

संदर्भ/Ref : CC-ENGG-C2021001-1001422-T14221-4522-BMDB+9BE

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/+9MBE
Orgn. Drg. No. : C2021001-1001422-T14221-4522-BMDB+9BE
Revision No. : 00
Drg. Title : BILL OF MATERIAL FOR TT DB +9M 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. SI/PGCIL/400KV/BUTW-GRKH/DB/+9MBE

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 "DB(0°-2°) MKD"G507 DB"

PART : +9M BODY EXTENSION

REF.DRG.NO. : C:ENGG:TL:4522-4ACSR-M-P-05 & C:ENGG:TL:4522-4ACSR-M-P-06 (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

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 +9M BODY EXTENSION		
1	WT.OF ALL (HT) MEMBERS IN KGS.	6307.80		
2	WT.OF ALL (MS) MEMBERS IN KGS.(INCL. PACK WASHERS)	1656.56		
3	WT.OF BOLT & NUTS IN KGS.	205.49		
	TOTAL WT. OF STRUCTURES IN KGS.	8169.85		
A	PROTO CORRECTED & SUCCESSFULLY TESTED AT M/s SKIPPER LTD. TEST BED DATED 29.05.24	05.06.2024	BKL	
0	FIRST ISSUE	18.10.2023	BKL	
REV. No.	DESCRIPTION	DATE	INITIAL	
PREPARED BY:	CHECKED BY:	VERIFIED BY:	CONTRACTOR	
			SKIPPER LIMITED	
			KOLKATA	
P.KOLE	B.K.LAHA	S.B		

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/DB/+9MBE

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

BILL OF MATERIALS

PART : +9M 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
PLAN AT +0M LEVEL										
1	SP4BDB	895H	HL110X110X6	90	9450	10.20	96.39	4	385.56	
2	SP4BDB	896H	HL110X110X6		7932	10.20	80.91	4	323.64	
3	SP4BDB	897H	H6 THK.		356	47.10	1.51	8	12.08	
4	SP4BDB	898H	HL100X100X6		356	9.26	3.30	4	13.20	
5	SP4BDB	901H	H8 THK.	185	731	62.80	8.49	4	33.96	
6	SP4BDB	902H	HL65X65X4		9673	4.03	38.98	4	155.92	
7	SP4BDB	903H	HL65X65X4		9673	4.03	38.98	4	155.92	
8	SP4BDB	904H	HL50X50X4		2055	3.08	6.33	4	25.32	
9	SP4BDB	905H	HL50X50X4	210	2055	3.08	6.33	4	25.32	
10	SP4BDB	906H	HL50X50X5		5896	3.79	22.35	4	89.40	
11	SP4BDB	907H	HL45X30X4		1480	2.27	3.36	4	13.44	
12	SP4BDB	908H	H6 THK.		263	47.10	2.60	4	10.40	
13	SP4BDB	909H	HL75X75X5	114	3960	5.77	22.85	4	91.40	
14	SP4BDB	910H	HL90X90X5		430	6.97	3.00	4	12.00	
15	SP4BDB	911H	H6 THK.		176	47.10	0.95	8	7.60	
16	SP4BDB	912H	H6 THK.		140	47.10	0.33	8	2.64	
17	SP4BDB	913H	H6 THK.	50	151	47.10	0.36	8	2.88	
+9M BODY EXTENSION										
18	SP4BDB	915H	HL200X200X17	165	5300	51.40	272.42	2	544.84	
19	SP4BDB	916H	HL200X200X17		5300	51.40	272.42	2	544.84	
20	SP4BDB	915AH	HL200X200X17		4280	51.40	219.99	2	439.98	
21	SP4BDB	916AH	HL200X200X17		4280	51.40	219.99	2	439.98	
22	SP4BDB	917H	HL200X200X15	80	746	45.60	34.02	8	272.16	
23	SP4BDB	918H	H12 THK.		746	94.20	11.60	16	185.60	
24	SP4BDB	919H	HL110X110X7		7000	11.80	82.60	2	165.20	
25	SP4BDB	920H	HL110X110X7		7265	11.80	85.73	2	171.46	
26	SP4BDB	921H	HL110X110X6	80	7000	10.20	71.40	2	142.80	
27	SP4BDB	922H	HL110X110X6		7265	10.20	74.10	2	148.20	
28	SP4BDB	923H	HL100X100X6		356	9.26	3.30	4	13.20	
29	SP4BDB	923XH	HL100X100X6		356	9.26	3.30	4	13.20	
30	SP4BDB	924H	H6 THK.	80	356	47.10	1.34	16	21.44	
31	SP4BDB	925	L50X50X4		1287	3.08	3.96	4	15.84	
32	SP4BDB	926	L50X50X4		1287	3.08	3.96	4	15.84	
33	SP4BDB	927	L50X50X4		1655	3.08	5.10	4	20.40	
34	SP4BDB	928	L50X50X4	80	1655	3.08	5.10	4	20.40	
35	SP4BDB	929	L65X65X5		2537	4.98	12.63	4	50.52	
36	SP4BDB	930	L65X65X5		2537	4.98	12.63	4	50.52	
37	SP4BDB	931	L60X60X5		2579	4.58	11.81	4	47.24	
38	SP4BDB	932	L60X60X5	80	2579	4.58	11.81	4	47.24	
39	SP4BDB	933	L45X45X4		2006	2.75	5.52	4	22.08	
40	SP4BDB	934	L45X45X4		2006	2.75	5.52	4	22.08	
41	SP4BDB	935	L60X60X4		2192	3.71	8.13	4	32.52	
42	SP4BDB	936	L60X60X4		2192	3.71	8.13	4	32.52	

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. SI/PGCIL/400KV/BUTW-GRKH/DB/+9MBE

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

BILL OF MATERIALS

PART : +9M 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
43	SP4BDB	937H	H6 THK.	105	110	47.10	0.54	8	4.32	
44	SP4BDB	938	L65X65X4		3703	4.03	14.92	4	59.68	
45	SP4BDB	939	L65X65X4		3703	4.03	14.92	4	59.68	
46	SP4BDB	940	L45X45X4		2176	2.75	5.98	4	23.92	
47	SP4BDB	941	L45X45X4		2176	2.75	5.98	4	23.92	
48	SP4BDB	942H	HL65X65X5		2794	4.98	13.91	4	55.64	
49	SP4BDB	943H	HL65X65X5		2794	4.98	13.91	4	55.64	
50	SP4BDB	944H	H6 THK.	105	204	47.10	1.01	8	8.08	
51	SP4BDB	945H	HL70X70X5		4890	5.38	26.31	4	105.24	
52	SP4BDB	946H	HL70X70X5		4890	5.38	26.31	4	105.24	
53	SP4BDB	947H	HL65X65X5		3404	4.98	16.95	4	67.80	
54	SP4BDB	948H	HL65X65X5		3404	4.98	16.95	4	67.80	
55	SP4BDB	949H	HL45X45X4		2467	2.75	6.78	4	27.12	
56	SP4BDB	950H	HL45X45X4		2467	2.75	6.78	4	27.12	
57	SP4BDB	951H	H6 THK.	110	249	47.10	1.29	8	10.32	
58	SP4BDB	952H	HL75X75X6		6103	6.86	41.87	4	167.48	
59	SP4BDB	953H	HL75X75X6		6103	6.86	41.87	4	167.48	
60	SP4BDB	954H	HL70X70X5		4808	5.38	25.87	4	103.48	
61	SP4BDB	955H	HL70X70X5		4808	5.38	25.87	4	103.48	
62	SP4BDB	956H	HL50X50X4		2897	3.08	8.92	4	35.68	
63	SP4BDB	957H	HL50X50X4		2897	3.08	8.92	4	35.68	
64	SP4BDB	958	6 THK.	100	103	47.10	0.49	8	3.92	
65	SP4BDB	959H	HL45X45X4		2280	2.75	6.27	4	25.08	
66	SP4BDB	960H	HL45X45X4		2280	2.75	6.27	4	25.08	
67	SP4BDB	961	L55X55X4		3134	3.40	10.66	4	42.64	
68	SP4BDB	962	L55X55X4		3134	3.40	10.66	4	42.64	
69	SP4BDB	963	L65X65X4		2142	4.03	8.63	4	34.52	
70	SP4BDB	964	L65X65X4		2142	4.03	8.63	4	34.52	
71	SP4BDB	965H	H6 THK.	130	180	47.10	1.10	8	8.80	
72	SP4BDB	965AH	H6 THK.	115	130	47.10	0.70	8	5.60	
73	SP4BDB	966H	HL110X110X7		7000	11.80	82.60	2	165.20	
74	SP4BDB	967H	HL110X110X7		7265	11.80	85.73	2	171.46	
75	SP4BDB	968H	HL110X110X6		7000	10.20	71.40	2	142.80	
76	SP4BDB	969H	HL110X110X6		7265	10.20	74.10	2	148.20	
77	SP4BDB	970	L45X30X4		1596	2.27	3.62	4	14.48	
78	SP4BDB	971	L45X45X4		3114	2.75	8.56	4	34.24	
79	SP4BDB	972	L45X45X4		3114	2.75	8.56	4	34.24	
80	SP4BDB	973	L55X55X4		4619	3.40	15.70	4	62.80	
81	SP4BDB	974	L55X55X4		4619	3.40	15.70	4	62.80	
82	SP4BDB	975	L50X50X4		7793	3.08	24.00	4	96.00	
83	SP4BDB	976	L50X50X4		7793	3.08	24.00	4	96.00	
84	SP4BDB	976P	6 THK.	107	163	47.10	0.82	4	3.28	
85	SP4BDB	977	L55X55X4		2590	3.40	8.81	4	35.24	
86	SP4BDB	978	L55X55X4		2590	3.40	8.81	4	35.24	

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/DB/+9MBE

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

BILL OF MATERIALS

PART : +9M 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
87	SP4BDB	979	L45X30X4		1496	2.27	3.40	4	13.60	
88	SP4BDB	980	L45X30X4		1496	2.27	3.40	4	13.60	
89	SP4BDB	981	L60X60X4		5090	3.71	18.88	4	75.52	
90	SP4BDB	982	L60X60X4		5090	3.71	18.88	4	75.52	
91	SP4BDB	983	L65X65X4		3235	4.03	13.04	4	52.16	
92	SP4BDB	984	L65X65X4		3235	4.03	13.04	4	52.16	
93	SP4BDB	985	L50X50X4		4608	3.08	14.19	4	56.76	
94	SP4BDB	986	L50X50X4		4608	3.08	14.19	4	56.76	
95	SP4BDB	987	L45X30X4		1308	2.27	2.97	4	11.88	
96	SP4BDB	988	L45X30X4		1308	2.27	2.97	4	11.88	
97	SP4BDB	989	5 THK.	110	150	39.25	0.65	8	5.20	
98	SP4BDB	990	5 THK.	110	150	39.25	0.65	8	5.20	
99	SP4BDB	991	5 THK.	143	205	39.25	1.15	4	4.60	
100	SP4BDB	992	5 THK.	143	205	39.25	1.15	4	4.60	
101	SP4BDB	993	5 THK.	110	150	39.25	0.65	8	5.20	
102	SP4BDB	994	5 THK.	206	218	39.25	1.76	4	7.04	
103	SP4BDB	995	5 THK.	206	218	39.25	1.76	4	7.04	
104	SP4BDB	996	5 THK.	125	215	39.25	1.05	4	4.20	
105	SP4BDB	997	5 THK.	125	215	39.25	1.05	4	4.20	
106	SP4BDB	998	5 THK.	110	150	39.25	0.65	8	5.20	
107	SP4BDB	999	6 THK.	170	200	47.10	1.60	4	6.40	
108	SP4BDB	SP1H	H6 THK.	130	180	47.10	1.10	4	4.40	
TOTAL WT=									7963.48	

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	16	0.29	
6 THK. PACK WASHERS (For 16 Ø Bolt)	0.021	28	0.59	
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	0	0.00	
TOTAL WT.			0.88	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/DB/+9MBE

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

BILL OF MATERIALS

PART : +9M 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
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WEIGHT OF STEEL MEMBERS

<u>A) TOTAL WT. OF HT STEEL FAB. MEMBER</u>	=	6307.80	Kgs
<u>B) TOTAL WT. OF MILD STEEL FAB. MEMBER</u>	=	1655.68	Kgs
<u>C) TOTAL WT. OF PACK WASHERS</u>	=	0.88	Kgs
<u>GRAND TOTAL WT. OF FAB. MEMBER WITH PACK WASHERS (A+B+C)</u>	=	7964.36	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	564	67.12
HRH BOLT / NUT FOR M16X40	0.126	239	30.11
HRH BOLT / NUT FOR M16X45	0.134	312	41.81
HRH BOLT / NUT FOR M16X50	0.142	96	13.63
HRH BOLT / NUT FOR M16X55	0.150	0	0.00
HRH BOLT / NUT FOR M16X60	0.158	0	0.00
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	1355	12.20
STEP BOLTS OF 16X175MM DIA WITH 2 NUTS 1 S.W	0.374	42	15.71
<u>TOTAL WT. OF HEXAGONAL BOLTS / NUTS , SPRING WASHERS STEP BOLT</u>	=	205.49	Kgs

SUMMARY OF WEIGHTS

<u>A) WT. OF MS MEMBERS</u>	=	1655.68	Kgs
<u>B) WT. OF PACK WASHERS</u>	=	0.88	Kgs
<u>C) WT. OF HT MEMBERS</u>	=	6307.80	Kgs
<u>D) WT. OF FAB MEMBERS (A+B+C)</u>	=	7964.36	Kgs
<u>E) WT. OF BOLT & NUTS</u>	=	205.49	Kgs
<u>F) TOTAL</u>	=	8169.85	Kgs

REV. No	REVISION	DATE	INITIAL

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 "DB(0°-2°)"-MKD"G507 DB"
PART : +9M BODY EXTENSION

BOM NO. SL/PGCIL/400KV/BUTW-GRKH/DB/+9MBE

SECTION ABSTRACT

MILD STEEL	WEIGHT (Kg)	HIGH TENSILE	WEIGHT (Kg)	MS. PLATE	WEIGHT
L40X40X3		HL45X30X4	13.44	2 THK.	
L40X40X4		HL45X30X5		3 THK.	
L40X40X5		HL45X45X4	104.40	4 THK.	
L40X40X6		HL45X45X5		5 THK.	52.48
L45X30X4	65.44	HL50X50X4	122.00	6 THK.	13.60
L45X30X5		HL50X50X5	89.40	8 THK.	
L45X45X4	160.48	HL55X55X4		10 THK.	
L45X45X3		HL55X55X5		12 THK.	
L45X45X5		HL60X60X4		14 THK.	
L45X45X6		HL60X60X5		16 THK.	
L50X50X3		HL60X60X6		20 THK.	
L50X50X4	378.00	HL65X65X4	311.84	22 THK.	
L50X50X5		HL65X65X5	246.88	25 THK.	
L50X50X6		HL65X65X6		32 THK.	
L55X55X4	281.36	HL70X70X4			
L55X55X5		HL70X70X5	417.44	TOTAL MS PLT.	66.08
L55X55X6		HL70X70X6			
L55X55X8		HL75X75X4		HT. PLATE	WEIGHT
L60X60X4	216.08	HL75X75X5	91.40	H5 THK.	
L60X60X5	94.48	HL75X75X6	334.96	H6 THK.	98.56
L60X60X6		HL80X80X5		H8 THK.	33.96
L65X65X4	292.72	HL80X80X6		H10 THK.	
L65X65X5	101.04	HL80X80X8		H12 THK.	185.60
L65X65X6		HL90X90X5	12.00	H14 THK.	
L80X80X5		HL90X90X6		H16 THK.	
L70X70X4		HL90X90X7		H18 THK.	
L70X70X5		HL90X90X8		H20 THK.	
L70X70X6		HL100X100X6	39.60	H30 THK.	
L75X75X4		HL100X100X7			
L75X75X5		HL100X100X8			
L75X75X6		HL100X100X10		TOTAL HT PLT.	318.12
L80X80X6		HL110X110X6	1291.20		
L80X80X8		HL110X110X7	673.32		
L90X90X5		HL110X110X8			
L90X90X6		HL110X110X10			
L90X90X7		HL110X110X12			
L90X90X8		HL120X120X7			
L100X100X6		HL120X120X8			
L150X150X20		HL200X200X12			
L200X200X16		HL200X200X14			
L200X200X20		HL200X200X15	272.16		
FL50X5		HL200X200X16			
		HL200X200X17	1969.64		
		HL200X200X18			
TOTAL	1589.60	TOTAL	5989.68		
		GRAND TOTAL =	7963.48		