

संदर्भ/Ref : CC-ENGG-C2021001-1001422-T14221-4522-BMDB+0BE

Date : 19/06/2024

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/DB/+0MBE
Orgn. Drg. No. : C2021001-1001422-T14221-4522-BMDB+0BE
Revision No. : 00
Drg. Title : BILL OF MATERIAL FOR TT DB +0M BE FOR 400 kV D/C WZ-5 (ACSR MOOSE) TL
App. Category : CAT-I
Release Date : 19/06/2024



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/DB/+0MBE

NO. OF SHEET : 4

POWER GRID CORPORATION OF INDIA LTD.

(A Government of India Enterprise)

BILL OF MATERIALSINITIAL / FINAL
(GALVANIZED)

STRUCTURE UNIT : 400KV D/C "DB(0°-2°) MKD"G507 DB"

PART : ±0M BODY EXTENSION

REF.DRG.NO. : C:ENGG:TL:4522-4ACSR-M-P-04

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	
SP4BDB XXX	FOR M.S
SP4BDB 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 ±0M BODY EXTENSION	
1	WT.OF ALL (HT) MEMBERS IN KGS.	4403.56	
2	WT.OF ALL (MS) MEMBERS IN KGS.(INCL. PACK WASHERS)	1117.97	
3	WT.OF BOLT & NUTS IN KGS.	188.63	
	TOTAL WT. OF STRUCTURES IN KGS.	5710.16	
A	PROTO CORRECTED & SUCCESSFULLY TESTED AT M/s SKIPPER LTD. TEST BED DATED 29.05.24		05.06.2024
0	FIRST ISSUE		18.10.2023
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. SI/PGCIL/400KV/BUTW-GRKH/DB/+0MBE

STRUCTURE : 400KV D/C "DB(0°-2°)"-MKD"G507 DB"

BILL OF MATERIALS

PART : ±0M BODY EXTENSION

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
+0M BODY EXTENSION									
1	SP4BDB	830H	HL200X200X17	165	5500	51.40	282.70	2	565.40
2	SP4BDB	831H	HL200X200X17		5500	51.40	282.70	2	565.40
3	SP4BDB	830AH	HL200X200X17		4080	51.40	209.71	2	419.42
4	SP4BDB	831AH	HL200X200X17		4080	51.40	209.71	2	419.42
5	SP4BDB	832H	HL200X200X15		746	45.60	34.02	8	272.16
6	SP4BDB	833H	H12 THK.		746	94.20	11.60	16	185.60
7	SP4BDB	834H	HL80X80X6		6000	7.36	44.16	4	176.64
8	SP4BDB	834XH	HL80X80X6		6000	7.36	44.16	4	176.64
9	SP4BDB	835H	HL80X80X6		6000	7.36	44.16	4	176.64
10	SP4BDB	835XH	HL80X80X6		6000	7.36	44.16	4	176.64
11	SP4BDB	836H	HL80X80X6		6642	7.36	48.89	4	195.56
12	SP4BDB	836XH	HL80X80X6		6642	7.36	48.89	4	195.56
13	SP4BDB	837H	HL80X80X6		6642	7.36	48.89	4	195.56
14	SP4BDB	837XH	HL80X80X6		6642	7.36	48.89	4	195.56
15	SP4BDB	838H	HL70X70X6	60	356	6.39	2.27	8	18.16
16	SP4BDB	839H	HL70X70X6		356	6.39	2.27	8	18.16
17	SP4BDB	840H	H6 THK.		356	47.10	1.01	8	8.08
18	SP4BDB	841H	H12 THK.		356	94.20	5.23	8	41.84
19	SP4BDB	842	L50X50X4		1294	3.08	3.99	4	15.96
20	SP4BDB	843	L50X50X4		1294	3.08	3.99	4	15.96
21	SP4BDB	844	L55X55X4		2065	3.40	7.02	4	28.08
22	SP4BDB	845	L55X55X4		2065	3.40	7.02	4	28.08
23	SP4BDB	846	L50X50X4		2868	3.08	8.83	4	35.32
24	SP4BDB	847	L50X50X4		2868	3.08	8.83	4	35.32
25	SP4BDB	848	L50X50X4		1804	3.08	5.56	4	22.24
26	SP4BDB	849	L50X50X4		1804	3.08	5.56	4	22.24
27	SP4BDB	850	L50X50X4		2807	3.08	8.65	4	34.60
28	SP4BDB	851	L50X50X4		2807	3.08	8.65	4	34.60
29	SP4BDB	852	L50X50X4	113	2841	3.08	8.75	4	35.00
30	SP4BDB	853	L50X50X4		2841	3.08	8.75	4	35.00
31	SP4BDB	854	L50X50X4		2362	3.08	7.27	4	29.08
32	SP4BDB	855	L50X50X4		2362	3.08	7.27	4	29.08
33	SP4BDB	856H	HL60X60X4		3833	3.71	14.22	4	56.88
34	SP4BDB	857H	HL60X60X4		3833	3.71	14.22	4	56.88
35	SP4BDB	858H	H12 THK.		185	94.20	1.97	8	15.76
36	SP4BDB	859H	HL60X60X4		3964	3.71	14.71	4	58.84
37	SP4BDB	860H	HL60X60X4		3964	3.71	14.71	4	58.84
38	SP4BDB	861H	HL45X45X4		3718	2.75	10.22	4	40.88
39	SP4BDB	862H	HL45X45X4		3718	2.75	10.22	4	40.88
40	SP4BDB	863H	HL45X30X4		1625	2.27	3.69	4	14.76
41	SP4BDB	864H	HL45X30X4		1625	2.27	3.69	4	14.76
42	SP4BDB	865	L45X45X4		2309	2.75	6.35	4	25.40
43	SP4BDB	866	L45X45X4		2309	2.75	6.35	4	25.40

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/DB/+0MBE

STRUCTURE : 400KV D/C "DB(0°-2°)"-MKD"G507 DB"

BILL OF MATERIALS

PART : ±0M BODY EXTENSION

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
44	SP4BDB	867	L55X55X4	248	1666	3.40	5.66	4	22.64	
45	SP4BDB	868	L55X55X4		1666	3.40	5.66	4	22.64	
46	SP4BDB	869	L45X30X4		1008	2.27	2.29	4	9.16	
47	SP4BDB	870	L45X30X4		1008	2.27	2.29	4	9.16	
48	SP4BDB	871H	H6 THK.		350	47.10	4.09	8	32.72	
49	SP4BDB	872	L45X45X4		1694	2.75	4.66	4	18.64	
50	SP4BDB	873	L50X50X4		3566	3.08	10.98	4	43.92	
51	SP4BDB	874	L50X50X4		3566	3.08	10.98	4	43.92	
52	SP4BDB	875	L50X50X4		4984	3.08	15.35	4	61.40	
53	SP4BDB	876	L50X50X4		4984	3.08	15.35	4	61.40	
54	SP4BDB	877	L55X55X4		4698	3.40	15.97	4	63.88	
55	SP4BDB	878	L55X55X4		4698	3.40	15.97	4	63.88	
56	SP4BDB	879	L50X50X4		2390	3.08	7.36	4	29.44	
57	SP4BDB	880	L50X50X4		2390	3.08	7.36	4	29.44	
58	SP4BDB	881	L45X45X4		4050	2.75	11.14	4	44.56	
59	SP4BDB	882	L45X45X4		4050	2.75	11.14	4	44.56	
60	SP4BDB	883	L45X30X4	110	1170	2.27	2.66	4	10.64	
61	SP4BDB	884	L45X30X4		1170	2.27	2.66	4	10.64	
62	SP4BDB	885	5 THK.		232	39.25	1.00	8	8.00	
63	SP4BDB	886	5 THK.		282	39.25	1.30	4	5.20	
64	SP4BDB	887	5 THK.		282	39.25	1.30	4	5.20	
65	SP4BDB	888	5 THK.		270	39.25	1.91	4	7.64	
66	SP4BDB	889	5 THK.		270	39.25	1.91	4	7.64	
67	SP4BDB	890	5 THK.		232	39.25	1.00	8	8.00	
68	SP4BDB	891	6 THK.		156	47.10	1.10	8	8.80	
69	SP4BDB	892	5 THK.		233	39.25	1.01	8	8.08	
70	SP4BDB	893	6 THK.		200	47.10	1.70	4	6.80	
71	SP4BDB	894	FL50X5		1245	2.00	2.49	2	4.98	
72	SP4BDB	SP1H	H6 THK.	130	180	47.10	1.10	4	4.40	
73	SP4BDB	912H	H6 THK.	50	140	47.10	0.33	8	2.64	
74	SP4BDB	913H	H6 THK.	50	151	47.10	0.36	8	2.88	
TOTAL WT=									5515.18	

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	0	0.00	
5 THK. PACK WASHERS (For 16 Ø Bolt)	0.018	0	0.00	
6 THK. PACK WASHERS (For 16 Ø Bolt)	0.021	24	0.50	
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	136	5.85	
TOTAL WT.			6.35	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. SI/PGCIL/400KV/BUTW-GRKH/DB/+0MBE

STRUCTURE : 400KV D/C "DB(0°-2°)"-MKD"G507 DB"

BILL OF MATERIALS

PART : ±0M BODY EXTENSION

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
--------	----------	--------------------------------	------------------	-------------	----------------	----------------	------------------	----------------	---------

WEIGHT OF STEEL MEMBERS

<u>A) TOTAL WT. OF HT STEEL FAB. MEMBER</u>	=	4403.56	Kgs
<u>B) TOTAL WT. OF MILD STEEL FAB. MEMBER</u>	=	1111.62	Kgs
<u>C) TOTAL WT. OF PACK WASHERS</u>	=	6.35	Kgs
<u>GRAND TOTAL WT. OF FAB. MEMBER WITH PACK WASHERS (A+B+C)</u>	=	5521.53	Kgs

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	440	52.36
HRH BOLT / NUT FOR M16X40	0.126	56	7.06
HRH BOLT / NUT FOR M16X45	0.134	200	26.80
HRH BOLT / NUT FOR M16X50	0.142	232	32.94
HRH BOLT / NUT FOR M16X55	0.150	32	4.80
HRH BOLT / NUT FOR M16X60	0.158	80	12.64
HRH BOLT / NUT FOR M16X65	0.164	0	0.00
HRH BOLT / NUT FOR M16X70	0.173	144	24.91
HRH BOLT / NUT FOR M16X75	0.180	0	0.00
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	1184	10.66
STEP BOLTS OF 16X175MM DIA WITH 2 NUTS 1 S.W	0.374	44	16.46
<u>TOTAL WT. OF HEXAGONAL BOLTS / NUTS , SPRING WASHERS STEP BOLT</u>	=	188.63	Kgs

SUMMARY OF WEIGHTS

<u>A) WT. OF MS MEMBERS</u>	=	1111.62	Kgs
<u>B) WT. OF PACK WASHERS</u>	=	6.35	Kgs
<u>C) WT. OF HT MEMBERS</u>	=	4403.56	Kgs
<u>D) WT. OF FAB MEMBERS (A+B+C)</u>	=	5521.53	Kgs
<u>E) WT. OF BOLT & NUTS</u>	=	188.63	Kgs
<u>F) TOTAL</u>	=	5710.16	Kgs

				SKIPPER LIMITED
REV. No	REVISION	DATE	INITIAL	



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 "DB(0°-2°)"-MKD"G507 DB"
PART : ±0M BODY EXTENSION

BOM NO. SL/PGCIL/400KV/BUTW-GRKH/DB/+0MBE

SECTION ABSTRACT

MILD STEEL	WEIGHT (Kg)	HIGH TENSILE	WEIGHT (Kg)	MS. PLATE	WEIGHT
L40X40X3		HL45X30X4	29.52	2 THK.	
L40X40X4		HL45X30X5		3 THK.	
L40X40X5		HL45X45X4	81.76	4 THK.	
L40X40X6		HL45X45X5		5 THK.	49.76
L45X30X4	39.60	HL50X50X4		6 THK.	15.60
L45X30X5		HL50X50X5		8 THK.	
L45X45X4	158.56	HL55X55X4		10 THK.	
L45X45X3		HL55X55X5		12 THK.	
L45X45X5		HL60X60X4	231.44	14 THK.	
L45X45X6		HL60X60X5		16 THK.	
L50X50X3		HL60X60X6		20 THK.	
L50X50X4	613.92	HL65X65X4		22 THK.	
L50X50X5		HL65X65X5		25 THK.	
L50X50X6		HL65X65X6		32 THK.	
L55X55X4	229.20	HL70X70X4			
L55X55X5		HL70X70X5		TOTAL MS PLT.	65.36
L55X55X6		HL70X70X6	36.32		
L55X55X8		HL75X75X4		HT. PLATE	WEIGHT
L60X60X4		HL75X75X5		H5 THK.	
L60X60X5		HL75X75X6		H6 THK.	50.72
L60X60X6		HL80X80X5		H8 THK.	
L65X65X4		HL80X80X6	1488.80	H10 THK.	
L65X65X5		HL80X80X8		H12 THK.	243.20
L65X65X6		HL90X90X5		H14 THK.	
L80X80X5		HL90X90X6		H16 THK.	
L70X70X4		HL90X90X7		H18 THK.	
L70X70X5		HL90X90X8		H20 THK.	
L70X70X6		HL100X100X6		H30 THK.	
L75X75X4		HL100X100X7			
L75X75X5		HL100X100X8			
L75X75X6		HL100X100X10		TOTAL HT PLT.	293.92
L80X80X6		HL110X110X6			
L80X80X8		HL110X110X7			
L90X90X5		HL110X110X8			
L90X90X6		HL110X110X10			
L150X150X12		HL150X150X18			
L150X150X15		HL150X150X20			
L150X150X16		HL180X180X15			
L150X150X20		HL200X200X12			
L200X200X16		HL200X200X14			
L200X200X20		HL200X200X15	272.16		
FL50X5	4.98	HL200X200X16			
		HL200X200X17	1969.64		
		HL200X200X18			
		HL200X200X19			

TOTAL **1046.26** **TOTAL** **4109.64**

GRAND TOTAL = **5515.18**