as required for Vacuum Circuit Breaker Panel / control relay panel.				
HG 6-1	Motor Protection Relays (CT Operated) 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	52068	1313	53381

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
HG 6-2	Over Current and Earth Fault Relay (C T Operated)				
	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	17325	750	18075
HG 6-3	High Speed Trip Relay / Master Trip Relay				
	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	3465	67	3532
HG 6-4	Combiflex / Electromagnetic Realy (Voltage operated) 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	3585	273	3858
HG 6-5	Auxiliary Relay for Transformer Protection				
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	2671	67	2738
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	4620	67	4687

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
HG 6-6	Power Factor Controller Relay				
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	13306	499	13805
HG 6-6-2	14 stages	Each	15058	499	15557
HG 6-7	Digital Timer				
	Providing, installing static digital timer with time delay on pick-up.	Each	1568	67	1635
HG 6-8	Automatic Semaphore Indicator				
	Providing, installing Automatic Semaphore indicator DC / AC operated for automatic indication of the position of Circuit Breakers				
	VAM 21	Each	2865	67	2932

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 12 - CB				
	[L.T. CABLE]				
CB 1	3 core PVC insulated, PVC sheathed copper conductor flat submersible cable				
	Supplying and erecting, Flat flexible submersible cable with, Copper Conductor, PVC insulated, and PVC sheathed.				
CB 1-1	3 core 1.5 sq mm	As per PWD			
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	262	14	276
CB 1-6	3 core 16 sq mm	Mtr	400	26	426
CB 1-7	3 core 25 sq mm	Mtr	649	26	675
CB 1-8	3 core 35 sq mm	Mtr	923	26	949
CB 2	Aluminium conductor single core, XLPE /PVC insulated & armoured cable				
	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	425	26	451
CB 2-2	Single core 400 sq mm	Mtr	543	51	594
CB 2-3	Single core 500 sq mm	Mtr	676	51	727
CB 2-4	Single core 630 sq mm	Mtr	872	51	923
CB 2-5	Single core 800 sq mm	Mtr	1075	78	1153
CB 2-6	Single core 1000 sq mm	Mtr	1320	78	1398

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
CB 3	Aluminium conductor Twin core, XLPE / PVC insulated & armoured cable				
	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 in an approved manner.				
CB 3-1	Two core 2.5 sq mm	As Per PWD CSR			
CB 3-2	Two core 4 sq mm				
CB 3-3	Two core 6 sq mm				
CB 3-4	Two core 10 sq mm				
CB 4	Aluminium conductor Three core, XLPE / PVC insulated & armoured cable				
	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	As per PWD			
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	357	28	385
CB 4-10	3 Core 95 sq mm	Mtr	453	28	481
CB 4-11	3 Core 120 sq mm	Mtr	546	51	597
CB 4-12	3 Core 150 sq mm	Mtr	652	51	703
CB 4-13	3 Core 185 sq mm	Mtr	767	51	818
CB 4-14	3 Core 240 sq mm	Mtr	1028	51	1079
CB 4-15	3 Core 300 sq mm	Mtr	1209	51	1260

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
CB 5	Aluminium conductor 3.5 Core, XLPE / PVC insulated & armoured cable				
	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	As per PWD			
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				
CB 5-10	3.5 Core 300 sq mm				
CB 5-11	3.5 Core 400 sq mm				
CB 6	Aluminium conductor 4 Core, XLPE / PVC insulated & armoured cable				
	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	90	17	107
CB 6-2	4 Core 6 sq mm	Mtr	103	17	120
CB 6-3	4 Core 10 sq mm	Mtr	131	17	148
CB 6-4	4 Core 16 sq mm	Mtr	146	17	163
CB 7	Copper conductor PVC insulated, armoured control cable				
CB 7-1	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.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	1.5 sq mm Copper conductor PVC insulated, armoured control cable				
CB 7-1-1	2 core 1.5 sq mm	Mtr	78	6	84
CB 7-1-2	3 core 1.5 sq mm	Mtr	94	6	100
CB 7-1-3	4 core 1.5 sq mm	Mtr	113	6	119
CB 7-1-4	5 core 1.5 sq mm	Mtr	132	6	138
CB 7-1-5	6 core 1.5 sq mm	Mtr	152	6	158
CB 7-1-6	7 core 1.5 sq mm	Mtr	168	6	174
CB 7-1-7	8 core 1.5 sq mm	Mtr	190	6	196
CB 7-1-8	9 core 1.5 sq mm	Mtr	200	6	206
CB 7-1-9	10 core 1.5 sq mm	Mtr	243	6	249
CB 7-1-10	12 core 1.5 sq mm	Mtr	323	6	329
CB 7-1-11	14 core 1.5 sq mm	Mtr	368	6	374
CB 7-2	2.5 sq mm Copper conductor PVC insulated, armoured control cable				
CB 7-2-1	2 core 2.5 sq mm	Mtr	101	6	107
CB 7-2-2	3 core 2.5 sq mm	Mtr	127	6	133
CB 7-2-3	4 core 2.5 sq mm	Mtr	159	6	165
CB 7-2-4	5 core 2.5 sq mm	Mtr	190	6	196
CB 7-2-5	6 core 2.5 sq mm	Mtr	220	6	226
CB 7-2-6	7 core 2.5 sq mm	Mtr	249	6	255
CB 7-2-7	8 core 2.5 sq mm	Mtr	277	6	283
CB 7-2-8	9 core 2.5 sq mm	Mtr	280	6	286
CB 7-2-9	10 core 2.5 sq mm	Mtr	327	6	333
CB 7-2-10	12 core 2.5 sq mm	Mtr	393	6	399
CB 7-2-11	14 core 2.5 sq mm	Mtr	453	6	459
CB 8	Copper conductor PVC insulated, Un-armoured control cable				
	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	48	6	54
CB 8-1-2	3 core 1.5 sq mm	Mtr	63	6	69
CB 8-1-3	4 core 1.5 sq mm	Mtr	76	6	82
CB 8-1-4	5 core 1.5 sq mm	Mtr	93	6	99
CB 8-1-5	6 core 1.5 sq mm	Mtr	111	6	117
CB 8-1-6	7 core 1.5 sq mm	Mtr	122	6	128
CB 8-1-7	8 core 1.5 sq mm	Mtr	137	6	143
CB 8-1-8	9 core 1.5 sq mm	Mtr	155	6	161
CB 8-1-9	10 core 1.5 sq mm	Mtr	169	6	175
CB 8-1-10	12 core 1.5 sq mm	Mtr	226	6	232
CB 8-1-11	14 core 1.5 sq mm	Mtr	259	6	265

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 13 - CB				
	[H.T. CABLE]				
CB 9	Aluminium conductor XLPE / PVC insulated, armoured Cable				
	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				
	3.3 kV- XLPE / PVC				
CB 9-1	3 Core 25 sq mm	Mtr	452	28	480
CB 9-2	3 Core 35 sq mm	Mtr	470	28	498
CB 9-3	3 Core 50 sq mm	Mtr	537	28	565
CB 9-4	3 Core 70 sq mm	Mtr	629	28	657
CB 9-5	3 Core 95 sq mm	Mtr	779	51	830
CB 9-6	3 Core 120 sq mm	Mtr	877	51	928
CB 9-7	3 Core 150 sq mm	Mtr	1033	51	1084
CB 9-8	3 Core 185 sq mm	Mtr	1156	51	1207
CB 9-9	3 Core 240 sq mm	Mtr	1432	51	1483
CB 9-10	3 Core 300 sq mm	Mtr	1676	80	1756
CB 9-11	3 Core 400 sq mm	Mtr	2084	80	2164
CB 10	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				
	6.6 kV -- XLPE / PVC				
CB 10-1	3 Core 35 sq mm	Mtr	509	28	537
CB 10-2	3 Core 50 sq mm	Mtr	575	28	603
CB 10-3	3 Core 70 sq mm	Mtr	684	28	712
CB 10-4	3 Core 95 sq mm	Mtr	809	28	837
CB 10-5	3 Core 120 sq mm	Mtr	933	51	984
CB 10-6	3 Core 150 sq mm	Mtr	1042	51	1093
CB 10-7	3 Core 185 sq mm	Mtr	1212	51	1263
CB 10-8	3 Core 240 sq mm	Mtr	1455	51	1506
CB 10-9	3 Core 300 sq mm	Mtr	1692	80	1772
CB 10-10	3 Core 400 sq mm	Mtr	2126	80	2206
CB 11	Supplying and erecting Aluminium conductor, XLPE / PVC - 11 kV , armoured cable complete erected in approved trench or on trays as per direction of Engineer In Charge				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	11 kV -- XLPE / PVC				
CB 11-1	3 Core 35 sq mm	Mtr	535	28	563
CB 11-2	3 Core 50 sq mm	As per PWD			
CB 11-3	3 Core 70 sq mm				
CB 11-4	3 Core 95 sq mm				
CB 11-5	3 Core 120 sq mm				
CB 11-6	3 Core 150 sq mm				
CB 11-7	3 Core 185 sq mm				
CB 11-8	3 Core 240 sq mm				
CB 11-9	3 Core 300 sq mm				
CB 11-10	3 Core 400 sq mm				
CB 12	Supplying and erecting Aluminium conductor, XLPE / PVC - 22 kV, armoured cable complete erected in approved trench or on trays as per direction of Engineer In Charge				
	22 kV -- XLPE / PVC				
CB 12-1	3 Core 95 sq mm	As per PWD			
CB 12-2	3 Core 120 sq mm				
CB 12-3	3 Core 150 sq mm				
CB 12-4	3 Core 185 sq mm				
CB 12-5	3 Core 240 sq mm				
CB 12-6	3 Core 300 sq mm				
CB 12-7	3 Core 400 sq mm	Mtr	2559	80	2639
CB 13	Supplying and erecting Aluminium conductor, XLPE / PVC - 33 kV, armoured cable complete erected in approved trench or on trays as per direction of Engineer In Charge				
	33 kV -- XLPE / PVC				
CB 13-1	3 Core 95 sq mm	As per PWD			
CB 13-2	3 Core 120 sq mm				
CB 13-3	3 Core 150 sq mm				
CB 13-4	3 Core 185 sq mm				
CB 13-5	3 Core 240 sq mm				
CB 13-6	3 Core 300 sq mm				
CB 13-7	3 Core 400 sq mm	Mtr	3091	80	3171

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
CB 14	MAKING TRENCH				
	Making a trench of suitable width and 0.9 m deep and laying provided cable and refilling the same with screened sand bed of 0.2 m thick to embed the cable and bricks placed on both side length wise and on top width wise all over the cable run and refilling the excavated earth without stone or hard material and making the surface proper with 0.15 m crown on top.				
CB 14-1	In Soft Soil	As per PWD			
CB 14-2	In Hard Murum or Tar Road				
Note 1	Add Rs 20/- per m length if Additional cable is to be laid by the side in the same trench with two Additional bricks to form another compartment.	As per PWD			
Note 2	For cable size up to 10 sq.mm, single brick is to be laid on the cable length wise and the above rate be reduced by 25%.	As per PWD			
CB 15	CABLE MARKER				
	Supplying and erecting cast iron cable marker plate of 100 mm dia and 6 mm thick welding with 0.7 m long galvanised iron rod of 12 mm dia and cross bars of 15 cm length welding at bottom of iron rod buried along with route of cable.	As per PWD			
CB 16	Cable enclosing G.I. Pipe "A" Grade				
	Supplying, erecting G.I. Pipe "A" grade erected for enclosing PVC armoured cable on wall or pole with clamp and upper end closed with T.W. bush and sealed with compound.				
CB 16-1	G.I. Pipe , 25 mm dia	As per PWD			
CB 16-2	G.I. Pipe , 40 mm dia				
CB 16-3	G.I. Pipe , 50 mm dia				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
CB 17	Cable enclosing RCC Pipe				
	Supplying and laying RCC hume pipe with coupling collar of standard thickness below ground / road surfacing for inclosing provided cable. The rates are inclusive of the work of required excavation of trench for pipe laying and refilling the trench with light ramming to make the road / ground surface as it was.				
CB 17-1	100 mm dia, RCC pipe	As per PWD			
CB 17-2	150 mm dia, RCC pipe				
CB 17-3	250 mm dia, RCC pipe				
CB 18	Cable enclosing G.I. Pipe "B" Class				
	Providing and laying 75 mm dia G.I. Pipe "B" grade ISI mark for enclosing provided cable to lay underground at required depth up to 90 cm with required excavation and refilling with light ramming to make the ground surface as it was.	As per PWD			
CB 19	Cable Lugs-- Aluminium				
	Supplying and erecting crimping type aluminium lugs conforming to IS suitable for cable as below evenly crimped with high pressure tool and connected to switch gear terminals with brass / cadmium plated nut bolts in an approved manner.				
CB 19-1	16 sq mm	As per PWD			
CB 19-2	25 sq mm				
CB 19-3	35 sq mm				
CB 19-4	50 sq mm				
CB 19-5	70 sq mm				
CB 19-6	95 sq mm				
CB 19-7	120 sq mm				
CB 19-8	150 sq mm				
CB 19-9	185 sq mm				
CB 19-11	240 sq mm				
CB 19-12	300 sq mm				
CB 19-13	400 sq mm				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
CB 20	Cable Glands (Brass)				
	Supplying and erecting heavy duty Siemens type brass cable glands of suitable size for PVC armoured cable as mentioned below with brass washers, rubber rings, complete erected with cable ends and lead connections.				
CB 20-1	2 to 4 core 2.5 to 4 sq mm	As per PWD			
CB 20-2	3 to 4 core 6 to 10 sq mm				
CB 20-3	3 to 4 core 16 to 25 sq mm				
CB 20-5	3 to 3.5 core 50 sq mm				
CB 20-6	3 to 3.5 core 70 sq mm				
CB 20-7	3 to 3.5 core 95 sq mm				
CB 20-8	3 to 3.5 core 120 sq mm				
CB 20-9	3 to 3.5 core 150 sq mm				
CB 20-10	3 to 3.5 core 185 sq mm				
CB 20-11	3 to 3.5 core 240 sq mm				
CB 20-12	3 to 3.5 core 300 sq mm				
CB 20-13	3 to 3.5 core 400 sq mm				
Note 3	For Flange type glands increase overall rate by 50% .				
CB 21	Cable Jointing Kit for Submersible cable				
	Providing cable jointing Kit with cable jointing compound and material for various size of submersible cable up to 35 sq mm etc complete.	As per PWD			
	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				
CB 22	INDOOR TERMINATION KIT for 3.3 kV / 6.6 kV XLPE 3 Core cable.				
CB 22-1	25-50 sq.mm	Each	3193	2489	5682
CB 22-2	70-120 sq.mm	Each	3536	2489	6025
CB 22-3	150-185 sq.mm	Each	4005	2489	6494
CB 22-4	240-400 sq.mm	Each	4463	2489	6952
CB 23	OUT DOOR TERMINATION KIT for 3.3 / 6.6 kV XLPE 3 Core cable.				
CB 23-1	25-50 sq.mm	Each	5208	2489	7697
CB 23-2	70-120 sq.mm	Each	5425	2489	7914
CB 23-3	150-185 sq.mm	Each	5849	2489	8338
CB 23-4	240-400 sq.mm	Each	7358	2489	9847

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
CB 24	STRAIGHT THROUGH JOINT for 3.3 / 6.6 kV XLPE 3 Core cable.				
CB 24-1	25-50 sq.mm	Each	11965	2489	14454
CB 24-2	70-120 sq.mm	Each	13397	2489	15886
CB 24-3	150-185 sq.mm	Each	17043	2489	19532
CB 24-4	240-400 sq.mm	Each	18639	2489	21128
CB 25	INDOOR TERMINATION KIT for 11 kV XLPE Screened 3 core cable.				
CB 25-1	25-50 sq.mm	Each	4612	2489	7101
CB 25-2	70-120 sq.mm	Each	5584	2489	8073
CB 25-3	150-225 sq.mm	Each	6686	2489	9175
CB 25-4	240-400 sq.mm	Each	7530	2489	10019
CB 26	OUT DOOR TERMINATION KIT for 11 kV XLPE Screened 3 core cable.				
CB 26-1	70-120 sq.mm	As per PWD			
CB 26-2	150-185 sq.mm				
CB 26-3	225 sq. mm				
CB 26-4	240-400 sq.mm				
CB 27	STRAIGHT THROUGH JOINT for 11 kV XLPE Screened 3 core cable.				
CB 27-1	70-120 sq.mm	As per PWD			
CB 27-2	150-185 sq.mm				
CB 27-3	240-300 sq.mm				
CB 28	INDOOR TERMINATION KIT FOR 22 kV XLPE Screened 3 core cable.				
CB 28-1	70-120 sq.mm	As per PWD			
CB 28-2	150-185 sq.mm				
CB 28-3	240-400 sq.mm				
CB 29	OUT DOOR TERMINATION KIT for 22 kV XLPE Screened 3 core cable.				
CB 29-1	70-120 sq.mm	As per PWD			
CB 29-2	150-185 sq.mm				
CB 29-3	240-400 sq.mm				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
CB 30	STRAIGHT THROUGH JOINT for 22 kV XLPE Screened 3 core cable.				
CB 30-1	70-95 sq.mm	As per PWD			
CB 30-2	120-150 sq.mm				
CB 30-3	185-240 sq.mm				
CB 30-4	300-400 sq.mm				
CB 31	INDOOR TERMINATION KIT for 33 kV XLPE Screened 3 core cable.				
CB 31-1	70-95 sq.mm	As per PWD			
CB 31-2	120-185 sq.mm				
CB 31-3	240-400 sq.mm				
CB 32	OUT DOOR TERMINATION KIT for 33 kV XLPE Screened 3 core cable.				
CB 32-1	70-95 sq.mm	As per PWD			
CB 32-2	120-185 sq.mm				
CB 32-3	240-400 sq.mm				
CB 33	STRAIGHT THROUGH JOINT for 33 kV XLPE Screened 3 core cable.				
CB 33-1	95-150 sq.mm	As per PWD			
CB 33-2	185-300 sq.mm				
CB 33-3	400 sq.mm				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
CB 34	CABLE TRAY				
	Providing and fixing G.I. Perforated cable trays of size as below including fixing on provided angles.				
CB 34-1	80mm X 20mm	As per PWD			
CB 34-2	200mm X 20mm				
CB 34-3	400mm X 20mm				
CB 35	CABLE DUCT RCC M-150				
	Providing and laying RCC (M-150) cable duct of size given below for laying electric cable including form work for centering M.S. bar reinforcement, necessary excavation bolder filling, PCC (M100), compacting, curing , plastering, including providing and fixing 35 X 35 X 5 mm M.S. angles, RCC pre cast cover of Adequate length with 100 mm over lap on either walls etc complete and providing RCC pre cast covers.				
CB 35-1	Cable duct 2 tier-750W X 750 D	Mtr	1444	0	1444
CB 35-2	Cable duct 3 tier-750W X 1000 D	Mtr	1696	0	1696
CB 35-3	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.
	SECTION 14 - MO				
	[L.T.MOTORS]				
MO 1	Foot Mounted Motors SPDP 1000 RPM				
	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	202637	3734	206371
MO 1-2	55 kW (75 HP)	Each	235588	3734	239322
MO 1-3	75 kW (100 HP)	Each	280134	4982	285116
MO 1-4	90 kW (120 HP)	Each	356962	4982	361944
MO 1-5	110 kW (150 HP)	Each	456357	7467	463824
MO 1-6	125 kW (170 HP)	Each	515084	7467	522551
MO 1-7	135 kW (180 HP)	Each	545117	7467	552584
MO 1-8	150 kW (200 HP)	Each	580038	7467	587505
MO 1-9	160 kW (215 HP)	Each	628726	7467	636193
MO 1-10	180 kW (240 HP)	Each	708612	9958	718570
MO 1-11	187 kW (250 HP)	Each	719933	9958	729891
MO 1-12	200 kW (270 HP)	Each	738930	9958	748888
MO 1-13	225 kW (300 HP)	Each	843843	9958	853801
MO 2	Foot Mounted Motor TEFC 1500 RPM				
	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	9742	251	9993
MO 2-2	1.5 kW (2 HP)	Each	10551	251	10802
MO 2-3	2.2 kW (3 HP)	Each	14040	251	14291
MO 2-4	3.7 kW (5 HP)	Each	18044	376	18420
MO 2-5	5.5 kW (7 HP)	Each	24834	622	25456
MO 2-6	7.5 kW (10 HP)	Each	29063	622	29685
MO 2-7	9.3 kW (12 HP)	Each	45168	1245	46413
MO 2-8	11 kW (15 HP)	Each	47468	1245	48713
MO 2-9	15 kW (20 HP)	Each	58946	1245	60191
MO 2-10	18.5 kW (25 HP)	Each	72661	2489	75150
MO 2-11	22 kW (30 HP)	Each	86376	2489	88865
MO 2-12	30 kW (40 HP)	Each	116750	2489	119239
MO 2-13	37 kW (50 HP)	Each	151227	3739	154966
MO 2-14	45 kW (60 HP)	Each	182928	3739	186667
MO 2-15	55 kW (75 HP)	Each	249389	3739	253128
MO 2-16	75 kW (100 HP)	Each	319349	4982	324331

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
MO 3	Vertical Hollow Shaft Motor TEFC 1500 RPM				
	Providing, erecting and giving test and trial of 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	111219	2489	113708
MO 3-2	22 kW (30 HP)	Each	123044	2489	125533
MO 3-3	30 kW (40 HP)	Each	134301	2489	136790
MO 3-4	37 kW (50 HP)	Each	154798	3739	158537
MO 3-5	45 kW (60 HP)	Each	197854	3739	201593
MO 3-6	55 kW (75 HP)	Each	251614	3739	255353
MO 3-7	67 kW (90 HP)	Each	333285	4982	338267
MO 3-8	75 kW (100 HP)	Each	336334	4982	341316
MO 3-9	90 kW (120 HP)	Each	348025	4982	353007
MO 3-10	110 kW (150 HP)	Each	415121	7467	422588
MO 3-11	125 kW (170 HP)	Each	424671	7467	432138
MO 3-12	135 kW (180 HP)	Each	490134	7467	497601
MO 3-13	150 kW (200 HP)	Each	575007	7467	582474
MO 3-14	160 kW (215 HP)	Each	619676	7467	627143
MO 3-15	180 kW (240 HP)	Each	643706	9958	653664
MO 3-16	187 kW (250 HP)	Each	651562	9958	661520
MO 3-17	200 kW (270 HP)	Each	688530	9958	698488
MO 3-18	225 kW (300 HP)	Each	717950	9958	727908
MO 4	Vertical Solid Shaft Motor TEFC - 1500 RPM				
Note 1	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.
	SECTION 15 - MO				
	[H.T.MOTORS]				
MO 5	3.3 kV Foot Mounted Motor TEFC 1000 RPM				
	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	661462	9958	671420
MO 5-2	250 kW (335 HP)	Each	750666	12442	763108
MO 5-3	280 kW (375 HP)	Each	889838	14931	904769
MO 5-4	340 kW (456 HP)	Each	937713	14931	952644
MO 5-5	390 kW (523 HP)	Each	988486	17423	1005909
MO 5-6	440 kW (590 HP)	Each	1051108	17423	1068531
MO 5-7	510 kW (684 HP)	Each	1201738	17423	1219161
MO 5-8	580 kW (777 HP)	Each	1298209	19912	1318121
MO 5-9	660 kW (885 HP)	Each	1457629	19912	1477541
MO 6	3.3 kV Foot Mounted Motor TEFC 1500 RPM				
MO 6-1	225 kW (300 HP)	Each	591870	9958	601828
MO 6-2	250 kW (335 HP)	Each	671623	12442	684065
MO 6-3	280 kW (375 HP)	Each	795918	14931	810849
MO 6-4	330 kW (442 HP)	Each	832171	14931	847102
MO 6-5	370 kW (495 HP)	Each	956467	17420	973887
MO 6-6	425 kW (569 HP)	Each	992718	17420	1010138
MO 6-7	510 kW (683 HP)	Each	1082487	17420	1099907
MO 6-8	660 kW (885 HP)	Each	1317269	19912	1337181
MO 7	3.3 kV Vertical Flange Mounted Motor TEFC 1000 RPM				
MO 7-1	225 kW (300 HP)	Each	696532	9958	706490
MO 7-2	250 kW (335 HP)	Each	790561	12442	803003
MO 7-3	280 kW (375 HP)	Each	936969	14931	951900
MO 7-4	340 kW (456 HP)	Each	984087	14931	999018
MO 7-5	390 kW (523 HP)	Each	1035878	17420	1053298
MO 7-6	440 kW (590 HP)	Each	1099750	17420	1117170
MO 7-7	510 kW (684 HP)	Each	1244763	17420	1262183
MO 7-8	580 kW (777 HP)	Each	1343163	19912	1363075
MO 7-9	660 kW (885 HP)	Each	1505082	19912	1524994

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
MO 8	3.3 kV Vertical Flange Mounted Motor TEFC 1500 RPM				
MO 8-1	225 kW (300 HP)	Each	618834	9958	628792
MO 8-2	250 kW (335 HP)	Each	702266	12442	714708
MO 8-3	280 kW (375 HP)	Each	785698	14931	800629
MO 8-4	330 kW (442 HP)	Each	870152	14931	885083
MO 8-5	370 kW (495 HP)	Each	984087	17420	1001507
MO 8-6	425 kW (569 HP)	Each	1020342	17420	1037762
MO 8-7	510 kW (683 HP)	Each	1110109	17420	1127529
MO 8-8	660 kW (885 HP)	Each	1336257	19912	1356169
Note 2	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.				
Note 3	For any special purpose if RTD and space heater are required in addition, add following extra charges				
	a) Space heater (240 Volts) Rs 5250/- for set of two				
	b) RTD Rs. 7500/- for six Nos.				
Note 4	All motors shall be of BEE mark				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 16 - TL				
	[TOOLS]				
TL 1	D.E. Open Jaw fix spanner 12 piece set - 6 -32 mm	Set	651	0	651
TL 2	Bi-hexagon Ring spanner 12 piece set - 6-32mm	Set	1133	0	1133
TL 3	Ball pen hammer with handle 800 gm	Each	293	0	293
TL 4	Combination side cutting plier 200 mm KDPE coated	Each	215	0	215
TL 5	Adjustable wrench chrome vanadium 250 mm - 30 mm	Each	279	0	279
TL 6	Pipe wrench stillson pattern carbon steel 450 mm - 60 mm	Each	549	0	549
TL 7	Pipe wrench stillson pattern carbon steel 600 mm - 76 mm	Each	983	0	983
TL 8	Screw driver Engineering pattern 6 X 300 mm	Each	94	0	94
TL 9	Screw driver Engineering pattern 8 X 200 mm	Each	82	0	82
TL 10	Screw driver Engineering pattern 5 X 200 mm	Each	59	0	59
TL 11	Screw driver Engineering pattern 5 X 300 mm	Each	61	0	61
TL 12	Screw driver with green neon bulb line tester 3.6 X 60 mm	Each	59	0	59
TL 13	Hack saw frame 300 mm size with heavy duty blade	Each	66	0	66
TL 14	Tool box fabricated from MS sheet of 18 SWG of size 50 X 30 X 30 cm with locking arrangement	Each	1045	0	1045
TL 15	Cold chisels chrome vanadium hexagonal 19/14 - 200 mm	Each	144	0	144
TL 16	Chain pipe wrench IS 54123 -- 210 - 4"	Each	3886	0	3886
TL 17	Chain pipe wrench IS 54123 -- 210 - 6"	Each	5704	0	5704
TL 18	25 mm dia heavy duty 1.2 m long crow bar	Each	197	0	197
TL 19	12 mm size 2 NT capacity wire rope 3 m long with dog bolt 2 Nos.	Each	262	0	262

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
TL 20	50 mm size G.I. "B" class pipe 1.5 m long with coupling on both side, for use as lever	Each	235	0	235
TL 21	Central punch Chrome Vanadium steel 175 mm	Each	61	0	61
TL 22	Triangular file 300 mm size of "Standard" make	Each	327	0	327
TL 23	Half round file of 300 mm size " Standard" make	Each	327	0	327
TL 24	Bearing puller three legs -- 8"	Each	346	0	346
TL 25	Bearing puller three legs -- 10"	Each	452	0	452
TL 26	Bearing puller three legs -- 12"	Each	549	0	549
TL 27	Hydraulic flip flop crimping tool suitable for 6 to 500 sq mm size cable lugs (Usha-Ismail or similar make)	Each	32375	0	32375
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	9141	0	9141
TL 29	Insulator tester (Megger) cranking type having metal body of range 100 Volts 1000 Ohms.	Each	4204	0	4204
TL 30	Earth Tester- 4 terminals of range 0-10-100-1000-10000 Ohms	Each	6466	0	6466
TL 31	Tong Tester (Clip on meter) of range 0-10-30-100-1000 Amps and 0-300-600 Volts	Each	3173	0	3173
TL 32	Engineer's precision steel level of size 300 mm	Each	391	0	391
TL 33	Precision stainless steel rules 500 mm	Each	262	0	262
TL 34	Allen Head Wrench Crome Vanadium 10 piece - 6-10mm	Set	317	0	317
TL 35	Tubler box spanner set with Tommy bar 8 piece- 6-22mm	Set	785	0	785
TL 36	Diagonal cutting pliers 150 mm PVC coated	Each	189	0	189
TL 37	Long nose pliers carbon steel 200 mm PVC coated	Each	181	0	181
TL 38	Water pump pliers chrome vanadium 259 mm - 40 mm	Each	264	0	264

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 17 - EC & GC				
	A - EC- ELECTRO CHLORINATION				
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. The electro chlorinator shall 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 wiring.				
	Control panel for the electro chlorinator consisting of DC voltage and current display in phase status unit on-off switches fuses etc.				
	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	174862	17532	192394
EC 17-2	50 gms / hr	Each	259054	25971	285025
EC 17-3	100 gms / hr	Each	458740	45990	504730
EC 17-4	150 gms / hr	Each	512711	51399	564110
EC 17-5	250 gms / hr	Each	615253	61681	676934

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
EC 17-6	350 gms / hr	Each	723192	72501	795693
EC 17-7	500 gms / hr	Each	917482	91978	1009460
EC 17-8	750 gms / hr	Each	1163864	116677	1280541
EC 17-9	1000 gms / hr	Each	1414001	141753	1555754
EC 17-10	1500 gms / hr	Each	1780994	178541	1959535
EC 17-11	2000 gms / hr	Each	2002270	200724	2202994
	B - GC - [AUTOMATIC GAS CHLORINATION SYSTEM]				
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.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	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	1308223	206589	1514812
GC 17-2	10 kg / hr (500 PPD)	Each	1369232	204442	1573674
	C . GAS CHLORINATION SYSTEM (Manual)				
	<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 & 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 & vacuum regulator including erection.</p>				
GC 17-3	4 kg / hr (200PPD)		264784	41366	306150
GC 17-4	10 kg / hr (500 PPD)		337896	41366	379262
	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.
	SECTION 18 - WM				
WM 1	Mechanical Type Meters.				
A)	Domestic Meters				
a)	I S I mark as per IS 779/1994				
	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	719	172	891
2	20 mm dia	Each	1633	172	1805
3	25 mm dia	Each	2314	172	2486
4	40 mm dia	Each	5068	172	5240
b)	Multijet meters				
	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	1691	172	1863
2	20 mm dia	Each	2096	172	2268
3	25 mm dia	Each	3667	172	3839
4	40 mm dia	Each	6976	172	7148

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
c)	AMR Meters				
	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 EEC / OIML.MID certification for Abroad meter and FCRI for India including 36 months guarantee etc complete.				
1	15 mm dia	Each	5355	653	6008
2	20 mm dia	Each	5891	747	6638
3	25 mm dia	Each	9199	923	10122
4	40 mm dia	Each	12542	1259	13801
B)	Bulk Meters.				
	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)	Removable mechanism type as per IS2373				
1	200 mm dia	Each	19898	2073	21971
2	250 mm dia	Each	38222	2731	40953
3	300 mm dia	Each	50511	3541	54052

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
b)	Removable mechanism type Bulk water meter as per ISO 4064				
	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	360	13459
2	80 mm dia	Each	14553	877	15430
3	100 mm dia	Each	16009	1243	17252
4	150 mm dia	Each	20331	1940	22271
5	200 mm dia	Each	26791	2073	28864
6	250 mm dia	Each	60703	2731	63434
7	300 mm dia	Each	102238	3541	105779
NOTE	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 flow.				
	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.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	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.				
	8) The rates are inclusive of all taxes , erection and commissioning.				
	9) Octroi/ LBT charges are not included in above rates and shall be as per actuals which will be included wherever in estimates for meter but not in tenders.				
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	2926	360	3286
2	80 mm dia	Each	4229	877	5106
3	100 mm dia	Each	6040	1243	7283
4	150 mm dia	Each	11072	1940	13012
5	200 mm dia	Each	16695	2073	18768
6	250 mm dia	Each	22260	2731	24991
7	300 mm dia	Each	42740	3541	46281
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.
WM 2	Ultrasonic Water Meter				
A)	AMR Domestic Meters				
	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.				
	General Specifications				
	1. Meter should be battery operated with no moving parts, low pressure loss, dry type as per ISO 4064/OIML R49 and certification as per FCRI / MID.				
	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	7720	753	8473
2	20 mm dia	Each	8420	822	9242
3	25 mm dia	Each	9818	958	10776
4	40 mm dia	Each	14015	1366	15381

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
B)	AMR Bulk Meters				
	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	21042	1977	23019
2	80 mm dia	Each	24434	2294	26728
3	100 mm dia	Each	28536	2680	31216
4	150 mm dia	Each	40015	3756	43771
5	200 mm dia	Each	60669	5695	66364
6	250 mm dia	Each	116344	10919	127263
7	300 mm dia	Each	161141	10919	172060
C)	Ultrasonic Flow meters				
	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 :				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
1	Ultrasonic Clamp-on portable type Flow Meter (Single Channel)				
	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	235655	0	235655
	a) Magnetic Clamps-1 Pair &				
	b) Suitable carrying case-1 No.				
2	Ultrasonic Clamp-on Fixed type Flow Meter (Single Channel)				
	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	204750	0	204750
3	Ultrasonic Insertion Fixed type Flow Meter (Single Channel)				
	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	210000	0	210000
	Mandatory Accessories:				
	1) Integrated signal converter transmitter enclosed in die cast aluminum case / any anticorrosive material confirming to IP-68 - 1 No.				
	2) Pair of transducers (Sensors) confirming to IP-68 with junction boxes - 1 No.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	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)				
	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) Lazer printer of EPSON, WIPRO, WEP or Hewlett Packard make with built in or separate printer interface unit for printing of stored data with online / offline printing facility -1 No.				
	9) Proper earthing shall be provided for protection against high voltage surge (only required for category B,C)				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	10) Suitable over voltage protection unit for protection of instrument from higher voltage (upto 275 V-300 V AC)				
	11) 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)				
	13) 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)				
	14) 5 meter steel measurement tape with level bottle.				
	15) Communication facility through GSM(without simcard (for category C)				
	16) Guarantee period shall be 36 months.				
	Optional Accessories:				
	1) Pressure transducer, which should be connected to the pressure lead of dual channel data loggers, compatible with the dual channel loggers of appropriate type with a pressure range of 5m to 150 m with an accuracy of not less than +/-1% to be supplied and installed at the upstream of the flow meters.	Each	13913	0	13913

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	2) 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	5565	0	5565
	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) Cables for pressure, flow & totalized details from transmitter to field gate system (10 Mtrs with each GSM / GPRS system)				
	6) OPC Software to be installed in central PC for SCADA interface as may be necessary				
	7) Commissioning charges for each locations.				
	8) Customized page with Java Applets XML-Data import software for online MIMIC				
	9) Sensor/Transmitter cable of following specification:				
	3 x 0.38 mm ² PVC cable with common branded copper shield 7mm dia and individually shielded cores-with empty pipe detection 9 EPD	Mtr	166	0	166
	4 x 0.38 mm ² PVC cable with common branded copper shield 7 mm dia and individually shielded cores.				
	Conductor resistance : ≤ 50 Ohm/Km				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	10) Conduit pipe (PVC / HDPE plumbing) 32 mm diameter with suitable digging, laying and concealing the duct	AS per MJP Civil CSR			
	11) Other Civil Works:				
	a) Flow meter chamber work with suitable man hole for entering the chamber & removal of flow meter for maintenance in future,	AS per MJP Civil CSR			
	b) Construction of meter room with roof slab (100 mm) brick masonry with pile foundation of minimum 1.5 M x 1.5 M or as per instruction from Engineer-in - Charge with RCC beam/column minimum 0.15mx0.15m size with steel door & cement jali ventilator and plinth height of minimum 0.5 M above GL and roof slab shall be 2.1 M from plinth inner and outer plaster with water proof cement painting	AS per MJP Civil CSR			
C)	Working Condition & Specifications				
	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 ²				
	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.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	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.				
	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.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
D)	Calibration, Testing & Inspection				
	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%				
E)	Manufacturer's Guarantee, Certificate & training				
	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.				
F)	O & M towards flow meter & accessories				
	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)				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	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				
G)	General Terms & Conditions				
	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) Octroi / LBT charges are not included in above rates and shall be as per actuals which will be included wherever applicable in estimates for meter up to site storage				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	e) The above prices are inclusive of Marine & inland insurance of flow meters up to site storage				
	f) Meter shall be procured with prior permission from concerned superintending Engineer/Chief Engineer.				
	g) 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				
WM 3	Full-Bore Electromagnetic Flow Meter:				
	Supply, install and commission Electromagnetic Flow Meter (EMF) As Per ISO 4064, for Raw/Pure water with accuracy +/-0.5% of measured value & protection as per given specifications for size 100 mm-1000mm including sensor, transmitter surge arrestor, 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	100115	3857	103972
2	150 mm Nominal Diameter Flowmeter	Each	107405	4688	112093
3	200 mm Nominal Diameter Flowmeter	Each	127746	4963	132709
4	250 mm Nominal Diameter Flowmeter	Each	140905	5763	146668
5	300 mm Nominal Diameter Flowmeter	Each	161170	7054	168224
6	350 mm Nominal Diameter Flowmeter	Each	223800	8835	232635
7	400 mm Nominal Diameter Flowmeter	Each	254013	10185	264198

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
8	450 mm Nominal Diameter Flowmeter	Each	271397	11658	283055
9	500 mm Nominal Diameter Flowmeter	Each	317069	12200	329269
10	550 mm Nominal Diameter Flowmeter	Each	351104	13291	364395
11	600 mm Nominal Diameter Flowmeter	Each	365681	13761	379442
12	700 mm Nominal Diameter Flowmeter	Each	392897	14632	407529
13	750 mm Nominal Diameter Flowmeter	Each	420995	15516	436511
14	800 mm Nominal Diameter Flowmeter	Each	472135	17176	489311
15	900 mm Nominal Diameter Flowmeter	Each	537971	19284	557255
16	1000 mm Nominal Diameter Flowmeter	Each	576244	22494	598738
A)	Mandatory Accessories:				
	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				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	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.				
B)	Optional Accessories:				
	1) Pressure transducer, which should be connected to the pressure lead of dual channel data loggers & should be compatible with the dual channel loggers. The pressure transducer should be of appropriate type with a pressure range of 5 m to 300 m with an accuracy of not less than 1% to be supplied and installed at the upstream of the flow meters.	Each	13913	0	13913

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	2) Providing and supplying DI/CI 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 Sr.No. (2) 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				
	6) Commissioning charges for each locations.				
	7) Sensor/Transmitter cable of following specification:				
	3 X 0.38 mm ² PVC cable with common, braided copper shield (-7mm dia) and individually shielded cores- with empty pipe detection 9 EPD): 4X0.38 mm ² PVC cable with common, braided copper shield (-7 mm dia) and individually shielded cores-conductor resistance: ≤ 50 Ohm/Km-Capacitance: core/shield: ≤ 420 pF/m.-permanent operating temperature:-20.....+80 Deg C	Mtr	171	0	171
	8) Coil cable of following specifications :				
	3 X 0.75 mm ² PVC cable with common, braided copper shield (-7mm dia) Conductor resistance : ≤ 37 Ohm/Km- Capacitance: core/core, shield grounded : ≤ 120 pF/m.-permanent operating temperature:-20+/-80 Deg C	Mtr	155	0	155

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	9) Pressure Transmitter cable of following specifications :	Mtr	155	0	155
	3 X 0.75 mm ² PVC cable with common, braided copper shield (-7mm dia) Conductor resistance : ≤ 37 Ohm/Km- Capacitance: core /core, shield grounded : ≤ 120 P F/m- permanent operating temperature: -20.....+80 Deg C.				
	10) GI Duct of 100 mm with suitable rating: for laying underground with all the necessary fittings, joints etc., for housing the cables between sensor & transmitter. The cable shall be installed in a suitable GI duct to minimize the risk of damage during excavation. All cable laid at a minimum depth of 0.5 M below the ground. GI duct shall be of 100 mm dia.	As per PWD			
	11) Other Civil Works:				
	a) Flow meter chamber work with suitable manhole for entering the chamber & removal of flow meter for maintenance in future,	As Per Civil CSR			
	b) Construction of meter room with roof slab (100 mm)				
C)	Working Condition & Specifications				
	a) Water Temp : 10 Deg to 50 Deg				
	b) Water Quality: Raw water, turbid in nature. Potable chlorinated water				
	c) Operating pressure:10-15 Kg./cm ²				
	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.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	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.				
	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				
D)	Calibration, Testing & Inspection				
	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.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
E)	Manufacturer's Guarantee, Certificate & training				
	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.				
F)	O & M towards flow meter & accessories				
	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 healthyness 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				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
G)	General Terms & Conditions				
	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 includes 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) 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				
	Note : While preparing the estimate of water meter / flowmeter, 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 .				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
WM 4	Battery Operated electromagnetic flow meter				
	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.				
A)	General Specifications				
	Sensor				
	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.
	Transmitter				
	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 485 Serial 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	110128	12053	122181
2	150 mm line size	Each	118146	12930	131076
3	200 mm line size	Each	140522	15378	155900
4	250 mm line size	Each	154996	16962	171958
5	300 mm line size	Each	177287	19402	196689
6	350 mm line size	Each	246180	26941	273121
7	400 mm line size	Each	279414	30578	309992
8	450 mm line size	Each	298537	32671	331208
9	500 mm line size	Each	348777	38168	386945
NOTE 1	Battery operated electromagnetic flow meter shall be considered for estimation and installation with prior approval from the Superintending Engineer (Mech.).				
NOTE 2	All erection of water meters must be done in presence & guidance of manufacturers representative.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	SECTION 19 - SA				
	[SCADA & AUTOMATION]				
SA 1	Raw Water Pump house				
1.1	Ultrasonic level transmitter				
	Designing, Supplying, Installing, commissioning & testing of Ultrasonic Raddar type level transmitter CE marked with following technical parameters at Raw Water Pump House and Interfacing with PLC panel including mounting arrangement.	Each	57435	4251	61686
	Output-4-20 mA				
	Power supply - 24V DC ext.				
	Display - 4" LED				
	Range- 0 to mtrs				
	Accuracy - +/- 0.25% of Full Scale or better				
	Enclosure- IP 67				
	Mounting - On PLC panel				
1.2	Pressure Transmitter	Each	28144	1984	30128
	Designing, Supplying, Installing, commissioning & testing of pressure transmitter 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.				
	Display - 4" LED				
	Accuracy - +/- 0.1 % of full scale or better				
	Enclosure- IP 67				
1.3	Power Analyser	Each	26535	1871	28406
	Designing, Supplying, Installing, commissioning & testing of Power Analyser interfacing to PLC Panel with modbus communicatuion port , as per IEC 62053 and in the prescribed format including mounting arrangement.				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
1.4	PLC Panel				
	Designing, Supplying, Installing, commissioning & testing of PLC Panel . Including PLC with CPU & Power supply unit, power supplyb cables interfacing cards, interfacing cables, wireless modules with 25% extra quantity of all accessories.	Each	20460	1417	21877
1.5	PLC based control monitoring and communication software				
	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	37005	5667	42672
1.6	Power Cable				
	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			
1.7	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			
1.8	Signal Cable				
1.8.1	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of 2 Pair x 1 sq.mm as per IS 694 copper Shielded twisted, multistranded armoured cablew on wall in GI tray or on ground.	Mtr	139	10	149
1.8.2	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of 3 Pairs x1 sq.mm. as per IS 694 copper Shielded, twisted, multi stranded armoured cable on wall in GI tray or on ground.	Mtr	177	12	189

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 4.5 Pairs x 1.0 sq.mm as per IS 694 copper shielded, twisted, multi stranded armoured cable on wall in GI tray or on ground.	Mtr	261	18	279
1.8.4	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of 8 Pairs x 1.0 sq.mm as per IS 694 copper shielded, twisted, multi stranded armoured cable on wall in GI tray or on ground.	Mtr	457	43	500
1.9	Cable Trays				
1.9.1	Designing, Supplying, Installing Bending, Cutting Perforated GI tray 80 x 20 mm x3 mm thk for laying of cable etc	As per PWD CSR			
1.9.2	Designing, Supplying, Installing, Bending, Cutting Perforated GI tray 200 x 20 x 3mm thk for for laying of cable etc				
1.9.3	EARTHING - Providing making separate Earthing arrangement for SCADA & Automation system with copper Earth Pit & Copper Earth Plate etc				
1.10	Surveillance System				
	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	22767	1701	24468

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
SA 2	Water Treatment Plant				
	Aeration Fountain				
2.1	Open channel type ultrasonic flowmeter with FIT	Each	42119	2833	44952
	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				
2.2	PH analyser				
	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 0.1% of full scale , Supply Voltage : 24V dc, Output : 4-20 mA As per IEC 61000-6-2 & IEC 61000-6-3	Each	80409	5667	86076
2.3	Turbidity Analyser				
2.3.1	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 with mounting arrangement.	Each	215460	20965	236425
	Overall Range : 0 - 2000 NTU				
	Accuracy : +/- 0.02 NTU				
	Supply Voltage : 230 V ac				
	Output : 4-20 mA				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	Alum / PAC Dosing				
2.3.2	Design, Supply, Installing commissioning and testing PLC compatible 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	175778	12750	188528
2.4	Level transmitter				
	Designing, Supplying, installing, commissioning & testing of Ultrasonic level transmitter CE marked at each filter bed with following technical parameters Interfacing with PLC panel including mounting arrangement.	Each	40205	2833	43038
	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				
2.5	Power Analyser				
	Designing, Supplying, Installing, commissioning & testing of Power Analyser interfacing to PLC Panel with modbus communicatuion port, as per IEC 62053 and in the prescribed format including mounting arrangement.	Each	25780	1871	27651
2.6	PLC Panel with HMI for Filter Bed				
	Designing, Supplying, Installing, commissioning & testing of PLC Panel with HMI including PLC with CPU & Power supply unit, power supply cable, Interfacing cards, interfacing cables, wireless modules with 25 % extra quantity of all accessories.	Each	20460	1417	21877

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
2.7	Master PLC Panel				
	Design, Supply, Installing, Commissioning & Testing of Master PLC control monitoring and communication panel 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.	Each	38767	1417	40184
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 CB7-1-1			
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 shieled, twisted, multistraned armoured cable on wall in GI tray or on ground.	As per MJP CSR SA1-8-1			
2.9.2	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of 3 pair x 1.0 sq.mm. as per IS 694 copper shieled, twisted, multistraned armoured cable on wall in GI tray or on ground.	As per MJP CSR SA1-8-2			

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
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 shieled, twisted, multistraned armoured cable on wall in GI tray or on ground.	As per MJP CSR SA1-8-3			
2.9.4	Designing, Supplying, Installing, commissioning & testing with Terminating & Interfacing of 8 pair x 1.0 sq.mm. as per IS 694 copper shieled, twisted, multistraned armoured cable on wall in GI tray or on ground.	As per MJP CSR Sa1-8-4			
3	Cable Trays				
3.1	Designing, Supplying, Installing Bending, Cutting Perforated GI tray 80 x 20 mm x3 mm thk for laying of cable etc.	As per PWD CSR			
3.2	Designing, Supplying, Installing, Bending, Cutting Perforated GI tray 200 x 20 x 3mm thk for for laying of cable etc.				
4	Blower				
4.1	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 SA1-1-2			
	Medium- Water				
	Pressure - 0-10 kg/cm2				
	Output 4-20 mA				
	Power supply - 24V DC ext.				
	Display - Large LED				
	Accuracy - +/- 0.5 % of full scale or better				
	Temp.- suitable for Amb.temp				
	Enclosure- IP 65 weatherproof				
	Mounting - In Line				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
4.2	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	40205	2833	43038
	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				
4.3	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	69075	11106	80181
4.4	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	22767	1701	24468
SA 3	Flash Mixer & Clariflocculator				
	Designing, Supplying, Installing, commissioning & testing with operation, controlling & Monitoring of Flash Mixer and Clariflocculator mechanism interfaced with Master PLC of WTP	Each	20460	1417	21877

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
SA 4	Valves with actuator	As per MJP Mech. CSR			
	Design, Supply, Installation, Testing of Motor Actuated Valve / Gate 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				
SA 5	Pure Water Pump house				
5.1	Ultrasonic level transmitter				
	Designing, Supplying, Installing, commissioning & testing of Ultrasonic level transmitter CE marked with following technical parameters at pure Water Pump House and Interfacing with PLC panel including Mounting accessories.	Each	40205	2833	43038
	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 pressure transmitter CE marked with following technical parameters at Raw Water Pump House and Interfacing with PLC panel including Mounting arrangement.	Each	28144	1984	30128
	Output 4-20 mA				
	Power supply - 24V DC ext.				
	Display - 4" LED				
	Accuracy - +/- 0.1 % of full scale or better				
	Enclosure- IP 67				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
5.3	pH analyser				
	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	80409	5667	86076
5.4	Turbidity meter / analyser				
	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	156242	11333	167575
5.5	Residual chlorine analyser				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
	Design, Supply, Installation, Testing of Residual chlorine analyser / meter 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) must be provided to avoid maintenance. IP 65 Nema 4 housing protection class required.	Each	210597	14166	224763
5.6	Power Analyzer				
	Designing, Supplying, Installing, commissioning & testing of Power Analyzer interfacing to PLC Panel with Modbus Communication Port, as per IEC 62053 and in the prescribed format including Mounting arrangement.		25780	1871	27651
5.7	PLC Panel				
	Designing, Supplying, Installing, commissioning & testing of PLC Panel including PLC with CPU & Power supply unit, power supply cable, Interfacing cards, interfacing cables, wireless modules with 25 % extra quantity of all accessories.	Each	20460	1417	21877
5.8	PLC based control monitoring and communication software				
	Design, Supply, Installing, Testing, PLC based control monitoring and communication panel 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	37005	5667	42672

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
5.9	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	22767	1701	24468
SA 6	SCADA Software				
6.1	Supply, Installation, Commissioning, Testing, Terminating & Interfacing Software Design to PLC and commissioning of SCADA software with required hard tags plus 25% extra and with unlimited soft Tags & life time licence Development version	Each	198140	22665	220805
6.2	Developing/programming charges to install the software as per logic defined by the dept.	Each	116300	16999	133299
6.3	Supply, Installation, Testing, Terminating & Interfacing Centralised Historian Server grade Historian PC with Window 7 or latest window operating system & Historian software development cost etc. complete	Each	61380	4251	65631
6.4	Supply, Installation, Testing, Terminating & Interfacing Secondary Computer Station Secondary computer station etc.	Each	48360	3684	52044
6.5	Supply, Installation, Testing, Intgeration & Commissioning of 46" LCD monitor at Conf. Room for display of total water system (Online)	Each	66966	5100	72066
6.6	Providing, installing, testing and commissioning of Laptop with programming software run time version alongwith required cables and communication devices for PLC and SCADA programming (web based)	As per PWD CSR			

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
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	40205	2833	43038
	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	136712	9917	146629
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	14062	1020	15082

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
SA 8 (I)	ESR Management Systems (RMS)				
	(For Inlet / outlet)				
	Designing, Supplying, Installing, Commissioning & testing of Flow Control Valve / Pressure reducing valve for inlet with flow measuring, flow controlling, pressure monitoring & web based with cable, PLC etc. complete				
SA8-1	80 mm Dia	Each	112989	11333	124322
SA8-2	100 mm Dia	Each	121967	11333	133300
SA8-3	150 mm Dia	Each	160669	11333	172002
SA8-4	200 mm Dia	Each	205269	11333	216602
SA8-5	250 mm Dia	Each	277340	11333	288673
SA8-6	300 mm Dia	Each	328729	11333	340062
SA8-7	350 mm Dia	Each	421104	11333	432437
SA8-8	400 mm Dia	Each	551998	11333	563331
SA8-9	450 mm Dia	Each	591266	11333	602599
SA8-10	500 mm Dia	Each	776053	11333	787386
SA8-11	550 mm Dia	Each	1116377	11333	1127710
SA8-12	600 mm Dia	Each	1116377	11333	1127710
SA 8 (II)	(Pressure Reducing valve) 80 mm to 600 mm				
	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				

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
a	80 mm	Each	51579	11333	62912
b	100 mm	Each	55887	11333	67220
c	150 mm	Each	100344	11333	111677
d	200 mm	Each	152710	11333	164043
e	250 mm	Each	234746	11333	246079
f	300 mm	Each	319158	11333	330491
g	350 mm	Each	389496	11333	400829
h	400 mm	Each	571584	11333	582917
i	450 mm	Each	705194	11333	716527
j	500 mm	Each	930353	11333	941686
k	600 mm	Each	1271806	11333	1283139
SA 8 (III)	(Flow cum Altitude Control valve) 80 mm to 600 mm				
	Flow cum Altitude Control Valve - 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 given specifications				
a	80 mm	Each	88280	11333	99613
b	100 mm	Each	100137	11333	111470
c	150 mm	Each	140984	11333	152317
d	200 mm	Each	187100	11333	198433
e	250 mm	Each	247709	11333	259042
f	300 mm	Each	337305	11333	348638
g	350 mm	Each	496770	11333	508103
h	400 mm	Each	643782	11333	655115
i	450 mm	Each	849230	11333	860563
j	500 mm	Each	1186708	11333	1198041
k	600 mm	Each	1370304	11333	1381637

Section & Code No.	Description	Unit	Supply Rate Rs.	Erection Rate Rs.	Total Amt Rs.
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 The valve should offer minimum restriction while allowing the flow inclusive of all the accessories like inbuilt timer controller, batteries etc. complete... as per given specifications				
a	80 mm	Each	76683	11333	88016
b	100 mm	Each	83421	11333	94754
c	150 mm	Each	127934	11333	139267
d	200 mm	Each	180010	11333	191343
e	250 mm	Each	262046	11333	273379
f	300 mm	Each	346458	11333	357791
g	350 mm	Each	420604	11333	431937
h	400 mm	Each	598884	11333	610217
i	450 mm	Each	793044	11333	804377
j	500 mm	Each	957653	11333	968986
k	600 mm	Each	1309125	11333	1320458
SA 9	Ultrasonic Flow Meter with battery backup.	As per MJP CSR			
	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.The meter shall be suitable for 50°C and provided with IP 68 protection class with complete immersion of water. The accuracy of the meter shall be +/- 1 % of measured value.as per detailed specification attached				
SA 10	Butterfly Valve with Actuator	As per MJP CSR			

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	Labour charges for Removing	Labour charges for Dismantling	Labour charges for Assembling	Labour charges for Re-erection
	SECTION 20 - LB - [REMOVING , DISMANTLING , ASSEMBLING & RE- ERECTION]				
Note	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.				
LB 1	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%
LB 2	Motor	20%	15%	20%	25%
LB 3	Transformer				
LB 3-1	Up to 315 kVA capacity	70%	20%	35%	90%
LB 3-2	Above 315 to 750 kVA	80%	20%	35%	90%
LB 4	Valves				
LB 4	Sluice Valve , Non return valve , butter fly valve and air valve	40%	50%	50%	60%
Note	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	982	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	-	-	-	-

Note 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.

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.

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

MULTIPLYING FACTOR FOR CALCULATING THE SIZES OF CAPACITOR FOR POWER FACTOR IMPROVEMENT

Original Power Factor of Load before applying Capacitor	SIZE OF CAPACITORS IN KVAR PER KW OF LOAD FOR RAISING THE POWER FACTOR												
	0.8	0.85	0.9	0.91	0.92	0.93	0.94	0.95	0.96	0.97	0.98	0.99	UNITY
0.45	1.23	1.36	1.501	1.532	1.561	1.592	1.626	1.659	1.695	1.737	1.784	1.846	1.988
0.46	1.179	1.309	1.446	1.473	1.502	1.533	1.567	1.6	1.636	1.677	1.725	1.786	1.929
0.47	1.13	1.26	1.397	1.425	1.454	1.485	1.519	1.552	1.588	1.629	1.677	1.758	1.881
0.48	1.076	1.206	1.343	1.37	1.4	1.43	1.464	1.497	1.534	1.575	1.623	1.684	1.826
0.49	1.03	1.16	1.297	1.326	1.355	1.386	1.42	1.435	1.489	1.53	1.578	1.639	1.782
0.5	0.982	1.112	1.248	1.276	1.303	1.337	1.363	1.403	1.441	1.481	1.529	1.49	1.732
0.51	0.936	1.066	1.202	1.23	1.357	1.291	1.323	1.357	1.395	1.435	1.483	1.544	1.686
0.52	0.894	1.024	1.16	1.188	1.215	1.249	1.281	1.315	1.353	1.393	1.441	1.502	1.644
0.53	0.85	0.98	1.116	1.144	1.171	1.205	1.237	1.271	1.309	1.349	1.397	1.487	1.6
0.54	0.809	0.939	1.075	1.103	1.13	1.164	1.196	1.23	1.268	1.308	1.356	1.458	1.559
0.55	0.769	0.899	1.035	1.063	1.09	1.124	1.156	1.19	1.268	1.268	1.316	1.377	1.519
0.56	0.73	0.86	0.996	1.024	1.051	1.085	1.117	1.151	1.189	1.229	1.277	1.338	1.48
0.57	0.692	0.822	0.958	0.986	1.013	1.047	1.079	1.113	1.151	1.191	1.239	1.3	1.442
0.58	0.655	0.785	0.921	0.949	0.976	1.01	1.042	1.076	1.114	1.154	1.202	1.263	1.405
0.59	0.618	0.748	0.884	0.912	0.939	0.973	1.005	1.039	1.077	1.117	1.165	1.226	1.368
0.6	0.584	0.714	0.849	0.878	0.905	0.939	0.971	1.005	1.044	1.083	1.131	1.192	1.334
0.61	0.549	0.679	0.815	0.843	0.87	0.904	0.936	0.97	1.008	1.048	1.096	1.157	1.299
0.62	0.515	0.645	0.781	0.809	0.836	0.87	0.902	0.936	0.974	1.014	1.08	1.123	1.265
0.63	0.483	0.613	0.749	0.777	0.804	0.838	0.87	0.904	0.942	0.982	1.062	1.091	1.233
0.64	0.45	0.58	0.716	0.744	0.771	0.805	0.837	0.871	0.909	0.949	1.03	1.058	1.2
0.65	0.419	0.549	0.685	0.713	0.74	0.774	0.806	0.84	0.878	0.918	0.997	1.027	1.169
0.66	0.388	0.518	0.654	0.682	0.709	0.743	0.775	0.809	0.847	0.887	0.966	0.996	1.138
0.67	0.358	0.488	0.624	0.652	0.679	0.713	0.745	0.779	0.817	0.857	0.935	0.966	1.108
0.68	0.329	0.459	0.595	0.623	0.65	0.684	0.716	0.758	0.788	0.828	0.905	0.937	1.079
0.69	0.299	0.429	0.565	0.593	0.62	0.654	0.686	0.72	0.758	0.798	0.876	0.907	1.049
0.7	0.27	0.4	0.536	0.564	0.591	0.625	0.657	0.691	0.729	0.769	0.84	0.878	1.02
0.71	0.242	0.372	0.508	0.536	0.563	0.597	0.629	0.663	0.701	0.741	0.811	0.85	0.992
0.72	0.213	0.343	0.479	0.507	0.534	0.568	0.6	0.634	0.672	0.712	0.783	0.821	0.963
0.73	0.186	0.316	0.452	0.48	0.507	0.541	0.573	0.607	0.645	0.685	0.754	0.794	0.936
0.74	0.159	0.289	0.425	0.453	0.48	0.514	0.546	0.58	0.618	0.658	0.727	0.767	0.909
0.75	0.132	0.262	0.398	0.426	0.453	0.487	0.519	0.553	0.591	0.631	0.7	0.74	0.882
0.76	0.105	0.235	0.371	0.399	0.426	0.46	0.492	0.526	0.564	0.604	0.673	0.713	0.855
0.77	0.079	0.209	0.345	0.373	0.4	0.434	0.466	0.5	0.538	0.578	0.652	0.687	0.829
0.78	0.053	0.183	0.319	0.347	0.374	0.408	0.44	0.474	0.512	0.552	0.62	0.661	0.803
0.79	0.026	0.156	0.292	0.32	0.347	0.381	0.413	0.447	0.485	0.525	0.594	0.634	0.776
0.8	-	0.13	0.266	0.294	0.321	0.355	0.387	0.421	0.459	0.499	0.567	0.608	0.75
0.81	-	0.104	0.24	0.268	0.295	0.329	0.361	0.395	0.433	0.473	0.541	0.582	0.724
0.82	-	0.078	0.214	0.242	0.269	0.303	0.335	0.369	0.407	0.447	0.515	0.556	0.698
0.83	-	0.052	0.188	0.216	0.243	0.277	0.309	0.343	0.381	0.421	0.489	0.53	0.672
0.84	-	0.026	0.162	0.19	0.217	0.251	0.283	0.317	0.355	0.396	0.463	0.504	0.645
0.85	-	-	0.136	0.164	0.191	0.225	0.257	0.291	0.329	0.369	0.437	0.478	0.62
0.86	-	-	0.109	0.14	0.167	0.198	0.23	0.264	0.301	0.343	0.39	0.45	0.593
0.87	-	-	0.083	0.114	0.141	0.172	0.204	0.238	0.275	0.317	0.364	0.424	0.567
0.88	-	-	0.054	0.085	0.112	0.143	0.175	0.209	0.246	0.288	0.335	0.395	0.538
0.89	-	-	0.028	0.059	0.086	0.117	0.149	0.183	0.23	0.262	0.309	0.369	0.512
0.9	-	-	-	0.031	0.058	0.089	0.121	0.155	0.192	0.234	0.281	0.341	0.484
0.91	-	-	-	-	0.027	0.058	0.09	0.124	0.161	0.203	0.25	0.31	0.453
0.92	-	-	-	-	-	0.031	0.063	0.097	0.134	0.176	0.223	0.283	0.426
0.93	-	-	-	-	-	-	0.032	0.066	0.108	0.145	0.192	0.252	0.395
0.94	-	-	-	-	-	-	-	0.034	0.071	0.113	0.16	0.22	0.363
0.95	-	-	-	-	-	-	-	-	0.037	0.079	0.126	0.186	0.329
0.96	-	-	-	-	-	-	-	-	-	0.042	0.089	0.149	0.292
0.97	-	-	-	-	-	-	-	-	-	-	0.047	0.107	0.25
0.98	-	-	-	-	-	-	-	-	-	-	-	0.06	0.203
0.99	-	-	-	-	-	-	-	-	-	-	-	-	0.143

eg. : 100 KW load to be improved from 0.77 to 0.95 power factor from table is 0.500 i.e. capacitor (KVAR) = $100 \times 0.5 = 50$ KVAR

CE/Testing/Star Rated/DT/

9923

Date: 28 APR 2017

CIRCULAR

Sub: Implementation of revised energy performance standards for Distribution Transformers up to 2500 KVA rating.

In exercise of the powers conferred by clause (a) of section 14 of the Energy Conservation Act, 2001, the Central Government in consultation with the Bureau of Energy Efficiency, has amended its notification i.e. S.O. 185(E) dated 12th Jan, 2009 vide S.O. No. 4062(E) dated 16th December 2016 and further amended vide S.O. No. 513(E) for distribution transformer dated 17/02/2017.

In reference with the said gazette of ministry of power ref no. S.O. No. 4062(E) dated 16th December 2016; energy performance standards for the distribution transformer have been revised in the star rating band.

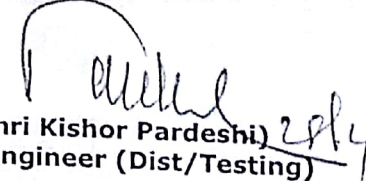
Accordingly the energy efficiency Level-1 of IS 1180(Part1):2014 is removed and energy efficiency Level 2 and Level-3 are re-designated as Star-1 and Star-2. As per the said notification the said revision have to be implemented from 01st Jan 2017 onwards.

However, now as per amendment notification no. S.O. No. 513(E), dated 17/02/2017 it is to inform that **the energy efficiency Level-1(old star-3) distribution transformers shall remain valid up to 30th June 2017. And Energy efficiency Level-2(revised star 1) distribution transformers shall be considered for procurement in various schemes up to 2500 KVA rating, with effect from 1st July 2017 onwards.**

The revised Star Rating and Standard Losses in Watts up to 11KV and 22KV class for 16 KVA to 2500KVA Outdoor Type Distribution Transformer are enclosed herewith as Annexure-A for ready reference.

This is for your information and further immediate necessary action please.

Encl: As Above.


(Shri Kishor Pardeshi)
Chief Engineer (Dist/Testing)

Copy s. w. r to:

- 1) The Director (Finance), / Director (Operations)/Director (Projects), MSEDCL.
- 2) The Executive Director, 1/1I/III/IV, MSEDCL.
- 3) The Regional Director, Pune/Konkan/Aurangabad/Nagpur, MSEDCL.

Copy f. w. cs to:

- 1) The Chief Engineer (Comm.)/APDRP/INFRA/PP/Stores/Civil, MSEDCL
- 2) All Chief Engineer, O & M Zones, MSEDCL

Copy to:

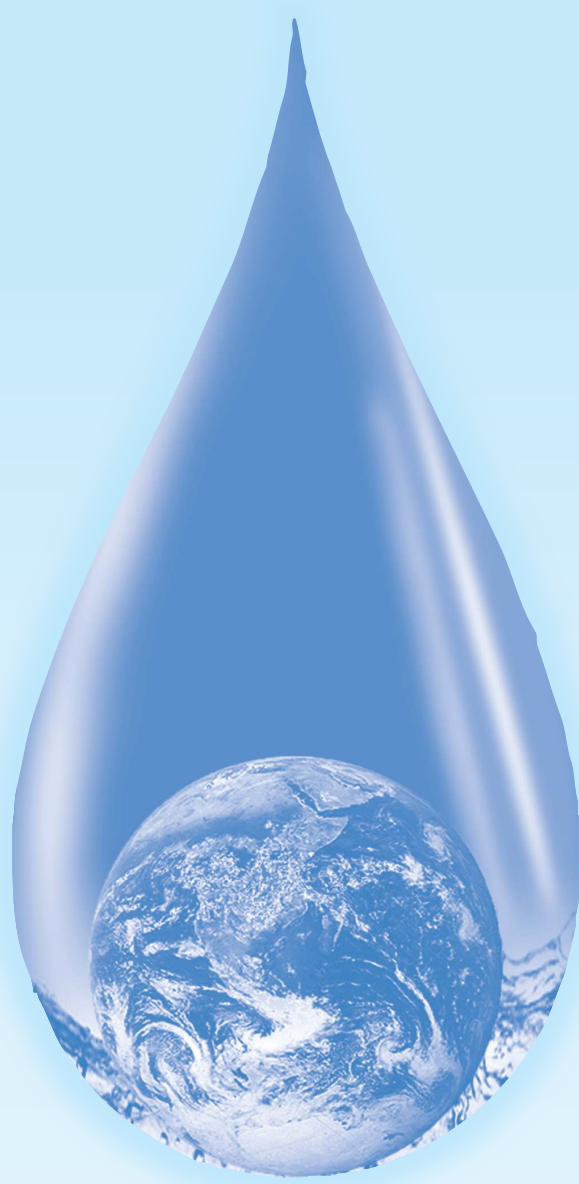
- 1) The OSD to Chairman & Managing Director, MSEDCL.
- 2) All Superintending Engineers, O&M Circles, MSEDCL.

Maximum Total Losses for 11KV class Distribution Transformers

RATING	1 STAR	2 STAR	3 STAR	4 STAR	5 STAR
TRANSFO RMER CAPACITY IN KVA	MAX LOSSES AT 50% (WATTS)	MAX LOSSES AT 100% (WATTS)	MAX LOSSES AT 50% (WATTS)	MAX LOSSES AT 100% (WATTS)	MAX LOSSES AT 50% (WATTS)
16	135	440	120	400	108
25	190	635	175	595	158
63	340	1140	300	1050	270
100	475	1650	435	1500	392
160	670	1950	570	1700	513
200	780	2300	670	2100	603
250	980	2930	920	2700	864
315	1025	3100	955	2750	890
400	1225	3450	1150	3330	1080
500	1510	4300	1430	4100	1354
630	1860	5300	1745	4850	1637
1000	2790	7700	2620	7000	2460
1250	3300	9200	3220	8400	2142
1600	4200	11800	3970	11300	3753
2000	5050	15000	4790	14100	4543
2500	6150	18500	5900	17500	5660

Maximum Total Losses for 22KV class Distribution Transformers

RATING	1 STAR	2 STAR	3 STAR	4 STAR	5 STAR
TRANSFO RMER CAPACITY IN KVA	MAX LOSSES AT 50% (WATTS)	MAX LOSSES AT 100% (WATTS)	MAX LOSSES AT 50% (WATTS)	MAX LOSSES AT 100% (WATTS)	MAX LOSSES AT 50% (WATTS)
16	141.75	462	126	420	113.4
25	199.5	666.75	183.75	624.75	165.9
63	357	1197	315	1102.5	283.5
100	498.75	1732.5	456.75	1575	411.6
160	703.5	2047.5	598.5	1785	538.65
200	819	2415	703.5	2205	633.15
250	1029	3076.5	966	2835	907.2
315	1076.25	3255	1002.75	2887.5	934.5
400	1286.25	3622.5	1207.5	3496.5	1134
500	1585.5	4515	1501.5	4305	1421.7
630	1953	5565	1832.25	5092.5	1718.85
1000	2929.5	8085	2751	7350	2583
1250	3465	9660	3381	8820	3249.1
1600	4410	12390	4168.5	11865	3940.65
2000	5302.5	15750	5029.5	14805	4770.15
2500	6457.5	19425	6195	18375	5943



“Water Saved ...
is Water Earned !
Energy Saved ...
is Energy Earned !”