

संदर्भ/Ref : CC-ENGG-C2021001-1001422-T14221-4523-BMDC+3BE

Date : 17/09/2024

From : NITESH KUMAR SINHA
Senior DGM**To :** SKIPPER LTD.
3A loudon Street Kolkata 700017
700017**Cc :** ER**Subject :** Tower Package-TW01 for Indian Portion of New Butwal-Gorakhpur 400kV D/C (Quad) line
LOA Ref : 5002002333/CONSULTANCY GIVEN/DOM/A04-CC CS-5/NOA-I/01,NOA-II/02 Dated 13/06/2023

Please find enclosed following drawings/ documents for necessary action at your end.

Vendor Drg. No. : SL/PGCIL/400KV/BUTW-GRKH/DC/+3MBE
Orgn. Drg. No. : C2021001-1001422-T14221-4523-BMDC+3BE
Revision No. : 00
Drg. Title : BILL OF MATERIAL FOR TT DC +3M BE FOR 400 kV D/C WZ-5 (ACSR MOOSE) TL
App. Category : CAT-I
Release Date : 17/09/2024



Scan to verify

Comments : Generally in order.**अनुमोदित श्रेणी/App. Category:**

- I. फेब्रिकेशन/निर्माण/टाइप टेस्टिंग हेतु जारी।
Approved/released for fabrication/construction.
- II. फेब्रिकेशन/निर्माण/टाइप टेस्टिंग हेतु अनुमोदित/जारी बशर्ते दिए गए टिप्पणियाँ एवं आशोधनों की सम्मिलित किया जाये। कृपया रिवाइज्ड दस्तावेज अनुमोदनार्थ प्रस्तुत करें।
Approved/released for fabrication/ construction subject to incorporation of comments and modification as noted. Revised drawing required for approval.
- III. टिप्पणियाँ सम्मिलित करने के उपरांत दस्तावेज को अनुमोदनार्थ प्रस्तुत करें।
To be resubmitted for approval after incorporating the comments.
- IV. सूचनार्थ एवं रिकार्ड हेतु।
For information and record.
- CATREL/
REL-CON निर्माण हेतु जारी।
Released for construction.

नोट/Note:

1. Approval/Comments conveyed herein neither relieve the contractor of his contractual obligations and his responsibilities, weights, quantities, design details assemble fits, performance particulars and conformity of the supplies with the Indian Statutory Laws as may be applicable, nor does it limits the purchaser's right under the contract.
2. The approval conveyed vide this letter does not cover the approval of make for sub-vendor items.

BOM NO. SL/PGCIL/400KV/BUTW-GRKH/DC/+3MBE

NO. OF SHEET : 5

POWER GRID CORPORATION OF INDIA LTD.

(A Government of India Enterprise)

BILL OF MATERIALSINITIAL / FINAL
(GALVANIZED)

STRUCTURE UNIT : 400KV D/C "DC(0°-30°)/MKD "QDC5"

PART : +3M BODY EXTENSION (ATTACHED TO BASIC BODY)

REF.DRG.NO. : C:ENGG:TL:4523-4ACSR-M-P-12 (SHEET 1 & 2)

NOA No. : 5002002333/CONSULTANCY GIVEN/DOM/ A04-CC CS -5/NOA-I/01 Dated 13.06.2023 (Supply) & 5002002333/CONSULTANCY GIVEN/DOM/A04-CC-CS -5/NOA-II/02 Dated 13.06.2023 (Service)

LINE NAME : Tower Package TW0I for India Portion of 400 KV D/C (Quad Moose) New Butwal - Gorakhpur Transmission Line.
(Specification No. 5002002333/ CONSULTANCY GIVEN/DOM/A04-CC CS-5)

NOTE FOR PREFIX	
SP4BDC XXX	FOR M.S
SP4BDC XXXH	FOR H.T

THIS BILL OF MATERIAL IS APPLICABLE FOR MANUFACTURE OF TOWERS
AT FACTORY OF SKIPPER LIMITED, HOWRAH

SUMMARY OF WEIGHTS

SL.NO.	DESCRIPTION	WEIGHT OF +3M BODY EXTENSION (ATTACHED TO BASIC BODY)
1	WT.OF ALL (HT) MEMBERS IN KGS.	7301.72
2	WT.OF ALL (MS) MEMBERS IN KGS.(INCL. PACK WASHERS)	1146.73
3	WT.OF BOLT & NUTS IN KGS.	265.42
	TOTAL WT. OF STRUCTURES IN KGS.	8713.87

0	PROTO CORRECTED	13.09.2024	BKL	
REV. No.	DESCRIPTION	DATE	INITIAL	
PREPARED BY:	CHECKED BY:	VERIFIED BY:	CONTRACTOR	
P.KOLE	B.K.LAHA	S.B	SKIPPER LIMITED KOLKATA	

WARNING : THIS IS PROPRIETARY ITEM AND DESIGN RIGHT IS STRICTLY RESERVED WITH POWERGRID.UNDER NO CIRCUMSTANCES
THIS DRAWING SHALL BE USED BY ANYBODY WITHOUT PRIOR PERMISSION FROM THE OWNER IN WRITING.

Tower Package TW0I for India Portion of 400 KV D/C (Quad Moose) New Butwal - Gorakhpur Transmission Line.
(Specification No. 5002002333/ CONSULTANCY GIVEN/DOM/A04-CC CS-5)

BOM NO. SL/PGCIL/400KV/BUTW-GRKH/DC/+3MBE

STRUCTURE : 400KV D/C "DC(0°-30°)/MKD "QDC5" BILL OF MATERIALS

PART : +3M BODY EXTENSION (ATTACHED TO BASIC BODY)

SL.No.	MARK No.		SECTION / PLATE THICKNESS (mm)	PLATE WIDTH (mm)	LENGTH (mm)	UNIT WT (kg/m)	WEIGHT/PC (kg)	PIECES / STRUCT.	TOTAL WT. (kg)	REMARKS
1	SP4BDC	2310H	HL250X250X18	200	7557	68.10	514.63	2	1029.26	
2	SP4BDC	2311H	HL250X250X18		7557	68.10	514.63	2	1029.26	
3	SP4BDC	2312H	HL250X250X18		5050	68.10	343.91	2	687.82	
4	SP4BDC	2313H	HL250X250X18		5050	68.10	343.91	2	687.82	
5	SP4BDC	2314H	HL200X200X15		810	45.60	36.94	8	295.52	
6	SP4BDC	2315H	H12 THK.		810	94.20	15.26	16	244.16	
7	SP4BDC	2316H	HL90X90X6		7601	8.32	63.24	4	252.96	
8	SP4BDC	2317H	HL90X90X6		7601	8.32	63.24	4	252.96	
9	SP4BDC	2318H	HL90X90X6		7601	8.32	63.24	4	252.96	
10	SP4BDC	2319H	HL90X90X6		7601	8.32	63.24	4	252.96	
11	SP4BDC	2320H	HL90X90X6		3337	8.32	27.76	4	111.04	
12	SP4BDC	2321H	HL90X90X6		3337	8.32	27.76	4	111.04	
13	SP4BDC	2322H	HL90X90X6		3337	8.32	27.76	4	111.04	
14	SP4BDC	2323H	HL90X90X6		3337	8.32	27.76	4	111.04	
15	SP4BDC	2324H	HL90X90X6		4867	8.32	40.49	4	161.96	
16	SP4BDC	2325H	HL90X90X6		4867	8.32	40.49	4	161.96	
17	SP4BDC	2326H	HL90X90X6		4867	8.32	40.49	4	161.96	
18	SP4BDC	2327H	HL90X90X6		4867	8.32	40.49	4	161.96	
19	SP4BDC	2328H	HL70X70X5	70	286	5.38	1.54	16	24.64	
20	SP4BDC	2329H	HL70X70X5		286	5.38	1.54	16	24.64	
21	SP4BDC	2330H	H12 THK.		286	94.20	1.89	16	30.24	
22	SP4BDC	2331H	H6 THK.		286	47.10	1.91	16	30.56	
23	SP4BDC	2332H	HL45X45X4		394	2.75	1.08	4	4.32	
24	SP4BDC	2333H	HL45X45X4		394	2.75	1.08	4	4.32	
25	SP4BDC	2334H	HL50X50X4		1505	3.08	4.64	4	18.56	
26	SP4BDC	2335H	HL50X50X4		1505	3.08	4.64	4	18.56	
27	SP4BDC	2336H	HL45X45X4		1064	2.75	2.93	4	11.72	
28	SP4BDC	2337H	HL45X45X4		1064	2.75	2.93	4	11.72	
29	SP4BDC	2338H	HL70X70X5		2895	5.38	15.58	4	62.32	
30	SP4BDC	2339H	HL70X70X5		2895	5.38	15.58	4	62.32	
31	SP4BDC	2340H	HL60X60X4		2131	3.71	7.91	2	15.82	
32	SP4BDC	2341H	HL60X60X4		2131	3.71	7.91	2	15.82	
33	SP4BDC	2342H	HL60X60X4		2131	3.71	7.91	2	15.82	
34	SP4BDC	2343H	HL60X60X4		2131	3.71	7.91	2	15.82	
35	SP4BDC	2344H	HL65X65X5	142	2861	4.98	14.25	4	57.00	
36	SP4BDC	2345H	HL65X65X5		2861	4.98	14.25	4	57.00	
37	SP4BDC	2346	L50X50X4		2752	3.08	8.48	2	16.96	
38	SP4BDC	2347	L50X50X4		2752	3.08	8.48	2	16.96	
39	SP4BDC	2348	L50X50X4		2752	3.08	8.48	2	16.96	
40	SP4BDC	2349	L50X50X4		2752	3.08	8.48	2	16.96	
41	SP4BDC	2350H	HL60X60X4		3197	3.71	11.86	4	47.44	
42	SP4BDC	2351H	HL60X60X4		3197	3.71	11.86	4	47.44	
43	SP4BDC	2352H	HL70X70X5		3128	5.38	16.83	4	67.32	
44	SP4BDC	2353H	HL70X70X5		3128	5.38	16.83	4	67.32	

Tower Package TW0I for India Portion of 400 KV D/C (Quad Moose) New Butwal - Gorakhpur Transmission Line.
(Specification No. 5002002333/ CONSULTANCY GIVEN/DOM/A04-CC CS-5)

BOM NO. SL/PGCIL/400KV/BUTW-GRKH/DC/+3MBE

STRUCTURE : 400KV D/C "DC(0°-30°)/MKD "QDC5" BILL OF MATERIALS

PART : +3M BODY EXTENSION (ATTACHED TO BASIC BODY)

SL.No.	MARK No.		SECTION / PLATE THICKNESS (mm)	PLATE WIDTH (mm)	LENGTH (mm)	UNIT WT (kg/m)	WEIGHT/PC (kg)	PIECES / STRUCT.	TOTAL WT. (kg)	REMARKS
45	SP4BDC	2354	L50X50X4		2968	3.08	9.14	4	36.56	
46	SP4BDC	2355	L50X50X4		2968	3.08	9.14	4	36.56	
47	SP4BDC	2356H	HL65X65X5		4264	4.98	21.23	4	84.92	
48	SP4BDC	2357H	HL65X65X5		4264	4.98	21.23	4	84.92	
49	SP4BDC	2358H	HL65X65X5		4614	4.98	22.98	4	91.92	
50	SP4BDC	2359H	HL65X65X5		4614	4.98	22.98	4	91.92	
51	SP4BDC	2360H	HL60X60X4		1781	3.71	6.61	4	26.44	
52	SP4BDC	2361H	HL60X60X4		1781	3.71	6.61	4	26.44	
53	SP4BDC	2362	L45X30X4		1336	2.27	3.03	4	12.12	
54	SP4BDC	2363	L45X30X4		1336	2.27	3.03	4	12.12	
55	SP4BDC	2364	L50X50X4		4197	3.08	12.93	4	51.72	
56	SP4BDC	2365	L50X50X4		4197	3.08	12.93	4	51.72	
57	SP4BDC	2366H	HL45X45X4		1663	2.75	4.57	4	18.28	
58	SP4BDC	2367H	HL45X45X4		1663	2.75	4.57	4	18.28	
59	SP4BDC	2368	L45X45X4		2661	2.75	7.32	4	29.28	
60	SP4BDC	2369	L45X45X4		2661	2.75	7.32	4	29.28	
61	SP4BDC	2370H	H6 THK.	118	218	47.10	1.21	4	4.84	
62	SP4BDC	2371H	H6 THK.	118	209	47.10	1.16	4	4.64	
63	SP4BDC	2372H	H6 THK.	109	125	47.10	0.64	8	5.12	
64	SP4BDC	2373H	H6 THK.	125	220	47.10	1.30	8	10.40	
65	SP4BDC	2374H	H6 THK.	130	125	47.10	0.77	8	6.16	
66	SP4BDC	2375H	H6 THK.	125	207	47.10	1.22	8	9.76	
67	SP4BDC	2376H	H6 THK.	110	125	47.10	0.65	8	5.20	
68	SP4BDC	2377H	H5 THK.	110	214	39.25	0.92	8	7.36	
69	SP4BDC	2378H	H5 THK.	110	110	39.25	0.47	8	3.76	
70	SP4BDC	2379	6 THK.	120	192	47.10	1.09	4	4.36	
71	SP4BDC	2380H	H5 THK.	124	172	39.25	0.84	8	6.72	
72	SP4BDC	2381H	H5 THK.	105	189	39.25	0.78	8	6.24	
73	SP4BDC	2400	L45X45X4		1517	2.75	4.17	4	16.68	
74	SP4BDC	2401	L50X50X4		3427	3.08	10.56	4	42.24	
75	SP4BDC	2402	L50X50X4		3427	3.08	10.56	4	42.24	
76	SP4BDC	2403	L50X50X4		4600	3.08	14.17	4	56.68	
77	SP4BDC	2404	L50X50X4		4600	3.08	14.17	4	56.68	
78	SP4BDC	2405	L60X60X4		5907	3.71	21.91	4	87.64	
79	SP4BDC	2406	L60X60X4		5907	3.71	21.91	4	87.64	
80	SP4BDC	2407	L60X60X4		5221	3.71	19.37	4	77.48	
81	SP4BDC	2408	L60X60X4		5221	3.71	19.37	4	77.48	
82	SP4BDC	2409	L50X50X4		2430	3.08	7.48	4	29.92	
83	SP4BDC	2410	L50X50X4		2430	3.08	7.48	4	29.92	
84	SP4BDC	2411	L45X30X4		1284	2.27	2.91	4	11.64	
85	SP4BDC	2412	L45X30X4		1284	2.27	2.91	4	11.64	
86	SP4BDC	2413	L45X45X4		4128	2.75	11.35	4	45.40	
87	SP4BDC	2414	L45X45X4		4128	2.75	11.35	4	45.40	
88	SP4BDC	2415	5 THK.	110	152	39.25	0.66	8	5.28	

Tower Package TW0I for India Portion of 400 KV D/C (Quad Moose) New Butwal - Gorakhpur Transmission Line.
(Specification No. 5002002333/ CONSULTANCY GIVEN/DOM/A04-CC CS-5)

BOM NO. SL/PGCIL/400KV/BUTW-GRKH/DC/+3MBE

STRUCTURE : 400KV D/C "DC(0°-30°)/MKD "QDC5"

BILL OF MATERIALS

PART : +3M BODY EXTENSION (ATTACHED TO BASIC BODY)

SL.No.	MARK No.		SECTION / PLATE THICKNESS (mm)	PLATE WIDTH (mm)	LENGTH (mm)	UNIT WT (kg/m)	WEIGHT/PC (kg)	PIECES / STRUCT.	TOTAL WT. (kg)	REMARKS
89	SP4BDC	2416	5 THK.	110	257	39.25	1.11	16	17.76	
90	SP4BDC	2417	5 THK.	125	318	39.25	1.56	4	6.24	
91	SP4BDC	2418	5 THK.	125	318	39.25	1.56	4	6.24	
92	SP4BDC	2419	5 THK.	110	288	39.25	1.24	4	4.96	
93	SP4BDC	2420	5 THK.	110	288	39.25	1.24	4	4.96	
94	SP4BDC	2421	5 THK.	110	291	39.25	1.26	4	5.04	
95	SP4BDC	2422	5 THK.	110	291	39.25	1.26	4	5.04	
96	SP4BDC	2423	5 THK.	120	279	39.25	1.31	4	5.24	
97	SP4BDC	2424	5 THK.	120	279	39.25	1.31	4	5.24	
98	SP4BDC	2425	6 THK.	140	196	47.10	1.29	4	5.16	
99	SP4BDC	2426	5 THK.	75	126	39.25	0.37	4	1.48	
100	SP4BDC	2427	5 THK.	75	157	39.25	0.46	4	1.84	
101	SP4BDC	2428	5 THK.	110	307	39.25	1.33	4	5.32	
102	SP4BDC	2429	5 THK.	110	307	39.25	1.33	4	5.32	
TOTAL WT=									8437.08	

For MILD STEEL : (As Per IS : 2062, Designated Y.S. 250Mpa)

For HIGH TENSILE STEEL : (As Per IS:2062, Designated Y.S. 350Mpa)

LIST OF PACK WASHERS

4 THK. PACK WASHERS (For 16 Ø Bolt)	0.014	16	0.22	
5 THK. PACK WASHERS (For 16 Ø Bolt)	0.018	12	0.22	
6 THK. PACK WASHERS (For 16 Ø Bolt)	0.021	160	3.36	
8 THK. PACK WASHERS (For 16 Ø Bolt)	0.028	0	0.00	
10 THK. PACK WASHERS (For 16 Ø Bolt)	0.036	0	0.00	
12 THK. PACK WASHERS (For 16 Ø Bolt)	0.043	176	7.57	
TOTAL WT.	11.37	Kgs		

WEIGHT OF STEEL MEMBERS

<u>A) TOTAL WT. OF HT STEEL FAB. MEMBER</u>	=	7301.72	Kgs
<u>B) TOTAL WT. OF MILD STEEL FAB. MEMBER</u>	=	1135.36	Kgs
<u>C) TOTAL WT. OF PACK WASHERS</u>	=	11.37	Kgs
GRAND TOTAL WT. OF FAB. MEMBER WITH PACK WASHERS (A+B+C)	=	8448.45	Kgs

				SKIPPER LIMITED
REV. No	REVISION	DATE	INITIAL	

Tower Package TW0I for India Portion of 400 KV D/C (Quad Moose) New Butwal - Gorakhpur Transmission Line.
(Specification No. 5002002333/ CONSULTANCY GIVEN/DOM/A04-CC CS-5)

BOM NO. SL/PGCIL/400KV/BUTW-GRKH/DC/+3MBE

STRUCTURE : 400KV D/C "DC(0°-30°)/MKD "QDC5"

BILL OF MATERIALS

PART : +3M BODY EXTENSION (ATTACHED TO BASIC BODY)

SL.No.	MARK No.	SECTION / PLATE THICKNESS (mm)	PLATE WIDTH (mm)	LENGTH (mm)	UNIT WT (kg/m)	WEIGHT/PC (kg)	PIECES / STRUCT.	TOTAL WT. (kg)	REMARKS
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LIST OF BOLTS & NUTS CONFORMING TO IS:12427 WITH MECHANICAL PROPERTIES CONFORMING TO PROPERTY CLASS 5.6 FOR BOLTS AND CLASS 5.0 FOR NUTS.
LIST OF SPRING WASHERS (TYPE-B) AS PER IS:3063-1994, ELECTRO GALVD.

BOLT & NUTS

HRH BOLT / NUT FOR M16X35	0.119		468	55.69
HRH BOLT / NUT FOR M16X40	0.126		280	35.28
HRH BOLT / NUT FOR M16X45	0.134		72	9.65
HRH BOLT / NUT FOR M16X50	0.142		328	46.58
HRH BOLT / NUT FOR M16X55	0.150		72	10.80
HRH BOLT / NUT FOR M16X60	0.158		72	11.38
HRH BOLT / NUT FOR M16X65	0.164		0	0.00
HRH BOLT / NUT FOR M16X70	0.173		332	57.44
HRH BOLT / NUT FOR M16X75	0.180		20	3.60
HRH BOLT / NUT FOR M16X80	0.185		0	0.00
HRH BOLT / NUT FOR M16X85	0.193		0	0.00
HRH BOLT / NUT FOR M16X90	0.199		0	0.00
MS STD. SPR. WASHERS FOR M16 BOLTS	0.009		1644	14.80
STEP BOLTS OF 16X175MM DIA WITH 2 NUTS 1 S.W	0.374		54	20.20
TOTAL WT. OF HEXAGONAL BOLTS / NUTS , SPRING WASHERS STEP BOLT			=	265.42

Kgs

SUMMARY OF WEIGHTS

A) WT. OF MS MEMBERS	=	1135.36	Kgs
B) WT. OF PACK WASHERS	=	11.37	Kgs
C) WT. OF HT MEMBERS	=	7301.72	Kgs
D) WT. OF FAB MEMBERS (A+B+C)	=	8448.45	Kgs
E) WT. OF BOLT & NUTS	=	265.42	Kgs
F) TOTAL	=	8713.87	Kgs

REV. No	REVISION	DATE	INITIAL
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SKIPPER LIMITED



Tower Package TW01 for India Portion of 400 KV D/C (Quad Moose) New Butwal - Gorakhpur Transmission Line.
(Specification No. 5002002333/ CONSULTANCY GIVEN/DOM/A04-CC CS-5)

STRUCTURE : 400KV D/C "DC(0°-30°)/MKD "QDCS"

BOM NO. SL/PGCIL/400KV/BUTW-GRKH/DC/+3MBE

PART : +3M BODY EXTENSION (ATTACHED TO BASIC BODY)

SECTION ABSTRACT					
MILD STEEL	WEIGHT (Kg)	HIGH TENSILE	WEIGHT (Kg)	MS. PLATE	WEIGHT
L40X40X3		HL45X30X4		2 THK.	
L40X40X4		HL45X30X5		3 THK.	
L40X40X5		HL45X45X4	68.64	4 THK.	
L40X40X6		HL45X45X5		5 THK.	79.96
L45X30X4	47.52	HL50X50X4	37.12	6 THK.	9.52
L45X30X5		HL50X50X5		8 THK.	
L45X45X4	166.04	HL55X55X4		10 THK.	
L45X45X3		HL55X55X5		12 THK.	
L45X45X5		HL60X60X4	211.04	14 THK.	
L45X45X6		HL60X60X5		16 THK.	
L50X50X3		HL60X60X6		20 THK.	
L50X50X4	502.08	HL65X65X4		22 THK.	
L50X50X5		HL65X65X5	467.68	25 THK.	
L50X50X6		HL65X65X6		32 THK.	
L55X55X4		HL70X70X4			
L55X55X5		HL70X70X5	308.56	TOTAL MS PLT.	89.48
L55X55X6		HL70X70X6			
L55X55X8		HL75X75X4		HT. PLATE	WEIGHT
L60X60X4	330.24	HL75X75X5		H5 THK.	24.08
L60X60X5		HL75X75X6		H6 THK.	76.68
L60X60X6		HL80X80X5		H8 THK.	
L65X65X4		HL80X80X6		H10 THK.	
L65X65X5		HL80X80X7		H12 THK.	274.40
L65X65X6		HL80X80X8		H14 THK.	
L80X80X5		HL90X90X5		H16 THK.	
L70X70X4		HL90X90X6	2103.84	H20 THK.	
L70X70X5		HL90X90X7		H30 THK.	
L70X70X6		HL90X90X8			
L75X75X4		HL100X100X6		TOTAL HT PLT.	375.16
L75X75X5		HL100X100X7			
L90X90X5		HL110X110X7			
L90X90X6		HL110X110X8			
L90X90X7		HL110X110X9			
L90X90X8		HL110X110X10			
L100X100X6		HL110X110X12			
L100X100X7		HL120X120X7			
L100X100X8		HL120X120X8			
L100X100X10		HL120X120X9			
L110X110X6		HL120X120X10			
L110X110X7		HL120X120X12			
L110X110X10		HL130X130X9			
L110X110X12		HL130X130X10			
L120X120X8		HL130X130X11			
L120X120X10		HL130X130X12			
L120X120X12		HL130X130X14			
L150X150X10		HL150X150X12			
L150X150X16		HL150X150X15			
		HL200X200X15	295.52		
		HL250X250X18	3434.16		
TOTAL	1045.88	TOTAL	6926.56		
		GRAND TOTAL =	8437.08		