

26.06.2018

Corrigendum / Clarification for PI No. 342270505, 342270506 dtd. 06.04.18,
Technical specification TB-395-316-013

Following changes have been made to BOQ (Annexure-1, section -1)

Supply items:

New items added - item no. 5,6,12, 13,14,15 ,39,47,48 of BOQ rev-01

Item description modified- item no. 37 of BOQ rev-01

Quantity change – item no. 4, 10,11 of BOQ rev-01

ETC items:

New items added - item no. 53,54,60,61,62,63, 87,93,94 of BOQ rev-01

Item description modified- item no. 85 of BOQ rev-01

Quantity change – item no. 52,58,59 of BOQ rev-01

M. M. M. M.
26/06/18

Rakesh
26/06/2018

ANNEXURE-1

BOQ for supply, receipt of material at Site, Unloading, Inspection, Verification , Storage, Up -keeping, Erection Testing & Commissioning (ETC) Works & handing over of illumination system for 765/400 KV Switchyard Medinipur & Jeerat s/s

Customer : POWERGRID Medinipur Jeerat Transmission Ltd

Project / Site : 765kV/400kV S/Stn at Medinipur & Jeerat

Rev-01

Sl. No.		Item Description	Unit	Jeerat	Medinipur	Remarks
		SUPPLY		(A)	(B)	
A		Illumination System: Outdoor Switchyard and Street Lighting at 765/400 kV S/S				
		Lighting Panel.				
1	Supply	Lighting Panel (Outdoor) Type ACP-2 as per technical specification.	Nos.	12	15	
2	Supply	Lighting Panel (Outdoor) Type ACP-3 as per technical specification	Nos.	5	5	
3	Supply	Sub-lighting panel (outdoor) Type SLP as per technical specification	Nos.	12	15	
		Lighting fixtures and Receptacles				
4	Supply	LED Lighting Fixture Type-OHB as per technical specification	Nos.	50	50	Qty change
5	Supply	LED flood lighting fixtures- type " FL2" as per technical specification	Nos.	140	190	New item
6	Supply	LED flood lighting fixtures- type " FL1" as per technical specification	Nos.	10	10	New item
7	Supply	63A, 415V : Interlocked switch socket outdoor Receptacle (Type RP) complete in all aspect except cable.	Nos.	5	5	
8	Supply	15A, 240V: Outdoor Receptacle 2 pole, 3-pin type (Type RO) complete in all aspect except cable.	Nos.	5	5	
9	Supply	4 m height Lighting pole	Nos.	8	8	
10	Supply	3m , 20mm dia ms rod electrode	Nos.	40	20	Qty change
11	Supply	LED road Lighting Fixture type - 'S-LED' as per technical specification	Nos.	8	8	Qty change
12	Supply	Street lighting Fixture type " SL-L1"	Nos.	40	20	New item
13	Supply	Street lighting Fixture type " SL-D1"	Nos.	8	8	New item
14	Supply	Street lighting pole type "A1"	Nos.	5	5	New item
15	Supply	Street lighting pole type "L1"	Nos.	40	20	New item
16	Supply	Outdoor Power Receptacle for Oil Filtration Unit (250A)	Nos.	7	7	
B		Illumination System: Indoor Systems				
		Lighting Panel.				
17	Supply	Lighting Panel (Indoor) Type ACP-1 as per technical specification.	Nos.	3	3	
18	Supply	Lighting Panel (Indoor) Type DCLP as per technical specification	Nos.	2	2	
		Lighting fixtures and Receptacles				
19	Supply	2X2 Luminair with high efficiency and low power consumption suitable for general office lighting,conference room and cabins application (LED) - Type 'I-LED1' suitable for recess mounting	Nos.	70	70	
20	Supply	19 W, Recessed type LED Luminaries with high efficiency and low power consumption for passage, corridor and toilets area, Type-I-LED2'	Nos.	10	10	
21	Supply	2X2 Luminair with high efficiency and low power consumption suitable for general office lighting,conference room and cabins application (LED) - Type 'I-LED1' suitable for surface mounting	Nos.	49	45	
22	Supply	LED based surface mounted downlighter, type SC-I	Nos.	70	70	
23	Supply	Bulkhead lighting fixture ; type -'IB'	Nos.	5	5	
24	Supply	Bulkhead lighting fixture ; type -'IF'	Nos.	15	15	
25	Supply	Exit Sign Board	Nos.	10	10	
26	Supply	DPMCB receptacles with 32A MCB for split AC supply	Nos.	15	15	
27	Supply	Air Conditioning Supply Panel with 160A TP MCCB incommer & 12 Nos 32A DP MCB outgoing feeders	Nos.	2	2	
28	Supply	Occupancy sensors and other accessories as required for control of lighting in the stairs area and corridors of control room cum administrative building as per specification	Lot	1	1	
29	Supply	Fire Fighting Pump House Building- LED based batten type luminaire with surface mounting bracket	nos.	15	15	
30	Supply	LED based bulk head luminaire	nos.	5	5	
31	Supply	32 A TP receptacles with MCB (3 phase) for AC units	Nos.	10	12	

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ANNEXURE-1

BOQ for supply, receipt of material at Site, Unloading, Inspection, Verification , Storage, Up –keeping, Erection
Testing & Commissioning (ETC) Works & handing over of illumination system for 765/400 KV Switchyard
Medinipur & Jeerat s/s

Customer : POWERGRID Medinipur Jeerat Transmission Ltd

Project / Site : 765kV/400kV S/Stn at Medinipur & Jeerat

Rev-01

Sl. No.		Item Description	Unit	Jeerat	Medinipur	Remarks
32	Supply	Temperature Transducer - Each switch-yard panel room shall be provided with temperature transducer to monitor the temperature of the panel room. The Temperature transducer shall have the following specification: Sensor : Air temperature sensor (indoor use) Output : 4 to 20 mA Temperature range : -5°C to 60°C Resolution : 0.1 °C Accuracy : 0.5 °C or better.	Nos.	10	10	
33	Supply	Bulkhead lighting fixture for dc lighting, Type 'BH'	nos.	7	7	
34	Supply	5A/15A receptacle Type RI	nos.	14	14	
35	Supply	15A/240V Receptacle type RO (Industrial type)	nos.	13	13	
36	Supply	63A/415V Receptacle type RP (industrial type)	nos.	2	2	
37	Supply	Telephone points- single outlet telephone socket including cable/wire and accessories	nos.	10	10	item description change
38	Supply	Telephone JB	Nos.	1	1	
39	Supply	LAN points incuding cable & accessories	Nos.	5	5	New item
40	Supply	Switchboards as per Technical specification	Lot	1	1	
41	Supply	MCB box for SPR	nos.	8	7	
42	Supply	1400mm sweep Ceiling fan with electronic Step regulator	nos.	15	15	
43	Supply	300 mm sweep Exhaust fans	nos.	6	6	
44	Supply	400mm sweep wall mounted fan	nos.	5	5	
		Misc. Items				
45	Supply	Self supported aluminium ladder as per technical specification.	Nos.	1	1	
46	Supply	Cartwheel mounted aluminium ladder as per technical specification	Nos.	1	1	
		Erection items				
47	Supply	Erection items for indoor like 3 way, G.I., circular J.B. (20mm and 25mm), 4 way, G.I., circular J.B. (20mm and 25mm), 90deg, G.I., Inspection Bend (20mm and 25mm), 90deg, G.I., Normal Bend (20mm and 25mm), Heavy duty, Saddle with base (20mm and 25mm), Heavy duty, Saddle without base (20mm and 25mm), M4X25mm, steel screw with nut and washer, G.I. check nut/lock nut (20mm and 25mm), PVC Rawl plug, 6mm, Wooden screw, 35mm, Earth clip/clamp (20mm and 25mm), Cleat fabrication out of 25x6mm M.S. flat (for hanging conduit in false ceiling areas, Anchor fastner (M10x75mm for cleats, M12x75mm for lighting panels), Rubber bush (20mm and 25mm), 20mm, PVC, flexible conduit, 20mm, PVC, Coupling, Swing out bracket, 20mm, Heavy duty, ball socket, Machine screw (for fixing surface mounting fixtures on circular J.B.), PVC closure (20mm and 25mm), Reducer (20mm and 25mm). GI conduits, epoxy coated conduits for corrosive areas , 1.5, 2.5 , 4 , 6 & 10 sq. mm wires, GI wire for earthing etc to complete	lot	1	1	New item
48	Supply	Erection items for outdoor like 20x1.5mm Aluminium flat, M12x40mm, G.I. Bolt with nut and washer for fixing outdoor lighting panels, M6x30mm, G.I. Bolt with nut and washer for fixing control gear boxes, M8x30mm, G.I. Bolt with nut and washer for fixing outdoor J.B.s, SLP, M10x35mm, G.I. Bolt with nut and washer for fixing outdoor lighting fixtures, G.I., 2.5 sqmm wire from STREET LIGHT POLE JB to fixture, Earth wire from J.B. to lighting fixtures, Mounting brackets for outdoor lighting fixtures, GI wire for earthing etc to complete	lot	1	1	New item
		ERECTION TESTING AND COMMISSIONING				
C		Illumination System: Outdoor Switchyard and Street Lighting				
		Lighting Panel.				
49	ETC	Lighting Panel (Outdoor) Type ACP-2 as per technical specification.	Nos.	12	15	
50	ETC	Lighting Panel (Outdoor) Type ACP-3 as per technical specification	Nos.	5	5	
51	ETC	Sub-lighting panel (outdoor) Type SLP as per technical specification	Nos.	12	15	
		Lighting fixtures and Receptacles				

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52	ETC	LED Lighting Fixture Type-OHB as per technical specification	Nos.	50	50	Qty change
53	ETC	LED flood lighting fixtures- type " FL2" as per technical specification	Nos.	140	190	New item
54	ETC	LED flood lighting fixtures- type " FL1" as per technical specification	Nos.	10	10	New item
55	ETC	63A, 415V : Interlocked switch socket outdoor Receptacle (Type RP) complete in all aspect except cable.	Nos.	5	5	
56	ETC	15A, 240V: Outdoor Receptacle 2 pole, 3-pin type (Type RO) complete in all aspect except cable.	Nos.	5	5	
57	ETC	4 m height Lighting pole	Nos.	8	8	
58	ETC	3m , 20mm dia ms rod electrode	Nos.	40	20	Qty change
59	ETC	LED road Lighting Fixture type - 'S-LED' as per technical specification	Nos.	8	8	Qty change
60	ETC	Street lighting Fixture type " SL-L1"	Nos.	40	20	New item
61	ETC	Street lighting Fixture type " SL-D1"	Nos.	8	8	New item
62	ETC	Street lighting pole type "A1"	Nos.	5	5	New item
63	ETC	Street lighting pole type "L1"	Nos.	40	20	New item
64	ETC	Outdoor Power Receptacle for Oil Filtration Unit (250A)	Nos.	7	7	
Illumination System: Indoor Systems						
Lighting Panel.						
65	ETC	Lighting Panel (Indoor) Type ACP-1 as per technical specification.	Nos.	3	3	
66	ETC	Lighting Panel (Indoor) Type DCLP as per technical specification	Nos.	2	2	
Lighting fixtures and Receptacles						
67	ETC	2X2 Luminair with high efficiency and low power consumption suitable for general office lighting, conference room and cabins application (LED) - Type 'I-LED1' suitable for recess mounting	Nos.	70	70	
68	ETC	19 W, Recessed type LED Luminaries with high efficiency and low power consumption for passage, corridor and toilets area, Type-I-LED2'	Nos.	10	10	
69	ETC	2X2 Luminair with high efficiency and low power consumption suitable for general office lighting, conference room and cabins application (LED) - Type 'I-LED1' suitable for surface mounting	Nos.	49	45	
70	ETC	LED based surface mounted downlighter, type SC-I	Nos.	70	70	
71	ETC	Bulkhead lighting fixture ; type -'IB'	Nos.	5	5	
72	ETC	Bulkhead lighting fixture ; type -'IF'	Nos.	15	15	
73	ETC	Exit Sign Board	Nos.	10	10	
74	ETC	DPMCB receptacles with 32A MCB for split AC supply	Nos.	15	15	
75	ETC	Air Conditioning Supply Panel with 160A TP MCCB incommer & 12 Nos 32A DP MCB outgoing feeders	Nos.	2	2	
76	ETC	Occupancy sensors and other accessories as required for control of lighting in the stairs area and corridors of control room cum administrative building as per specification	Lot	1	1	
77	ETC	Fire Fighting Pump House Building- LED based batten type luminaire with surface mounting bracket	nos.	15	15	
78	ETC	LED based bulk head luminaire	nos.	5	5	
79	ETC	32 A TP receptacles with MCB (3 phase) for AC units	Nos.	12	10	
80	ETC	Temperature Transducer - Each switch-yard panel room shall be provided with temperature transducer to monitor the temperature of the panel room. The Temperature transducer shall have the following specification: Sensor : Air temperature sensor (indoor use) Output : 4 to 20mA Temperature range : -5°C to 60°C Resolution : 0.1 °C Accuracy : 0.5 °C or better.	Nos.	6	10	
81	ETC	Bulkhead lighting fixture for dc lighting, Type 'BH'	nos.	7	7	
82	ETC	5A/15A receptacle Type RI	nos.	14	14	
83	ETC	15A/240V Receptacle type RO (Industrial type)	nos.	13	13	
84	ETC	63A/415V Receptacle type RP (Industrial type)	nos.	2	2	

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85	ETC	Telephone points- single outlet telephone socket including cable/wire and accessories	nos.	10	10	item description change
86	ETC	Telephone JB	Nos.	1	1	
87	ETC	LAN points incuding cable & accessories	Nos.	5	5	New item
88	ETC	Switchboards as per Technical specification	Lot	1	1	
89	ETC	MCB box for SPR	nos.	8	7	
90	ETC	1400mm sweep Ceiling fan with electronic Step regulator	nos.	15	15	
91	ETC	300 mm sweep Exhaust fans	nos.	6	6	
92	ETC	400mm sweep wall mounted fan -	nos.	5	5	
93	ETC	Erection items for indoor like 3 way, G.I., circular J.B. (20mm and 25mm), 4 way, G.I., circular J.B. (20mm and 25mm), 90deg, G.I., Inspection Bend (20mm and 25mm), 90deg, G.I., Normal Bend (20mm and 25mm), Heavy duty, Saddle with base (20mm and 25mm), Heavy duty, Saddle without base (20mm and 25mm), M4X25mm, steel screw with nut and washer, G.I. check nut/lock nut (20mm and 25mm), PVC Rawl plug, 6mm, Wooden screw, 35mm, Earth clip/clamp (20mm and 25mm), Cleat fabrication out of 25x6mm M.S. flat (for hanging conduit in false ceiling areas, Anchor fastner (M10x75mm for cleats, M12x75mm for lighting panels), Rubber bush (20mm and 25mm), 20mm, PVC, flexible conduit, 20mm, PVC, Coupling, Swing out bracket, 20mm, Heavy duty, ball socket, Machine screw (for fixing surface mounting fixtures on circular J.B.), PVC closure (20mm and 25mm), Reducer (20mm and 25mm). GI conduits, epoxy coated conduits for corrosive areas , 1.5, 2.5 , 4 , 6 & 10 sq. mm wires, GI wire for earthing etc to complete	lot	1	1	New item
94	ETC	Erection items for outdoor like 20x1.5mm Aluminium flat, M12x40mm, G.I. Bolt with nut and washer for fixing outdoor lighting panels, M6x30mm, G.I. Bolt with nut and washer for fixing control gear boxes, M8x30mm, G.I. Bolt with nut and washer for fixing outdoor J.B.s, SLP, M10x35mm, G.I. Bolt with nut and washer for fixing outdoor lighting fixtures, G.I., 2.5 sqmm wire from STREET LIGHT POLE JB to fixture, Earth wire from J.B. to lighting fixtures, Mounting brackets for outdoor lighting fixtures, GI wire for earthing etc to complete	lot	1	1	New item
E		Illumination System: Outdoor cabling				
		Cable Laying - Cabling including laying, tagging , dressing, ferruling, lugging, installation of cable gland ,soldering, tapping, jointing, crimping, termination, and drilling/ cutting holes in cable gland plates- laying can be either on trays, supports, underground, buried in ground or through GI/PVC pipe over/under ground, through wall, on LM/ tower etc. All erection materials viz. ferrules, copper lugs, cable glands , cable ties / straps, Al. tags, markers, GI / PVC wall sleeves with rubber / nylon bushes and flexible steel conduits shall be supplied by bidder.				
95	ETC	2 Core X 2.5 Sq mm Cu. cable	Km	1.5	7.5	
96	ETC	4 Core X 16 Sq mm Al. cable	Km	6	7.5	
97	ETC	Directly burried cable - 4 Core X 16 Sq mm cables along with lugs, cable glands to be laid in burried trench , all civil activities such as excavation, supply and laying of sand, bricks etc. shall be in contractor's scope. Cable glands to be supplied by bidder.	Km	1	1	
		GS strip including cutting, bending, welding with 40 mm dia MS rod riser/earth strip, applying zinc rich paint, clamping to structure/building wall etc. to complete. Hardware required for connecting flat on pads of structure & equipment included in scope.				
98	ETC	50 x 6 mm GI Flat	kM	0.5	0.5	

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Rev-01

Sl. No.	Item Description	Unit	Jeerat	Medinipur	Remarks
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Remark -1: The above quantities (BOQ) are as per preliminary design only. The detail design will be submitted by Vendor and subject to approval by Customer. The BOQ quantities which are finalised after approval has to be supplied. BHEL reserves the right for quantity variation due to any reason upto $\pm 30\%$ of total value at same unit rate and terms during execution of contract . The quantity of individual items may however vary upto any extent

Remark-2: Supply of cable glands included in the erection item for cabling.

Remark -3: If extra items required for completion of Job but not covered above, shall be quoted separately as a list of items and same shall be submitted with the bid (price of supply and ETC to be quoted on Lumpsum basis).





Project : 400kV Switchyard at Ennore SEZ
Subject : Pipe structure for 400kV BPI
Work Order No: 0

Document No: TB-378-618-013-3
Revision No : 0

Base Plate Design

Equipment Type

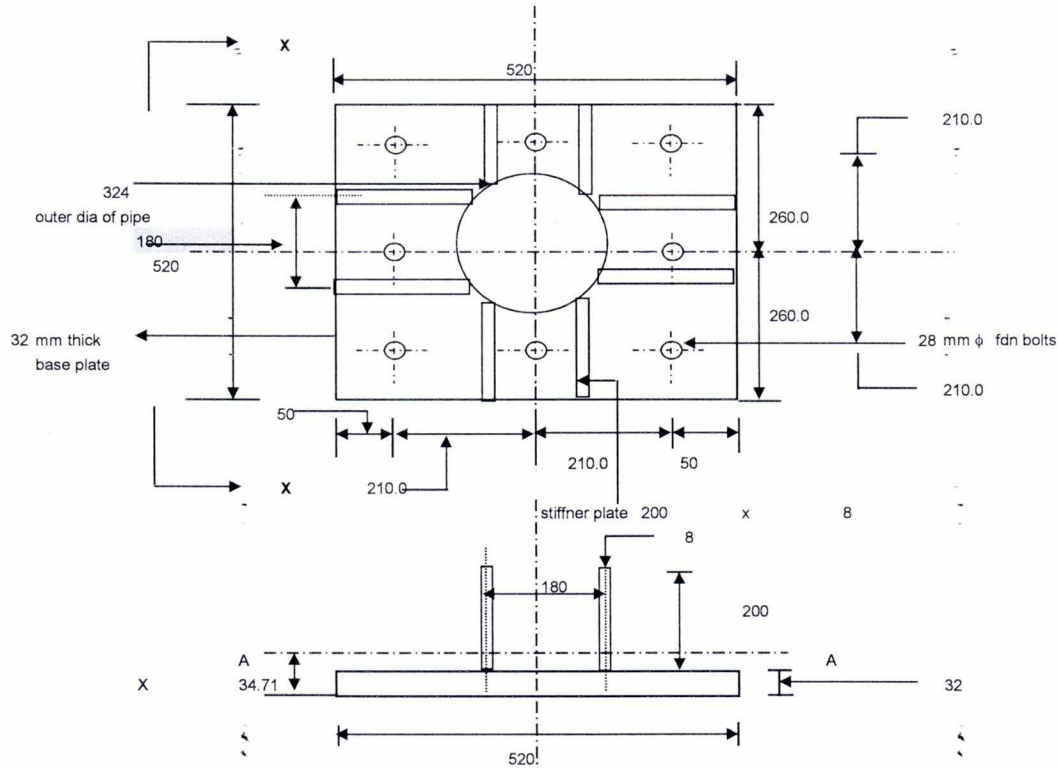
400 KV BPI

Maximum Design Forces

$F_x/F_y = F_h = 16.14 \text{ kN}$
 $M_y/M_x = M = 79.37 \text{ kN-m}$
 $F_z = F_v = 10.14 \text{ kN}$

Permissible Stresses

Base Pl.	Concrete	Weld
Bending**, f_b	Bond**, f_b	Bearing**, f_c
(MPa)	(MPa)	(MPa)
161.87	1	8
		100.5



VIEW X-X

Trial Sections

Base Plate Thickness	32	mm
Base Plate width	520	mm
Stiffner Plate thickness	8	mm
Stiffner Plate height	200	mm
No of Stiffner Plate in critical section	2	
Dist. of outer edge of base pl. from C/L of leg	260.0	mm
Dist. of inner edge of base pl. from C/L of leg	260.0	mm
Haunch size at inner edge,	0.00	mm
Reqd. edge distance of Bolt ($\approx 1.5 \times$ dia of bolt)	42	mm
Providing edge distance	50	mm