

	Madras School of Economics, Koturpuram, Chennai				
	Supply & Installation of 1 no. 125 & 1 no. 200 KVA DG set & Allied works				
S.No	Description of Item	Qty	Unit	Rate	Amount
				Rs.	Rs.
	Schedule 1 - 200 KVA & 125 KVA DG Sets				
1	Supply, erection, testing and commissioning of 200 KVA DG set complete with all accessories like engine, alternator, batteries with leads, automatically operated control panel, base frame, anti vibration mounts, hospital silencer, fuel tank, in let piping, exhaust piping with lagging inside the DG set and up to the top of the canopy including silencer, engine driven fuel oil pump, other miscellaneous accessories for the total set, control wiring, annunciation etc., all as per CPCB IV + norms including trial run on full load inclusive of all consumable and diesel oil				
	Engine:				
	Standard design, contineous duty, multi cylinder 4 stroke coupled to alternator, naturally aspirated, radiator cooled developing required BHP @ 1500 rpm under NTP condition of BS 5514 with an over load capacity of 10 % for one hour in any 12 contineous hours of operation				
	The engine shall be with fhe following accessories				
	Crankshaft				
	Induction hardened bearings				
	Alloy cast iron removable V liner cylinder block				
	Corrosion resistant cylinder heads with supply and return lines and valves				
	Central Sump				
	Crank shaft actuated injectors with integral Electronic Governor fuel system				
	Forced feed gear type pump for lubrication				
	Aluminium alloy ring carrier piston with provision for thermal expansion				
	Heat and corrosion resistant intake and exhaust valves				
	Breather crank case				
	Air filter				
	Blower type fan with shrouding				
	Lube oil cooler and outboard after coolers				
	Dry type replacable paper element air cleaner with restriction indicator				
	Full flow paper element filters - fuel, lube oil and by-pass				
	Fly wheel housing & fly wheel to suit single/double bearing alternator				
	Starting motor - Electric, battery charging alternator				
	Flexible coupling for double bearing alternator				
	Electronic control panel				
	Engine protections				
	High water temperature, Low lube oil pressure, Over speed, low coolant oil level (alarm)				
	Holset turbocharger, pulse tuned exhaust manifold stainless steel exhaust flexible connection				

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S.No	Description of Item	Qty	Unit	Rate	Amount
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	Panel instruments provided with Ammeter, hour Meter with RPM indicator, lubricating oil pressure gauge, water temperature gauge, starting switch, belt driven centrifugal coolant pump, over speed trip, flexible coupling, lube oil measuring lever etc.				
	Alternator				
	Alternator rated at 200 KVA 0.8 PF (lag) 415 V, 3 phase 4 wire 50 Hz, 1500 rpm, seperately excited and self regulated with brushless excitation, band of voltage regulation +/- 0.5 % of rated voltage from no load to full load.				
	Insulation class H. Ingress protection IP 23. Alternator confirming to BS:5000/IS: 4722				
	Terminal box suitable for termination of 3.5C 300 sq.mm 1.1 KV LT XLPE Alu. Cond. Cable				
	Soild state High Speed Automatic Voltage Regulator				
	Alternator shall have local control with 320 A 36 KA 4 pole Thermal Magnetic type MCCB with adjustable over load and short circuit protection in the container with access door and should have a adopter box for termination of outgoing cables				
	Base Frame				
	Study fabricated weleded construction channel iron base frame for mounting the above engine and alternator with anit-vibration mounts				
	Battery				
	Heavy duty Batteries in fully charged condition with connecting leads and terminals, metal stand of suitable size with rubber mat etc.				
	Acoustic Enclosure all as per CPCB 4 + norms and with doors on both sides with viewing glass and emergency trip button	1	each		
2	Control panel suitable for 200 KVA DG set				
	The control panel shall be made out ot 16 SWG, re inforced sheet steel channel, floor mounting, free standing, dust and vermin proof, cubicle type, in IP 51 enclosure front opereated with openable cover on all four sides				
	Built in Battery charger with trickle and boost charging facility, DC contorl Relays and timers, Auto/Manual/Test selector switch				
	Frequency Meter - Digital type				
	Push Button - Accept/Reset with lamp				
	ON/OFF indicating lamps, fuses, tag blocks				
	320 Amps Copper bus bars with heat shrink PVC sleeve mounted on SMC/DMC supports				
	The bus bars shall be separate for incoming and outgoing with proper shrouding				

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S.No	Description of Item	Qty	Unit	Rate	Amount
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	It shall be provided with 320 A 4 pole 36 KA Micro processor based MCCB control Electronic trip type with Auto/Manual Power closing mechanism, twin core current transformer for metering and protection with relevant class & VA rating, Over Current & Earth Fault Relay, Micro Processor based control and Annunciation System for Engine & Alternator controls, Over Voltage Relay, High Speed Tripping Relay, Digital type Voltmeter with built in 3 phase selector switch, Digital type Ammeter with built in 3 phase selector switch, Power Factor meter, KWH Meter, Annunciation windows with relays and timers				
	Removable type gland plate for in coming and outgoing				
	Base frame, lifting hooks, terminal block including control wiring				
	Protective Relays in the control panel				
	2 over current and 1 earth fault relay (IDMT)				
	Restricted Earth Fault Relay	1	each		
3	Local Isolation				
	Supplying and fixing 320 A 4 pole 36 KA Thermal Magnetic type MCCB with adjustable Over Load & short Circuit Protection, extended rotary handle, phase barrier, terminal shrouds etc., with suitable enclosure complete with copper cabling of adequate size between alternator and the MCCB for local isolation	1	each		
	125 KVA DG:				
4	Supply, erection, testing and commissioning of 125 KVA DG set complete with all accessories like engine, alternator, batteries with leads, automatically operated control panel, base frame, anti vibration mounts, hospital silencer, fuel tank, in let piping, exhaust piping with lagging inside the DG set and up to the top of the canopy including silencer, engine driven fuel oil pump, other miscellaneous accessories for the total set, control wiring, annunciation etc., all as per CPCB IV + norms including trial run on full load inclusive of all consumable and diesel oil	1	each		
	Alternator				
	Alternator rated at 125 KVA 0.8 PF (lag) 415 V, 3 phase 4 wire 50 Hz, 1500 rpm, seperately excited and self regulated with brushless excitation, band of voltage regulation +/- 0.5 % of rated voltage from no load to full load.				
	Insulation class H. Ingress protection IP 23. Alternator conrfirming to BS:5000/IS: 4722				
	Terminal box suitable for termination of 3.5C 185 sq.mm 1.1 KV LT XLPE Alu. Cond. Cable				
	Soild state High Speed Automatic Voltage Regulator				

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	Supply & Installation of 1 no. 125 & 1 no. 200 KVA DG set & Allied works				
S.No	Description of Item	Qty	Unit	Rate	Amount
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	Alternator shall have local control with 250 A 36 KA 4 pole Thermal Magnetic type MCCB with adjustable over load and short circuit protection in the container with access door and should have a adopter box for termination of outgoing cables				
	Base Frame				
	Study fabricated weleded construction channel iron base frame for mounting the above engine and alternator with anti-vibration mounts				
	Battery				
	Heavy duty Batteries in fully charged condition with connecting leads and terminals, metal stand of suitable size with rubber mat etc.				
	Acoustic Enclosure all as per CPCB 4 + norms and with doors on both sides with viewing glass and emergency trip button	1	each		
5	Control panel suitable for 125 KVA DG set				
	The control panel shall be made out of 16 SWG, reinforced sheet steel channel, floor mounting, free standing, dust and vermin proof, cubicle type, in IP 51 enclosure front operated with openable cover on all four sides				
	Built in Battery charger with trickle and boost charging facility, DC control Relays and timers, Auto/Manual/Test selector switch				
	Frequency Meter - Digital type				
	Push Button - Accept/Reset with lamp				
	ON/OFF indicating lamps, fuses, tag blocks				
	250 Amps Copper bus bars with heat shrink PVC sleeve mounted on SMC/DMC supports				
	The bus bars shall be separate for incoming and outgoing with proper shrouding				
	It shall be provided with 250 A 4 pole 36 KA Micro processor based MCCB control Electronic trip type with Auto/Manual Power closing mechanism, twin core current transformer for metering and protection with relevant class & VA rating, Over Current & Earth Fault Relay, Micro Processor based control and Annunciation System for Engine & Alternator controls, Over Voltage Relay, High Speed Tripping Relay, Digital type Voltmeter with built in 3 phase selector switch, Digital type Ammeter with built in 3 phase selector switch, Power Factor meter, KWH Meter, Annunciation windows with relays and timers				
	Removable type gland plate for incoming and outgoing cables				
	Base frame, lifting hooks, terminal block including control wiring				
	Protective Relays in the control panel				
	2 over current and 1 earth fault relay (IDMT)				
	Restricted Earth Fault Relay	1	each		

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	Supply & Installation of 1 no. 125 & 1 no. 200 KVA DG set & Allied works				
S.No	Description of Item	Qty	Unit	Rate	Amount
				Rs.	Rs.
6	Local Isolation				
	Supplying and fixing 250 A 4 pole 36 KA Thermal Magnetic type MCCB with adjustable Over Load & short Circuit Protection, extended rotary handle, phase barrier, terminal shrouds etc., with suitable enclosure complete with copper cabling of adequate size between alternator and the MCCB for local isolation	1	each		
	Total for Schedule 1				
	Schedule 2 - Electrical works				
7	Supplying and laying 3.5 core 300 sq.mm PVC armoured Aluminium conductor cable 1.1 KV grade from the isolation panel in the DG set to the AMF panel and to ATS panel in the electrical room. Cable laid in wall/ceiling etc., with suitable powder coated clamps and fixing screws all as per site requirement. (Main cable for 200 KVA DG set)	75	mt		
8	Same as above, but supplying and laying 3.5 core 185 sq.mm PVC armoured cable with Aluminium conductor 1.1 KV grade (Main cable for 125 KVA DG set) Sensing cable)	175	mt		
9	Same as above, but supplying and laying 4 core 2.5 sq.mm PVC armoured cable with copper conductor 1.1 KV grade (Sensing cable)	250	mt		

10	Providing end termination for the above cable using double compression brass cable glands and copper cable sockets. Rate should include for earthing the cable gland with earth clamp and copper wire as required				
a	for 300 sq.mm cable	8	each		
b	for 185 sq.mm cable	8	each		
c	for 2.5 sq.mm cable	4	each		
EB/DG Change Over					
11	Supplying and fixing the following in a suitable Powder coated enclosure made of 16G CRC sheet with cable boxes for termination of incoming and outgoing cables with removable type cable gland. The enclosure fixed on a suitable MS powder coated angle iron frame work. The rate should include for all connected civil works for grouting the frame as required				
	1 no. 320A 4 pole ATyS (Automatic Transfer switching equipment with LVM (Line Voltage Monitor)				
	LVM for ATS motor protection should have OV & UV protection				
	ATS should continue to feed supply even when one/two of the incoming phase fails				
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Supply & Installation of 1 no. 125 & 1 no. 200 KVA DG set & Allied works					
S.No	Description of Item	Qty	Unit	Rate Rs.	Amount Rs.
	A neutral pole fully rated, identified and positioned on the right of phase poles				
	ATSE shall have high short time current with stand capability				
	1 set EB ON, DG ON, Load on EB/Load on DG LED indication lamp with control MCB (for 200 KVA DG set)	1	each		
12	Same as above, but supplying and fixing 200A ATyS for 125 KVA DG set	1	each		
EB Mains for SC 408					
13	Supplying and fixing 320A TP+N 36 KA double break MCCB Micro Processor based with adjustable over load, short circuit and earth fault protection. The MCCB should be provided with extended rotary handle, spreaders and phase barriers as required.				
	The MCCB should be housed in a suitable 16G thick Powder coated sheet steel enclosure with locking arrangement. The unit mounted on wall with suitable angle iron frame work. Rate should include for painting the angle iron frame and all connected civil work for grouting the frame	1	each		
EB Mains for SC 373					
14	Same as above but supplying and fixing 200A tp + N MP based MCCB	1	each		

	Earthing				
15	Providing earth electrode all as per IS-3043 with 10 feet long 100 mm dia. 8 -10 mm thick cast iron pipe with flange welded on top including providing double clamp arrangement using 2 nos. 25 x 3 mm copper flat run along the pipe up to flange with holes drilled for tapping connection with brass bolt and nuts as required				
	The electrode should be buried in alternate layers of salt/charcoal mixture				
	Rate should include for providing all connected civil work including masonry chamber construction of size 450 x 450 mm (inner dimension) and SFRC cover with (Precon or equivalent) RCC frame with lifting arrangement and holes for receiving water to the earth pit (4 nos. for DG Body and 4 nos. for DG Neutral)	8	each		
16	Supplying and laying 25 x 3 mm copper flat for earthing. All the tapping connections in the earth pit are to be tinned and suitable copper rivets should be used for joining the copper flat	200	mt		
	Total for Schedule 2				
	Madras School of Economics, Koturpuram, Chennai				
	Supply & Installation of 1 no. 125 & 1 no. 200 KVA DG set & Allied works				
S.No	Description of Item	Qty	Unit	Rate	Amount
				Rs.	Rs.
	Schedule 3 - Mechanical Installation:				
	Exhaust pipe:				
17	Supplying and fixing 5" dia. ' B ' class MS pipe for exhaust system complete with all accessories including bends, flanges etc. For 200 KVA DG set	20	mt		
18	Same as above, but supplying and fixing 4" dia. ' B ' class MS pipe for exhaust system complete with all accessories including bends, flanges etc. For 125 KVA DG set	20	mt		
19	Providing Thermal insulation for the exhaust pipes with 50 mm thick mineral wool bound with chicken mesh and cladding with 26 SWG Aluminium foil up to the top of the Acoustic Enclosure all as per IS 3677/1073	40	mt		
20	Same as above, but for hospital type silencer	2	set		
21	Supply and erection of MS supports with suitable MS Channel/Angle/flat etc., in welded construction for supporting the Exhaust pipe. Rate should include for all civil work for grouting the supports and painting the supports with approved colour paint complete as required.	5	MT		
22	Supply and installation of stainless steel rain hood at the top of exhaust pipe to prevent rain water in the pipe with provision of drain plug in the system	2	each		

23	Charges for unloading the 200 KVA DG set complete with Acoustic Enclosure, isolation panel. Fuel tank and all other accessories at site including positioning the DG set in the existing foundation bed. Rate should include for all tools & tackles for unloading the DG & Freight charges from the works upto the site installation as required	1	each		
24	Same as above but for 125 KVA DG set	1	each		
25	Charges towards testing and commissioning 200 KVA DG sets complete with Acoustic Enclosure for full load, for 8 Hrs. continuous operation including all consumables like lube oil, diesel etc., complete as required.	1	each		
26	same as above, but for 125 KVA DG set	1	each		
27	Providing Emission sampling point in the exhaust pipe line as per standard norms	2	each		
Total for Schedule 3					
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Supply & Installation of 1 no. 125 & 1 no. 200 KVA DG set & Allied works					
S.No	Description of Item	Qty	Unit	Rate	Amount
				Rs.	Rs.
Schedule 4 - Approvals					
28	Charges for preparation of necessary drawings for submission to Chief Electrical Inspector to Government of Tamilnadu, getting approval, submission of completion certificate under, arranging inspection, submission of rectification report and obtaining Safety Certificate for the entire installation complete all as per relevant codes and regulations. For both 200 KVA & 125 KVA DG sets	1	job		

Total for Schedule 4					
Schedule 5 - Civil Works					
200 KVA & 125 KVA DG Set Platform					
29	Excavate for foundation in all kinds of soil including soft rock (except hard rock requiring blasting) part return and fill in foundation and basement in layers not exceeding 15cm in depth including watering, breaking clods and consolidating, and disposal of surplus earth away from the site upto 1.5m depth (No extra shall be payable for working space).	17	cu. m		
30	Supplying and filling inside basement under floors with Q.Dust in layers of not exceeding 300mm thick including watering and consolidating all complete as directed.	6.5	cu. m		
	Cement concrete 1:5:10 (1 cement, 5 sand, 10 hard blue granite stone metal 40mm and down gauge) laid in layers not exceeding 15cm each in depth and well consolidated in foundation including necessary shuttering. steps etc. all complete as directed.	6.5	cu. m		
31	RCC M30 (design mix) using hard blue granite metal 20mm and down gauge including centering, shuttering, curing etc. complete but excluding cost of reinforcement. Minium cement content should be 400kg/cu.m.				
	In Foundation, Footing, Raft, Grade slabs and like	18	cu. m		
32	Supply, straighten, handle, cut bend, crank, fix and tie in position in all RCC items of work including cost of GI binding wire 18SWG double strand complete. (On actual length measurements of fabricated steel work, including authorised lappages only at theoretical weight for different sections payment will be made.) Basic price Rs.60,000.00 / M.T				
	High yield strength deformed bars	MT	1.50		
Total for Schedule 5					
Supply & Installation of 1 no. 125 & 1 no. 200 KVA DG set & Allied works					
S.No	Description of Item	Qty	Unit	Rate	Amount
				Rs.	Rs.

Schedule 6 - Cable Trench					
	75 M Length 450 mm W x750 mm D Electrical Cable Trench				
33	Earthwork excavation in all type of soil up to 1.50M depth.	100	cu. m		
34	Supplying and filling inside basement under floors with Quarry dust in layers of not exceeding 300mm thick including watering and consolidating all complete as directed.	13	cu. m		
35	Cement concrete 1:4:8(1 cement, 4 sand,8 hard blue granite stone metal 40mm and down gauge) in layers not exceeding 15cms in depth well consolidated in levelling course under floors including ecessary shuttering of required profile all complete as directed.	13	cu. m		
36	RCC M30(design mix) using hard blue granite metal 20mm and down gauge including centering, shuttering, curing etc. complete but excluding cost of reinforcement. Minium cement content should be 360kg/cu.m.				
	Raft 100 mm thk	8	cu. m		
	150mm Thk RCC Wall	14	cu. m		
	Cover Slab 100mm Thk	10	cu. m		
37	Supply, straighten, handle, cut bend, crank, fix and tie in position in all RCC items of work including cost of GI binding wire 18SWG double strand complete.(On actual length measurements of fabricated steel work, including authorised lappages only at theoretical weight for different sections payment will be made.) Basic price Rs.60,000.00 / M.T				
	High yield strength deformed bars	4	MT		
38	Prepare surfaces and plaster with C.M 1:5(1 cement,5 sand) ,12mm minimum thick to all external faces of brick walls(sponge finish) including RCC surfaces not contiguous to masonry.	135	sq.mm		
Total for Schedule 6					