



Government of India
Central Electricity Authority
Regional Inspectorial Organisation
Ground Floor, WRPC Building, F-3, MIDC Area
Marol, Andheri (East), Mumbai 400 093



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No. WRIO/MP/Bhopal/ICAR/A-8935/SE/2021/

3239-40

Dated: 07 DEC 2021

Approval for Energisation

(under Regulation 32 & 43 of CEA(Measures relating to Safety and Electric Supply), Regulations,2010)

To
The Registrar
ICAR Central Institute of Agriculture Engineering
Nabi Bagh Barasia Road, Bhopal MP - 462038

Subject: Acceptance & Approval for Energisation of Electrical Installations of 381.9Kw SPV Solar Power Plant at ICAR Central Institute of Agriculture Engineering Nabi Bagh Barasia Road, Bhopal MP under regulation 32 & 43 of Central Electricity Authority (Measures relating to Safety and Electric Supply), Regulations 2010 (As amended till date).

Reference: Your online application (under self certification) No: A/2021/08935 dated 03/12/2021

Registrar, ICAR Central Institute of Agriculture Engineering, Nabi Bagh Barasia Road, Bhopal MP submitted online application (under self certification) dated 03/12/2021 for acceptance & approval for Energisation of Electrical Installations of 381.9Kw SPV Solar Power Plant at ICAR Central Institute of Agriculture Engineering Nabi Bagh Barasia Road, Bhopal MP.

The WCC, drawing, test reports etc. in application has been thoroughly checked and found in order. Therefore self certification by ICAR Central Institute of Agriculture Engineering Nabi Bagh Barasia Road, Bhopal is here by accepted & approval for Energisation of Electrical Installations of 381.9Kw SPV Solar Power Plant at ICAR Central Institute of Agriculture Engineering Nabi Bagh Barasia Road, Bhopal MP is accorded subject to consistent compliance of relevant provisions of CEA (Measures relating to Safety and Electric Supply) Regulations, 2010 (as amended till date) by M/s. ICAR Central Institute of Agriculture Engineering Nabi Bagh Barasia Road, Bhopal MP.

The list of equipments is attached at Annexure-I.

The above apparatus /Installations shall be due for periodical inspection under regulation 30 within Four years from the date of inspection. This periodicity is subject to change by government notification.


(LKS Rathore)

Director
For Chief Electrical Inspector
to the Govt. of India

Copy to: Chief Engineer (CEI), CEA, 3rd Floor, NRPC Building, Katwaria Sarai, New Delhi.

ICAR 381.9KWP

7-Dec-20
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DETAILED BILL OF MATERIAL

BUILDING
NAME

ARRAY NO.

1

DC CAPACITY

EM SIZE

381.9

AC CAPACITY

380

TOTAL BOM QTY

S.No.	ITEM	TECHNICAL SPECIFICATION	UNIT	QUANTITY	
A	DC SECTION - SOLAR MODULES		Nos	1140	1140
	1	Solar Modules	Poly-335 Wp (with RF identification tag and qualify to IEC 61701 & 61215)		
B	DC SECTION - MOUNTING STRUCTURE		Nos	381.9 kW	381.9 kW
	1	Mounting Structure	Flat Roof Ballast module mounting Structure (300 mm front clearance)		
	2		Module mounting structure over Existing truss structure		
	3		Lightening Arrester RCC Mounting Structure		
	4		Semsor Mounting Structure		
	5		Inverter Mounting Structure		
	6		Combiner/Disconnect Box Mounting Structure		
	7		Inverter Caging & Canopy		
	8		Pump MS & Canopy		
C	Inverter				
	3	100kW String inverter ,The PCU/ inverters should be tested from the MNRE approved test centres/ NABL/ BIS/ IEC accredited testing- calibration laboratories. (2 nos of MOV type surge arrestor required for positive and negative terminals)	Nos	2	2
	4	80kW String inverter ,The PCU/ inverters should be tested from the MNRE approved test centres/ NABL/ BIS/ IEC accredited testing- calibration laboratories. (2 nos of MOV type surge arrestor required for positive and negative terminals)	Nos	1	1
	5	40kW String inverter ,The PCU/ inverters should be tested from the MNRE approved test centres/ NABL/ BIS/ IEC accredited testing- calibration laboratories. (2 nos of MOV type surge arrestor required for positive and negative terminals)		1	1
	6	30kW String inverter ,The PCU/ inverters should be tested from the MNRE approved test centres/ NABL/ BIS/ IEC accredited testing- calibration laboratories. (2 nos of MOV type surge arrestor required for positive and negative terminals)		2	2
D	DC SECTION - DC CABLES & ACCESSORIES				
	1	DC Cables	Mtrs	1629	1629
	2	MC4 Connector	Nos	21	21
	3	Cable Ties	Nos	2280	2280
	4		Nos	1140	1140
	5	Conduit	Mtrs	305	305
	6		Nos	68	68
	7		Nos	81	81
	8		Nos	14	14
	9		Mtrs	15	15
	10		Nos	5	5
	11		Nos	5	5
	12		Mtrs	480	480
	13		Nos	176	176
	14		Nos	160	160
	15		Nos	6	6
	16	Numbering Ferrules	Nos	1	1
E	MONITORING SYSTEM - CABLES & ACCESSORIES				
	1	Data Logger	set	1	1
	2	Sensor	set	1	1
	3	PC	Nos	0	0
	4	Communication Cable	Mtrs	430	430
F	EARTHING - DC & AC - CABLES & ACCESSORIES				
	1	Lightning Arrester	Nos	1	1

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G	2	Earthing Electrode and pit chamber	Earthing Pipe - 17.2 mm dia. Cu Bonded, 3mtr long, UL listed to meet IS 304	Nos	6	6
	3	Earthing Enhance Compound	Chemical Enhance Compound - 25 kg Bag as per IEC 62561-7	Set	6	6
	4	Earthing Cables	1C X 4 mm ² Plain Copper Conductor, PVC Insulated & Un sheathed Cable 1.1kV, C	Mtrs	171	171
	5		1C X 16 mm ² Plain Copper Conductor, PVC Insulated & Un sheathed Cable 1.1kV	Mtrs	10	10
	6	Strip	25 X 3 mm GI strip	Mtrs	200	200
7	25 X 6 mm GI strip		Mtrs	60	60	
G AC - EQUIPMENTS						
H	1	AC Combiner Box	(2) 125A 4P, Isolator, (2) 63A, 4P Isolator, Input with 1 output of 320A, 3PN, MCCB, 6A 2P MCB with S/C, O/V, E/F, 415V, 50HZ, IP-65 (Outdoor Type) rated AC Combiner with Cu TPN busbar, with Sutaible earthing, with metal clad, totally enclosed, rigid, floor/Wall mounted, air - insulated.	Nos	1	1
	2	Isolator Box	(1)125A , 4P Isolator, 415V, 50HZ, IP-65 (Outdoor type) Rated AC disconnect switch, Cu TPN Busbar, Type -II SPD of MOV type with Sutaible earthing, with metal clad, totally enclosed, rigid, floor/wall mounted, air - insulated.	Nos	-	0
	3		(1)320A , 4P Isolator, 415V, 50HZ, IP-65 (Outdoor type) Rated AC disconnect switch, Cu TPN Busbar, Type -II SPD of MOV type with Sutaible earthing, with metal clad, totally enclosed, rigid, floor/wall mounted, air - insulated.	Nos	1	1
	4	AC Disconnect Box	(1)320A , TPN MCCB with S/C,O/VE/F, 415V, 50HZ, IP-65 (Outdoor type) Rated AC disconnect switch with MFM & TVM Meter,Accuracy Class of CT 0.5s, Cu TPN Busbar, Type -II SPD of MOV type with Sutaible earthing, with metal clad, totally enclosed, rigid, floor mounted, air - insulated.	Nos	1	1
	5		(1)125A , TPN MCCB with S/C,O/VE/F, 415V, 50HZ, IP-65 (Outdoor type) Rated AC disconnect switch with MFM & TVM Meter,Accuracy Class of CT 0.5s, Cu TPN Busbar, Type -II SPD of MOV type with Sutaible earthing, with metal clad, totally enclosed, rigid, floor mounted, air - insulated.	Nos	-	0
H AC - CABLE & ACCESSORIES						
I	1	AC Cables	3C X 2.5mm ² Annealed Plain Copper Conductor, XLPE Insulated & Armoured	Mtrs	50	50
	2		4C X 16mm ² Annealed Plain Copper Conductor, XLPE Insulated & Unarmoured	Mtrs	10	10
	3		3.5C X 35mm ² Annealed Plain Copper Conductor, XLPE Insulated & Unarmoured	Mtrs	5	5
	4		4C X 50 mm ² Annealed Plain Copper Conductor, XLPE Insulated & Unarmoured	Mtrs	-	0
	5		4C X 25mm ² Al Conductor, XLPE Insulated & Armoured PVC Sheathed 1.1kV	Mtrs	-	0
	6		4C X 35mm ² Al Conductor, XLPE Insulated & Armoured PVC Sheathed 1.1kV	Mtrs	-	0
	7		3.5C X 70 mm ² Al Conductor, XLPE Insulated & Armoured PVC Sheathed 1.1kV	Mtrs	-	0
	8		3.5C X 185mm ² Al Conductor, XLPE Insulated & Armoured PVC Sheathed 1.1kV	Mtrs	0	0
	9		3.5C X 300mm ² Al Conductor, XLPE Insulated & Armoured PVC Sheathed 1.1kV	Mtrs	360	360
	10	Lugs	0.5 mm ² Cu Pin Type Lugs	Nos	-	0
	11		2.5 mm ² Cu Ring Type Lugs	Nos	-	0
	12		4 mm ² Cu Ring Type Lugs	Nos	-	0
	13		4 mm ² Cu Pin Type Lugs	Nos	-	0
	14		10 mm ² Cu Pin Type Lugs	Nos	-	0
	15		16 mm ² Cu Pin Type Lugs	Nos	5	5
	15		16 mm ² Bimetallic Ring Type Lugs	Nos	5	5
	16		35mm ² Cu Pin Type Lugs	Nos	3	3
	17		35mm ² Bimetallic Ring Type Lugs	Nos	3	3
	18		50 mm ² Cu Pin Type Lugs	Nos	-	0
	19		50 mm ² Cu Ring Type Lugs	Nos	-	0
	20		70 mm ² Bimetallic Ring Type Lugs	Nos	-	0
	21		70 mm ² Cu Ring Type Lugs	Nos	-	0
	16		25mm ² Al. Ring Type Lugs	Nos	-	0
	22		70 mm ² Al Ring Type Lugs	Nos	-	0
	23		95 mm ² Al. Ring Type Lugs	Nos	0	0
	24		185 mm ² Al Ring Type Lugs	Nos	0	0
	25		185 mm ² Bimetallic Ring Type Lugs	Nos	-	0
	26		150 mm ² Al Ring Type Lugs	Nos	-	0
	27		150 mm ² Bimetallic Ring Type Lugs	Nos	6	6
	28		300 mm ² Al Ring Type Lugs	Nos	18	18
29	300 mm ² Bimetallic Ring Type Lugs		Nos	-	0	
30	Tape	Electrical Tape (R,Y,B)	Nos	-	0	
I Safety Equipment						
J	1	Danger Board	Danger boards should be provided as per IE Act	Nos	1	1
	2	Fire Extinguishers	DCP type dry power portable fire extinguishers of minimum capacity 5 kg	Set	1	1
J Module cleaning						
K	1	0.5 HP Motor for module cleaning		Nos	0	0

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	2		1 HP Motor for module cleaning	Nos	1	1
	3		Pipe-0.5"- ASTM(UPVC), SCH-40	Mtrs	130	130
	4	Module Cleaning	Coupler-0.5"- ASTM(UPVC), SCH-80	Nos	52	52
	5		Elbow-0.5"- ASTM(UPVC), SCH-80	Nos	21	21
	6		Tee-0.5"- ASTM(UPVC), SCH-80	Nos	8	8
	7		Water Taps	Nos	5	5
K	OTHER MISCELLANEOUS					
	1	Nut & Bolt	M8 for Earthing strip	Nos	65	65
	2	Cable Tray	100X75, Perforated Type	Mtrs	35	35
	3		Saddle for 1.5" Conduit with 6mm base	Nos	305	305
	4	Saddles with Nut & Bolts	Saddle for 2" Conduit with 6mm base	Nos	15	15
	5		Saddle for 1" Conduit with 6mm base	Nos	480	480
	6		Saddle for 0.5" Conduit with 6mm base	Nos	130	130
	7		For 4C X 16mm ² Annealed Plain Copper Conductor, XLPE Insulated & Unarmoured	Mtrs	1	1
	8	Heat Sink Sleeve	For 3.5C X 35 mm ² Annealed Plain Copper Conductor, XLPE Insulated & Unarmoured	Mtrs	1	1
	9		For 3.5C X 70mm ² Al Conductor, XLPE Insulated & Armoured PVC Sheath	Mtrs	-	0
	10		For 3.5C X 185mm ² Al Conductor, XLPE Insulated & Armoured PVC Sheath	Mtrs	3	3
	12		For 4C X 16mm ² Annealed Plain Copper Conductor, XLPE Insulated & Unarmoured	Nos	2	2
	13	Cable Gland	For 3.5C X 35 mm ² Annealed Plain Copper Conductor, XLPE Insulated & Unarmoured	Nos	2	2
	14		For 3.5C X 70mm ² Al Conductor, XLPE Insulated & Armoured PVC Sheath	Nos	-	0
	15		For 3.5C X 300mm ² Al Conductor, XLPE Insulated & Armoured PVC Sheath	Nos	6	6
	16	Earthing Clamp	Standard for 25X3	Nos	300	300
	17		Standard for 25X6	Nos	90	90
	18					
	19	Supporting Wire	Cable Hanging support kit	Mtrs	0	0
	20	Cable tag	For AC Cable	Nos	4	4
	21	Earthing Insulator with	For 25X3	Nos	200	200
	22	Nut & Bolts	For 25X6	Nos	60	60
	23	Industrial Foam	Standard	Bottle	16	16
	24	Gitty	Gitty for earth strip laying	Nos	152	152
	25	Civil Block	Civil Block for cable tray/conduit support	Nos	800	800
	26	Cable Trench	Standard	Mtrs	280	280
	27	Adhesive Solution	Standard	Gram	16	16

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