

Ordnance Factory Dum Dum, Jessore Road , Kolkata -700028

Detailed Technical Specification for Supply, Erection , Commissioning and testing of 'Grid Connected Roof top Solar PV power Plant of Cap 100 KWp' at OFDC

		/Supplier of proposed PV modules must have the ISO 9001:2008 or ISO 14001 Certification for their items under supplies.	
44.0	Desired specification of the PV Module shall be as given below.		
45.0	Item	Description	
46.0	Certification	(i) IEC 61215 or IS 14286	(ii) IEC 61730
47.0	Test certificate issuing authority.	NABL/ IEC Accredited Testing Laboratories or MNRE, Accredited test centres	
48.0	PV Cell		
49.0	Type	poly crystalline	
50.0	PV Module		
51.0	Minimum capacity	250 Wp at STC	
52.0	Rating at STC	250 Wp to 320 Wp, (without any negative tolerance)	
53.0	Efficiency	15 % (Minimum)	
54.0	Fill factor	70 % (Minimum)	
55.0	Glass		
56.0	Thickness	3.2 mm (minimum)	
57.0	Type	High transmission, low iron, tempered & textured, glass with anti reflective coating.	
58.0	PV Module Junction Box		
59.0	Protection level	IP 65 or above	
60.0	Bypass Diode		
61.0	System Voltage (V _{sys})	1000 V dc	
62.0	Number	3 numbers	
63.0	Module Frame		
64.0	Type	Anodized aluminium frame	
65.0	Make	As per MNRE approved make in India.	
66.0	PV Array	Desired specification of the PV Array shall be conforming to the following:	
67.0	Item	Description	
68.0	Nominal Capacity	100 kWp	
69.0	PV Module interconnection	MC-4 / Tyco	

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	connector		
70.0	PV Module interconnection cable and array cable	PV 1-F standard / NEC Standard ' USE-2 or (RHW-2" type (double insulated).	
71.0	PV array String Voltage	Compatible with the MPPT Channel of the inverter	
72.0	PV Module Mounting Structure	PV module shall be mounted on fixed metallic structure having adequate strength and proper design which can withstand the load of module and high wind velocities. For this they shall comply with the following standards.	
73.0	Standard	Description	
74.0	IS 800	General constructions in steel- Code of Practice.	
75.0	IS 456	Plain & reinforced Concrete- Code of Practice.	
76.0	IS 2062	Hot rolled medium and high tensile structural steel specification.	
77.0	IS 875 Part III	Code of practice for design wind loads for building and structures.	
78.0	IS 4759	hot-dip zinc coatings on structural steel and other allied products – specification	
79.0	During Structural design following points must be included and shall be ensured that the requirement is fully met:		
80.0		The Module Mounting structure must be made of MS as per IS Standard (latest edition) ISI Make.	
81.0		The contractor shall have to submit the drawing of PV Module mounting structure supported by Stad- pro design to OFDC for necessary approval. Angle-channel structure shall only be considered.	
82.0		The PV Array mounting should be capable of withstanding a wind velocity load of up to 200 km/hrs after installation duly certified MNRE empanelled chartered engineer. (200 Km/Hour, Certified by govt. institutions like Jadavpur University, BESU).	
83.0		All structures including any metallic part thereof	

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		must be protected against any corrosion. The structures must also be compatible with the materials used in the module frame, fasteners, fixtures, nuts, bolts or any similar nature of metallic components whichever are required to complete the job.	
84.0		The array structure will be made of hot dip galvanized MS structure of minimum galvanizing thickness 85 micron.	
85.0		Structures will be supplied complete with all members to be compatible for allowing easy installation.	
86.0		The module mounting structure will have to be designed and fabricated with tilt angle for obtaining optimum generation from the PV power Plant as per site condition. The work shall be carried out as per design approved by OFDC.	
87.0		The structures will be designed for simple mechanical and electrical installation. There will be no requirement of welding or complex machinery at the installation site.	
88.0		The PV Array structure will support SPV modules at the mentioned orientation and absorb, transfer the mechanical loads to the ground or any suitable/ existing strength structure as deemed fit.	
89.0		Nuts and Bolts of Array structure: Stainless steel SS 304.	
90.0		All fasteners, fixtures for supporting conduits Shall be made with stainless steel or aluminium or UV Protected PVC.	
91.0		Access for the cleaning and maintenance of the Panel shall be suitably provided.	
92.0	PV Array Junction Box (AJB)	PV array Junction Box (AJB) shall have to be used for termination of series strings connecting array with each inverter. The array Junction Box may be inbuilt with the Inverter or it may be a separate unit. There shall be two Arrays Junction Boxes in case, the	

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		inverter is located away from PV Array. General requirements for this shall be confirming for connectors- safety AC/DC as IEC 60947 Part I, II, & III/IS:60947 Part I, II & III, EN 50521.	
93.0	The desired specification of the PV Array Junction Box and accessories shall be as follows.		
94.0	Item Description	Desired Data	
95.0	Degree of Protection	IP65 with UV Protected	
96.0	Material	Polycarbonate (If AJB is a separate Unit and not Inbuilt in Inverter).	
97.0	Withstanding voltage	1000 V DC	
98.0	Number of Strings entry	As may be required.	
99.0	Cable Entry and Exit		
100.0	Position	Bottom at cable entry and exit	
101.0	Cable Entry and Exit connector type	MC 4 / Tyco Connector (PV Array String cable)	
102.0	Cable gland	PVC gland	
103.0	Surge Protecting Device (SPD)		
104.0	Type	DC	
105.0	Protection class	Type II	
106.0	Rating (8/20)	25 kA	
107.0	Number of set	As may be required as per string Design (minimum 1 set against each MPPT Chanel)	
108.0	Voltage	1000 V (Y connection also be considered)	
109.0	Standard	PV Standard	
110.0	Fuse with fuse holder related with AJB		
111.0	Position	Positive and negative terminal for each series string.	
112.0	Type	Glass fuse, for PV Use only	
113.0	Rating /make	Current: Minimum 1.25 times the rated short circuit current of the string : - Voltage: Minimum 1000 V DC /Cooper Bussman/ Ferazz Shamut or equivalent as per acceptability of user.	
114.0	Standard	PV Standard	
115.0	Earthing Provision	Terminal blocks will have to be provided for Earthing.	
116.0	Terminals, lugs and bus bar	Tinned copper	

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117.0	Grid Connected Inverter	The inverters shall be of ON Grid string inverter. The proposed 100 kWp grid connected solar PV power plant shall be connected with grid. As such, the inverters shall be compatible to operate with existing utility supply.	
118.0	The power from PV array shall be feed into grid through grid connected string inverter(s)each of nominal capacity ranging from 10 kVA to 50 kVA, 3Ø 415 V 50Hz AC. These inverters should have in built MPPT Controller / function - Qty 1 No or more .Desired specification of grid connected inverter shall be as given below.		
119.0	Operating Parameter	Desired specification	
120.0	Type and make	Grid connected String Inverter / Make	
		ABB/Delta/Power one/ Redius	
121.0	Operation AC Voltage	(Three) 3 phase 415 V	
122.0	Operating frequency range	48.5 - 51.5 Hz	
123.0	Operating Temp range	-10 Deg C to + 55 Deg	
124.0	Usage	Specially used for PV system	
125.0	Standards		
126.0	Efficiency Measurement	IEC 61683/ Equivalent BIS Std.	
127.0	Environmental testing	IEC 60068-2 (1,2,14,30) /Equivalent BIS Std.	
128.0	Interfacing with utility grid	IEC 61727	
129.0	Islanding Prevention Measurement Safety compliance	IEC 62116 IEC 62109-1 and IEC 62109-2	
130.0	Type Test certificate issuing authority	NABL/ IEC Accredited Testing Laboratories	
131.0	EM Compatibility (EMC) (for item no 3.1 , 3.2,3.3 and 3.4)	IEC 61000-6-2,IEC 61000-6-4 or MNRE approved test centres.	
132.0	Input (DC)		
133.0	PV array connectivity capacity	10 % more than the rated AC kVA (minimum)	
134.0	MPPT Voltage	Compatible with the array voltage	