DEENDAYAL PORT AUTHORITY
ISO 9001:2008 | ISO 14001 | ISPS Compliant Port

Office of Executive Engineer (Electrical), Ground Floor, Nirman Building, New Kandla, Kutch, Pin Code 370210.

No.: EL/AC/2777 Date: 03/05/2024

EXPRESSION OF INTEREST [EOI]

"Electrification of the Dome shaped Storage Sheds inside Cargo Jetty Area"

(This EOI is issued to elicit Expression of Interest from the parties interested in the work and does not constitute any binding commitment from the Deendayal Port Authority to proceed with the work or invite any or all the parties in the subsequent bidding process. The Open Tenders will be issued subsequently.)

Executive Engineer (Electrical), DPA invites Expression of Interest for the work of "Electrification of the Dome shaped Storage Sheds inside Cargo Jetty Area" from the reputed firms from those who have executed similar work in Government/public sectors and other leading private organizations. The Expression of Interest (EOI) documents containing details of Scope of Work and Technical Specifications are enclosed herewith.

The interested firms are requested to submit their expression of interest for the said work in BOQ format as enclosed at Annexure I. The completed EOI (Expression of Interest) shall be submitted to the office of the undersigned on or before 13/05/2024. A soft copy of EOI is also acceptable through e-mail Id Deepak.hazra@deendayalport.gov.in & Nikunjkksolanki@deendayalport.gov.in

Executive Engineer (E)
Deendayal Port Authority

ANNEXURE – I

Sr. No.	Description	Qty.	Unit	Rate	Amount
1	Supply at site 4 Core, 150 Sq.mm, 1.1kV grade, armoured aluminium conductor XLPE cable as per Technical Specification No. 1	1800	m		
2	Supply at site 4 Core, 70 Sq.mm, 1.1kV grade, armoured aluminium conductor XLPE cable as per Technical Specification No. 2	700	m		
3	Supply at site 4 Core, 35 Sq.mm, 1.1kV grade, armoured aluminium conductor XLPE cable as per Technical Specification No. 3	900	m		
4	Supply at site 4 Core, 6 Sq.mm, 1.1kV grade, armoured aluminium conductor XLPE cable as per Technical Specification No. 4	4900	m		
5	Supply at site 3 core, 1.5 Sq.mm, 1.1kV grade, armoured Copper conductor XLPE cable as per Technical Specification No. 5	5300	m		
6	Supply at site 400mm width hot dip galvanized ladder type cable tray along with its accessories as per Technical Specification No. 6	410	m		
7	Supply at site 300mm width hot dip galvanized ladder type cable tray along with its accessories as per Technical Specification No. 7	415	m		
8	Supply at site 200mm width hot dip galvanized ladder type cable tray along with its accessories as per Technical Specification No. 8	140	m		
9	Supply at site of 400mm width hot dip galvanized 90 degree Bend as per Technical Specification No. 9	4	No.		
10	Supply at site 300mm width hot dip galvanized Vertical Inside Riser as per Technical Specification No. 10	4	No.		
11	Supply at site 300mm width hot dip galvanized Vertical Outside Riser as per Technical Specification No. 11	4	No.		

12	Supply at site hot dip galvanized Right hand Reducer of size 400mm to 300mm width as per Technical Specification No. 12	2	No.		
13	Supply at site hot dip galvanized Left hand Reducer of size 400mm to 300mm width as per Technical Specification No. 13	2	No.		
14	Supply at site 600mm Cantilever Bracket for cable tray as per Technical Specification No. 14	380	No.		
15	Supply at site 500mm Cantilever Bracket for cable tray as per Technical Specification No. 15	390	No.		
16	Supply at site 400mm Cantilever Bracket for cable tray as per Technical Specification No. 16	125	No.		
17	Supply at site 500mm Pipe Bracket for cable tray as per Technical Specification No. 17	40	No.		
18	Supply at site 400mm Pipe Bracket for cable tray as per Technical Specification No. 18	30	No.		
19	Supply at site 300mm Stand-off Bracket for cable tray as per Technical Specification No. 19	16	No.		
20	Supply at site J – Hanger & Bracket Clamp as per Technical Specification No. 20	570	No.		
21	Fixing of 600mm Cantilever Bracket as per Technical Specification No. 21	380	No.		
22	Fixing of 500mm Cantilever Bracket as per Technical Specification No. 22	390	No.		
23	Fixing of 400mm Cantilever Bracket as per Technical Specification No. 23	125	No.		
24	Fixing of 500mm Pipe Bracket as per Technical Specification No. 24	40	No.		
25	Fixing of 400mm Pipe Bracket as per Technical Specification No. 25	30	No.		
26	Fixing of 300mm Stand-off Bracket as per Technical Specification No. 26	12	No.		
27	Fixing of 300mm Stand-off Bracket as per Technical Specification No. 27	4	No.		
28	Fixing of 400mm width hot dip galvanized ladder type cable tray	372	m		

	along with its accessories on cantilever bracket as per Technical Specification No. 28				
29	Fixing of 400mm width hot dip galvanized ladder type cable tray along with its accessories on bracket as per Technical Specification No. 29	36	m		
30	Fixing of 300mm width hot dip galvanized Vertical Inside Riser as per Technical Specification No. 30	4	No.		
31	Fixing of 300mm width hot dip galvanized Vertical Outside Riser as per Technical Specification No. 31	4	No.		
32	Fixing of 300mm width hot dip galvanized ladder type cable tray along with its accessories on cantilever bracket as per Technical Specification No. 32	384	m		
33	Fixing of 300mm width hot dip galvanized ladder type cable tray along with its accessories on bracket as per Technical Specification No. 33	28	m		
34	Fixing of 200mm width hot dip galvanized ladder type cable tray along with its accessories on cantilever bracket as per Technical Specification No. 34	120	m		
35	Fixing of 200mm width hot dip galvanized ladder type cable tray along with its accessories on bracket as per Technical Specification No. 35	16	m		
36	Fixing of 400mm width hot dip galvanized 90 degree Bend as per Technical Specification No. 36	4	No.		
37	Fixing of hot dip galvanized Right hand Reducer of size 400mm to 300mm width as per Technical Specification No. 37	2	No.		
38	Fixing of hot dip galvanized Left hand Reducer of size 400mm to 300mm width as per Technical Specification No. 38	2	No.		
39	Fixing of J – Hanger & Bracket Clamp as per Technical Specification No. 39	570	No.		

40	Laying of double run of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable through Existing Trench of Substation as per Technical Specification No. 40	40	m		
41	Laying of double run of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable through existing NP2 Pipe as per Technical Specification No. 41	20	m		
42	Laying of double run of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable through Existing RCC Trench as per Technical Specification No. 42	40	m		
43	Laying of double run of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable in Cable Tray as per Technical Specification No. 43	312	m		
44	Laying of double run of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable in Vertical Cable Tray as per Technical Specification No. 44	12	m		
45	Laying of double run of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable as Loop as per Technical Specification No. 45	10	m		
46	Laying of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable through Existing Trench of Substation as per Technical Specification No. 46	47	m		
47	Laying of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable through J – hanger as per Technical Specification No. 47	320	m		
48	Laying of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable on Vertical Tray as per Technical Specification No. 48	16	m		

49	Laying of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable through Road/Railway Crossing by HDD method as per Technical Specification No. 49	265	m		
50	Laying of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable in Cable Tray as per Technical Specification No. 50	102	m		
51	Laying of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable in Vertical Cable Tray as per Technical Specification No. 51	16	m		
52	Laying of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable as Loop as per Technical Specification No. 52	10	m		
53	Laying of 1.1kV 4 Core 70 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable in Cable Tray as per Technical Specification No. 53	492	m		
54	Laying of 1.1kV 4 Core 70 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable in Vertical Cable Tray as per Technical Specification No. 54	64	m		
55	Laying of 1.1kV 4 Core 70 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable as Loop as per Technical Specification No. 55	20	m		
56	Laying of 1.1kV 4 Core 35 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable in Cable Tray as per Technical Specification No. 56	600	m		
57	Laying of 1.1kV 4 Core 35 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable in Vertical Cable Tray as per Technical Specification No. 57	96	m		
58	Laying of 1.1kV 4 Core 35 Sq.mm Aluminium Conductor XLPE	120	m		

	Insulated Armoured Cable as Loop as per Technical Specification No. 58				
59	Laying of 1.1kV 4 Core 6 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable in Cable Tray as per Technical Specification No. 59	3084	m		
60	Laying of 1.1kV 4 Core 6 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable in Vertical Cable Tray as per Technical Specification No. 60	84	m		
61	Laying of 1.1kV 4 Core 6 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable through Clamping on RCC Structure as per Technical Specification No. 61	656	m		
62	Laying of 1.1kV 4 Core 6 Sq.mm Aluminium Conductor XLPE Insulated Armoured Cable as Loop as per Technical Specification No. 62	780	m		
63	Laying of 3 core, 1.5 Sq.mm, 1.1kV grade LT armoured Copper conductor XLPE cable on RCC Structure through clamps as per Technical Specification No. 63	114	m		
64	Laying of 3 core, 1.5 Sq.mm, 1.1kV grade LT armoured Copper conductor XLPE cable through existing hangers provided in dome shaped roof structure as per Technical Specification No. 64	4788	m		
65	Laying of 3 core, 1.5 Sq.mm, 1.1kV grade LT armoured Copper conductor XLPE cable as Loop as per Technical Specification No. 65	114	m		
66	Supply at site LT Load Point Panel as per Technical Specification No. 66	2	No.		
67	Supply at site LT Sub Load Point Panel as per Technical Specification No. 67	2	No.		
68	Supply at site FRP 8-Way Power Distribution Board as per Technical Specification No. 68	12	No.		
69	Installation, Testing & Commissioning of LT Load Point	2	No.		

	Panel as per Technical Specification No. 69				
70	Installation, Testing & Commissioning of LT Sub Load Point Panel as per Technical Specification No. 70	2	No.		
71	Installation, Testing & Commissioning of FRP 8-Way Power Distribution Board as per Technical Specification No. 71	12	No.		
72	Supply at site FRP Junction Box as per Technical Specification No. 72	130	No.		
73	Fixing of FRP Junction Box as per Technical Specification No. 73	130	No.		
74	Supply at site LED High Bay fitting for inside Shed Area as per Technical Specification No. 74	228	No.		
75	Installation, Testing & Commissioning of LED High Bay fitting as per Technical Specification No. 75	228	No.		
76	Supply at site LED Flood Light fitting as per Technical Specification No. 76	54	No.		
77	Installation, Testing & Commissioning of LED Flood Light fitting as per Technical Specification No. 77	54	No.		
78	Preparation of earthing system with 60mm diameter, 3m GI electrode & chemical back fill compound as per Technical Specification No. 78	32	No.		
79	Supply, Laying, connecting of GI Strip of 50×6 mm size between earth station to the equipment as per Technical Specification No. 79	340	m		
80	Supply, Laying, connecting of GI Strip of 25×6 mm size as per Technical Specification No. 80	950	m		
81	Supply, Laying, connecting of GI Wire of 8 SWG size as per Technical Specification No. 81	330	m		
Total					

(In words Rupees _____ only)

(NOTE: The rates should be inclusive of all taxes, duties, fees, cess etc. and all incidental charges; but exclusive of GST).

Signature & Seal of Contractor

Executive Engineer (E)
Deendayal Port Authority

SCOPE OF WORK

Deendayal Port Authority (DPA) is one of the Major Port in India. The Specification is intended to cover the Electrification work for Dome Shaped Godowns (size: 2 Nos. of 198m×30m & 2 Nos. of 180m×30m) inside Cargo jetty area at Deendayal Port. The work will be carried out simultaneously with Civil work. The scope of work consists of Supply, installation, testing & commissioning of LT Load Point Panels, LT Sub Load Point Panels, FRP Power Distribution Boards, LED High Bay Fittings for inside Shed Area & LED Flood Light Fittings, Supply & laying of LT XLPE insulated aluminium conductor Cables and LT XLPE insulated copper conductor Cables. The work shall be executed to the satisfaction of the Engineer in-Charge. The contractor shall arrange all types of tools, tackles, scaffoldings, temporary power supply at his own cost for installation, testing & commissioning of the work. The contractor shall submit layout colored drawing of complete of wiring, installation & distribution in two set hard copy & soft copy after completion of work.

TECHNICAL SPECIFICATION

Technical Specification No. 1:

This item includes supply at site 1.1kV grade, 4 Core, 150 Sq.mm, Aluminium Conductor, XLPE Insulated, PVC Sheathed, Flat Strip Armoured Cable conforming to IS:7098 (Part-I):1988 with latest amendment. The cable shall have marking/embossing at an interval of every 1.0 meter showing its progressive length.

The contractor shall submit Type Test Report for the type tests conducted in accordance with IS:7098(Part-I): 1988 within last 5 years from the date of Work Order on similar type of Cables in a NABL accredited Test House or Laboratory at the time of supply of Cable at site. The rate shall be inclusive of all taxes (excluding GST), packing, forwarding, insurance, transportation, and unloading at site of work.

Technical Specification No. 2:

This item includes supply at site 1.1kV grade, 4 Core, 70 Sq.mm, Aluminium Conductor, XLPE Insulated, PVC Sheathed, Flat Strip Armoured Cable conforming to IS:7098 (Part-I):1988 with latest amendment. The cable shall have marking/embossing at an interval of every 1.0 meter showing its progressive length.

The contractor shall submit Type Test Report for the type tests conducted in accordance with IS:7098(Part-I): 1988 within last 5 years from the date of Work Order on similar type of Cables in a NABL accredited Test House or Laboratory at the time of supply of Cable at site. The rate shall be inclusive of all taxes (excluding GST), packing, forwarding, insurance, transportation, and unloading at site of work.

Technical Specification No. 3:

This item includes supply at site 1.1kV grade, 4 Core, 35 Sq.mm, Aluminium Conductor, XLPE Insulated, PVC Sheathed, Flat Strip Armoured Cable conforming to IS:7098 (Part-I):1988 with latest amendment. The cable shall have marking/embossing at an interval of every 1.0 meter showing its progressive length.

The contractor shall submit Type Test Report for the type tests conducted in accordance with IS:7098(Part-I): 1988 within last 5 years from the date of Work Order on similar type of Cables in a NABL accredited Test House or Laboratory at the time of supply of Cable at site. The rate shall be inclusive of all taxes (excluding GST), packing, forwarding, insurance, transportation, and unloading at site of work.

Technical Specification No. 4:

This item includes supply at site 1.1kV grade, 4 Core, 6 Sq.mm, Aluminium Conductor, XLPE Insulated, PVC Sheathed, Round Wire Armoured Cable conforming to IS:7098 (Part-I):1988 with latest amendment. The cable shall have marking/embossing at an interval of every 1.0 meter showing its progressive length.

The contractor shall submit Type Test Report for the type tests conducted in accordance with IS:7098(Part-I): 1988 within last 5 years from the date of Work Order on similar type of Cables in a NABL accredited Test House or Laboratory at the time of supply of Cable at site. The rate shall be inclusive of all taxes (excluding GST), packing, forwarding, insurance, transportation, and unloading at site of work.

Technical Specification No. 5:

This item includes supply at site 1.1kV grade, 3 Core, 1.5 Sq.mm, Copper Conductor, XLPE Insulated, PVC Sheathed, Round Wire Armoured Cable conforming to IS:7098 (Part-I): 1988 with latest amendment. The cable shall have marking/embossing at an interval of every 1.0 meter showing its progressive length.

The contractor shall submit Type Test Report for the type tests conducted in accordance with IS:7098(Part-I): 1988 within last 5 years from the date of Work Order on similar type of Cables in a NABL accredited Test House or Laboratory at the time of supply of Cable at site. The rate shall be inclusive of all taxes (excluding GST), packing, forwarding, insurance, transportation, and unloading at site of work.

Technical Specification No. 6:

This item includes supply at site hot dip galvanized steel ladder type cable tray of following size along with its accessories:

Cable Tray:

Ladder Tray Dimension: 400mm (W) × 100mm (H) × 15mm (C), 2500mm length.

Runner: 100mm (H) × 15mm (C) × 2mm (T),

Rung: 40mm (W) × 15mm (C) × 2mm (T),

Distance between Rungs: 250mm.

Tray Cover:

Width: Suitable for 400 mm (width) cable tray,

Thickness: 1 mm, Length: 2500mm, Height: 15mm

Coupler Plates:

Coupler Plates shall have 8 holes (4 holes & 4 slots) suitable with tray dimensions. The thickness of the Coupler Plates shall be 3mm.

Hardware:

Sets of M8×25mm long SS304 bolt & nut with two plain washers and one spring washer suitable for coupler plates as per requirement.

The tray shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the trays shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Cable Tray will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same

will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. All materials, hardware components shall function and work properly against deterioration due to the aggressive climate conditions. The Cable Tray manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of cable tray. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 7:

This item includes supply at site hot dip galvanized steel ladder type cable tray of following size along with its accessories:

Cable Tray:

Ladder Tray Dimension: 300mm (W) × 100mm (H) × 15mm (C), 2500mm length.

Runner: 100mm (H) × 15mm (C) × 2mm (T),

Rung: 40mm (W) × 15mm (C) × 2mm (T),

Distance between Rungs: 250mm.

Tray Cover:

Width: Suitable for 300 mm (width) cable tray,

Thickness: 1 mm, Length: 2500mm, Height: 15mm

Coupler Plates:

Coupler Plates shall have 8 holes (4 holes & 4 slots) suitable with tray dimensions. The thickness of the Coupler Plates shall be 3mm.

Hardware:

Sets of M8×25mm long SS304 bolt & nut with two plain washers and one spring washer suitable for coupler plates as per requirement.

The tray shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the trays shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Cable Tray will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. All materials, hardware components shall function and work properly against deterioration due to the aggressive climate conditions. The Cable Tray manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of cable tray. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 8:

This item includes supply at site hot dip galvanized steel ladder type cable tray of following size along with its accessories:

Cable Tray:

Ladder Tray Dimension: 200mm (W) × 100mm (H) × 15mm (C), 2500mm length.

Runner: 100mm (H) × 15mm (C) × 2mm (T),

Rung: 40mm (W) × 15mm (C) × 2mm (T),

Distance between Rungs: 250mm.

Tray Cover:

Width: Suitable for 200 mm (width) cable tray,

Thickness: 1 mm, Length: 2500mm, Height: 15mm

Coupler Plates:

Coupler Plates shall have 8 holes (4 holes & 4 slots) suitable with tray dimensions. The thickness of the Coupler Plates shall be 3mm.

Hardware:

Sets of M8×25mm long SS304 bolt & nut with two plain washers and one spring washer suitable for coupler plates as per requirement.

The tray shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the trays shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Cable Tray will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. All materials, hardware components shall function and work properly against deterioration due to the aggressive climate conditions. The Cable Tray manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of cable tray. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 9:

This item includes supply at site hot dip galvanized 90-degree Bend for steel ladder type cable tray of following size along with its accessories:

90-degree Bend:

Dimension: 400mm (W) × 100mm (H) × 15mm (C), Radius: 600mm.

Runner: 100mm (H) × 15mm (C) × 2mm (T),

Rung: 40mm (W) × 15mm (C) × 2mm (T),

Distance between Rungs: 250mm.

Bend Cover:

Width: Suitable for 400 mm (width) cable tray bend,

Thickness: 1 mm, Length: As per 90-degree Bend, Height: 15mm

Coupler Plates:

Coupler Plates shall have 8 holes (4 holes & 4 slots) suitable with tray dimensions. The thickness of the Coupler Plates shall be 3mm.

Hardware:

Sets of M8×25mm long SS304 bolt & nut with two plain washers and one spring washer suitable for coupler plates as per requirement.

The Bend tray shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the trays shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Bend tray will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. All materials, hardware components shall function and work properly against deterioration due to the aggressive climate conditions. The Bend tray manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of Bend Tray. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 10:

This item includes supply at site hot dip galvanized 90-degree Vertical Inside Riser for steel ladder type cable tray of following size along with its accessories:

Inside Riser:

Dimension: 300mm (W) × 100mm (H) × 15mm (C), Radius: 600mm.

Runner: 100mm (H) × 15mm (C) × 2mm (T),

Rung: 40mm (W) × 15mm (C) × 2mm (T),

Distance between Rungs: 250mm.

Riser Tray Cover:

Width: Suitable for 300 mm (width) cable tray riser,

Thickness: 1 mm, Length: As per Inside Riser, Height: 15mm

Coupler Plates:

Coupler Plates shall have 8 holes (4 holes & 4 slots) suitable with tray dimensions. The thickness of the Coupler Plates shall be 3mm.

Hardware:

Sets of M8×25mm long SS304 bolt & nut with two plain washers and one spring washer suitable for coupler plates as per requirement.

The Riser tray shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the trays shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Riser Tray will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. All materials, hardware components shall function and work properly against deterioration due to the aggressive climate conditions. The Riser Tray manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of Riser Tray. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 11:

This item includes supply at site hot dip galvanized 90-degree Vertical Outside Riser for steel ladder type cable tray of following size along with its accessories:

Inside Riser:

Dimension: 300mm (W) × 100mm (H) × 15mm (C), Radius: 600mm.

Runner: 100mm (H) × 15mm (C) × 2mm (T),

Rung: 40mm (W) × 15mm (C) × 2mm (T),

Distance between Rungs: 250mm.

Riser Tray Cover:

Width: Suitable for 300 mm (width) cable tray riser,

Thickness: 1 mm, Length: As per Outside Riser, Height: 15mm

Coupler Plates:

Coupler Plates shall have 8 holes (4 holes & 4 slots) suitable with tray dimensions. The thickness of the Coupler Plates shall be 3mm.

Hardware:

Sets of M8×25mm long SS304 bolt & nut with two plain washers and one spring washer suitable for coupler plates as per requirement.

The Riser tray shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the trays shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Riser Tray will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. All materials, hardware components shall function and work properly against deterioration due to the aggressive climate conditions. The Riser Tray manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of Riser Tray. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 12:

This item includes supply at site hot dip galvanized Right hand Reducer for steel ladder type cable tray of following size along with its accessories:

Reducer:

Dimension: 400mm (W) to 300mm (W) × 100mm (H) × 15mm (C).

Runner: 100mm (H) × 15mm (C) × 2mm (T),

Rung: 40mm (W) × 15mm (C) × 2mm (T),

Distance between Rungs: 250mm.

Reducer Tray Cover:

Width: Suitable for 400mm (W) to 300mm (W) Reducer,

Thickness: 1 mm, Height: 15mm

Coupler Plates:

Coupler Plates shall have 8 holes (4 holes & 4 slots) suitable with tray dimensions. The thickness of the Coupler Plates shall be 3mm.

Hardware:

Sets of M8×25mm long SS304 bolt & nut with two plain washers and one spring washer suitable for coupler plates as per requirement.

The Reducer tray shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the trays shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Reducer Tray will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. All materials, hardware components shall function and work properly against deterioration due to the aggressive climate conditions. The Reducer Tray manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of Reducer Tray. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 13:

This item includes supply at site hot dip galvanized Left hand Reducer for steel ladder type cable tray of following size along with its accessories:

Reducer:

Dimension: 400mm (W) to 300mm (W) × 100mm (H) × 15mm (C).

Runner: 100mm (H) × 15mm (C) × 2mm (T),

Rung: 40mm (W) × 15mm (C) × 2mm (T),

Distance between Rungs: 250mm.

Reducer Tray Cover:

Width: Suitable for 400mm (W) to 300mm (W) Reducer,

Thickness: 1 mm, Height: 15mm

Coupler Plates:

Coupler Plates shall have 8 holes (4 holes & 4 slots) suitable with tray dimensions. The thickness of the Coupler Plates shall be 3mm.

Hardware:

Sets of M8×25mm long SS304 bolt & nut with two plain washers and one spring washer suitable for coupler plates as per requirement.

The Reducer tray shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the trays shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Reducer Tray will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. All materials, hardware components shall function and work properly against deterioration due to the aggressive climate conditions. The Reducer Tray manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of Reducer Tray. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 14:

This item includes supply at site hot dip galvanized steel Cantilever Bracket Support of size 600mm (L) x 40mm (W) x 400mm (H) x 50mm (Height of other end of bracket) x 2mm (T). The Cantilever Bracket Support shall be made out of minimum 2 mm thick Rolled Sheet Steel. The support shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the support shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Supports will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. The Support shall function and work properly against deterioration due to the aggressive climate conditions.

The Support manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of Cantilever Bracket Support. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 15:

This item includes supply at site hot dip galvanized steel Cantilever Bracket Support of size 500mm (L) x 40mm (W) x 300mm (H) x 50mm (Height of other end of bracket) x 2mm

(T). The Cantilever Bracket Support shall be made out of minimum 2 mm thick Rolled Sheet Steel. The support shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the support shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Supports will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. The Support shall function and work properly against deterioration due to the aggressive climate conditions.

The Support manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of Cantilever Bracket Support. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 16:

This item includes supply at site hot dip galvanized steel Cantilever Bracket Support of size 400mm (L) x 40mm (W) x 200mm (H) x 50mm (Height of other end of bracket) x 2mm (T). The Cantilever Bracket Support shall be made out of minimum 2 mm thick Rolled Sheet Steel. The support shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the support shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Supports will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. The Support shall function and work properly against deterioration due to the aggressive climate conditions.

The Support manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of Cantilever Bracket Support. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 17:

This item includes supply at site hot dip galvanized steel Pipe Bracket Support of size 500mm (L) × 40mm (H) × 40mm (W) × 2mm (T). The dimension of base plate of Support shall be 120mm (H) × 60mm (W) × 2mm (T). The support shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the support shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Supports will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency.

Site galvanization or site repairs will not be permitted. The Support shall function and work properly against deterioration due to the aggressive climate conditions. The Support manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of Pipe Bracket Support. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 18:

This item includes supply at site hot dip galvanized steel Pipe Bracket Support of size 400mm (L) × 40mm (H) × 40mm (W) × 2mm (T). The dimension of base plate of Support shall be 120mm (H) × 60mm (W) × 2mm (T). The support shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the support shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Supports will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. The Support shall function and work properly against deterioration due to the aggressive climate conditions. The Support manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of Pipe Bracket Support. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 19:

This item includes supply at site hot dip galvanized steel Stand-off Bracket Support of size 300mm (L) × 40mm (H) × 40mm (W) × 2mm (T). The support shall be shop fabricated and the fabrication process shall include pressing, punching, slotting, drilling, welding etc. It shall be free from burr & sharp edges. After fabrication, the support shall be Hot Dip Galvanized as per IS 2629: 1989 and coverage as per IS 4759:1984. The minimum thickness of galvanizing shall be 120 microns.

The Supports will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be repair/replaced to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. The Support shall function and work properly against deterioration due to the aggressive climate conditions. The Support manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of Stand-off Bracket Support. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

Technical Specification No. 20:

This item includes supply of J – Hanger & Bracket Clamp with fasteners for laying of Cable in the beam structure of existing Storage Shed. The Bracket Clamp shall be made from 30mm (W) × 3mm (T) hot dipped galvanized steel of required size for fixing it on a beam structure of size 200mm × 75mm approximately. Both ends of the clamp shall be provided

with a hole suitable for fastener of size M10. The J – Hanger shall be made from 30mm (W) × 3mm (T) hot dipped galvanized steel having a diameter of required size with respect to overall diameter of the Cable. The length of the J – Hanger shall be 300mm. The J – Hanger shall be provided with a PVC insulation sleeve on bent portion. The J – Hanger shall be provided with two hole of size M10 for fixing it with the Bracket Clamp on the beam structure of existing Storage Shed. The J – Hanger & Bracket Clamp shall be hot dip galvanized as per relevant IS standard with minimum coating thickness of 85 microns. The Galvanising shall be done in single dipping method for better adhesion and life. The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of J – Hanger & Bracket Clamp.

Technical Specification No. 21:

This item includes fixing of 600mm Cantilever Bracket Support on the RCC Structure/Wall of Shed at a height of approximately 4m. The Cantilever Bracket Support shall be rigidly fixed with three stainless steel expansion Anchor Fasteners of minimum size M10 x 160mm on RCC Structure/Wall of Shed. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 22:

This item includes fixing of 500mm Cantilever Bracket Support on the RCC Structure/Wall of Shed at a height of approximately 4m. The Cantilever Bracket Support shall be rigidly fixed with three stainless steel expansion Anchor Fasteners of minimum size M10 x 160mm on RCC Structure/Wall of Shed. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 23:

This item includes fixing of 400mm Cantilever Bracket Support on the RCC Structure/Wall of Shed at a height of approximately 4m. The Cantilever Bracket Support shall be rigidly fixed with three stainless steel expansion Anchor Fasteners of minimum size M10 x 160mm on RCC Structure/Wall of Shed. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 24:

This item includes fixing of 500mm Pipe Bracket Support on the RCC Structure/Wall of Shed at a height of up to 4m. The Pipe Bracket Support shall be rigidly fixed with four stainless steel expansion Anchor Fasteners of minimum size M10 x 160mm on RCC Structure/Wall of Shed. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 25:

This item includes fixing of 400mm Pipe Bracket Support on the RCC Structure/Wall of Shed at a height of up to 4m. The Pipe Bracket Support shall be rigidly fixed with four stainless steel expansion Anchor Fasteners of minimum size M10 x 160mm on RCC Structure/Wall of Shed. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 26:

This item includes fixing of 300mm Stand-off Bracket Support on the Steel Column Structure of Shed at a height of up to 4m. The Bracket Support shall be rigidly fixed with two stainless steel nut-bolt of minimum size M10 x 30mm on Steel Column Structure of Shed. This

item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 27:

This item includes fixing of 300mm Stand-off Bracket Support on the Wall at a height of up to 4m. The Pipe Bracket Support shall be rigidly fixed with two stainless steel expansion Anchor Fasteners of minimum size M10 x 100mm on Wall. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 28:

This item includes fixing of 400mm width Ladder Type Cable Tray along with accessories on the Cantilever Bracket Support mounted on RCC Structure/Wall of Shed. The Tray Cover shall be fixed after completion of work of laying of Cables in the Cable Tray and after getting clearance from Engineer in-Charge. The installation shall be in accordance with equipment manufacturer's instructions, and with best workmanship & best industrial practice to the satisfaction of Engineer in-Charge. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 29:

This item includes fixing of 400mm width Ladder Type Cable Tray along with accessories on the Pipe Bracket Support mounted on RCC Structure/Wall of Shed. The Tray Cover shall be fixed after completion of work of laying of Cables in the Cable Tray and after getting clearance from Engineer in-Charge. The installation shall be in accordance with equipment manufacturer's instructions, and with best workmanship & best industrial practice to the satisfaction of Engineer in-Charge. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 30:

This item includes fixing of 300mm width 90-degree Vertical Inside Riser along with accessories on the Cantilever/Pipe Bracket Support mounted on RCC Structure/Wall of Shed. The Tray Cover shall be fixed after completion of work of laying of Cables in the Cable Tray and after getting clearance from Engineer in-Charge. The installation shall be in accordance with equipment manufacturer's instructions, and with best workmanship & best industrial practice to the satisfaction of Engineer in-Charge. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 31:

This item includes fixing of 300mm width 90-degree Vertical Outside Riser along with accessories on the Cantilever/Pipe Bracket Support mounted on RCC Structure/Wall of Shed. The Tray Cover shall be fixed after completion of work of laying of Cables in the Cable Tray and after getting clearance from Engineer in-Charge. The installation shall be in accordance with equipment manufacturer's instructions, and with best workmanship & best industrial practice to the satisfaction of Engineer in-Charge. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 32:

This item includes fixing of 300mm width Ladder Type Cable Tray along with accessories on the Cantilever Bracket Support mounted on RCC Structure/Wall of Shed. The Tray Cover shall be fixed after completion of work of laying of Cables in the Cable Tray and

after getting clearance from Engineer in-Charge. The installation shall be in accordance with equipment manufacturer's instructions, and with best workmanship & best industrial practice to the satisfaction of Engineer in-Charge. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 33:

This item includes fixing of 300mm width Ladder Type Cable Tray along with accessories on the Pipe Bracket Support mounted on RCC Structure/Wall of Shed. The Tray Cover shall be fixed after completion of work of laying of Cables in the Cable Tray and after getting clearance from Engineer in-Charge. The installation shall be in accordance with equipment manufacturer's instructions, and with best workmanship & best industrial practice to the satisfaction of Engineer in-Charge. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 34:

This item includes fixing of 200mm width Ladder Type Cable Tray along with accessories on the Cantilever Bracket Support mounted on RCC Structure/Wall of Shed. The Tray Cover shall be fixed after completion of work of laying of Cables in the Cable Tray and after getting clearance from Engineer in-Charge. The installation shall be in accordance with equipment manufacturer's instructions, and with best workmanship & best industrial practice to the satisfaction of Engineer in-Charge. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 35:

This item includes fixing of 200mm width Ladder Type Cable Tray along with accessories on the Pipe/Stand-off Bracket Support mounted on RCC Structure/Wall/Steel Column. The Tray Cover shall be fixed after completion of work of laying of Cables in the Cable Tray and after getting clearance from Engineer in-Charge. The installation shall be in accordance with equipment manufacturer's instructions, and with best workmanship & best industrial practice to the satisfaction of Engineer in-Charge. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 36:

This item includes fixing of 90-degree Bend of size 400mm width along with accessories on the Cantilever/Pipe Bracket Support mounted on RCC Structure/Wall of Shed. The Tray Cover shall be fixed after completion of work of laying of Cables in the Cable Tray and after getting clearance from Engineer in-Charge. The installation shall be in accordance with equipment manufacturer's instructions, and with best workmanship & best industrial practice to the satisfaction of Engineer in-Charge. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 37:

This item includes fixing of Right hand Reducer of size 400mm to 300mm width along with accessories on the Cantilever Bracket Support mounted on RCC Structure/Wall of Shed. The Tray Cover shall be fixed after completion of work of laying of Cables in the Cable Tray and after getting clearance from Engineer in-Charge. The installation shall be in accordance with equipment manufacturer's instructions, and with best workmanship & best industrial practice to the satisfaction of Engineer in-Charge. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 38:

This item includes fixing of Left hand Reducer of size 400mm to 300mm width along with accessories on the Cantilever Bracket Support mounted on RCC Structure/Wall of Shed. The Tray Cover shall be fixed after completion of work of laying of Cables in the Cable Tray and after getting clearance from Engineer in-Charge. The installation shall be in accordance with equipment manufacturer's instructions, and with best workmanship & best industrial practice to the satisfaction of Engineer in-Charge. This item includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 39:

This item includes fixing of J – Hanger & Bracket Clamp with GI fasteners of size M10 on the beam structure at a height of approximately 4m as directed by Engineer in-Charge. The work includes all material, labour, ladder/scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 40:

This item includes laying of double run of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in the existing cable trench of Substation. The cable shall be laid after opening of trench by removing the MS chequered plates. After laying of the cable, cable trench shall be properly covered with existing chequered plates as per its original condition. This item includes all labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 41:

This item includes laying of double run of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in the existing NP2 Pipe Trench. The cable shall be passed through the existing NP2 pipe after opening & removing RCC trench manhole cover. After laying of the cable, the manhole shall be properly covered with existing removed RCC covers as per its original position. This item includes all labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 42:

This item includes laying of double run of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in existing RCC cable trench. The cable shall be laid after opening of RCC trench by removing its cover. Before laying of cable, the RCC cable trench shall be cleaned properly including removal of garbage, dust, etc. from the trench line without damaging other existing cables laying in the trench. After laying of the cable, cable trench shall be properly covered with its existing covers as per original. This item includes all labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 43:

This item includes laying of double run of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in horizontal cable tray installation. The cable shall be properly dressed in such a manner that crossing of cables shall be minimized. The cable shall be clamped with suitable clamps/thick PVC straps at every 1 m distance in cable tray. All cables shall be laid in parallel in side-by-side as directed by Engineer in-Charge. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 44:

This item includes laying of double run of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in vertical cable tray installation. The cable shall be properly dressed in such a manner that crossing of cables shall be minimized. The cable shall be clamped with suitable clamps/thick PVC straps at every 1 m distance in cable tray. All cables shall be laid in parallel in side-by-side as directed by Engineer in-Charge. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 45:

This item includes laying of double run of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable as Loop. The Loop shall be at both ends of the laid cable as directed by Engineer in-Charge. The cable shall be properly dressed & clamped with suitable clamps as directed by Engineer in-Charge. The work includes all material, labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 46:

This item includes laying of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in the existing cable trench of Substation. The cable shall be laid after opening of trench by removing the MS chequered plates. After laying of the cable, cable trench shall be properly covered with existing chequered plates as per its original condition. This item includes all labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 47:

This item includes laying of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable through J – Hangers in the beam structure of existing Storage Shed. A distance between two hangers will be approximately 0.5m. The cable shall be laid & tied/fixed on the J – Hanger at a height of approximately 4m as directed by Engineer in-Charge. The work includes all material, labour, ladder/scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 48:

This item includes laying of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in vertical cable tray installation. The cable shall be properly dressed in such a manner that crossing of cables shall be minimized. The cable shall be clamped with suitable clamps/thick PVC straps at every 1 m distance in cable tray. All cables shall be laid in parallel in side-by-side as directed by Engineer in-Charge. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 49:

This item includes laying of 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable through Road/Railway Crossing by using Horizontal Directional Drilling (HDD) method by providing suitable diameter of HDPE pipe having strength of 10kg/sq.cm. The contractor shall arrange machine for excavation, water for drilling, dewatering pump, HDD equipment at his own cost. The heavy duty HDPE pipe shall be buried at nominal minimum depth of 1.5m as directed by Engineer in-Charge. The LT cable shall be passed through the buried HDPE pipe. Backfilling & dressing of excavated trenches shall be done as per its original condition. The work includes all material, labour, HDD equipment, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 50:

This item includes laying of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in horizontal cable tray installation. The cable shall be properly dressed in such a manner that crossing of cables shall be minimized. The cable shall be clamped with suitable clamps/thick PVC straps at every 1 m distance in cable tray. All cables shall be laid in parallel in side-by-side as directed by Engineer in-Charge. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 51:

This item includes laying of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in vertical cable tray installation. The cable shall be properly dressed in such a manner that crossing of cables shall be minimized. The cable shall be clamped with suitable clamps/thick PVC straps at every 1 m distance in cable tray. All cables shall be laid in parallel in side-by-side as directed by Engineer in-Charge. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 52:

This item includes laying of 1.1kV 4 Core 150 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable as Loop. The Loop shall be at both ends of the each laid cable as directed by Engineer in-Charge. The cable shall be properly dressed & clamped with suitable clamps as directed by Engineer in-Charge. The work includes all material, labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 53:

This item includes laying of 1.1kV 4 Core 70 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in horizontal cable tray installation. The cable shall be properly dressed in such a manner that crossing of cables shall be minimized. The cable shall be clamped with suitable clamps/thick PVC straps at every 1 m distance in cable tray. All cables shall be laid in parallel in side-by-side as directed by Engineer in-Charge. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 54:

This item includes laying of 1.1kV 4 Core 70 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in vertical cable tray installation. The cable shall be properly dressed in such a manner that crossing of cables shall be minimized. The cable shall be clamped with suitable clamps/thick PVC straps at every 1 m distance in cable tray. All cables shall be laid in parallel in side-by-side as directed by Engineer in-Charge. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 55:

This item includes laying of 1.1kV 4 Core 70 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable as Loop. The Loop shall be at both ends of the each laid cable as directed by Engineer in-Charge. The cable shall be properly dressed & clamped with suitable clamps as directed by Engineer in-Charge. The work includes all material, labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 56:

This item includes laying of 1.1kV 4 Core 35 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in horizontal cable tray installation. The cable shall

be properly dressed in such a manner that crossing of cables shall be minimized. The cable shall be clamped with suitable clamps/thick PVC straps at every 1 m distance in cable tray. All cables shall be laid in parallel in side-by-side as directed by Engineer in-Charge. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 57:

This item includes laying of 1.1kV 4 Core 35 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in vertical cable tray installation. The cable shall be properly dressed in such a manner that crossing of cables shall be minimized. The cable shall be clamped with suitable clamps/thick PVC straps at every 1 m distance in cable tray. All cables shall be laid in parallel in side-by-side as directed by Engineer in-Charge. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 58:

This item includes laying of 1.1kV 4 Core 35 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable as Loop. The Loop shall be at both ends of the each laid cable as directed by Engineer in-Charge. The cable shall be properly dressed & clamped with suitable clamps as directed by Engineer in-Charge. The work includes all material, labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 59:

This item includes laying of 1.1kV 4 Core 6 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in horizontal cable tray installation. The cable shall be properly dressed in such a manner that crossing of cables shall be minimized. The cable shall be clamped with suitable clamps/thick PVC straps at every 1 m distance in cable tray. All cables shall be laid in parallel in side-by-side as directed by Engineer in-Charge. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 60:

This item includes laying of 1.1kV 4 Core 6 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable in vertical cable tray installation. The cable shall be properly dressed in such a manner that crossing of cables shall be minimized. The cable shall be clamped with suitable clamps/thick PVC straps at every 1 m distance in cable tray. All cables shall be laid in parallel in side-by-side as directed by Engineer in-Charge. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 61:

This item includes laying of 1.1kV 4 Core 6 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable through clamping on RCC lantern/column structure. The G.I. Saddle clamps shall be provided of size 20mm×2mm (size suitable with respect to cable outer diameter) with suitable size of heavy duty screws for clamping as directed. The cable shall be laid on RCC lantern/column structure with clamps at a height of approximately 4m to 6m as directed by Engineer in-Charge. The clamp shall be fixed rigidly on lantern/column structure at 0.5m intervals. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in Charge.

Technical Specification No. 62:

This item includes laying of 1.1kV 4 Core 6 Sq.mm Aluminium Conductor XLPE Insulated PVC Sheathed Armoured Cable as Loop. The Loop shall be at both ends of the each

laid cable as directed by Engineer in-Charge. The cable shall be properly dressed & clamped with suitable clamps as directed by Engineer in-Charge. The work includes all material, labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 63:

This item includes laying of 1.1kV grade, 3 Core, 1.5 Sq.mm, Copper Conductor, XLPE Insulated, PVC Sheathed, Round Wire Armoured Cable through clamping on RCC structure. The G.I. Saddle clamps shall be provided of size 20mm×2mm (size suitable with respect to cable outer diameter) with suitable size of heavy duty screws for clamping as directed. The cable shall be laid on RCC structure with clamps at a height of approximately 6m as directed by Engineer in-Charge. The clamp shall be fixed rigidly on RCC structure at 0.3m intervals. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 64:

This item includes laying of 1.1kV grade, 3 Core, 1.5 Sq.mm, Copper Conductor, XLPE Insulated, PVC Sheathed, Round Wire Armoured Cable through clamp provided on existing hangers in the dome shaped roof structure of the Shed. A distance between two existing hangers will be approximately 2m. The cable shall be passed & tied/fixed in the clamp provided on existing hanger in the Shed structure as directed by Engineer in-Charge. Contractor shall arrange necessary scaffolding/any other equipment of required height for laying of the cable through existing hangers in the roof structure of the Shed. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 65:

This item includes laying of 1.1kV grade, 3 Core, 1.5 Sq.mm, Copper Conductor, XLPE Insulated, PVC Sheathed, Round Wire Armoured Cable as Loop. The Loop shall be at both ends of the each laid cable as directed by Engineer in-Charge. The cable shall be properly dressed & clamped with suitable clamps as directed by Engineer in-Charge. The work includes all material, labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 66:

This item includes design, manufacture, testing & supply at site outdoor type LT Load Point Panel with double door, top canopy, handle with locking arrangement (pad lock 5 level with keys).

- Load point panel shall be fabricated from Stainless Steel sheet of 2.00 mm thick, 304 Grade Stainless Steel.
- The Board shall be enclosed by stainless sheet steel of minimum 2 mm thickness smoothly finished & level, door & covers shall be made 1.6 mm thick stainless sheet steel. Adequate stiffeners shall be provided wherever necessary.
- Load point panel shall be dust & vermin proof having Protection Class of IP 54.
- Load point panel shall have bottom Cable entry.
- All panel edges and door edges shall be reinforced against distortion. Cut outs shall be true in shape and devoid of sharp edges.
- The complete structure shall be rigid, self-supporting free from vibration, twists & bends.

The Load Point Panel shall be specious for easy maintenance and shall be provided with following electrical items:

1) 200 Amp, FP MCCB, 25kA, Microprocessor based: 2 No. for Incomer
2) 200 Amp, FP Changeover Switch: 1 No.
3) 100 Amp, FP MCCB, 25kA: 1 No. (Outgoing Feeder for Section – II of Storage Shed)
4) 40 Amp, FP MCCB, 25 kA: 3 Nos. (Outgoing Feeder to PDB)
5) 40 Amp, FP MCCB, 25 kA: 1 No. (Spare Outgoing Feeder)
6) Digital Multi-Function Energy Meter, Accuracy Class 0.5, with RS485: 1 No.
7) 200/5 Amp CT coil (Class 1) Tape Wound: 3 Nos.
8) LED Indication lamps for R, Y, B, ON, OFF & Trip indication: 6 Nos.

Main Bus & Taps:

The board shall be provided with three phase and neutral bus-bar. Bus-bars shall be of uniform cross section throughout the length of the board and up to the incoming terminals of feeder circuit breaker/switch. The bus-bars shall be made of high conductivity aluminum alloy of E91E grade, Bus bar joints shall be complete with high tensile steel bolt and washers and nuts. Bus-bars shall be thoroughly cleaned at the joint locations and suitable contact grease shall be applied just before making a joint, separate supports shall be provided for each phase of the bus-bars. If a common support is provided for all three phase, anti-tracking barriers shall be incorporated. Bus-bars shall be adequately supported and braced to withstand the stresses due to the specified short circuit currents. Bus bar supports shall be made of hylum sheets; glass reinforced moulded plastic material or cast resin.

All these components shall be mounted/erected in the Load Point Panel by means of suitable cadmium passivated hardware. The Panel shall be complete in all respects with cable glands, lugs for incoming and outgoing cables including interconnection with PVC insulated cable single core, standard copper conductor of 650/1100V grade. Load point panel shall be provided with 2 Nos. SS terminals for earthing.

The Load Point Panel shall be tested as per the relevant IS standard. Before Manufacturing the Load Point Panel, the relevant test certificate in support of Panel manufacturing, along with design & drawing shall be submitted to DPA for approval and also all Electrical accessories shall be used as per approved Make List of DPA.

The rates shall be inclusive of all the taxes (excluding GST), insurance, transportation, unloading as directed by Engineer-in-Charge.

Technical Specification No. 67:

This item includes design, manufacture, testing & supply at site outdoor type LT Sub Load Point Panel with double door, top canopy, handle with locking arrangement (pad lock 5 level with keys).

- Load point panel shall be fabricated from Stainless Steel sheet of 2.00 mm thick, 304 Grade Stainless Steel.
- The Board shall be enclosed by stainless sheet steel of minimum 2 mm thickness smoothly finished & level, door & covers shall be made 1.6 mm thick stainless sheet steel. Adequate stiffeners shall be provided wherever necessary.
- Load point panel shall be dust & vermin proof having Protection Class of IP 54.
- Load point panel shall have bottom Cable entry.

- All panel edges and door edges shall be reinforced against distortion. Cut outs shall be true in shape and devoid of sharp edges.
- The complete structure shall be rigid, self-supporting free from vibration, twists & bends.

  The Load Point Panel shall be specious for easy maintenance and shall be provided with following electrical items:

  1) 100 Amp, FP MCCB, 25kA: 1 No. for Incomer
  2) 40 Amp, FP MCCB, 25 kA: 3 Nos. (Outgoing Feeder to PDB)
  3) 40 Amp, FP MCCB, 25 kA: 1 No. (Spare Outgoing Feeder)
  4) Digital Multi-Function Energy Meter, Accuracy Class 0.5, with RS485: 1 No.
  5) 100/5 Amp CT coil (Class 1) Tape Wound: 3 Nos.
  6) LED Indication lamps for R, Y, B, ON, OFF & Trip indication: 6 Nos.

Main Bus & Taps:

The board shall be provided with three phase and neutral bus-bar. Bus-bars shall be of uniform cross section throughout the length of the board and up to the incoming terminals of feeder circuit breaker/switch. The bus-bars shall be made of high conductivity aluminum alloy of E91E grade, Bus bar joints shall be complete with high tensile steel bolt and washers and nuts. Bus-bars shall be thoroughly cleaned at the joint locations and suitable contact grease shall be applied just before making a joint, separate supports shall be provided for each phase of the bus-bars. If a common support is provided for all three phase, anti-tracking barriers shall be incorporated. Bus-bars shall be adequately supported and braced to withstand the stresses due to the specified short circuit currents. Bus bar supports shall be made of hylum sheets; glass reinforced moulded plastic material or cast resin.

All these components shall be mounted/erected in the Load Point Panel by means of suitable cadmium passivated hardware. The Panel shall be complete in all respects with cable glands, lugs for incoming and outgoing cables including interconnection with PVC insulated cable single core, standard copper conductor of 650/1100V grade. Load point panel shall be provided with 2 Nos. SS terminals for earthing.

The Load Point Panel shall be tested as per the relevant IS standard. Before Manufacturing the Load Point Panel, the relevant test certificate in support of Panel manufacturing, along with design & drawing shall be submitted to DPA for approval and also all Electrical accessories shall be used as per approved Make List of DPA.

The rates shall be inclusive of all the taxes (excluding GST), insurance, transportation, unloading as directed by Engineer-in-Charge.

Technical Specification No. 68:

This item includes design, manufacture, testing & supply at site outdoor type FRP Power Distribution Board. The FRP Power Distribution Board shall be outdoor surface mounting type with door, with locking arrangement and top canopy. The Power Distribution Board shall be of suitable size; however, it shall be specious for easy maintenance and the minimum depth of the Power Distribution Board shall be 300mm.

The FRP Power Distribution Board shall have following features:

- The material for the enclosure shall be Fiber Reinforced Polyester (FRP) with F1 grade raw material of ultra-guard.
- Protection Class: IP 65.

- Impact Resistance: IK 10
- Sheet thickness shall be minimum 4 mm.
- Gasket shall be of properly greed with proper compression to maintain the ingress protection.
- Distribution Board shall comply with the requirement of dielectric strength as per IEC62208 standard, ultraviolet resistance test as per UL746C standard and glow wire test with flammability of 5VA as per UL94 standard.
- Distribution Board shall have continuous hinges. All the accessories like hinges, locking arrangement, screws & mounting brackets shall be of SS304 or higher grade SS.
- Distribution Board shall have backside mounting arrangement.
- Distribution Board edges and door edges shall be reinforced against distortion. Cut outs shall be true in shape and devoid of sharp edges.
- The complete structure shall be rigid, self-supporting free from vibration, twists & bends.
- Finished painted appearance of equipment shall present an aesthetically, pleasing appearance, free from dents and uneven surfaces.

The Power Distribution Board shall be provided with following electrical items:

1) Incomer – 40 Amp FP MCCB, 25 kA, 50Hz: 1 No.
2) Outgoing – 10 Amp TP MCBs, 10kA, C Curve: 8 Nos.
3) Wiring: Internal with complete wiring with suitable size of flexible copper cable for I/c to O/g, suitably bind with proper gap as per IS.
4) 50A, 415V, 3 phase contactor with coil voltage 215-240 V: 1 No.
5) Digital Astronomical Time switch for switching, single phase operated: 1 No.

The Power Distribution Board shall be complete in all respects having interconnection with PVC insulated cable single core, standard copper conductor of 1100V grade. The cable entry and exit shall be from bottom of the Distribution Board.

The Power Distribution Board shall be provided with suitable size of Earthing Busbar. Before placing the order for manufacturing the drawing should be approved by Engineer in-Charge showing the arrangement of the electrical components and should fulfil the needs of IE rules. The Power Distribution Board shall be manufactured from type test certificate holder for Power Distribution Board of similar or above rating.

The rate shall be inclusive of all taxes (excluding GST), packing, forwarding, insurance, transportation, and unloading at site of work.

Technical Specification No. 69:

This item includes installation, testing & commissioning of LT Load Point Panel. The Load Point Panel shall be installed on base frame made of Stainless Steel (Grade SS 304) angle of size 50mm×5mm with six legs of size 50mm×5mm×800mm each. The panel shall be erected on RCC foundation of suitable size having height of 500mm above ground level and 400mm below ground level. Before RCC, 100mm PCC shall be done. For cable entry & exit, suitable size & length of HDPE Pipe shall be kept in the foundation during its casting as directed by Engineer in-Charge. This work also includes termination of the incoming &

outgoing Cables along with providing suitable size of glands (Gland suitable for Incoming/Outgoing XLPE Power Cables of size 4C×150 sq.mm/4C×70Sq.mm/4C×35Sq.mm) and necessary earth linking connection. The work includes all material, labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 70:

This item includes installation, testing & commissioning of LT Sub Load Point Panel. The Sub Load Point Panel shall be installed on base frame made of Stainless Steel (Grade SS 304) angle of size 50mm×5mm with six legs of size 50mm×5mm×800mm each. The panel shall be erected on RCC foundation of suitable size having height of 500mm above ground level and 400mm below ground level. Before RCC, 100mm PCC shall be done. For cable entry & exit, suitable size & length of HDPE Pipe shall be kept in the foundation during its casting as directed by Engineer in-Charge. This work also includes termination of the incoming & outgoing Cables along with providing suitable size of glands (Gland suitable for Incoming/Outgoing XLPE Power Cables of size 4C×70 sq.mm/4C×35Sq.mm) and necessary earth linking connection. The work includes all material, labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 71:

This item includes installation, testing & commissioning of FRP 8-Way Power Distribution Board on wall of Shed as directed by Engineer in-Charge. The Distribution Board shall be fixed rigidly on wall through suitable size of anchor fasteners as directed by Engineer in-Charge. This work includes termination of the incoming & outgoing Cables along with providing suitable size of glands (Gland suitable for Incoming/Outgoing XLPE Power Cables of size 4C×35 sq.mm/4C×6Sq.mm) and necessary earth linking connection. The work includes all material, labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 72:

This item includes supply at site FRP Junction Box of size 160 mm × 160 mm × 90 mm (W×H×D) along with 9 nos. of minimum 32A capacity Connector suitable for 6sq.mm Cable size duly mounted on DIN rail channel with suitable size of gland for incomer 4 core, 6 Sq.mm XLPE aluminum conductor Cable and three outgoing 3 core, 1.5 Sq.mm XLPE Copper Conductor Cable. The Junction Box shall have ingress protection of IP65. The Junction Box shall be provided with suitable wall mounting bracket. The size of the Junction Box is tentative and minimum. The rate shall be inclusive of all taxes (excluding GST), insurance, transportation, unloading at site as directed by Engineer in-Charge.

Technical Specification No. 73:

This item includes fixing of supplied FRP Junction Box on RCC Structure/Wall of the Shed at the location as directed. The Junction Box shall be fixed rigidly on wall through suitable size of nut bolts/anchor fasteners, at a height of approximately 6m, as directed. This work includes necessary wiring, connections & earth linking with all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 74:

The contractor shall supply at site LED High Bay fittings to achieve average illumination level of not less than 150 Lux on ground level in a grid of 5m × 5m with uniformity ratio

(Emin/Eavg) of 0.40 and maintenance factor of 0.80 inside Storage Shed near G-19 (Section – I & II of size 198m × 30m) & Storage Shed near G-25 (Section – I & II of size 180m × 30m). A drawing is enclosed at Annexure – II for reference. The lighting design of inside Sheds shall comply with IS 3646: (Part II) – 1966 with latest amendments.

The bidder shall submit their illumination design for Storage Sheds near G-19 & G-25 with following details:

(1) Width of Section I & II each of Storage Sheds near G-19 & G-25 is 30m (Width – Y axis).

(2) Length of Section I & II of Storage Shed near G-19 is 198m (Length – X axis).

(3) Length of Section I & II of Storage Shed near G-25 is 180m (Length – X axis).

(4) Position of LED high bay fittings in width – Y axis of Section I & II each of Storage Sheds near G-19 & G-25: first fitting at 5.500m, second fitting at 14.900m & third fitting at 25.000m.

(5) Position of LED high bay fittings in length – X axis of Section I & II of Storage Shed near G-19 (198m × 30m): For both Section I & II, first group of three fittings at 3.150m and thereafter subsequent group of three fittings at an equal distance of 10.080m up to 20th group of three fittings.

(6) Position of LED high bay fittings in length – X axis of Section I & II of Storage Shed near G-25 (180m × 30m): For both Section I & II, first group of three fittings at 4.410m and thereafter subsequent group of three fittings at an equal distance of 10.080m up to 18th group of three fittings.

(7) Mounting height of LED high bay fittings (between Ground level of Shed and surface of the LED high bay fitting's glass) shall not be less than 12.50 m for the middle row of LED high bay fittings and not less than 10.00 m each for side rows of high bay fittings inside Storage Shed.

(8) The reflection factor for the Floor, Ceiling & Wall shall not be more than 10.

(9) For Section I & II of Storage Shed near G-19 (198m × 30m) the size of grid shall not be less than 40×7 points and for Section I & II of Storage Shed near G-25 (180m × 30m) the size of grid shall not be less than 37×7 points.

The bidder shall submit their detailed design reports showing the illumination level with total quantity of fittings, maintenance factor, reflection factor & uniformity ratio in a grid of 5m×5m along with their bid document.

The bidder shall submit LM79 test reports of the offered LED High Bay fitting issued by any NABL accredited laboratory only for calculation of power consumption of the design along with the bid document.

Note: The locations of hangers provided in the roof structure of Storage Sheds by DPA for fixing of LED high bay fittings by the contractor will be as per the details provided at sr. no. 4, 5 & 6 above. However, the exact locations of the hangers are subject to minor change depending on the actual site condition only at Storage Sheds and the same will be decided by the Engineer in-Charge, DPA and decision of the Engineer in-Charge shall be final & binding on the contractor.

The Technical Specifications of LED High Bay Fitting(s) is as below:

SR.NO.	DESCRIPTION	SPECIFICATION
1	Input Power of High Bay fitting(s)	**To be offered by bidder**
2	Input voltage AC	120-270 V AC
3	Input Frequency	50 Hz +/-1 Hz
4	Life	50,000 burning hours @ L70B50, Ta 35°C Outdoor
5	Mounting type for High Bay fitting	Eye bolt/Bracket for suspension mounting
6	Total Harmonic Distortion	<10% maximum
7	Working Temperature	0°C to +45°C
8	Working Humidity	10% to 90% RH
9	Temperature	5700K to 6500K
10	Colour rendering index	>70
11	Lumens / Watt	≥ 120 Lumen/Watt at System Level
12	Finishing	Corrosion resistant powder coating
13	Power factor	Not less than 0.95
14	Warranty	5 Years from the date of successful commissioning. It is clarified that during Warranty Period, if the material is found to be defective or has poor performance or has lumen depreciation beyond permissible limit as per LM80 report, the Contractor shall promptly, Replace the material against manufacturing defects /Rectify the material, on receiving the instruction from Engineer in-Charge at contractor's cost. The contractor shall have final & total single point responsibility for performance of the LED light fittings supplied.
15	Construction	The housing should be of single piece non-corrosive powder coated pressure die-cast alluminium frame. The weight of the High Bay fitting shall not be more than 8.0 kg.
16	Surge Protection	The Luminaire should have a 10kV SPD. The SPD should be able to sustain a minimum 15 hits of 5kA rating i.e. Total of 45 hits across all the three modes as per IEC 61000.
17	Electrical Protection	The Luminaire should be capable of withstanding voltage stress of 440V phase to phase for 8 hrs at 50 degree Celsius and should have low voltage protection as 100V for 48 hours & high voltage cut-off above 325 VAC and should have an auto restart feature.

18	Impact Resistance	IK08
19	Driver Construction	The Drivers should be a potted driver not a printed circuit board without casing, mounted inside the luminaire. The Driver shall be of constant current type and shall have Over voltage, Over current, Over temperature & Short circuit Protection. The driver efficiency shall be more than 85%. List of make of Driver: PHILLIPS Xitanium/ MEANWELL/ OSRAM/ BAG/ SOSEN/ INVENTRONICS. Manufacturers can use their own make LED driver and the LED Driver shall be BIS certified and shall meet the specifications and comply with Safety requirements (IEC 61347-1, IEC 61347-2-13), EMC requirements (CISPR 15/ EN 55015, IEC/EN 61547, IEC/EN 61000-3-2, IEC/EN 61000-3-3).
20	Driver shall safety compliance	As per IEC 61347-1/ IS 15885 (Part2/ SEC13)/BIS certified
21	Ingress Protection Level of LED Light Fitting	IP 65 or more
22	Optics	As per Design
23	Material of optics	PC lens with toughened glass cover. The LEDs should be provided with UV resistant lens/glass cover for avoiding yellowing of the lense/glass cover. Or Exposed lensed PC Lens plate, the LEDs should be provided with anti-dust, UV resistant exposed lens for avoiding any dust & dirt accumulation on the fixtures and yellowing of the lenses.
24	Makes of LEDs	Osram, Cree, Lumileds, Nichia, Seoul.
25	Specification of LED	SMD type with wattage of each LED should be > 1 Watt and ≤ 3 Watt.
26	Certificate/Report	(1) Type test reports for LED fittings & LED Driver. (2) The luminaire should be tested as per IEC 60598 standards and following test reports should be submitted: Thermal Test, Ingress Protection Test, Electrical / Insulation Resistance Test, Endurance Test, Humidity Test. The luminaire should be tested for 'Drop test' as per IEC 60068-2-31/IS9000 Part 7 / Sec 3 standards. The luminaire

		should be tested for 'Vibration test' as per ANSI/IEC 68-2-6 standards. (3) Should comply to IESNA LM-79 (Approved method for the Electrical and Photometric Measurements of Solid-State Lighting Products). LM79 report from NABL accredited laboratory. (4) The LEDs used should comply to LM-80 standards (IESNA: Approved Method for Measuring Lumen Maintenance of LED Light Sources and LED lumen depreciation time to L70 based on LM-80 data). (5) The LEDs shall comply with photo biological safety norms as per IEC 62471/EN 62471/IS:16108 under Risk Group 1 (Low Risk). (6) BIS Certificate for LED Driver. (7) BIS Certificate for LED Luminaire. Contractor shall submit all the above certificate/report including BIS certificate (excluding LM79 report) for all LED light fitting at the time of supply of fittings.

The rate shall be inclusive of all taxes (excluding GST), insurance, transportation, unloading at site as directed by Engineer in-Charge.

List of make of LED luminaire: Bajaj/ Philips/ Crompton/ C&S/ SYSKA/ WIPRO/ Pyrotech/ Surya/ Nessa/ Panasonic/ Havells/ Halonix/ Orient Electric/ WMEL.

Field Test for LED High Bay Fittings:

The Contractor shall carry out field test for the illumination level provided for Storage Sheds in the presence of Engineer in-Charge & TPIA. The lux level measurement shall be done by Third Party Inspection Agency (TPIA) (to be engaged & payment shall be made by DPA). The contractor shall prepare grid of 5m × 5m and mark the measuring points for measurement of lux level by the TPIA as directed by Engineer in-Charge.

The contractor shall demonstrate in the Field Test that their design achieves the average illumination level as below:

Illumination Level at inside Section I & II each of Storage Sheds near G-19 & G-25:

An average illumination level shall not be less than 150 Lux on ground level in a grid of 5m × 5m with uniformity ratio (Emin/Eavg) of 0.40 and maintenance factor of 0.80 inside Storage Sheds near G-19 & G-25. It is clarified that the measured average lux level at the time of Field Test shall not be less than 187.5 lux.

The illumination level shall be measured at inside Storage Shed in a size of 50m × 30m by making a grid of a 5m x 5m covering the entire area at ground level. The location of 50m × 30m for the field test will be randomly selected by Engineer in-Charge from Section I or II of Storage Shed near G-19 or G-25.

In the event of illumination level not found as per the requirement, the contractor shall have to carry out the work by replacing the LED high bay fittings installed with other wattage and/or make of LED high bay fittings, at the same locations where hangers are fixed/provided for the LED high bay fittings, at his own cost to complete the work within the stipulated time and as per the requirement. Also, the contractor shall pay compensation to the Deendayal Port Authority for the assessed additional power consumption at an applicable Energy Charges per Unit as per the tariff order for DPA (The present tariff of Energy Charges is ₹5.55 per Unit). Deendayal Port Authority shall not pay anything extra to contractor to achieve the required illumination level. The compensation on account of extra energy consumption shall be calculated as below:

Compensation on account of extra energy consumption = Additional Power of LED High bay (kW) × 12 hours × 365 days × 10 years × (Energy Charges per Unit as per the tariff order for DPA).

Technical Specification No. 75:

This item includes installation, testing & commissioning of supplied LED high bay fitting. The LED high bay fitting shall be fixed on existing hanger by providing required length of SS 304 eye bolt & required accessories complete in all respect as directed by Engineer in-Charge. DPA will provide Hanger duly fixed in the Shed structure for mounting of the LED high bay fitting only. The work includes necessary wiring & connections of LED High Bay fitting from laid 3 core, 1.5 Sq.mm XLPE Copper Conductor Cable with 3 core Power Cable of LED High Bay fitting by providing IP65 Power Connector of minimum 10A rating as directed by Engineer in-Charge. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 76:

The contractor shall supply at site 200 ± 5% Watt energy efficient LED Flood Light Fitting as per the following Technical Specification:

SR. NO.	DESCRIPTION	SPECIFICATION
1	Input Power	200 ± 5% Watt
2	Input voltage AC	120-270 V AC
3	Input Frequency	50 Hz ± 1 Hz
4	Life	50,000 burning hours @ L70B50, Ta 35°C Outdoor
5	Mounting type	Suitable for wall mounting with bracket
6	Total Harmonic Distortion	<10% maximum
7	Working Temperature	0°C to +45°C
8	Working Humidity	10% to 90% RH
9	Temperature	5700K
10	Colour rendering index	>70
11	Efficacy	≥ 120 Lumen/Watt
12	Finishing	Corrosion resistant powder coating
13	Power factor	Not less than 0.95
14	Warranty	5 Years from the date of successful commissioning.

		It is clarified that during Warranty Period, if the material is found to be defective or has poor performance or has lumen depreciation beyond permissible limit as per LM80 report, the contractor shall promptly, Replace the material against manufacturing defects /Rectify the material, on receiving the instruction from Engineer in Charge at contractor's cost. The contractor shall have final & total single point responsibility for performance of the LED light fitting supplied.
15	Construction	The housing should be of single piece non-corrosive powder coated pressure die-cast aluminum frame with heat resistant toughened clear glass fixed with SS screw. The LED Flood Light shall have its make embossed/engraved on the Fitting.
16	Surge Protection	The Luminaire should have a 10kV SPD duly bolted inside the Luminaire. The SPD should be able to sustain a minimum 15 hits of 5kA rating i.e. Total of 45 hits across all the three modes as per IEC 61000.
17	Electrical Protection	The Luminaire should be capable of withstanding voltage stress of 440V phase to phase for 8 hrs. at 50 degree Celsius and should have low voltage protection as 100V for 48 hours & high voltage cut-off above 325 VAC and should have an auto restart feature.
18	Impact Resistance	IK07
19	Driver Construction	The Drivers should be a potted driver not a printed circuit board without casing, mounted inside the luminaire. The Driver shall be of constant current type and shall have Over voltage, Over current, Over temperature & Short circuit Protection. The driver efficiency shall be more than 85%. List of make of Driver: PHILLIPS Xitanium/ MEANWELL/ OSRAM/ BAG/ SOSEN/ INVENTRONICS. Manufacturers can use their own make LED driver and the LED Driver shall be BIS certified and shall meet the specifications and comply with Safety requirements (IEC 61347-1, IEC 61347-2-13), EMC requirements (CISPR 15/ EN 55015, IEC/EN 61547, IEC/EN 61000-3-2, IEC/EN 61000-3-3).
20	Driver shall safety compliance	As per IEC 61347-1/ IS 15885 (Part2/ SEC13)/BIS certified
21	Ingress Protection Level of LED Light Fitting	IP 65 or more
22	Optics	Asymmetric Wide or Wide Beam Angle

23	Material of optics	PC lens with toughened glass cover. The LEDs should be provided with UV resistant lens/glass cover for avoiding yellowing of the lense/glass cover. Or Exposed lensed PC Lens plate, the LEDs should be provided with anti-dust, UV resistant exposed lens for avoiding any dust & dirt accumulation on the fixtures and yellowing of the lenses.
24	Makes of LEDs	Osram, Cree, Lumileds, Nichia, Seoul.
25	Specification of LED	SMD type with wattage of each LED should be > 1 Watt and ≤ 3 Watt.
26	Certificate/Report	(1) Type test reports for LED fitting & LED Driver. (2) Should comply to IESNA LM-79 (Approved method for the Electrical and Photometric Measurements of Solid-State Lighting Products). LM79 report from any NABL accredited laboratory. (3) The LEDs used should comply to LM-80 standards (IESNA: Approved Method for Measuring Lumen Maintenance of LED Light Sources and LED lumen depreciation time to L70 based on LM-80 data). (4) BIS Certificate for LED Driver. (5) BIS Certificate for LED Luminaire. Contractor shall submit all the above certificate/report including BIS certificate (excluding LM79 report) for all LED light fitting at the time of supply of fittings.

The rate shall be inclusive of all taxes (excluding GST), insurance, transportation, unloading at site as directed by Engineer in-Charge.

List of make of LED Luminaire: Bajaj/ Philips/ Crompton/ C&S/ SYSKA/ WIPRO/ Pyrotech/ Surya/ Nessa/ Panasonic/ Havells/ Halonix/ Orient Electric/ WMEL.

Technical Specification No. 77:

This item includes fixing and commissioning of 200 ±5% Watt LED Flood Light Fitting. The LED Flood Light fitting shall be fixed on Wall/RCC structure at a height of approximately 7m of dome shaped Storage Shed as directed by the Engineer in-Charge. The LED flood light fitting shall be fixed on Wall/RCC structure with required size of anchor fasteners as per installation manual of the LED Fitting's manufacturer and as directed by Engineer in-Charge. The work includes necessary wiring & connections of LED flood light fitting from FRP JB with 3 core, 1.5 Sq.mm PVC insulated PVC sheathed Copper Flexible Cable. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 78:

This item includes preparation of maintenance free earth station by providing 60mm diameter, 3 meter, 100 micron hot dipped GI chemical electrode with back fill compound including accessories & masonry work. A cement concrete (ratio 1:4:8) chamber of at least 500 mm × 500 mm × 500mm × 50mm (thickness of wall) shall be prepared and a cover of suitable size shall be provided for the chamber. The work shall be carried out to entire

satisfaction of Engineer in-Charge. This work includes all material, labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 79:

This item includes supply at site, laying, fixing and connection of GI strip of size 50x6 mm from earth station to LT Load Point Panel/ LT Sub Load Point Panel/ LT Power Distribution Board as directed. The GI strip shall be laid and clamped suitably on wall/floor/structure or buried in the ground as directed. This work includes all material, labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 80:

This item includes supply at site, laying, fixing and connection of GI strip of size 25×6 mm. The GI strip shall be laid and clamped suitably on wall/floor/structure. The strip shall be connected with the earth station. The GI Saddle clamps shall be provided of size 20mm×2mm with suitable size of heavy duty screws for clamping as directed. The GI strip shall be laid on wall/structure with clamps at a height parallel to the cable tray/cable wall clamping as directed by Engineer in-Charge. The clamp shall be fixed rigidly on wall/structure at 0.5m intervals. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 81:

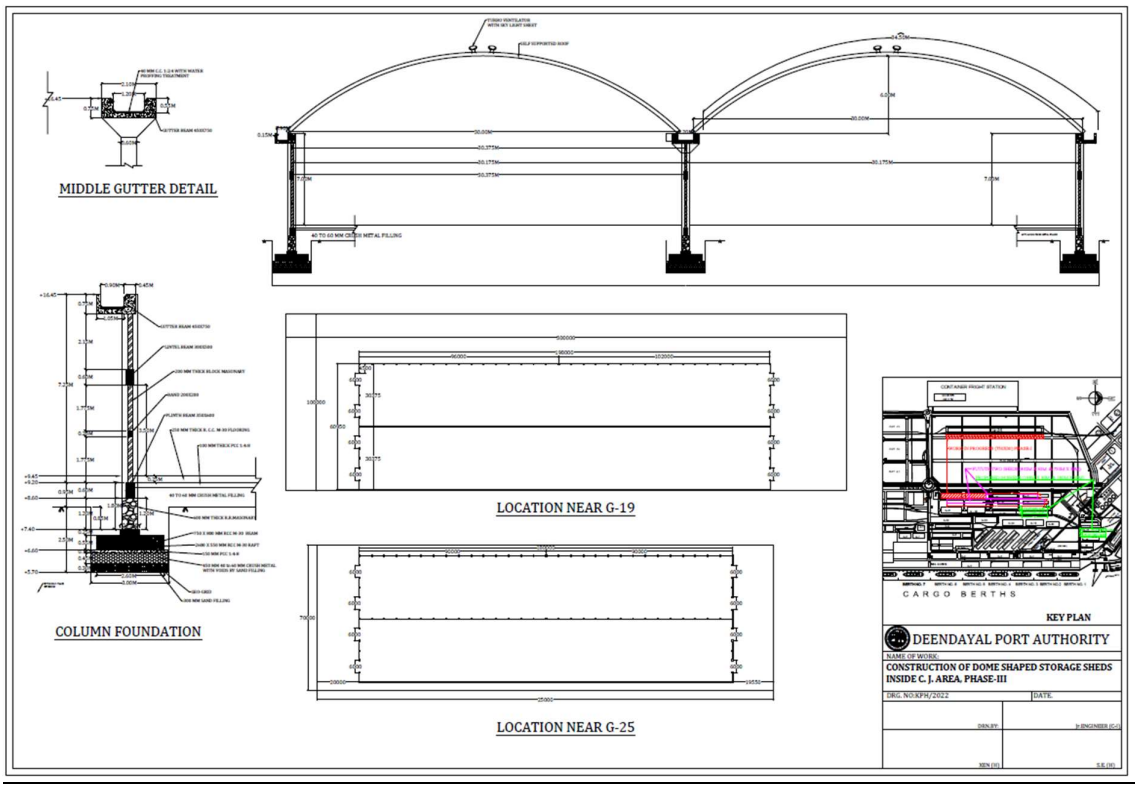
This item includes supply at site, laying, fixing and connection of 8 SWG GI Wire between GI strip of size 25×6 mm to earthing terminal of FRP Junction Box as directed. The GI Wire shall be laid and clamped suitably on wall/structure at height as directed. The work includes all material, labour, scaffolding, tools & tackles as directed by Engineer in-Charge.

Signature & Seal of Firm

Executive Engineer (E)
Deendayal Port Authority

ANNEXURE – II

Drawing of Storage Sheds near G-19 & G-25 inside C.J. Area:



Make List for Electrical Items		
Sr. No.	**Description**	**Recommended Makes**
1	HV VCB	SIEMENS / CROMPTON GREAVES/ABB/Schneider
1(a)	HV Gas Insulated Breakers	SIEMENS /Schneider/ABB
2	POWER TRANSFORMERS	VOLTAMP/CROMPTON GREAVES /BHARAT BIJLEE/ BHEL/ SIEMENS/ABB/ Schneider/T&R
3	DISTRIBUTION TRANSFORMERS	EMCO/KIRLOSKAR/PATSON/VOLTAMP/ABB/Schneider/T&R
4	RESIN CAST TRANSFORMERS	
	A) RESIN CAST IMPREGNATED	VOLTAMP / KIRLOSKAR / EMCO
	B) DRY CAST	VOLTAMP/KIRLOSKAR/EMCO
5	HT XLPE CABLES	POLYCAB/ TORRENT/ RPG ASIAN/ GLOSTER/ UNISTAR
6	LT XLPE CABLES	POLYCAB/TORRENT/RPG ASIAN/ RALLISON/PRIMECAB/ HAVELLS/ UNISTAR/AVOCAB/ALLCAB/ADCAB
7	LT ACB	SIEMENS/L&T/SCHNEIDER/C&S
8	PROTECTION RELAYS	AREVA/L&T/SIEMENS/ABB/C&S
9	LT PANEL	CPRI APPROVED
10	CHANGE OVER SWITCH	SIEMENS/L&T/ABB/C&S/SCHNIDER/ LEGRAND / INDOASIAN
11	SFU FOR MAIN LT DISTRIBUTION PANELS	SIEMENS/L&T/ABB/C&S
12	SFU FOR DISTRIBUTION PANELS & FEEDER PILLERS	SIEMENS/L&T/ABB/C&S/ SCHNEIDER/ LEGRAND/ INDOASIAN/HAVELLS
13	MCCB FOR MAIN LT DISTRIBUTION PANELS	SIEMENS/L&T/ABB
14	MCCB FOR DISTRIBUTION PANELS AND FEEDER PILLERS	SIEMENS/L&T/ABB/C&S/ SCHNIDER/ LEGRAND/ INDOASIAN/HAVELLS
15	MCB/ELCB/RCCB/ RCCBO FOR MAIN LT DISTRIBUTION PANELS	SIEMENS/HAGER L&T/ABB
16	MCB FOR DISTRIBUTION PANELS AND FEEDER PILLERS	SIEMENS/L&T/ABB/C&S/ SCHNEIDER/ LEGRAND/ INDOASIAN/ HAVELLS/ STANDARD
17	MCB DISTRIBUTION BOARD	STANDARD / HENSEL/LEGRAND / INDOASIAN / HAVELLS
18	MULTI FUNCTION DIGITAL METER FOR MAIN LT DISTRIBUTION PANELS/DIGITAL KWH METERS	L&T/ENERCON/SECURE/L&G/ RISHABH
19	ANALOG VOLT/AMPARE METER FOR DISTRIBUTION PANELS AND FEEDER PILLERS	RISHABH/AE/ENERCON/L&T
20	SLECTOR SWITCH FOR VOLTMETER/AMPARE METER	L&T/SIEMENS/C&S

21	POWER CONTACTOR & OVER LOAD RELAYS	L&T/SIEMENS/ABB
22	QUARTZ TIME CLOCK SWITCH	L&T/INDOASIAN/SIEMENS
23	PVC WIRE WITH COPPER CONDUCTOR	RRKABEL/KEI/POLYCAB/MILEX/GUJCAB/ STANDARD/ FINOLEX/ ANCHOR
24	FLUSH TYPE SWITCHES, SOCKETS, HOLDERS AND CEILING ROSES & ELECTRONIC REGULATORS	ANCHOR/MK/NORTHWEST/VINAY/PANAMA/HAVELLS
25	DOOR BELLS/CALL BELLS	ANCHOR/LEGEND/MK/NORTHWEST
26	MODULAR SWITCHES, SOCKETS, PLATES & BOXES	ANCHOR / MK / NORTHWEST / LEGRAND /HAVELLS/ INDOASIAN/ SIEMENS
27	PVC CONDUIT/OVAL CONDUIT & CASSING CAPPING AND ACCESSORIES	PRECISION/VULCAN/FINOLEX/ GARWARE/ RESTOPLAST/ SWASTIK/ BPI
28	GLS LAMPS & FLUORESCENT LAMPS	PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI /GE
29	HPSV, HPMV & METAL HELIDE LAMPS	PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI /GE
30	IGNITORS FOR HPSV, METAL HELIDE LAMPS	PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI /GE
31	LUMINARIES	PHILIPS/BAJAJ/WIPRO/CROMPTON GREAVES / OSRAM / SURYA ROSHNI /GE
31a	LED Luminaries	Philips /Bajaj/Wipro/CG/Surya/Pyrotech/Syska/Nessa having surge Protection ≥10KV for fittings & internal Surge protection for Driver of≥4KV, LED Chip only OSRAM/CREE/Philips Lumileds/Citizen/Nicia with LM-79,80 CERTIFICATION
32	CEILING FANS	BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC
33	WALL MOUNTING FANS	BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC
34	EXHUAST FANS	BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC
35	HEAVY DUTY INDUSTRIAL WALL MOUNTING FANS	BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC
36	WATER COOLER	VOLTAS/SHRIRAM USHA/BLUE STAR
37	AIR CONDITIONERS	VOLTAS/CARRIER/BLUESTAR/USHA/ HITACHI/LG/ SAMSUNG/ONIDA

38	REFRIGERATORS	VOLTAS/CARRIER/BLUESTAR/USHA/ HITACHI/LG/ SAMSUNG/WHIRLPOOL
39	VOLTAGE STABILIZER	VEELINE / CAPRI
40	INVERTERS	SUKAM / MICROTEK
41	D.G. SETS (a) ENGINE (b) ALTERNATOR	CUMMINS/GREAVES/KIRLOSKAR/ CATERPILLAR/ ASHOK LEYLAND/VOLVO STAMFORD/CROMPTON GREAVES /JYOTI/ KIRLOSKAR ELECTRIC
42	ELECTRIC MOTOR	ALSTOM/CROMPTON GREAVES /SIEMENS/ KIRLOSKAR/ABB
43	WATER PUMPS	SWASTIK / KSB
44	WATER GEYSER	BAJAJ/USHA / CROMPTON GREAVES / SPHEREHOT / RACOLD
45	LUGS & CABLE GLANDS	DOWELLS / JAINSON / BRACO

TERMS AND CONDITIONS

1. Time Schedule: The work shall be completed within 4 (four) months from the date of issue of Work Order.

2. The employer will award the work to the bidder whose bid has been evaluated to be techno – commercially responsive and the lowest evaluated amount bid as per the following Power Loading Criteria subject to submission of agreement and performance security.

Evaluation of Price Bid:

The DPA do not bind itself to accept the lowest or any tender and reserve the right to accept any tender in part or to reject any tender without assigning any reason thereof. However, DPA reserves the right to reject any or all bids without assigning any reason thereof. Decision of DPA in deciding total amount of financial loading shall be final and binding upon the bidder and DPA will under no obligation to disclose or share working with the bidder.

(1) Financial evaluation of technically qualified bids shall be done as per the following:

(a) The Power Consumption of the LED High Bay fitting(s) offered by each of the technically qualified bids, as measured & certified in the LM79 test reports submitted in the bid issued by any NABL accredited laboratory only will be considered for calculating the Input power for that Bid.

Input Power for a Bid = {Power consumption of LED High bay fitting for inside Shed Area × (Total Quantity of High bay fitting in design = 228)} + {Power consumption of LED Flood Light fitting × (Total Quantity of Flood Light fitting = 54)}

(b) Input Power of the Bid having the lowest Input Power value shall form the "Base" of the power loading calculations.

(c) The difference in Input Power for a Bid with respect to the "Base" shall be calculated for each technically qualified Bid. The expenditure cost on account of extra energy consumption due to difference in Input Power shall be loaded for each technically qualified bid as below:

Extra Energy Expenditure Cost = Difference in Input Power with respect to Base (kW) X 12 hours X 365 days X 5 years X Prevailing Tariff at DPA (which is at present ₹5.55)

(For example, if there are 3 technically qualified bids having input power of 80kW, 90kW and 100kW respectively then 80kW shall become the Base. The prices of the bids having input powers 90kW and 100kW shall be loaded considering a difference in Input Power of 10kW and 20kW respectively).

(d) This extra energy expenditure cost due to difference in Input Power for each Bid shall be added to the price bid of that Bid to arrive at Final Evaluated Price. **Final evaluated price of the Bid = Amount quoted in the Price Bid + Extra Energy Expenditure cost.**

(e) This Final Evaluated Price bid by each Bidder shall be considered for evaluating the Lowest Offer.

3. Bidder should have legally enforceable undertaking jointly executed by himself and the Manufacturer/Authorized Channel Partner of LED High Bay/Flood Light Fittings for satisfactory design, manufacture, supply, installation, testing, commissioning and

performance including all warranty obligations as per Technical Specification, General & Special conditions of Contract.

4. Bidder shall submit their detailed illumination design report for Storage Sheds, as per the details provided in the Technical Specification, showing the illumination level at ground level with Quantity of LED high bay fittings, Position of LED high bay fittings in width & length of the Shed, Mounting height of LED high bay fittings, maintenance factor, reflection factor & uniformity ratio (Emin/Eavg) in a grid of 5m×5m {For Section I & II of Storage Shed near G-19 (198m × 30m) the size of grid shall not be less than 40×7 points and for Section I & II of Storage Shed near G-25 (180m × 30m) the size of grid shall not be less than 37×7 points}. Deendayal Port Authority reserves the right to reject the alternative design/offer of the bidder at DPA's sole discretion.

5. The bidder shall submit LM79 test reports of (1) offered LED High bay fitting(s) for inside Shed Area & (2) LED Flood Light fitting issued by any NABL accredited laboratory only for calculation of power consumption of the design along with the bid document.

6. The contractor shall install display board at site of work indicating the details of the work such as name of the work, name of contractor, scheduled date of start & completion of work, value of work etc. at his own cost.

7. The bidder, at his own responsibility and risk is encouraged to visit and examine the site of work and its surroundings and obtain all information that may be necessary for preparing the Bid. The costs of visiting the site shall be at the Bidders' own expense.

8. DPA will award the work to the bidder whose bid has been evaluated to be techno – commercially responsive and the lowest evaluated amount bid.

9. Work shall be guaranteed for 12 months from the date of completion of the work.

10. The rates should be quoted in figures and words both. In case of difference in figure & words, the rate mentioned in words will be considered.

11. The contractor shall affix SEAL along with SIGNATURE in the Offer.

12. The work shall be carried out in accordance with the best standards of workmanship and to the entire satisfaction of the Engineer in-Charge.

13. Security Deposit @ 5% recovered from the bill and the SD can be released only after successful completion of guarantee period.

14. Payments Terms:

    i) 70% payment will be released after receipt of material at site in good condition, after obtaining insurance cover as per tender condition and after inspection & certification of the same by Third Party Inspection Agency appointed by DPT and after inspection & acceptance of material by DPT.

    ii) 20% of item rate after completion of erection, installation, testing and commissioning etc. and 90% of item rate for item covers only laying/fixing etc. (TPI appointed then after inspection & certification of the same by Third Party Inspection Agency).

    iii) 10% will be released after successful completion of whole work (TPI appointed then after inspection & certification of the same by Third Party Inspection Agency) and handing over to DPT.

    All payments shall be made in Indian rupees unless specifically mentioned

15. Payment will be made by RTGS only after satisfactory completion of work and submission of duly signed bill.

16. The contractor shall not deposit any materials at such a place that may cause inconvenience to the public or staff or nearby offices.

17. The Contractor shall execute the work in such a way that not to cause inconvenience to the public or staff or nearby offices and not to cause hindrance to traffic. Necessary barricading shall be done by the contractor at his own cost if required.

18. Income-tax and surcharge as applicable will be deducted from the bill while making payment to the contractor for carrying out the work and only net amount shall be paid to the contractor.

19. All tools, plants, scaffolding, ladder etc. and other machinery etc. required temporary for the purpose of execution of work will have to be arranged by the contractor at his own cost and storing of such tools, plants etc. will have to be made by him.

20. All the materials should be got approved from Engineer-in-Charge before put into use.

21. Correction if any should be signed / initialed by the contractor. White ink correction will not be allowed and lead to rejection of quotation.

22. All the rules and regulations governing DPA will be applicable.

23. After completion of the work, the site should be neatly cleaned by the contractor.

24. The contractor shall ensure not to cause any damages to the port properties in the vicinity of work site during execution of work. If any damage occurs due to workmen/ machinery of the contractor, the contractor has to make good the loss / damage at his cost.

25. For Entry & exist of material and contractor personnel, pass shall be arranged by contractor.

26. The contractor shall quote the price exclusive of GST. The contractor shall quote prevailing GST rate separately, which shall be reimbursed by DPA after ascertaining necessary compliance as per Goods & Service Tax, 2017. All other duties, taxes, cesses applicable if any, shall be borne by the contractor.

    Income-Tax deductions and surcharge as applicable thereon shall be made good while making payments due to the contractor for carrying out the work and only net amount shall be paid as directed by the Central Board of Direct Taxes, Ministry of Finance, Government of India.

    The rates quoted by the contractor shall be deemed to be inclusive of the taxes, duties etc. which the contractor will have to pay for the performance of this contract, except GST. The employer will perform such duties in regard to the deduction of such taxes at sources as per applicable law.

27. All the work shall be carried out to the entire satisfaction of Engineer in-Charge.

Signature & Seal of Firm

Executive Engineer (E)
Deendayal Port Authority