

संदर्भ/Ref : CC-ENGG-C2021001-1001422-T14221-4524-BMDD+6BE

Date : 25/06/2024

**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. :****Orgn. Drg. No. :** C2021001-1001422-T14221-4524-BMDD+6BE**Revision No. :** 01**Drg. Title :** BILL OF MATERIAL FOR TT DD +6M BE FOR 400 kV D/C WZ-5 (ACSR  
MOOSE) TL**App. Category :** CAT-I**Release Date :** 25/06/2024

Scan to verify

**Comments :** GENERALLY IN ORDER.**अनुमोदित श्रेणी/App. Category:**

- फेब्रिकेशन/निर्माण/टाइप टेस्टिंग हेतु जारी।  
**Approved/released for fabrication/construction.**
  - 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.**
  - टिप्पणियाँ सम्मिलित करने के उपरांत दस्तावेज को अनुमोदनार्थ प्रस्तुत करें।  
**To be resubmitted for approval after incorporating the comments.**
  - सूचनार्थ एवं रिकार्ड हेतु।  
**For information and record.**
- CATREL/ निर्माण हेतु जारी।  
REL-CON **Released for construction.**

**नोट/Note:**

- 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.
- The approval conveyed vide this letter does not cover the approval of make for sub-vendor items.

BOM NO. SL/PGCIL/400KV/BUTW-GRKH/DD/+6MBE

NO. OF SHEET : 6

**POWER GRID CORPORATION OF INDIA LTD.**

(A Government of India Enterprise)

**BILL OF MATERIALS**INITIAL / FINAL  
( GALVANIZED )

STRUCTURE UNIT : 400KV D/C "DD(0°-60°)/DE(0°-15°)"-MKD"G507 DD"

PART : +6M BODY EXTN. INCLUDING CP @ +0m LEVEL

REF.DRG.NO. : C:ENGG:TL:4524-4ACSR-M-P-11 & 13

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)

**TOWER COMBINATION :**

DD+6M TOWER BASIC TOWER (+) +0M BE (+) +6M BE

**NOTE FOR PREFIX**

|             |         |
|-------------|---------|
| SP4BDD XXX  | FOR M.S |
| SP4BDD 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 +6M BODY EXTN.<br>INCLUDING CP @ +0m LEVEL |              |                            |
|--------------|----------------------------------------------------|------------------------------------------------------|--------------|----------------------------|
| 1            | WT.OF ALL (HT) MEMBERS IN KGS.                     | 9147.06                                              |              |                            |
| 2            | WT.OF ALL (MS) MEMBERS IN KGS.(INCL. PACK WASHERS) | 1110.00                                              |              |                            |
| 3            | WT.OF BOLT & NUTS IN KGS.                          | 366.91                                               |              |                            |
|              | TOTAL WT. OF STRUCTURES IN KGS.                    | 10623.97                                             |              |                            |
| 1            | UPDATED UNIT WEIGHT AS PER PGCIL COMENTS           |                                                      | 24.06.2024   | BKL                        |
| 0            | PROTO CORRECTED                                    |                                                      | 19.06.2024   | BKL                        |
| REV. No.     | DESCRIPTION                                        | DATE                                                 | INITIAL      |                            |
| PREPARED BY: |                                                    | CHECKED BY:                                          | VERIFIED BY: | CONTRACTOR                 |
| P.KOLE       |                                                    | B.K.LAHA                                             | S.B          | SKIPPER LIMITED<br>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/DD/+6MBE**

**STRUCTURE : 400KV D/C "DD(0°-60°)/DE(0°-15°)"-MKD"G507 DD"**

**PART : +6M BODY EXTN. INCLUDING CP @ +0m LEVEL**

**BILL OF MATERIALS**

| 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 |
|---------------------------|----------|--------|--------------------------------|------------------|-------------|----------------|----------------|------------------|----------------|---------|
| COMMON PLANT AT +0M LEVEL |          |        |                                |                  |             |                |                |                  |                |         |
| 1                         | SP4BDD   | 2000AH | HL110X110X9                    |                  | 6500        | 15.00          | 97.50          | 1                | 97.50          |         |
| 2                         | SP4BDD   | 2000H  | HL110X110X9                    |                  | 6500        | 15.00          | 97.50          | 1                | 97.50          |         |
| 3                         | SP4BDD   | 2001H  | HL110X110X7                    |                  | 6500        | 11.80          | 76.70          | 2                | 153.40         |         |
| 4                         | SP4BDD   | 2002H  | HL110X110X9                    |                  | 6371        | 15.00          | 95.57          | 2                | 191.14         |         |
| 5                         | SP4BDD   | 2003H  | HL110X110X7                    |                  | 6371        | 11.80          | 75.18          | 2                | 150.36         |         |
| 6                         | SP4BDD   | 2004AH | HL110X110X9                    |                  | 6500        | 15.00          | 97.50          | 1                | 97.50          |         |
| 7                         | SP4BDD   | 2004H  | HL110X110X9                    |                  | 6500        | 15.00          | 97.50          | 1                | 97.50          |         |
| 8                         | SP4BDD   | 2005H  | HL110X110X7                    |                  | 6500        | 11.80          | 76.70          | 2                | 153.40         |         |
| 9                         | SP4BDD   | 2006H  | HL100X100X7                    |                  | 346         | 10.73          | 3.71           | 4                | 14.84          |         |
| 10                        | SP4BDD   | 2007H  | HL100X100X6                    |                  | 346         | 9.26           | 3.20           | 4                | 12.80          |         |
| 11                        | SP4BDD   | 2008H  | H6 THK.                        | 90               | 346         | 47.10          | 1.47           | 16               | 23.52          |         |
| 12                        | SP4BDD   | 2009H  | H14 THK.                       | 145              | 605         | 109.90         | 9.64           | 4                | 38.56          |         |
| 13                        | SP4BDD   | 2010H  | HL200X200X12                   | 416              | 527         | 36.85          | 19.42          | 8                | 155.36         |         |
| 14                        | SP4BDD   | 2011H  | H14 THK.                       |                  | 527         | 109.90         | 24.09          | 4                | 96.36          |         |
| 15                        | SP4BDD   | 2012H  | H14 THK.                       |                  | 527         | 109.90         | 9.56           | 8                | 76.48          |         |
| 16                        | SP4BDD   | 2013H  | HL90X90X5                      |                  | 4323        | 6.97           | 30.13          | 4                | 120.52         |         |
| 17                        | SP4BDD   | 2014H  | HL90X90X5                      | 165              | 4323        | 6.97           | 30.13          | 4                | 120.52         |         |
| 18                        | SP4BDD   | 2015H  | HL90X90X5                      |                  | 6500        | 6.97           | 45.31          | 4                | 181.24         |         |
| 19                        | SP4BDD   | 2016H  | HL90X90X5                      |                  | 6500        | 6.97           | 45.31          | 4                | 181.24         |         |
| 20                        | SP4BDD   | 2017H  | HL65X65X5                      |                  | 266         | 4.98           | 1.32           | 8                | 10.56          |         |
| 21                        | SP4BDD   | 2018H  | H5 THK.                        | 72               | 266         | 39.25          | 0.75           | 16               | 12.00          |         |
| 22                        | SP4BDD   | 2019H  | HL90X90X6                      | 125              | 466         | 8.32           | 3.88           | 4                | 15.52          |         |
| 23                        | SP4BDD   | 2020H  | HL75X75X5                      |                  | 6504        | 5.77           | 37.53          | 4                | 150.12         |         |
| 24                        | SP4BDD   | 2021H  | HL45X45X4                      |                  | 1651        | 2.75           | 4.54           | 4                | 18.16          |         |
| 25                        | SP4BDD   | 2022   | L45X45X4                       |                  | 1195        | 2.75           | 3.29           | 4                | 13.16          |         |
| 26                        | SP4BDD   | 2023   | L45X45X4                       |                  | 1195        | 2.75           | 3.29           | 4                | 13.16          |         |
| 27                        | SP4BDD   | 2024H  | HL45X45X4                      |                  | 1837        | 2.75           | 5.05           | 4                | 20.20          |         |
| 28                        | SP4BDD   | 2025H  | HL45X45X4                      |                  | 1837        | 2.75           | 5.05           | 4                | 20.20          |         |
| 29                        | SP4BDD   | 2026H  | HL50X50X4                      |                  | 2318        | 3.08           | 7.14           | 4                | 28.56          |         |
| 30                        | SP4BDD   | 2027H  | HL50X50X4                      | 2318             | 3.08        | 7.14           | 4              | 28.56            |                |         |
| 31                        | SP4BDD   | 2028H  | H5 THK.                        |                  | 131         | 39.25          | 0.64           | 8                | 5.12           |         |
| 32                        | SP4BDD   | 2029H  | HL60X60X4                      |                  | 3263        | 3.71           | 12.11          | 4                | 48.44          |         |
| 33                        | SP4BDD   | 2030H  | HL60X60X4                      |                  | 3263        | 3.71           | 12.11          | 4                | 48.44          |         |
| 34                        | SP4BDD   | 2031H  | HL60X60X4                      |                  | 3385        | 3.71           | 12.56          | 4                | 50.24          |         |
| 35                        | SP4BDD   | 2032H  | HL90X90X5                      |                  | 565         | 6.97           | 3.94           | 4                | 15.76          |         |
| +6M BODY EXTENSION        |          |        |                                |                  |             |                |                |                  |                |         |
| 36                        | SP4BDD   | 2150H  | HL200X200X15                   |                  | 6443        | 45.60          | 293.80         | 2                | 587.60         |         |
| 37                        | SP4BDD   | 2151H  | HL200X200X15                   |                  | 6443        | 45.60          | 293.80         | 2                | 587.60         |         |
| 38                        | SP4BDD   | 2152H  | HL200X200X15                   |                  | 6443        | 45.60          | 293.80         | 4                | 1175.20        |         |
| 39                        | SP4BDD   | 2153H  | HL200X200X12                   |                  | 610         | 36.85          | 22.48          | 8                | 179.84         |         |

**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/DD/+6MBE**

**STRUCTURE : 400KV D/C "DD(0°-60°)/DE(0°-15°)"-MKD"G507 DD"**

**PART : +6M BODY EXTN. INCLUDING CP @ +0m LEVEL**

**BILL OF MATERIALS**

| 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 |
|--------|----------|-------|--------------------------------|------------------|-------------|----------------|----------------|------------------|----------------|---------|
| 40     | SP4BDD   | 2154H | HL200X200X12                   |                  | 610         | 36.85          | 22.48          | 8                | 179.84         |         |
| 41     | SP4BDD   | 2155H | H14 THK.                       | 346              | 610         | 109.90         | 23.20          | 4                | 92.80          |         |
| 42     | SP4BDD   | 2156H | H14 THK.                       | 150              | 610         | 109.90         | 10.06          | 8                | 80.48          |         |
| 43     | SP4BDD   | 2157H | HL110X110X7                    |                  | 4700        | 11.80          | 55.46          | 2                | 110.92         |         |
| 44     | SP4BDD   | 2158H | HL110X110X7                    |                  | 4701        | 11.80          | 55.47          | 2                | 110.94         |         |
| 45     | SP4BDD   | 2159H | HL110X110X7                    |                  | 4701        | 11.80          | 55.47          | 2                | 110.94         |         |
| 46     | SP4BDD   | 2160H | HL110X110X7                    |                  | 4700        | 11.80          | 55.46          | 2                | 110.92         |         |
| 47     | SP4BDD   | 2161H | HL100X100X6                    |                  | 4700        | 9.26           | 43.52          | 2                | 87.04          |         |
| 48     | SP4BDD   | 2162H | HL100X100X6                    |                  | 4701        | 9.26           | 43.53          | 2                | 87.06          |         |
| 49     | SP4BDD   | 2163H | HL100X100X6                    |                  | 4701        | 9.26           | 43.53          | 2                | 87.06          |         |
| 50     | SP4BDD   | 2164H | HL100X100X6                    |                  | 4700        | 9.26           | 43.52          | 2                | 87.04          |         |
| 51     | SP4BDD   | 2165H | HL110X110X7                    |                  | 4300        | 11.80          | 50.74          | 2                | 101.48         |         |
| 52     | SP4BDD   | 2166H | HL110X110X7                    |                  | 4300        | 11.80          | 50.74          | 2                | 101.48         |         |
| 53     | SP4BDD   | 2167H | HL110X110X7                    |                  | 4300        | 11.80          | 50.74          | 2                | 101.48         |         |
| 54     | SP4BDD   | 2168H | HL110X110X7                    |                  | 4300        | 11.80          | 50.74          | 2                | 101.48         |         |
| 55     | SP4BDD   | 2169H | HL100X100X6                    |                  | 4300        | 9.26           | 39.82          | 2                | 79.64          |         |
| 56     | SP4BDD   | 2170H | HL100X100X6                    |                  | 4300        | 9.26           | 39.82          | 2                | 79.64          |         |
| 57     | SP4BDD   | 2171H | HL100X100X6                    |                  | 4300        | 9.26           | 39.82          | 2                | 79.64          |         |
| 58     | SP4BDD   | 2172H | HL100X100X6                    |                  | 4300        | 9.26           | 39.82          | 2                | 79.64          |         |
| 59     | SP4BDD   | 2173H | HL110X110X7                    |                  | 3851        | 11.80          | 45.44          | 2                | 90.88          |         |
| 60     | SP4BDD   | 2174H | HL110X110X7                    |                  | 3852        | 11.80          | 45.45          | 2                | 90.90          |         |
| 61     | SP4BDD   | 2175H | HL110X110X7                    |                  | 3852        | 11.80          | 45.45          | 2                | 90.90          |         |
| 62     | SP4BDD   | 2176H | HL110X110X7                    |                  | 3851        | 11.80          | 45.44          | 2                | 90.88          |         |
| 63     | SP4BDD   | 2177H | HL100X100X6                    |                  | 3851        | 9.26           | 35.66          | 2                | 71.32          |         |
| 64     | SP4BDD   | 2178H | HL100X100X6                    |                  | 3852        | 9.26           | 35.67          | 2                | 71.34          |         |
| 65     | SP4BDD   | 2179H | HL100X100X6                    |                  | 3852        | 9.26           | 35.67          | 2                | 71.34          |         |
| 66     | SP4BDD   | 2180H | HL100X100X6                    |                  | 3851        | 9.26           | 35.66          | 2                | 71.32          |         |
| 67     | SP4BDD   | 2181H | HL90X90X6                      |                  | 306         | 8.32           | 2.55           | 8                | 20.40          |         |
| 68     | SP4BDD   | 2182H | HL90X90X6                      |                  | 306         | 8.32           | 2.55           | 8                | 20.40          |         |
| 69     | SP4BDD   | 2183H | HL80X80X6                      |                  | 306         | 7.36           | 2.25           | 8                | 18.00          |         |
| 70     | SP4BDD   | 2184H | HL80X80X6                      |                  | 306         | 7.36           | 2.25           | 8                | 18.00          |         |
| 71     | SP4BDD   | 2185H | H14 THK.                       | 80               | 306         | 109.90         | 2.69           | 16               | 43.04          |         |
| 72     | SP4BDD   | 2186H | H6 THK.                        | 184              | 306         | 47.10          | 2.65           | 16               | 42.40          |         |
| 73     | SP4BDD   | 2187H | H14 THK.                       | 126              | 416         | 109.90         | 5.76           | 4                | 23.04          |         |
| 74     | SP4BDD   | 2188H | H14 THK.                       | 100              | 336         | 109.90         | 3.69           | 16               | 59.04          |         |
| 75     | SP4BDD   | 2189H | H14 THK.                       | 110              | 416         | 109.90         | 5.03           | 4                | 20.12          |         |
| 76     | SP4BDD   | 2190H | HL65X65X4                      |                  | 1687        | 4.03           | 6.80           | 4                | 27.20          |         |
| 77     | SP4BDD   | 2191H | HL65X65X4                      |                  | 1687        | 4.03           | 6.80           | 4                | 27.20          |         |
| 78     | SP4BDD   | 2192H | HL90X90X6                      |                  | 3218        | 8.32           | 26.77          | 4                | 107.08         |         |
| 79     | SP4BDD   | 2193H | HL90X90X6                      |                  | 3218        | 8.32           | 26.77          | 4                | 107.08         |         |
| 80     | SP4BDD   | 2194H | HL80X80X6                      |                  | 3384        | 7.36           | 24.91          | 4                | 99.64          |         |
| 81     | SP4BDD   | 2195H | HL80X80X6                      |                  | 3384        | 7.36           | 24.91          | 4                | 99.64          |         |
| 82     | SP4BDD   | 2196  | L45X45X4                       |                  | 2137        | 2.75           | 5.88           | 4                | 23.52          |         |

**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/DD/+6MBE**

**STRUCTURE : 400KV D/C "DD(0°-60°)/DE(0°-15°)"-MKD"G507 DD"**

**PART : +6M BODY EXTN. INCLUDING CP @ +0m LEVEL**

**BILL OF MATERIALS**

| 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 |
|--------|----------|--------|--------------------------------|------------------|-------------|----------------|----------------|------------------|----------------|---------|
| 83     | SP4BDD   | 2197   | L45X45X4                       | 150              | 2137        | 2.75           | 5.88           | 4                | 23.52          |         |
| 84     | SP4BDD   | 2198   | L45X45X4                       |                  | 1717        | 2.75           | 4.72           | 4                | 18.88          |         |
| 85     | SP4BDD   | 2199   | L45X45X4                       |                  | 1717        | 2.75           | 4.72           | 4                | 18.88          |         |
| 86     | SP4BDD   | 2200H  | HL100X100X6                    |                  | 6461        | 9.26           | 59.83          | 3                | 179.49         |         |
| 87     | SP4BDD   | 2200AH | HL100X100X6                    |                  | 6461        | 9.26           | 59.83          | 1                | 59.83          |         |
| 88     | SP4BDD   | 2201H  | HL100X100X6                    |                  | 6461        | 9.26           | 59.83          | 3                | 179.49         |         |
| 89     | SP4BDD   | 2201AH | HL100X100X6                    |                  | 6461        | 9.26           | 59.83          | 1                | 59.83          |         |
| 90     | SP4BDD   | 2202H  | H6 THK.                        |                  | 358         | 47.10          | 2.53           | 8                | 20.24          |         |
| 91     | SP4BDD   | 2203   | 5 THK.                         |                  | 277         | 39.25          | 1.58           | 8                | 12.64          |         |
| 92     | SP4BDD   | 2204H  | HL80X80X6                      |                  | 3304        | 7.36           | 24.32          | 3                | 72.96          |         |
| 93     | SP4BDD   | 2204AH | HL80X80X6                      | 145              | 3304        | 7.36           | 24.32          | 1                | 24.32          |         |
| 94     | SP4BDD   | 2205H  | HL80X80X6                      |                  | 3304        | 7.36           | 24.32          | 3                | 72.96          |         |
| 95     | SP4BDD   | 2205AH | HL80X80X6                      |                  | 3304        | 7.36           | 24.32          | 1                | 24.32          |         |
| 96     | SP4BDD   | 2206   | L45X45X4                       |                  | 1571        | 2.75           | 4.32           | 4                | 17.28          |         |
| 97     | SP4BDD   | 2207   | L45X45X4                       |                  | 1571        | 2.75           | 4.32           | 4                | 17.28          |         |
| 98     | SP4BDD   | 2208   | L45X45X4                       |                  | 2142        | 2.75           | 5.89           | 4                | 23.56          |         |
| 99     | SP4BDD   | 2209   | L45X45X4                       |                  | 2142        | 2.75           | 5.89           | 4                | 23.56          |         |
| 100    | SP4BDD   | 2210   | L55X55X4                       |                  | 2946        | 3.40           | 10.02          | 4                | 40.08          |         |
| 101    | SP4BDD   | 2211   | L55X55X4                       |                  | 2946        | 3.40           | 10.02          | 4                | 40.08          |         |
| 102    | SP4BDD   | 2212   | L45X45X4                       | 72               | 2367        | 2.75           | 6.51           | 4                | 26.04          |         |
| 103    | SP4BDD   | 2213   | L45X45X4                       |                  | 2367        | 2.75           | 6.51           | 4                | 26.04          |         |
| 104    | SP4BDD   | 2214   | L45X45X4                       |                  | 2468        | 2.75           | 6.79           | 4                | 27.16          |         |
| 105    | SP4BDD   | 2215   | L45X45X4                       |                  | 2468        | 2.75           | 6.79           | 4                | 27.16          |         |
| 106    | SP4BDD   | 2216   | L45X45X4                       |                  | 1216        | 2.75           | 3.34           | 4                | 13.36          |         |
| 107    | SP4BDD   | 2217   | L45X45X4                       |                  | 1216        | 2.75           | 3.34           | 4                | 13.36          |         |
| 108    | SP4BDD   | 2218   | 2 THK.                         |                  | 221         | 15.70          | 0.25           | 4                | 1.00           |         |
| 109    | SP4BDD   | 2219   | 5 THK.                         |                  | 145         | 39.25          | 0.63           | 8                | 5.04           |         |
| 110    | SP4BDD   | 2220   | 5 THK.                         |                  | 382         | 39.25          | 2.17           | 8                | 17.36          |         |
| 111    | SP4BDD   | 2221   | 5 THK.                         |                  | 329         | 39.25          | 1.87           | 8                | 14.96          |         |
| 112    | SP4BDD   | 2222H  | HL75X75X5                      | 100              | 4358        | 5.77           | 25.15          | 4                | 100.60         |         |
| 113    | SP4BDD   | 2223   | L55X55X4                       |                  | 7641        | 3.40           | 25.98          | 4                | 103.92         |         |
| 114    | SP4BDD   | 2224   | L55X55X4                       |                  | 7641        | 3.40           | 25.98          | 4                | 103.92         |         |
| 115    | SP4BDD   | 2225   | L45X45X4                       |                  | 2442        | 2.75           | 6.72           | 4                | 26.88          |         |
| 116    | SP4BDD   | 2226   | L45X45X4                       |                  | 2442        | 2.75           | 6.72           | 4                | 26.88          |         |
| 117    | SP4BDD   | 2227   | 5 THK.                         |                  | 106         | 39.25          | 0.42           | 8                | 3.36           |         |
| 118    | SP4BDD   | 2227A  | 6 THK.                         |                  | 152         | 47.10          | 0.57           | 4                | 2.28           |         |
| 119    | SP4BDD   | 2228   | L60X60X4                       |                  | 4990        | 3.71           | 18.51          | 4                | 74.04          |         |
| 120    | SP4BDD   | 2229   | L60X60X4                       |                  | 4990        | 3.71           | 18.51          | 4                | 74.04          |         |
| 121    | SP4BDD   | 2230   | 5 THK.                         |                  | 114         | 39.25          | 0.47           | 8                | 3.76           |         |
| 122    | SP4BDD   | 2231   | L55X55X4                       | 105              | 4806        | 3.40           | 16.34          | 4                | 65.36          |         |
| 123    | SP4BDD   | 2232   | L55X55X4                       |                  | 4806        | 3.40           | 16.34          | 4                | 65.36          |         |
| 124    | SP4BDD   | 2233   | 5 THK.                         |                  | 105         | 39.25          | 0.41           | 8                | 3.28           |         |
| 125    | SP4BDD   | 2234   | L50X50X4                       |                  | 1968        | 3.08           | 6.06           | 4                | 24.24          |         |

**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/DD/+6MBE**

**STRUCTURE : 400KV D/C "DD(0°-60°)/DE(0°-15°)"-MKD"G507 DD"**

**PART : +6M BODY EXTN. INCLUDING CP @ +0m LEVEL**

**BILL OF MATERIALS**

| 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 |
|------------------|----------|-------|--------------------------------|------------------|-------------|----------------|----------------|------------------|-----------------|---------|
| 126              | SP4BDD   | 2235  | L50X50X4                       |                  | 1968        | 3.08           | 6.06           | 4                | 24.24           |         |
| 127              | SP4BDD   | 2236  | 5 THK.                         | 140              | 169         | 39.25          | 0.93           | 4                | 3.72            |         |
| 128              | SP4BDD   | 2237H | H8 THK.                        | 120              | 174         | 62.80          | 1.31           | 8                | 10.48           |         |
| 129              | SP4BDD   | 2238H | H5 THK.                        | 185              | 325         | 39.25          | 2.36           | 4                | 9.44            |         |
| 130              | SP4BDD   | 2239H | H5 THK.                        | 185              | 325         | 39.25          | 2.36           | 4                | 9.44            |         |
| 131              | SP4BDD   | 2240  | 5 THK.                         | 120              | 303         | 39.25          | 1.43           | 4                | 5.72            |         |
| 132              | SP4BDD   | 2241  | 5 THK.                         | 120              | 303         | 39.25          | 1.43           | 4                | 5.72            |         |
| 133              | SP4BDD   | 2242  | 5 THK.                         | 135              | 339         | 39.25          | 1.80           | 4                | 7.20            |         |
| 134              | SP4BDD   | 2243  | 5 THK.                         | 135              | 339         | 39.25          | 1.80           | 4                | 7.20            |         |
| 135              | SP4BDD   | 2244  | 5 THK.                         | 120              | 306         | 39.25          | 1.44           | 4                | 5.76            |         |
| 136              | SP4BDD   | 2245  | 5 THK.                         | 120              | 306         | 39.25          | 1.44           | 4                | 5.76            |         |
| 137              | SP4BDD   | 2246H | H8 THK.                        | 120              | 184         | 62.80          | 1.39           | 8                | 11.12           |         |
| <b>TOTAL WT=</b> |          |       |                                |                  |             |                |                |                  | <b>10246.78</b> |         |

**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 | 12  | 0.17         |            |
| 5 THK. PACK WASHERS ( For 16 Ø Bolt )  | 0.018 | 8   | 0.14         |            |
| 6 THK. PACK WASHERS ( For 16 Ø Bolt )  | 0.021 | 160 | 3.36         |            |
| 8 THK. PACK WASHERS ( For 16 Ø Bolt )  | 0.028 | 236 | 6.61         |            |
| 10 THK. PACK WASHERS ( For 16 Ø Bolt ) | 0.036 | 0   | 0.00         |            |
| 12 THK. PACK WASHERS ( For 16 Ø Bolt ) | 0.043 | 0   | 0.00         |            |
| <b>TOTAL WT.</b>                       |       |     | <b>10.28</b> | <b>Kgs</b> |

|         |          |      |         |                        |
|---------|----------|------|---------|------------------------|
|         |          |      |         | <b>SKIPPER LIMITED</b> |
|         |          |      |         |                        |
|         |          |      |         |                        |
| 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/DD/+6MBE**

**STRUCTURE : 400KV D/C "DD(0°-60°)/DE(0°-15°)"-MKD"G507 DD"**

**PART : +6M BODY EXTN. INCLUDING CP @ +0m LEVEL**

**BILL OF MATERIALS**

| 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**

|                                                                 |          |                 |     |
|-----------------------------------------------------------------|----------|-----------------|-----|
| <b><u>A) TOTAL WT. OF HT STEEL FAB. MEMBER</u></b>              | <b>=</b> | <b>9147.06</b>  | Kgs |
| <b><u>B) TOTAL WT. OF MILD STEEL FAB. MEMBER</u></b>            | <b>=</b> | <b>1099.72</b>  | Kgs |
| <b><u>C) TOTAL WT. OF PACK WASHERS</u></b>                      | <b>=</b> | <b>10.28</b>    | Kgs |
| <b>GRAND TOTAL WT. OF FAB. MEMBER WITH PACK WASHERS (A+B+C)</b> | <b>=</b> | <b>10257.06</b> | 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    | 458           | 54.50 |
| HRH BOLT / NUT FOR M16X40                                             | 0.126    | 324           | 40.82 |
| HRH BOLT / NUT FOR M16X45                                             | 0.134    | 378           | 50.65 |
| HRH BOLT / NUT FOR M16X50                                             | 0.142    | 72            | 10.22 |
| HRH BOLT / NUT FOR M16X55                                             | 0.150    | 268           | 40.20 |
| HRH BOLT / NUT FOR M16X60                                             | 0.158    | 56            | 8.85  |
| HRH BOLT / NUT FOR M16X65                                             | 0.164    | 128           | 20.99 |
| HRH BOLT / NUT FOR M16X70                                             | 0.173    | 232           | 40.14 |
| HRH BOLT / NUT FOR M16X75                                             | 0.180    | 56            | 10.08 |
| HRH BOLT / NUT FOR M16X80                                             | 0.185    | 300           | 55.50 |
| HRH BOLT / NUT FOR M16X85                                             | 0.193    | 20            | 3.86  |
| HRH BOLT / NUT FOR M16X90                                             | 0.199    | 0             | 0.00  |
| MS STD. SPR. WASHERS FOR M16 BOLTS                                    | 0.009    | 2292          | 20.63 |
| STEP BOLTS OF 16X175MM DIA WITH 2 NUTS 1 S.W                          | 0.374    | 28            | 10.47 |
| <b>TOTAL WT. OF HEXAGONAL BOLTS / NUTS , SPRING WASHERS STEP BOLT</b> | <b>=</b> | <b>366.91</b> | Kgs   |

**SUMMARY OF WEIGHTS**

|                                       |          |                 |     |
|---------------------------------------|----------|-----------------|-----|
| <b>A ) WT. OF MS MEMBERS</b>          | <b>=</b> | <b>1099.72</b>  | Kgs |
| <b>B ) WT. OF PACK WASHERS</b>        | <b>=</b> | <b>10.28</b>    | Kgs |
| <b>C ) WT. OF HT MEMBERS</b>          | <b>=</b> | <b>9147.06</b>  | Kgs |
| <b>D ) WT. OF FAB MEMBERS (A+B+C)</b> | <b>=</b> | <b>10257.06</b> | Kgs |
| <b>E ) WT. OF BOLT &amp; NUTS</b>     | <b>=</b> | <b>366.91</b>   | Kgs |
| <b>F ) TOTAL</b>                      | <b>=</b> | <b>10623.97</b> | Kgs |

|         |          |      |         |                        |
|---------|----------|------|---------|------------------------|
|         |          |      |         | <b>SKIPPER LIMITED</b> |
|         |          |      |         |                        |
|         |          |      |         |                        |
| 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 "DD(0°-60°)/DE(0°-15°)"-MKD"G507 DD"**  
**PART : +6M BODY EXTN. INCLUDING CP @ +0m LEVEL**

**BOM NO. SL/PGCIL/400KV/BUTW-GRKH/DD/+6MBE**

| SECTION ABSTRACT |               |                      |                 |                      |               |
|------------------|---------------|----------------------|-----------------|----------------------|---------------|
| MILD STEEL       | WEIGHT (Kg)   | HIGH TENSILE         | WEIGHT (Kg)     | MS. PLATE            | WEIGHT        |
| L40X40X3         |               | HL180X180X15         |                 | 2 THK.               | 1.00          |
| L40X40X4         |               | HL180X180X16         |                 | 3 THK.               |               |
| L40X40X5         |               | HL45X45X4            | 58.56           | 4 THK.               |               |
| L40X40X6         |               | HL45X45X5            |                 | 5 THK.               | 101.48        |
| L45X30X4         |               | HL50X50X4            | 57.12           | 6 THK.               | 2.28          |
| L45X30X5         |               | HL50X50X5            |                 | 8 THK.               |               |
| L45X45X4         | 379.68        | HL55X55X4            |                 | 10 THK.              |               |
| L45X45X3         |               | HL55X55X5            |                 | 14 THK.              |               |
| L45X45X5         |               | HL60X60X4            | 147.12          | 32 THK.              |               |
| L45X45X6         |               | HL60X60X5            |                 | 20 THK.              |               |
| L50X50X3         |               | HL60X60X6            |                 | 22 THK.              |               |
| L50X50X4         | 48.48         | HL65X65X4            | 54.40           |                      |               |
| L50X50X5         |               | HL65X65X5            | 10.56           | <b>TOTAL MS PLT.</b> | <b>104.76</b> |
| L50X50X6         |               | HL65X65X6            |                 |                      |               |
| L55X55X4         | 418.72        | HL70X70X5            |                 | HT. PLATE            | WEIGHT        |
| L55X55X5         |               | HL70X70X6            |                 | H6 THK.              | 86.16         |
| L55X55X6         |               | HL75X75X5            | 250.72          | H5 THK.              | 36.00         |
| L55X55X8         |               | HL75X75X6            |                 | H8 THK.              | 21.60         |
| L60X60X4         | 148.08        | HL80X80X6            | 429.84          | H10 THK.             |               |
| L60X60X5         |               | HL80X80X5            |                 | H12 THK.             |               |
| L60X60X6         |               | HL90X90X6            | 270.48          | H14 THK.             | 529.92        |
| L65X65X4         |               | HL90X90X7            |                 | H16 THK.             |               |
| L65X65X5         |               | HL90X90X5            | 619.28          | H20 THK.             |               |
| L65X65X6         |               | HL100X100X6          | 1443.52         | H18 THK.             |               |
| L80X80X5         |               | HL100X100X7          | 14.84           |                      |               |
| L70X70X5         |               | HL100X100X8          |                 | <b>TOTAL HT PLT.</b> | <b>673.68</b> |
| L70X70X6         |               | HL100X100X10         |                 |                      |               |
| L75X75X5         |               | HL110X110X8          |                 |                      |               |
| L75X75X6         |               | HL110X110X10         |                 |                      |               |
| L80X80X6         |               | HL110X110X9          | 581.14          |                      |               |
| L80X80X8         |               |                      |                 |                      |               |
| L90X90X5         |               | HL120X120X8          |                 |                      |               |
| L90X90X7         |               | HL120X120X10         |                 |                      |               |
| L90X90X8         |               | HL120X120X9          |                 |                      |               |
| L100X100X6       |               | HL130X130X14         |                 |                      |               |
| L100X100X7       |               | HL130X130X12         |                 |                      |               |
| L110X110X10      |               | HL150X150X10         |                 |                      |               |
| L150X150X15      |               | HL130X130X15         |                 |                      |               |
| L150X150X16      |               | HL130X130X9          |                 |                      |               |
| L150X150X20      |               | HL150X150X12         |                 |                      |               |
| L200X200X16      |               | HL150X150X14         |                 |                      |               |
| L200X200X20      |               | HL110X110X6          |                 |                      |               |
|                  |               | HL110X110X7          | 1670.36         |                      |               |
|                  |               | HL120X120X7          |                 |                      |               |
|                  |               | HL200X200X12         | 515.04          |                      |               |
|                  |               | HL200X200X15         | 2350.40         |                      |               |
| <b>TOTAL</b>     | <b>994.96</b> | <b>TOTAL</b>         | <b>8473.38</b>  |                      |               |
|                  |               | <b>GRAND TOTAL =</b> | <b>10246.78</b> |                      |               |